Clinical Reference Manual
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Notes
Practice of Medicine II: Navigating the Medical Campus

An overview of the medical center

- The Medical School is at the southeast corner.
- South Campus (blue) houses most of the inpatient wards (medicine, surgery, OB, etc).
- North Campus (yellow) has most of the outpatient services plus Oncology and some surgery.
- Children’s Hospital (purple) faces Kingshighway.
TO GET ANYWHERE ON THE SOUTH CAMPUS:

From the med school, go across the street to the hospital (the McMillan Hospital Entrance, which faces the Farrell LTC). Follow the very long carpeted corridor. You will pass the Vision Center on your left, then the chapel on your right, and then you will be at the central intersection (marble floor). From there you can go to various destinations as listed below.

Barnes-Jewish Hospital South Campus Nursing Divisions for Hospital Sessions

“100” Divisions (9100, 10100, 11100, 12100): Follow the very long carpeted corridor on past the marble intersection, all the way to the end. Take the Queeny Tower elevators to your floor.

“200” Divisions (9200, 10200, etc.): Follow the very long carpeted corridor past the marble intersection. On your left (just past Medical Records) are the Rand-Johnson elevators, which will go to your floor.

“300,” “400,” “500” Divisions (14400, 7500, etc): At the marble intersection, turn left. You will see the marble lobby with the fountain. Take the Central Elevators to the left of the fountain. (Admitting is off this lobby)

Department of Internal Medicine, Kipnis & Moore Conference Rooms (6th floor Wohl Hospital)

Follow the very long carpeted corridor to the marble intersection. Turn right. Go past the Barnes cafeteria, to the very end of the hall. On your left are 2 elevators for the Wohl Hospital. Go to the 6th floor. The Kipnis Conference Room is just to your left. On your right are a receptionist’s desk and the Moore conference room.

Wohl Clinics Building – Clopton Auditorium (lower level) and the POM Office (2nd floor)

Follow the very long carpeted corridor to the marble intersection. Turn right. Go past the Barnes cafeteria, to the very end of the hall. To your left are the 2 elevators for the Wohl Hospital building, to your right, around the corner, is the Wohl Clinic building. In the Wohl Clinic building you will see a bank of 2 elevators, a stairway and a bank of 3 elevators; take any of those down 1 floor to the lower level and you will be in the lobby of the Clopton Auditorium. (On CPC days just follow the stream of white coats from the cafeteria to Clopton!)

Tricks

- When in doubt, go back to 1st floor and get reoriented to the long east-west corridor
- The Southwest Tower is across from the south campus cafeteria, just beyond the Barnard elevators
  - ER – “Street” level SW Tower
  - Cardiac Cath lab on 1st floor SW Tower (across from cafeteria, beyond Barnard elev.)
  - The CT-ICU is on 5th floor SW Tower which connects to 7th floor Rand Johnson
STANDARDIZED PATIENT HISTORY AND PHYSICAL EXAM CHECKLIST

NOTE:
- The history and the physical examination must be tailored to each patient's chief complaint and acuity of illness. These checklists would constitute a very thorough H&P in a patient with no particular complaints. The neurologic exam in particular can be quite expanded or abbreviated, depending on symptoms, PMH, and exam signs.
- Abnormal symptoms or signs warrant further evaluation. If you notice a limp then you need to do careful musculoskeletal and neurologic exams.
- Careful observation yields much information. As examples – if the patient mentions “my wife made me come” then you don’t have to ask about marital status. Watching the patient walk across the room and climb onto the exam table tells you a lot about gait, balance, strength and coordination.

COMMUNICATION & INTERPERSONAL SKILLS

<table>
<thead>
<tr>
<th>The student did the following:</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The student knocked on the door before entering</td>
<td></td>
</tr>
<tr>
<td>The student introduced himself/herself to me appropriately, using my name to confirm my identity.</td>
<td></td>
</tr>
<tr>
<td>The student maintained appropriate eye contact during the session</td>
<td></td>
</tr>
<tr>
<td>The student allowed me to state my reason for being here without interrupting me</td>
<td></td>
</tr>
<tr>
<td>The student asked concise and understandable questions</td>
<td></td>
</tr>
<tr>
<td>The student told me about the Physical exam before starting to actually do the physical exam</td>
<td></td>
</tr>
<tr>
<td>The student washed his/her hands before starting P/E</td>
<td></td>
</tr>
<tr>
<td>The student draped me appropriately and respectfully prior to starting the physical exam</td>
<td></td>
</tr>
<tr>
<td>The student maintained “draping manners” during P/E (by asking permission and explaining why before exposing any part of the body to be examined; and avoided examining me through the drape or gown).</td>
<td></td>
</tr>
<tr>
<td>The student respected my comfort during the encounter by helping me sit up and get on/off the examination table, re-tied my gown (if the gown was untied by student during the physical exam).</td>
<td></td>
</tr>
<tr>
<td>The student respected my comfort during the encounter by avoiding unnecessarily repeating painful maneuvers.</td>
<td></td>
</tr>
<tr>
<td>Communicated with me throughout the course of the physical exam using language I could understand?</td>
<td></td>
</tr>
<tr>
<td>Had an organized sequence in performing the different parts of the exam (i.e., minimized the number of times that I needed to change my position)?</td>
<td></td>
</tr>
<tr>
<td>The student summarized the encounter findings (history and physical exams) with possible diagnoses being considered in terms I could understand.</td>
<td></td>
</tr>
<tr>
<td>The student summarized the next steps for evaluating my problem in terms I could understand.</td>
<td></td>
</tr>
<tr>
<td>The student asked if I had any questions or concerns and responded to them appropriately.</td>
<td></td>
</tr>
<tr>
<td>Rate your overall level of satisfaction with the student encounter:</td>
<td></td>
</tr>
<tr>
<td>- Outstanding (i.e., I would seek out this person for my future care needs and would personally recommend this person to my friends seeking care)</td>
<td></td>
</tr>
<tr>
<td>- Very good (i.e., I would definitely return to this person for further care)</td>
<td></td>
</tr>
<tr>
<td>- Good (i.e., I felt adequately cared for &amp; had no particular concerns about my encounter)</td>
<td></td>
</tr>
<tr>
<td>- Needs Improvement (i.e., I would prefer not to see this person again for further care)</td>
<td></td>
</tr>
<tr>
<td>- Marginal (i.e., I would specifically avoid seeing this person again for further care)</td>
<td></td>
</tr>
<tr>
<td>- Unacceptable (i.e., I would absolutely refuse to see this person again for further care and would personally advise my friends to avoid seeking care from this person)</td>
<td></td>
</tr>
</tbody>
</table>
### HISTORY - The student asked the following?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 2. Chief Complaint | the student asked if I had any complaints/problems today
| 3. History of Present Illness | The student thoroughly characterized my chief complaint.
|   | a. The student used open ended questions and did not interrupt my answers
|   | b. Describe the symptom (such as What does the pain feel like/the quality of the pain? What did your “dizziness” feel like?)
|   | c. For pain symptoms - Where is the pain? Does the pain radiate/spread anywhere?
|   | d. When did the (symptom) start? Did anything seem to trigger it?
|   | e. Is the (symptom) progressing, getting better or worse? Steady or comes and goes?
|   | f. What makes the (symptom) better or worse?
|   | g. When, if ever, has this occurred before?
|   | h. What are associated symptoms?
|   | i. How is this affecting your life/is it preventing you from doing anything?
|   | b. Treatment.
|   | c. Complications
|   | d. Asked specifically about hypertension, heart disease, diabetes, and high cholesterol?
| 5. About my **past surgical problems**: | a. Type of surgery and why performed
|   | b. When the surgery was performed.
| 6. For women: about my **Ob/Gyn history**: | a. Age at first menstruation.
|   | b. Number of times I have been pregnant and number of deliveries.
|   | c. Whether I currently have periods.
|   | d. If so, whether my periods are regular, duration of cycle and duration of flow
|   | e. Date of my last menstrual period.
|   | f. If no periods, age at menopause?
| 7. About my **medications**: | a. Dose.
|   | b. Frequency.
|   | c. About over-the-counter or non-prescription medications.
| 8. About my **allergies**: | a. The specific allergic reaction.
|   | b. My marital status/living situation - Who do you live with? Where do you live? (Depending on the complaint: Who helps you when you are ill?)
|   | c. Habits:
|   | 1. Smoking.
|   | 2. Drinking.
|   | 3. Use of any drugs.
|   | d. Exposures.
|   | 2. Exposure to Tuberculosis.
|   | 3. Any occupational exposures (dust, fumes, etc.).
| 10. About my **family history**: | a. Whether anything runs in my family.
|   | b. Whether heart disease runs in my family.
|   | c. Whether diabetes runs in my family.
|   | d. Whether high blood pressure runs in my family.
|   | e. Whether cancer runs in my family.
| 11. About my **sexual history**: | a. Whether I am sexually active
|   | d. If I have ever had a sexually transmitted disease
12. The **Review of Systems:**

Began by explaining to me that these are screening questions.

Had an organized sequence in asking me ROS questions.

The ROS was brief and efficient.

**Asked me whether or not I had any of the following (at least 1 symptom per category):**

<table>
<thead>
<tr>
<th>Category</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. General/systemic</td>
<td>Fever, chills, night sweats, changes in weight or appetite, fatigue</td>
</tr>
<tr>
<td>b. Skin/Integument</td>
<td>Rashes, lumps, itchiness, changes in hair or nails</td>
</tr>
<tr>
<td>c. HEENT</td>
<td>Changes/problems with vision (nearsightedness, blurred vision, double vision), changes/problems with hearing, ringing in ears, dizziness, lumps/swollen glands in neck</td>
</tr>
<tr>
<td>d. Endocrine</td>
<td>Hot or cold at temperatures where others are comfortable, excessive hunger, excessive thirst, frequent urination</td>
</tr>
<tr>
<td>e. Breasts</td>
<td>Lumps, pain, nipple discharge</td>
</tr>
<tr>
<td>f. Cardiovascular</td>
<td>Chest pain, heart racing/fluttering, shortness of breath with activity, awake at night short of breath, sleep on more than one pillow because of shortness of breath, fainting or lightheadedness, swelling in legs, pain in calf with walking which is relieved with rest</td>
</tr>
<tr>
<td>g. Pulmonary</td>
<td>Cough, wheezing, shortness of breath</td>
</tr>
<tr>
<td>h. Gastrointestinal</td>
<td>Difficulty swallowing, heartburn, nausea, vomiting, abdominal pain, constipation, diarrhea, changes in stool size/caliber, black/tarry stool, blood in stool</td>
</tr>
<tr>
<td>i. Genitourinary</td>
<td>Burning/pain with urination, blood in urine, need to urinate urgently/suddenly, getting up in the middle of the night to urinate, loss of control of urination, difficulty getting urine stream started, genital discharge, genital sores</td>
</tr>
<tr>
<td>j. Musculoskeletal</td>
<td>Muscle weakness or pain, joint pain or swelling, back pain, limitation of motion or activity</td>
</tr>
<tr>
<td>k. Hematologic</td>
<td>Abnormal bleeding, easy bruising, enlarged lymph nodes in neck/armpits/groin</td>
</tr>
<tr>
<td>l. Neurologic</td>
<td>Headaches, weakness, numbness, change in memory, difficulties with speech, difficulties walking</td>
</tr>
<tr>
<td>m. Psychiatric</td>
<td>Depressed mood, excessive moodiness, nervousness</td>
</tr>
</tbody>
</table>
## PHYSICAL EXAMINATION

### Patient Sitting or Supine:

#### General Inspection and Vital Signs:

- Observed my respiratory rate?
- Checked the pulse in my wrist for pulse rate?
- Measured blood pressure in both my arms?

Throughout the history and exam, the student should observe the following. If any abnormalities are noted then more directed testing should be done.

- Level of consciousness (hypervigilent, alert, lethargic, obtunded, comatose)
- Attentiveness, ability to follow directions
- Speech – structure and content
- Insight, reasoning

### Patient Supine:

#### Neck:

- Felt and listened to the pulses on both sides of my neck?
- Checked the veins on the right side of my neck?

#### Heart Exam:

- Listened to my heart in four different places? (underneath my gown?)
- Felt my heartbeat under my left breast?

#### Abdominal Exam:

- Inspected my abdomen for scars, etc.?
- Listened to my abdomen in several places? (underneath my gown?)
- Tapped out my liver size?
- Pressed on my abdomen in several places?
- Pressed the right side of my abdomen to look for my liver edge?
- Pressed on the left side of my abdomen to look for my spleen?
- Pressed on my abdomen with both hands at once to examine my abdominal aorta?
- Examined the arteries (femoral arteries) in my groin?
- Examined the lymph nodes in my groin?

### Patient Sitting:

#### Head (Eyes, Ears, Nose):

- Evaluated my eye movements?
- Tested my pupils for reaction to light?
- Examined my eyes with an ophthalmoscope?
- Examined the inside of my ears using an otoscope?
- Inspected my nose with an otoscope tip?
- Examined my mouth with a tongue depressor and asked me to say “ah”?
- Asked me to stick out my tongue and move it from side to side?
- Checked my hearing with a finger rub on both sides?
- Tested my facial muscles? (such as raise eyebrows/close my eyes tightly/clench my teeth/smile)
- Asked me to shrug my shoulders while pressing on my shoulders?
- Asked me to turn my head to each side against his/her hand?
- Asked me if I could feel a cotton swab touching my face (forehead, cheeks, chin on both sides) while my eyes were closed?

#### Neck:

- Tested my neck for movement – forward, backward?
- Examined the lymph nodes in the front and back of neck, under chin, and across collarbone?
- Examined my thyroid gland? (Usually done with student standing behind you and asking you to swallow).
**Back:**
- Checked my spine and flank/kidney area for tenderness?
- Tapped on my lungs in the back? (underneath my gown?)
- Listened to the front and back of my lungs? (underneath my gown?)

**Arms:**
- Checked the pulses in **both** my wrists?
- Checked the movement in my wrists, elbows, and shoulders (**both** arms)?
- Checked my hand grip and the strength in my arms and shoulders (**both** arms)?
- Checked my reflexes in 3 places (biceps, triceps, brachioradialis/wrist) on **both** arms?
- When my eyes were closed, asked me if I could feel a cotton swab touching my hands (**both** hands)?
- Asked me to touch one of their fingers and then my nose (with **both** hands)?
- Examined the lymph nodes underneath my armpits?

**Legs: (This part of the exam may also be done when you are lying down.)**
- Checked for swelling in **both** my legs (usually by pressing on your shins)?
- Checked the pulses near my ankles and on top of my feet (on **both** feet)?
- Checked the muscle strength in my legs and feet (**both** legs)?
- Checked reflexes in my knees and ankles (**both** legs)?
- Checked my response to having the bottom of **both** my foot stroked (plantar response)?
- Asked me to move each of my heels down the opposite shin (**both** legs)?
- When my eyes were closed asked me if my great toe was up/down (**both** feet)?
- When my eyes were closed asked me if I could feel a cotton swab touching my feet (**both** legs)?

**Patient Standing**
- Asked me to stand with my feet together and close my eyes?
- Asked me to stand with my arms forward and eyes closed?
- Asked me to walk across the room?
- Asked me to walk on my heels?
- Asked me to walk on my toes?
- Asked me to walk heel-to-toe?
Instructions for writing up a complete H&P with differential diagnosis

This is a very important document. This is the complete written record for your patient. It explains what you did and why you did it. You and others may look back at this document multiple times as new questions arise. Physicians cross-covering on your patient will rely on this document to help them in the event of an emergency, especially if your patient is unable to speak to them directly. In the event of future legal action, this document is part of the patient’s medical record and may be used in court.

1. Write up the history and physical exam findings:

Chief Complaint (CC): Try to keep this short and simple. It should be the presenting symptom or a direct quote from the patient (eg. chest pain or "My chest feels like an elephant is sitting on it") The chief complaint "sets the stage" for the rest of the story. It gives your listener-reader the beginning of a differential diagnosis list to work with and tunes them into listening for "clues" you will offer them in the rest of the history and physical to trim down this list.

History of Present Illness (HPI): This is the main story, the place where you give all of the details of the chief complaint. It is customary to start out with an identifier sentence stating the age, ethnicity, gender, and any pertinent past medical history for your patient with a restatement of the chief complaint. For example, "M.R. is a 45 year-old white male with history of HTN and diabetes who presents with chest pain." Do not include all of the patient’s past medical history in this sentence, just those items which are pertinent to the chief complaint. Try to tell the story in chronological order; do not jump around in time—this is confusing to the reader.

   Remember the "WH" questions when writing up the details of the patient’s complaint. Where exactly is the pain? Where does it radiate? What does it feel like? What makes it better or worse? What is it associated with? When/how often does it happen? When, if ever, has this happened in the past?

   The HPI should also include pertinent positive and negative items from the review of systems. For example, in a patient presenting with chest pain, +SOB, fever to 102, and productive cough would move pneumonia closer to the top of your differential, whereas +heartburn, water brash, and a clear association with food intake would move GERD closer to the top of your list.

Past Medical History: This is usually written in list format. Remember to include the date of diagnosis, treatment, and associated complications or tests for each diagnosis.

For example:

1. DM II: dx’d 11/01, +retinopathy/+nephropathy/+neuropathy, last A1C= 9.4 on 3/4/03.

2. CAD: dx’d after MI 4/02, s/p LAD stent 4/02, last ECHO 6/02 revealed LVH, mild TR, EF 55%.

Past Surgical History: Again, this is usually written in list format. Remember to include the date and reason for each surgery. For example:
1. TAH (total abdominal hysterectomy): 2/89 for fibroids.

2. s/p appy: age 8 for acute appendicitis.

**Medications:** Include name and dosage. Include OTC meds and herbal supplements.

**Allergies:** Remember to include reaction.

**Social History:** Include occupation, marital status/living situation, habits (tobacco, alcohol, and drug use—specify amount), exposure history (including environmental, TB, blood transfusion). Depending upon the presenting complaint, the social history may need to be expanded. For example, if a patient presents with fever of unknown origin, animal exposure/pets and travel history become significant. Some physicians include the patient’s sexual history in this section and some write this as a separate heading; either is correct.

**Family History:** Generally, this includes only first-degree relatives. Include age of diagnosis if known. This is especially important for CAD and cancer. Do not write "non-contributory" under this heading.

**Review of Systems (ROS):** This is the "laundry list" of possible symptoms for each system. Include both positives and negatives. If you have already covered a system in the HPI, it is acceptable to write "see HPI."

**Physical Exam:** Write what you see or don’t see—don’t write "normal"! The general order of the headings is listed below. For specific examples of what to include in each section and how to write it, please review the sample H&P attached to this packet. There are a few specific comments/suggestions written below.

**General:** This is a short, one-sentence comment about the patient’s general appearance. For example, "Very tachypneic in severe respiratory distress, using accessory respiratory muscles, unable to speak in full sentences."

**Vitals:** Include the position of the patient when the blood pressure was taken (standing, sitting, or supine). Include O2 stat if appropriate and specify the amount of oxygen the patient was receiving when it was recorded (eg. RA vs. 2L NC, etc.)

**HEENT:**

**Neck:**

**Breast:**

**CV:** JVP measurement may be included either here or in the "neck" section.

Peripheral pulses may be included either here or in the extremities section. Some physicians write the peripheral pulses in a table format, others write them out separately.

Example: 2+ bilateral radial, brachial, femoral, popliteal, PT, and DP pulses, OR...
**Carotid**
- Left: 2+
- Right: 2+

**Radial**
- Left: 2+
- Right: 2+

**Brachial**
- Left: 2+
- Right: 2+

**Femoral**
- Left: 2+
- Right: 2+

**Popliteal**
- Left: 2+
- Right: 2+

**PT**
- Left: 2+
- Right: 2+

**DP**
- Left: 2+
- Right: 2+

*Note: carotid pulses may be included with the neck exam.*

**Resp:**

**Aabd:** Remember to mention any old surgical scars on the abdomen.

**Rectal:** In males, include prostate exam. If you perform a stool guaiac, write the results here.

**GU:**

**Ext:**

**Neuro:** Do not write “non-focal”-- write out all of the components of the neuro exam. You may summarize motor and reflex testing in a figure or table if you prefer.

3. **Add pertinent diagnostic study data** (labs, radiology studies, EKGs, etc.)

Electrolytes are generally written in a grid:

\[
\begin{array}{cccc}
\text{Na} & \text{Cl} & \text{BUN} & \text{Glucose} \\
\text{K}^+ & \text{HCO}_3^- & \text{Scr} & \\
\end{array}
\]

The complete blood count CBC is also reported in a grid

\[
\begin{array}{ccc}
\text{WBC} & \text{Hgb} & \text{Plts} \\
\text{Hct} & & \\
\end{array}
\]

***When reporting the CBC be sure to include the MCV and the differential.***

"Liver function tests (LFTs)" generally include: TB (total bilirubin), DB (direct bilirubin), A (alkaline phosphatase), AST, ALT, TP (total protein), alb (albumin).

**UA (urinalysis):** includes pH, sg (specific gravity), LE (leukocyte esterase), Nit (nitrates), glucose, protein, blood.

**ABGs:** pH/pCO2/pO2/calc HCO3—always specify whether the patient was on any oxygen when the measurement was taken, and if so, how much (e.g. 2L O2 NC or .5FiO2).

There are many other lab values which you could potentially report, but include them only if they are pertinent.

In general, you do not need to include units when reporting common labs. Include the normal range in parenthesis for uncommon labs (e.g. prolactin) and include the therapeutic range in parenthesis when reporting drug levels (e.g. dilantin).
When reporting EKGs include: rate, rhythm, axis, interval sizes (PR, QRS, QTc), ST segment depression or elevation, T wave inversions, and comparison to prior EKGs.

4. **Formulate a problem list**

Generally, we only include problems that are active. For example, if your patient presents with a chief complaint of dyspnea and has a medical history which includes diabetes, HTN, and hysterectomy, you would include dyspnea, DM II, and HTN on your problem list since all of these problems require monitoring and treatment. You would not include hysterectomy on your problem list since this is no longer an active issue and does not require ongoing treatment.

5. **Generate a differential diagnosis for the chief complaint**

You do not need to generate a differential for items on your problem list that already have an established diagnosis (e.g. DM II, HTN, hyperlipidemia).

Use the attached reference guide for help with creating a differential. For example, you can look up "epigastric pain" in any of these references and you will find a list of things which can cause epigastric pain. You can then move to a general reference book to help decide if the description of a certain diagnosis (such as pancreatitis or peptic ulcer disease) fits with your patient’s presentation.

6. **Formulate a plan of action for each item on your problem list.**

***Note: We will not work on this step in POM II. You will add this step during your third year clerkships."
Creating a Problem List and Differential Diagnosis

Step #1 – Begin by constructing a "Problem List" – a complete list of the patient’s "problems" or issues

- You are essentially summarizing the clinical data that you have gathered into a simplified and more manageable form by creating a list. All of the items on the patient’s problem list will need to be addressed as part of a complete diagnostic/therapeutic management plan. The list of problems/issues may consist of any of the following:
  - Symptom - This is often the patient’s chief complaint. The chief complaint may need to be "translated" into a clinical diagnosis: "I fell out this morning" --> Syncope, "I have burning when I urinate" --> dysuria.
  - Sign = physical exam finding.
  - Clinical finding or known diagnosis - such as "history of hypertension."
  - Lab abnormality.
  - Additional issues impacting the patient’s care, including psychosocial factors (eg, inability to pay for medications; homelessness; etc).

Step #2 – Prioritize the List of Problems

- Consider the following points when prioritizing the problem list:
  - Which issue is the most concerning to the patient? This is often, but not always, the chief complaint.
  - What is the most life threatening issue?
  - Which issue requires the most immediate attention?

- Note that the issue that is most concerning to the patient is not always the most urgent or important issue to address from a clinical standpoint.

Step #3 – For each item on your problem list, generate a complete list of potential diagnostic possibilities.

- This complete list of potential causes or diagnoses is called the Differential Diagnosis (ddx).

- There are many approaches to constructing a differential diagnosis. There is no right or wrong approach to use in a given case, each technique is just a stimulus to your thought process. You may use more than one technique to make sure you haven't missed an important diagnostic possibility. Over the course of the case development sessions, some of these techniques will be demonstrated and put to use.
Potential approaches to formulating a DDX:

- Simple list of diagnoses.
- Mnemonic to remember a longer list of diagnoses.
- Diagnostic template based on pathophysiology, such considering renal failure as categorized into pre-renal, intra-renal, and post-renal causes; or anemia as categorized into microcytic, normocytic and macrocytic.
- Pattern recognition based on a cluster of findings - this can be useful but requires more knowledge and clinical experience.
- Anatomic - consider what anatomic structures are in the vicinity of the problem; this can work well for pain: chest pain, RUQ abdominal pain, etc.
- Systems approach - The list is based on the underlying mechanisms of the disease process in question. A complete listing will include all of the following systems (there are mnemonics to help remember the categories):
  - Genetic/congenital.
  - Mechanical/trauma.
  - Infectious.
  - Neoplastic.
  - Inflammatory.
  - Endocrinologic.
  - Immunologic.
  - Iatrogenic.
  - Metabolic.
  - Vascular.
  - Toxic.
  - Degenerative.
  - Nutritional.
  - Psychogenic.
  - Idiopathic.

Step #4 – Prioritize the potential causes or diagnoses that you have listed as the differential diagnosis.

- Review the following 4 categories of information/data:
  - History of present illness and relevant items in the review of systems.
  - Patient characteristics (age/gender, past medical history, social history, family history).
  - Physical examination.
  - Laboratories.
• For each of the diagnostic possibilities that you have listed ask:
  o Are there supporting data? (Pertinent positive findings)
  o Are there any findings that are absent, that are common/necessary for that particular diagnosis? (pertinent negatives)

• Once you have examined each of the 4 categories of information and asked these questions prioritize your differential diagnosis taking into consideration the following points:
  o **Most likely** for your patient (i.e., after reviewing all available historical, physical exam, and laboratory information).
  o **Most common** diagnosis (often also the most likely diagnosis).
  o **Most serious**/potentially life-threatening diagnosis ("don't miss" diagnoses – they would be dangerous to miss and thus should always be considered).
  o **Most interesting** diagnosis (may be important to consider for teaching/academic purposes).

**Step #5 – Collect additional information in order to refine your initial differential diagnosis.**

• Once you have developed a prioritized differential diagnosis based on the information that is initially available, you will need to think about gathering additional information to narrow the differential diagnosis.
  o At this stage of your training, your initial differential diagnosis and knowledge about specifics of the diagnoses will be limited (this is to be expected since you have not had extensive clinical experience). So, the first piece of "additional information" that you will need at this point is information from a textbook or other source about the potential diagnoses. Read about the specific features of the various diagnoses and think about them in the context of your patient.
  o After you have gathered clinical information on the diagnosis you may find that there are pertinent positive or negative history or physical exam features for diagnoses listed on your differential that you didn’t look for when you performed your initial H/P. You should go back to the patient and ask a few more specific questions or look for additional physical exam findings that would be useful in confirming or refuting a particular diagnosis or diagnoses. Even an experienced clinician will go back to a patient to gather more information as new diagnostic possibilities are considered.
  o You may also need to take a more detailed look at the lab data or at the medical chart or old medical records for additional information. You may need to contact other sources of information (with the patient's permission, of course): the patient's family members, or the patient's prior health care providers such as the primary care physician, the dialysis unit, the nursing home).

**Step #6**

• Refine the differential diagnosis after you have performed Step #5.
• You may need to perform Step #5 several times before you are able to create a reasonable differential diagnosis that will be part of your write-up.
Once you have a differential diagnosis that you have created based on all the currently available information, you will then begin to think about additional labs or testing that will be helpful in reaching a final diagnosis.

Ultimately you want a differential that is relevant to your patient but still remains broad enough that you are not missing any reasonable or important diagnostic possibilities.

Repeat Steps #3-6 for each symptom, sign, clinical finding/diagnosis, or lab finding on your prioritized list of problems.

References for Generating a Differential Diagnosis

**Reference Books** (available in Becker Medical Library)


**Online References via Becker Library**

Stat Ref – includes
  - DeGowin’s Diagnostic Examination
  - Current Medical Diagnosis and Treatment
  - Harrison’s Principles of Internal Medicine

Isabel, clinical decision support system

MD Consult – includes Ferri’s Clinical Advisor 2007: Instant Diagnosis and Treatment, 9th ed.

UpToDate on line (available only at Washington University computers): www.utdol.com
EXAMPLE OF A FAIRLY THOROUGH H&P

(Pt’s Name & DOB)

12/10/06  0900

CHIEF COMPLAINT: Abdominal pain x 7 days

HISTORY OF PRESENT ILLNESS:
Mrs. A is a 65-year-old woman who is 11 years S/P liver transplant. She presents to the ED today with a seven day history of abdominal pain. She was in her usual state of health until 7 days ago when she had the insidious onset of pain across the lower abdomen. She describes the pain as sharp and steady. It has gradually worsened and is currently 5 out of 10 in intensity. There is some radiation to the low back. The pain is not particularly worsened by eating, but she hasn’t had much appetite. She has had nausea and occasional vomiting for several days; no hematemesis or coffee grounds emesis. The pain is not changed by bowel movements. Her BMs are normally once daily, but her last BM was yesterday morning. There has been no change in the color or consistency of the stools. She denies any bloody or black stools. No fever. No dysuria. She did not eat any unusual foods prior to this episode. None of her friends or family have had GI symptoms. No new medications recently. No travel. She was up all night with the pain and finally called her primary care physician this morning and was instructed to come to the emergency room. The patient states that she has experienced similar pain approximately one year ago which resolved spontaneously and was attributed to abdominal scar tissue.

PAST MEDICAL HISTORY:
- Chronic Hepatitis C
- Cirrhosis secondary to Hep C, S/P liver transplant 1995; she has done well since then and has stable labs with good liver function
- Type 2 diabetes x 11 yrs, diet controlled, last A1c 5.8%, no albuminuria, last eye exam 1 yr ago, no retinopathy
- Hypertension x 11 yrs, mild and well controlled
- Chronic renal insufficiency, baseline creat 1.4-1.7
- Pulmonary sarcoidosis; interstitial infiltrates on CXR in past; no sx, no Rx
- GERD
- S/P CVA 1995 (post-op); she has mild residual L foot numbness
- S/P pulmonary embolism 2001
- Hx depression
- Possible gout
- 12/05 partial small bowel obstruction, no surgery required

PAST SURGICAL HISTORY:
- Hx ectopic preg & RSO many years ago
- 1995 orthotopic liver transplantation
- 1/05 Total vaginal hysterectomy with LSO, A&P repair; course complicated by post-op abscess
ALLERGIES: NKDA

MEDICATIONS:
- Allopurinol 100 mg per day
- Atenolol 100 mg per day
- calcium with vitamin D 2 tablets b.i.d.
- hydrochlorothiazide 25 mg per day
- lisinopril 10 mg per day
- loperamide 2 mg p.r.n. diarrhea
- Ranitidine 150 mg q. h.s.
- Rapamune sirolimus 1 mg every other day
- Tylenol #3 1 or 2 tablets t.i.d. p.r.n. (she uses infrequently)

FAMILY HISTORY: Her parents are deceased. Her father had hypertension and died of an MI at age 80. Her mother had hypertension, diabetes, and died of breast cancer at age 86. Three brothers all have hypertension. Two sons are alive and well.

SOCIAL HISTORY: She is a retired secretary. No history of exposure to chemicals/dusts/fumes. She is widowed and is not sexually active. She has 2 sons, one in St Louis and one in Atlanta. She lives alone in an apartment and is independent in all ADLs. She has never used tobacco or alcohol. +blood transfusions with liver transplant.

REVIEW OF SYSTEMS:
- Gen’l - No fevers, chills, night sweats, change in appetite, change in weight, or fatigue.
- HEENT - No hearing changes or problems, vertigo. No blurry or double vision. She is due for her annual eye exam.
- CV - No chest pain, palpitations, dyspnea on exertion, PND, orthopnea, edema, syncope, presyncope, claudication
- Resp - No cough, shortness of breath or wheezing.
- GI – as per HPI
- GU - No dysuria, hematuria, urinary urgency, incontinence, nocturia, vaginal discharge, or sores.
- MSK – she often has pain in the right ankle and foot.
- Integ - No rash, lesions, or pruritis. Breasts - no masses, pain, discharge
- Neuro - No weakness, changes in memory, speech abnormalities, gait difficulties. Left foot numbness since CVA.
- Psych - No depressed mood.
- Endocrine - No heat/ cold intolerance, excessive hunger, polyuria or polydipsia. Weight stable.
- Heme/lymph - No abnormal bleeding, easy bruising, no lymphadenopathy.
- Allergic/imm – “sinus trouble” in spring and fall

PHYSICAL EXAMINATION:
- Gen’l – The patient is lying on her right side and she appears uncomfortable.
• HEENT – NC/AT, PERRL, EOMI, fundi – disks sharp, no hemorrhages or exudates; nares patent, septum midline, oropharynx is pink and moist.
• Neck – supple without goiter, adenopathy, masses, JVD.
• Breasts – no masses or discharge.
• Heart – Regular rate and rhythm with no murmurs, gallops or rubs.
• Lungs – clear to auscultation and percussion bilaterally.
• Abd – well healed midline incision; moderate distension; bowel sounds diminished; tenderness to palpation in the right and left lower quadrants, + voluntary guarding, no rebound; no masses palpated; liver ~10 cm in MCL, smooth and nontender.
• Rectal – normal sphincter tone, + tenderness towards RLQ, stool brown and guaiac negative
• Pelvic – normal external genitalia, no discharge in vaginal vault, no cervix present, + tenderness towards RLQ
• Ext – no C/C/E. Pulses 2+ bilat in carotid, radial, DP, PT
• Neuro –
  Mental status – alert and oriented x 3; speech fluent and appropriate
  Cranial nerves
    II: Visual fields full; disc margin sharp.
    III, IV, VI: EOMI, PERRL
    V: Facial sensation intact; jaw movement symmetrical
    VII: Face symmetric
    VIII: Hearing normal to finger rub
    IX, X: Intact gag reflex; no hoarseness.
    XI: Intact head turning and shoulder shrug.
    XII: Tongue midline
  Motor: normal tone; strength 5/5 x 4 extr
  Sensory: intact to LT in feet, except subjectively decreased, “different” in left foot
  Coordination: intact to finger-nose-finger and heel-knee-shin bilat
  Reflexes: 2+ and symmetric bilat biceps, triceps, knees; ankle jerks not elicited. Toes downgoing.
  Station & gait – deferred due to abdominal pain

LABS:

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<th>Lipase 62</th>
<th>84 N, 12 Ly, 3 Mono, 1 Eo</th>
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<th>266</th>
</tr>
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</table>

Amylase 51, Lipase 62
Total Protein  6.4  
Albumin  3.6  
Calcium  9.2  
Total Bilirubin  0.3  
Alkaline phosphatase  103  
ALT  34  
AST  49  

UA – yellow, clear, Sp gravity 1.011, pH 6.5, protein neg, glu neg, ketone neg, blood neg, leukocyte esterase neg, nitrate neg, RBC-0, WBC-1, bact-1+

A&P

This 65 year old woman who is S/P liver transplant presents with a 1 week history of lower abdominal pain, nausea and vomiting.

1) Abdominal pain, nausea and vomiting – Possible etiologies include diverticulitis, appendicitis, or early small bowel obstruction. She did have a partial small bowel obstruction 1 yr ago. Diverticulitis or appendicitis would most commonly localize to the left or right lower quadrant respectively, but can present with diffuse pain/tenderness if there is widespread inflammation. On exam she does not have peritoneal signs at this point. Inflammatory bowel disease is possible, but less likely (no diarrhea or bleeding). Severe cystitis is unlikely given the unremarkable UA. She has no symptoms of infectious gastroenteritis. Gyn diagnoses are ruled out as she is S/P hysterectomy and oophorectomy.

Will check an abdominal/pelvic CT to look for evidence of obstruction or inflammation. A surgical consultation will be requested.

2) Hepatitis C S/P liver transplant for cirrhosis. Her labs document continued good hepatic function. Will continue sirolimus. Will notify Hepatology of her admission.

3) DM type 2 – this has been well controlled with just diet. Will monitor her blood sugar. The stress of an acute illness may necessitate insulin therapy while in hospital.

4) Hypertension, mild and well controlled on current meds

5) CRI – creat at baseline

6) Hx of pulmonary sarcoidosis – asymptomatic

7) GERD

8) S/P CVA 1995 (post-op); she has mild residual L foot numbness

9) S/P pulmonary embolism 2001

10) Hx depression – currently euthymic off meds

11) Possible gout

Sam Student, WUMS III
Pager 823-1111
EXAMPLE OF A MEDIUM LENGTH H&P

(Pt’s Name & DOB)

12/10/06 0900

CHIEF COMPLAINT: Abdominal pain x 7 days

HISTORY OF PRESENT ILLNESS: Mrs. A is a 65-year-old woman who is 11 years S/P liver transplant. She was in her usual state of health until 7 days ago when she had the insidious onset of sharp/steady pain across the lower abdomen. It has gradually worsened and is currently 5 out of 10 in intensity. There is some radiation to the low back. The pain is not particularly worsened by eating, but she hasn’t had much appetite. She has had nausea and occasional vomiting for several days; no hematemesis or coffee grounds emesis. The pain is not changed by bowel movements. Her BMs are normally once daily, but her last BM was yesterday morning. There has been no change in the color or consistency of the stools. She denies any bloody or black stools. No fever. No dysuria. She was up all night with the pain and finally called her primary care physician this morning and was instructed to come to the emergency room. The patient states that she has experienced similar pain approximately one year ago which resolved spontaneously and was attributed to abdominal scar tissue.

PAST MEDICAL HISTORY:
- Chronic Hepatitis C
- Cirrhosis secondary to Hep C, S/P liver transplant 1995; she has done well since then and has stable labs with good liver function
- Type 2 diabetes x 11 yrs, diet controlled, last A1c 5.8%, no albuminuria, last eye exam 1 yr ago, no retinopathy
- Hypertension x 11 yrs, mild and well controlled
- Chronic renal insufficiency, baseline creat 1.4-1.7
- Pulmonary sarcoidosis; interstitial infiltrates on CXR in past; no sx, no Rx
- GERD
- S/P CVA 1995 (post-op); she has mild residual L foot numbness
- S/P pulmonary embolism 2001
- Hx depression
- Possible gout
- 12/05 partial small bowel obstruction, no surgery required

PAST SURGICAL HISTORY:
- Hx ectopic preg & RSO many years ago
- 1995 orthotopic liver transplantation
- 1/05 Total vaginal hysterectomy with LSO, A&P repair; course complicated by post-op abscess

ALLERGIES: NKDA
MEDICATIONS:
- Allopurinol 100 mg per day
- Atenolol 100 mg per day
- calcium with vitamin D 2 tablets b.i.d.
- hydrochlorothiazide 25 mg per day
- lisinopril 10 mg per day
- loperamide 2 mg p.r.n. diarrhea
- Ranitidine 150 mg q. h.s.
- Rapamune sirolimus 1 mg every other day
- Tylenol #3 1 or 2 tablets t.i.d. p.r.n. (she uses infrequently)

FAMILY HISTORY: Her parents are deceased. Her father had hypertension and died of an MI at age 80. Her mother had hypertension, diabetes, and died of breast cancer at age 86. Three brothers all have hypertension. Two sons are alive and well.

SOCIAL HISTORY: She is a retired secretary. She is widowed and has 2 sons, one in St Louis and one in Atlanta. She lives alone and is independent in all ADLs. She has never used tobacco or alcohol. +blood transfusions with liver transplant.

REVIEW OF SYSTEMS:
- Gen’l - No fevers/chills, no weight change
- HEENT – neg
- CV - No CP, palpitations, DOE, PND, orthopnea, edema, syncope,
- Resp - No cough or SOB
- GI – as per HPI
- GU - No dysuria, hematuria, urgency
- MSK – she often has pain in the right ankle and foot.
- Integ – neg
- Neuro - Left foot numbness since CVA; o/w neg
- Psych - No depressed mood.
- Endocrine - neg
- Heme/lymph – neg
- Allergic/imm – “sinus trouble” in spring and fall

PHYSICAL EXAMINATION:
- Gen’l – The patient is lying on her right side and she appears uncomfortable.
- HEENT – NC/AT, PERRL, EOMI, fundi benign, nares patent, septum midline, oropharynx is pink and moist.
- Neck – supple without goiter, adenopathy, masses, JVD.
- Breasts – no masses or discharge.
- Heart – Regular rate and rhythm with no murmurs, gallops or rubs.
- Lungs – clear to auscultation and percussion bilaterally.
Abd – well healed midline incision; moderate distension; bowel sounds diminished; tenderness to palpation in the right and left lower quadrants, + voluntary guarding, no rebound; no masses palpated; liver ~10 cm in MCL, smooth and nontender.

Rectal – normal sphincter tone, + tenderness towards RLQ, stool brown and guaiac negative

Pelvic – normal external genitalia, no discharge in vaginal vault, no cervix present, + tenderness towards RLQ

Ext – no C/C/E. Pulses 2+ bilat in carotid, radial, DP, PT

Neuro –

Mental status – alert and oriented x 3; speech fluent and appropriate

Cranial nerves
- II: Visual fields full; disc margin sharp.
- III, IV, VI: EOMI, PERRL
- V: Facial sensation intact; jaw movement symmetrical
- VII: Face symmetric
- VIII: Hearing normal to finger rub
- IX, X: Intact gag reflex; no hoarseness.
- XI: Intact head turning and shoulder shrug.
- XII: Tongue midline

Motor: normal tone; strength 5/5 x 4 extr

Sensory: intact to LT in feet, except subjectively decreased, “different” in left foot

Coordination: intact to finger-nose-finger and heel-knee-shin bilat

Reflexes: 2+ and symmetric bilat biceps, triceps, knees; ankle jerks not elicited. Toes downgoing.

Station & gait – deferred due to abdominal pain

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Amylase 51, Lipase 62

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<td>Total Bilirubin</td>
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UA – yellow, clear, Sp gravity 1.011, pH 6.5, protein neg, glu neg, ketone neg, blood neg, leukocyte esterase neg, nitrate neg, RBC-0, WBC-1, bact-1+
This 65 year old woman who is S/P liver transplant presents with a 1 week history of lower abdominal pain, nausea and vomiting.

1) Abdominal pain, nausea and vomiting – Possible etiologies include diverticulitis, appendicitis, or early small bowel obstruction. She did have a partial small bowel obstruction 1 yr ago. Diverticulitis or appendicitis would most commonly localize to the left or right lower quadrant respectively, but can present with diffuse pain/tenderness if there is widespread inflammation. On exam she does not have peritoneal signs at this point. Inflammatory bowel disease is possible, but less likely (no diarrhea or bleeding). Severe cystitis is unlikely given the unremarkable UA. She has no symptoms of infectious gastroenteritis. Gyn diagnoses are ruled out as she is S/P hysterectomy and oophorectomy. Will check an abdominal/pelvic CT to look for evidence of obstruction or inflammation. A surgical consultation will be requested.

2) Hepatitis C S/P liver transplant for cirrhosis. Her labs document continued good hepatic function. Will continue sirolimus. Will notify Hepatology of her admission.

3) DM type 2 – this has been well controlled with just diet. Will monitor her blood sugar. The stress of an acute illness may necessitate insulin therapy while in hospital.

4) Hypertension, mild and well controlled on current meds

5) CRI – creat at baseline

6) Hx of pulmonary sarcoidosis – asymptomatic

7) GERD

8) S/P CVA 1995 (post-op); she has mild residual L foot numbness

9) S/P pulmonary embolism 2001

10) Hx depression – currently euthymic off meds

11) Possible gout

Sam Student, WUMS III
Pager 823-1111
EXAMPLE OF A FAIRLY SHORT H&P

(Pt’s Name & DOB)

12/10/06 0900

CC: Abd pain x 7 d

HPI: 65 y.o. woman, 11 years S/P liver transplant, presents w/ 7 d hx of RLQ/LLQ abd pain. Pain is sharp and steady, radiates to back, now up to 5/10 in intensity. No change with food or with BM. + anorexia, N/V, – hematemesis/coffee grounds. Last BM yesterday a.m., normal. No melena/hematochezia. No fever. No dysuria.

PMH
- Hep C \(\rightarrow\) cirrhosis \(\rightarrow\) liver transplant 1995; liver function stable
- DM2, diet controlled, A1c 5.8%
- HTN, controlled
- CRI, creat 1.4-1.7
- Pulmonary sarcoidosis; interstitial infiltrates on CXR in past; no sx, no Rx
- GERD
- S/P CVA 1995 (post-op); she has mild residual L foot numbness
- S/P PE 2001
- Hx depression
- Possible gout
- 12/05 partial SBO, no surgery required

PSH
- Hx ectopic preg & RSO many years ago
- 1995 orthotopic liver transplantation
- 1/05 Total vaginal hysterectomy with LSO, A&P repair; course compl.by post-op abscess

ALLERGIES: NKDA

MEDS:
- Allopurinol 100 mg per day
- Atenolol 100 mg per day
- calcium with vitamin D 2 tablets b.i.d.
- hydrochlorothiazide 25 mg per day
- lisinopril 10 mg per day
- loperamide 2 mg p.r.n. diarrhea
- Ranitidine 150 mg q. h.s.
- Rapamune sirolimus 1 mg every other day
- Tylenol #3 1 or 2 tablets t.i.d. p.r.n. (she uses infrequently)

FHx: NC

SHx: Widowed. No tobacco or alcohol. +blood transfusions with liver transplant.
ROS – No F/Ch/nt sweats. Wt stable. No CP/palp/PND/orthopnea/edema. No cough/SOB. No dysuria, hematuria, urgency/freq. + pain in the right ankle and foot. All other systems negative.

PE: T 36.7, HR 62, RR 20, BP 142/80
- Gen’l – lying on her right side and she appears uncomfortable.
- HEENT – PERRL, EOMI, OP clear
- Neck – supple, no goiter/LN/JVD
- Heart – RRR, no m/g/r
- Lungs – clear to A&P
- Abd – well healed midline incision; moderate distension; bowel sounds diminished; tenderness to palpation RLQ & LLQ, + vol guarding, no rebound; no masses; liver ~10 cm in MCL, smooth and nontender.
- Rectal – normal sphincter tone, + tenderness towards RLQ, stool brown and guaiac negative
- Pelvic – normal ext gen; no d/c in vaginal vault, no cervix present, + tenderness in RLQ
- Ext – no C/C/E. Pulses 2+ bilat
- Neuro – A&O x3; cranial nerves grossly intact; motor 5/5 x 4 extr;
  Sensory: intact to LT in feet, except subjectively decreased, “different” in left foot
  Reflexes: 2+ & sym bilat biceps, triceps, knees. Toes downgoing.

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</tr>
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84 N, 12 Ly, 3 Mono, 1 Eo

A&P - This 65 y.o. woman S/P liver transplant presents with a 1 week history of lower abdominal pain, N/V.
1) Abdominal pain, N/V – DDX includes diverticulitis, appendicitis, or early small bowel obstruction. + hx partial SBO 1 yr ago. Diverticulitis or appendicitis would most commonly localize to the left or right lower quadrant respectively, but can present with diffuse pain/tenderness. On exam she does not have peritoneal signs. Doubt IBD (no diarrhea or bleeding). UA R/O UTI. She has no sx of infectious gastroenteritis. Gyn diagnoses R/O as she is S/P hysterectomy and oophorectomy.
Plan – check abd/pelvic CT. Consult Surgery.
3) DM 2 – diet-controlled; monitor glu
4) HTN – continue current meds
5) CRI – creat at baseline
6) Hx of pulmonary sarcoidosis – asymptomatic
8) S/P CVA 1995 (post-op); she has mild residual L foot numbness
9) S/P pulmonary embolism 2001

Sam Student, WUMS III
Pager 823-1111
NOTE – Standardized Patient cases will NOT have a history as complex as Mrs A. Here is a very brief focused write-up (USMLE style) on an SP similar to Mrs A. For Standardized Patient cases you will NOT do breast/rectal/GU exams. They are included in your proposed plans (as in USMLE exams). In the post-encounter you will type a short list of DDX and Plans.

1. History

HPI: 65 y.o. woman, 11 years S/P liver transplant, presents w/ 7 d hx of RLQ/LLQ abd pain. Pain is sharp and steady, radiates to back, now up to 5/10 in intensity. No change with food or with BM. + anorexia, N/V, – hematemesis/coffee grounds. Last BM yesterday a.m. - normal. No melena/hematochezia. No fever. No dysuria.

PMH/PSH
- Hep C → cirrhosis → liver transplant 1995; liver function stable
- DM2, diet contr
- HTN, contr
- 1995 orthotopic liver transplantation
- S/P TAH/BSO

NKDA

MEDS:
- Allopurinol 100 mg/day
- Atenolol 100 mg/day
- HCTZ 25 mg/day
- lisinopril 10 mg/day
- Rapamune sirolimus 1 mg every other day

SHx: No tobacco or alcohol.

2. Physical Examination

PE:  T 36.7, HR 62, RR 20, BP 142/80
She appears uncomfortable.
Heart – RRR, no m/g/r
Lungs – clear
Abd – well healed midline incision; moderate distension; bowel sounds diminished; tenderness to palpation in the right and left lower quadrants, + voluntary guarding, no rebound; no masses palpated; liver ~10 cm in MCL, smooth and nontender.

3. Differential Diagnoses: Please list up to five (5) differential diagnoses for this patient:

- Diverticulitis
- Appendicitis
- Partial small bowel obstruction
- Inflammatory bowel disease

4. Diagnostic Work Up: Please list up to five (5) tests you would like to order for this patient.

- Rectal exam
- Pelvic exam
- Abd/pelvic CT
- CBC
- UA
Example Of An H&P For A Healthy Patient

CC: Here for a check-up

HPI: SK is a 41-year-old woman who is new to the St Louis area and needs a primary care physician. She feels well and has no current complaints, just needs a check-up.

PMH
Medical – none
Surgical – none
Ob Gyn: G0P0; cycles regular, q28 days. LMP 2 weeks ago; no history of sexually transmitted diseases; she uses oral contraceptive pills; monogamous; last Pap smear about 6 months ago

Medications – OrthoNovum 7/7/7 one tablet daily

Allergies - NKDA

SH: The patient is married. Her husband was just transferred to St Louis 2 months ago. She is job hunting and previously worked as a secretary. She does not smoke, drink alcohol or use illicit drugs. She has not had any blood transfusions or Tb exposure. She drinks 1 glass of milk a day. She exercises 20-30 minutes daily (walk or exercise bike). She wears seatbelts. She does not have a Living Will or Advance Directive, but she trusts her husband to speak for her and would not want prolonged life support if she had severe neurologic impairment.

FH: Parents are alive and well at age 50; 2 brothers are A&W. Maternal GM has HTN; maternal GF had an MI age 71. Paternal GM has “mild” DM; patern al GF is A&W.

ROS

Gen’l - No fevers, chills, night sweats, change in appetite, change in weight, or fatigue.

Skin - No rash, lesions, or pruritis; no changes in hair or nails.

HEENT - No hearing problems, vertigo, or tinnitus. No visual problems; wears contact lenses. She is due for her annual eye exam.

Endocrine - No heat or cold intolerance, excessive hunger, polyuria or polydipsia.

Breasts - No masses, pain, discharge.

CV– No CP, palpitations, lightheadedness or edema

Pulm - No cough, shortness of breath or wheezing.

GI - No dysphagia, reflux symptoms, nausea, vomiting, abdominal pain, changes in stool caliber, constipation, diarrhea, blood in stools, or black/tarry stools.

GU - No dysuria, hematuria, urinary urgency, incontinence, nocturia, genital discharge, or genital sores.

MSK - No muscle weakness or pain, joint pain or swelling, back pain, limitations of motion or activity.

Hematologic - No abnormal bleeding or bruising, no lymphadenopathy.
Neuro - No numbness or weakness, changes in memory, speech abnormalities, or gait difficulties.

Psych - No depressed mood

**Physical Examination**

Gen'l – Healthy appearing young woman

Vital Signs – Ht 65", wt 135#, T 37.6, RR 14, P 92 and regular, BP (seated) Left arm 115/74, Rt Arm 115/70

Skin - Warm without any rashes or lesions;

HEENT- NC/AT; PERRL; EOMI; conjunctivae clear. Fundi - Sharp disc margins, nl vessels; Ears – clear TMs bilat; Nares – Clear; Oropharynx - Clear and moist.

Neck - Supple with full range of motion; no lymphadenopathy, thyroid enlargement or nodules noted.

Cardiac – PMI nondisplaced, RRR nl S1 & S2, no m/g/r

Chest - Clear to auscultation bilaterally

Breasts - No masses or skin change; no nipple discharge; no axillary lymphadenopathy.

Back - No costovertebral angle tenderness or spine tenderness.

Abdomen - Flat, normal bowel sounds, no tenderness, no masses or hepatosplenomegaly

Extremities - No clubbing, cyanosis, or edema. No carotid, abdominal or femoral bruits noted. Pulses 2+ and symmetric throughout (carotid, radial, DP and PT)

Neuro

Mental Status – Alert, oriented x 3; speech fluent and appropriate

Cranial nerves

II: Visual fields full; disc margins sharp.

III, IV, VI: Eye movements full, pupil 4 mm and equal, responsive to light and accommodation.

V: Facial sensation intact; jaw movement symmetrically.

VII: Face symmetric, normal eye closure and smile.

VIII: Hearing normal to rubbing fingers.

IX, X: Intact gag reflex; no hoarseness.

XI: Intact head turning and shoulder shrug.

XII: Tongue midline without atrophy.

Sensory: Light touch, pain intact.
Motor: normal tone & bulk; strength 5/5 throughout.

Reflexes: 2+ and symmetric throughout.

Plantar Responses - Flexor bilaterally

A&P
1) Health maintenance - Ms. SK is a healthy 41 y.o. woman. Health maintenance issues include:
   - Clinical breast exam done today. She agreed to start annual mammography
   - Pap smear up to date
   - Counseled to increase dairy products to about 3 servings/day
   - Check fasting lipid panel (never checked previously)
   - Counseled about importance of daily exercise

RTC 1 yr or prn

Sarah Student, WUMS III
823-1111
Example of a Write-up (POM)

August 1, 2007
WUMS III Admit Note

CC: Epigastric pain

HPI: M.C. is a 47 yo BF with history of EtOH abuse and pancreatitis who presents with c/o 3 days of epigastric pain. The pain is described as a “gnawing” feeling centered over the epigastrium and does not radiate. It fluctuates in intensity throughout the day but never completely resolves, and can wake her from sleep. She first noted the pain 3 days ago. It began about two hours after eating dinner, which consisted of fried chicken and coleslaw. The pain is associated with severe nausea. She has also had two episodes of non-bloody, non-bilious emesis over the last two days. She denies any hematochezia, but thinks she may have had a few “dark” stools the last couple of days. Food initially relieves the pain, but it recurs about 2-3 hours later. Mylanta gives only short-lived relief. She routinely takes ibuprofen for bilateral knee arthalgias and drinks alcohol regularly, both of which aggravate her pain. The pain is somewhat similar to her prior episode of pancreatitis.

Past Medical History:

1. Pancreatitis 8/99 felt secondary to EtOH abuse.
2. EtOH abuse, no history of chemical dependency treatment.
3. DWIs (last 3/01), no history of withdrawal seizures or DTs.
5. Osteoarthritis bilateral knees.

Past Surgical History:


OB/GYN History: G0P0, LMP 7/22/03.

Medications: OTC ibuprofen ~6-12 tabs qd.

Allergies: PCN—hives.

Social Hx: Currently unemployed, in past has worked as a secretary. Divorced, lives alone, no children. Not sexually active x 4 months. No exposure hx (no transfusions). +tobacco use 1ppd x 23 years. +EtOH use ~6 beers + 1 pint vodka qd. +intranasal cocaine use (last 2 weeks ago), no other drug use.
**Family Hx:** Mother died in MVA at age 51, Father unknown, one sister alive at age 47 with DM II and HTN, one brother alive at age 59 with HTN. No known family hx of CAD or cancer.

**ROS:**

Constitutional: +anorexia for last 2-4 weeks, no F/C, no change in weight. HEENT: no vision or hearing changes, no sore throat. CV: no CP, orthopnea, DOE, palpitations, edema, or claudication. Resp: no SOB, cough, or hemoptysis. Breast: no masses or discharge. GI: see HPI, no diarrhea or constipation. GU: no dysuria, hematuria, vaginal lesions or discharge. Ext: no limitation of movement, +chronic bilateral knee pain for which she takes OTC ibuprofen. Skin: no rashes. Neuro: +occ generalized throbbing headaches without associated sx; no dysarthria, dysphagia, numbness, paresthesias, or weakness. Psych: occ low mood, no SI, no HI.

**Physical Exam:**

**General:** WDWN woman lying in bed in NAD, looks her stated age.

**Vitals:** T 98.8 oral, P 90, R 14, BP 100/52 right arm supine & 98/54 left arm supine, 90/50 left arm sitting, O2 sat 98% on RA.

**HEENT:** NCAT, PERRL, EOMI, sclerae without injection or icterus, TM clear bilaterally, nares clear bilaterally, posterior OP slightly red but without exudates.

**Neck:** supple, good ROM, no thyromegaly, no lymphadenopathy, no carotid bruits.

**CV:** RRR, S1&S2, no S3, +S4, no murmurs or rubs, PMI non-displaced, JVP 6 cm, 2+radial/brachial/femoral/popliteal/PT/DP pulses bilaterally.

**Resp:** CTA bilaterally but distant with slightly prolonged expiratory phase.

**Abd:** soft, ND, tender to deep palpation in epigastrium, NABS, no HSM, no masses, old appy scar RLQ, no rebound or guarding, no bruits.

**Rectal:** guaiac + black stool in vault, no masses or tenderness.

**Back:** no spine tenderness, no CVA tenderness, full ROM.

**Ext:** Full ROM bilateral UE & LE, no c/c/e.

**Skin:** no rashes or lesions.

**Neuro:**
Mental status: A&Ox3, flow of thought WNL, mood "good", affect pleasant and appropriate, no errors on serial 7s, memory 3 out of 3 at zero and 5 minutes, insight and judgment appropriate.
Cranial nerves:

CN II: Visual acuity 20/20 bilaterally, visual fields full, disc margins sharp.
CN III, IV, VI: PERRL, EOMI, no nystagmus.
CN V: Facial sensation intact to PP in 3 divisions bilaterally, jaw moves symmetrically.
CN VII: Symmetric facial movements, nl eye closure and smile.
CN VIII: Hearing intact to finger rub bilaterally.
CN IX, X: Palate rises symmetrically, voice not hoarse.
CN XI: Intact to head turning and shoulder shrug.
CN XII: Tongue midline with no atrophy and nl movement.

Motor: No pronator drift of outstretched arms, nl tone, nl muscle bulk

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<th>Shoulder abd/add</th>
<th>Elbow flex/ext</th>
<th>Wrist flex/ext</th>
<th>Grip</th>
<th>Hip flex/ext</th>
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Reflexes: 2+ and symmetric at the biceps, triceps, knees, and ankles; Plantar responses flexor bilaterally.

Sensation intact to LT & PP bilateral fingers and toes.

Coordination: Rapid alternating movements and fine finger movements intact; no dysmetria on finger-nose-finger or heel-knee-shin; Romberg absent.

Gait/stance: NL tandem walking, heel, and toe walking.

**Lab data:**

```
   142  100  22
   4.5  24  1.1  104

8.9  9.3   140
   27.  MCV 74
```

Diff: N68/L30/ M2/ B0/E0

TB 0.8, DB 0.3, A 130, AST 28, ALT 20, TP 7.8, alb 3.8, Ca 9.8
UA: -LE, -Nit, -blood, -prot, 4 WBC, 1 RBC
Amylase 10, Lipase 8

**Assessment and Plan**

MC is a 47 yo female with hx of EtOH abuse and pancreatitis who presents with 3 days of epigastric pain, N/V, melena, and anemia.

1. Epigastric pain with nausea, emesis, and guaiac + stools. Differential diagnosis of epigastric pain with nausea and emesis includes:
PUD.
Erosive gastritis/Non-ulcer dyspepsia.
Reflux esophagitis.
Pancreatitis.
Cholecystitis.
Hepatitis.
Gastroenteritis

The patient’s presentation is very concerning for active PUD with upper GI bleed. Alcohol, tobacco, and NSAID use are risk factors for PUD. Pain associated with PUD is often described as burning or gnawing, can awaken the patient from sleep. Pain associated with duodenal ulcers tends to occur 90 minutes to 3 hours after eating and is often relieved with food, while pain associated with gastric ulcers may actually be precipitated or accentuated by food.

The patient’s presentation may also be consistent with an erosive gastritis. Both alcohol and NSAIDs are risk factors for erosive gastritis which often presents with epigastric pain, nausea, and vomiting. Bleeding from gastritis is often mild but cannot be distinguished from that of PUD without endoscopy.

Pancreatitis, gallstones, acute hepatitis, and gastroenteritis can all cause epigastric pain (although gallstones and hepatitis are more often localized to the RUQ), nausea, emesis, and anorexia, but do not, by themselves, cause GI bleeding. In addition, transaminases should be elevated in acute hepatitis and amylase and lipase are usually elevated in acute pancreatitis.

Plan:

- Maintain 2 large bore peripheral IVs at all times.
- Type and cross for possible transfusion.
- Follow serial CBCs.
- PPI for acid suppression.
- Keep patient npo.
- Check H. Pylori antibody.
- GI consult for upper endoscopy.

2. Alcohol abuse: Withdrawal precautions—treat with Ativan as needed. Dietary supplementation with thiamine, folate, MVI. Chemical dependency consult when clinically stable. Will check urine tox screen to r/o use of other illicit substances which could cause withdrawal sx's.

Jane Doe, WUMS III
Pager 555-5000
06/23/10

CC: Cough, lower extremity swelling

HPI: The patient is an 84 year old female with a history of CAD s/p MI, advanced Alzheimer’s dementia, Waldenstrom’s macroglobulinemia, hiatal hernia, and anemia who presents to the ED with bilateral lower extremity swelling and cough productive of purulent sputum over the past three days. The patient was accompanied to the ED by her daughters who provided the remainder of the history. Her daughters noted rhinorrhea and productive cough in addition to increased lethargy and loss of appetite, all of which they initially believed to be due to a bad cold. The cough has increased in frequency and severity since the onset of symptoms and sputum has continued to be cloudy, yellow, and non-bloody. She complains of difficulty taking deep breaths, which also trigger “coughing spells”. The patient vomited once yesterday with non-bilious, non-bloody emesis and was slightly feverish for the last few days prior to admission. She has not expressed any sensation of chest pain, ear pain, sore throat, headache, or nausea. She has not had any recent illnesses in the past few months but had a previous episode of pneumonia 3-4 years ago from which she recovered without complications. She was previously a “chain smoker” but quit approximately 20 years ago.

The patient’s lower extremity swelling has not progressed since her daughters first noticed it and is not painful to the patient.

PMH: 1. Coronary artery disease s/p MI in 1999 – positive stress test and echo in 2002 showed normal ejection fraction and signs of diastolic dysfunction

2. Waldenstrom’s macroglobulinemia – diagnosed 5-6 years ago – has never been treated and is currently in remission, seen at the CAM in March 2009 with recommendation for no treatment necessary

3. Alzheimer’s dementia – diagnosed in 1999 – progressive decline in memory over the past few years. Daughters take care of all of her activities of daily living, and she is able to walk with assistance. Generally has a very good appetite which is occasionally supplemented by Ensure per her daughter’s judgment of her eating habits. Experiences urinary incontinence and requires constant use of Depends.

4. Anemia – diagnosed in 2006 – was transfused with two units of blood at the time of diagnosis.

5. Hiatal hernia – diagnosed 5-6 years ago – never repaired, requires the patient to sleep on 2 pillows at night to prevent reflux.

6. Arthritis – began experiencing joint pain particularly in her hands 2-3 years ago.

7. Nephrolithiasis
Meds:  1. Aricept – 10 mg PO Qday, for dementia
   2. Aspirin – 81 mg PO Qday, for CAD
   3. Calcium supplement PO Qday, for nutritional supplement
   4. Iron supplement 325 mg PO TID, for nutritional supplement

Allerg:  Penicillin – causes hives

FH:  Father passed away at an unknown age with a history of cancer and MI, mother had no significant past medical history. Per the patient’s daughters, no other known family history of diabetes, high cholesterol, hypertension, or cancer.

SocH:  No current use of alcohol, smoking, or illicit drugs. She lives with her daughter and is unable to care for herself independently.

ROS:  General – slight fever over the last few days; no chills, night sweats, or changes in weight
   Skin – no rashes, bumps, or changes in hair or nails
   Neuro – no weakness, numbness, changes in memory or mental status from baseline, difficulties speaking, or difficulties walking
   Psych – no recent depressed mood, anxiety, or nervousness
   HEENT – no changes in vision or hearing
   Endocrine – no changes in thirst or urination
   CV – no complaints of claudication, palpitations, chest pain, or syncope
   Pulm – see HPI
   GI – diarrhea/loose stools approximately 3-4 times per day for the last few days, non-bloody; no difficulties swallowing, abdominal pain
   GU – no complaints of dysuria, hematuria, nocturia, or genital discharge/sores
   MSK – no complaints of muscle pain or increased weakness
   Hem – no abnormal bleeding, easy bruising, or enlarged lymph nodes

PE:  General – elderly African-American female, very thin, appears stated age, no acute distress, altered mental status, persistent productive cough, appears to be in significant discomfort from coughing

VS – HR 84, BP 135/80, RR 28, SPO₂ 98 (3L oxygen by nasal cannula), T 36.9

HEENT – normocephalic/atraumatic; anicteric sclera; extraocular movements intact; pupils equal, round, and reactive to light; moist mucous membranes
Neck – slight lymphadenopathy; carotid pulse 2+ bilaterally; no bruits; JVP approximately 2 cm
Lungs – tachypneic; prominent breath sounds; crackles and rhonchi throughout lung fields bilaterally; breathing extremely labored with significant accessory muscle use
CV – tachycardic; S1/S2; distant heart sounds; radial and DP pulses 2+ bilaterally
GI – normal active bowel sounds; slightly tender to palpation in all quadrants; soft; non-distended
Lymphatics – no/little lower extremity swelling
Skin – diaphoretic, no visible lesions
MSK – all joints mobile, significant weakness
Neuro – not oriented to person, place, or date; some comprehension; cranial nerves II-XII grossly intact; sensation intact to light touch throughout; motor strength 3/5 in the upper extremities, not tested in lower extremities due to lack of cooperation

Labs:

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<tr>
<th>Troponin I</th>
<th>CK-MB</th>
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<th>ALT</th>
<th>BNP</th>
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<td>0.11</td>
<td>&lt;2</td>
<td>21</td>
<td>11</td>
<td>1713</td>
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Urine microscopy: RBC: 1; WBC: 7; Bacteria: 4+; positive for hyaline casts; negative for epithelial cells

Chest X-ray showed left basilar atelectasis and retrocardiac opacity in the right medial lobe which may represent effusion or infiltrate.

Assessment:

84 year old female with history of CAD s/p MI, Alzheimer’s dementia, Waldenstrom’s macroglobulinemia, hiatal hernia, and anemia who presents with lower extremity swelling and productive cough for the past 3 days.

1. Cough – With the patient’s presenting symptoms of cough productive of purulent sputum, rhinorrhea, and low-grade fever in addition to physical exam findings of significant rhonchi and crackles, bacterial pneumonia seems likely. She has not been admitted to a hospital in the past few months, which suggests that she has developed community-acquired pneumonia though her
daughters state that she has no known sick contacts. Viral or fungal causes could also be possible, though less likely. Current work-up could include sputum culture and Gram stain, blood cultures, and treatment with moxifloxacin for broad coverage of both Gram positive and Gram negative organisms and azithromycin for further coverage of atypical organisms.

2. Elevated BNP – Given the patient’s history of CAD, MI, and past evaluation of diastolic dysfunction, it is possible that the elevated BNP is due to an exacerbation of congestive heart failure; however, with otherwise normal laboratory values and negative troponin-I, it seems unlikely that she has experienced an acute MI. Also, increased levels of BNP may be found in patients of advanced age, female sex, and African-American ethnicity. She was placed on an IV nitroglycerin infusion of 50 mg/250 mL D5W in the ED, and we may start lisinopril to reduce preload and afterload. We will also continue to monitor oxygen saturation and any changes in lower extremity swelling or JVP as markers of cardiac dysfunction.

3. Waldenstrom’s macroglobulinemia – in remission and has not been treated previously; will continue to monitor CBC.

4. Anemia – Hemoglobin and hematocrit values are within normal limits; will continue to monitor CBC.

5. Alzheimer’s dementia – Patient illustrates a decline in mental status from baseline, which may be due to current infection and symptoms; will continue Aricept and monitor mental status changes.

(name), WUMS III
(pager)
CC: low blood sugar

HPI:
Ms. Jones is a 45-year-old female with a history of type II diabetes, HTN, and hyperlipidemia who presented to the ER this morning because she “felt like her blood sugar dropped.” She woke up at 7AM this morning and was talking to her children when she started sweating profusely. She also notes that her children thought she wasn’t making any sense, although she thought everything was fine. She denies any lightheadedness or loss of consciousness. Her current diabetic medication regimen is a home injection of 10 units Lantus at bedtime and 5 units Novolog at mealtimes, adjusted based on the size of her meal. She notes that she hadn’t eaten breakfast or given herself any insulin injections in the morning, but got her regular dose of Lantus at bedtime and 3 units of Novolog for a small dinner of soup and chicken that she ate around 9:30PM the night before. On admission to the ED, she was found to have a blood glucose of 30, and she was given glucagon, D50, and oral glucose until her blood glucose levels stabilized.

The patient was diagnosed with gestational diabetes during two previous pregnancies, but wasn’t formally diagnosed with type II diabetes until 2007, when she developed diabetic retinopathy. She was placed on Janumet, a combination of metformin and Januvia, for control of her diabetes, but was switched to her current regimen of Lantus and Novolog injections in November of 2009 after an admission for DKA. During that same admission, she complained of over 30 pounds of weight gain from whole body edema, which has persisted despite diuresis. She also complains of orthopnea, paroxysmal nocturnal dyspnea, and dyspnea on exertion. She had a recent occupational fall in mid-November and some associated hip pain, which in combination with her edema and SOB severely limit her functional status. She is currently Medicaid pending, disability pending, and states that she has some trouble affording her glucose monitoring strips, so she doesn’t check her glucose as frequently as her doctor tells her to. Her last HbA1c in November of 2009 was 13.3. Since then, she has had several episodes of low blood glucose in the 40-50 range according to her glucose monitor, but she has had no major symptomatic episodes. She is followed by Dr. (name) in the Wohl Clinic for management of her diabetes.

PMH/PSH:
1. Diabetes mellitus type II, on Lantus and Novolog injections
2. Hypertension
3. Hyperlipidemia
4. Peptic ulcer disease confirmed by EGD on 11/24/2009, H pylori positive
5. Anemia diagnosed in November 2009
6. Tubal ligation in 2002
7. Left eye surgery in 2008 for cataract and vitreous hemorrhage
8. Questionable TIA at age 19

Meds:
- Lantus 10 units injected at bedtime
- Novolog 5 units injected at mealtimes
- Cozaar 100mg PO Qday
- Lasix 40mg PO BID
- Carvedilol 12.5mg PO BID
- Ferrous sulfate 325mg PO Qday
- Sodium bicarbonate 650mg PO Qday
- Aspirin 81mg PO Qday
- Nexium 40mg PO Qday
- Acetaminophen 325mg PO Qday
- Pravastatin

Allergies:
- Lisinopril, causing a cough

Family history:
Significant for diabetes in 4 sisters and several aunts and uncles, a mother with HTN, and a maternal grandmother with colon and lung cancer.

Social History:
The patient is separated and lives in St. Louis with her 4 children. She was previously a licensed practical nurse, but has not worked since her fall in mid-November. She denies alcohol, tobacco, and other drugs.

ROS:
Constitutional: mild fatigue, 30lb weight gain, no fevers or chills
HEENT: some chronic sinus congestion and blurry vision, no dry mouth, headaches, tinnitus, sore throat, or unexplained neck masses
Pulm: dyspnea since November, worse over last few weeks, cites dyspnea on exertion, orthopnea, and paroxysmal nocturnal dyspnea
CV: palpitations, no chest pain
GI: no nausea, vomiting, diarrhea, constipation, or loss of appetite
GU: no urinary hesitancy, urgency, or frequency
Musculoskeletal: some leg pains with activity, significant edema in bilateral upper and lower extremities
Skin: no unexplained rashes
Psych: no depression or anxiety

Physical Exam:
Vitals: T 36.9, P 95, R 20, BP 223/107, S 96% on RA
General: tired-looking, well-nourished, slightly diaphoretic female in NAD
HEENT: NC/AT, sclerae anicteric, MMM, PERRL, EOMI, some left lens clouding on fundoscopic exam
Neck: no lymphadenopathy or thyromegaly, no carotid bruits, no obvious JVD, but general neck swelling seen
Lungs: CTAB, no W/R/R
CV: RRR, 2/6 systolic murmur, pulses 2+ in all extremities, 2+ pitting edema in bilateral lower extremities, 1+ edema in upper extremities
GI: soft, nontender, moderately distended, NABS
GU: genital and rectal exams deferred
Lymphatic: no cervical adenopathy
Skin: warm, diaphoretic
Musculoskeletal: full ROM
CNS: ANO x3, no dysarthria, CN II-XII grossly intact, sensation to light touch intact in all extremities, muscle strength testing was deferred due to discomfort from line placements

Labs and Diagnostics:

BMP: 140 | 111 | 28 (H) / 90
4.3 | 23 | 1.55 (H)

CBC: WBC 13.0 (H), Hgb 5.3 (L), Hct 15.9 (L), Plt 652 (H), MCV 90.3
PTT 28.1, PT 14.7, INR 1.12

UA: yellow, cloudy, pH 6.5, no WBCs, no RBCs, no ketones, no glucose, 3+ protein, 1+ blood, no nitrates, no leukocyte esterase

Urine microscopy: 7 RBCs, 14 WBCs, 1+ bacteria, >2 hyaline casts

Troponins: <0.07

CK: 81

HFP: protein 7.6, albumin 1.7 (L), total bilirubin 0.2 (L), alkaline phosphatase 94, AST 29, ALT 21

CXR: patchy left lower lobe opacities and small pleural effusion, calcified hilar nodes consistent with old granulomatous disease, no pneumothorax, mild cardiomegaly

BNP: 2808 (H)

Assessment and Plan:
This is a 40-year-old female with a history of type II diabetes, HTN, anemia, and hyperlipidemia who presented with an episode of hypoglycemia this morning.

1. Hypoglycemia: The patient’s symptoms of diaphoresis, difficulty with words, and palpitations are consistent with an episode of hypoglycemia. In a patient with diabetes, the most common causes of hypoglycemia are small or absent meals and diabetic drugs. In Ms. Jones’ case, she ate a fairly small meal the night before, which may have contributed to her hypoglycemia, but the major culprit is likely her insulin injections. She was only recently switched to her insulin injections in mid-November, and although she notes no problems with her injections, she does state that her insulin regimen is still being adjusted. Her compact blood glucose monitor shows several instances of blood glucose levels in the 30-50 range, although she denies major symptomatic episodes that have led to hospitalizations. This indicates that she is likely being over-dosed on insulin. Part of the problem could be the patient’s lack of insurance, which is causing her to skimp on blood glucose measurements in the interest of saving money. Accurate pre-prandial, post-prandial, and nighttime glucose measurements are essential in fine-tuning the patient’s insulin regimen, and social work assistance in obtaining vouchers for glucose measuring strips or in obtaining Medicaid may help in the creation of a stable insulin injection regimen and ward off future episodes of hypoglycemia.

2. Anemia: The patient was admitted to the ED with a hemoglobin of 5.3, but she was alert, oriented, and didn’t complain of significant fatigue. This indicates that her anemia is likely chronic and not due to any acute blood loss. Her MCV, however, was 90.3, which classifies her anemia as normocytic. Differential diagnosis for a normocytic anemia includes anemia of chronic disease, hemolytic anemia, aplastic anemia, and uncompensated fluid overload. With the patient’s lack of symptoms, anemia of chronic disease and uncompensated fluid overload are the two most likely causes. The patient is Coombs negative and doesn’t have any history to
substantiate a diagnosis of hemolytic anemia, and aplastic anemia would manifest as a pancytopenia, which is inconsistent with her elevated white cell and platelet counts. Anemia of chronic disease has a characteristic profile on an iron panel, including low serum iron, high ferritin, low transferring saturation, and high levels of hepcidin. Therefore, an iron panel would be the simplest test to corroborate a diagnosis of anemia of chronic disease, likely secondary to her chronic kidney disease. Uncompensated fluid overload would be the other explanation for the patient’s anemia, as she has had a 30lb gain of fluid weight since November 2009. However, a hemoglobin of 5.3 is incredibly low to be explained simply by fluid overload, and a previous hemoglobin was above 9 on a hospitalization in December when she was already in a fluid overload state. With such a low hemoglobin, there would have to be another process such as bleeding from her peptic and duodenal ulcers occurring concurrently. It may be worthwhile to consider a repeat EGD or stool guaiac to rule out GI bleed as a cause for her anemia.

3. Diabetes: With a recent HbA1c of 13.3 in November 2009, it appears that the patient’s diabetes is sub-optimally controlled. It is unclear, however, whether this is due to an inadequate regimen or patient noncompliance. The patient states that Janumet recently stopped working for her, leading to a hospitalization for presumed DKA and a change in regimen to Lantus and Novolog injections. Since then, her glucose meter shows blood glucose levels ranging from low 30s to 170, although it appears that she has had more problems with hypoglycemia than hyperglycemia since starting her new regimen. At this point, it has been less than two months since her last HbA1c measurement, and she recently started a new insulin regimen, so it may be worthwhile to recheck an HbA1c in order to determine the effectiveness of her glucose control on insulin.

In addition, the patient needs to be screened for long-term sequelae of diabetes, including retinopathy, nephropathy, and peripheral neuropathy. She will likely need follow-up with an ophthalmologist for evaluation of blurry vision in her left eye. Initial neurological screening revealed no sensory deficits in any extremities, and no scrapes, ulcers, or signs of injury were seen on the patient’s feet. The patient does exhibit significant proteinuria, however, and will likely require renal evaluation.

4. Kidney disease: On urinalysis, the patient exhibits significant proteinuria along with mild hematuria, leukocyturia, and some hyaline casts. Her proteinuria is concerning for nephrotic syndrome. Although there are many possible etiologies of nephrotic syndrome, including autoimmune disorders such as SLE, infections such as syphilis and HIV, and drugs such as NSAIDs, the most likely culprit in this patient is her diabetes. Based on her HbA1c level, she has poorly controlled diabetes, which predisposes her to many of the late-term sequelae such as diabetic nephropathy. She also did not test positive on any autoantibody tests, is not on NSAIDs, and doesn’t appear to have any manifestations of a severe infection that may otherwise explain her nephropathy.

The patient’s presentation is also fairly consistent with nephrotic syndrome. She has proteinuria, hypoalbuminemia, and significant edema, manifesting as pitting lower extremity edema, a left pleural effusion, and generalized edema throughout the body. She does not, however, have any hyperlipidemia. Hyperlipidemia occurs in nephrotic syndrome due to overproduction of lipoproteins from the liver secondary to hypoproteinemia as well as decrease in lipoprotein lipase, thereby slowing the rate of lipid catabolism. A renal consult during the patient’s hospitalization in December 2009 noted that the patient’s nephrotic-range proteinuria
was not due to nephrotic syndrome due to lack of hyperlipidemia on a fasting lipid panel, but agrees that the patient has a kidney disease likely secondary to diabetes and hypertension.

Treatment for the patient’s diabetic nephropathy would typically involve control of hypertension, use of ACE inhibitors/ARBs, and progression to calcium channel blockers, beta blockers, and diuretics as the disease progresses. Due to the patient’s bradykinin-mediated cough reaction to lisinopril, she is not a candidate for ACEIs and is therefore on losartan. She is also on beta blockers and Lasix. Disease progression should be monitored with serial creatinine measurements, and medications should be adjusted as necessary.

5. Volume overload: The patient has been significantly volume overloaded since her hospitalization in November of 2009. The most likely culprits in her case are her kidneys and her heart. Edema formation in nephrotic syndrome is due to interstitial fluid buildup according to Starling forces due to changes in oncotic pressure gradients. The most effective treatment in this case is renal natriuresis, which can be accomplished by a loop diuretic such as furosemide. There is, however, some evidence that the natriuretic effect of loop diuretics is blunted by intrinsic compensatory renal mechanisms, and a drug such as amiloride can be an effective way to increase the natriuretic effects of loop diuretics in this population.¹

The patient is also exhibiting orthopnea, paroxysmal nocturnal dyspnea, and decreased functional status, all of which typically point to heart failure. An echo performed in November of 2009, however, showed a normal ejection fraction, mild LVH, and mild MR, which is fairly inconsistent with a heart failure picture. The patient has been significantly fluid overloaded in the past few months, however, raising the possibility of a fluid overload state causing strain on cardiac myocytes. The patient’s extremely elevated BNP corroborates such a theory. Aggressive diuresis should be attempted, and if the patient’s dyspnea does not resolve with loss of fluid volume, a follow-up echo would be warranted to look for signs of heart failure.

6. HTN: Despite being on multiple antihypertensives, including an ARB, a beta blocker, and a diuretic, the patient was still significantly hypertensive on admission at 223/107. This could be secondary to her volume overload state, and aggressive diuresis would be the first step to determining whether there is a need for additional pharmacotherapy. If after obtaining adequate diuresis, the patient still has high blood pressure, the dose of her ARB or beta blocker could be titrated up to achieve better blood pressure control.

7. Hyperlipidemia: A fasting lipid panel should be obtained to evaluate the current extent of the patient’s hyperlipidemia. Her previous lipid panel in December was unremarkable, and if her lipids continue to be normal, no change in treatment is warranted.

---

**CLINICAL ABBREVIATIONS**

Common abbreviations in medication orders:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q or q</td>
<td>Every (always used with some time interval)</td>
</tr>
<tr>
<td>Q day</td>
<td>every day</td>
</tr>
<tr>
<td>BID or bid</td>
<td><em>bis in die</em>, twice a day</td>
</tr>
<tr>
<td>TID or tid</td>
<td><em>ter in die</em>, three times a day</td>
</tr>
<tr>
<td>QID or qid</td>
<td><em>quarter in die</em>, four times a day</td>
</tr>
<tr>
<td>PRN or prn</td>
<td><em>pro re nata</em>, as often as needed</td>
</tr>
<tr>
<td>Q x hours</td>
<td>Every x hours</td>
</tr>
<tr>
<td>i, ii, iii, iv</td>
<td>(lower case Roman #s)</td>
</tr>
<tr>
<td>PO or po</td>
<td><em>per os</em> = by mouth</td>
</tr>
<tr>
<td>SL</td>
<td>sublingual</td>
</tr>
<tr>
<td>PR</td>
<td><em>Per rectum</em></td>
</tr>
<tr>
<td>IV</td>
<td>Intravenously</td>
</tr>
</tbody>
</table>

**BJH Guidelines on Abbreviations**

<table>
<thead>
<tr>
<th>Unacceptable form</th>
<th>Acceptable form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero after decimal (1.0 mg)</td>
<td>No terminal zero (1 mg)</td>
</tr>
<tr>
<td>No zero before decimal (.5mg)</td>
<td>Zero before decimal (0.5 mg)</td>
</tr>
<tr>
<td>U or u</td>
<td>Write “unit”</td>
</tr>
<tr>
<td>µg</td>
<td>Write “mcg” or “microgram”</td>
</tr>
<tr>
<td>cc</td>
<td>Write “mL” or “ml” or “milliliters” or “cubic centimeters”</td>
</tr>
<tr>
<td>QOD or qod</td>
<td>Write “every other day”</td>
</tr>
<tr>
<td>QD or Q.D.</td>
<td>Write “daily” or “every day” or “Q day” or “Q 24 hours”</td>
</tr>
<tr>
<td>HS</td>
<td>Write “half-strength” or “at bedtime”</td>
</tr>
<tr>
<td>AU, AS, AD</td>
<td>Write “both ears” or “left ear” or “right ear”</td>
</tr>
<tr>
<td>OU, OS, OD</td>
<td>Write “both eyes” or “left eye” or “right eye”</td>
</tr>
<tr>
<td>TIW</td>
<td>Write “three times weekly” or specify days (“Q M-W-F”)</td>
</tr>
<tr>
<td>IU</td>
<td>Write “international units”</td>
</tr>
<tr>
<td>MS, MSO4, MgSO4</td>
<td>Write “magnesium sulfate” or “morphine sulfate”</td>
</tr>
</tbody>
</table>
**Other abbreviations:**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>abdominal aortic aneurysm</td>
</tr>
<tr>
<td>AAF/M</td>
<td>African American female/male</td>
</tr>
<tr>
<td>A-a Gradient</td>
<td>alveolar to arterial oxygen gradient</td>
</tr>
<tr>
<td>Ab</td>
<td>antibody</td>
</tr>
<tr>
<td>Abd</td>
<td>abdomen</td>
</tr>
<tr>
<td>ABG</td>
<td>arterial blood gases</td>
</tr>
<tr>
<td>ABx</td>
<td>antibiotic(s)</td>
</tr>
<tr>
<td>ac</td>
<td>before meals</td>
</tr>
<tr>
<td>AC</td>
<td>assist control (ventilation)</td>
</tr>
<tr>
<td>ACBE</td>
<td>air contrast barium enema</td>
</tr>
<tr>
<td>ACLS</td>
<td>advanced cardiac life support</td>
</tr>
<tr>
<td>ACTH</td>
<td>adrenocorticotropic hormone</td>
</tr>
<tr>
<td>AD</td>
<td><em>aud dexter</em>, right ear [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>ADH</td>
<td>antidiuretic hormone</td>
</tr>
<tr>
<td>ad lib</td>
<td>as much as needed or desired</td>
</tr>
<tr>
<td>afib</td>
<td>atrial fibrillation</td>
</tr>
<tr>
<td>AF</td>
<td>afebrile</td>
</tr>
<tr>
<td>AFB</td>
<td>acid-fast bacilli</td>
</tr>
<tr>
<td>AFP</td>
<td>alpha-fetoprotein</td>
</tr>
<tr>
<td>Ag</td>
<td>antigen</td>
</tr>
<tr>
<td>AI</td>
<td>aortic insufficiency</td>
</tr>
<tr>
<td>AKA</td>
<td>above the knee amputation</td>
</tr>
<tr>
<td>ALB</td>
<td>albumin</td>
</tr>
<tr>
<td>ALL</td>
<td>acute lymphocytic leukemia</td>
</tr>
<tr>
<td>ALT</td>
<td>SGPT, alanine aminotransaminase</td>
</tr>
<tr>
<td>AMA</td>
<td>antimitochondrial antibodies</td>
</tr>
<tr>
<td>AMI</td>
<td>acute or anterior myocardial infarction</td>
</tr>
<tr>
<td>AML</td>
<td>acute myelocytic leukemia</td>
</tr>
<tr>
<td>ANA</td>
<td>antinuclear antibodies</td>
</tr>
<tr>
<td>ANCA</td>
<td>anti-neutrophilic cytoplasmic antibodies</td>
</tr>
<tr>
<td>AODM</td>
<td>adult onset diabetes mellitus</td>
</tr>
<tr>
<td>AP</td>
<td>anterior-posterior</td>
</tr>
<tr>
<td>APC</td>
<td>atrial premature contraction</td>
</tr>
<tr>
<td>Appy</td>
<td>appendectomy</td>
</tr>
<tr>
<td>APR</td>
<td>abdominal-perineal resection</td>
</tr>
<tr>
<td>ARDS</td>
<td>adult respiratory distress syndrome</td>
</tr>
<tr>
<td>ARF</td>
<td>acute renal failure</td>
</tr>
<tr>
<td>AS</td>
<td>aortic stenosis</td>
</tr>
<tr>
<td>AS</td>
<td><em>aud sinister</em>, left ear [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>ASAP</td>
<td>as soon as possible</td>
</tr>
<tr>
<td>ASCVD</td>
<td>atherosclerotic cardiovascular disease</td>
</tr>
<tr>
<td>ASD</td>
<td>atrioseptal defect</td>
</tr>
<tr>
<td>ASHD</td>
<td>atherosclerotic heart disease</td>
</tr>
<tr>
<td>ASMI</td>
<td>anterosetal myocardial infarction</td>
</tr>
<tr>
<td>AST</td>
<td>SGOT, aspartate aminotransaminase</td>
</tr>
<tr>
<td>AU</td>
<td>both ears [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>AV</td>
<td>arteriovenous or atrioventricular</td>
</tr>
<tr>
<td>B</td>
<td>bilateral</td>
</tr>
<tr>
<td>BBB</td>
<td>bundle branch block</td>
</tr>
<tr>
<td>BCCA</td>
<td>basal cell carcinoma</td>
</tr>
<tr>
<td>BCG</td>
<td><em>Bacillus Calmette-Guerin</em></td>
</tr>
<tr>
<td>BCx</td>
<td>blood culture</td>
</tr>
<tr>
<td>BE</td>
<td>barium enema</td>
</tr>
<tr>
<td>BF/M</td>
<td>black female/male</td>
</tr>
<tr>
<td>b.i.d.</td>
<td><em>bis in die</em>, twice a day</td>
</tr>
<tr>
<td>BKA</td>
<td>below the knee amputation</td>
</tr>
<tr>
<td>BM</td>
<td>bowel movement</td>
</tr>
<tr>
<td>BMBx</td>
<td>bone marrow biopsy</td>
</tr>
</tbody>
</table>
BP  blood pressure
BPH  benign prostatic hypertrophy
BPM  beats per minute
BR  bathroom
BRBPR  bright red blood per rectum
BRP  bathroom privileges
BS  breath sounds or bowel sounds
BSO  bilateral salpingo-oophorectomy
BUN  blood urea nitrogen
Bx  biopsy
c  **cum**, with
C&S  culture and sensitivity
CA  cancer
Ca ++  calcium
CABG  coronary artery bypass grafting
CAD  coronary artery disease
CBC  complete blood count
CC  chief complaint
CCK  cholecystectomy
CCx  cholecystectomy
CCU  coronary care unit
CEA  carcinoembryonic antigen
CF  cystic fibrosis
CHF  congestive heart failure
CHOL  cholesterol
CI  cardiac index
CK  creatine phosphokinase
Cl  chloride
CLL  chronic lymphocytic leukemia
CML  chronic myelogenous leukemia
CMV  cytomegalovirus
CN  cranial nerve
CNS  central nervous system
CO  cardiac output
C/O  complaining of
COPD  chronic obstructive pulmonary disease
CP  chest pain
CPAP  continuous positive airway pressure
CPK  creatine phosphokinase
CPR  cardiopulmonary resuscitation
CPT  chest physiotherapy
Cr  creatinine
CrCl  creatinine clearance
CR  chronic renal disease
CRI  chronic renal insufficiency
CRNA  certified registered nurse anesthetist
CSF  cerebrospinal fluid
C-sxn  Caesarean section
CT  computed tomography or chest tube
CTS  cardiothoracic surgery
CVA  cerebrovascular accident
CVAT  costovertebral angle tenderness
CVP  central venous pressure
CVS  clean voided sample (of urine for culture)
CVU  cardiovascular unit
Cx  culture(s)
CXR  chest x-ray
D5W  5% dextrose in water
D/C or DC  discharge or discontinue
D&C  dilation and curettage
DB  direct bilirubin
DBP  diastolic blood pressure
DDx  differential diagnosis
DER  dual energy radiography (for bone mass)
DI  diabetes insipidus
DIC  disseminated intravascular coagulation
DIP  distal interphalangeal joint
DJD  degenerative joint disease
DKA  diabetic ketoacidosis
dl  deciliter
DLCO  diffusing capacity of the lung for carbon monoxide
DM  diabetes mellitus
DNR  do not resuscitate
DOA  day of admission or dead on arrival
DOE  dyspnea on exertion
DP  dorsalis pedis (artery)
DPT  Diphtheria-pertussis-tetanus vaccination
DTR  deep tendon reflexes
DU  duodenal ulcer
DVT  deep venous thrombosis
Dx  diagnosis
EBL  estimated blood loss
EBV  Ebstein-Barr virus
ECG  electrocardiogram
ECT  electroconvulsive therapy
EKG  electrocardiogram
EMG  electromyography
ENA  extractable nuclear antigens
ENT  ear, nose and throat (otolaryngology)
EOMI  extraocular movements intact
EP  electrophysiologic study
ERCP  endoscopic retrograde cholangio-pancreatography
ERPC  endoscopic retrograde pancreato-cholangiography
ESR  erythrocyte sedimentation rate
EST  exercise stress test
ETM  exercise treadmill
ET  endotracheal tube
ETOH  ethanol
FA  femoral artery
FBS  fasting blood sugar
FDP  fibrin degradation products
FEV₁  forced expiratory volume at 1 second
FFP  fresh frozen plasma
FiO₂  fraction inspired oxygen (%)
FLP  fasting lipid profile
FMHX  family history
FOB  foot of bed
FRC  functional residual capacity
FSH  follicle stimulating hormone
FTA-ABS  fluorescent treponemal antibody absorption
FTW  failure to wean (from mechanical ventilation)
F/U or FU  follow up
FUO  fever of unknown origin
FV  femoral vein
FVC  forced vital capacity
Fx  fracture
G  gravida
GC  Gonococcus
GERD  gastroesophageal reflux disease
GET  general endotracheal (anesthesia)
GFR  glomerular filtration rate
GGT  glutamic-glutamyl transpeptidase
GI  gastrointestinal
GLC  glucose
GNR  gram negative rod
gtt  *gutta*, drop(s)
GTCS  generalized tonic-clonic seizure
GU  genitourinary or gastric ulcer
HA  headache
HAV  hepatitis A virus
HBP  high blood pressure
HBV  hepatitis B virus
HBsAb  hepatitis B surface antibody
HBsAg  hepatitis B surface antigen
HCV  hepatitis C virus
HCG  human chorionic gonadotropin
Hct  hematocrit
HDL  high density lipoprotein
HEENT  head, eyes, ears, nose and throat
Hgb  hemoglobin
HgbA1c  hemoglobin A1c or glycohemoglobin
HH  hiatal hernia
HHM  humoral hypercalcemia of malignancy
HIV  human immunodeficiency virus
HJR  hepatojugular reflex
HO  house officer
H/O  history of
HOB  head of bed
HPF  high power field
HPI  history of the present illness
HR  heart rate
HS  *hora somni*, bedtime  [NOTE – now regarded as an unacceptable abbreviation]
HSM  hepatosplenomegaly or holosystolic murmur
HSV  herpes simplex virus
HTN  hypertension
Hx  history
I&D  incision and drainage
I&O  intake and output
IABP  intra-aortic balloon pump
ICU  intensive care unit
ID  identification or infectious diseases
IDDM  insulin dependent diabetes mellitus
IHSS  idiopathic hypertrophic cardiomyopathy
IJ  internal jugular (vein)
IM  intramuscular
IMI  inferior myocardial infarction
IMV  intermittent mandatory ventilation
INR  international normalized ratio
ISI  international sensitivity index
ITP  idiopathic thrombocytopenic purpura
IV  intravenous
IVAD  intravenous access device
IVC  inferior vena cava
IVDA  intravenous drug abuse
IVP  intravenous pyelogram
JVD  jugular venous distention
K  potassium
KUB  kidneys, ureters and bladder (an abdominal film)
KVO  keep vein open
L  left or liter
LA  left atrium
LAD  left axis deviation or left anterior descending artery or lymphadenopathy
LAE  left atrial enlargement
LAFB  left anterior fascicular block
Lat  lateral
LBBB  left bundle branch block
LDH  lactate dehydrogenase
LDL  low density lipoprotein
LFGRN  lactose fermenting gram negative rod
LH  leutinizing hormone
LIH  left inguinal hernia
LLE  left lower extremity
LLL  left lower lobe
LLQ  left lower quadrant
LLSB  left lower sternal boarder
LMP  last menstrual period
LP  lumbar puncture
LPFB  left posterior fascicular block
LPN  licensed practical nurse
LSB  left sternal boarder
LUE  left upper extremity
LUL  left upper lobe
LUQ  left upper quadrant
LV  left ventricle
LVEDP  left ventricular end diastolic pressure
LVH  left ventricular hypertrophy
M  murmur
MAC  Mycobacterium avium complex
MAI  Mycobacterium avium-intracellulare
MAP  mean arterial pressure
MCHC  mean corpuscular hemoglobin
MCV  mean corpuscular volume
Mg  magnesium
MI  myocardial infarction
ml  milliliter
MMR  measles-mumps-rubella vaccination
MRI  magnetic resonance imaging
MRSA  methacillin resistant Staphylococcus aureus
MS  mitral stenosis
MS  multiple sclerosis
MS  morphine sulfate [NOTE – now regarded as an unacceptable abbreviation]
MSO₄  morphine sulfate [NOTE – now regarded as an unacceptable abbreviation]
MVA  motor vehicle accident
MVI  multivitamin
Na  sodium
NAD  no active disease (on CXR) or no apparent distress
NAS  no added salt (diet)
ng  nanogram
NG  nasogastric (tube)
NIDDM  noninsulin dependent diabetes mellitus
NIH  National Institutes of Health
NKA  no known allergies
NKDA  no known drug allergies
NLFGNR  non-lactose fermenting gram negative rod
npo  nil per os, nothing by mouth
NS  normal saline
NSAID  nonsteroidal antiinflammatory drugs
NSR  normal sinus rhythm
NSSTTW  nonspecific ST segment and T wave change
NSVT  nonsustained ventricular tachycardia
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>NT</td>
<td>nasotracheal or nursing technician (nurse’s aide)</td>
</tr>
<tr>
<td>OB/Gyn</td>
<td>obstetrics and gynecology</td>
</tr>
<tr>
<td>OD</td>
<td><em>oculus dexter</em>, right eye [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>OD</td>
<td>overdose</td>
</tr>
<tr>
<td>OGD</td>
<td>old granulomatous disease (on CXR)</td>
</tr>
<tr>
<td>OM</td>
<td>otitis media</td>
</tr>
<tr>
<td>OOB</td>
<td>out of bed</td>
</tr>
<tr>
<td>OR</td>
<td>operating room</td>
</tr>
<tr>
<td>ORSA</td>
<td>oxacillin resistant <em>Staphylococcus aureus</em></td>
</tr>
<tr>
<td>OS</td>
<td><em>oculus sinister</em>, left eye [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>OSSA</td>
<td>oxacillin sensitive <em>Staphylococcus aureus</em></td>
</tr>
<tr>
<td>OU</td>
<td>both eyes [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>O/W</td>
<td>otherwise</td>
</tr>
<tr>
<td>p</td>
<td><em>post</em>, after</td>
</tr>
<tr>
<td>P</td>
<td>para, pending</td>
</tr>
<tr>
<td>PO₂</td>
<td>partial pressure of oxygen</td>
</tr>
<tr>
<td>PO₄</td>
<td>phosphate</td>
</tr>
<tr>
<td>PCO₂</td>
<td>partial pressure of carbon dioxide</td>
</tr>
<tr>
<td>PA</td>
<td>posteroanterior or pulmonary artery</td>
</tr>
<tr>
<td>PACU</td>
<td>post-anesthesia care unit (“the recovery room”)</td>
</tr>
<tr>
<td>PAR</td>
<td>post-anesthesia recovery (“the recovery room”)</td>
</tr>
<tr>
<td>PAT</td>
<td>paroxysmal atrial tachycardia</td>
</tr>
<tr>
<td>pc</td>
<td><em>post cibum</em>, after eating</td>
</tr>
<tr>
<td>PCP</td>
<td><em>Pneumocystis carinii</em> pneumonia</td>
</tr>
<tr>
<td>PCWP</td>
<td>pulmonary capillary wedge pressure</td>
</tr>
<tr>
<td>PCU</td>
<td>patient care unit (ward)</td>
</tr>
<tr>
<td>PDA</td>
<td>patent ductus arteriosus</td>
</tr>
<tr>
<td>PDR</td>
<td>Physicians Desk Reference</td>
</tr>
<tr>
<td>PE</td>
<td>pulmonary embolus, physical exam or pleural effusion</td>
</tr>
<tr>
<td>PEEP</td>
<td>positive end expiratory pressure</td>
</tr>
<tr>
<td>PERRL</td>
<td>pupils equal, round and reactive to light</td>
</tr>
<tr>
<td>PFT</td>
<td>pulmonary function tests</td>
</tr>
<tr>
<td>PID</td>
<td>pelvic inflammatory disease</td>
</tr>
<tr>
<td>PIP</td>
<td>proximal interphalangeal joint</td>
</tr>
<tr>
<td>Plt</td>
<td>platelets</td>
</tr>
<tr>
<td>PMHx</td>
<td>past medical history</td>
</tr>
<tr>
<td>PMI</td>
<td>point of maximal impulse</td>
</tr>
<tr>
<td>PND</td>
<td>paroxysmal nocturnal dyspnea</td>
</tr>
<tr>
<td>PNS</td>
<td>peripheral nervous system</td>
</tr>
<tr>
<td>po</td>
<td><em>per os</em>, by mouth</td>
</tr>
<tr>
<td>POD</td>
<td>post-operative day</td>
</tr>
<tr>
<td>PPD</td>
<td>purified protein derivative (TB skin test)</td>
</tr>
<tr>
<td>pr</td>
<td><em>per rectum</em>, rectally</td>
</tr>
<tr>
<td>PRBC</td>
<td>packed red blood cells</td>
</tr>
<tr>
<td>PRN or prn</td>
<td><em>pro re nata</em>, as often as needed</td>
</tr>
<tr>
<td>PT</td>
<td>prothrombin time, physical therapy, posterior tibial (artery)</td>
</tr>
<tr>
<td>Pt</td>
<td>patient</td>
</tr>
<tr>
<td>PTCA</td>
<td>percutaneous transluminal angioplasty</td>
</tr>
<tr>
<td>PTH</td>
<td>parathyroid hormone</td>
</tr>
<tr>
<td>PTT</td>
<td>partial thromboplastin time</td>
</tr>
<tr>
<td>PUD</td>
<td>peptic ulcer disease</td>
</tr>
<tr>
<td>PVC</td>
<td>premature ventricular contraction</td>
</tr>
<tr>
<td>q</td>
<td><em>quaque</em>, every</td>
</tr>
<tr>
<td>qd</td>
<td><em>quaque die</em>, every day [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>qhs</td>
<td><em>quaque hora somni</em>, every bedtime [NOTE – now regarded as an unacceptable abbreviation]</td>
</tr>
<tr>
<td>q.i.d.</td>
<td><em>quarter in die</em>, four times a day</td>
</tr>
<tr>
<td>q.o.d.</td>
<td>every other day</td>
</tr>
<tr>
<td>R</td>
<td>right</td>
</tr>
<tr>
<td>RA</td>
<td>rheumatoid arthritis or right atrium</td>
</tr>
<tr>
<td>RAD</td>
<td>right axis deviation</td>
</tr>
<tr>
<td>Abbr</td>
<td>Full Form</td>
</tr>
<tr>
<td>------</td>
<td>-----------</td>
</tr>
<tr>
<td>RAE</td>
<td>right atrial enlargement</td>
</tr>
<tr>
<td>RBBB</td>
<td>right bundle branch block</td>
</tr>
<tr>
<td>RBC</td>
<td>red blood cell</td>
</tr>
<tr>
<td>RCA</td>
<td>right coronary artery</td>
</tr>
<tr>
<td>RDP</td>
<td>random donor platelets</td>
</tr>
<tr>
<td>RDW</td>
<td>red cell distribution width</td>
</tr>
<tr>
<td>RF</td>
<td>rheumatoid factor or rheumatic fever</td>
</tr>
<tr>
<td>RIH</td>
<td>right inguinal hernia</td>
</tr>
<tr>
<td>RLE</td>
<td>right lower extremity</td>
</tr>
<tr>
<td>RLL</td>
<td>right lower lobe</td>
</tr>
<tr>
<td>RLQ</td>
<td>right lower quadrant</td>
</tr>
<tr>
<td>RML</td>
<td>right middle lobe</td>
</tr>
<tr>
<td>RN</td>
<td>registered nurse</td>
</tr>
<tr>
<td>R/O</td>
<td>rule out</td>
</tr>
<tr>
<td>ROM</td>
<td>range of motion</td>
</tr>
<tr>
<td>ROS</td>
<td>review of systems</td>
</tr>
<tr>
<td>RPR</td>
<td>rapid plasma reagin</td>
</tr>
<tr>
<td>RR</td>
<td>respiratory rate</td>
</tr>
<tr>
<td>RRR</td>
<td>regular rate and rhythm</td>
</tr>
<tr>
<td>RTA</td>
<td>renal tubular acidosis</td>
</tr>
<tr>
<td>RTC</td>
<td>return to clinic</td>
</tr>
<tr>
<td>RUE</td>
<td>right upper extremity</td>
</tr>
<tr>
<td>RUL</td>
<td>right upper lobe</td>
</tr>
<tr>
<td>RUQ</td>
<td>right upper quadrant</td>
</tr>
<tr>
<td>RV</td>
<td>right ventricle or residual volume</td>
</tr>
<tr>
<td>RVH</td>
<td>right ventricular hypertrophy</td>
</tr>
<tr>
<td>Rx</td>
<td>treatment or prescription</td>
</tr>
<tr>
<td>s</td>
<td>sine, without</td>
</tr>
<tr>
<td>SA</td>
<td>sinoatrial (node)</td>
</tr>
<tr>
<td>SBE</td>
<td>subacute bacterial endocarditis</td>
</tr>
<tr>
<td>SBFT</td>
<td>small bowel follow through (a radiologic test)</td>
</tr>
<tr>
<td>SBP</td>
<td>systolic blood pressure</td>
</tr>
<tr>
<td>SC</td>
<td>subcutaneous</td>
</tr>
<tr>
<td>SCCA</td>
<td>squamous cell carcinoma</td>
</tr>
<tr>
<td>SCV</td>
<td>subclavian vein</td>
</tr>
<tr>
<td>SCx</td>
<td>sputum culture</td>
</tr>
<tr>
<td>SDP</td>
<td>single donor platelets</td>
</tr>
<tr>
<td>SEM</td>
<td>systolic ejection murmur</td>
</tr>
<tr>
<td>SGC</td>
<td>Swan-Ganz catheter</td>
</tr>
<tr>
<td>SGOT</td>
<td>AST, serum glutamic-oxaloacetic transaminase</td>
</tr>
<tr>
<td>SGPT</td>
<td>ALT, serum glutamic-pyruvic transaminase</td>
</tr>
<tr>
<td>SHx</td>
<td>social history</td>
</tr>
<tr>
<td>SIADH</td>
<td>syndrome of inappropriate ADH secretion</td>
</tr>
<tr>
<td>sig</td>
<td>signa, write on the label</td>
</tr>
<tr>
<td>SL</td>
<td>sublingual</td>
</tr>
<tr>
<td>SLE</td>
<td>systemic lupus erythematosus</td>
</tr>
<tr>
<td>SOAP</td>
<td>subjective, objective, assessment and plan</td>
</tr>
<tr>
<td>SOB</td>
<td>short(ness) of breath</td>
</tr>
<tr>
<td>S/P</td>
<td>status post</td>
</tr>
<tr>
<td>spgr</td>
<td>specific gravity</td>
</tr>
<tr>
<td>SQ</td>
<td>subcutaneous</td>
</tr>
<tr>
<td>stat</td>
<td>statim, immediately</td>
</tr>
<tr>
<td>SVC</td>
<td>superior vena cava</td>
</tr>
<tr>
<td>SVD</td>
<td>spontaneous vaginal delivery</td>
</tr>
<tr>
<td>SVR</td>
<td>systemic vascular resistance</td>
</tr>
<tr>
<td>SVT</td>
<td>supraventricular tachycardia</td>
</tr>
<tr>
<td>Sx</td>
<td>symptom(s)</td>
</tr>
<tr>
<td>Sz</td>
<td>seizure</td>
</tr>
<tr>
<td>T3</td>
<td>triiodothyronine</td>
</tr>
<tr>
<td>T4</td>
<td>thyroxine</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
</tr>
<tr>
<td>T&amp;C</td>
<td>type and crossmatch (blood)</td>
</tr>
<tr>
<td>T&amp;H</td>
<td>type and hold (blood)</td>
</tr>
<tr>
<td>T&amp;S</td>
<td>type and screen (blood)</td>
</tr>
<tr>
<td>TAH</td>
<td>total abdominal hysterectomy</td>
</tr>
<tr>
<td>TB</td>
<td>tuberculosis or total bilirubin</td>
</tr>
<tr>
<td>TIA</td>
<td>transient ischemic attack</td>
</tr>
<tr>
<td>TIBC</td>
<td>total iron binding capacity</td>
</tr>
<tr>
<td>t.i.d.</td>
<td>ter in die, three time a day</td>
</tr>
<tr>
<td>TCO</td>
<td>to keep open (IV fluids)</td>
</tr>
<tr>
<td>TLC</td>
<td>total lung capacity or triple lumen catheter</td>
</tr>
<tr>
<td>TNC</td>
<td>too numerous to count</td>
</tr>
<tr>
<td>TP</td>
<td>total protein</td>
</tr>
<tr>
<td>TPN</td>
<td>total parenteral nutrition</td>
</tr>
<tr>
<td>TSH</td>
<td>thyroid stimulating hormone</td>
</tr>
<tr>
<td>TT</td>
<td>thrombin time</td>
</tr>
<tr>
<td>TMM</td>
<td>thallium treadmill (stress test)</td>
</tr>
<tr>
<td>TTP</td>
<td>thrombotic thrombocytopenic purpura</td>
</tr>
<tr>
<td>TURP</td>
<td>transurethral resection of the prostate</td>
</tr>
<tr>
<td>TURBT</td>
<td>transurethral resection of a bladder tumor</td>
</tr>
<tr>
<td>TV</td>
<td>tidal volume</td>
</tr>
<tr>
<td>TVH</td>
<td>total vaginal hysterectomy</td>
</tr>
<tr>
<td>Tx</td>
<td>treatment or therapy</td>
</tr>
<tr>
<td>UA</td>
<td>urinalysis of uric acid</td>
</tr>
<tr>
<td>UCx</td>
<td>urine culture</td>
</tr>
<tr>
<td>UGI</td>
<td>upper gastrointestinal series</td>
</tr>
<tr>
<td>URI</td>
<td>upper respiratory tract infection</td>
</tr>
<tr>
<td>US</td>
<td>ultra sound or unit secretary</td>
</tr>
<tr>
<td>UTI</td>
<td>urinary tract infection</td>
</tr>
<tr>
<td>VC</td>
<td>vital capacity</td>
</tr>
<tr>
<td>VPC</td>
<td>ventricular premature contraction</td>
</tr>
<tr>
<td>V/Q</td>
<td>ventilation perfusion scan</td>
</tr>
<tr>
<td>VRE</td>
<td>vancomycin resistant Enterococcus</td>
</tr>
<tr>
<td>VSS</td>
<td>vital signs stable</td>
</tr>
<tr>
<td>VT</td>
<td>ventricular tachycardia</td>
</tr>
<tr>
<td>WBC</td>
<td>white blood cell</td>
</tr>
<tr>
<td>WD/WN</td>
<td>well-developed and well-nourished</td>
</tr>
<tr>
<td>WF</td>
<td>white female</td>
</tr>
<tr>
<td>WM</td>
<td>white male</td>
</tr>
<tr>
<td>WNL</td>
<td>within normal limits</td>
</tr>
<tr>
<td>WPW</td>
<td>Wolf-Parkinson-White Syndrome</td>
</tr>
<tr>
<td>XRT</td>
<td>radiation therapy</td>
</tr>
<tr>
<td>Y/O or YO</td>
<td>years old</td>
</tr>
</tbody>
</table>
Reference: Lab Guide

- There are no "required" laboratory tests on admission to the hospital, but typical admitting labs include the following:
  - Complete Blood Count (CBC).
  - Coagulation Panel.
  - Basic Metabolic Panel (BMP) or Complete Metabolic Panel (CMP).
  - Urinalysis.
  - Chest X-ray (CXR).
  - Electrocardiogram (ECG or EKG).

- All listed normal ranges are for Barnes-Jewish Hospital; other laboratories publish their own normal ranges. Reference ranges are subject to change as laboratories change analytic reagents and techniques.

**Complete Blood Count (CBC)**

![Complete Blood Count Diagram]

<table>
<thead>
<tr>
<th>Serum Lab</th>
<th>Abbreviation</th>
<th>Normal Range</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>White Blood Cells</td>
<td>WBC</td>
<td>3.8-9.8</td>
<td>K/cumm</td>
</tr>
<tr>
<td>Hemoglobin</td>
<td>Hgb</td>
<td>Females 12.1-15.1 Males 13.8-17.2</td>
<td>gm/dl</td>
</tr>
<tr>
<td>Hematocrit</td>
<td>Hct</td>
<td>Females 36.1 - 44.3 Males 40.7 - 50.3</td>
<td>%</td>
</tr>
<tr>
<td>Platelets</td>
<td>Plt</td>
<td>140-440</td>
<td>K/ul</td>
</tr>
<tr>
<td>mean Cell Volume</td>
<td>MCV</td>
<td>80-98</td>
<td>Femtoliters</td>
</tr>
<tr>
<td>Mean Cell Hemoglobin</td>
<td>MCH</td>
<td>27-34</td>
<td>Picograms = uug</td>
</tr>
<tr>
<td>Red blood cell distribution width</td>
<td>RDW</td>
<td>11.8-14.6</td>
<td>SD</td>
</tr>
<tr>
<td>White Blood Cells</td>
<td>WBC</td>
<td>3.8-9.8</td>
<td>K/cumm</td>
</tr>
<tr>
<td>% Lymphocytes</td>
<td>% L</td>
<td>20-54</td>
<td>%</td>
</tr>
<tr>
<td>% Monocytes</td>
<td>% M</td>
<td>2.7-9.8</td>
<td>%</td>
</tr>
<tr>
<td>% Neutrophils</td>
<td>% N</td>
<td>38.7-74.9</td>
<td>%</td>
</tr>
<tr>
<td>% Eosinophils</td>
<td>% Eo</td>
<td>0-6</td>
<td>%</td>
</tr>
<tr>
<td>% Basophils</td>
<td>% B</td>
<td>0-3</td>
<td>%</td>
</tr>
<tr>
<td>Absolute Lymphocyte</td>
<td>-</td>
<td>1.2-3.3</td>
<td>K/cumm</td>
</tr>
<tr>
<td>Absolute Monocyte</td>
<td>-</td>
<td>0.2-0.7</td>
<td>K/cumm</td>
</tr>
<tr>
<td>Absolute Neutrophils</td>
<td>-</td>
<td>1.8-6.6</td>
<td>K/cumm</td>
</tr>
<tr>
<td>Absolute Eosinophils</td>
<td>-</td>
<td>0-0.5</td>
<td>K/cumm</td>
</tr>
<tr>
<td>Absolute Basophils</td>
<td>-</td>
<td>0-0.2</td>
<td>K/cumm</td>
</tr>
</tbody>
</table>
White Blood Cell Count (WBC)

- Major types of white blood cells (leukocytes):
  - Polymorphonuclear leukocytes (PMNs or PMLs or “polys”)
    - Neutrophils (N)
    - Basophils (B)
    - Eosinophils (Eo)
  - Lymphocytes (Ly)
  - Monocytes (Mo)

- If there is an abnormality in the WBC count, the differential and absolute counts are used to investigate diagnostic possibilities:

- Differential = % distribution of various types of white blood cells.

- Absolute counts for individual cell populations = WBC count x the % of each cell type from the differential

- Abnormal CBC results should be evaluated further by examining the peripheral smear.

### Neutrophils

<table>
<thead>
<tr>
<th>Increased, examples:</th>
<th>Decreased, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute bacterial infections</td>
<td>Bone marrow failure</td>
</tr>
<tr>
<td>Inflammatory disorders</td>
<td>Overwhelming bacterial infection</td>
</tr>
<tr>
<td>Metabolic disturbance</td>
<td>Rickettsial disease</td>
</tr>
<tr>
<td>Tissue necrosis</td>
<td>Viral infection</td>
</tr>
<tr>
<td>Drugs</td>
<td>Drugs, toxins</td>
</tr>
<tr>
<td>Chronic myelocytic leukemia</td>
<td>Systemic Lupus Erythematosis</td>
</tr>
</tbody>
</table>

### Lymphocytes

<table>
<thead>
<tr>
<th>Increased, examples:</th>
<th>Decreased, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral Infections</td>
<td>Bone marrow failure</td>
</tr>
<tr>
<td>Some bacterial infection</td>
<td>HIV</td>
</tr>
<tr>
<td>Chronic inflammatory conditions</td>
<td>Drugs, toxins</td>
</tr>
<tr>
<td>Lymphocytic leukemia</td>
<td></td>
</tr>
</tbody>
</table>

### Eosinophils

<table>
<thead>
<tr>
<th>Increased, examples:</th>
<th>Decreased, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parasitic infection</td>
<td>Bone marrow failure</td>
</tr>
<tr>
<td>Allergic reactions</td>
<td>Corticosteroids</td>
</tr>
<tr>
<td>Eosinophilic syndromes</td>
<td></td>
</tr>
<tr>
<td>Collagen vascular diseases</td>
<td></td>
</tr>
<tr>
<td>Neoplasia</td>
<td></td>
</tr>
<tr>
<td>Drug reaction</td>
<td></td>
</tr>
</tbody>
</table>
Monocytes

<table>
<thead>
<tr>
<th>Increased, examples:</th>
<th>Decreased, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protozoal infections</td>
<td></td>
</tr>
<tr>
<td>Rickettsial infections</td>
<td></td>
</tr>
<tr>
<td>Some bacterial infections (SBE, TB, brucellosis)</td>
<td></td>
</tr>
<tr>
<td>Monocytic leukemia</td>
<td></td>
</tr>
<tr>
<td>Inflammatory disorders (IBD, systemic lupus)</td>
<td></td>
</tr>
</tbody>
</table>

Hemoglobin (Hgb or Hb) and Hematocrit (Hct)

- Hemoglobin measures grams of protein per unit volume of blood (gm/dL), and hematocrit (%) is the volume of packed red blood cells per unit volume of blood.
- The normal hemoglobin and hematocrit are higher in men than women.
- Mean cell volume (MCV) is used to initially classify anemia as macrocytic, normocytic, or microcytic. There are different causes for each of the different classes of anemia.

Hemoglobin and Hematocrit

<table>
<thead>
<tr>
<th>Increased, examples:</th>
<th>Decreased, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dehydration, hypovolemia (many causes)</td>
<td>Anemia</td>
</tr>
<tr>
<td>Chronic hypoxemia (high altitude, smoking)</td>
<td>Hemodilution</td>
</tr>
<tr>
<td>Polycythemia vera</td>
<td></td>
</tr>
</tbody>
</table>

Mean cell volume (MCV)

<table>
<thead>
<tr>
<th>Microcytic, examples:</th>
<th>Normocytic, examples:</th>
<th>Macrocytic, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron deficiency</td>
<td>Blood loss</td>
<td>Vitamin B12 deficiency</td>
</tr>
<tr>
<td>Thalassemia</td>
<td>Hemolysis</td>
<td>Folate deficiency</td>
</tr>
<tr>
<td>Lead poisoning</td>
<td>Decreased production</td>
<td>Drugs affecting DNA synthesis</td>
</tr>
<tr>
<td>sideroblastic anemia</td>
<td></td>
<td>Liver disease</td>
</tr>
</tbody>
</table>

Platelets

- Decreased platelet count (thrombocytopenia) should always be confirmed by peripheral smear since artifactually low machine counts occur when platelets are clumped.

<table>
<thead>
<tr>
<th>Thrombocytosis (increased), examples:</th>
<th>Thrombocytopenia, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactive thrombocytosis (acute phase reactant)</td>
<td>Marrow depression (neoplasm, drugs, alcohol)</td>
</tr>
<tr>
<td>Essential thrombocytosis</td>
<td>Infections</td>
</tr>
<tr>
<td>Myeloproliferative Disorders</td>
<td>Autoimmune thrombocytopenic purpura (ITP)</td>
</tr>
<tr>
<td></td>
<td>Hemolytic uremic syndrome (HUS)</td>
</tr>
<tr>
<td></td>
<td>Thrombotic thrombocytopenic purpura (TTP)</td>
</tr>
<tr>
<td></td>
<td>Disseminated intravascular coagulation (DIC)</td>
</tr>
<tr>
<td></td>
<td>Drugs, toxins</td>
</tr>
<tr>
<td></td>
<td>Hypersplenism</td>
</tr>
</tbody>
</table>
Serum Coagulation Panel

<table>
<thead>
<tr>
<th>Serum Lab</th>
<th>Abbreviation</th>
<th>Normal Range</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prothrombin time</td>
<td>PT</td>
<td>10.4-14.5</td>
<td>Seconds</td>
</tr>
<tr>
<td>International Normalized Ratio</td>
<td>INR</td>
<td>0.78-1.22</td>
<td>(unitless ratio)</td>
</tr>
<tr>
<td>Partial thromboplastin time</td>
<td>PTT</td>
<td>23-35</td>
<td>Seconds</td>
</tr>
</tbody>
</table>

Prothrombin Time (PT) and International Normalized Ratio (INR)

- PT monitors the extrinsic coagulation system: Factors I (fibrinogen), II (thrombin), V, VII, X.
- PT is usually not prolonged until factors have decreased to less than 50% of normal.
- Two of the most common clinical uses of PT are to monitor anticoagulation therapy with warfarin (Coumadin) and to assess synthetic function of the liver.
- The measured PT can vary from lab to lab depending on variations in the sensitivity of the thromboplastin reagent and the lab method. The International Sensitivity Index (ISI) is an empirically determined correction factor for the responsiveness of each thromboplastin.
- The PT of the patient is divided by the lab's normal PT; this ratio is raised to the power of ISI. The resulting number is the INR.
- The target INR range varies according to the clinical situation, but a typical therapeutic INR range is 2.0 to 3.0.

Partial Thromboplastin Time (PTT)

- PTT monitors the intrinsic coagulation system (Factors I, II, V, VII-XII). The PTT is essentially a measure of all blood factors except for factor VII (measured by PT).
- One of the common clinical uses of PTT is for monitoring anti-coagulation with heparin.

| Prolonged PT/INR, examples:       | Prolonged PTT, examples:       |
|                                  |                              |
| Deficiencies in factors I, II, V, VII, or X | Deficiency in factors I, II, V, VIII, IX, X, XI, or XII |
| Liver disease                     | Disseminated intravascular coagulation |
| Disseminated intravascular coagulation | Heparin administration |
| Vitamin K deficiency              | Lupus anticoagulant, antiphospholipid syndrome |
| Warfarin administration           | Antibody-mediated inhibitors of clotting factors |
| Incomplete filling of the Vacutainer tube |                              |
**Basic Metabolic Panel (BMP)**

<table>
<thead>
<tr>
<th>Serum Lab</th>
<th>Abbreviation</th>
<th>Normal Range</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>Na</td>
<td>135-145</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Potassium</td>
<td>K</td>
<td>3.3-4.9</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Chloride</td>
<td>Cl</td>
<td>97-110</td>
<td>mmol/l</td>
</tr>
<tr>
<td>Carbon Dioxide or Bicarbonate</td>
<td>CO₂ or HCO₃</td>
<td>22-32</td>
<td>mmol/L</td>
</tr>
<tr>
<td>Blood Urea Nitrogen</td>
<td>BUN</td>
<td>8-25</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Creatinine</td>
<td>Cr</td>
<td>0.6-1.4</td>
<td>mg/dl</td>
</tr>
<tr>
<td>Glucose</td>
<td>Gl</td>
<td>65-199</td>
<td>mg/dl</td>
</tr>
</tbody>
</table>

**Sodium**
- Predominant cation in the extracellular fluid
- Value for sodium on the BMP is the plasma concentration. Thus, this number gives an indication regarding the balance between sodium and water but alone does not provide information about overall sodium deficiency or excess in the body.
  - An increased serum Na⁺ concentration indicates a relative total body water deficit and decreased serum Na⁺ indicates water excess.
- When serum sodium levels are outside the normal range, the patient’s extracellular volume status, plasma osmolality (solute concentration) and urine sodium are helpful in sorting out the potential causes.

<table>
<thead>
<tr>
<th>Hypernatremia (Increased), examples:</th>
<th>Hyponatremia (Decreased), examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inadequate access to water</td>
<td>Diarrhea or vomiting with inadequate Na+ replacement</td>
</tr>
<tr>
<td>Diabetes Insipidous</td>
<td>Diuretics</td>
</tr>
<tr>
<td>Insensible water loss</td>
<td></td>
</tr>
<tr>
<td>Diarrhea with inadequate water replacement</td>
<td></td>
</tr>
<tr>
<td>Hypertonic IV fluids</td>
<td></td>
</tr>
</tbody>
</table>

**Potassium**
- The main intracellular cation (intracellular concentration about 150 mmol/L.)
- Less than 1% of total body K⁺ is in the plasma so small shifts of K⁺ from the cells causes relatively large changes in the serum [K⁺].
- Hemolysis occurring during sample collection falsely elevates the serum K⁺.

<table>
<thead>
<tr>
<th>Hyperkalemia (Increased), examples:</th>
<th>Hypokalemia (Decreased), examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal Failure</td>
<td>Urinary loss (Diuretics, Mg⁺ depletion, amphotericin)</td>
</tr>
<tr>
<td>Rhabdomyolysis</td>
<td>GI losses (vomiting, diarrhea, malabsorption, laxative abuse)</td>
</tr>
<tr>
<td>Hypoaldosteronism</td>
<td>Redistribution of potassium from extracellular to intracellular fluid (Acidosis)</td>
</tr>
<tr>
<td>Aldosterone antagonist drugs (Spironolactone)</td>
<td>Redistribution of potassium from extracellular to intracellular fluid (alkalosis, insulin, beta agonists)</td>
</tr>
<tr>
<td>Redistribution of potassium from intracellular to extracellular fluid (Acidosis)</td>
<td></td>
</tr>
<tr>
<td>Hemolysis</td>
<td></td>
</tr>
</tbody>
</table>
Chloride – Principal anion in the extracellular fluid

<table>
<thead>
<tr>
<th>Hyperchloremia (Increased), examples:</th>
<th>Hypochloremia (Decreased), examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonanion gap metabolic acidosis</td>
<td>Usually due to excessive GI loss of chloride, less commonly due to renal losses</td>
</tr>
<tr>
<td>Dehydration</td>
<td>Anion gap metabolic acidosis</td>
</tr>
<tr>
<td></td>
<td>Metabolic alkalosis (bicarbonate replaces Cl-)</td>
</tr>
</tbody>
</table>

Carbon Dioxide or Bicarbonate

- On the wards the terms “bicarb” and “CO2” are often used interchangeably for this analyte because the values are almost the same.
  - Plasma “total dissolved CO2” = HCO3 + H2CO3
  - Normally the plasma bicarbonate concentration is about 24 while the carbonic acid concentration is only about 1.2 mmol/L.
  - Clinical management isn’t really affected by a one point change in the value of CO2/HCO3 so either can be used clinically.
- This CO2 must be differentiated from the “CO2” on arterial blood gas (ABG) measurements – the ABG measures the partial pressure of the gas (PCO2) while the BMP measures the concentration of dissolved gas.

<table>
<thead>
<tr>
<th>Increased bicarbonate, examples:</th>
<th>Decreased bicarbonate, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Metabolic alkalosis and/or compensation for respiratory acidosis.</td>
<td>Metabolic acidosis and/or compensation for respiratory alkalosis</td>
</tr>
</tbody>
</table>

Blood Urea Nitrogen (BUN)

- Metabolism of protein produces ammonia which the liver converts to urea
- Urea is filtered and reabsorbed by the kidney

<table>
<thead>
<tr>
<th>Increased BUN, examples:</th>
<th>Decreased BUN, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased renal function (decreased GFR)</td>
<td>Malnutrition</td>
</tr>
<tr>
<td>Dehydration (decreased GFR)</td>
<td>Liver disease</td>
</tr>
<tr>
<td>Catabolic state (burns, fever, corticosteroids)</td>
<td></td>
</tr>
<tr>
<td>GI bleed (increased production in the gut)</td>
<td></td>
</tr>
</tbody>
</table>

Creatinine (Cr)

- Results from metabolism of creatine in the muscles; amount produced is proportional to muscle mass.
- Creatinine is cleared by glomerular filtration (75%) and tubular secretion (25%), without reabsorption.
- The rate of urinary creatinine excretion is an indicator of glomerular filtration.
- The glomerular filtration rate (GFR) can be estimated by the Cockcroft-Gault formula:
  \[
  \frac{(140 - \text{age}) \times (\text{wt in kg})}{\text{Scr (mg/dl)}} \times 0.85 \text{ if female} \times 72
  \]
- Another formula to estimate GFR is the MDRD (Modification of Diet in Renal Disease study) formula:
  \[
  \text{Est GFR (ml/min/1.73m}^2) = 186 \times (\text{Pcr})^{-1.154} \times (\text{age})^{-0.203} \times (0.742 \text{ if female}) \times (1.210 \text{ if African American})
  \]
• Calculators are available for these and other formulae are available on many websites, including:
  o www.nephron.com/
  o www.clinicalcalculator.com/homepage.htm
  o www.medcalc.com/
  o www.med-ia.ch/medcalc/ (free PDA download)

<table>
<thead>
<tr>
<th>Increased creatinine, examples:</th>
<th>Decreased creatinine, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased renal function</td>
<td>Decreased muscle mass</td>
</tr>
<tr>
<td>Rhabdomyolysis</td>
<td></td>
</tr>
</tbody>
</table>

In acute renal failure it is useful to categorize potential diagnoses into pre-renal, renal, or post-renal/obstructive processes. The BUN:Cr ratio can be suggestive of the etiology, but is not definitive.

<table>
<thead>
<tr>
<th>Typical BUN/Cr Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>Pre-renal</td>
</tr>
<tr>
<td>Intrinsic Renal</td>
</tr>
<tr>
<td>Post-renal</td>
</tr>
</tbody>
</table>

Complete Metabolic Panel (CMP)

Complete Metabolic Panel (CMP) = BMP + other serum chemistries

<table>
<thead>
<tr>
<th>Serum Lab</th>
<th>Abbreviation</th>
<th>Normal Range</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Protein</td>
<td>TP</td>
<td>6.5-8.5</td>
<td>g/dL</td>
</tr>
<tr>
<td>Albumin</td>
<td>Alb</td>
<td>3.6-5.0</td>
<td>g/dL</td>
</tr>
<tr>
<td>Calcium</td>
<td>Ca</td>
<td>8.6-10.3</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Total Bilirubin</td>
<td>TB</td>
<td>0.3-1.1</td>
<td>mg/dL</td>
</tr>
<tr>
<td>Alkaline phosphatase</td>
<td>AΦ</td>
<td>38-126</td>
<td>IU/L</td>
</tr>
<tr>
<td>Alanine aminotransferase</td>
<td>ALT</td>
<td>7-53</td>
<td>IU/L</td>
</tr>
<tr>
<td>Aparatate aminotransferase</td>
<td>AST</td>
<td>11-47</td>
<td>IU/L</td>
</tr>
<tr>
<td>Magnesium</td>
<td>Mg</td>
<td>1.3-2.2</td>
<td>mEq/L</td>
</tr>
</tbody>
</table>

Albumin
• A protein synthesized in the liver; has a half life of approximately 2-3 weeks.
• Comprises more than half the total serum protein
• Contributes to about 80% of osmotic pressure of the plasma.

<table>
<thead>
<tr>
<th>Increased Albumin, examples:</th>
<th>Decreased Albumin, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>May be artifactually increased in dehydration</td>
<td>Chronic debilitating disease</td>
</tr>
<tr>
<td></td>
<td>Liver disease</td>
</tr>
<tr>
<td></td>
<td>Malabsorption</td>
</tr>
<tr>
<td></td>
<td>Protein losing enteropathy</td>
</tr>
<tr>
<td></td>
<td>Proteinuria</td>
</tr>
<tr>
<td></td>
<td>Malnutrition</td>
</tr>
</tbody>
</table>
Calcium

- About 99% of the body calcium is in the bones.
- Serum calcium circulates in the serum in both ionized (free) and protein-bound forms. The ionized fraction of calcium is the most important physiologically.
- The total serum calcium level cannot be interpreted without a serum albumin level. Hypoalbuminemia reduces total serum calcium without affecting the physiologically active ionized form.
  - Estimated "corrected" total calcium can be compared to the usual reference range.
  - "Corrected" serum calcium = measured serum calcium + [(0.8) x (4 - measured albumin)]
- When the total serum calcium level is above or below the normal range, the serum ionized calcium should be measured.

<table>
<thead>
<tr>
<th>Hypercalcemia, examples:</th>
<th>Hypocalcemia, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary hyperparathyroidism</td>
<td>Hypoalbuminemia</td>
</tr>
<tr>
<td>Malignancy</td>
<td>Renal Failure</td>
</tr>
<tr>
<td>Sarcoidosis</td>
<td>Hypoparathyroidism</td>
</tr>
<tr>
<td>Vitamin D toxicity</td>
<td>Vitamin D deficiency</td>
</tr>
<tr>
<td>Lithium Use</td>
<td></td>
</tr>
<tr>
<td>Milk-ALKali Syndrome</td>
<td></td>
</tr>
<tr>
<td>Immobilization (increased bone breakdown)</td>
<td></td>
</tr>
</tbody>
</table>

Bilirubin

- Unconjugated bilirubin is insoluble in water until conjugated in the liver with glucuronic acid.
- The water-soluble conjugated bilirubin is normally excreted in the bile. When the level exceeds 0.4 mg/dL, the water-soluble form appears in the urine.

<table>
<thead>
<tr>
<th>Unconjugated (indirect) hyperbilirubinemia, examples:</th>
<th>Conjugated (direct) hyperbilirubinemia, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hemolysis</td>
<td>Ineffective hepatocyte excretion of bilirubin</td>
</tr>
<tr>
<td>Ineffective erythropoiesis</td>
<td>(Dubin-Johnson syndrome, Rotor syndrome)</td>
</tr>
<tr>
<td>Decreased hepatic uptake of unconjugated bilirubin</td>
<td>Intrahepatic cholestasis (hepatitis, drugs,</td>
</tr>
<tr>
<td>(Gilbert syndrome)</td>
<td>granulomatous disease)</td>
</tr>
<tr>
<td>Impaired hepatic conjugation (neonatal jaundice,</td>
<td>Bile duct obstruction.</td>
</tr>
<tr>
<td>drugs or Crigler-Najjar syndrome)</td>
<td></td>
</tr>
</tbody>
</table>

Alkaline Phosphatase

- Alkaline Phosphatase isoenzymes are plentiful in both liver and bone, as well as in osteoblasts, intestinal mucosa, placental cells, and renal epithelium.
- When Alk phos levels are elevated, other enzymes which rise with liver disease but not with bone disease are measured in order to determine the source of the elevated Alk phos (i.e. liver vs. bone): Gamma-glutamyl transpeptidase (GGT) or 5'-nucleotidase.
- Elevation of the alk phos and bilirubin is referred to as a "cholestatic pattern."

<table>
<thead>
<tr>
<th>Increased hepatic alk phos, examples:</th>
<th>Increased bone alk phos, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common bile duct obstruction</td>
<td>Hyperparathyroidism (osteitis fibrosa cystica)</td>
</tr>
<tr>
<td>Intrahepatic cholestasis</td>
<td>Acromegaly</td>
</tr>
<tr>
<td>Passive congestion of the liver</td>
<td>Paget disease</td>
</tr>
<tr>
<td>Drug reactions (intrahepatic cholestasis)</td>
<td>chronic osteomyelitis</td>
</tr>
<tr>
<td>Metastatic cancer</td>
<td>healing fractures</td>
</tr>
<tr>
<td></td>
<td>Metastatic cancer</td>
</tr>
</tbody>
</table>
Transaminases

- Aspartate Aminotransferase (AST) is also known as serum glutamic oxalacetic transaminase (SGOT).
- Alanine Aminotransferase (ALT) is also known as serum glutamic pyruvate transaminase (SGPT).
- Elevation of the alk phos and bilirubin is referred to as a "cholestatic pattern."
- AST and ALT are abundant in the liver, skeletal and heart muscle; ALT is more liver-specific.
- Increased ALT usually indicates damage to the liver, although severe damage to skeletal muscle can produce significant elevations.
- Increased AST can result from damage to the liver or muscle.
- Elevation of the transaminases is referred to as "hepatocellular pattern."
- AST > 2 x ALT - suggests alcoholic hepatitis

<table>
<thead>
<tr>
<th>Elevated ALT, examples:</th>
<th>Elevated AST, examples:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viral hepatitis</td>
<td>Muscular dystrophy</td>
</tr>
<tr>
<td>Passive liver congestion</td>
<td>Paget disease</td>
</tr>
<tr>
<td>Extrahepatic biliary obstruction</td>
<td>Cholecystitis</td>
</tr>
<tr>
<td>Drug-induced liver disease</td>
<td>Hepatocellular injury</td>
</tr>
<tr>
<td>Alcoholic liver disease</td>
<td>Hemolytic diseases</td>
</tr>
<tr>
<td>Hepatocellular carcinoma, liver metastases</td>
<td>Polymyositis</td>
</tr>
<tr>
<td></td>
<td>Rhabdomyolysis</td>
</tr>
<tr>
<td></td>
<td>Extrahepatic biliary obstruction</td>
</tr>
<tr>
<td></td>
<td>Bone metastases</td>
</tr>
<tr>
<td></td>
<td>Myocardial infarction</td>
</tr>
</tbody>
</table>

Cardiac Markers/Cardiac Enzymes

- Serum cardiac markers are proteins released into the blood from necrotic heart tissue in the setting of myocardial infarction (MI). Diagnosis of acute MI is typically based on the presence of the following clinical elements:
  - History of ischemic chest discomfort.
  - Characteristic changes seen on serially obtained EKGs.
  - A rise and fall in serum cardiac markers.

- Because the other elements required for a diagnosis of myocardial infarction may not be present and characteristic rises of serum cardiac markers occur in almost all patients with clinically proven myocardial infarction, cardiac enzyme measurements are an important part of confirming the diagnosis of MI.

- Troponin-I and CK-MB are currently the most widely used cardiac markers. For the purposes of confirming the diagnosis of MI, serum cardiac markers are measured at the time of admission/onset of symptoms, and 12 and 24 hours later.

<table>
<thead>
<tr>
<th>Cardiac Marker</th>
<th>Normal Range</th>
<th>Rise (Hours)</th>
<th>Peak (Hours)</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Myoglobin</td>
<td>0-2 mcg/ml</td>
<td>1-4</td>
<td>12</td>
<td>24 hours</td>
</tr>
<tr>
<td>Creatine Phosphokinase – MB isoenzyme (CK-MB)</td>
<td>0-7 IU/L</td>
<td>4-8</td>
<td>24</td>
<td>2-3 days</td>
</tr>
<tr>
<td>Troponin – I (trop-I)</td>
<td>0-1.4 ng/ml</td>
<td>4-5</td>
<td>24-36</td>
<td>7-10 days</td>
</tr>
<tr>
<td>Lactate Dehydrogenase (LDH)</td>
<td>100-250 IU/L</td>
<td>8-12</td>
<td>72</td>
<td>7-12 days</td>
</tr>
</tbody>
</table>
Cardiac Specific Troponins

- Troponins are proteins present in both cardiac and skeletal muscle but encoded by different genes in each of these locations and have different amino acid sequences. This has allowed the development of monoclonal antibodies specific for the cardiac forms of Troponin-I and Troponin-T.

- Cardiac troponin measurements are now the serum markers of choice for myocardial infarction. They should be nearly indetectable in healthy individuals but may increase to 20 times the "normal" range in the setting of an MI. At Barnes-Jewish Hospital, Troponin-I is the main serum marker used in diagnosis of an acute coronary syndrome/MI.

- Because troponin levels remain elevated for more than a week after infarction, they can be useful when the patient presents several days after the onset of symptoms.

Creatine Phosphokinase

- Creatine phosphokinase (CK) is present in all muscle tissue. The MM isoenzyme of CK predominates in skeletal muscle while the MB isoenzyme is present primarily in cardiac muscle with only 1-3% in skeletal muscle. CK-MB values are most useful if they are obtained serially since the temporal pattern of the CK-MB rise and fall differs for skeletal muscle vs. cardiac muscle release.
  - Skeletal muscle release - Plateau over several days.
  - Cardiac muscle release - Peaks within 24 hours after the myocardial damage and then falls.

- In addition to myocardial infarction, CK-MB can be elevated with other forms of cardiac muscle injury, including myocarditis, pericarditis, cardiac trauma or cardiac procedures (catheterization, surgery).

- CK-MB is more useful than Troponin-I in diagnosing episodes of reinfarction (i.e., due to the prolonged elevation of Troponin-I).

Myoglobin

- Myoglobin is found in both skeletal and cardiac muscle and is the main protein of striated muscle. Limitations of the use of myoglobin are that it is not cardiac specific and that it is rapidly excreted into the urine, limiting serial determinations of myoglobin. Other causes of increased myoglobin include rhabdomyolysis, skeletal muscle trauma or surgical procedures, seizures, burns, or crush injury.

- One advantage of myoglobin as a serum cardiac marker is that it is likely to be the first to rise above the normal range after acute MI. (i.e., may be released into the circulation within 1-4 hours after the infarction event)

- An isolated myoglobin measurement does not confirm the diagnosis of an MI. Myoglobin should always be supplemented by more cardiac specific markers such as CK-MB or Troponin-I.

Lactic Dehydrogenase (LDH)

- Total LDH is sensitive but not specific. Other causes of increased LDH include hemolysis, liver disease, renal disease, skeletal muscle disease, and pulmonary embolism.

- LDH has 5 isoenzymes; the heart predominantly contains the LDH-1 isoenzyme. A ratio of LDH1:LDH2 of >1 has been used in confirming MI.

- LDH and LDH isoenzyme testing in the setting of potential MI has been superceded by the newer more cardiac-specific markers (i.e., the troponins).
Lipoprotein profile (lipid panel)

- Lipoproteins are large molecular compounds that are essential for transporting cholesterol and triglycerides within the blood. They contain a lipid core composed of triglyceride and cholesterol esters surrounded by phospholipid and specialized proteins known as apolipoproteins. Cholesterol is carried on three lipoproteins in the blood resulting in 3 cholesterol fractions:
  - Very low density lipoprotein (VLDL).
  - Low density lipoprotein (LDL).
  - High density lipoprotein (HDL).

- Lipoprotein profile measures the total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides (TG).
  - LDL = Total Cholesterol - HDL - (TG ÷ 5).

- Total cholesterol, TG, and HDL are measured directly and LDL is calculated. The VLDL cholesterol fraction is approximated by TG ÷ 5.

- A 12-14 hour fasting sample is ideal since LDL and TG are affected by recent fat intake.

- During the first 24-48 hours after a myocardial infarction, total cholesterol and HDL levels remain at baseline and then begin to fall. These levels reach a minimum in 4-6 days and do not return to baseline for another 6-8 weeks.

Urinalysis (UA)

<table>
<thead>
<tr>
<th>Macroscopic</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Yellow</td>
</tr>
<tr>
<td>Clarity</td>
<td>Clear</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.003-1.030</td>
</tr>
<tr>
<td>pH</td>
<td>4.5-8.0</td>
</tr>
<tr>
<td>Protein</td>
<td>Negative (less than 150mg/24 hours)</td>
</tr>
<tr>
<td>Glucose</td>
<td>Negative</td>
</tr>
<tr>
<td>Ketone</td>
<td>Negative</td>
</tr>
<tr>
<td>Occult Blood</td>
<td>Negative</td>
</tr>
<tr>
<td>Leukocyte Esterase</td>
<td>Negative</td>
</tr>
<tr>
<td>Nitrate</td>
<td>Negative</td>
</tr>
<tr>
<td>Urobilinogen</td>
<td>0.1-1.0 mg/dl</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Microscopic</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Blood Cells</td>
<td>0-3/HPF (High Power Field)</td>
</tr>
<tr>
<td>White Blood Cells</td>
<td>0-5/HPF (Low Power Field)</td>
</tr>
<tr>
<td>Casts</td>
<td>0/LPF</td>
</tr>
<tr>
<td>Bacteria</td>
<td>0/HPF</td>
</tr>
<tr>
<td>Renal Epithelial Cells</td>
<td>0/HPF</td>
</tr>
</tbody>
</table>

Urinalysis – Macroscopic Evaluation

- Procedure for examining the urinary sediment (deGowin) – Centrifuge 10 mL of urine in a conical tube for 5 minutes, decant the supernatant, flick the tube to disperse formed elements in the remaining drop, and place it on a slide under a cover slip to be examined with the high-power objective of a microscope (hpf).
- **Specific gravity**
  - An index of weight per unit volume; reflects urine concentration
  - **Increased Specific Gravity** –
    - Dehydration
    - Glycosuria
    - Proteinuria
    - Radiographic contrast media
  - **Decreased Specific Gravity** –
    - Compulsive water drinking
    - Diabetes insipidus

- **pH**
  - Normal urine is acidic
  - Interpretation of the urine pH requires an assessment of the serum acid-base status
  - **High pH** (alkaline urine) –
    - Infection with urea-splitting organisms (e.g., Proteus)
    - Systemic alkalosis
    - Renal tubular acidosis
    - Carbonic anhydrase inhibitors
  - **Low pH** (acid urine) –
    - Metabolic acidosis

- **Protein**
  - Glomerular disease produces proteinuria by allowing filtration of larger molecules than normal.
  - **Slightly increased protein** –
    - Pyelonephritis
    - Benign orthostatic proteinuria
    - Idiopathic focal glomerulonephritis
  - **Marked proteinuria** –
    - Glomerulonephritis
    - Diabetes mellitus
    - Systemic lupus erythematosus
    - Renal vein thrombosis
    - Amyloidosis
    - Other causes of nephrotic syndrome.
  - **Degree of proteinuria** can be quantified by a 24-hour urine collection
    - Normal: < 30 mg albumin or 150 mg protein per 24 hours
    - Nephrotic syndrome is defined as >3.5 g/d of proteinuria
  - **A spot urine albumin to creatinine ratio can be used to estimate proteinuria**
    - Normal: < 30 mg alb/gm creat
    - Microalbuminuria = 30-300 mg alb/gm creat

- **Glucose**
  - Glucose is filtered in the glomerulus then reabsorbed in the proximal tubule
  - If serum glucose is >200 mg/dL, the filtered load will exceed the capacity for tubular reabsorption and glucose will appear in the urine.
  - **Glycosuria** –
    - Diabetes mellitus
    - Acute tubular damage
    - Fanconi syndrome.

- **Ketones**
  - Ketonuria indicates that cellular metabolism is dependent upon fatty acids rather than glucose for energy.
  - **Ketonuria** –
    - Diabetic keto-acidosis
    - Fasting/starvation
- Alcoholic ketoacidosis

- Blood
  - The dipstick tests for heme, which is found in both hemoglobin and myoglobin.
  - A dipstick positive for blood should be followed up with a microscopic analysis.
  - Hematuria
    - Infection/inflammation of bladder or prostate
    - Nephrolithiasis
    - Malignancy (bladder, renal cell)
    - Consider myoglobinuria if the dipstick is positive for "blood" but the microscopic analysis reveals no red blood cells.

- Leukocyte Esterase (LE)
  - Indicates the presence of leukocytes which have liberated esterase
  - Infection or inflammation within the urinary tract.

- Nitrite
  - Indicates the presence of bacteria which have reduced nitrate in urine to nitrite (note that some bacteria are not associated with nitrite production)

- White Blood Cells (WBC)
  - Pyuria suggests infection, interstitial nephritis, inflammation of the urinary tract
  - In women the UA may be contaminated by vaginal leukocytes

- Red Blood Cells (RBC)
  - Hematuria suggests infection or inflammation of bladder or prostate, nephrolithiasis, malignancy (bladder, renal cell).

- Casts
  - Hyaline
    - From the normal renal tubular secretion of mucoproteins
    - May be seen in fresh concentrated specimens
  - Granular
    - Composed of serum proteins
    - Renal parenchymal disease, acute tubular necrosis
  - WBC – Pyelonephritis, glomerulonephritis, renal infarction, infection
  - RBC – glomerulonephritis

- Bacteria

**Cerebrospinal Fluid (CSF)**

Some of the commonly ordered studies are as follows:

- Protein
  - Normal CSF protein: 20-50 mg/dL
  - Increased CSF protein found in: traumatic tap, infection, hemorrhage, metabolic and demyelinating disorders.
  - Decreased CSF protein found in: young children, CSF leakage, water intoxication, CSF removal, hyperthyroidism.

- Glucose
  - Normal CSF glucose: 40-70 mg/dL (SI Units: 2.2-3/9 mmol/L).
  - Elevated CSF glucose found in: hyperglycemia.
- Decreased CSF glucose found in: hypoglycemia, infection (especially bacterial or mycobacterial), meningeal malignancy.
- Cell count
  - Normal CSF cell count: Adults 0-5 (neonates, 0-30) nucleated cells per microliter;
  - Nucleated cells increase in infection of the CNS (viral and early bacterial meningitis, meningoencephalitis, or abscess), neurologic disorders, and hematologic malignancies.

**Pleural fluid**

- The first step is to characterize the fluid as a transudate or an exudate, usually by Light’s Criteria:
  - Pleural fluid is classified as an exudate if it meets any of the following criteria:
    - Ratio of pleural fluid protein to serum protein > 0.5, OR
    - Ratio of pleural fluid LDH to serum LDH > 0.6, OR
    - Pleural fluid LDH >2/3 upper limit of normal (ULN) for serum LDH
      - (ULN = 250 in BJH lab, so 2/3 = 166)
  - Pleural fluid is characterized as a transudate if it meets none of the above criteria.
- Whether a fluid is transudative or exudative has important clinical implications:

<table>
<thead>
<tr>
<th></th>
<th>Transudate</th>
<th>Exudate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caused by</td>
<td>Systemic factors</td>
<td>Local factors</td>
</tr>
<tr>
<td>Due to</td>
<td>Alterations in hydrostatic or oncotic forces</td>
<td>Inflammation</td>
</tr>
<tr>
<td>Typical appearance</td>
<td>Clear and pale, straw-colored fluid</td>
<td>May be cloudy</td>
</tr>
<tr>
<td>Protein content</td>
<td>Low protein</td>
<td>Protein-rich</td>
</tr>
<tr>
<td>Cells</td>
<td>Few</td>
<td>May have many cells</td>
</tr>
<tr>
<td>DDX</td>
<td>Narrow</td>
<td>Broad</td>
</tr>
<tr>
<td>Most common etiologies</td>
<td>CHF, Cirrhosis, Pulmonary embolism (25% of PE effusions are transudative) nephrotic syndrome</td>
<td>Bacterial pneumonia, Malignancy, Viral infection, Pulmonary embolism (75% of PE effusions are exudative), Inflammatory diseases</td>
</tr>
<tr>
<td></td>
<td>Diagnosis is often clear</td>
<td>Often needs further diagnostic testing</td>
</tr>
</tbody>
</table>

**Ascites Fluid**

- Serum/Ascites Albumin Gradient (SAAG)
  - SAAG = Serum albumin minus peritoneal
  - SAAG <1.1 indicates an exudate (bacterial peritonitis, neoplasm, nephrotic syndrome, pancreatitis, vasculitis);
  - SAAG <1.1 (low albumin ascites) indicates a transudate (portal hypertension caused by cirrhosis, hepatic vein thrombosis, portal vein thrombosis, congestive heart failure).
- White Blood Cell Counts.
  - Neutrophil counts of >250/mm³ suggest infection (spontaneous bacterial peritonitis)
Cardiac Risk Factors

Cardiac risk factors appear to interact synergistically in producing risk with mortality rates due to coronary artery disease (CAD) increasing with an increasing number of risk factors.

<table>
<thead>
<tr>
<th>Unmodifiable Risk Factors</th>
<th>Potentially Modifiable Risk Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Cigarette Smoking</td>
</tr>
<tr>
<td>Male sex</td>
<td>Hypertension</td>
</tr>
<tr>
<td>Family History of Premature CAD</td>
<td>Dyslipidemia (elev LDL, elev TG, low HDL)</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
</tr>
<tr>
<td></td>
<td>Obesity</td>
</tr>
<tr>
<td></td>
<td>Sedentary life style/ physical inactivity</td>
</tr>
<tr>
<td></td>
<td>Elevated homocysteine</td>
</tr>
</tbody>
</table>

NCEP Guidelines

- “NCEP” is the National Cholesterol Education Program, sponsored by the National Institutes of Health
  - Cardiac risk factors are discussed in detail in the “ATP III” Guideline
  - Available at: www.nhlbi.nih.gov/guidelines/cholesterol/atp3_rpt.htm

- Risk Factors
  - Age
    - Male 45 years of age or older
    - Female 55 years of age or older
  - Family history of premature Coronary Heart Disease
    - Definite myocardial infarction or sudden death
    - Before age 55 in a male first degree relative
    - Before age 65 in a female first degree relative
  - Current cigarette smoking
  - Hypertension (140/90 or greater, or on antihypertensive therapy)
  - Low HDL cholesterol (<40 mg/dL)

- Negative (protective) Risk Factor
  - High HDL cholesterol (60 mg/dL or greater)
Specific Risk Factors

Age/Sex

- Men ≥ 45 years old
- Women ≥ 55 years old

Family history of premature coronary artery disease (FHx CAD)

- Male 1st degree relative with CAD at <55 years old
- Female 1st degree relative with CAD at <65 years old

Cigarette Smoking

- The adverse cardiovascular effect of smoking impacts both men and women of all ages and ethnic groups with or without prior known CAD.
- A dose response relationship exists between smoking and CAD: the duration of smoking and daily amount of cigarette smoking influences the risk for CAD.
- Duration and amount of smoking is often expressed as "pack-years" in the social history: Pack-years = Packs/day x number of years smoked (example: 1-1/2 pack per day times 10 years = 15 pack-years)
- With smoking cessation, the increased risk of CAD diminishes over time and falls by 50% in just 2-3 years. The risk approaches the level of a nonsmoker after about 15 years of abstinence.

Hypertension

- Defined as a blood pressure of >140/90 mmHg, OR being treated for hypertension (so even well controlled hypertension counts as a risk factor)

Dyslipidemia

- Total cholesterol (TC) is carried on three lipoproteins in the blood resulting in 3 separate cholesterol fractions with different prognostic significance.
  - Very low density lipoprotein (VLDL)
  - Low density lipoprotein (LDL) - the so-called "bad" cholesterol
  - High density lipoprotein (HDL) - the so-called "good" cholesterol
- There is an increased risk of CAD with increasing levels of LDL
  - LDL is the primary target of medical therapy for primary and secondary prevention of CAD.
  - LDL goal for prevention of CAD is based on assessment of cardiac risk factors, and ranges from less than 100 mg/dL to less than 160 mg/dL depending on the patient's risk profile (see section on the "ATP-III" guidelines).
- HDL is inversely related to incidence of CAD
  - HDL of 60mg/dL or more may be cardioprotective – a "negative risk factor"
  - HDL < 40 is a cardiac risk factor
- Ratio of Total Cholesterol to HDL may be the best lipid measure in terms of predicting risk. A ratio greater than 5 represents elevated CAD risk.
- Serum Triglycerides - triglycerides >200 may also be an independent risk factor CAD
Diabetes Mellitus (DM)

- Both Type I and Type II DM are potent independent predictors of CAD. This is the single most powerful risk factor for CAD for women and negates any sex-related difference in cardiovascular morbidity/mortality.
- Type II DM is typically accompanied by multiple metabolic abnormalities including elevated triglycerides levels, lower HDL levels, and hypertension. LDL cholesterol levels are typically normal but the LDL particles tend to be smaller and denser and may be more atherogenic.
- Atherosclerosis in diabetics tends to be accelerated and more extensive than in non-diabetics.
  - Diabetics often have additional cardiac risk factors which all contribute to accelerated atherosclerosis (dyslipidemia, hypertension, abdominal obesity).
  - CAD is the leading cause of premature deaths among diabetics.
  - Diabetics tend to have significantly more severe CAD with decreased coronary collateral circulation.
  - In diabetics who suffer an MI, both the early and late mortality rate is higher than that in non-diabetics.
- Although in both Type I and Type II diabetes tight glycemic control has been shown to improve microvascular risk (retinopathy, neuropathy, etc.), it has not been shown to improve macrovascular risk (CAD, PVD).

Obesity

- Obesity contributes to increased CAD by aggravating known CAD risk factors such as hypertension, low HDL cholesterol, and high triglycerides. Even after adjustment for these risk factors, however, obesity appears to contribute independently to CAD risk.
- Although both the body mass index (BMI) and the waist-to-hip ratio have a positive linear association with CAD, the waist:hip ratio may be a better predictor of CAD risk than BMI.
  - Distribution of fat appears to be a more important predictor than total amount of fat. Android fat patterns (apple shaped body) or truncal obesity appear to be more highly associated with dyslipidemia and hypertension and confer a greater risk of CAD than gynoid fat patterns (pear-shaped body).
  - The risk of CAD is elevated in men with a waist circumference >40” or waist-to-hip ratio >1.0; and in women with a waist circumference >35” or waist-to-hip ratio >0.8.

Sedentary Life Style/Physical Inactivity

- In multiple exercise studies people with the lowest levels of exercise conditioning had age-adjusted CAD mortality rates 2-10 times that of participants in the best conditioned groups.
- Sedentary life style is also associated with other cardiac risk factors including obesity, hypertension, diabetes, and dyslipidemia.
- Cardiovascular benefits of exercise:
  - Improved blood pressure
  - Elevated HDL
  - Decreased LDL
  - Decreased triglycerides
  - Decreased Insulin resistance

Elevated Homocysteine

- There is evidence that elevated homocysteine levels are associated with increased risk of CAD, but no proof that reducing homocysteine levels will lead to a mortality/morbidity benefit for CAD.
Potential Risk Factors

Lipoprotein (a)

- Lipoprotein (a) (also called Lp(a), "lipoprotein little a") is a lipoprotein but is often considered a marker of thrombosis and has been associated with CAD risk in several studies. There is no data to support specific therapy to decrease Lipoprotein (a) levels, but levels will decrease with LDL-lowering therapy.

Fibrinogen

- This is a large glycoprotein made predominately in the liver that activates platelet aggregation.
- Plasma fibrinogen level >350 mg/dL is an independent risk factor for MI and stroke.
- Determinants of high fibrinogen level include age, female sex, menopause, African American race, smoking, obesity, use of oral contraceptives, pregnancy, and consumption of large amounts of dietary fat.
- Factors associated with a decrease of fibrinogen levels include smoking cessation, physical activity, moderating alcohol intake, normalizing body weight.
- No clinical trials exist which identify a drug that reduces fibrinogen safely and selectively.

Alcohol

- There may be a protective effect of alcohol mediated by increase in HDL cholesterol. The maximum overall benefit for alcohol appears to be reached at a single drink per day; at higher levels of alcohol consumption, blood pressure increases and total CAD risk may actually be increased.
- Alcohol is not currently recommended for cardioprotection.

Infection and Inflammation

- Some have hypothesized that infectious agents may be involved in pathogenesis of atherosclerosis. Chlamydia pneumonia has been isolated from atherosclerotic plaques and patients with CAD have been shown to have elevated titers.
- The link between infection and CAD is not clear but inflammation is likely to be involved.

Psychosocial Factors

- Anger/anxiety, type A behavior, and depression have been associated with occurrence or recurrence of CAD but there is not data to show whether psychosocial interventions reduce risk.
ATP III Guidelines At-A-Glance
Quick Desk Reference

Step 1

Determine lipoprotein levels—obtain complete lipoprotein profile after 9- to 12-hour fast.

ATP III Classification of LDL, Total, and HDL Cholesterol (mg/dL)

<table>
<thead>
<tr>
<th>LDL Cholesterol - Primary Target of Therapy</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;100</td>
<td>Optimal</td>
</tr>
<tr>
<td>100-129</td>
<td>Near optimal/above optimal</td>
</tr>
<tr>
<td>130-159</td>
<td>Borderline high</td>
</tr>
<tr>
<td>160-189</td>
<td>High</td>
</tr>
<tr>
<td>≥190</td>
<td>Very high</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;200</td>
<td>Desirable</td>
</tr>
<tr>
<td>200-239</td>
<td>Borderline high</td>
</tr>
<tr>
<td>≥240</td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HDL Cholesterol</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>Low</td>
</tr>
<tr>
<td>≥60</td>
<td>High</td>
</tr>
</tbody>
</table>

Step 2

Identify presence of clinical atherosclerotic disease that confers high risk for coronary heart disease (CHD) events (CHD risk equivalent):

- Clinical CHD
- Symptomatic carotid artery disease
- Peripheral arterial disease
- Abdominal aortic aneurysm.

Step 3

Determine presence of major risk factors (other than LDL):

**Major Risk Factors (Exclusive of LDL Cholesterol) That Modify LDL Goals**

- Cigarette smoking
- Hypertension (BP ≥140/90 mmHg or on antihypertensive medication)
- Low HDL cholesterol (<40 mg/dL)*
- Family history of premature CHD (CHD in male first degree relative <55 years; CHD in female first degree relative <65 years)
- Age (men ≥45 years; women ≥55 years)

* HDL cholesterol ≥60 mg/dL counts as a “negative” risk factor; its presence removes one risk factor from the total count.

- Note: in ATP III, diabetes is regarded as a CHD risk equivalent.
If 2+ risk factors (other than LDL) are present without CHD or CHD risk equivalent, assess 10-year (short-term) CHD risk (see Framingham tables).

Three levels of 10-year risk:
- >20% — CHD risk equivalent
- 10-20%
- <10%

Determine risk category:
- Establish LDL goal of therapy
- Determine need for therapeutic lifestyle changes (TLC)
- Determine level for drug consideration

**LDL Cholesterol Goals and Cutpoints for Therapeutic Lifestyle Changes (TLC) and Drug Therapy in Different Risk Categories.**

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>LDL Goal</th>
<th>LDL Level at Which to Initiate Therapeutic Lifestyle Changes (TLC)</th>
<th>LDL Level at Which to Consider Drug Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD or CHD Risk Equivalents (10-year risk &gt;20%)</td>
<td>&lt;100 mg/dL</td>
<td>&gt;100 mg/dL</td>
<td>&gt;130 mg/dL (100-129 mg/dL: drug optional)*</td>
</tr>
<tr>
<td>2+ Risk Factors (10-year risk ≤20%)</td>
<td>&lt;130 mg/dL</td>
<td>&gt;130 mg/dL</td>
<td>10-year risk 10-20%: &gt;130 mg/dL</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10-year risk &lt;10%: &gt;160 mg/dL</td>
</tr>
<tr>
<td>0-1 Risk Factor†</td>
<td>&lt;160 mg/dL</td>
<td>≥160 mg/dL</td>
<td>≥190 mg/dL (160-189 mg/dL: LDL-lowering drug optional)</td>
</tr>
</tbody>
</table>

* Some authorities recommend use of LDL-lowering drugs in this category if an LDL cholesterol <100 mg/dL cannot be achieved by therapeutic lifestyle changes. Others prefer use of drugs that primarily modify triglycerides and HDL, e.g., nicotinic acid or fibrate. Clinical judgment also may call for deferring drug therapy in this subcategory.
† Almost all people with 0-1 risk factor have a 10-year risk <10%, thus 10-year risk assessment in people with 0-1 risk factor is not necessary.

Initiate therapeutic lifestyle changes (TLC) if LDL is above goal.

**TLC Features**
- TLC Diet:
  - Saturated fat <7% of calories, cholesterol <200 mg/day
  - Consider increased viscous (soluble) fiber (10-25 g/day) and plant stanols/sterols (2g/day) as therapeutic options to enhance LDL lowering
- Weight management
- Increased physical activity.
Consider adding drug therapy if LDL exceeds levels shown in Step 5 table:
- Consider drug simultaneously with TLC for CHD and CHD equivalents
- Consider adding drug to TLC after 3 months for other risk categories.

### Drugs Affecting Lipoprotein Metabolism

<table>
<thead>
<tr>
<th>Drug Class</th>
<th>Agents and Daily Doses</th>
<th>Lipid/Lipoprotein Effects</th>
<th>Side Effects</th>
<th>Contraindications</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMG CoA reductase inhibitors (statins)</td>
<td>Lovastatin (20-80 mg) Pravastatin (20-40 mg) Simvastatin (20-80 mg) Fluvastatin (20-80 mg) Atorvastatin (10-80 mg) Cerivastatin (0.4-0.8 mg)</td>
<td>LDL ↓18-55% HDL ↑5-15% TG ↓7-30%</td>
<td>Myopathy Increased liver enzymes</td>
<td>Absolute: • Active or chronic liver disease Relative: • Concomitant use of certain drugs*</td>
</tr>
<tr>
<td>Bile acid sequestrants</td>
<td>Cholestyramine (4-16 g) Colestipol (5-20 g) Colesevelam (2-6-3.8 g)</td>
<td>LDL ↓15-30% HDL ↑3-5% TG No change or increase</td>
<td>Gastrointestinal distress Constipation Decreased absorption of other drugs</td>
<td>Absolute: • dysbeta-lipoproteinemia Relative: • TG &gt;400 mg/dL</td>
</tr>
<tr>
<td>Nicotinic acid</td>
<td>Immediate release (crystalline) nicotinic acid (1.5-3 gm), extended release nicotinic acid (Niaspan®) (1-2 g), sustained release nicotinic acid (1-2 g)</td>
<td>LDL ↓7-10% HDL ↑20-50% TG ↓20-50%</td>
<td>Flushing Hyperglycemia Hyperuricemia (or gout) Upper GI distress Hepatotoxicity</td>
<td>Absolute: • Chronic liver disease • Severe gout Relative: • Diabetes • Hyperuricemia • Peptic ulcer disease</td>
</tr>
<tr>
<td>Fibric acids</td>
<td>Gemfibrozil (600 mg BID) Fenofibrate (200 mg) Clofibrate (1000 mg BID)</td>
<td>LDL ↓5-20% HDL ↑10-20% TG ↓20-50%</td>
<td>Dyspepsia Gallstones Myopathy</td>
<td>Absolute: • Severe renal disease • Severe hepatic disease</td>
</tr>
</tbody>
</table>

* Cyclosporine, macrolide antibiotics, various anti-fungal agents, and cytochrome P-450 inhibitors (fibrates and niacin should be used with appropriate caution).
Identify metabolic syndrome and treat, if present, after 3 months of TLC.

Clinical Identification of the Metabolic Syndrome - Any 3 of the Following:

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Defining Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal obesity*</td>
<td>Waist circumference†</td>
</tr>
<tr>
<td>Men</td>
<td>&gt;102 cm (&gt;40 in)</td>
</tr>
<tr>
<td>Women</td>
<td>&gt;88 cm (&gt;35 in)</td>
</tr>
<tr>
<td>Triglycerides</td>
<td>≥150 mg/dL</td>
</tr>
<tr>
<td>HDL cholesterol</td>
<td></td>
</tr>
<tr>
<td>Men</td>
<td>&lt;40 mg/dL</td>
</tr>
<tr>
<td>Women</td>
<td>&lt;50 mg/dL</td>
</tr>
<tr>
<td>Blood pressure</td>
<td>≥130/≥85 mmHg</td>
</tr>
<tr>
<td>Fasting glucose</td>
<td>≥110 mg/dL</td>
</tr>
</tbody>
</table>

* Overweight and obesity are associated with insulin resistance and the metabolic syndrome. However, the presence of abdominal obesity is more highly correlated with the metabolic risk factors than is an elevated body mass index (BMI). Therefore, the simple measure of waist circumference is recommended to identify the body weight component of the metabolic syndrome.

† Some male patients can develop multiple metabolic risk factors when the waist circumference is only marginally increased, e.g., 94-102 cm (37-39 in). Such patients may have a strong genetic contribution to insulin resistance. They should benefit from changes in life habits, similarly to men with categorical increases in waist circumference.

Treatment of the metabolic syndrome

- Treat underlying causes (overweight/obesity and physical inactivity):
  - Intensify weight management
  - Increase physical activity.

- Treat lipid and non-lipid risk factors if they persist despite these lifestyle therapies:
  - Treat hypertension
  - Use aspirin for CHD patients to reduce prothrombotic state
  - Treat elevated triglycerides and/or low HDL (as shown in Step 9).
Treat elevated triglycerides.

ATP III Classification of Serum Triglycerides (mg/dL)

<table>
<thead>
<tr>
<th>Classification</th>
<th>Triglycerides (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;150</td>
</tr>
<tr>
<td>Borderline high</td>
<td>150-199</td>
</tr>
<tr>
<td>High</td>
<td>200-499</td>
</tr>
<tr>
<td>Very high</td>
<td>≥500</td>
</tr>
</tbody>
</table>

Treatment of elevated triglycerides (≥150 mg/dL)

- Primary aim of therapy is to reach LDL goal
- Intensify weight management
- Increase physical activity
- If triglycerides are ≥200 mg/dL after LDL goal is reached, set secondary goal for non-HDL cholesterol (total – HDL) 30 mg/dL higher than LDL goal.

Comparison of LDL Cholesterol and Non-HDL Cholesterol Goals for Three Risk Categories

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>LDL Goal (mg/dL)</th>
<th>Non-HDL Goal (mg/dL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD and CHD Risk Equivalent (10-year risk for CHD &gt;20%)</td>
<td>&lt;100</td>
<td>&lt;130</td>
</tr>
<tr>
<td>Multiple (2+) Risk Factors and 10-year risk ≤20%</td>
<td>&lt;130</td>
<td>&lt;160</td>
</tr>
<tr>
<td>0-1 Risk Factor</td>
<td>&lt;160</td>
<td>&lt;190</td>
</tr>
</tbody>
</table>

If triglycerides 200-499 mg/dL after LDL goal is reached, consider adding drug if needed to reach non-HDL goal:

- intensify therapy with LDL-lowering drug, or
- add nicotinic acid or fibrate to further lower VLDL.

If triglycerides ≥500 mg/dL, first lower triglycerides to prevent pancreatitis:

- very low-fat diet (<15% of calories from fat)
- weight management and physical activity
- fibrate or nicotinic acid
- when triglycerides <500 mg/dL, turn to LDL-lowering therapy.

Treatment of low HDL cholesterol (<40 mg/dL)

- First reach LDL goal, then:
- Intensify weight management and increase physical activity
- If triglycerides 200-499 mg/dL, achieve non-HDL goal
- If triglycerides <200 mg/dL (isolated low HDL) in CHD or CHD equivalent consider nicotinic acid or fibrate.
<table>
<thead>
<tr>
<th>Total Cholesterol</th>
<th>Points</th>
<th>Age 20-39</th>
<th>Age 40-49</th>
<th>Age 50-59</th>
<th>Age 60-69</th>
<th>Age 70-79</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;160</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>160-199</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>200-239</td>
<td>7</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>240-279</td>
<td>9</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>≥280</td>
<td>11</td>
<td>8</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HDL (mg/dL)</th>
<th>Points</th>
<th>Age 20-39</th>
<th>Age 40-49</th>
<th>Age 50-59</th>
<th>Age 60-69</th>
<th>Age 70-79</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥60</td>
<td>-1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>50-59</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40-49</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&lt;40</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Systolic BP (mmHg)</th>
<th>If Untreated</th>
<th>If Treated</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;120</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>120-129</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>130-139</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>140-159</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>≥160</td>
<td>2</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Point Total</th>
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<tbody>
<tr>
<td>&lt;0</td>
<td>&lt; 1</td>
</tr>
<tr>
<td>0</td>
<td>1</td>
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<tr>
<td>1</td>
<td>1</td>
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<td>2</td>
<td>1</td>
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<tr>
<td>3</td>
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<td>1</td>
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<td>15</td>
<td>2</td>
</tr>
<tr>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>≥17</td>
<td>≥ 30</td>
</tr>
</tbody>
</table>
Guide to Oral Presentation (POM)

For the rest of your career you will have to present patient information to your colleagues, both in writing and verbally. For better or for worse, you will be judged on your presentation skills and whether you seem to know your case well. Really polished oral presentations can help you at grading time.

Oral presentations vary in length, complexity and formality according to the setting. You will rarely have to give a very formal presentation to a senior faculty member in a structured conference setting in an auditorium, but you will frequently present cases in attending rounds and work rounds. The guidelines below are applicable for attending rounds on many rotations, which may be characterized as moderately formal.

On each new rotation it is important to clarify expectations: ASK your resident and/or attending how they would like the cases to be presented. Detailed or problem focused? Full ROS or just the pertinents? Etc. Then afterwards you should ask for feedback: next time would they like more or less detail? Any suggestions for improvement? Your attending will often ask you to make your first presentation rather formal and detailed. Once you have shown that you know your stuff, subsequent presentations can often be more focused.

It is also helpful to pay attention as others on the team present cases. Listen and decide elements distinguish concise presentations from those that are confusing or boring. Be aware that students are often held to higher standards. The attending will expect you to present your 1 or 2 patients in a polished manner while allowing sloppier presentations from the intern who admitted 5 patients and was up all night with cross-coverage.

Different attendings also have different listening styles. Some will listen quietly as you present your case, no matter how long. Some will interrupt occasionally or even frequently to ask questions. Some will stop you at intervals to ask other team members for their interpretation of the data presented (it is fairly common to pause and discuss the differential diagnosis based on the HPI alone).

Structurally, the oral presentation follows the same format as the written H&P but is edited so that the audience can follow the thought process. In preparation for your presentation, you need to decide what is the most important information. You might want to photocopy your written H&P then go through and circle the most pertinent bits. Keep asking yourself, “Is this important to the story?” Remember that you are indeed telling a story; you are trying to convince your audience of your point of view. That means that you need to have a point of view! What do you think is going on with the patient and what should be done about it? (For example, you think that the patient’s chest pain is probably unstable angina, but you are also concerned about a possible aortic dissection; you doubt esophagitis, chest wall pain, PE, or other causes of CP.) If you present a jumble of a thousand disconnected facts it will look like you don’t understand the case. Your attending will turn to the resident who will then capture the essence of the case in 2 or 3 sentences. If that happens to you, don’t panic; learn from the experience and prepare more thoroughly next time.

*The noted American writer Mark Twain commented: “The time to begin writing an article is when you have finished it to your satisfaction. By that time you begin to clearly and logically perceive what it is you really want to say.”*

As painful as it sounds, you MUST PRACTICE your presentation in advance. You may present your case to your resident, your friend or even your mirror. If you don’t practice what to say, there is a good chance that it will all get muddled as you try to present to a roomful of people staring at you. Do not try to memorize your H&P like a script; you would just bore your group to tears. Depending on your speaking skills, it may take weeks, months or years to present well extemporaneously.
Mark Twain was also noted for his ready wit and his public speaking. He observed that, “It usually takes more than three weeks to prepare a good impromptu speech.”

The appropriate use of notes takes practice. Do not have your written H&P is in front of you. It will almost certainly draw your eye and you will start reading it out loud or will appear to (that is considered to be very poor form). Your attending will usually (but not always!) let you use notes, but this is not a time for micrographia! As tempting as it is to cram your whole H&P onto a note card, it will just distract you. Just list bullet points of important material to jog your memory, and any detailed lists such as an extensive PMH. Many people refer to the card for the lab results.

You shouldn’t present everything you know about the case – just the facts most pertinent to your presentation. Remember the limitations of the human attention span. Do know all the material though because there will be questions. Be truthful. If you didn’t ask about something, just say so. Never ever make up data or claim that you examined something that you didn’t.

Below are some more detailed suggestions and some examples.

ID/CC: This is the opening sentence of your story; it sets the stage for what’s to come. You should usually include age, sex, chief complaint and duration of symptoms. Noting the patient’s general level of health can be helpful. You may want to include a very few items from the PMH if they are really critical for understanding the HPI. (Note that different attendings may have strong opinions about how much or how little to include in the first sentence; when in doubt – ask!)

Ms A is a healthy 20 year old student who presented to the ER last night with 1 day of fever and back pain.

Ms B is a 20 year old paraplegic who presented to the clinic with a 1 month history of intermittent fever and back pain.

Mr C is a 40 year old tennis coach who presents with 1 day of aching chest pain.

Mr D is a 40 year man with hypertension, diabetes, and coronary artery disease, status post LAD stenting one month ago, who presents today with 2 hours of crushing substernal chest pain.

HPI: This will be very similar to your written HPI and will comprise a large portion of your oral presentation. It is the section where you really tell the story, then the remainder of the presentation provides supporting evidence.

If you didn’t mention the patient’s baseline level of functioning in the CC, then it should start the HPI.

He was in his usual state of robust good health, playing tennis 5 hours a day, until about a week ago when he gradually noticed that he felt much more winded than usual after a game.

If some of the PMH is essential for understanding the current problem then it can be briefly summarized at this point.

Present the most important problem first, with a well organized chronology. This can be rather extensive if the patient presents with an exacerbation of a chronic complex illness. Thoroughly characterize the chief complaint (quality, severity, location, duration, progression, relieving and exacerbating factors, associated symptoms, etc). At the end, include pertinent positives and negatives about the problem.

If there is more than one problem, treat each separately. It may be appropriate to link them at the end, if they are truly related. Again, you have to know the conclusion in order to tell a logical story; after you
have thought out the assessment and differential diagnosis, you will have an opinion about whether the problems are related.

PMH: Discuss the past medical history in order of importance. Items thoroughly covered in the HPI do not need to be repeated ("...other past medical history includes...") or can be mentioned in passing ("...her past medical history includes lupus as already described..."). If only the most recent part of a complex problem was covered in the HPI, then the rest of the information can be covered in the PMH.

The more pertinent a problem is to a patient's care, then the more detail should be provided. If a patient is seeing a surgeon for a broken leg then it might suffice to say,

“He has a history of hypertension and diabetes, both well controlled.”

However, if the patient is seeing an internist about his angina then more detail would be appropriate,

“He has had hypertension for 10 years, well controlled on an ACE inhibitor alone, and diabetes for 2 years. He checks his sugar twice daily with results usually 90-140. His A1c in June was 6.2%. He has no known diabetic complications.”

The past surgical history can likewise be expanded or contracted according to the relevance to the current problem. A moderate amount of information would include the procedure name, date, and indication.

“She is status post TAH/BSO in 1990 for fibroids and cholecystectomy in 1998 for choledolithiasis.”

When the surgical history is more pertinent to the current problem it was probably included in the HPI with more details about the reasons for surgery and the findings.

“She was status post TAH/BSO many years ago. In December she presented with an acute abdomen. At laparotomy she was found to have a 10 cm smooth walled cyst in the pelvis. The cyst was resected and pathology was positive for primary peritoneal carcinoma. She has now undergone 2 cycles of chemotherapy with carboplatin and paclitaxel.”

In general, less pertinent issues can be just mentioned in passing or even left off.

“She also has GERD and osteoarthritis of the knees. She is status post TAH/BSO and cholecystectomy.” (no mention of her tonsillectomy at age 5 or fractured arm at age 8)

Medications/allergies: List all the medications that the patient is taking. Some attendings may tell you to just list the names, without dosages. Note any medication allergies, including the reaction.

“He is currently taking lisinopril 20 mg daily, metformin 1000 mg bid, and aspirin 81 mg daily. He is allergic to penicillin which causes hives and shortness of breath.”

Family History: Don’t hesitate to say, “family history is noncontributory” if it truly is noncontributory. Do make note of illnesses that may be genetically based. It is probably not significant if a great-aunt had breast cancer at age 90, but it is usually pertinent if a sister and mother both had breast cancer in their 30's or if every man in the family had a MI in his 40's. Again this will vary according to the patient's chief complaint, the acuity (seriousness) of the problem, and the style of presentation. A family history of cancer is a lower priority if the patient is in the midst of an acute aortic dissection (but a FHx of Marfan’s would be pertinent!).
Social History: This section also expands or contracts radically depending on the situation. The listeners generally want to know about smoking, drinking and illicit drugs. It is usually pertinent to mention something about occupation or living situation.

“Miss T is a retired librarian who lives alone. She does not smoke or drink alcohol.”

“Miss M is an unemployed high school dropout. She is homeless and is living in a cardboard box behind St Patrick’s Center. She uses crack cocaine, smokes 1 pack per day of cigarettes and occasionally drinks beer.”

The SHx can often be quite abbreviated in a didactic situation such as Professor’s Rounds where the focus is on DDX and decision making, but would need to be much more thorough when discussing with a team who will actually be planning the patient’s ongoing follow-up care.

ROS: Be quite selective about what is mentioned from the ROS. Feel free to say that the ROS is noncontributory if it is. Most pertinent items should have been mentioned in the HPI. Do mention items that are unrelated to the HPI but are nonetheless important health issues. You don’t need to go through the laundry list of miscellaneous somatic complaints that many patients have. If the attending wants to know about a specific item, he can ask.

“The review of systems is significant for a 10 pound weight loss, poor appetite, and frequent constipation. There is no abdominal pain, diarrhea, melena or hematochezia. The remainder of the review of systems is noncontributory.”

Physical Exam: Report your findings from the physical exam. This section is for the physical exam only; do not add in extra bits of history and do not make diagnoses at this point. Don’t editorialize: don’t say, “I didn’t hear a murmur, but, you know, I’m not really very good at hearing murmurs, I always miss them.” Just say, “I didn’t hear a murmur.”

Set the stage by beginning with a clear description of the overall appearance of the patient. Give the full set of vital signs. Never say “vital signs stable.” (Note that “stable” does not mean “normal”; if the BP has been 200/110 for the last week, then it is stable = unchanging.) If the VS were changing you may want to give the values at different times.

“On presentation to the ER his blood pressure was 90/60 with a heart rate of 120. After 2 liters of fluid his blood pressure was 112/74 with a heart rate of 90. When I saw him on the floor I got a blood pressure of 106/66, his heart rate was 96 and he was breathing 30 times a minute. He was afebrile throughout. On the floor his O2 sat was 96% on 2 liters.”

Mention any abnormal findings and any pertinent negatives (eg, lack of wheezing in a dyspneic patient). Students are often expected to recount a fairly thorough exam.

Here is a moderately thorough PE:

“Mr. H was resting comfortably in bed, wearing O2. He was able to speak in full sentences. His vital signs were: temp 38.3, pulse 90, BP 150/90, respiratory rate 20, O2 Sat 95% on 2 liters. The skin was warm and moist; there was no rash. On HEENT exam the pupils were equal, round and reactive to light; extraocular muscles were intact; there was no conjunctivitis and the sclerae were anicteric. The tympanic membranes were clear. The oropharynx was clear. The neck was supple with shotty cervical adenopathy; there was no goiter or jugular venous distension. The back was nontender. The lungs had dullness to percussion at the right base with crackles and egophony. There was no wheezing. The heart had a regular rate and rhythm, normal S1 and S2; no murmurs or extra heart sounds were noted. The abdomen had normal bowel sounds, was soft, and non-tender with no palpable masses or
organomegaly. There were no masses on rectal exam; stool was brown and guaiac negative. The prostate was small, smooth and non-tender. On GU exam the testes were descended bilaterally; no masses; no hernia; penis without lesions. The extremities were without clubbing, cyanosis or edema. Dorsalis pedis and posterior tibial pulses were 2+ and equal bilaterally. On neurologic exam he was awake, alert, appropriate and completely oriented. Cranial nerves 2 thru 12 were intact. Motor strength was 5/5 in all extremities. Cerebellar function was intact by finger-nose-finger. Reflexes were 2+ at ankles, knees, biceps and triceps, with down-going toes. Sensation was intact to light touch and pin prick bilaterally. Gait was normal.”

Here is a briefer version of the same exam:

"Mr. H was resting comfortably in bed, wearing O2. He was able to speak in full sentences. Temp was 38.3, pulse 90, BP 150/90, respiratory rate 20, O2 Sat 95% on 2 liters. HEENT exam was unremarkable. The neck was supple with shotty cervical adenopathy; there was no goiter or JVD. The back was nontender. The lungs had dullness to percussion at the right base with crackles and egophony. There was no wheezing. The heart had a regular rate and rhythm, normal S1 and S2; no murmur, gallop or rub. The abdomen was benign. Rectal was guaiac negative. The extremities were without clubbing, cyanosis or edema. Pedal pulses were 2+ bilaterally. He was alert and oriented; neurologic exam was nonfocal.”

Here’s an ultrashort version, such as might be used in a quick hallway presentation:

“He was in no distress. The exam was remarkable for a temp of 38.3, BP of 150/90, respiratory rate 20, O2 Sat 95% on 2 liters. The lungs had dullness to percussion at the right base with crackles and egophony. There was no wheezing. The heart was regular, without murmur, gallop or rub. The abdomen was benign.”

Labs: In advance make sure that you understand the labs. Could you present the labs without any numbers? For example, "her labs are notable for a mild hypochromic microcytic anemia and for pyuria; her chemistries are all normal.”

You don’t need to recite the actual values if they are normal and not directly pertinent to the patient’s problems. They can ask if they want to actual value for something. People do often want the creatinine and H&H so they are worth mentioning.

“His labs showed a normal CMP with a creatinine of 1.2; the H&H was 14 and 42; the white count was 15 thousand with 90% neutrophils; coags were normal. The UA was normal. The chest X-ray showed a right lower lobe infiltrate and mild cardiomegaly. The ECG showed normal sinus rhythm, LVH and no acute changes.”

Know the meaning of what you say. If you report an LAFB, you’d better know what features on the ECG represent an LAFB.

Assessment and Plan: This is your time to really show that you understand the case. After listing all the details of the exam and labs, reorient your listeners by summing up the case in a sentence or two.

Start by discussing the most important problem first; this may or may not be the chief complaint. The patient may have come in with toe pain, but you are more concerned about the probable endocarditis that caused the embolic lesion on his toe. Spend the most time on the most important problem and progressively less time as you work your way down your prioritized problem list (this is why you go to the trouble of prioritizing your problem list.)
Discuss the differential diagnosis; persuade the audience with your logic. Most of your discussion should center on realistic diagnostic possibilities. If you want to show that you considered a very broad differential, you can quickly list the unlikely possibilities and why they are unlikely ("Moya-moya syndrome is ruled out by the angiogram"). For each of the problems, discuss your diagnostic and therapeutic plans. Have some ideas about what you want to do, and why. Some work-up has probably already taken place; understand why certain tests were ordered, how the drugs were chosen. You don’t have to say everything you know. After your presentation the attending will often have “discussion questions” for you and/or the group. Here is one example:

“So in summary, Ms G is a 50 year old woman who presented with shortness of breath and was found to be profoundly anemic. She also has a UTI.

1) Dyspnea.
Her shortness of breath is almost certainly due to her severe anemia. Her percent O2 saturation is normal, but with an H & H of 5 & 15 her oxygen carrying capacity is significantly diminished. She has some signs of high output failure including JVD and a hyperdynamic precordium with a laterally displaced PMI.

Her dyspnea will probably resolve as her hematocrit improves. If not, then further cardiac or pulmonary workup could be considered (she has no history of heart or lung disease in the past).

2) Anemia.
Her very low MCV and her pica both point towards iron deficiency as the etiology of her anemia. We have sent iron studies and we have begun transfusions. There are no schistocytes on her smear and her WBC and platelets are normal, so there is no evidence of any other process going on.

The most likely etiology of her anemia is menorrhagia. She reports heavy bleeding almost daily for more than 2 years. Possible causes include endometrial carcinoma, fibroids, or dysfunctional uterine bleeding from chronic anovulation. On our exam her uterus seemed somewhat large but the exam was otherwise benign. We need to consult Gyn for a more thorough exam, probably including an endometrial biopsy. We have ordered a transvaginal ultrasound to evaluate the endometrial thickness. She was started on medroxyprogesterone 10 mg/day to try to stop the bleeding.

Other causes of iron deficiency are much less likely. She has no signs or symptoms of GI malignancy, but she does report a family history of colon cancer in her father. It would be appropriate to do a colonoscopy when she has stabilized because she needs it for screening anyway. She doesn’t have any history of heavy drinking or NSAID use to suggest ulcer or gastritis as a cause.

3) She also has a UTI. A urine culture has been sent and she was started on Septra DS bid. Since she is fairly healthy, 3 days of therapy should be adequate.

4) Health Maintenance.
She has no other known health problems, but she hasn’t seen a doctor in many years. When she follows up in clinic she will need some routine screening such as mammograms and a fasting lipid panel.”
Some pet peeves of various people:

I know that these will sound harsh, but they really are the things that residents and attendings complain about. They may or may not tell you that these things annoy them, but they are certain to influence their impression of your professional abilities (and thus your grade).

- Reading your write-up. Some attendings fume silently; some will actually yank the write-up out of your hands; both will mark you down.

- Spelling errors in your written work:
  - Small lymph nodes are not “shoddy” (poorly made), they are “shotty” (like buckshot)
  - “Guaiac” has an A before and after the I (the chemical is derived from guano so the root “gua” is added to the adjectival ending “iac” forming “gua-iac”)

- Pronunciation:
  - The throat is the pharynx: “fair – inks”, not the “fair – nix”
  - The nostrils are nares: “nair – eez” not “nairz” (and the singular is naris, not nare; just as the plural of basis is bases)

- Disorganization. Putting bits of the physical in the HPI and ROS in the physical does not make a good impression of your organizational abilities.

- “Oh I forgot to tell you…..” Adding bits of history to the physical exam shows that you are disorganized.

- Saying “vital signs stable” (you probably actually mean “normal,” not “unchanging”)

- Not checking the vital signs for yourself.

- Not knowing why things were done a certain way. Saying “because ID said so” can set off a tirade. Better to say “for better gram positive coverage” or whatever the medical reason was.

- Lying. Making up data or claiming to have examined something is unethical, dangerous to the patient, is unprofessional and can seriously jeopardize a career. Much better to honestly say that you don’t know or forgot to do something.

- Editorializing and qualifying (as mentioned in physical exam section above)

- Unnecessary slowness. A plodding pace of delivery will bore and annoy your audience. They may have to listen to another half dozen presentations that morning and they are probably sleep deprived.

- Not confidently committing to a differential diagnosis and/or not having a plan (diagnostic or therapeutic). A common trap for a “junior learner” is to present all the data beautifully but then come to a crashing halt when it comes to actually interpreting the data.
Guide to Writing Admission Orders

First, remember the basic rules for all orders and prescriptions:

- Make sure your handwriting is legible (seriously!)
- Make sure your order is complete (the BJH Pharmacy is now more assertive about rejecting any order or prescription that is illegible or incomplete)
  - Patient’s name and birthdate
  - Date and time
  - Drug name
  - Formulation, if applicable (eg, immediate vs extended release; tablet vs suspension)
  - Route
    - These include: topical, subcutaneous, intradermal, per os (PO), sublingual (SL), per rectum (PR), intravaginal, intramuscular (IM), intravenous (IV), or in the eyes, ears, or nose
  - Indication is now mandatory at BJH (eg, “for arthritis pain”)
  - Signature, printed name, beeper/phone number
- Avoid common prescribing errors; make sure to think about:
  - Patient factors
    - Allergies
    - Renal function
    - Hepatic function
    - Drug-drug interactions (example: warfarin and just about any other drug!)
    - Drug-patient interactions (ex: avoid anticholinergics in man with BPH)
  - Drug names
    - Easily misunderstood: MS, MSO4 (morphine vs magnesium sulfate)
    - Look-alike or sound-alike names (eg, Celexa/Celebrex/Cerebyx; Losec/Lasix; Xanax/Zantac/Zyrtec; etc)
  - Drugs with difficult dosing, narrow therapeutic index (eg, heparin, warfarin, insulin)
  - Be very careful with abbreviations and numerals
- Be very careful about dosing – read the drug guide carefully and double-check your math
  - You may need to round off a calculated dose of a medication.

*Example:* an 8 kilogram baby needs amoxicillin, the drug guide says:

40 mg/kg/day PO given in divided doses every 8 hours

8 kg x 40 mg/kg/day = 320 mg/day → divide into 3 doses/day → 106.66 mg/dose
It comes in a suspension of 125 mg/5 ml
106.66 mg = 4.266 ml – a ridiculous amount to ask any parent to measure out!
Round it off to 4 ml per dose
Correcting errors:

If you make an error while writing orders, draw a single line through the incorrect information, initial it, then write the correct information. Do not obliterate the error with scribbles, White-Out, black marker, etc.

<table>
<thead>
<tr>
<th>Date</th>
<th>Order Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/18/11</td>
<td>Atenolol 100 mg po Qday for HTN</td>
</tr>
<tr>
<td>1130</td>
<td>Metoprolol ER 100 mg po Q day for HTN</td>
</tr>
</tbody>
</table>

Sarah Student, WUMS III
Sarah Student (beeper xxx-xxxx)

If you realize an error at a later time (ie, after the orders have been taken off), then you must write a new order to clarify or change the order. Do not try to scratch out the previous order.

### BJH recommended abbreviations

<table>
<thead>
<tr>
<th>Unacceptable form</th>
<th>Acceptable form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero after decimal</td>
<td>No terminal zero</td>
</tr>
<tr>
<td>No zero before decimal</td>
<td>Zero before decimal</td>
</tr>
<tr>
<td>U or u</td>
<td>Write “unit”</td>
</tr>
<tr>
<td>μg</td>
<td>Write “mcg” or “microgram”</td>
</tr>
<tr>
<td>cc</td>
<td>Write “mL” or “ml” or “milliliters” or “cubic centimeters”</td>
</tr>
<tr>
<td>QOD or qod</td>
<td>Write “every other day”</td>
</tr>
<tr>
<td>QD or Q.D.</td>
<td>Write “daily” or “every day” or “Q day” or “Q 24 hours”</td>
</tr>
<tr>
<td>HS</td>
<td>Write “half-strength” or “at bedtime”</td>
</tr>
<tr>
<td>AU, AS, AD</td>
<td>Write “both ears” or “left ear” or “right ear”</td>
</tr>
<tr>
<td>OU, OS, OD</td>
<td>Write “both eyes” or “left eye” or “right eye”</td>
</tr>
<tr>
<td>TIW</td>
<td>Write “three times weekly” or specify days (“Q M-W-F”)</td>
</tr>
<tr>
<td>IU</td>
<td>Write “international units”</td>
</tr>
<tr>
<td>MS, MSO4, MgSO4</td>
<td>Write “magnesium sulfate” or “morphine sulfate”</td>
</tr>
</tbody>
</table>

Why no zero after decimal? Why put zero before decimal? When your orders come off the fax machine in the pharmacy that decimal point is nearly invisible: 1.0 mg looks like 10 mg and .5 mg looks like 5 mg

### Other Common Abbreviations:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q day</td>
<td>every day</td>
</tr>
<tr>
<td>BID or bid</td>
<td>twice daily</td>
</tr>
<tr>
<td>TID or tid</td>
<td>three times daily</td>
</tr>
<tr>
<td>QID or qid</td>
<td>four times daily</td>
</tr>
<tr>
<td>PRN or prn</td>
<td>as needed</td>
</tr>
<tr>
<td>Q X hours</td>
<td>Every X hours</td>
</tr>
<tr>
<td>i, ii, iii, iv</td>
<td>(lower case Roman #s)</td>
</tr>
<tr>
<td>PO or po</td>
<td>per os = by mouth</td>
</tr>
<tr>
<td>SL</td>
<td>sublingual</td>
</tr>
<tr>
<td>PR</td>
<td>Per rectum</td>
</tr>
<tr>
<td>IV</td>
<td>Intravenously</td>
</tr>
</tbody>
</table>
Formatting for inpatient orders:

The elements are similar to those in prescriptions:
- Patient’s name and birthdate
- Date and time
- Drug name
- Formulation, if applicable (eg, immediate vs extended release)
- Route (eg, PO, IM, IV, etc)
- You don’t have to specify # to dispense or # days of therapy unless it is limited
- Indication is now mandatory at BJH (eg, “for arthritis pain”)
- Signature, printed name, beeper/phone number

You can also “free text” other orders such as instructions to nurses, diet orders, etc.
Full Admission Orders

When you start your clerkships, your residents will ask you to “write admit orders” on your patients. This can seem intimidating at first, but there a system to it. In order to remember the standard categories to be included in admission orders, residents and students all over the country use similar mnemonics. You may see: ADC VAN DISSEL or ADC VAAN DIMLS or ADC VAAN DIMSL or other variations (just type “admission orders” into a Google search and you can see many examples). Here is one version, and a sample set of orders for an internal medicine patient.

**ADAC VAN DISSL**

<table>
<thead>
<tr>
<th>Explanation, Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> = Admit to Service, housestaff, attending “Admit to Unit III Surgery” “Admit to Med I Blue/White”</td>
</tr>
<tr>
<td><strong>D</strong> = Diagnosis at admission Can be a diagnosis, symptom, problem (eg, fever, femur fracture, croup)</td>
</tr>
<tr>
<td><strong>A</strong> = Allergies</td>
</tr>
<tr>
<td><strong>C=</strong> Condition on admission Such as good, fair, poor, guarded, critical</td>
</tr>
<tr>
<td><strong>V</strong> = Vital signs frequency VS q shift HR &amp; BP q2hrs x 4 then q4hrs</td>
</tr>
<tr>
<td><strong>A</strong> = Activity Ad lib Up in chair for meals; walk bid Bedrest with bathroom privileges</td>
</tr>
<tr>
<td><strong>N</strong> = Nursing procedures Seizure precautions Suction at bedside Daily weights O2 2 LPM per NC, wean to keep O2 sat&gt;90% Turn q 2hrs Incentive spirometry I&amp;O q shift SCDs (sequential compression devices) Call HO orders</td>
</tr>
<tr>
<td><strong>D</strong> = Diet Regular Prudent diabetic 1800 cal ADA (Am Diabetic Assoc) AHA (Am Heart Assoc) Clear liquid NAS (no added salt)</td>
</tr>
<tr>
<td><strong>I</strong> = IV fluids D5 ½ NS at 75 ml/hour LR at 125 ml/hr</td>
</tr>
<tr>
<td><strong>S</strong> = Specific drugs Scheduled medications – may include pt’s usual home meds, new meds in hospital, etc DVT prophylaxis</td>
</tr>
<tr>
<td><strong>S</strong> = Symptomatic drugs List any “prn” meds for pain, insomnia, constipation, etc</td>
</tr>
<tr>
<td><strong>L</strong> = Labs Specify what and when: CBC today at 1800 and midnight A.M. labs: CBC and BMP</td>
</tr>
<tr>
<td>Date</td>
</tr>
<tr>
<td>------------</td>
</tr>
<tr>
<td>12/15/03</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
|            |                                                                                   |                        |            |            |            |                                   |                  |        |         | Thank you!                                | Sarah Student, WUMS III
|            |                                                                                   |                        |            |            |            |                                   |                  |        |         | Sarah Student (beeper xxx-xxxx)            |
Guide to Writing a Prescription

The exact appearance will vary depending on the state and the institution, but here is an example from Basic & Clinical Pharmacology (http://online.statref.com). Examples from Washington University and from TouchWorks (an electronic medical record system used in many of our clinics) are below.

Prescription blanks are valuable legal documents (like blank checks) and should be carefully safeguarded at all times to prevent theft and forgery.

The elements include:

- The heading has important identifying information:
  - The prescriber’s name (1), license classification (eg, MD, DO, OD, etc) (2), address (3), office telephone number (4). The pharmacist must be able to contact the prescriber if any questions arise.
  - The date when the prescription order is written. (5) A pharmacist may refuse to fill a prescription if too much time has elapsed since its writing.
  - The patient’s name (6) and address (7). The patient’s birth date can be used instead or, or in addition to, the address.
  - It may include the symbol Rx (thought to be an abbreviation for "recipe," the Latin for "take thou.")

- The body of the prescription includes:
  - The name (8) and amount or strength of each ingredient (9). Liquids must specify concentration (eg, mg/5ml) and formulation (eg, elixir, suspension, etc).
  - The directions for compounding the drug and the directions to the pharmacist (10), usually consisting of a short sentence such as: "make a solution" or "dispense 10 tablets." These days pharmacists rarely compound drugs from ingredients so you will usually see “disp #30” or even just “#30” as the only directions to the pharmacist.
  - For abusable drugs the quantity should also be written out in words to reduce alterations: "dispense #30 (thirty)"
  - The amount to be dispensed should be clearly stated and should be that needed by the patient.
    - For short term meds – enough for the expected duration (eg, a 10 day supply of an antibiotic or an 8 oz bottle of cough syrup)
    - For long term meds – typically a one month supply plus refills

- The directions to the patient are sometimes preceded by “Sig.” (from the Latin "signa," meaning "write" or "label").
  - These should ideally be written in English; however, pharmacists will translate Latin abbreviations into English
  - “Take as directed,” should be avoided.
  - The directions to the patient should include a reminder of the intended purpose of the medication by including such phrases as "for blood pressure," or "to relieve itching."
  - Pro re nata is a Latin phrase that literally means "for the thing born". It is commonly used in medicine as “PRN" to mean "as needed" or "as the situation arises." For example, “Take 1 tablet every 8 hours prn nausea.”

- Designate the number of refills the patient should have (12)

- The prescriber’s signature (15). Many prescription blanks have two signature lines – “Generic” and “Dispense as Written” (DAW). Others have a “DAW” box to be checked. Usually use the generic side.
Some additional information for your reference:

Common Abbreviations:

- Q day every day
- BID or bid twice daily
- TID or tid three times daily
- QID or qid four times daily
- PRN or prn as needed
- Q X hours Every X hours
- PO or po per os, by mouth
- SL sublingual
- IV Intravenously
- SQ or subQ Subcutaneously
- i, ii, iii, iv 1, 2, 3, 4

<table>
<thead>
<tr>
<th>Unacceptable form</th>
<th>Acceptable form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zero after decimal (1.0 mg)</td>
<td>No terminal zero (1 mg)</td>
</tr>
<tr>
<td>No zero before decimal (.5 mg)</td>
<td>Zero before decimal (0.5 mg)</td>
</tr>
<tr>
<td>U or u</td>
<td>Write “unit”</td>
</tr>
<tr>
<td>µg</td>
<td>Write “mcg” or “microgram”</td>
</tr>
<tr>
<td>Cc</td>
<td>Write “mL” or “ml” or “milliliters” or “cubic centimeters”</td>
</tr>
<tr>
<td>QOD or qod</td>
<td>Write “every other day”</td>
</tr>
<tr>
<td>QD or Q.D.</td>
<td>Write “daily” or “every day” or “Q day” or “Q 24 hours”</td>
</tr>
<tr>
<td>HS</td>
<td>Write “half-strength” or “at bedtime”</td>
</tr>
<tr>
<td>AU, AS, AD</td>
<td>Write “both ears” or “left ear” or “right ear”</td>
</tr>
<tr>
<td>OU, OS, OD</td>
<td>Write “both eyes” or “left eye” or “right eye”</td>
</tr>
<tr>
<td>TIW</td>
<td>Write “three times weekly” or specify days (“Q M-W-F”)</td>
</tr>
<tr>
<td>IU</td>
<td>Write “international units”</td>
</tr>
<tr>
<td>MS, MSO4, MgSO4</td>
<td>Write “magnesium sulfate” or “morphine sulfate”</td>
</tr>
</tbody>
</table>

Classes of medications:

- Over-the-Counter (OTC) Drugs: These drugs do not require a prescription.
- Legend Drugs = Rx only. These drugs may not be dispensed by a pharmacist without a prescription from a physician, dentist, etc. Labels on these medications carry the legend: "Caution! Federal law prohibits dispensing without a prescription."
- Controlled Drugs: In addition to requiring a prescription, these drugs require additional safeguards for storage. Refills are limited. Both State and Federal government agencies promulgate regulations regarding these drugs. The Federal agency is the Drug Enforcement Administration and the Missouri agency is the Bureau of Narcotics and Dangerous Drugs (BNDD).
**General format for an outpatient prescription:**

<table>
<thead>
<tr>
<th>Field</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient’s name</td>
<td>___________________________</td>
</tr>
<tr>
<td>DOB</td>
<td>___________________________</td>
</tr>
<tr>
<td>Address</td>
<td>_____________________________________________________________________</td>
</tr>
<tr>
<td>Date written</td>
<td>___________________________</td>
</tr>
<tr>
<td># refills allowed</td>
<td>___________________________</td>
</tr>
<tr>
<td>Drug name</td>
<td>___________________________</td>
</tr>
<tr>
<td>Strength</td>
<td>___________________________</td>
</tr>
<tr>
<td>Frequency</td>
<td>___________________________</td>
</tr>
<tr>
<td>Route</td>
<td>___________________________</td>
</tr>
<tr>
<td>(duration if not indefinite)</td>
<td>___________________________</td>
</tr>
<tr>
<td>Indication</td>
<td>___________________________</td>
</tr>
<tr>
<td>Prescriber’s signature</td>
<td>___________________________</td>
</tr>
<tr>
<td>DEA number</td>
<td>___________________________</td>
</tr>
<tr>
<td>MISSOURI MEDICAID</td>
<td>222555 111</td>
</tr>
<tr>
<td>SUBSTITUTION ALLOWED</td>
<td>___________________________</td>
</tr>
<tr>
<td>DISPENSE AS WRITTEN</td>
<td>___________________________</td>
</tr>
</tbody>
</table>

---

**Example Prescription:**

**NAME:** Patty Patient  
**DOB:** (01/01/1982)  
**ADDRESS:** _____________________________________________________________________  
**DATE:** 12/1/10  
**REFILL:** 0  
**Levsin (hyoscyamine) 0.125 mg**  
i tab p.o. q 4hrs prn abdominal pain and cramping  
(max 5 doses/day)  
Disp # 20 tablets  

**Prescriber’s name:** Sarah Student, WUMS II  
**DEA number:** ________________  
**MISSOURI MEDICAID:** 222555 111  
**Prescriber’s signature:** ___________________________  

---

**Checklist:**
- Pt’s name
- Date of birth and/or address
- Date written
- # refills
- Drug name
- Drug strength
- Dosage
- Frequency
- Route (PO, IV, etc)
- Indication or PRN (specify what it’s PRN for)
- How much to dispense
- Signature
- Title (MD)
- Also print your name if illegible signature
How to Call Report on a Patient

- When a patient is transferred from the care of one provider to another provider, information must be exchanged.
  - Nurses “give report” at each change of shift.
  - Physicians in the ER “call report” to the admitting team.
  - The day team “signs out” to the night team.

- This communication must be very concise – just a minute or two. The person at the other end is very busy and can’t hang on the phone for a 10 minute presentation.

- A report is formatted somewhat the reverse of a traditional oral presentation. In the usual presentation you give detailed information about the history, exam and labs, then you give the “punch line” – your assessment and plan, what you think the diagnosis is and why. When calling report you give the diagnosis or problem first, then the supporting information.

- The basic elements to include:
  - Identify yourself and why you are calling
  - Include identifying information so the accepting physician can find the patient:
    - Patient’s name
    - Date of birth
    - Location (current and/or scheduled room number)
    - You may also include the admitting physician or team assignment
  - The main issue, problem or diagnosis
  - Background information – about one sentence each of history, PMH, exam, labs
  - What has been done, needs to be done and/or your recommendations
  - Any other useful information – this might include:
    - Offer to read off the meds list or send a copy of it
    - Phone numbers of family members who can provide more history
    - “Off the record” observations such as how to best deal with the patient’s personality

An example:

Hi, this is Sarah Jones; I’m one of the interns in the Medicine Clinic. We are admitting a patient to your team. Her name is Rhonda Jackson, date of birth 1/1/60, going to room 12105 bed B. She is being admitted for pyelonephritis. She is a 50 year old lady with hypertension, diabetes, and hyperlipidemia who presents with a week of right flank pain, fever, dysuria, anorexia, nausea and vomiting. In the clinic she is febrile to 38.5, and has a blood pressure of 92/68; she has a benign abdomen but marked right CVA tenderness. Her urine dip shows 3+ leukocyte esterase and 3+ nitrites. We have sent off basic admitting labs, a UA and a urine culture. They wouldn’t draw a blood culture in the clinic, so that will have to be done on the floor. She will need antibiotics and hydration. Her blood pressure is much lower than her usual so we are concerned that she is dehydrated and may have acute renal failure. When you meet her she may seem grouchy but she just feels really bad; she is usually a very sweet lady. I updated her meds list and my note is in TouchWorks. Is there anything else you need? ..... Thank you for taking her. I’ll stop by to check on her tomorrow.
Hospitalized patients must have at least daily written documentation of their medical status and progress. The standard daily progress note is often called a "SOAP note," which stands for
- **Subjective**
- **Objective**
- **Assessment**
- **Plan**

The daily progress note is another item that seems a bit mysterious when you start your first clerkship, but quickly becomes routine. Progress notes will vary somewhat in format and content from one service to another. In general surgical notes are shorter than those on non-surgical services. As in all things, when in doubt – Ask! You can also look at your interns’ progress notes to get a general idea of what is expected, but remember that students are expected to write beautiful model notes, while the harried intern can be sloppier. Soon you will be the intern and you will receive the same leeway.

Here is the basic format and a sample note on an internal medicine patient.

**Title** – Many different people read the chart, and many of them write notes: students, interns, residents, attendings, subspecialty consultants, nurses, case coordinators, dieticians, social workers, etc. It can quickly become chaos unless all clearly label their notes. You need to specify your rank and the service you represent (the service can be omitted if you are on the primary/admitting team). Abbreviations are fine; some common ones are:

- **PN**: Progress Note
- **IPN**: Intern Progress Note (or R1 PN or PGY1 PN)
- **RPN**: Resident Progress Note
- **R1 PN**: R1 (= intern = PGY1) PN
- **MSPN**: Medical Student Progress Note

On a surgical service it is customary to keep track of hospital day and post-op day number:

- **MS PN** – Neurosurgery – HD#5, POD#3

**Date and time are mandatory on all chart entries and orders.** Remember, the chart is a legal document. Years later it may be examined in detail by lawyers. You may have to stand up in court and read your note out loud and explain it. Remember to make all your documentation accurate in content and professional in tone.

**Subjective:** Briefly report what the patient has to say about how he/she is feeling. Be sure to include pertinent positives and negatives with respect to the patient’s main
problem(s). You may also want to comment on how the patient is doing with basic functions: eating, drinking, voiding, BMs, getting out of bed, walking, etc.

Objective: Always start with vital signs. If applicable, this would include “ins and outs” or “I/Os” (usually pronounced “I’n’O”) – a summary of fluids taken in by mouth or IV and out via urine, diarrhea, tube drainage, or other output. If your primary concern is the patient’s overall fluid status (eg, in CHF, renal failure) then just summarize the amount in, the amount out, and the net.

\[ I/O = 1200/2500 = -1300 \text{ ml (cum -4500 ml over 7 days)} \]

Sometimes patients have quite complex plumbing arrangements and you are concerned about the exact breakdown of the output (note: JP is a Jackson Pratt surgical drain).

\[ I/O = 1200/2500 = -1300 \text{ ml } \quad \text{Foley- 485 ml} \]
\[ \text{NG} – 1500 \text{ ml } \quad \text{JP#1 - 100 ml } \quad \text{JP#2 - 15 ml } \quad \text{Colostomy – 400 ml} \]

Another item that may be included VS section is fingerstick blood glucose monitoring (often called the Accu √). If the patient is on telemetry (continuous heart monitoring) include the summary after the VS.

Then record a focused physical exam. It is usually appropriate to include the general appearance and at least a brief heart and lung exam. Much of the other content is guided by the patient’s clinical problems (eg, on the Neuro service you’d better document a nice neuro exam!).

Next you should summarize any lab results and diagnostic tests from the last 24 hours.

Medications are often listed in the left-hand column. It is very helpful to keep count of how many days of antibiotics a patient has received (“vanco 1 gm IV q 12 hrs, day #12”) and the anticipated course length if known (“Septra DS i bid, day 3/7”)

Assessment and Plan: This is where you can show that you really understand what is going on. In the early days of a hospitalization you may need to document the team’s ongoing thought process about the differential diagnosis and the plans for diagnostic studies and new therapies. As the patient’s clinical status improves the notes will become briefer.

The A&P is organized by problem, usually from most active/serious to least. In very complex patients (eg, in the MICU) the list may be organized by systems: CV, pulm, GI, FEN (fluid/electrolyte/nutrition), etc.

Signature: Don’t forget to sign your name. Unless your signature is amazingly legible you should also print your name. Always list your title and beeper number.

Shirley Student
Shirley Student, WUMS-III
424-1111
**Barnes-Jewish Hospital**

**Jane J. Doe**
09/06/26

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>MS Progress Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>12/15/03</td>
<td>1030</td>
<td>S: Feeling much better; no more dizziness on standing up. Nausea has entirely resolved. Eating well, but no BM x 3 days.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Observation</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>O: Afebrile, Tmax 37.8° po</td>
<td>HR 80-96, BP 140-168/76-84, RR 20</td>
</tr>
<tr>
<td>I/O</td>
<td>2400 / 1800 ml, wt 126# (up 1#)</td>
</tr>
<tr>
<td>Cipro 400mg IVq12h</td>
<td>Tele - SR 80-100, frequent PVCs</td>
</tr>
<tr>
<td>ASA 81 mg/day</td>
<td>Lungs - clear to ausc</td>
</tr>
<tr>
<td>Lovenox 40 mg SQ</td>
<td>CV - no JVD; RRR, nl S1 S2, III/VI harsh SEM LLSB</td>
</tr>
<tr>
<td>Once daily</td>
<td>Abd - NABS, soft, NT</td>
</tr>
<tr>
<td>Multivitamins</td>
<td>Extr - no edema</td>
</tr>
<tr>
<td>OsCal bid</td>
<td>Neuro - alert, oriented to Barnes Hosp, Dec “14 or 15?” 2003</td>
</tr>
<tr>
<td>Labs:</td>
<td>145 / 104 / 36 / 112</td>
</tr>
<tr>
<td></td>
<td>3.2 / 28 / 2.0 \</td>
</tr>
<tr>
<td>Urine C&amp;S</td>
<td>&gt;100,000 col/ml, E Coli, pan-sens</td>
</tr>
<tr>
<td>Blood cx</td>
<td>no growth to date</td>
</tr>
<tr>
<td>Renal sono</td>
<td>nl size kidneys, no hydronephrosis, no abscess</td>
</tr>
</tbody>
</table>

**AG&P**

1) **Pyelonephritis** - Clinically much improved with hydration and antibiotics. Urine culture is growing E coli sensitive to ciprofloxacin; blood cultures negative. Will change Cipro to po today as it has excellent po absorption. Must D/C Foley catheter.

No structural renal abnormalities on ultrasound so this is an Uncomplicated pyelo. Would continue antibiotics for total 14 day course. D/C Foley!

2) **Acute renal failure** - Her ARF is probably due to dehydration. She had very poor po intake for several days because of the nausea from her pyelo. With hydration her BUN has fallen from 60 to 36 and creat from 3.2 to 2.0. She may have significant underlying chronic renal insufficiency. Will try to contact her PMD for past lab results.

D/C Foley!

3) **Dizziness** - resolved. Was 2° to dehydration/orthostatic hypotension. No evidence of significant arrhythmia on tele → D/C tele

4) **HTN** - with rehydration her BP is now elevated. Will restart her lisinopril (ACE-I will also be reno-protective)

5) **DVT prophylaxis** - enoxaparin daily; out of bed for meals; encourage ambulation

Sarah Student, WUMS III
Sarah Student (beeper xxx-xxxx)
INTERNAL MEDICINE CLERKSHIP
FORMULATING A DIFFERENTIAL DIAGNOSIS

Generating a differential diagnosis is critical to the practice of internal medicine. It requires a broad range of preexistent medical knowledge, the ability to obtain the relevant symptoms and signs from the patient, a logical but flexible thought process, and the resourcefulness to pursue self-directed learning. Producing an all-encompassing list of diagnoses that might explain a particular sign, symptom, laboratory/diagnostic test abnormality, is insufficient. If it were that simple, we internists would have been replaced a long time ago! A differential diagnosis must be carefully tailored to the individual patient—the highest priority items first, impossible diagnoses omitted, unlikely but still possible/interesting items given brief mention. The ability to develop a thoughtfully prioritized differential in the context of a specific patient also requires a good deal of clinical experience. Some patient problems are rather stereotypical given a particular clinical setting (e.g. nasal congestion in an allergist’s office). In this case, familiarity, even expertise, can develop rapidly. Other problems and scenarios defy all our logical attempts (e.g. fatigue, dizziness, malaise). Many an internist avoids such vagaries as the sole or primary subject of differential diagnosis, although we are sometimes left with no other choice.

When beginning a differential diagnosis, recall the concept of the “MOST.”

The most likely diagnosis
Based on the particular clinical evidence surrounding the patient. For example, chest pain in an elderly hypertensive, smoking diabetic is not the same as chest pain in a young motor vehicle accident victim.

The most common diagnosis
Based on your prior clinical experiences and the known frequency of diseases. Often the most likely diagnosis as well. For example, the common cold is by far the most common diagnosis for nasal congestion most situations.

The most dangerous diagnosis
Such diagnoses are generally not the most common explanation for a problem but they are the ones you would really feel bad about missing. Missing them could result in severe patient harm in relatively short order (e.g. aortic dissection in chest pain or spontaneous pneumothorax in dyspnea).

The most interesting diagnosis
This is the stuff internists love talking about—Wegener’s granulomatosis, sarcoidosis, amyloidosis, histiocytosis X, Waldenström’s macroglobulinemia, etc. Generally such diagnoses are most useful as “roundsmanship.” However, it is important to appreciate that rare and interesting diagnoses do occur (particularly at a tertiary care referral center like Barnes-Jewish Hospital) and given the right clinical scenario cold be the most likely diagnosis.
DIFFERENTIAL DIAGNOSTIC PARADIGMS

As note above, a logical but flexible thought process is required to generate useful differential diagnoses. A single approach or strategy simply will not work for every patient problem. Decades of clinical practice have repeatedly shown certain approaches are most effective in certain clinical scenarios. You should try them all out to find the approaches that best fit the way your brain works.

THE LIST

This method is appropriate only for short and common differential diagnoses. Unfortunately, when under stress or caught off guard many students revert to this most rudimentary and inelegant method—naming at random anything they can think of. Try to avoid this if at all possible!

EXAMPLE (where it might work): What is the differential diagnosis of nasal congestion?

1. Common cold
2. Allergic rhinitis
3. Acute sinusitis

These three diagnoses will encompass the vast majority of patients with nasal congestion. There are precious few “most dangerous” conditions that would be missed. A “diagnostic paradigm” hardly seems worth the effort for most clinicians.

EXAMPLE (where it certainly will not work): What is the differential diagnosis of dyspnea?

1. Lung cancer
2. Metabolic acidosis
3. Tuberculosis
4. High altitude
5. Pleural effusion
6. Pneumoconiosis
7. Intracardiac shunt
8. etc, etc, etc…

This example is not nearly as absurd as it might seem! It happens all the time. Sure there might be many items on the list but the randomness suggests a lack of understanding of the mechanisms of dyspnea. Knowing these mechanisms will get you a lot further than a random list. Besides, in the long run, it takes a whole lot more effort to remember a long list than it does to understand the mechanisms (see below).
There are, however, situations when a brief list can be very helpful, particularly when it specifically focuses and the most likely/common/dangerous diagnoses. Such lists are never meant to be all-inclusive or the end of your thinking.

**EXAMPLE:** You are the intern doing night float and have just been called to see your fifth patient of the night with shortness of breath. As you’re trotting down the hall you go over this list of most likely/common/dangerous causes of dyspnea in hospitalized medical patients.

1. CHF
2. Anginal equivalent/MI
3. Pulmonary embolism
4. Bronchoconstriction
5. COPD
6. Pneumonia
7. Pneumothorax
8. Anxiety

To reiterate, such a list is not intended to all-inclusive; there are many more reasonable possibilities.

**THE MNEMONIC DEVICE**

We internists are famous (or infamous) for these. Some doctor brains really have a knack for these; however, most do not. Fairly succinct lists are most appropriate. The mnemonic itself must be very easy to remember. I once knew a mnemonic for diarrhea and it was, get this, “DIARRHEA.” I can remember that much but nothing more. On the other hand, the mechanisms of diarrhea easily stay with me and the diagnoses under each seem to fall relatively simply into line. Forced funny spellings, letters standing in for more than one thing, etc, will only confuse the situation. A “mnemonic savant” colleague of mine even constructed a mnemonic in cockney rhyming slang. Using a paradigm based on mechanisms/pathophysiology, anatomy/systems are much preferable and you’ll look a whole lot smarter!

**EXAMPLE** (the quintessential): What is the differential diagnosis for an anion gap acidosis?

“**MUDPIES**
M Methanol
U Uremia
D Diabetic ketoacidosis
P Paraldehyde
I Ischemia
E Ethylene Glycol
S Salicylate

Honestly, most people don’t even “need” this devise because it’s so famous. We seem very attached to this one. True enough, but do you notice anything missing
from the list? Well you should also add alcoholic ketoacidosis, starvation ketoacidosis, propylene glycol, and a few others. “Ischemia” is a pretty poor stand-in for all the things that can cause lactic acidosis.

And did you know you can also do it this way?

“MUDPILES”

M Methanol
U Uremia
D Diabetic ketoacidosis
P Paraldehyde/Phenformin/Propylene glycol
I Infection/Iron/Isoniazid
L Lactic acidosis
E Ethylene glycol/Ethanol
S Salicylate/Starvation/Solvents (toluene)

True, this does pick up more diagnoses it’s starting to get pretty complex. Also note that some things cross mechanistic lines. In reality ethanol and starvation should be with DKA because the mechanisms are quite similar. Paraldehyde and phenformin are relics, not to mention phenformin (and rarely metformin) causes a lactic acidosis. Nobody really knows how paraldehyde or toluene causes metabolic acidosis. Lactic acidosis has many potential causes (not just the simplistic notion of “ischemia” in the first mnemonic) but you do not get a sense of this. And what if you get the two mnemonics mixed up?

You get the point. Mnemonics have their place but definitely don’t over do it because there are many potential pitfalls.

PATTERN RECOGNITION

Most diseases and syndromes have very characteristic patterns of symptoms and signs. If they didn’t, we’d have an incredibly hard time doing our job. Human brains are quite good at recognizing patterns and the trained doctor brain should be especially good. Pattern recognition can work for the ubiquitous to the rare.

EXAMPLE:

Malaise
Low-grade fever
Nasal congestion
Rhinorrhea
Mild sore throat
Cough

Your mom knows this as the common cold
EXAMPLE:
Thrombocytopenia
Microangiopathic hemolytic anemia
Neurologic symptoms and signs
Renal dysfunction
Fever

Even you might not recognize the classic pentad of thrombotic thrombocytopenic purpura—never mind that most TTP patients don’t even have it.

Of course, nothing is this simple. There are a few caveats. “Obvious” patterns can be obscured by other related or unrelated symptoms and signs. Be sure to try multiple different clusters of facts. Patients may very well not have all features of a classic pattern. Of course, if you don’t know the pattern then you can’t recognize it. You shouldn’t put all your faith in patterns; remember to think about the differential diagnosis of each symptom/sign independently.

EXAMPLE: A 20 year old male college student presents with the follow symptoms:

Meningitis
Headache
Myalgias
Otalgia
Fever
Cough
Nasal congestion
Pleuritic chest pain
Purulent nasal discharge
Knee pain

Of course, the most likely diagnosis is a really bad cold and a sprained knee!

THE ANATOMIC APPROACH

The list is based on what anatomic structures are in the vicinity of the patient’s complaint. This method won’t work very well when important potential causes include things far removed from the site of the complaint. There are various ways to go about this, head to toe or outside in, for example. The visual aspect of this paradigm aids memory in many people (so called visual learners). If you can remember the image, the specific differential points will follow.
EXAMPLE: Chest pain

Bones/Muscles/Nerves:
- Radiculopathy
- Chostochondritis
- Rib fracture
- Muscle sprain/strain

Esophagus:
- GERD
- Spasm
- Dysmotility

Stomach:
- Ulcer
- Cancer
- Gastroparesis

Cardiac:
- Angina/MI
- Valvular disease
- Pericarditis
- Aortic dissection

Skin/Nerves:
- Zoster

Lungs:
- PE
- Pneumonia
- Bronchitis
- Pleuritis
- Pneumothorax

Gallbladder:
- Cholelithiasis
- Cholecystitis

THE SYSTEMS APPROACH (A.K.A. THE CATEGORIES OF DISEASE OR THE UNIVERSAL DIFFERENTIAL DIAGNOSIS)

Such lists are based on the underlying mechanisms of the disease process in question. Theoretically, this method should be able to uncover the cause of any patient problem. The categories/systems are:

- Autoimmune
- Allergic/Immunologic
- Degenerative
- Drugs
- Endocrinologic
- Genetic/Congenital
- Iatrogenic
- Idiopathic
- Infectious
- Inflammatory
- Metabolic
- Neoplastic
- Nutritional
- Psychiatric
- Toxic
- Trauma/Mechanical
- Vascular
It can be challenging to remember all the categories of disease so, you guessed it, there are multiple mnemonics you could use. Pick one; don’t waste your time with the rest.

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EXAMPLE: Fever (VERY abbreviated example):

Idiopathic: any fever you don’t yet know the etiology of after extensive diagnostic testing could be called “idiopathic pyrexia” (as the Brits say) or “fever of unknown origin,” a cause usually turns up Vascular: DVT, PE, MI, phlebitis, CNS hemorrhage, aortic dissection, hematoma, vasculitis, sickle cell crisis Infection: viral, bacterial, fungal, mycobacterial, parasitic, endocarditis Neoplastic: lymphoma, leukemia, carcinoma, sarcoma, atrial myxoma Degenerative: it would be a stretch to find anything that clearly fits this category Inflammatory: inflammatory bowel disease, sarcoidosis, pancreatitis, atelectasis, hepatitis/cirrhosis, papillary necrosis, thyroiditis, pneumonitis, pericarditis, connective tissue diseases Congenital: familial Mediterranean fever (FMF), porphyria, cyclic neutropenia, Fabry’s disease, malignant hyperthermia (MH) Autoimmune: RA, Still’s disease, SLE, temporal arteritis, PMR, rheumatic fever spondyloarthropathies, vasculitis Trauma: crush injury Toxic: scorpion bite, spider bite, snake bite, heavy metal poisoning, cocaine, PCP, LSD, amphetamines Endocrine: thyroiditis, thyrotoxicosis, pheochromocytoma, Addison’s disease Metabolic: FMF, porphyria, neuroleptic malignant syndrome (NMS), MH, heatstroke, delirium tremens Allergy: allergic dermatitis, transfusion reaction Iatrogenic: drug fever, NMS, MH, post-bronchoscopy Drugs: sulfonamides, penicillins, cephalosporins, methyldopa, phenytoin, levothyroxine, amphetamines, anticholinergics, depolarizing muscle relaxants (MH), potent inhalational anesthetics (MH), neuroleptics (NMS)

Many diseases can be placed in several categories. For instance, infectious diseases and autoimmune diseases cause an inflammatory reaction. Many metabolic diseases are genetic. Some of the conditions that can cause a particular problem are themselves idiopathic. Drugs are obviously iatrogenic but there many other things we do to patients that are not drugs. Generally, elicit drugs are considered in the toxins category.

THE DIAGNOSTIC TEMPLATE

A diagnostic template emphasizes the way doctors think. It follows a line of reasoning that is ultimately helpful in establishing the correct diagnosis. It typically consists of a flowchart with branch points that correspond to clinical decisions or facts. Instead of memorizing a list, you learn an established way of approaching a problem. Once again, you look (and are) incredibly more intelligent than a person who spouts off a long list but doesn’t know why or how the problem exists in the first place.
EXAMPLE: hyponatremia (one of the very best examples)

Serum Na
<134 mEq/L

Plasma osmolality

High
(>300 mOsm/kg)

Hypertonic Hyponatremia
Hyperglycemia
Mannitol

Normal
(275-300 mOsm/kg)

Psudohyponatremia
Hyperglycemia
Hyperlipidemia
Hyperproteinemia

Low
(<275 mOsm/kg)

True hyponatremia

Urine osmolality

Normal water excretion
<100 mOsm/kg
Primary polydipsia
Hypotonic irrigation solutions
Excessive tap-water enemas
Reset osmostat

Impaired water excretion
>100 mOsm/kg

Clinical volume status
JVP/HJR
Orthostasis
Peripheral edema
Ascites
S3
Pulmonary edema

Hypovolemic Hyponatremia

Urine Na

Extrarenal Na loss
< 10 mEq/L
GI loss
Skin loss
Third spacing

Renal Na loss
>20 mEq/L
Diuretics
Hypoaldosteronism
Na-wasting nephropathy
Nonoliguric ATN
Post-obstructive diuresis

Isovolemic Hyponatremia
SIADH
Hypothyroidism
Hypoaldrenism

Hypervolemic Hyponatremia
CHF
Cirrhosis
Nephrosis
Renal failure

Hypothyroidism
Cirrhosis
Hypoaldrenism
Renal failure

GI loss
Skin loss
Third spacing

Diuretics
Hypoaldosteronism
Na-wasting nephropathy
Nonoliguric ATN
Post-obstructive diuresis
**EXAMPLE:** acute oliguria (frequently used in hospitalized patients), greatly simplified

- **Pre-Renal**
  - systemic hypotension
  - renal artery disease
  - decreased effective renal perfusion
  - glomerular disease

- **Intra-Renal**
  - interstitial or tubular disease

- **Post-Renal**
  - ureteral obstruction
  - bladder obstruction
  - urethral obstruction

**THE MECHANISTIC/PATHOPHYSIOLOGIC APPROACH**

This approach is the ultimate in differential diagnosis. It requires an understanding of the fundamental mechanisms of disease and is indicative of high-level thought processes. Many problems cannot be directly approached this way because the pathophysiology mechanisms may not be known. These differentials often follow the course of something through the physiologic/anatomic machinery. Basic biochemical/metabolic reactions are often involved.

**EXAMPLE:** jaundice or hyperbilirubinemia

1. **Production**
   - Hemolysis
   - Ineffective erythropoiesis

2. **Hepatocyte Uptake**
   - Gilberts’ Syndrome
   - Drugs

3. **Conjugation**
   - Neonatal jaundice
   - Breast milk jaundice
   - Crigler-Najjar Syndrome
   - Gilbert’s Syndrome

4. **Hepatocyte Excretion**
   - Dubin-Johnson Syndrome
   - Rotor Syndrome

**5. Intrahepatic Diseases**
   - **Hepatitis**
     - Viral, drugs, etc…
   - **Steatosis/Steatohepatitis**
     - ETOH, DM, etc…
   - **Cirrhosis**
     - ETOH, CHF, etc…
   - **Cholestasis**
     - Drugs, pregnancy, TPN, etc…
   - **Biliary Cirrhosis**
     - Primary biliary cirrhosis
   - **Infiltrative Diseases**
     - Amyloid, sarcoid, Wilson’s disease, Hemochromotosis, etc…

**6. Extrahepatic Obstruction**
   - Gallstone disease
   - Stricture
   - Sclerosing cholangitis
   - Hepatobiliary parasitism
   - Pancreatic cancer
   - Enlarged lymph nodes in the porta hepatitis
INTERNAL MEDICINE CLERKSHIP
WRITTEN H&P AND ORAL PRESENTATION
GUIDELINES

THE WRITTEN HISTORY AND PHYSICAL

The History of The Present Illness

- Always include a chief complaint (usually the patient’s own words) and identifying data.
- The “identifying data” should be brief and definitely not a condensed PMHx.
- An effective HPI is detailed but concise, chronologic, and includes pertinent positives and negatives.

Past Medical History

- Major ongoing chronic medical problems summarized succinctly
  - Original diagnosis, date and diagnostic test
  - Current management, control of symptoms and level of daily functioning
  - Complications
  - Recent objective measures (e.g. HbA1c, LVEF, recent office or home BPs)
- Surgical history
  - Type of surgery, date performed (many surgeries will be addressed in the context of a major problem above)
- Medications
  - List all prescription drugs including dosages and frequencies
  - List over-the-counter medications and herbals
- Allergies
  - Be sure to include the type of allergic reaction

Social History

- Marital status
- Work history, including possible work-related exposures
- Ethanol, tobacco, and illicit drug use
- Any psychosocial issues that impact on the patient’s illness

Family History

Review of Systems

- A complete ROS should be obtained and documented on all patients.
- If it is directly pertinent to the HPI, put in the HPI, not the ROS.
- If the patient cannot provide an ROS then you must say so.

Physical Examination

- The physical examination should be detailed and organized by organ system.
• Avoid making diagnoses in the PE, rather describe what you see, hear, or feel. For example, rather than saying the patient has a psoriatic rash, say the patient has a red plaque with silvery scale.
• A rectal examination is almost always appropriate for every patient admitted to the hospital.
• Likewise a breast exam is almost always called for with female patients.
• If you are uncertain of your skills to perform either a rectal or breast exam, discuss this with your resident.
• You and your resident will determine together whether a gynecologic exam is appropriate. Of course, this will always be done under direct supervision.
• At the very least a simple neurologic exam should be done on all patients (including a fundoscopic examination). When the patient has a presenting complaint that is or may be neurologic in origin, a thorough and complete neurologic exam should be performed and documented by you.
• Perform a fundoscopic exam on all your patients.
• Even if your attending and/or resident does not specifically verbalize these expectations to you, do them anyway! They’ll almost certainly be looking for them.

Laboratory Tests
• Include all admitting labs.
• Include any initial radiographic studies (be sure you look at the actual study yourself).
• Include your interpretation of the ECG (be sure you look at the actual ECG yourself).

Assessment and Plan
• A complete, detailed, organized, thoughtful assessment and plan is vital to the practice of internal medicine. You should strive to commit your thought process to paper.
• Start with a prioritized problem list of all the patient’s active problems. List all active problems in order of descending importance.
• A problem can be a sign, symptom, diagnosis or laboratory abnormality.
• Make sure your list is complete. It will help assist with cross coverage, will help you keep on top of all problems and is a valuable reference for consultants.
• Less active problems will require much less attention.
• For each problem document an assessment and plan.
• More emphasis is placed on the assessment (what you think is going on and why) and less to the plan (what you are going to do about it).
• You must commit to a differential diagnosis and back it up with clinical reasoning skills (refer to the document Formulating a Differential Diagnosis). An exhaustive differential is not necessary but you should address all reasonable possibilities. However, it is also important to include the not very likely possibilities that are particularly serious or life threatening. The differential diagnosis is prioritized based on the patient’s history, physical exam, and labs. The ranking may also reflect the
fact some of the possibilities are life threatening and, therefore, require immediate
diagnosis.
• Even when the diagnosis seems completely clear-cut, you should always think about
additional contributing or exacerbating factors.
• The plan should outline the diagnostic and/or therapeutic plans which reflect the
prioritization and reasoning in the assessment.

Model Written History and Physical
• Following this section of the clerkship manual you will find the Model Written
History and Physical for the Internal Medicine Clerkship; please review it carefully.
• The model was developed to help you better understand what most internists are
looking for in an outstanding H&P.
• The style of writing is telegraphic rather than prose. It is clearly understandable but
there is a distinct economy of words. Words that aren’t completely necessary are
often left out. Grammatically complete sentences are not a priority. Punctuation is
used somewhat creatively for increased clarity.
• You will note that abbreviations are used fairly liberally but only standard and widely
accepted abbreviations. They simply help to get the job done faster. Creative
abbreviations confuse and slow the reader down; avoid them.
• Your attending and resident may feel differently about the use of abbreviations so be
sure to ask them.
• The model is shown in a handwriting font to help simulate the amount of space that is
taken up by the typical H&P. Yours will never be this neat but please do not forget
that “Neatness Counts.” If no one can read what you write, what good is it?
• The PMHx section includes information about the most important problems.
• The physical includes genital, rectal, neurological, and fundoscopic exams. A nearly
complete neurologic exam is included but this may not be necessary for all patients.
• In the medications section notice the avoidance of the use of dangerous abbreviations.
• The ROS is compact but complete. You should do the same.
• The A&P is organized in the form of a prioritized problem list. The most important
problems get the most attention. A clear differential diagnosis is given with attention
to the most common, most likely, and most dangerous possibilities. A specific
diagnosis is state and defended. A clear diagnostic and therapeutic plan is stated.
• Any note longer than one page should indicate “continued” at the bottom along with
your signature.

THE ORAL PRESENTATION

• As you prepare your presentation, it may be helpful to remember that the listener is
creating, prioritizing, and re-prioritizing his/her own differential diagnosis based on
what you say.
• “Tell the story” with minimal reference to notes. Definitely do not read off a
copy of your H&P.
• You will find it useful to practice your presentation before rounds to get the hang of
doing it from memory.
• The degree of thoroughness, and therefore length, will depend on your attending and the forum in which you are presenting. If you are uncertain about how much information to give, by all means ask.
• The HPI makes up 1/3-1/2 of the total presentation and is chronological, attentive to detail, and includes pertinent positives and negatives.
• In the PMHx major ongoing chronic medical problems should be summarized succinctly.
• Medications and allergies are always presented.
• The SHx, FMHx, and ROS can usually be eliminated. If the information was key, it should be in the HPI.
• Your exam should be orderly and include the pertinent negatives.
• Labs should be presented in an edited fashion. Feel free to refer to notes for the lab values.
• Your assessment should include a brief discussion of the major problem(s), differential diagnosis of that problem, which diagnosis is most likely and why (using the data you have just presented), and the initial diagnostic and/or therapeutic strategy.
• If you have done additional reading/research present that information concisely during attending rounds.

THE BASIC DAILY PROGRESS NOTE

The following is a detailed description of the standard “SOAP” note style for a daily progress note. You are strongly encouraged to follow this format in all progress notes that you write. When appropriate (e.g. on a call day), such notes may be less detailed and brief but this is also determined by the acuity of the patient’s problems.

Title
There are various titles, most designated by initials. Examples include: IPN (intern progress note), RPN (resident progress note), Gold-PN (Gold service progress note), MS-PN (medical student progress note). On the title line it is also a nice touch to include a day to day tally of certain drugs or treatments like antibiotics, TPN, and post-op day. For example:

MS-PN: Amp Day #5/Gent Day #5/Flagyl Day #3/TPN Day #2

Subjective
Those things that the patient tells you spontaneously and in response to direct questioning. This should include pertinent positive and negative symptoms regarding the main diagnoses or diagnostic considerations. For example, if the patient were admitted with chest pain, it would be important to ask the patient every day about chest pain and document it’s presence or absence. Similarly, if the patient were admitted with abdominal pain it would be appropriate to document whether or not it is continuing, if there is nausea or vomiting, diarrhea or constipation, if they are eating, etc. Many times it is appropriate to use the patient’s exact words in quotations (e.g. “I almost fell out last night!”).
Objective
Should include the following in roughly the same order:

VS (vital signs): BP HR RR Tcurrent Tmax

I/O (ins and outs)
At times it is appropriate to break these down, e.g. how much was oral, how much was IV, how much was by Foley catheter, how much was by NG etc.

ACCU√ (i.e. bedside glucose monitoring, only if these are being done)

Telemetry Report (only if this is being done)

Physical Exam
Typically this is limited and directed by the patients particular problems but usually includes: GENERAL APPEARANCE LUNGS, COR (i.e. the heart), ABD, and EXT. Other parts of the exam are added only if necessary.

Laboratory Data
All lab data from the day or new data from previous days.
Don’t forget to document any new culture data each day.

Diagnostic Tests (e.g. chest X-rays, CT scans, MRIs, V/Q scans, etc.)

Assessment and Plan
This is the most difficult section and experience helps tremendously. It consists of a numbered prioritized (i.e. most important to least important) listing of the patient’s problems. The “problems” may be a symptom, sign, lab abnormality, or specific diagnoses. The number one point is almost always the reason why the patient was admitted to the hospital, for example: chest pain, MI, pneumonia, UTI, pyelonephritis, SOB, COPD exacerbation, elevated LFTs (liver “function” tests), the list is endless. The other problems follow behind. Under each problem there should be a brief and relevant discussion of the problem including statements of the patient’s progress, differential diagnostic points, diagnostic and therapeutic plans.

Model SOAP NOTE
Following the Model Written History and Physical you will find a Model SOAP Note; please review it carefully. Some patient’s problems are not nearly this clear and require a more round about discussion of often overlapping problems. On other hand, many times the discussion section can be far briefer. Above all, practice makes perfect but all of us need to work hard to communicate exactly what we are thinking to the other health care providers who are reading the chart. Any note longer than one page should indicate “continued” at the bottom along with your signature.

tmd/6-15-07
INTERNAL MEDICINE CLERKSHIP
INTRODUCTION TO
PROFESSOR’S ROUNDS &
THE EVIDENCE-BASED MEDICINE ASSIGNMENT

THE PRESENTATION

For better or worse, Professor’s Rounds can be one of the more anxiety provoking activities of the Internal Medicine Clerkship. At its most fundamental level, it encompasses the following aspects: 1) Your ability to present a patient concisely with exceptional clarity. 2) Your powers of persuasion during the presentation. In other words, making the rest of the group believe in your most likely diagnosis. 3) An exercise in critical thinking utilizing the information presented and your research regarding the patient. Each student will also be required to complete an evidence-based medicine (EBM) assignment and present it in Professor’s Rounds. These skills will be used for the rest of your career.

Every Professor’s Rounds is somewhat different (depending on the particular professor and the dynamics of the group), making generalizations difficult. However, the survival skills that follow should serve you well in most Professor’s Rounds situations. As well, remember that if you are uncertain about the expectations, ask!

There are two schools of thought regarding the selection of a patient to present in Professor’s Rounds. Some believe that the more exotic or complex the better. Others feel that a patient with a single straightforward diagnosis is best. The best patient to pick is probably one you feel most comfortable with and can present the most clearly and persuasively. If you are having difficulty selecting a patient, discuss the possibilities with your resident.

The presentation you will do during Professor’s Rounds will differ somewhat from those done on the wards pertaining directly to patient care. It should be polished and as much from memory as possible (except for the labs). It’s a very good idea to rehearse your presentation several times before your assigned day, perhaps for your resident. It should follow a very standard format as below:

1. INTRODUCTORY STATEMENT: This should be very brief and to the point. State the patient’s age, race, sex and chief complaint. Only if necessary should you mention any PMHx here. A good example would be, “65 YOWM with a H/O CAD and CABG admitted with CP.” If the PMHx is not absolutely relevant, do not put it here!

2. HPI: Remember that you are telling a story. Be logical, chronologic, concise, and persuasive. Pertinent positives and negatives are critically important here; however, do not do a complete review of systems. The pertinent positives and negatives are the first step in narrowing down the differential diagnosis. It is generally acceptable to leave certain details out for the sake of clarity. This is especially true if these “factoids” did not ultimately affect the patient’s care. For example, most of the HPI, as you see it, relates to the patient’s CP. Suddenly, at the end of taking the history the patient wants to talk about his chronic back pain. And he does, at great length and with tremendous
complexity. Although it’s remotely possible that the patient’s CP and back pain are both caused by a dissecting aortic aneurysm, the team does not seriously pursue this and the back pain seems very chronic. For clarity, do not include this in the HPI as a key element of the history or as a pertinent positive or negative. Put it in the ROS. This is just an example and you will have to make judgments about whether to include such things in the HPI. It is never acceptable to embellish the history by adding things. Do not discuss prior evaluations of medical problems at length, or at all, in the HPI.

3. PMHx: Succinctly summarized the major medical problems and prior major surgeries. If it has no relevance, you may safely leave it out.

4. MEDICATIONS: Quickly list all medications with doses and frequencies.

5. ALLERGIES: If there is an allergy state the specific nature of the reaction.

6. SHx: Be very brief and only present key information.

7. FMHx: Be very brief and only present key information.

8. ROS: Again, brevity is crucial. Only present the positives in list form. It is not necessary to explain the aspects of each. If they were important, you should have included them in the HPI. If it is truly irrelevant, just leave it out. After the positives, you may state that the other systems were negative.

9. PHYSICAL EXAM: Your exam should be orderly and include the positive findings and the pertinent negatives. Do not feel compelled to recite all the normal findings. Regarding the positive findings, remember to describe them as completely as you can. Avoid making specific diagnoses.

10. LABS: Labs should be presented in an edited fashion. Feel free to refer to notes for the lab values. For the CXR, ECG, and any other diagnostic test, be sure you understand the interpretation! You should be able to explain why it’s CHF on the CXR and not pneumonia. Know what the features of a left anterior fascicular block are. Be able to describe the features of an obstructive abnormality on the PFTs. You should bring these diagnostic tests along with you to Professor’s Rounds if they are important to the diagnosis.

This is a general outline and your professor may want substantially less. It is clearly better to be armed with more information than one ultimately needs. Do not be surprised or dejected if you get interrupted many times as you try to get through the 10 items above. It is somewhat unpredictable as to when you will be interrupted. Lack of practice, lack of chronological sequencing, giving the above elements out of order, and providing contradictory information are sure invitations to being interrupted. Do not panic or get flustered. Remember where you left off. Answer the question. Resume where you left off. On the other hand, a flawlessly crafted and highly practiced presentation can be interrupted just as often. But remember, the more chronological, logical, and concise your presentation is, the less likely you will be interrupted.

Multiple interruptions aren’t always a bad thing. They may have nothing to do with your presentation. That may just be the style of your professor. This method can be very effective at stimulating discussion and participation by other members of the group. It also gives you a moment to tailor the rest of your presentation based on the questions asked.
After the presentation of the facts comes the discussion of the assessment. Some professors will focus on the presenter while others will focus on the members of the group who did not present.

In order to prepare yourself for the discussion, begin with a prioritized list of your patient’s problems. Next, develop a differential diagnosis for each of the important problems. You must be able to commit to and support a most likely diagnosis. You should have done fairly extensive reading about the most likely diagnoses. Your professor will be asking pointed questions meant to reveal your thought process. For more information about this topic, refer to the “Assessment and Plan” section of the Written H&P and Oral Presentation Guidelines and the Formulating a Differential Diagnosis documents. Above all, commit yourself and attempt to defend your opinion.

There are times when the professor will focus on aspects of the case that you did not anticipate. It can be difficult to predict when this will happen. If you have read extensively about your patient you will probably be able to “think on your feet” and have something substantive to say about most aspects of the case. Fortunately, it is unusual that the entire discussion will focus on a minor or peripheral aspect of the case you aren’t completely comfortable with.

THE EVIDENCE-BASED MEDICINE ASSIGNMENT

- As noted above, each student is REQUIRED to research a single focused clinical question of his or her choice that is directly and clinically relevant to the patient you present, no matter which rotation you are on. This is specifically intended to build on the knowledge, skills, and attitudes regarding evidence-based medicine obtained in The Practice of Medicine I and II during the 1st and 2nd years.
- You should determine your clinical question in advance and be fully prepared to discuss it on your assigned day.
- This portion of your Professor’s Rounds presentation should be 10 minutes or less. Brevity is one of the goals of this exercise. If on the ACES rotation, the assignment will be completed during the last Thursday as a part of the ambulatory curriculum. If at the VA your professor chooses not to follow this format, you are still required to complete the assignment some time during the month and turn it in.
- Your clinical question should be about diagnosis or therapy and conform to the this standard format\(^1,2\):
  1. Patient or problem
  2. Intervention (e.g. a cause, exam maneuver, diagnostic test, treatment, etc)
  3. Comparison intervention (if appropriate, e.g. a control group or an alternative diagnostic or treatment modality)
  4. Outcome (e.g. operating characteristics, morbidity, mortality, etc)

---


For example, a clinical question about a diagnostic test or exam maneuvers might sound like this:

In patients with suspected CHF what is the accuracy of B-type natriuretic peptide compared to echocardiography?

In patients with suspected acute bacterial sinusitis what is the accuracy of the patient’s history compared to plain sinus radiography?

Clinical questions about treatment might sound like this:

In patients with dilated cardiomyopathy do ARBs compared to ACE-Is decrease cardiovascular morbidity and mortality?

In patients with acute low back pain does no bed rest compared to 3 days of bed rest reduce the time to return to work?

- You will then quarry the medical literature for the original article, meta-analysis, best evidence synthesis, qualitative review, etc. that best answers your clinical question. Excellent resources include:

  Medline
  PubMed
  Best Evidence
  EBMSolutions
  Cochrane Database

All are available to you via the BBML website:

http://becker.wustl.edu/

And its EBM resources:

http://becker.wustl.edu/departments/reference/ebmlinks.htm

- You will then produce a 1-page EBM summary (no smaller than 10-point font) that specifically addresses the following:
Clinical questions regarding diagnostic tests\textsuperscript{3,4}:

1. **Your name and the date.**
2. What is your focused clinical question?
3. What was your search strategy?
4. What is the citation?
5. What are the characteristics and results of the study?
   
   These are some of the issues you may want to consider:
   a. Was there an independent, blind comparison with a reference ("gold") standard?
   b. Was the diagnostic test evaluated in an appropriate spectrum of patients (like those in whom it would be used in practice)?
   c. Was the reference standard applied regardless of the diagnostic test result?
   d. What were the results of the study (e.g. sensitivity, specificity, likelihood ratios, and/or pre- and post-test probabilities)?
   e. Comments
6. How will these results affect clinical practice?

Clinical questions regarding treatment\textsuperscript{5,6}:

1. **Your name and the date.**
2. What is your focused clinical question?
3. What was your search strategy?
4. What is the citation?
5. What are the characteristics and results of the study?
   
   These are some of the issues you may want to consider:
   a. Was the assignment of patients to treatments randomized?
   b. Were all patients who entered the trial properly accounted for at the conclusion of the study and analyzed in the group they were randomized to?
   c. Were patients and study personnel blind to the treatment?
   d. Were the groups similar at the start of the trial?
   e. Aside from the experimental intervention, were the groups treated equally?
   f. What were the results of the trial (e.g. relative risk reduction, absolute risk reduction, and "number needed to treat")?
   g. Comments
6. How will the results affect clinical practice?

\footnotesize{\textsuperscript{3} Jaeschke R, Guyatt GH, Sackett DL, for the Evidence-Based Medicine Working Group. Users’ guides to the medical literature: III. How to use an article about a diagnostic test: A. Are the results of the study valid? \textit{JAMA}. 1994;271:389-391.}

\footnotesize{\textsuperscript{4} Jaeschke R, Guyatt GH, Sackett DL, for the Evidence-Based Medicine Working Group. Users’ guides to the medical literature: III. How to use an article about a diagnostic test: B. What are the results and will they help me in caring for my patients? \textit{JAMA}. 1994;271:703-707.}

\footnotesize{\textsuperscript{5} Guyatt GH, Sackett DL, Cook DJ, for the Evidence-Based Medicine Working Group. Users’ guides to the medical literature: II. How to use an article about therapy or prevention: A. Are the results of the study valid? \textit{JAMA}. 1993;270:2598-2601.}

\footnotesize{\textsuperscript{6} Guyatt GH, Sackett DL, Cook DJ, for the Evidence-Based Medicine Working Group. Users’ guides to the medical literature: II. How to use an article about therapy or prevention: B. What were the results and will they help me in caring for my patients? \textit{JAMA}. 1994;271:59-63.
• Your oral presentation of the information should follow essentially the same format.
• It is definitely not necessary to present any background information; in fact, it’s often undesirable. Remember, you only have 10 minutes! Don’t waste it.
• Two examples of these 1-page EBM summaries follow this section.
• Students on the ACES rotation will also complete a similar assignment.
• Bring a copy of your summary for each person in the group.
• It is not necessary to bring a copy of the actual article for everyone. If you wish, you may bring copies of the 1st page of the article with the abstract.
• If there is a table or figure that is particularly helpful, you should consider incorporating this into your 1-page EBM summary.
• You will be REQUIRED to turn in your 1-page summary for each 4-week rotation. It is your responsibility to turn in your summaries monthly to the clerkship office. You may drop them off (6th floor Wohl Hospital), mail them (campus box 8121), e-mail them (preferred) (defert@msnotes.wustl.edu or tdefer@im.wustl.edu), or turn them in at the feedback lunch.
• Although your summaries will not be graded, you MUST turn in 3 in order to receive a final clerkship grade.
Date: 6/12/07

CC: Chest pain

HPI:
The pt is a 62 YOWM c a h/o HTN, DM2, & ↑ chol who developed CP ~4 months ago. In early Feb. the pt began to have CP c activity. He describes the pain as a dull aching or heaviness in the center of his chest. “Maybe it’s a little like indigestion.” He denies any radiation of the pain or associated SOB, diaphoresis, palpitations, N/V, or dizziness. It typically lasts ~10 minutes. Initially he developed CP ~once every other week c relatively heavy exertion (e.g. walking briskly for more than ~15 minutes). It has slowly ↑ ed in frequency to a few times a week during the last month c less activity (e.g. normal-paced walking for more than ~5 minutes). The CP is rated as ~4/10. Rest seems to improve it. He’s tried antacids & Pepcid AC & initially thought they helped but isn’t sure now. Lying flat doesn’t seem to bring on the CP.

At 9:00PM last night the pt developed the same pain at rest while watching TV after dinner. It began as a 2/10, increased to 6/10 over ~5 minutes then waxed & waned s completely resolving for ~25 minutes. He reports mild SOB during this episode but no other associated sx. This morning after breakfast he had an essentially identical episode. He told his wife about the CP at noon today; she called the pt’s PMD who instructed them to come to the BJH ED. Currently the pt denies CP or SOB. He has had very mild DOE for at least 10 yrs, which he attributes to smoking that hasn’t recently changed. He has heartburn & “indigestion” (abdominal fullness and bloating) 1-2x per week but now is uncertain if they’re related to the CP. He denies syncope, PND, orthopnea, edema, cough, sputum production, F/C/S, pleuritic CP, ABD pain, regurgitation of
food, bitter taste in mouth, or trauma to or tenderness of the chest wall. He reports being very anxious lately about the CP but has not had distinct episodes of panic related to the CP.

PMHx:

1. **HTN**-diagnosed ~20 yrs ago; pt not sure of the level of control but does report frequent medication changes in the past; reports good compliance with medications
2. **DM 2**-diagnosed ~5 yrs ago; last documented HbA1c 9.1% 6 months ago; accu's at home “160-180” fasting (only does them “1-2x per week”); frequent dietary noncompliance; sees an ophthalmologist yearly; denies h/o retinopathy, neuropathy, or nephropathy; he hasn't been to his PMD for 6 months
3. ↑**Chol**-last lipid profile 6 months ago tot. 220, LDL 114, HDL 45, TG 240; LFTs at the same time WNL
4. **Glucoma**
5. **Obesity**-pt reports having been overweight his entire life, he is relatively inactive
6. **Gout**-multiple prior attacks in both great toes but none since starting allopurinol ~5 yrs ago
7. **DJD**-mostly in knees
8. **Anxiety**-the pt reports being anxious most his life, this became particularly problematic after he retired, medication has been helpful
9. **S/P CCK-1996, s** complications
10. **S/P appy in the early 1950s**

**Meds:**

- Lisinopril 80mg once daily
- HCTZ 25mg once daily
- Amlodipine 10mg once daily
- Metformin 1000mg twice daily
- Simvastatin 20mg once daily

**Allergies:**

- Sulfa → Hives
- Famotidine 10mg PRN
- Timoptic 0.5% 1 drop, both eyes twice daily
- Allopurinol 300mg once daily
- Paroxetine 100mg once daily
- Rofecoxib 25mg once daily

cont → JJ Jones
**SHx:**
The pt lives with his wife of 42 yrs in University City. He has a 40 y/o son & a 37 y/o daughter; both live in the St. Louis area. He retired from his job as a mechanical engineer at McDonald Douglas 2 yrs ago.
Tobacco: 1 PPD for 45 yrs. He’s tried to quit several times but has not been successful.
ETOH: ~2-4 alcohol-containing beverages per week.
Illicit drug use: never.

**FHx:**
Father died of CAD @ 71; his 1st MI was at ~age 50. Mother alive @ 85 c HTN, DM2, Alzheimer’s disease, CAD; lives in a nursing home. Brother alive c a h/o MI & CABG at 60.

**ROS:**
- Constitutional-no weakness or malaise
- HEENT-no new visual sx, wears glasses, mild nasal congestion in the spring the pt attributes to “allergies”
- Pulm-see HPI
- CV-see HPI, no claudication
- GI-see HPI, no diarrhea, constipation, melena, BRBPR, hematochezia
- GU-no dysuria, hematuria, urgency, hesitancy, or frequency
- Musculoskeletal-knees hurt c occasional LBP
- Skin-no rashes, no foot ulcers
- CNS-no HA, focal motor or sensory changes
- Psych-no recent depression

**PE:**
GENERAL: moderately obese WM, lying in bed, looks nervous, appears stated age
VS: BP LUE 149/92, RUE 145/90; HR 88; RR 18; T 36.7°; Wt. 225#; Ht. 5’10”; BMI 32.3
HEENT: NC/AT, EOMI, PERRLA, nasal & pharyngeal mucosa pink & moist, TM’s pearly gray c normal landmarks
NECK: no LAD, TM, bruits; JVP @ 6cm
LUNGS: breath sounds somewhat distant, no rales, wheezes, or rhonchi

*cont→ JJJones*
CV: RRR, normal S1 & S2, S4 heard; no S3 or murmur; PMI in the 5th intercostals space @ the MCL; no chest wall tenderness; pulses 2+ throughout
GI: protuberant, NABS, NTND, no HSM; brown stool guaiac negative
GU: male external genitalia without lesions; masses, or discharge; prostate smooth, nontender, & not enlarged
LYMPHATIC: no cervical, axillary, or inguinal LA; no edema
SKIN: warm & dry, no lesions, no foot ulcers
MUSCULOSKELETAL: full ROM of all joints, no bony tenderness
CNS: A & Ox3; anxious affect; speech clear & fluent, appropriate use of language; good comprehension; CN II: VA 20/40 OU with glasses; visual fields full; CNIII/IV/VI: EOMI, PERRLA; CN V: intact symmetric facial sensation to LT; CN VII: face symmetric with smile; CN IX/X: palate elevates midline; CN XII: tongue protrudes midline; sensation intact to LT & PP throughout; intact sensation to monofilament testing on bottoms of feet, motor strength 5/5 throughout; gait stable; Romberg's sign not present; intact FNF ability; fundoscopic exam s papilledema; hemorrhages, or exudates; A-V nicking present

Labs:

<table>
<thead>
<tr>
<th>AST</th>
<th>AlkPhos</th>
<th>Ca</th>
<th>Troponin-I</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>95</td>
<td>9.3</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>22</td>
<td>Tbili 1.0</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>UA-neg WBC, neg nitrite, trace protein, pH 6.0, neg blood, SPGR 1.015, neg ketone, 1+ glucose</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CXR-no bony abnormalities; heart size normal; no consolidation, congestion, or effusions</td>
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<tr>
<td>ECG-NSR @ 90, PR 0.16, QRS 0.09, QTc 0.40, QRS morphology normal; no pathologic Q waves; nonspecific ST flattening in V5-V6 &amp; in I &amp; aVL; no prior ECG for comparison</td>
<td></td>
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</tbody>
</table>

cont→JJJones
Assessment & Plan:
62 YOWM with DM2, HTN, ↑ chol, & smoking presents with escalating CP.

1. CP - The most likely causes of CP inc’ cardiac, pulmonary, GI, musculoskeletal, & Ψ. The pt’s CP is very characteristic of angina (substernal, aching/heaviness, brought on by exertion, & relieved by rest). Given this & the pt’s multiple CV risk factors (age, FMHx, HTN, DM, tobacco), the most likely & concerning Dx is cardiac ischemia. The pattern of escalation, particularly in the last 24 hours, suggests unstable angina. MI seems less likely given neg. troponin-I > 12 hours from first prolonged (total duration ~30 minutes) episode of CP yesterday. However, a non-ST-elevation MI related to the more recent episode of CP is still possible. While the pt’s ECG findings (i.e. ST flattening in V5, V6, I, & aVL) are nonspecific, they potentially suggest ischemia in the LAD/circumflex territory. The pt does have a h/o heartburn & indigestion but his CP is so c/w angina that a GI cause seems much less likely. Doubt anxiety/somatization as a primary etiology, though it may be playing a minor role. Given the lack of other sx, pulmonary & musculoskeletal causes are extremely unlikely.

Will plan to begin ASA, nitropaste, and β-blocker. Has not had CP x ~6 hours so will not initiate IV nitro or enoxaparin. Follow serial troponin-Is. Repeat ECG in AM. Telemetry monitor. Assuming troponin-Is are negative & the pt doesn’t redevelop CP, a stress test could be done. Given a high pretest probability, a cardiac cath would also be reasonable. Should he redevelop CP, would begin IV nitro & enoxaparin. If recurrent CP is prolonged consider urgent cath.

2. DM2 - the pt’s DM is relatively uncontrolled; most recent HbA1c 9.1% (goal <7%). He will need more intensive Rx after discharge, additional oral agent(s) or insulin. Dietary noncompliance, obesity, & lack of activity all contributing to poor control. For the short-term, will hold metformin (because of the possibility of a cardiac cath/IV cont→ JJJones
contrast), control glucose SS1, ADA diet. Dietician consult 
D/C.
3. HTN-at present BP needs better control (goal <130/80) & the 
addition of β-blocker will be helpful. Cont’ ACE-I.
4. ↑Chol-when last checked LDL was above goal (<100), recheck 
now and adjust simvastatin PRN. Dietician consult D/C 
5. Obesity-a long term goal for this pt will be wt. reduction, 
which will probably improve his DM, HTN, ↑chol, and knee 
pain. Dietician consult D/C.
6. Tobacco abuse-clearly need to strongly encourage smoking 
cessation! @ D/C consider nicotine patches or bupropion.
7. Gout/DJD-cont’ allopurinol and rofecoxib.
8. Anxiety D/O-cont’ paroxetine.

John J. Jones Jr., WUMS III
424-1234

tmd/6-15-07
INTERNAL MEDICINE CLERKSHIP  
MODEL SOAP NOTE

WUMS III PN

S: Denies any further CP, SOB, or reflux sx. Is a bit nervous about the stress test today.

O: VS: BP 132/78, HR 78, RR 18, Tc 36.7°, Tm 37.0°  
I/O: 1800/1650 Telemetry-NSR accw 130,165, 112, 150 NAD

Lungs-CTA  
CV-RRR, S1S2, no-S3, S4, or (M)  
ABD-NABS, NT, ND, no HSM  
EXT-no C/C/E

<table>
<thead>
<tr>
<th>139</th>
<th>101</th>
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<tr>
<td>4.0</td>
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<td>76</td>
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<tr>
<td>15</td>
<td></td>
<td>78</td>
</tr>
<tr>
<td>11.5</td>
<td>36.0</td>
<td>278</td>
</tr>
</tbody>
</table>

Troponin-I <0.1 x 2  
ECG-NSR @ 68, NSSTTW Δ, same as 6/12/03

Meds:  
Metoprolol 100mg BID  
Lisinopril 60mg QD  
HCTZ 25mg QD  
ASA 325mg QD  
Nitropaste 1" q6°  
Glucotrol XL 5mg QD  
Prevacid 30mg BID

A&P:  
1. CP-No further CP since admit. R/O for MI by enzymes/ECGs. Telemetry unremarkable. DDx possibilities still include ischemia, musculoskeletal CP, and GI pain. Hx most c/w of GI pain (e.g. GERD). Given the patient’s risk factors (HTN, DM, ↑ chol, & +FMHx) must strongly consider ischemia. Plan to obtain an exercise stress echo today. If this is neg. will do upper endoscopy. In the mean time, the pt is on ASA, nitropaste, β-blocker & PPI.

2. HTN-acceptable control on current Rx of metoprolol, lisinopril and HCTZ.

3. DM-accu√ fairly good on Glucotrol XL and diet alone. Will obtain an HbA1c.

4. ↑Chol-LDL above goal on dietary therapy alone (140 vs. <100). Will add atorvastatin.

5. Mild Anemia-H/H has been stable but stools were guaiac positive on admission (negative since). MCV slightly microcytic, suggests iron deficiency of GI source. Will obtain a ferritin level to confirm iron deficiency. Pt may well require a GI work-up. As in #1 to have an upper endoscopy if stress echo negative. If that is negative would consider a colonoscopy.

Jane J. Jones, WUMS III  
424-1234
DIVISION OF GERIATRICS AND NUTRITIONAL SCIENCE  
SHORT BLESSED TEST

<table>
<thead>
<tr>
<th>PATIENT NAME __________________________</th>
<th>DATE ________________</th>
</tr>
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</table>

**COGNITIVE SCREEN (Short Blessed)**

<table>
<thead>
<tr>
<th></th>
<th>MAX ERROR</th>
<th>ERROR SCORE</th>
<th>X WEIGHT</th>
<th>SUB SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What year is it now?</td>
<td>1</td>
<td>___________</td>
<td>4</td>
<td>________</td>
</tr>
<tr>
<td>2. What month is it now?</td>
<td>1</td>
<td>___________</td>
<td>3</td>
<td>________</td>
</tr>
</tbody>
</table>

Repeat this phrase after me and remember it:  
John Brown 42 Market Street, Chicago  
Number of trials to learning: ________

3. About what time is it without looking at your watch? (within 1 hour)
   Response ___________ Actual Time ___________

4. Count backward from 20 down to 1.  
   Mark correctly sequenced #’s.  
   20 19 18 17 16 15 14 13 12 11  
   10 9 8 7 6 5 4 3 2 1
   2 | ________ | 2 | ________ |

5. Say the months of the year in reverse.  
   D N O S A J L JU M Y AP M F J  
   TIME ___________ Sec.
   2 | ________ | 2 | ________ |

6. Repeat the name and address I asked you to remember.  
   John Brown 42 Market Street, Chicago
   _______ ______ ______ ______ ______
   5 | ________ | 2 | ________ |

(c) TOTAL WEIGHTED ERROR SCORE ________

(a) Scoring: 0=no errors, 1=1 error, 2=2 or more errors  
(b) An answer of either Market or Market Street is acceptable  
(c) A total weighted error score of 9 or greater indicates a need for further assessment

**CLOCK CONSTRUCTION**

Ask the patient to put (all) the numbers on the clock face.
Cognitive Screens Scoring

The **Clock Completion Test (CCT)** is scored by evaluating placement of digits in the four quadrants of a pre-drawn circle. Scores range from 0-7; scores greater than 3 indicate cognitive impairment.

**Clock Drawing Instructions**
The patient is instructed to draw the numbers within a pre-drawn circle to make that circle look like the face of a clock.

**CCT Scoring Rules**
1. Divide the circle into 4 equal quadrants by drawing one line through the center of the circle and the number 12 (or mark that best corresponds to the 12) and a second line perpendicular to and bisecting the first.
2. Count the number of digits in each quadrant in the clockwise direction beginning with the digit corresponding to number 12. Each digit is counted only once. If a digit falls on one of the reference lines, it is included in the quadrant that is clockwise to the line. Any three digits in a quadrant is considered to be correct.
3. For any error in the number of digits in the first, second, or third quadrants assign a score of 1. For any error in the number of digits in the fourth quadrant assign a score of 4.
4. Normal range of score is 0-3. Abnormal (demented) score is 4-7.

A score of greater than 3 has a sensitivity of 87% and specificity of 82% for identifying dementia.

The **Short Blessed Test (SBT)** is scored from 0-28, with higher scores indicating increasing severity of cognitive impairment. A score of 9 or greater is considered indicative of cognitive impairment. The SBT has demonstrated a sensitivity and specificity for identifying dementia of 82% and 88% respectively. Its specificity is influenced by race and education, and it’s simpler to administer than MMSE.
Choose the best answer for how you felt over the past week.

1. Are you basically satisfied with your life?  
   YES  NO

2. Do you often get bored?  
   YES  NO

3. Do you often feel helpless?  
   YES  NO

4. Do you prefer to stay in at home (or in your own room) rather than go out and do new things?  
   YES  NO

5. Do you feel pretty worthless the way you are now?  
   YES  NO

Score __________

Positive answers for depression screening are “no” to question 1 and “yes” to questions 2-5. A score of 0-1 indicates low likelihood of depression. A score of ≥ 2 indicates possible depression.

The 5-item GDS had a sensitivity of 97% and specificity of 85% for detecting depression in geriatric outpatients and was as effective as the 15-item GDS.
GAIT AND BALANCE ASSESSMENT TOOLS

Three different tools are provided as a reference for you and to aid you when assessing a patient's gait and balance. You may not perform all of these gait and balance tests on every patient. Which tool you use can be a case-by-case decision. Following the tools are reference tables describing what you should be observing in patients as you evaluate their gait and balance.

1. **Standing Balance/Progressive Romberg**: For each stand first demonstrate the task, then support patient with one arm while he/she positions feet, then release. Test stops when patient moves their feet or grasp interviewer for support or 10 seconds has elapsed. Test six positions eyes open, eyes closed with three different stances: #2 = Side-by-Side, #3 = Semi-tandem, #4 = Full tandem (see below). The patient gets 1 point for each successfully completed stance. Score ranges 0-6. Any score less than three indicates need for referral to physical therapy for balance training.

![Standing Balance/Progressive Romberg Diagram](image)

2. **Chair Stands**: Patient rises from a chair with arms folded across their chest. If successful, have patient stand up and sit down 5 times as quickly as possible. Time from initial sitting position to end of fifth stand. Any time greater than 12 seconds indicates a patient with proximal muscle weakness and an increased risk of morbidity and mortality. Consider referral to physical therapy.

3. **Get-Up and Go Test**:  
   A. Have the patient sit in a straight-backed high-seat chair.  
   B. Instructions for the patient:  
      1) Get up (without use of armrests, if possible)  
      2) Stand still momentarily  
      3) Walk forward 10 ft (3m)  
      4) Turn around and walk back to chair  
      5) Turn and be seated  
   C. Factors to note:  
      1) Sitting balance  
      2) Transfers from sitting to standing  
      3) Pace and stability of walking (see Appendix for explanations of gait abnormalities)  
      4) Ability to turn without staggering
KATZ INDEX OF ACTIVITIES OF DAILY LIVING (ADLs) ¹

Instructions: Indicate the level of assistance needed with the following six ADLs by circling the score that most closely describes the patient.

1. **Bathing:** (either sponge bath, tub bath, or shower)
   - Receive no assistance (gets in and out of tub by self if tub is usual means of bathing) .... 3
   - Receives assistance in bathing only one part of body, such as the back or a leg .......... 2
   - Receives assistance in bathing more than one part of body or is not bathed ............. 1

2. **Continence:**
   - Controls urination and bowel movement completely by self................................. 3
   - Has occasional “accidents” .................................................................................. 2
   - Needs supervision to keep urine or bowel control, uses catheter, or is incontinent ...... 1

3. **Dressing:** (getting clothes from closets and drawers, including underclothes, outer garments; uses fasteners, including braces, if worn)
   - Gets clothes and gets completely dressed without assistance ................................... 3
   - Gets clothes and gets dressed without assistance except in tying shoes ................... 2
   - Receives assistance in getting clothes or getting dressed or stays partly or completely undressed ................................................................. 1

4. **Feeding:**
   - Feeds self without assistance .............................................................................. 3
   - Feeds self except for assistance in cutting meat or buttering bread ....................... 2
   - Receives assistance in feeding or is fed partly or completely by nasogastric or gastric tubes or intravenous fluids ......................................................... 1

5. **Toileting:** (going to the “toilet room” for bowel and urine elimination; cleansing self after elimination and arranging clothes)
   - Goes to “toilet room”, cleans self, and arranges clothes without assistance (may use objects for support, such as cane, walker, or wheelchair, and may manage night bedpan commode and empty same in morning) .............................................. 3
   - Receives assistance in going to “toilet room”, cleaning self, or arranging clothes after elimination or receives assistance in using night bedpan or commode .......... 2
   - Does not go to room termed “toilet” for the elimination process .............................. 1

6. **Transferring:**
   - Moves in and out of bed or chair without assistance (may use object for support such as cane or walker) ................................................................. 3
   - Moves in and out of bed or chair with assistance ..................................................... 2
   - Does not get out of bed ........................................................................................... 1

**Total Score:** ____________
LAWTON INDEX OF INSTRUMENTAL ACTIVITIES OF DAILY LIVING (IADLs)\textsuperscript{2}

Instructions: Indicate the level of assistance needed with the following IADLs by circling the score that most closely describes the patient.

<table>
<thead>
<tr>
<th>Score</th>
<th>1. Can you use the telephone:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help</td>
</tr>
<tr>
<td>2</td>
<td>With some help</td>
</tr>
<tr>
<td>1</td>
<td>Completely unable</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>2. Can you get to places out of walking distance:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help</td>
</tr>
<tr>
<td>2</td>
<td>With some help</td>
</tr>
<tr>
<td>1</td>
<td>Completely unable to travel unless special arrangements are made?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>3. Can you go shopping for groceries:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help</td>
</tr>
<tr>
<td>2</td>
<td>With some help</td>
</tr>
<tr>
<td>1</td>
<td>Are you completely unable to do any shopping?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>4. Can you prepare your own meals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help</td>
</tr>
<tr>
<td>2</td>
<td>With some help</td>
</tr>
<tr>
<td>1</td>
<td>Are you completely unable to prepare any meals?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>5. Can you do your own housework:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help</td>
</tr>
<tr>
<td>2</td>
<td>With some help</td>
</tr>
<tr>
<td>1</td>
<td>Are you completely unable to do any housework?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>6. Can you do your own laundry:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help</td>
</tr>
<tr>
<td>2</td>
<td>With some help</td>
</tr>
<tr>
<td>1</td>
<td>Are you completely unable to do any laundry at all?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>7a. Do you take medicines or use any medications:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(if yes, answer Question 7b) Yes</td>
</tr>
<tr>
<td>2</td>
<td>(if no, answer Question 7c) No</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>7b. Do you take your own medicine:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help (in the right doses at the right time)</td>
</tr>
<tr>
<td>2</td>
<td>With some help (take medicine if someone prepares it for you) and/or reminds you to take it, or</td>
</tr>
<tr>
<td>1</td>
<td>(are you/would you be) completely unable to take your own medicine?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>7c. If you had to take medicine, can you do it:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help (in the right doses at the right time)</td>
</tr>
<tr>
<td>2</td>
<td>With some help (take medicine if someone prepares it for you) and/or reminds you to take it, or</td>
</tr>
<tr>
<td>1</td>
<td>(are you/would you be) completely unable to take your own medicine?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Score</th>
<th>8. Can you manage your own money:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Without help</td>
</tr>
<tr>
<td>2</td>
<td>With some help</td>
</tr>
<tr>
<td>1</td>
<td>Are you completely unable to handle money?</td>
</tr>
</tbody>
</table>

Total Score: ____________
ROSENBAUM CHART FOR NEAR VISION

Have the subject sitting wearing corrective lenses if they wear them on a daily basis.

1. Cover left eye with blank 3 X 5 card.

2. Hold Rosenbaum Chart 14 inches from the right eye.

3. Have subject start reading the numbers at the 20/200 distance equivalent.

4. If they cannot read the numbers at that 20/200 distance equivalent work backwards toward the 20/800 until they can read the numbers. If they cannot read the 20/800 “95” they are considered legally blind in that eye.

5. If they can read the numbers at the 20/200 distance level move on to the 20/70 level and so on until they miss two numbers in one row.

6. If they cannot read numbers (illiterate) ask them to tell you which direction the “E”s are pointing or to do the “X, O” portion.

7. Repeat procedure with right eye covered and testing left eye.
APPENDIX

The following tables are references to help you assess performance of balance and gait tests in elderly patients. In different clinical settings and situations you may select which maneuvers/screens you ask patients to perform. The entire tables are provided for your reference and to explain adaptive and abnormal responses you are to look for in evaluating older adults with balance or gait abnormalities.

TABLE 1. Performance-Oriented Assessment of Balance

<table>
<thead>
<tr>
<th>Maneuver</th>
<th>Normal</th>
<th>Adaptive</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sitting balance</td>
<td>Steady, stable</td>
<td>Holds onto chair to keep upright</td>
<td>Leans, slides down in chair</td>
</tr>
<tr>
<td>Arising from chair</td>
<td>Able to arise in a single movement without using arms</td>
<td>Uses arms (on chair or walking aid) to pull or push up; and/or moves forward in chair before attempting to arise</td>
<td>Multiple attempts required or unable without human assistance</td>
</tr>
<tr>
<td>Immediate standing balance (first 3-5s)</td>
<td>Steady without holding onto walking aid or other object for support</td>
<td>Steady, but uses walking aid or other object for support</td>
<td>Any sign of unsteadiness†</td>
</tr>
<tr>
<td>Standing balance</td>
<td>Steady, able to stand with feet together without holding object for support</td>
<td>Steady, but cannot put feet together</td>
<td>Any sign of unsteadiness regardless of stance or holds onto object</td>
</tr>
<tr>
<td>Balance with eyes closed (with feet as close together as possible)</td>
<td>Steady without holding onto any object with feet together</td>
<td>Steady with feet apart</td>
<td>Any sign of unsteadiness or needs to hold onto an object</td>
</tr>
<tr>
<td>Sitting down</td>
<td>Able to sit down in one smooth movement</td>
<td>Needs to use arms to guide self into chair or not a smooth movement</td>
<td>Falls into chair, misjudges distances (lands off center)</td>
</tr>
</tbody>
</table>

* The patient begins this assessment seated in a hard, straight-backed, armless chair.
† Unsteadiness defined as grabbing at objects for support, staggering, moving feet, or more than minimal trunk sway.
<table>
<thead>
<tr>
<th>Observation</th>
<th>Normal</th>
<th>Abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Components†</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initiation of gait (patient asked to begin walking down hallway)</td>
<td>Begins walking immediately without observable hesitation; initiation of gait is single, smooth motion</td>
<td>Hesitates; multiple attempts; initiation of gait not a smooth motion</td>
</tr>
<tr>
<td>Step height (begin observing after first few steps: observe one foot, then the other; observe from side)</td>
<td>Swing foot completely clears floor but by no more than 1-2 in</td>
<td>Swing foot is not completely raised off floor (may hear scraping) or is raised too high (&gt; 1-2 in)‡</td>
</tr>
<tr>
<td>Step length (observe distance between toe of stance foot and heel of swing foot; observe from side; do not judge first few or last few steps; observe one side at a time)</td>
<td>At least the length of individual's foot between the stance toe and swing heel (step length usually longer but foot length provides basis for observation)</td>
<td>Step length less than described under normal‡</td>
</tr>
<tr>
<td>Step symmetry (observe the middle part of the patch not the first or last steps; observe from side; observe distance between heel of each swing foot and toe of each stance foot)</td>
<td>Step length same or nearly same on both sides for most step cycles</td>
<td>Step length varies between sides or patient advances with same foot with every step</td>
</tr>
<tr>
<td>Step continuity</td>
<td>Begins raising heel of one foot (toe off) as heel of other foot touches the floor (heel strike); no breaks or stops in stride; step lengths equal over most cycles</td>
<td>Places entire foot (heel and toe) on floor before beginning to raise other foot; or stops completely between steps; or step length varies over cycles ‡</td>
</tr>
<tr>
<td>Path deviation (observe from behind; observe one foot over several strides; observe in relation to line on floor (eg. tiles) if possible; difficult to assess if patient uses a walker)</td>
<td>Foot follows close to straight line as patient advances</td>
<td>Foot deviates from side to side or toward one direction§</td>
</tr>
<tr>
<td>Trunk stability (observe from behind; side to side motion of trunk may be a normal gait pattern, need to differentiate this from instability)</td>
<td>Trunk does not sway; knees or back are not flexed; arms are not abducted in effort to maintain stability</td>
<td>Any of preceding features present§</td>
</tr>
<tr>
<td>Walk stance (observe from behind)</td>
<td>Feet should almost touch as one passes other</td>
<td>Feet apart with stepping?</td>
</tr>
<tr>
<td>Turning while walking</td>
<td>No staggering; turning continuous with walking; and steps are continuous while turning</td>
<td>Staggers; stops before initiating turn; or steps are discontinuous</td>
</tr>
</tbody>
</table>

* The patient stands with examiner at end of obstacle-free hallway. Patient uses usual walking aid. Examiner asks patient to walk down hallway at his or her usual pace. Examiner observes one component of gait at a time (analogous to heart examination). For some components the examiner walks behind the patient; for other components, the examiner walks next to patient. May require several trips to complete.

† Also ask patient to walk at a “more rapid than usual” pace and observe whether any walking aid is used correctly (see text for discussion).

‡ Abnormal gait finding may reflect a primary neurologic or musculoskeletal problem directly related to the finding or reflect a compensatory maneuver for other, more remote problem.

§ Abnormality may be corrected by walking aid such as cane, observe with and without walking aid if possible.

? Abnormal finding is a usually compensatory maneuver rather than a primary problem.
<table>
<thead>
<tr>
<th>Sensori-motor level</th>
<th>Within-Level classification</th>
<th>Condition (pathology, symptoms, signs)</th>
<th>Typical gait findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Periipheral sensory</td>
<td>Sensory ataxia (posterior column, peripheral nerves)</td>
<td>Unsteady, uncoordinated</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vestibular ataxia</td>
<td>Unsteady, weaving (&quot;drunken&quot;)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visual ataxia</td>
<td>Tentative, uncertain</td>
</tr>
<tr>
<td></td>
<td>Peripheral motor</td>
<td>Arthritic (antalgic, joint deformity)</td>
<td>Avoids weight bearing on affected side, shorten stance phase.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painful hip may produce “Trendelenberg” (trunk shift over affected side).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painful knee is flexed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Painful spine produces short, slow steps and decreased lumbar lordosis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Other nonantalgic features: contractures, deformity-limited motion, bucking with weight bearing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kyphosis and ankylosing spondylosis produce stooped posture.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unequal leg length can produce trunk and pelvic motion abnormalities (including “Trendelenberg”).</td>
</tr>
<tr>
<td></td>
<td>Myopathic and neuropathic (weakness)</td>
<td>Pelvic girdle weakness produces exaggerated lumbar lordosis and lateral trunk flexion (“Trendelenberg” and “waddling” gait).</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Proximal motor neuropathy produces “waddling” and “foot slap.”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Distal motor neuropathy produces distal weakness (especially ankle dorsiflexion, “foot drop”), which may lead to exaggerated hip flexion/foot lifting (“steppage gait”) and “foot slap.”</td>
</tr>
<tr>
<td>Middle</td>
<td>Spasticity</td>
<td>Hemiplegia/paresis</td>
<td>Leg swings outward and in semicircle from hip (&quot;circumduction&quot;). Knee may hyperextend (&quot;genu recurvatum&quot;), and ankle may excessively plantar flex and invert (&quot;equinovarus&quot;). With less paresis, some may only lose arm swing and only drag or scrape the foot.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Paraplegia/paresis</td>
<td>Both legs circumduct, steps are short shuffling and scapping, and when severe, hip adducts so that knees cross in front of each other (&quot;scissoring&quot;).</td>
</tr>
<tr>
<td>Parkinsonism</td>
<td></td>
<td></td>
<td>Small shuffling steps, hesitation, acceleration(&quot;festination&quot;), falling forward (&quot;propulsion&quot;), falling backward (&quot;retropulsion&quot;), moving the whole body while turning (&quot;turning en bloc&quot;), absent arm swing.</td>
</tr>
<tr>
<td>Cerebellar ataxia</td>
<td></td>
<td></td>
<td>Wide based with increased trunk sway, irregular stepping, especially on turns.</td>
</tr>
<tr>
<td>High</td>
<td>Cautious gait</td>
<td></td>
<td>Fear of falling with appropriate postural responses, normal to widened based shortened stride, decreased velocity, and en bloc turns.</td>
</tr>
<tr>
<td>Frontal-related gait disorder</td>
<td>Cerebrovascular, normal pressure hydrocephalous</td>
<td>Proposed spectrum ranges from gait ignition failure, to frontal gait disorder, to frontal dysequilibrium. May also have cognitive, pyramidal, and urinary disturbances. Gait ignition failure: difficulty initiating gait, short shuffling gait, may freeze with diversion of attention or turning. Frontal gait disorder: similar to Parkinson’s but wider base, upright posture, preservation of arm swing. Frontal dysequilibrium: cannot stand unsupported.</td>
<td></td>
</tr>
</tbody>
</table>
REFERENCES


Module Objectives:
1. Be able to describe a logical approach to pain management
2. Know differences between neuropathic, nociceptive pain; visceral, somatic
3. Become familiar with WHO Ladder, steps of analgesic management
4. Become familiar with adjuvant analgesic agents
5. Be able to convert between opioids while maintaining analgesia
6. Know adverse effects of analgesics, their management
7. Understand common barriers to pain management

"The management of pain is a cornerstone of the compassionate practice of medicine. The knowledge exists to ameliorate pain in most of our patients. We now require the will to do so."
--Schecter, Berde, Yaster, 2003

Pain is "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage, or both."

*International Association for the Study of Pain (2001)*

Outline:
- Types of Pain: Acute vs. Chronic
  - Nociceptive (sharp, aching, throbbing)
    - Somatic (skin, deep tissues) vs. Visceral (internal organs)
    - Nociceptors send painful signal through spinal cord to brain for interpretation
  - Neurogenic/Neuropathic (tingling, burning, stinging, shooting)
    - Caused by nerve damage

*****Problem Set 1*****
Identify the types of pain each of the following examples represent.

a) 14 year old boy comes to ER with fractured radius suffered during football game. Pain is sharp, throbbing and constant.

b) 65 year old M with a history of Type 2 Diabetes for 25 years, HgA1C 10 presents with decreased vision over last year, blood pressure of 140/90, 3+ protein on urinalysis and bilateral tingling and numbness in his toes and fingers.

c) 23 year old F legal assistant (avid typer) who presents with 3 month history of tingling and numbness in her R thumb, index and middle fingers with radiation from wrist up her arm. Pain is worst after work especially while driving home holding the steering wheel.

d) 31 year old gentleman who began experiencing dull periumbilical pain which over the course of the next twelve hours migrated to a sharp intense pain in his RLQ.

e) 42 year old F with history of three C-sections comes into ER with no bowel movement for 3 days and 4/10 diffuse, crampy intermittent abdominal pain.
WHO Pain Ladder

- Use most effective and comfortable route in clinical context allowing pts max control.
- Give analgesics for mild to severe pain on a fixed dose schedule around the clock, not PRN.

I. Step 1 (Mild pain): Nonopioid analgesic such as acetaminophen or NSAIDs. +/- Adjuvant Rx

II. Step 2 (Moderate pain): Moderate opioid +/- nonopioid analgesic +/- Adjuvant Rx

III. Step 3 (Severe pain): Strong opioid +/- nonopioid analgesic +/- Adjuvant Rx

Non Opioid Analgesics:

- NSAIDS: analgesic, many have pain relief ceiling (1g/day), dose sparing synergy with opioids. ex. Ketorlac (IV)
  - Adverse effects: gastropathy, renal insufficiency, platelet aggregation
- Acetaminophen- hepatic toxicity if >4g/day (especially chronic alcoholics, hepatitis)

<table>
<thead>
<tr>
<th>NSAID examples</th>
<th>Dose</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin (ASA)</td>
<td>325-650mg PO q4-6hrs</td>
<td>Tabs, buffered caps, enteric coated, chewable, gum (Aspergum) rectal suppository</td>
</tr>
<tr>
<td>Ibuprofen</td>
<td>200-800mg PO 3-4times/daily</td>
<td>Tablets/ capsules</td>
</tr>
<tr>
<td>Diclofenac</td>
<td>100-150mg/day in 2-3 divided doses</td>
<td>Immediate or extended release, topical gel (Voltaren), transdermal patch (Flector)</td>
</tr>
<tr>
<td>Naproxen</td>
<td>250-500mg q12 hours</td>
<td>Tablet or suspension</td>
</tr>
<tr>
<td>Celecoxib</td>
<td>100-200mg q12-24hrs</td>
<td>Tablet</td>
</tr>
<tr>
<td>Indomethacin</td>
<td>20-50mg PO tid</td>
<td>Short or extended release, suppository, suspension</td>
</tr>
</tbody>
</table>

Opioids

- Pharmacology: Conjugated in liver, Excreted (~90%) in Kidney
  - Cmax: PO= 1hr, SC/IM ≈ 30 min, IV = 6min  Clearance Half Life ≈3-4hrs
  - Routes of administration: enteral feeding tubes, transmucosal, rectal, transdermal, parenteral, intraspinal
  - Moderate opioids: tramadol, codeine, oxycodone, hydrocodone
  - Strong opioids: morphine, levorphanol, hydromorphone, fentanyl

- General Approach to starting Opioids:
  - Titrate dose of a short-acting (immediate-release) drug to effect, monitoring for side effects. The 24-hour period drug amount is then converted to a sustained release form and administered 2-3 times a day around the clock. Rescue doses of immediate release preparations (5%–15% of 24-h dose) should be given PRN for breakthrough pain.

- Oral options (immediate release):
  - Codeine, hydrocodone, morphine, hydromorphone, oxycodone, tramadol
  - Daily adjustments:
    - mild / moderate pain ↑ 25%–50%
    - severe / uncontrolled pain ↑ 50%–100%
• Oral options (extended release): Morphine: MScontin, Avinza, Kadian; Tramadol: Ultram ER
  o Dose q 8, 12, or 24 h
    ▪ Adjust dose every 2-4 days once at steady state.

  o Transdermal patch: Fentanyl
    ▪ Only use in moderate to severe stable pain in opioid-tolerant pts (regular oral opioids for at least one week). Peak effect in 24 hrs. Lasts 2-3 days.
    ▪ 25µg/hr patch ≈ 45–135mg morphine / day

  o Methadone:
    ▪ Opioid agonist as well as an N-methyl-D-aspartic acid antagonist,
    ▪ Analgesia with additional adjuvant effects for neuropathic pain.
    ▪ Relatively long 1/2 life and varies significantly between pts.
    ▪ Analgesic effect is much shorter than its half-life.
    ▪ Interacts with many common medications,
    ▪ Close follow-up during dose titration is essential.

  o Alternative Routes of Administration.
    ▪ In general, the oral route is the least invasive, most convenient route for administering opioids on a routine basis
    ▪ Alternative routes may be more appropriate if:
      ▪ PO is not possible due to vomiting, dysphagia, esophageal obstruction
      ▪ PO causes uncontrollable adverse effects: nausea, drowsiness, confusion

Adjuvant Medications
  ▪ Used for enhancing analgesics, controlling side effects and other symptoms associated with chronic pain, such as nausea, depression, sedation, insomnia.
  ▪ Includes meds for neuropathic pain not well treated with opioids.

  o Adjuvant Pain Medications
    ▪ Neuropathic pain: TCAs, gabapentin, carbamazepine, valproic Acid
      ▪ Amitriptyline (TCA): 10–25 mg po q hs, titrate (escalate q 4–7 d) Analgesia in days-wks, anticholinergic adverse effects prominent, cardiac toxicity.
      ▪ Desipramine (TCA): 10–25 mg po q hs, titrate, less anticholinergic or sedating effects
      ▪ Gabapentin (Anticonvulsant): usual effective dose 900–1800 mg / d; start at 100 mg po q d to tid, titrate, increase dose q 1–3 d. Tolerance develops quickly. Effective for diabetic neuropathy and for postherpetic neuralgia.
      ▪ Carbamazepine (Anticonvulsant): 100 mg po bid, titrate. Shooting pain.
      ▪ Valproic Acid: (Anticonvulsant) 250 mg po q hs, titrate. Monitor plasma levels.
    ▪ Antispasmodics, other anti-depressants may be useful in certain instances.

Non-Pharmacologic Pain Management:

Minimal to no definitive evidence on efficacy aside from radiation therapy for bony metastases. However, may be VERY useful in some individuals. Pain management is an individualistic field

  ▪ Neurostimulation, acupuncture, nerve blocks, PT, OT, exercise, heat, cold.
  ▪ Psychological approaches: cognitive therapies (relaxation, imagery, hypnosis);
  ▪ Biofeedback, behavior therapy, psychotherapy
  ▪ Transcutaneous electrical nerve stimulation
  ▪ Complementary therapies: massage, art, music, aroma therapy
  ▪ Radiation therapy indicated for painful bony metastases
Equianalgesic Dosing

- Use caution: equianalgesic doses are approximations only!!
- Does not recognize the wide variation between individuals.
- Dose needs to be individualized and carefully titrated to effect.

1. Calculate the 24-hour dose of the current drug.
2. Convert this drug to the equivalent dose of the desired new drug.

\[
(\text{24-hour dose of current drug}) \times \left( \frac{\text{New drug equianalgesic equivalent}}{\text{Current drug equianalgesic equivalent}} \right) = \text{New drug 24-hour dose}
\]

3. Give only 50 to 75% of the calculated new drug equivalent dose to account for incomplete cross-tolerance between opioids. (Exception - methadone, start with 10-25%)

<table>
<thead>
<tr>
<th>Oral/Rectal Dose (mg)</th>
<th>Analgesic</th>
<th>Parenteral Dose (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>Codeine</td>
<td>60</td>
</tr>
<tr>
<td>-</td>
<td>Fentanyl</td>
<td>0.1</td>
</tr>
<tr>
<td>15</td>
<td>Hydrocodone</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>Hydromorphone</td>
<td>1.5</td>
</tr>
<tr>
<td>2</td>
<td>Levorphanol</td>
<td>1</td>
</tr>
<tr>
<td>150</td>
<td>Meperidine</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>Methadone</td>
<td>5</td>
</tr>
<tr>
<td>15</td>
<td>Morphine</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Oxycodone</td>
<td>-</td>
</tr>
</tbody>
</table>
*****Problem Set 2*****

Mr. A has been receiving PO Immediate Release Morphine Sulfate the last 24hr:

<table>
<thead>
<tr>
<th>Time</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>0200</td>
<td>15mg</td>
</tr>
<tr>
<td>0500</td>
<td>None Given</td>
</tr>
<tr>
<td>0900</td>
<td>30mg</td>
</tr>
<tr>
<td>1200</td>
<td>15mg</td>
</tr>
<tr>
<td>1600</td>
<td>15mg</td>
</tr>
<tr>
<td>2000</td>
<td>30mg</td>
</tr>
<tr>
<td>2300</td>
<td>15mg</td>
</tr>
</tbody>
</table>

You would like to convert his regimen to a long acting morphine (available in 15, 30, 60, 100, 200 mg tablets) with breakthrough control (IR morphine). What should your order be?

*****Problem Set 3*****

Mrs. D is a 52-year-old librarian who has breast cancer metastatic to bone. She is comfortable on a continuous infusion of morphine at 5 mg/hr sc. Before discharge to home she needs to be transitioned to PO meds. You decide to do q4hr dosing with oxycodone and close follow up after discharge. What should your prescription be?

Opioid Adverse Effects/Management

- Common: constipation, nausea and vomiting, dry mouth, sedation, sweats
- Uncommon: respiratory depression, delirium, myoclonus/seizures, pruritus, urinary retention
  - Constipation management:
    - Prokinetic agents: metoclopramide, cisapride
    - Osmotic laxative: lactulose, sorbitol
    - Diet usually insufficient and bulk forming agents not recommended
    - Stimulant laxative: senna, bisacodyl, glycerine, casanthranol
    - Combine with a stool softener: senna + docusate sodium
    - Methylnaltrexone: peripherally acting opioid-receptor antagonist
  - Nausea/vomiting: Quick onset of symptoms, quick tolerance
    - Prochlorperazine, 10 mg q 6 h (dopamine blocking agent)
    - Haloperidol, 1 mg q 6 h (dopamine blocking agent)
    - Metoclopramide, 10 mg q 6 h (dopamine blocking agent)
  - Respiratory Depression: Pain is stimulus to breath. Less of issue. Tolerance rapid. Observe for vital sign instability → naloxone, 0.1-0.2 mg IV q 1-2 min

*****Problem Set 4*****

49 year old F with recently diagnosed pancreatic cancer is status post a successful Whipple procedure and in the recovery unit. To control the patient's anticipated pain she was given a moderately large dose of IV morphine. The patient began to have shallow infrequent respirations and proceeded to become confused and having difficulty staying awake. On physical exam pinpoint pupils are noted.

a) What caused the patients symptoms? What is the most feared complication?
b) What is the most appropriate form of treatment in this setting? Mechanism?
Barriers: Lack of Knowledge, Poor Assessment

- Misconceptions concerning Addiction
  - Physical dependence: withdrawal symptoms result with the rapid discontinuation of opioid following prolonged administration, usually one month or longer.
  - Tolerance: increasing amounts of opioid are required to produce an equivalent level of efficacy.
  - Addiction: form of psychological dependence, compulsive disorder in which an individual becomes preoccupied with obtaining and using a substance, the continued use of which results in a decreased quality of life.
  - De novo development of addiction when opioids are used for the relief of pain is low.

- Fear of inducing respiratory depression
  - Usually a transient phenomenon, generally occurs only in the opioid-naive patient, and is antagonized by pain.

- Fear of Diversion (the transfer of a prescription drug from lawful to an unlawful channel of distribution or use).
  - May be somewhat prevented through use of pain contracts (see below), pain diaries, occasional urine drug screens, pill counting.

*****Problem Set 5******

A 36 year old M with a known history of heroin use/abuse comes into the ER with RLQ pain and +TTP at McBurney’s point subsequently diagnosed with appendicitis and has a laparoscopic appendectomy that evening. The patient must remain in the hospital for possible infection of wound site. The patient starts experiencing symptoms of opiate withdrawal.

- List the common signs/symptoms of opiate withdrawal.
We are committed to doing all we can to treat your chronic pain condition. In some cases, controlled substances are used as a therapeutic option in the management of chronic pain and related anxiety and depression, which is strictly regulated by both state and federal agencies. This agreement is a tool to protect both you and the physician by establishing guidelines, within the laws, for proper controlled substance use. The words “we” and “our” refer to the facility and the words “I”, “you”, “your”, “me”, or “my” refer to you, the patient.

1. I understand that chronic opioid therapy has been associated with not only addiction and abuse, but also multiple medical problems including the suppression of endocrine function resulting in low hormonal levels in men and women which may affect mood, stamina, sexual desire, and physical and sexual performance.

II. For female patients, if I plan to become pregnant or believe that I have become pregnant while taking this medication, I am aware that, should I carry the baby to delivery while taking these medications; the baby will be physically dependent upon opioids. I will immediately call my obstetrician and this office to inform them of my pregnancy. I am also aware that opioids may cause a birth defect, even though it is extremely rare.

III. I have been informed that long-term and/or high doses of pain medications may also cause increased levels of pain known as opioid induced hyperalgesia (pain medicine causing more pain) where simple touch will be predicted as pain and pain gradually increases in intensity and also the location with hurting all over the body. I understand that opioid-induced hyperalgesia is a normal, expected result of using these medicines for a long period of time. This is only treated with addition of non-steroidal anti-inflammatory drugs such as Advil, ibuprofen, etc., or by reducing or stopping opioids.

IV. I understand that physical dependence is not the same as addiction. I am aware physical dependence means that if my pain medicine use is markedly decreased, stopped, or reversed by some of the agents mentioned above, I will experience a withdrawal syndrome. This means I may have any or all of the following: runny nose, yawning, large pupils, goose bumps, abdominal pain and cramping, diarrhea, irritability, aches throughout my body and a flu-like feeling. I am aware that opioid withdrawal is uncomfortable, but not life threatening.

V. I am aware that tolerance to analgesia means that I may require more medicine to get the same amount of pain relief. I am aware that tolerance to analgesia does not seem to be a big problem for most patients with chronic pain; however, it has been seen and may occur to me. If it occurs, increasing doses may not always help and may cause unacceptable side effects. Tolerance or failure to respond well to opioids may cause my doctor to choose another form of treatment, reduce the dose, or stop it.

2. All controlled substances must come from the physician whose signature appears below or during his/her absence, by the covering physician, unless specific authorization is obtained for an exception.

II. I understand that I must tell the physician whose signature appears below or during his/her absence, the covering physician, all drugs that I am taking, have purchased, or have obtained, even over-the-counter medications. Failure to do so may result in drug interactions or overdoses that could result in harm to me, including death.

III. I will not seek prescriptions for controlled substances from any other physician, health care provider, or dentist. I understand it is unlawful to be prescribed the same controlled medication by more than one physician at a time without each physician's knowledge.

IV. I also understand that it is unlawful to obtain or to attempt to obtain a prescription for a controlled substance by knowingly misrepresenting facts to a physician or his/her staff or knowingly withholding facts from a physician or his/her staff (including failure to inform the physician or his/her staff of all controlled substances that I have been prescribed).
3. All controlled substances must be obtained at the same pharmacy where possible. Should the need arise to change pharmacies, our office must be informed. The pharmacy that you have selected is:

________________________________________________________________________
Phone: __________________________________________________________________

4. i. You may not share, sell, or otherwise permit others, including your spouse or family members, to have access to any controlled substances that you have been prescribed.

ii. Early refills will not be given. Renewals are based upon keeping scheduled appointments. Please do not make excessive phone calls for prescriptions or early refills and do not phone for refills after hours or on weekends.

5. Unannounced pill counts, random urine or serum, or planned drug screening may be requested from you and your cooperation is required. Presence of unauthorized substances in urine or serum toxicology screens may result in your discharge from the facility and its physicians and staff.

6. I will not consume excessive amounts of alcohol in conjunction with controlled substances. I will not use, purchase, or otherwise obtain any other legal drugs except as specifically authorized by the physician whose signature appears below or during his/her absence, by the covering physician, as set forth in Section 2 above. I will not use, purchase, or otherwise obtain any illegal drugs, including marijuana, cocaine, etc. I understand that driving while under the influence of any substance, including a prescribed controlled substance or any combination of substances (e.g., alcohol and prescription drugs), which impairs my driving ability, may result in DUI charges.

7. Medications or written prescriptions may not be replaced if they are lost, stolen, get wet, are destroyed, left on an airplane, etc. If your medication has been stolen, it will not be replaced unless explicit proof is provided with direct evidence from authorities. A report narrating what you told the authorities is not enough.

8. In the event you are arrested or incarcerated related to legal or illegal drugs (including alcohol), refills on controlled substances will not be given.

9. I understand that failure to adhere to these policies may result in cessation of therapy with controlled substances prescribed by this physician and other physicians at the facility and that law enforcement officials may be contacted.

10. I also understand that the prescribing physician has permission to discuss all diagnostic and treatment details, including medications, with dispensing pharmacists, other professionals who provide your health care, or appropriate drug and law enforcement agencies for the purpose of maintaining accountability.

11. I affirm that I have full right and power to sign and to be bound by this agreement, that I have read it, and understand and accept all of its terms. A copy of this document has been given to me.

Patient’s full name
________________________________________________________________________

Patient’s signature
________________________________________________________________________ Date

Physician’s signature
________________________________________________________________________ Date
PROBLEM SET ANSWERS:

1. a) nocioceptive somatic b) neuropathic c) neuropathic d) visceral \(\rightarrow\) somatic nocioceptive e) nocioceptive visceral

2. Total 24hr Morphine Requirement: 120mg. For Long acting morphine (MSContin) do q8 or q12 dosing. 60mg MSContin PO q12hrs for pain. For breakthrough: Order 5-15% 24hr dose q4hrs PRN. 15mg IR morphine sulfate PO q4hrs PRN for pain.

3. Calculate total daily dose of IV morphine: 5mg/hr x 24 hrs = 120mg. Using equianalgesic table provided calculate equivalent oral morphine: (5mg IV morphine = 10mg PO oxycodone) OR (1mg IV morphine = 2mg PO oxycodone): 120mg IV morphine = 240mg Oral Oxycodone. Divide 240mg by six for q4hr dosing = 40mg or two 20mg tabs. Order should be take 2 two tabs of 20mg oxycodone PO Q4hrs for pain.

4. a) (opioid over dose \(\rightarrow\) Resp, CNS Depression \(\rightarrow\) cyanosis \(\rightarrow\) death)
   b) Opiate antagonist, Nalaxone- It expels the natural opiates and synthetic opioids from the opiate receptors and blocks the opiates and opioids from coming back to these receptors. Reversal of post-operative respiratory depression and coma: 0.1-0.2 mg IV q 1-2 min

5. General discomfort, agitation, sweats, shakes, nausea, diarrhea, vomiting, rhinorrhea, elevated BP, piloerection

Resources:

Steps to Approaching the Neurological History And Exam
Allyson Zazulia, MD

Do not skimp on the neurological history! What you learn from the history is often more important than what you can learn from the exam.

Document a careful chronological history of the patient’s symptoms. Start with the very first symptom and work forward from there. Determine the circumstances surrounding the onset of symptoms. What was the patient doing? Construct a time-intensity profile of symptom progression. Was the process acute, subacute, recurrent-remittent, or chronic progressive? Think about localization and pathophysiology while taking the history in order to guide what other questions to ask and what parts of the exam to focus on (i.e., think about “neighboring signs”). (For more information on time-intensity profile and neighboring signs, look at the “Neurological Diagnosis” handout from the DNS course.)

Use the patient’s own words, but be sure you understand what those words mean to the patient. Do not substitute your words for the patient’s writing “hemiplegia” instead of “weakness on my left side” adds little to the accuracy of the information and invites error in interpretation. Similarly, do not accept another doctor’s diagnosis or interpretation, which patients often like to give you in place of details about their actual symptoms. “I was dizzy last week. My doctor said it must have been my blood pressure." But don’t simply accept the patient’s own words without clarifying what those words mean to the patient. You must insist on a detailed description of symptoms so that you can be sure the two of you are on the same wavelength. You would be surprised what some patients actually mean when they say they have numbness or dizziness. With further questioning, “dizzy” may be described as “my head was swimmy,” and with still further questioning, refined to “things spinning around like when you get sea sick.” This is much more useful, as it suggests vertigo rather than light-headedness or unsteadiness. You can set aside your Holter monitor and tilt table test and focus on causes of labyrinthine dysfunction.

Since neurological illness may affect the patient’s level of consciousness, ability to attend, or cognitive function, sometimes it is necessary to involve family members or witnesses in history taking. If you see a patient who was “found down” and has no memory for what happened, it is imperative to speak with somebody who witnessed the event. Finding out that the patient complained of an excruciating headache prior to losing consciousness or that there was jerking of his right face and arm just prior to his falling to the ground is indispensable information.

Steps to Approaching the Neurological Examination

Although the neurological exam can be intimidating to those just learning it and although it will inevitably take you a long time to do at first, practice will certainly allow you to become proficient. Your job at this stage is to work on thoroughness, not speed. At some point, you will be able to perform a more focused exam, but right now it is more important to learn the proper way to do all parts of the neurological exam and to practice the complete exam on all patients. It may seem like unnecessary torture to do a complete exam on a patient who has a very specific neurological complaint or even no neurological complaint, but if you don’t, how will you know the correct way to perform all the tests when they become relevant in a future patient? And how will you ever learn the normal variability in responses to each test to recognize when something falls out of the range of normalcy? It helps to understand why you are performing each test rather than just doing it without thinking. For example, realizing that asking a patient to spell the word WORLD backwards has little to do with spelling ability but is a test of attentiveness will make the results more meaningful.

Once you get to the stage where you are proficient at the complete neurological exam, it is still important to perform certain parts of the “screening exam” on all patients. In a patient who has no
neurological complaints, you are looking for unexpected findings that may lead to an early diagnosis and possibly treatment of a pre-symptomatic disease, just as you would do by listening to a patient’s lungs even if he has no pulmonary symptoms. Or you may find neurological abnormalities that point towards a specific cause for a systemic disease. Many non-neurologists think banging on their patients’ knees constitutes an adequate screening neurological exam. But if you think about it, what patellar reflex abnormalities are you likely to find that will be of any clinical significance in the absence of symptoms of weakness, gait difficulties, or sensory loss? If you find an extensor plantar response, on the other hand, you can be sure the patient has a corticospinal tract lesion and subsequent imaging may disclose subclinical cerebrovascular disease or cervical spine disease. If you find absent joint position sense in a patient who complains of fatigue, anorexia, and irritability, it would be prudent to look for B12 deficiency before writing her symptoms off as depression and prescribing Prozac.

For patients with specific neurological complaints, the goal is to test your hypotheses about the nature of the patient’s illness. You should perform not only those tests that will support your hypothesis, but also those tests that will refute it. For example, weakness may be due to a lesion anywhere within the neuroaxis from the cerebral cortex down to the muscle. Finding associated hyperactive reflexes and extensor plantar responses gives you very different information (upper motor neuron dysfunction) than finding hypoactive reflexes, atrophy, and fasciculations (lower motor neuron dysfunction). And if you examine only the muscles and reflexes and ignore the sensory exam because the patient has no sensory complaints, you may miss vital clues to the diagnosis: the presence of associated sensory deficits excludes isolated muscle or neuromuscular junction disease.

A great deal of information can be learned about the patient’s neurological function by simple observation. Does he swing his arms symmetrically when walking into your office? Does she interact with you when you stand on the right side of her bed, but ignore you when you stand on the left? Is the sole of one of his shoes worn and the other not? Much of the mental status exam can be completed during history taking. Asking a patient his name as part of a test of orientation may be needless and insulting when he just finished giving you a coherent, detailed chronological description of his illness.

The neurological exam can be organized into 7 categories: (1) mental status, (2) cranial nerves, (3) motor system, (4) reflexes, (5) sensory system, (6) coordination, and (7) station and gait. It will help if you approach the exam systematically and establish a routine. Some people prefer the standard order listed above. Others like to work from head to toe. There is no right way to do it, as long as you cover all the categories and keep your patient’s comfort in mind (e.g., minimize the number of times he needs to move from the supine to the seated or standing position). During the course of the exam pay attention to the distribution of abnormalities (proximal vs. distal, arms vs. legs, left vs. right).

Additional Exam Points.

A. **Mental Status**: In addition to its value in helping to localize lesions, the mental status exam is required to establish the reliability of the rest of your exam. You must determine that the patient is alert, attentive, oriented, cooperative, and not debilitated by depression or psychosis before you can appropriately interpret other exam findings. If a patient is severely inattentive, he may fail to follow commands, mistakenly leading you to diagnose aphasia. If he is uncooperative and combative, your sensory exam will likely be unreliable. (This does not mean you cannot do any sensory exam, just that you will have to substitute techniques that do not rely on cooperation, i.e., response to pain.)

1. **Level of awareness**: e.g., awake and alert (If not alert, quantify with statement of stimulus required to evoke response, e.g., voice, touch, pain).

2. **Attentiveness**: test with serial 7s, WORLD backwards, count backwards, say months backwards.

3. **Orientation** to self, place, time.
4. **Speech and language**: fluency, repetition, comprehension, reading, writing, naming.

5. **Memory**: registration and retention.
   
a. Immediate recall: 3 objects (e.g., apple, table, penny) or a name and address, digit span.
   
b. Recent: current events, home address, what was eaten for breakfast.
   
c. Remote: date of birth/marriage, military experience, birthplace, list past presidents.

6. **Higher intellectual function**: general knowledge, abstraction, judgment, insight, reasoning.

7. **Mood and affect**.

B. **Cranial Nerves**: The cranial nerves consist of nerves that exit through foramina in the skull, not necessarily nerves that originate in the brain (though most do).

<table>
<thead>
<tr>
<th>Cranial Nerve</th>
<th>Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Smell (use coffee, lemon, vanilla, etc; avoid peppermint, menthol, and ammonia since they may stimulate taste buds or trigeminal nerves and do not specifically test smell).</td>
</tr>
<tr>
<td>II</td>
<td>Visual acuity (Snellen chart), visual fields, ocular fundi.</td>
</tr>
<tr>
<td>III, IV, VI</td>
<td>Eye movements, convergence, pupillary reaction.</td>
</tr>
<tr>
<td>V</td>
<td>Facial sensation, jaw movements, corneal reflex.</td>
</tr>
<tr>
<td>VII</td>
<td>Facial movements (raising eyebrows, closing eyes, frowning, smiling).</td>
</tr>
<tr>
<td>VIII</td>
<td>Hearing.</td>
</tr>
<tr>
<td>IX, X</td>
<td>Swallowing, gag reflex, voice, taste (e.g., salt, sugar, lemon).</td>
</tr>
<tr>
<td>XI</td>
<td>Shrugging shoulders, turning head against resistance.</td>
</tr>
<tr>
<td>XII</td>
<td>Tongue movements.</td>
</tr>
</tbody>
</table>

C. **Motor exam**: The motor exam is affected not only by muscle strength, but also by effort, coordination, and extrapyramidal function. Tests of dexterity and coordination are most sensitive to picking up upper motor neuron and cerebellar abnormalities whereas direct strength testing is more sensitive to lower motor neuron dysfunction. Other important aspects of the motor exam include assessment of muscle tone (e.g., spastic, rigid, flaccid), patterns of muscle atrophy or hypertrophy, disturbances of kinesis (e.g., the hypokinesia [poverty of movement] and bradykinesia [loss of speed and spontaneity of movement] of parkinsonism), and endurance of the motor response (e.g., the fatigability of myasthenia gravis). With regard to muscle strength testing, there are several points to remember. First is the importance of proper positioning. The limb must be positioned in such a way as to permit the muscle being examined to act directly and to avoid as much as possible the recruitment of other muscles having similar function (e.g., biceps and brachioradialis). The proximal portion of the limb must be fixed when movements of distal muscles are being tested. The humerus should be fixed when testing pronation, so that the patient is unable to use his shoulder to compensate for weak pronation. Weakness of grip may be erroneously diagnosed if the wrist of a patient with radial nerve palsy is not placed into a position of wrist extension. Second, always give yourself the advantage when testing individual muscle strength. For example, test the iliopsoas by pushing down on the foot of the outstretched leg rather than on the thigh. Even more subtle weakness can be detected by asking the patient to walk on his toes (ankle plantar flexion) and heels (ankle dorsiflexion) and to do a knee bend (predominantly iliopsoas). Third, be aware of normal variability in strength based on age, sex, handedness (i.e., the muscles on the dominant side are usually stronger), and muscle (e.g., in a
patient with normal strength, you should never be able to overcome the ankle plantar flexors but you will likely be able to overcome the abductor digiti minimi).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No muscular contraction.</td>
</tr>
<tr>
<td>1</td>
<td>Barely detectable muscle contraction.</td>
</tr>
<tr>
<td>2</td>
<td>Active movement/strength present.</td>
</tr>
<tr>
<td>3</td>
<td>Active movement/strength against gravity.</td>
</tr>
<tr>
<td>4</td>
<td>Active movement/strength against gravity and against some resistance.</td>
</tr>
<tr>
<td>5</td>
<td>Normal muscle strength; active movement against full resistance.</td>
</tr>
</tbody>
</table>

*Note: "+" or "-" after the number may be used to further distinguish between items on the scale.*

D. Reflexes: Reflex testing is important because it is the most objective part of the neurological exam, it is the least dependent on cooperation (but note that reflexes can be reinforced or decreased voluntarily to some extent, as occurs in guarding), and it may provide an early indication of neurological dysfunction. The muscle stretch reflexes (a.k.a. deep tendon reflexes, which is incorrect terminology since it is the indirect stretching of the muscle that elicits the reflex; the tendon just happens to be conveniently located to apply the stimulus to) are obtained by placing the muscle in a state of slight tension and then quickly tapping either the tendon or the periosteum to which the muscle is attached and observing the vigor and briskness of the response. The muscle contraction should be seen and felt. If reflexes are diminished or absent, try reinforcing the reflex by distracting the patient. Note, however, that symmetrically brisk, diminished, or even absent reflexes may be found in normal people. The superficial (cutaneous) reflexes are elicited by applying a stimulus to either the skin or mucous membranes and include, among others, the superficial abdominal, cremasteric, anal, and plantar reflexes. Plantar reflexes are often considered to be the most important test in the neurological armamentarium because an abnormal response (i.e., extensor plantar response, Babinski sign, “upgoing toe”) is a specific indicator of corticospinal tract dysfunction and may be the only sign of ongoing disease or the only residual sign of previous disease.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No response.</td>
</tr>
<tr>
<td>1+</td>
<td>Diminished response.</td>
</tr>
<tr>
<td>2+</td>
<td>Normal/average response.</td>
</tr>
<tr>
<td>3+</td>
<td>Brisker than average response.</td>
</tr>
<tr>
<td>4+</td>
<td>Markedly hyperactive, often with sustained clonus (rhythmic oscillations of flexion/extension).</td>
</tr>
</tbody>
</table>

E. Sensation: The sensory exam can be frustrating at times because of its subjective nature and reliance on cooperation. It is prudent to test sensation early in your exam if you anticipate poor cooperation to be a factor. Always explain to your patients what you are going to do and what you expect of them, then have them close their eyes for the testing. Avoid leading questions like, "Is this sharp?" Sometimes it is useful to apply the stimulus to an uninvolved part of the body and say, "If this sharpness is worth $1, how much is this worth?" and then apply the pin elsewhere. Be aware of the fact that patients may report differences in sensation in the presence of normal sensory function because of actual differences in the stimulus intensity applied. You are not a machine and cannot apply identical pressure each time you poke them with a pin. It is often necessary to repeat parts of the exam multiple times.

Superficial sensation (pain and temperature) is mediated by unmyelinated and small myelinated nerve fibers via the spinothalamic tract. Deep sensation (pressure, position sense and vibration) is mediated by large fibers via the dorsal columns. Integrative sensation requires higher level processing of the above primary sensory modalities and includes such functions as stereognosis,
graphesthesia, 2-point discrimination, extinction, finger agnosia, constructional ability (copying simple and complex forms, drawing a clock).

F. **Coordination and gait** testing involves the assessment of the control, precision, rhythm, and synergy of movement. It requires appropriate functioning of the cerebellum as well as the motor, sensory, and vestibular systems. (Remember: the Romberg sign is primarily a test of proprioception [position sense], not cerebellar function.) Coordination is tested at rest and with action. It is tested in the trunk (e.g., ability to maintain an erect posture) and in the limbs. Loss of the ability to judge and control the distance, speed, and power of a motor act is termed **dysmetria**. Dysmetria may be detected during finger-to-nose, heel-knee-shin, and rapid alternating movements, and will usually be apparent through simple observation of the patient performing routine acts such as signing her name. The presence of extraneous movements (e.g., tremor, chorea, myoclonus) should be noted somewhere, whether here or under motor. Normal gait requires proper functioning of postural, righting, neck, and labyrinthine reflexes in addition to the systems required for coordination. Examination of gait should include assessment of body and extremity posture; length, speed, and rhythm of steps; base of gait; arm movements; steadiness; and turning. Examples of abnormal gaits include the **ataxic gait**, which is irregular, jerky, and broad based and is due to either proprioceptive or cerebellar dysfunction and the **spastic hemiparetic gait** resulting from contralateral corticospinal tract injury, which involves flexion of the upper extremity and extension and internal rotation of the lower extremity with hip hike, circumduction, and scraping of the toes on the ground.

Write-up.

Your write-up must include the patient's complete neurological history and examination. The history section should include the standard categories:

- Chief complaint.
- History of present illness.
- Past medical history.
- Medications.
- Allergies.
- Social history.
- Family history.
- Review of systems.

The exam section should include any relevant areas of the general physical exam as well as the seven categories of the neurological exam.
Sample Exam.

Mental Status:

General appearance and behavior: Elderly woman, well groomed and cooperative.

Sensorium: Alert, attentive, and oriented to person, place, and time.

Language/articulation: Speech clear and fluent; Normal comprehension, repetition, naming, reading, writing.

Memory: Registers and recalls 3/3 objects at 0 and 3 minutes; Knows current events.

Higher intellectual function: Knows state capitals and presidents; Able to differentiate "lie" and "mistake."

Cranial nerves:

I Able to identify coffee and lemon bilaterally.
II Visual acuity 20/20 bilaterally; visual fields full; disc margins sharp.
III, IV, VI Pupils 4mm, equal and reactive to light; eye movements full; no nystagmus.
V Facial sensation intact to pinprick in all 3 divisions bilaterally; jaw moves symmetrically.
VII Face symmetric; normal eye closure and smile.
VIII Hearing normal to rubbing fingers.
IX, X Palate elevates symmetrically; voice not hoarse.
XI Intact head turning and shoulder shrug.
XII Tongue midline; normal movement; no atrophy.

Motor: No pronator drift of out-stretched arms; normal tone; normal muscle bulk.

<table>
<thead>
<tr>
<th>Deltoid</th>
<th>Biceps</th>
<th>Triceps</th>
<th>Wrist Extension</th>
<th>Finger Abduction</th>
<th>Hip Flexion</th>
<th>Hip Extension</th>
<th>Knee Flexion</th>
<th>Knee Extension</th>
<th>Ankle Flexion</th>
<th>Ankle Extension</th>
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</table>

Reflexes: 2+ and symmetric at the biceps, triceps, knees, and ankles; Plantar responses flexor.

Sensory: Light touch, pinprick, position sense, and vibration sense intact in fingers and toes.

Coordination: Rapid alternating movements and fine finger movements intact; No dysmetria on finger-to-nose and heel-knee-shin; No abnormal or extraneous movements; Romberg absent.

Gait/Stance: Normal posture; Gait steady with normal steps, base, arm swing, and turning; Normal tandem walking, heel, and toe walking.

You should then put together the data you have collected and work through the anatomic localization of the problem, a differential diagnosis, and management plan. Since the focus of this activity is obtaining a good H & P, you can save the 12-page assessment and plan for next year. But you should certainly think through localization and take a stab at the diagnosis and how you might evaluate it further. Your write-up should be turned in to your preceptor when you meet the next day and will be returned to you with comments and suggestions by the following week. At your first meeting with your preceptor, you are encouraged to make arrangements for a way to get your subsequent write-ups to him/her before the next
session if possible (e.g., via e-mail). Make sure to arrange a way for the preceptor to return your write-ups from the final session since you will not be meeting again.

**Additional Resources for the Neurological H & P:**


Bickley LS. *Bates' Guide to Physical Examination and History Taking*. Philadelphia: Lippincott Williams & Wilkins; 1999

Your write-up must include the patient’s complete neurological history and examination. The history section should include the standard categories:

Chief complaint  
History of present illness  
Past medical history  
Medications  
Allergies  
Social history  
Family history  
Review of systems

Chief Complaint

The chief complaint should be a brief summation of why the patient came to the hospital. Some attendings expect this to be in the patient’s own words. However, in neurology this is frequently impossible and sometimes it is not informative. It is sufficient to describe the primary symptoms - without interpreting them or adding medical jargon – and the time course.

This is a 35 year old man with back pain and progressive difficulty walking over three weeks.

If the source of the history is not the patient, it is appropriate here to say how the information is derived.

Source: Since the patient was unable to speak on admission, the history was obtained from his wife and review of the outside medical record.

HPI

Your initial sentence should indicate the patient’s handedness. This is important for interpretation of the physical exam (e.g., a right-handed person would be expected to have better dexterity with the right hand) and for lesion localization (e.g., a left-handed person may have right hemisphere dominance for language, so a lesion of the left frontal or temporal lobe might not produce the expected aphasia in such a patient). It is often useful to include any medical history relevant to the patient’s complaint in the first sentence as long as you keep it brief. Avoid the habit of including the entire medical history in the first breath.

The patient is a 55-year-old right-handed woman with long-standing hypertension, diabetes, and tobacco use who was standing at the kitchen sink washing dishes 12 hours after having her neck manipulated by a chiropractor when she suddenly developed nausea, spinning sensation, and inability to feel the temperature of the dish water with her left hand.

The remainder of the HPI should chronicle the temporal course of the patient’s symptoms:
The patient reports that one day prior to admission, she saw a chiropractor for chronic neck pain, who stretched and “popped” her neck. She awakened on the morning of admission feeling well, ate breakfast without difficulty, and was washing dishes at 8 AM when she suddenly realized that the hot water did not feel hot on her left hand. She was immediately overcome with nausea and felt as if the room were spinning around her. She needed to grab onto the sink to keep from falling. She staggered back to her bedroom, tending to fall into the wall on her right side, and lay down to wait for the feeling to pass. The spinning sensation persisted regardless of the position she was in, and she continued to feel nauseated. At noon, she tried to pick up the telephone with her right hand but kept reaching her hand out too far or too near and knocked over the lamp and clock on the nightstand. She was eventually able to dial 911 with her left hand and noticed that her voice sounded raspy on the phone. Upon arrival to the emergency room at 1 PM, she vomited once. Otherwise, there was no change in her symptoms.

This first part of the HPI should conclude with a statement of how the patient presented for the current admission:

The patient’s daughter found her unresponsive on the bathroom floor. She called 911 and the patient was transported by EMS to the BJH ED at 9:45 AM.

Or

The patient was referred to the neuromuscular clinic for further evaluation of progressive weakness. He was seen by Dr. Pestronk last week, who scheduled the current admission for further diagnostic studies.

It is appropriate in the written H & P to describe medical details leading up to the current admission, including previous testing, diagnoses, treatment, and effects of treatment. Remember to report such results with appropriate skepticism. This information does not have to be reported chronologically; sometimes it’s more helpful to summarize all the data at once. (However, when you are presenting in a group setting, always check first whether medical details or test results should be deferred. Many attendings will prefer that you withhold past medical details which might either give away the diagnosis or mislead the audience.)

Mrs. Smith has been evaluated by several physicians in the last year. According to the patient’s daughter, the following tests have been negative: head MRI, EMG x 2, spinal tap, “blood test for toxins.” The discharge summary from Evanston Memorial Hospital states only that the patient has “psychosomatic illness.”

Following the chronological description of each problem in the HPI, a new paragraph should include a description of the patient’s current state including disabilities.

The patient states that his jaw pain has been continuous for the last week. He has been able to eat only liquids and has lost 25 pounds in the last month. He can walk short distances but uses a wheelchair outside his home and requires assistance to dress or cook.

Finally, the HPI should include any pertinent positives and negatives relevant to the differential diagnosis.

Mr. Smith denies previous episodes of weakness or sensory loss. He is unaware of any family members or co-workers with similar problems. He denies exposure to insecticides or industrial toxins, insect bites, and recent travel. On further questioning he notes that he
recently completed construction of a wooden deck and has been using the treated scrap wood in his fireplace.

Documenting the rest of the history:

Avoid repetition. There is no need to repeat information in the ROS which was already stated in HPI.

The social history should include information about the patient’s living situation and ability to return there. Document whether the patient lives alone, needs help for activities of daily living, etc. This information will be essential for discharge planning.

Exam

The exam section should include any relevant areas of the general physical exam as well as the seven categories of the neurological exam. In the above example, relevant general physical findings would include the neck exam and the cardiac exam.

Assessment and Plan

Your assessment and plan should always begin with a brief summary of the patient’s history and exam findings:

In summary, the patient is a 60-year-old woman with multiple cerebrovascular risk factors and recent chiropractic manipulation who had the acute onset of nausea, vertigo, and right hand numbness. On exam has a right Horner’s syndrome, right-sided dysmetria, right facial and left hemibody sensory loss, and hoarse voice. Admission noncontrast CT is normal.

This should always be followed by anatomic localization of the process.

These symptoms and signs localize to the right lateral medulla with involvement of the vestibular nuclei, spinal trigeminal nucleus, sympathetic fibers, spinothalamic tract, inferior cerebellar peduncle, and nucleus ambiguus.

Explain why other localizations are or aren’t possible.

The history exam strongly suggests a slowly expanding cervical lesion at approximately C6 level. However, we can’t exclude the possibility that the patient has a C8 radiculopathy with coexisting severe peripheral neuropathy.

Next, you should put all this data together to come up with a short list of possible diagnoses, being sure to indicate which one you think is the most likely and why, as well as how you are going to prove or disprove it.

Given the acute onset of symptoms and the fact that the signs and symptoms are all referable to a specific vascular territory, the most likely diagnosis is a stroke. The patient has multiple risk factors for vascular disease, so there may be atherosclerosis of the vertebral artery as a source for distal embolism. Alternatively, the recent chiropractic
manipulation raises the possibility of a vertebral dissection with distal embolism. A cardiac source for embolism is unlikely since she has no history of cardiac disease and has a normal cardiac exam, EKG, and chest x-ray. Other processes, such as multiple sclerosis and tumor, may involve the medulla, but are much less likely based on the patient’s age and time course of symptom development. An MRI scan showing restricted diffusion in the left lateral medulla would confirm the diagnosis of ischemic stroke. It may also provide evidence for a vertebral dissection, though angiography would be the definitive test if a dissection were not seen on MRI.

Lastly, you should address the management plan.

The patient will be admitted to the neurology floor. She is not a candidate for t-PA because her symptom onset was more than 3 hours ago. She will be started on aspirin for stroke treatment/stroke prevention and on subcutaneous heparin for deep venous thrombosis prophylaxis since her mobility is impaired. Because of her impaired pharyngeal function, she will have a swallow evaluation before being permitted to take anything by mouth. She will have speech, occupational, and physical therapy. She will be counseled on smoking cessation. Her antihypertensive medications and insulin will be continued, and diabetes control will be assessed with accuchecks and a hemoglobin AIC. A cholesterol panel will be obtained. MRI of the brain and neck will be performed tomorrow.

You are strongly encouraged to use a problem-based plan for initial and subsequent notes. It is very rare that a patient has only a single problem, and a problem-based plan gives you a framework for daily work.

Formatting issues.

You may write your note on standard chart paper or print it out on blank pages. Aside from the standard neurology forms you may not create a new form for your notes.

All notes must begin with the heading “WUMS 3 Admission Note” or “WUMS 3 Progress Note.”

All notes must start with the date and time. If there is more than one page, number each page (“page 2/6” etc). Sign and date each page. If your signature is not easily legible you should print your name as well.

Correct errors with a single strikethrough and add your initials. No white-out or erasures.

Notes must be in the chart on the day of admission. It is your responsibility to have your resident review and sign each note before leaving at the end of the day.
Sample neurological H & P

CC: The patient is a 50-year-old right-handed woman with a history of chronic headaches who complains of acute onset of double vision and right eyelid droopiness three days ago.

History of present illness: Mrs. Smith states that on Sunday evening (7/14/03) about 20 minutes after sitting down to work at her computer, she developed blurred vision, which she describes as the words on the computer looking fuzzy and seeming to run into each other. When she looked up at the clock on the wall, she had a hard time making out the numbers. At the same time, she also noted a strange sensation in her right eyelid. She went to bed and upon awakening the following morning, she was unable to open her right eye. When she lifted the right eyelid with her fingers, she had double vision with the objects appearing side by side. The double vision was most prominent when she looked to the left, but was also present when she looked straight ahead, up, down, and to the right, and went away when she closed either of her eyes. She also noted that she had pain in both of her eyes that increased if she moved her eyes around, especially on looking to the left. She was seen in the Alton Memorial Hospital ER and subsequently transferred to BJH by ambulance.

Mrs. Smith also notes that for the past two to three weeks, she has been having intermittent pounding bifrontal headaches that worsen with straining, such as when coughing or having a bowel movement. The headaches are not positional and are not worse at any particular time of day. She rates the pain as 7 or 8 on a scale of 1 to 10, with 10 being the worst possible headache. The pain lessened somewhat when she took Vicodin that she had lying around. She denies associated nausea, vomiting, photophobia, loss of vision, seeing flashing lights or zigzag lines, numbness, weakness, language difficulties, and gait abnormalities. Her recent headaches differ from her “typical migraines”, which occur about 4-6 times per year and consist of seeing shimmering white stars move horizontally across her vision for a couple minutes followed by a pounding headache behind one or the other eye, photophobia, phonophobia, and nausea and vomiting lasting several hours to two days. The last headache of that type was two months ago.

Her visual symptoms have not changed since the initial presentation. She denies previous episodes of transient or permanent visual or neurologic changes. She denies head trauma, recent illness, fever, tinnitus or other neurologic symptoms. She is not aware of a change in her appearance, but her husband notes that her right eye seems to protrude; he thinks that this is a change in the last few days.

Past medical history: 1) Headaches since childhood diagnoses as migraine, as described in HPI. She has been treated with Imitrex injections with no benefit. 2) Depression. There is no history of diabetes or hypertension.

Medications: Zoloft 50 mg daily, ibuprofen 600 mg a few times per week, and Vicodin a few times per week.

Allergies: None.

Social history: The patient lives with her husband and 16-year-old daughter and works as a medical receptionist. She denies tobacco use and rarely drinks a glass of wine.

Family history: Her mother had migraines and died at the age of 70 after a heart attack. Her maternal grandfather had a stroke at age 69. There is no other family history of stroke or vascular disease, but she has no information about her father’s side of the family.
**Review of systems:** She states that she had an upper respiratory infection with rhinorrhea, congestion, sore throat, and cough about 6 weeks ago. She denies fever, chills, malaise, weight loss, neck stiffness, chest pain, dyspnea, abdominal pain, diarrhea, constipation, urinary symptoms, joint pain, or back pain. Neurologic complaints as per HPI.

**General physical examination:**
The patient is obese but well-appearing. Temperature is 37.6, blood pressure is 128/78, and pulse is 85. There is no tenderness over the scalp or neck and no bruits over the eyes or at the neck. There is no proptosis, lid swelling, conjunctival injection, or chemosis. Cardiac exam shows a regular rate and no murmur.

**Neurologic examination:**
- **Mental status:** The patient is alert, attentive, and oriented. Speech is clear and fluent with good repetition, comprehension, and naming. She recalls 3/3 objects at 5 minutes.

**Cranial nerves:**
- **CN II:** Visual fields are full to confrontation. Fundoscopic exam is normal with sharp discs and no vascular changes. Venous pulsations are present bilaterally. Pupils are 4 mm and briskly reactive to light. Visual acuity is 20/20 bilaterally.
- **CN III, IV, VI:** At primary gaze, there is no eye deviation. When the patient is looking to the left, the right eye does not adduct. When the patient is looking up, the right eye does not move up as well as the left. She develops diplopia in all directions of gaze especially when looking to the left. There is ptosis of the right eye. Convergence is impaired.
- **CN V:** Facial sensation is intact to pinprick in all 3 divisions bilaterally. Corneal responses intact.
- **CN VII:** Face is symmetric with normal eye closure and smile.
- **CN IX, X:** Palate elevates symmetrically. Phonation is normal.
- **CN XI:** Head turning and shoulder shrug are intact.
- **CN XII:** Tongue is midline with normal movements and no atrophy.

**Motor:**
There is no pronator drift of out-stretched arms. Muscle bulk and tone are normal. Strength is full bilaterally.

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<th>Bice</th>
<th>Trice</th>
<th>Wrist</th>
<th>Finger</th>
<th>Hip</th>
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**Reflexes:**
Reflexes are 2+ and symmetric at the biceps, triceps, knees, and ankles. Plantar responses are flexor.

**Sensory:**
Light touch, pinprick, position sense, and vibration sense are intact in fingers and toes.
Coordination:
Rapid alternating movements and fine finger movements are intact. There is no dysmetria on finger-to-nose and heel-knee-shin. There are no abnormal or extraneous movements. Romberg is absent.

Gait/Stance:
Posture is normal. Gait is steady with normal steps, base, arm swing, and turning. Heel and toe walking are normal. Tandem gait is normal when the patient closes one of her eyes.

Laboratory Data:

(Record here all available lab data; circle any abnormal values).

CT (non-contrast) 7/17: no abnormalities. Orbits not well seen.

MRI 7/18: Multi-focal areas of increased signal on T2 and FLAIR in the deep white matter bilaterally. These range in size from 1 to 10 mm. There are no signal abnormalities in the brain stem or in the corpus callosum. No abnormalities in orbits, sinuses, or venous structures.

Assessment:
In summary, the patient is a 50-year-old woman with longstanding headaches who has had an acute onset of pupil-sparing partial third nerve palsy on the right (involving levator palpabrae, superior rectus, and medial rectus) associated with a bifrontal headache. Because this is an isolated third nerve palsy without involvement of other cranial nerves or orbital abnormalities, the lesion is localized to the nerve itself, e.g. in the subarachnoid space. Ophthalmoplegic migraine remains a likely diagnosis given the history of migraine with aura, even though the current headache is different in character from her usual headaches and is not associated with visual aura, nausea/vomiting, or photophobia. However, other potentially serious causes of third nerve palsy must be excluded. If a third nerve palsy is due to a compressive lesion, the pupillary fibers will generally become involved within about one week of the onset of symptoms. So the fact that her pupil is normal in size and reactive to light weighs against the diagnosis of a compressive lesion such as an aneurysm or tumor, but does not eliminate the possibility.

The MRI does not show evidence of a mass lesion, but an aneurysm cannot be completely excluded without an angiogram. Another potentially serious cause of the third nerve palsy is meningitis. The patient is afebrile, has no meningeal signs, is well-appearing, and has been stable over three days, making bacterial meningitis highly unlikely, but atypical meningitis including fungal, Lyme, sarcoid or carcinomatous meningitis are possibilities. Finally, the patient may have a vascular lesion of the third nerve due to unrecognized diabetes.

The appearance of the MRI abnormalities is non-specific. The lesions are potentially explainable by migraines, but are also consistent with hypertension or a vasculopathy. The patient denies a history of hypertension, is not currently hypertensive, and has no risk factors for vascular disease, but the possibility of a genetic disorder such as CADASIL cannot be excluded given the lack of paternal history.

Plan:

Problem 1. R IIIrd nerve palsy.

The patient will undergo a cerebral angiogram to evaluate for an aneurysm, particularly a posterior communicating aneurysm. Patient has been informed of risks and benefits of this procedure and it is scheduled for AM. She will be kept NPO for the procedure.
A lumbar puncture will be performed with opening pressure assessed and CSF sent for cell count and differential, protein, glucose, cultures and cytology. She will have her glucose and hemoglobin A1C drawn to evaluate for diabetes.

Close observation for possible neurologic worsening. Neuro checks 2/shift for first 24 h.

Eye patch for comfort to eliminate the diplopia.

Problem 2. Headache.

Current symptoms appear related to new cranial nerve palsy. History suggests migraine with aura in past. Trial of NSAID (naprosyn 400 mg po bid); if this is ineffective may require narcotic analgesia.

Problem 3. Depression.

Denies current symptoms; will continue Zoloft at current dose.

Problem 4. Obesity.

Patient requests referral to dietician.
Dept of Ob/Gyn/WUSM  GYN or Well-Woman Note  page 1 of 6

CONSULT  NEW  ESTABLISHED PATIENT

Pt. Name:  
DOB:  
Age: 42  G: ∅  P:  AB:  

Date: 5/29/03

[ ] Annual Pelvic/Breast Exam
[ ] Referred by:  
for evaluation of:  

[ ] GYN Chief Complaint: lower abdominal pain
HPI: 42yo 9 presents for flu of lower ab pain. Pt notes sharp, lower ab pain began Friday. Pt describes pain as sharp, intermittent, non-radiating. Notes pain was improved since Friday. Was seen in the ED x 2. Pt denies fevers, chills. Was diagnosed UTI - Currently on Cipro. Pt had a abdominal ultrasound protocol. No stone disease or masses were seen. Since that time, pt notes vaginal discharge.  

MEDICAL HISTORY
□ Non contributory  □ No Change to Pt. Health History dated:  (Pt. health history to be updated q 2yrs)

Past Gynecologic History:
Menses started @ 9 yrs, have been regular lasting 23 days.
Sexually active 1 new partner
Sexual contact:  chlamydia, gonorrhea
Past Obstetrics History:  

Go

Past Medical History:  
unremarkable

Past Surgical History:  
none

Current Medications:  
Cipro

Allergies:  
NKA
### FAMILY HISTORY

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<tr>
<th>Illness</th>
<th>YES</th>
<th>Relative</th>
<th>Illness</th>
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<th>Relative</th>
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<tr>
<td>Cancer (list type)</td>
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<td>mother</td>
<td>Heart Disease</td>
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<td>father</td>
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<tr>
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<td>Heart Attack</td>
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<td>Gyn.</td>
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<td>Stroke</td>
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<td>Colon</td>
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<td>Diabetes</td>
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<td>other</td>
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<td>Hypertension</td>
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<td>Osteoporosis</td>
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<td></td>
<td>Bleeding Problem</td>
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### SOCIAL HISTORY

- Noncontributory
- No change to Pt. Health History dated: (Pt. health hx To be updated q 2yrs)

#### SCREENING & COUNSELING pertinent per age of patient

<table>
<thead>
<tr>
<th>Diet &amp; Exercise</th>
<th>Substance Use</th>
<th>Disease &amp; Injury Prevention</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diet: Tobacco Use</td>
<td>Breast Self Exam</td>
<td>Contraception</td>
<td></td>
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<tr>
<td>Weight loss: Alcohol/ Drug Use</td>
<td>Suicide/Depression</td>
<td>HRT/ERT</td>
<td></td>
</tr>
<tr>
<td>Calcium Intake: Treatment options</td>
<td>Physical or Sexual Abuse</td>
<td>Safe Sex / High Risk Behaviors</td>
<td></td>
</tr>
<tr>
<td>Caffeine Intake: Other</td>
<td>Colon Cancer Screen</td>
<td>STD screen</td>
<td></td>
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<tr>
<td>Regular Exercise: Other</td>
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</table>

Notes: [Handwritten Notes]

### REVIEW OF SYSTEMS

- Non changes to Pt. Health History dated: (Pt. health hx To be updated q 2yrs)

<table>
<thead>
<tr>
<th>NEGATIVE</th>
<th>System Reviewed</th>
<th>Circle if Positive</th>
<th>Document other symptoms</th>
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<tbody>
<tr>
<td></td>
<td>Constitutional</td>
<td>weight loss, weight gain, fever, fatigue</td>
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<tr>
<td></td>
<td>Eyes: vision change, glasses/contacts</td>
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<td></td>
<td>HENT: headache, dentures, hearing loss, sinusitis</td>
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<td></td>
<td>Cardiovascular: edema, orthopnea, palpitations, chest pain</td>
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<td>Respiratory: SOB, wheezing, hemoptysis, cough</td>
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<td></td>
<td>Gastrointestinal: Nausea/Vomiting/Diarrhea, pain, constipation, bleeding</td>
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<tr>
<td></td>
<td>Genitourinary: hematuria, dysuria, urgency, incontinence, PMS, abnormal periods, dyspareunia, vag. discharge, dysmenorrhea</td>
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<tr>
<td></td>
<td>Musculoskeletal: muscle weakness, joint pain</td>
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<td>Skin: rash, lesions, sores, acne</td>
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<td>Breast: discharge, pain, lumps, asymmetry</td>
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<tr>
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<td>Neurologic: headache, dizziness, numbness</td>
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<td>Psychiatric: depression, anxiety</td>
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<td>Endocrine: diabetes, thyroid, hot flashes, hair loss</td>
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<td>Hemato-Lymph: bleeding, bruising, adenopathy, ABO/Rh</td>
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</table>

- All other Systems Negative

I have reviewed and revised the patient's history information with the patient as above:

- PF: CC + 1 HPI
- EPF: CC + 1 HPI + 1 ROS
- Detailed: CC + 4 HPI + 2 ROS + 1 PFSH
- Comprehensive: CC + 4 HPI + 10 ROS + 3 PFSH
Physical Exam - Breast Pelvic Exam

CHECK BOX IF EXAM NORMAL/NEGATIVE AND DOCUMENT ALL POSITIVE FINDINGS

**CONSTITUTIONAL:**
- Vital Signs, minimum 3
  - BP 124/80 T: 37⁰ P: 88 R: 16
  - Well developed, well Nourished

**GI:**
- Abdomen, soft and nontender, no masses
- No Hernias
- No Hepatosplenomegaly

**LYMPHATIC:**
- No axillary or inguinal nodes palpated

**SKIN:**
- Normal inspection

**BREASTS:**
- No Masses or Lumps
- Non-tender
- Without discharge or galactorrhea

**GU:**
- 6 of 10 exam areas
  - External Genitalia,
    - Normal appearance, no lesions
  - Urethral meatus,
    - Normal size and location
    - No lesions or prolapse
  - Urethra
    - No masses or tenderness
  - Bladder,
    - No Masses or tenderness
  - Vagina/Pelvic Support
    - Visualized, no abnormal discharge
    - Good pelvic support
  - Cervix,
    - No lesions
    - Pap obtained
    - Screen for Gonorrhea/Chlamydia
  - Uterus,
    - Normal size, mobile, nontender
  - Adnexa/parametria
    - No masses, tenderness or organomegaly
  - Digital Rectal Exam,
    - Normal sphincter tone, w/ masses
    - Stool Guaiac obtained
  - Anus/Perineum,
    - Normal

**PSYCHIATRIC:**
- Oriented X 3

**HEENT:**
- Thyroid nontender, not enlarged, no masses

**RESPIRATORY:**
- Normal Respiratory Effort, Clear to P & A

**CARDIOVASCULAR:**
- Normal Heart Sounds, regular rhythm
- No Murmurs
- Normal peripheral vascular

**MUSCULOSKELETAL:**
- No deformities/weakness

**NEUROLOGIC:**
- Normal Reflexes

I have personally examined the patient and agree/revised with the above physical exam.

<table>
<thead>
<tr>
<th>Prob. Focused -</th>
<th>Exp. Prob. Focused-</th>
<th>Detailed-</th>
<th>Comprehensive</th>
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<tbody>
<tr>
<td>1 Organ system</td>
<td>2 Organ system</td>
<td>5 Organ Systems</td>
<td>8 organ Systems or GYN specialty exam</td>
</tr>
</tbody>
</table>

Well Woman
Coast-Breast
AMOUNT AND COMPLEXITY OF DATA REVIEWED:

SCREENING/TESTS ORDERED:
- 1 pt for lab
- 1 pt for radiology
- 1 pt for diagnostic
- Only add 1 pt no matter how many ordered or done today
- Urine Dipstick today. Results:
- Pap obtained today.
- Wet Mount results:
- Fecal Occult Blood test
- HDL/Cholesterol
- Thyroid stimulating hormone test
- Fasting Glucose test
- Other lab: describe EMB

- Radiology/Ultrasound/Diagnostic
- BMD
- Mammogram
- Sigmoidoscopy/Colonoscopy
- Ultrasound: describe
- Other: describe

REVIEW OF RECORDS (points as indicated)
- □ Review previous Test Results (1 pt)
- Discussion of Test results w/performing physician (1 pt)
- Old records reviewed and summarized (2 pt)
- History obtained from other source (2 pt)
- Decision to obtain other medical records (1 pt)
- Independent review of image/specimen/tracing (2 pt)

Total Pts 1 or less—minimum 2—limited 3—moderate 4 or more—extensive

DIAGNOSIS AND MANAGEMENT OPTIONS

1 pt ea minor prob
1 pt ea stable est prob
2 pt ea unstable est prob
3 pt ea new prob/no workup planned
4 pt ea new prob w/workup

Total points =

Age 42  G D P S/P

□ Normal pelvic and breast exam. return 1 year (V72.3 gyn exam w/o p/v)

AND/OR
Impression:
1. Vt
2. Abnormal bleeding
3. Desires pregnancy
4. Tobacco abuse
5. HM

Plan:
1. Can't lipro. 5/s p/v then menstrual
2. EMB obtained. Triage based on results. Instructed to keep menses/period long
3. Start PNV
4. Tobacco cessation—extensive counseling done

PHYSICIAN SIGNATURE: [Signature]

TODAY'S DATE:
### RISK OF COMPLICATION

<table>
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<th>High</th>
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<tr>
<td>Self limited minor prob</td>
<td>Multiple prob/chronic stable illness</td>
<td>1 or chronic illness/undx new prob</td>
<td>Illness acute/severe exacerbation</td>
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<td>Lab tests ordered</td>
<td>Imaging study/blood draw</td>
<td>minor surg w/risks</td>
<td>Invasive diagnostics</td>
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<tr>
<td>Rest etc</td>
<td>OTC/minor procedure</td>
<td>RX management</td>
<td>Major surg w/risks</td>
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#### Medical Decision Making (2 of 3)

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### COUNSELING AND/OR COORDINATION OF CARE:

I have spent a total of ________ minutes with patient of which ________ minutes were spent discussing the following:

(-if more than 50% of time spent in counseling patient then bill e&m services by total time, as documented above)

Beginning Time:  
Ending Time:    
Total Time: 

### Selection of E&M level

#### Established patient (2 or 3 elements)

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<th>MDM</th>
<th>Min.</th>
<th>Level</th>
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<th>New Level</th>
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### PHYSICIAN SIGNATURE:  

TODAY'S DATE:
OUTLINE FOR

PEDIATRIC HISTORY

AND

PHYSICAL EXAMINATION
OUTLINE FOR PEDIATRIC HISTORY
AND PHYSICAL EXAMINATION

Introduction

This outline is designed to assist you in obtaining a complete pediatric history and performing a thorough physical examination on your patients while on the pediatrics rotation. It is important to emphasize that there is an art to interviewing and examining a patient, especially a child. It is more than just asking a predetermined list of questions. For example, after eliciting that a child has pain, it is very important to inquire into its nature, character (burning, stabbing, etc.), location, frequency, and time of day of its occurrence, how it is relieved, and whether its nature has been changing. In addition, one always has to keep in mind the relationship of age and developmental status to the symptoms and signs that are present or that you observe. As the historian, you help the patient and his/her parent with their history, without being too leading in your questioning. Much can be learned by careful observation of the patient and of the interaction between the patient and his/her family. Some questions may elicit a response that is different when the parents and child are separate than when they are together. Be certain that you use only accepted, standard abbreviations in your written evaluations.

HISTORY

Chief Complaint: (In parent's or child's words.) Duration
Source of History: Mother, father, patient, doctor's notes, etc. …estimate of reliability
Present Illness: (Name) is a (age, sex, race) admitted with…
Chronologically, where possible, with dates. Initial symptom and date of onset, subsequent symptoms chronologically. Pertinent negative data, obtained by direct questioning. If previous hospitalizations with chronic disease, an interval history since the last admission is appropriate.
Past History:

1. Birth
   a. Date, hospital and city where born.
      Birth weight.
      Respirations—spontaneous or after resuscitation. Apgars.
      Cesarean vs vaginal delivery.
   b. Parity of mother, length of gestation, diet, complications, diseases, exposure to infectious diseases, medications during pregnancy, length, type and complications of delivery, anesthesia during labor.

2. Neonatal Period
   Cyanosis; pallor; convulsions; jaundice, hemorrhage, birthmarks or deformities; respiratory or feeding difficulties. Did baby go to the NICU or to the regular nursery, home with mother?

3. Nutrition
   Breast or bottle fed. When switched to formula—type and amount of formula. Vitamins—type, when started, and when stopped. Age solids started—any food intolerances. Appetite. Weight at one month, one year and present, history of Pica, and present diet pattern.

   Smiled; head up; rolled over (prone to supine; supine to prone); reached for objects; sat without support; stood with and without support; walked without support; first tooth; first meaningful words; nursery games (bye-bye, patacake)
   Toilet training --- when began and when successfully completed.
   Age started school --- scholastic and social achievement; present grade in school; learning disabilities, attention deficit disorder.

5. Habits and Personality -- Adjust for age.
   Hours of sleep, usual bedtime, change in pattern of sleep, dreams, nightmares, exercise, favorite games and hobbies; thumb sucking; nail biting; tantrums; breath holding; tics; enuresis; encopresis; personal habits; social adjustment, friends --- hostile, aggressive, submissive, friendly, etc. Discipline methods.
6. **Immunizations**  
   (indicate source of information: Health Dept. record, mother’s verbal information, school record). Date, type of reaction, and boosters (if any). (refer to immunization schedule)

7. **Tuberculin Test** and results, PPD

8. **General Health** and previous source of medical care. Primary physician.

9. **Previous Illnesses**  
   (Age, severity, complications, and sequelae.)
   **Contagion** --- measles, mumps, varicella, rubella, pertussis, etc.
   **Other medical illnesses**, hospitalized? – if so, when, where and for how long, therapy received, final diagnosis.
   **Surgical conditions** – date and place of operation.
   **Accidents**, fractures, etc.
   **Transfusions**
   **Exposures**, lead, toxic substances.

10. **Allergies**  
    Eczema, asthma, hay fever, hives, food or drug sensitivities

11. **Medications**  
    generic name and mg/kg/day or mg/m²/day.

12. **Family History**  
    **Parents & Grandparents**  
    Age, occupation, state of physical and emotional health and if parents are not living, age at death, cause, and nature of symptoms. Height and weight of parents.
    **Siblings.**  
    Age, state of health, and where living. (If not living, age at death, cause, and nature of symptoms.)

    **Familial Illnesses or Anomalies:** (1<sup>st</sup> and 2<sup>nd</sup> degree)  
    Cancer, heart disease, hypertension, kidney disease, diabetes, allergy, hereditary, blood dyscrasias, mental retardation, dystrophies, congenital anomalies, congenital or heritable illnesses or syndromes.

    **Family Pedigree:** Diagram
13. Social History
   Living Circumstances
   Place and nature of dwelling; sleeping arrangements; number of persons living in home in addition to parents and children; relation of such persons to family members. Day care, where; smokers in the home, pets, source of water.
   Economic Circumstances:
   Members of family who work; working hours if unusual; general level of economic independence, support from community agencies, if any; medical coverage, insurance, Medicaid, HMO.
   Neighborhood Circumstances:
   Available recreational and educational facilities in neighborhood. Sports. Daily program – after school activity – TV watching, Nintendo or Sega, Computer, Pets in neighborhood, travel, Parents as Teachers participation.

14. Review of Systems (list only positives)
   Head, eyes, ears, nose, throat, and neck-
   Head -- Headache, head trauma.
   Eyes – vision, glasses, squint, inflammatory disease; vision tested at school, special seating needed.
   Ears – hearing, otitis, discharge.
   Nose – discharge, epistaxis.
   Skin -- rashes, eczema
   Mouth – gingivitis, condition of teeth, date of last dental visit, whitening, brush teeth.
   Throat – tonsillitis, recurrent pharyngitis.
   Neck – masses.
   Respiratory – Chronic cough, frequent URI’s, previous pneumonia, exposure to tuberculosis, previous chest x-ray & when.
   Cardiac – History of murmurs; history of dyspnea, orthopnea, cyanosis
   Gastrointestinal – Appetite and digestion.
   Bowel habits, character and frequency of stools. Jaundice, diarrhea, constipation, vomiting, hematemesis, melena, passage of worms, abdominal pain.
   Genitourinary – Circumcised; dysuria; hematuria; polydipsia; nocturia; enuresis; frequency. Onset of menarche in females;
date of last menstrual period; frequency and duration.

**Neuromuscular** – Tremors, seizures, weakness or paralysis, polio.

**Joints** – Arthritis or arthralgia; loss of mobility; hyperextensibility, early morning stiffness.

**Hematologic Disorders** – Hemorrhages, anemia, bleeding tendency.

**Recent infectious disease exposure.**

**PHYSICAL EXAMINATION**

Performance of a successful pediatric physical examination will vary with the age of the patient. It is often easiest to examine the neonate and the very young infant on an examining table. From several months of age through the preschool years, it is often more effective to have the patient lie or sit in his/her parent’s lap and carry out the majority of the examination while the child is held. For adolescents, unless they wish otherwise, it is wisest to examine them without the family present, at which time additional confidential historical information may be obtained. If the adolescent is of the opposite sex of the examining physician, it is best to have a nurse or attendant present.

Observation is of prime importance in pediatrics. Assessment of performance capabilities and neurologic status is difficult once a child is disturbed. Therefore, observe the spontaneous activity of the patient—play with the infant, have an older child walk heel to toe and hop—and obtain a quick screen for intelligence, hearing and vision before the rest of the physical examination.

The sequence of the examination is noteworthy (least invasive first, most invasive last). It is often prudent to leave the examination of ears and throat until last. Should the history suggest a cardiac or abdominal problem, carry out that part of the examination while cooperation is at its best.

Always be aware of a reason for each phase of the physical examination as you are conducting it and obtain as complete an explanation as you can of anything which seems unusual.

1. **General Appearance** – Sex, state of nutrition and hydration, attitude, position, sensorium, pitch, intensity of cry or voice, distress, gait, personality, cooperation,
interest in environment, gross
developmental status for age.

2. **Vitals** - Temperature, pulse, respirations, blood pressure, arms and legs (when patient is relaxed)

3. **Growth Parameters** - Weight (kg) (percentile), Height (cm) (percentile), head circumference (cm) (percentile)

4. **Head** – Contour, bossing, texture of hair, scalp, fontanelles (dimensions in cm) if open, and comment on tension and sutures. Percussion and auscultation.

5. **Eyes** – Proptosis, sclerae, conjunctivae, ptosis, squint, photophobia, discharge.

6. **Ears** – Hearing, discharge, canals, examination of drums (color, bulging, landmarks, perforation, mastoid tenderness, mobility of drums on insufflation).

7. **Nose** – Patency of nares, flaring of alae nasi, discharge, obstruction, mucous membranes, and turbinates (swollen, red, pale, boggy), septum, sinus tenderness (frontal, ethmoid and maxillary).

8. **Mouth and Throat** -
   - **Lips** – color, dryness, fissures, lesions.
   - **Tongue** – color, moisture, coating, fissures, ulcers, frenulum, protrusion.
   - **Breath** – odor
   - **Teeth** – number, arrangement, caries.
   - **Gums** – color, hypertrophy, bleeding, ulcers.
   - **Buccal mucosa** – color, exudate, postnasal discharge, lymphoid tissue.
   - **Epiglottis**.
   - **Tonsils** – size, signs of inflammation, exudate, membrane, tonsillar pillars.

9. **Neck** – Flexibility, swelling, thyroid enlargement,

10. **Lymph Glands** – location, size in centimeters, consistency, tenderness, mobility, fluctuance, discrete or matted.

11. **Spine** – Curvature, tenderness along spinous processes, mobility; check for pilonidal sinus.


13. **Lungs** – percussion, palpation, fremitus, auscultation.
14. Cardiovascular –
   Heart – inspection, precordial bulge, apical heave.
   Palpation – PMI-diffuse or circumscribed, thrill.
   Percussion – heart borders
   Auscultation – rhythm, character, and quality of sounds, S1; A2 and P2. Splitting of S2 and intensity.
   Murmurs – time, duration, location, intensity, transmission, alteration with change of position, with patient’s exercise.
   Pulse – radial and femoral – rate and rhythm, amplitude.

15. Abdomen
   Inspection – contour, umbilicus, hernia, distension, veins, visible peristalsis.
   Percussion – Fluid wave, shifting dullness, tympanites, bladder, liver and spleen size, tenderness. CVA tenderness.
   Palpation – Tone, tenderness, voluntary or involuntary rebound. Diastasis recti, masses, liver, spleen, kidneys, auscultation of bowel sounds. Transillumination of abdominal masses in young infants.

16. Genitourinary
   Male – Tanner stage, prepuce or circumcision, meatus, testes size and descent, hydrocoele (transillumination).
   Female – Tanner stage, external examination —vulva, clitoris, discharge. Presence or absence of pubic and axillary hair. Pelvic on sexually active females by one experienced person.


18. Skin – Texture, color, tissue turgor, temperature, moisture, icterus, cyanosis, eruption, scars, ecchymosis, petechiae, desquamation, hemangioma, Mongolian spots, nevi.

20. Neurologic

Mental State – Affect. Orientation, level of consciousness. Estimate of intelligence.

Motor – Gait, stance, muscle power, tone, carpopedal spasm, tics, tremors, athetosis, etc.

Cerebellar Signs – Incoordination or ataxia, intention tremor, dysmetria.

Cranial Nerves --

Smell

Visual acuity, visual fields, optic discs.
Eyelids, EOM, pupils, nystagmus (describe)

Motor – muscles of mastication (jaw deviates to side of lesion)

Sensory – sensation of face, forehead, lips, tongue, buccal mucosa, corneal reflex.

Peripheral lesion – paralysis of all facial muscles, impaired lid closure. Loss of taste on anterior 2/3 of tongue.

Supranuclear lesion – weakness of lower ½ of face; expressions of emotion are intact and symmetrical.

Auditory – hearing – vestibular function (caloric testing done by one experienced person if indicated).

Elevation of palate - gag reflex, swallowing, movements of vocal cords.

Sternomastoid and trapezius

Tongue movements - atrophy, fasciculation (tongue protrudes toward the paralyzed side).

Reflexes –

Deep Tendon Reflexes (1—4+ .....2+ average), biceps, triceps, radial, knee, ankle.
Chvostek.

Superficial – abdominal, cremasteric.

Abnormal – Babinski (toes dorsiflex to plantar stimulation). If symmetric, normal in infant.

In Infants – palmar and plantar grasps, suck, Moro, root, tonic neck, stepping, placing, Landau and Gallant.

Sensory System – pinprick, touch, position and vibratory sense. Romberg.

Meningeal signs – Kernig, Brudzinski.
ASSESSMENT AND PLAN
Should include:

1. **Summary** of patient with a discussion of the **differential diagnosis** and of the problem as presented by this patient.
2. **Impression** – the diagnosis or diagnoses and the list of problems.
3. **Plan** for diagnostic work-up in order of importance. Plan for therapy, diet, etc.

Updated 10/2003
wine and physical

date: 6/23/03

cc: “working harder to breathe”
source: patient’s mother, who is an able
historian

hpi:

jimmy is a 4 year-old, african-american
male, with a history of reactive airway disease,
who presents with a 2 day history of increased
work of breathing. his mother reports that 4
days prior to admission, jimmy developed clear
rhinorrhea and cough. 3 days prior to
admission, he developed fever to 101 f. for the
past two days, jimmy has been “working harder
to breathe.” his mother has noticed him
breathing faster and describes audible wheeze.
he seems to tire more quickly at play and is
sleeping more. he is able to speak in complete
sentences and is eating and drinking normally.
for the past 2 days, jimmy has been receiving
albuterol nebulizer treatments at home (0.5 cc
albuterol in 2 cc saline), approximately every 4
hours. his mother says that the treatments help,
but the effect wears off after 1-2 hours.

jimmy’s mother reports that she administers
albuterol nebs or mdi to jimmy at least every
other day. the longest period jimmy has gone
without albuterol is 1 week. the patient’s usual
triggers are upper respiratory infections, weather
changes, dust, and smoke. jimmy’s mother often
hears him coughing at night. jimmy’s first
wheezing episode was at 5 months old in the
setting of rsv infection. he was diagnosed with
reactive airway disease at 15 months. 3 previous
hospitalizations and 3 other ed visits for
wheezing. no intubation or icu stay.

jimmy presented to the slch ed with a
respiratory rate of 50 and sao2 97% on room air.
he received an albuterol/atrovent nebulizer
treatment and 2 mg/kg po prednisolone. his
respiratory rate improved to 40, but he continued
to have significant wheeze and retractions. he
received 2 additional albuterol treatments. he
is admitted to the general pediatrics service for
further care.
Past History:

1. Birth
   - born at 34 weeks estimated gestational age by normal spontaneous vaginal delivery to a 24 yo G2P2 female at Barnes-Jewish Hospital in St. Louis, MO
   - mother was healthy throughout pregnancy; no known maternal illness, medication, or drug use; maternal serologies negative
   - birth weight 4 lbs. 10 oz (2.099 kg)
   - spontaneous respirations; APGAR scores 7 at 1 minute and 8 at 5 minutes

2. Neonatal Period
   - hospitalized for 2 weeks immediately after birth in the Barnes Special Care Nursery for oxygen, feeding assistance, and temperature instability; no intubation/mechanical ventilation; discharged home on room air

3. Previous Illnesses
   - hospitalized at SLCH at 3 months old with fever for “rule out sepsis”; no bacterial etiology found
   - hospitalized at SLCH at 5 months old for 5 days with RSV
   - 2 prior hospitalizations at SLCH at 15 months & 2½ years for RAD exacerbation; 3 ED visits in the past year for wheezing
   - followed for eczema as an outpatient
   - no history of surgery, fracture, blood transfusion

4. Nutrition
   - bottle fed Enfamil with iron until 12 months old
   - introduced cereal at 4 months old without problems
   - taking table foods by 10 months old
   - no history of feeding intolerance or pica
   - currently eats small amounts of food from all 4 food groups and drinks 50 oz 2% milk per day

5. Development
   - smiled and held head up at 2 months; rolled over at 4 months; sat without support at 6 months; stood with out support and took first steps at 12 months; said “mama” and “dada” by 7 months and specifically by 10 months;
began toilet training at 3 years-old, currently toilet trained for bowel and bladder in both night and day, but occasionally has nocturnal enuresis with change of routine

currently in second year of preschool (3 half days per week) and daycare 2 full days per week; teachers report that Jimmy does well with activities and gets along well with the other children

Immunizations
- up to date; completed Prevnar, Hepatitis B, Varicella, and Hib vaccine courses; has received 4 DtaP, 3 IPV, and 1 MMR vaccines
- no history of reactions to vaccines

Medications
- albuterol MDI with aerochamber and mask 2 puffs q 4 hours prn
- albuterol nebulizer solution 0.5 cc in 2 cc normal saline q 4 hours prn
- hydrocortisone 1% ointment to body and 0.5% ointment to face bid
- Vaseline to body bid and after baths

Allergies
- no known medication allergies
- contact dermatitis with silk tape
- eczema followed by PMD

General health
- PMD is Dr. Janet Smith, Pediatric Care Clinic, St. Louis, MO

Social History
1. Habits and Personality
- sleeps 10 hours per night, usual bedtime 8 PM; occasionally takes 1 hour afternoon nap; no history of night terrors
- enjoys playing kickball and coloring; interested in dinosaurs and race cars; outgoing and friendly towards other children
- rarely has temper tantrums; usually responds well to time-out for discipline

2. Living Situation
Jimmy lives at home with his parents and 2 siblings in St. Louis, MO
- attends pre-school and Daycare
- no smoking in the home
- family has 2 cats
- city water

Family History
- mother, 28 yo social worker, history of asthma as a child, history of eczema; 63 inches tall, 130 lbs.
- father, 30 yo high school teacher, history of asthma; 70 inches tall, 180 lbs.
- grandparents, MGF-60 yo, HTN, high cholesterol; MGM-57 yo, breast CA in remission, PGF 64 yo, HTN, Type II DM, PGM 60 yo, rheumatoid arthritis
- siblings- 6 yo brother, ADHD, seasonal allergies; 2 yo sister, RAD, eczema
- no family history of blood dyscrasias, mental retardation, psychiatric disorders

Review of Systems
- wears glasses; last eye exam 6 months ago
- clear rhinorrhea and cough x3 days
- dry, pruritic skin rash on trunk and flexor extremities
- healthy dentition; last dental visit 4 months ago
- chronic cough at night
- ROS otherwise negative

Physical Exam
4 yo, well-developed African-American male, sitting up in bed. Alert, pleasant, and cooperative, in mild to moderate respiratory distress.
T 38.9 C HR 154 RR 40 BP 95/57 SaO2 97% on RA
Wt 13 kg (3%) Ht 95 cm (3%)
HEENT: Head atraumatic, normocephalic, no frontal bossing. Sclerae white, no eye discharge or conjunctivitis. No photophobia. Normal pinnae. Left tympanic membrane red and bulging with poor mobility, right tympanic membrane clear with good landmarks and mobility. Small amount of

**Neck:** Supple, flexible. No thyroid enlargement.

**Lymph glands:** Shotty anterior cervical lymphadenopathy, no tenderness or fluctuance. No supraclavicular, axillary, or inguinal lymphadenopathy.

**Spine:** Spine straight. No tenderness or lesions.

**Thorax:** Symmetric expansion. Moderate subcostal and intracostal retractions, no grunting.

**Lungs:** Symmetric air entry. Diffuse end-expiratory wheezes, prolonged inspiratory to expiratory ratio.

**Cardiovascular:** Normal appearing precordium. No thrill or heave. PMI at the 4th ICS mid-clavicular line. Regular rate and rhythm, normal S1 and S2, no S3 or S4. Normal splitting of S2. No murmur. 2+ carotid, brachial, radial, and femoral pulses.

**Abdomen:** Normal contour. Active bowel sounds. No distention or veins. No tenderness. Liver at the right costal margin. No splenomegaly or mass. No CVA tenderness. No rebound or guarding.

**Genitourinary:** Tanner I male, circumcised. Testes descended bilaterally.

**Skin:** Dry patches of excoriated hypopigmented skin on trunk and flexural extremities. No icterus or cyanosis. No petechiae or ecchymosis.

**Extremities:** Warm, normal color and tone. No clubbing, cyanosis, or edema. No joint tenderness or swelling. Full ROM of extremities bilaterally.

**Neurologic:** Pleasant affect. Oriented to person and place. Normal gait. Strength 5/5. Normal tone. No tics, tremor, or other abnormal movements. Cranial nerves I-XII
intact. EOMI, PERRLA. DTR’s 2+ bilaterally. Toes downgoing.

Laboratory:
CBC: WBC 7.5 (62 segs, 28 lymphs)
   Hgb 8.2, Hct 24.6, MCV 68, RDW 15.2, retic 1.2
   Plt 305
Peripheral smear-hypochromic, microcytic anemia
Blood culture-pending

Radiology:
CXR: hyperinflated lung fields, no lobar infiltrate, normal heart size

Problem list:
1. Respiratory distress
2. Fever
3. Right otitis media
4. Eczema
5. Microcytic anemia
6. Poor growth

Impression:
Jimmy is a 4 year-old African-American male with a history of moderate-persistent reactive airway disease, presenting with a 2 day history of wheeze, cough, and fever.

Plan:
1. Respiratory distress:
The most likely cause of this patient’s respiratory distress is reactive airway disease exacerbation. Given the patient’s past medical history of RAD, common trigger of URI, and negative chest X-ray, this diagnosis fits well. The patient’s positive response to albuterol in the ED also supports a diagnosis of RAD exacerbation. Pneumonia is always a consideration in the setting of respiratory distress and fever, but is less likely in this case, given the negative chest X-ray. Foreign body aspiration is another concern, but seems less likely given the negative chest X-ray (although many aspirated items are
radiolucent) and gradual worsening of symptoms.
- Continue albuterol/Atrovent nebulizer treatments. Start at q 2 hour treatments and space as tolerated.
- Methylprednisolone 2 mg/kg/day for 5 days.
- Consider adding an inhaled steroid to the patient’s daily regimen given the chronic RAD symptoms described.
- Asthma education for patient and family, including recognizing early signs of RAD exacerbation, eliminating household triggers, and reviewing an Asthma Action Plan.

2. Fever:
Likely secondary to acute otitis media or viral URI, but will monitor closely for other signs of infection
- Amoxicillin 80 mg/kg/day divided tid versus otitis media
- Follow-up blood culture
- Nasopharyngeal swab to evaluate for viral etiology of URI symptoms

3. Eczema:
Has been managed as an outpatient with topical lubricants and steroid ointments. With RAD, support atopic predisposition in this patient.
- Continue Vaseline and hydrocortisone

4. Microcytic anemia:
Patient has a hypochromic, microcytic anemia, likely due to iron-deficiency. Diet history reveals a large milk intake, likely at the expense of other iron-containing foods.
- 3 mg/kg/day elemental iron
- Limit milk intake to 24 oz per day
- Repeat CBC in 3 months

5. Poor growth:
Patient’s height & weight are at the 3%. This may be his natural growth pattern, but could also represent inadequate caloric intake, especially in light of his dietary history.
- Obtain old growth charts from PMD
WUMS III Admit Note

Date: 6/23/03

CC: “working harder to breathe”
Source: patient’s mother, who is an able historian

HPI:

Jimmy is a 4 year-old, African-American male, with a history of reactive airway disease, who presents with a 2 day history of increased work of breathing. His mother reports that 4 days prior to admission, Jimmy developed clear rhinorrhea and cough. 3 days prior to admission, he developed fever to 101 F. For the past two days, Jimmy has been “working harder to breathe.” His mother has noticed him breathing faster and describes audible wheeze. He seems to tire more quickly at play and is sleeping more. He is able to speak in complete sentences and is eating and drinking normally. For the past 2 days, Jimmy has been receiving albuterol nebulizer treatments at home (0.5 cc albuterol in 2 cc saline), approximately every 4 hours. His mother says that the treatments help, but the effect wears off after 1-2 hours.

Jimmy’s mother reports that she administers albuterol nebs or MDI to Jimmy at least every other day. The longest period Jimmy has gone without albuterol is 1 week. The patient’s usual triggers are upper respiratory infections, weather changes, dust, and smoke. Jimmy’s mother often hears him coughing at night. Jimmy’s first wheezing episode was at 5 months old in the setting of RSV infection. He was diagnosed with reactive airway disease at 15 months. 3 previous hospitalizations and 3 other ED visits for wheezing. No intubation or ICU stay.

Jimmy presented to the SLCH ED with a respiratory rate of 50 and SaO2 97% on room air. He received an albuterol/Atrovent nebulizer treatment and 2 mg/kg po
prednisolone. His respiratory rate improved to 40, but he continued to have significant wheeze and retractions. He received 2 additional albuterol treatments. He is admitted to the general pediatrics service for further care.

Past History:
1. Birth
   -born at 34 weeks estimated gestational age by normal spontaneous vaginal delivery to a 24 yo G2P2 female at Barnes-Jewish Hospital in St. Louis, MO
   -mother was healthy throughout pregnancy; no known maternal illness, medication, or drug use; maternal serologies negative
   -birth weight 4 lbs. 10 oz (2.099 kg)
   -spontaneous respirations; APGAR scores 7 at 1 minute and 8 at 5 minutes

2. Neonatal Period
   -hospitalized for 2 weeks immediately after birth in the Barnes Special Care Nursery for oxygen, feeding assistance, and temperature instability; no intubation/mechanical ventilation; discharged home on room air

3. Previous Illnesses
   -hospitalized at SLCH at 3 months old with fever for “rule out sepsis”; no bacterial etiology found
   -hospitalized at SLCH at 5 months old for 5 days with RSV
   -2 prior hospitalizations at SLCH at 15 months & 2½ years for RAD exacerbation; 3 ED visits in the past year for wheezing
   -followed for eczema as an outpatient
   -no history of surgery, fracture, blood transfusion
4. Nutrition
- Bottle fed Enfamil with iron until 12 months old
- Introduced cereal at 4 months old without problems
- Taking table foods by 10 months old
- No history of feeding intolerance or pica
- Currently eats small amounts of food from all 4 food groups and drinks 50 oz 2% milk per day

5. Development
- Smiled and held head up at 2 months; rolled over at 4 months; sat without support at 6 months; stood with out support and took first steps at 12 months; said “mama” and “dada” by 7 months and specifically by 10 months;
- Began toilet training at 3 years-old, currently toilet trained for bowel and bladder in both night and day, but occasionally has nocturnal enuresis with change of routine
- Currently in second year of pre-school (3 half days per week) and Daycare 2 full days per week; teachers report that Jimmy does well with activities and gets along well with the other children

Immunizations
- Up to date; completed Prevnar, Hepatitis B, Varicella, and Hib vaccine courses; has received 4 DtaP, 3 IPV, and 1 MMR vaccines
- No history of reactions to vaccines

Medications
- Albuterol MDI with aerochamber and mask 2 puffs q 4 hours prn
- Albuterol nebulizer solution 0.5 cc in 2 cc normal saline q 4 hours prn
- Hydrocortisone 1% ointment to body and 0.5% ointment to face bid
- Vaseline to body bid and after baths
**Allergies**  
- no known medication allergies  
- contact dermatitis with silk tape  
- eczema followed by PMD

**General health**  
- PMD is Dr. Janet Smith, Pediatric Care Clinic, St. Louis, MO

**Social History**

1. Habits and Personality  
- sleeps 10 hours per night, usual bedtime 8 PM;  
  occasionally takes 1 hour afternoon nap; no history of night terrors  
- enjoys playing kickball and coloring; interested in dinosaurs and race cars; outgoing and friendly towards other children  
- rarely has temper tantrums; usually responds well to time-out for discipline

2. Living Situation  
- Jimmy lives at home with his parents and 2 siblings in St. Louis, MO  
- attends pre-school and Daycare  
- no smoking in the home  
- family has 2 cats  
- city water

**Family History**  
- mother, 28 yo social worker, history of asthma as a child, history of eczema; 63 inches tall, 130 lbs.  
- father, 30 yo high school teacher, history of asthma; 70 inches tall, 180 lbs.  
- grandparents, MGF-60 yo, HTN, high cholesterol; MGM-57 yo, breast CA in remission; PGF 64 yo, HTN, Type II DM, PGM 60 yo, rheumatoid arthritis  
- siblings- 6 yo brother, ADHD, seasonal allergies; 2 yo sister, RAD, eczema  
- no family history of blood dyscrasias, mental retardation, psychiatric disorders
Review of Systems
- wears glasses; last eye exam 6 months ago
- clear rhinorrhea and cough x3 days
- dry, pruritic skin rash on trunk and flexor extremities
- healthy dentition; last dental visit 4 months ago
- chronic cough at night
- ROS otherwise negative

Physical Exam
4yo, well-developed African-American male, sitting up in bed. Alert, pleasant, and cooperative, in mild to moderate respiratory distress.
T 38.9 C  HR 154  RR 40  BP 95/57  SaO2 97% on RA
Wt 13 kg (3%)  Ht 95 cm (3%)
HEENT: Head atraumatic, normocephalic, no frontal bossing. Sclerae white; no eye discharge or conjunctivitis. No photophobia. Normal pinnae.
Neck: Supple, flexible. No thyroid enlargement.
Lymph glands: Shotty anterior cervical lymphadenopathy, no tenderness or fluctuance. No supraclavicular, axillary, or inguinal lymphadenopathy.
Spine: Spine straight. No tenderness or lesions.
Thorax: Symmetric expansion. Moderate subcostal and intracostal retractions; no grunting.
Lungs: Symmetric air entry. Diffuse end-expiratory wheezes, prolonged inspiratory to expiratory ratio.
Cardiovascular: Normal appearing precordium. No thrill or heave. PMI at the 4th ICS mid-clavicular
line. Regular rate and rhythm, normal S1 and S2, no S3 or S4. Normal splitting of S2. No murmur. 2+ carotid, brachial, radial, and femoral pulses.

**Abdomen:** Normal contour. Active bowel sounds. No distention or veins. No tenderness. Liver at the right costal margin. No splenomegaly or mass. No CVA tenderness. No rebound or guarding.

**Genitourinary:** Tanner I male, circumcised. Testes descended bilaterally.

**Skin:** Dry patches of excoriated hypopigmented skin on trunk and flexural extremities. No icterus or cyanosis. No petechiae or ecchymosis.

**Extremities:** Warm, normal color and tone. No clubbing, cyanosis, or edema. No joint tenderness or swelling. Full ROM of extremities bilaterally.


**Laboratory:**

- **CBC:** WBC 7.5 (62 segs, 28 lymphs)
  - Hgb 8.2, Hct 24.6, MCV 68, RDW 15.2, retic 1.2
  - Plt 305
  - Peripheral smear-hypochromic, microcytic anemia

**Blood culture:** pending

**Radiology:**

- **CXR:** hyperinflated lung fields, no lobar infiltrate, normal heart size
Problem list:
1. Respiratory distress
2. Fever
3. Right otitis media
4. Eczema
5. Microcytic anemia
6. Poor growth

Impression:
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   - Continue albuterol/Atrovent nebulizer treatments. Start at q 2 hour treatments and space as tolerated.
   - Methylprednisolone 2 mg/kg/day for 5 days.
   - Consider adding an inhaled steroid to the patient’s daily regimen given the chronic RAD symptoms described.
   - Asthma education for patient and family, including recognizing early signs of RAD
exacerbation, eliminating household triggers, and reviewing an Asthma Action Plan.

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   Likely secondary to acute otitis media or viral URI, but will monitor closely for other signs of infection
   - Amoxicillin 80 mg/kg/day divided tid versus otitis media
   - follow-up blood culture
   - nasopharyngeal swab to evaluate for viral etiology of URI symptoms

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   Has been managed as an outpatient with topical lubricants and steroid ointments. With RAD, support atopic predisposition in this patient.
   - continue Vaseline and hydrocortisone

4. Microcytic anemia:
   Patient has a hypochromic, microcytic anemia, likely due to iron-deficiency. Diet history reveals a large milk intake, likely at the expense of other iron-containing foods.
   - 3 mg/kg/day elemental iron
   - limit milk intake to 24 oz per day
   - repeat CBC in 3 months

5. Poor growth:
   Patient’s height & weight are at the 3%. This may be his natural growth pattern, but could also represent inadequate caloric intake, especially in light of his dietary history.
   - obtain old growth charts from PMD

Jamie C. Student
WUMS III
Pediatrics Clerkship – Sample Daily Progress Note

WUMS III Daily Progress Note
Date: 7/14/10  11:20

Subjective:
Ryan says his arm doesn’t hurt anymore and his mother says he is ready to go home.

Objective:
Ryan has been afebrile for 24 hours, Tmax 36.9. Vital signs normal.

Medications:
Clindamycin Day #2  375 mg IV every 8 hours

Physical Exam:
Wt 45 Kg  T 37.0  P 80  R 16
Comfortable, talkative
Cardiovascular: normal S1, S2, regular rate and rhythm, no murmurs
Lungs: clear to auscultation, good equal breath sounds
Abdomen: soft, non tender, no hepatosplenomegaly
Skin: no rashes
Lymph nodes: no significant adenopathy
Extremities: right forearm- 5 x 6 cm area of erythema, minimal induration, no discharge, non tender to palpation

Labs: wound culture growing staph aureus sensitive to clindamycin, erythromycin, TMP-SMX, vancomycin. Resistant to penicillin, oxacillin, cefazolin

Assessment:
Ryan is a 12 yr old with MRSA abscess of his right arm s/p incision and drainage. He has shown remarkable improvement on clindamycin.

Plan:
Transition to oral clindamycin 450 mg every 8 hours for 7 days
Discharge to home
Follow up in 1 week with his primary care provider

Jamie C Student, WUMS III
What follows are the essential elements of the initial psychiatric work-up. Although very similar to the evaluations performed by other fields of medicine, the history and physical (H&P) described below is modified and expanded in certain areas to meet the specific needs of psychiatry. Medicare also requires certain elements in a work-up. Most required elements are consistent with routine medical care. However, there are occasional required elements, which are not routinely done. These are bolded.

Some general information about the process:
- The H&P must be dictated at the time of hospital admission. Use the STAT dictation mode. Forms are available to facilitate completion of the examination, document that an examination was performed and serve as a template for dictation - but are not mandatory. Evaluations performed in outpatient settings are less urgent and frequently will not include a physical examination but should follow the same format otherwise.

- If a particular aspect of the examination is not performed, indicate, "not done". Do not write, "defer" unless you plan to document the examination later. It can be useful to elaborate on the reasons (e.g. “patient too somnolent to allow testing of cognition”). These occurrences should be rare. Examinations of the genitals and breasts may be skipped if the patient has had it done in the past year. However, this should not be an invariant practice and a sensible plan to address this portion of the physical examination seems prudent (e.g. “mammograms one year ago – unremarkable according to patient, she will follow-up with primary care doctor”). If an important portion of the examination is incomplete, attention should be given in the A/P to a sensible plan to complete the examination at a later date. If the patient is not admitted to your service, inform the resident about the aspects of the exam that could not be completed or, in the case of attendings without a resident, inform the admitting attending.

- Do not use descriptions such as "within normal limits". Instead, indicate the results.

- Each examination needs to uniquely reflect the person being examined. Comments made by the patient should be placed in quotation marks and can be a very effective way to document certain aspects about a patient’s mental status.

- The dictation should be initiated in a standard manner - example: "This is Dr. (resident) dictating the STAT psychiatric admission note for patient (W), hospital name (X), floor (Y), attending physician (Z)."

I. "IDENTIFICATION":
"This is the __ psychiatric admission of this __ (age) year old, ______ (marital status, race, gender) who was brought to the hospital by _____ (relatives, police, self)". If in hospital, "He/she enters as a patient on Dr. _____ 's service as a voluntary/involuntary patient".
II. "INFORMANTS":
Estimate the reliability of the source. Also include the relationship of the source to the patient and how well the source knows the patient. Because of HIPPA one should also note here that permission was obtained to talk with informants.

III. "CHIEF COMPLAINT":
The chief complaint should always be a quotation of the patient's own complaint, not the relative's or doctor's paraphrase.

At the physician's discretion in addition to the patient’s chief complaint a chief complaint of an informant other than the patient may be added. The source must be clear. Again, it is a quotation, not a paraphrase.

IV. "HISTORY OF PRESENT ILLNESS":
The HPI is the most important part of the history and physical. Most of the data, which will aid, directly or indirectly, in the diagnosis and treatment of the patient's illness, should be included in the HPI. Most severe psychiatric illnesses are chronic and recurrent and thus the knowledge of the longitudinal course is extremely important in assessing the patient and planning treatment. Therefore, although certain phases or manifestations of an illness may have existed for years, they are reported in the HPI. For example, in the case of a patient admitted to the hospital with affective symptoms, the initial affective episode 20 years ago is described in the HPI. This approach is similar to that taken for other chronic debilitating illnesses in which it is important to have a longitudinal perspective on the illness (e.g. asthma, CAD, PVD). Obviously one should not list verbatim everything that has happened to the patient, but rather consolidate and present the pertinent information concisely. In most cases, the data of the HPI are presented chronologically. Occasionally, the complexity of the present illness will require separate consideration of part of the history or separate consideration of one informant's report. After reading the HPI one should have an impression of the course of the patient's illness (e.g. specific symptoms and their severity, response to treatment, compliance with treatment). Doing a thorough and complete HPI will result in one including what Medicare considers the essential elements of the HPI (Location of symptom in the body [usually not an issue for psychiatric patients], Quality, Severity, Duration, Timing, Context, Modifying Factors and Associated Signs and Symptoms).

When the relevancy of certain data of the more remote history is indeterminate, such data should be included in the past medical or social history as is appropriate. Similarly, certain data about current problems (e.g. medical illnesses, drug or alcohol use, sexuality) should be included in the HPI only if they are pertinent to the present illness. If they are not, then they should be placed in the appropriate section below.

It is improper to employ flippant language. The hospital record is a formal document that may be subject to inspection by courts of law.

An earnest attempt must be made to include all the diagnostic possibilities and to avoid prejudice by presenting data referable to only one of the illnesses requiring differential consideration.
The following specific considerations should be observed in writing the HPI:

a) What was the mode of onset? Was it insidious or abrupt? Was it first apparent to the patient or to others?

b) How did the evolving illness affect the patient's usual life functions? Were his/her marriage, occupation, or avocations disrupted? Did his/her relationships with people change? Were there alterations in habits such as those of taking meals or those involving patterns of sleep? If alterations have occurred, indicate when, and how extensively.

c) What are the specific symptoms, which have appeared during the time of the Present Illness? A psychiatric case history, like histories elsewhere in medicine, is based on patterns of symptoms. Current signs observed or elicited by you are listed in the MSE section because these were obtained as a part of the examination. However, signs observed by an informant are listed in the HPI. A diagnosis becomes possible when it is found that a patient has experienced a pattern of symptoms in content and chronology with the natural history of a known illness.

d) Do not forget to include pertinent negative findings as well as positive findings.

Obviously a great many questions could be asked of each patient, but certain symptoms have proven to be particularly important in psychiatric disorders. These include: symptoms of change in physiologic functions (eating, sleeping, elimination, menses, potency), loss or gain in weight, changes in mood, changes in memory or judgment, changes in behavior suggesting hallucinations or delusions, ideas of sin, guilt, persecution, jealousy or infidelity. This list is not complete but representative.

IV. "PAST MEDICAL HISTORY":
List pertinent childhood illnesses or facts concerning growth and development.

In chronological order list operations, other hospitalizations, significant injuries, significant illnesses not resulting in hospitalization.

Specific inquiry should be made concerning head injury and neurological illness.

V. "ALLERGIES":
Formally speaking, this section should only contain medications that provoke an allergic immune response in a patient. Not uncommonly though, non-allergic responses are listed here. In order to avoid confusion one should indicate the specific response for each allergy.

VI. "MEDICATIONS":

VII."FAMILY HISTORY":
Note the presence or absence of psychiatric or neurological illness among first-degree relatives (parents, siblings, children). Inquire specifically about "nervous breakdown", depression, schizophrenia, alcoholism, mental deficiency, delinquency, legal difficulties, suicide, suicide attempts, "neuroses", epilepsy, syphilis, hospital care, and psychotherapy. When any positive material emerges, age of onset, the course of illness, specific symptoms, and treatment are all important.

Similar history concerning second-degree relatives (aunts, uncles, grandparents) is also important.

Finally, questions should be asked concerning family history of the more important and common nonpsychiatric illnesses.

VIII."SOCIAL HISTORY":
Upbringing (family constellation, socioeconomic status, religion). School and occupational history (grade completed and age when stopped, for what reason, ability, performance, and behavior in school). Types of work and job history, if pertinent. Military service (record and type of discharge). Sexual and marital history (details not only of sexual experience, but also the family dynamics with patient's role may be of importance. Premorbid personality (personality of patient before the onset of an acute psychiatric illness). Although it is often delineated with difficulty, it is worth assessing a patient's personality in order to appreciate the changes subsequent to illness. Describe briefly his/her premorbid activities, interests, general mood and social patterns. Also detail the patient's drug, alcohol and tobacco history if it is not part of the HPI. Finally, mention here if the patient is legally incompetent or has somebody legally qualified to make health decisions.

IX. "ASSETS":
Medicare requires statements regarding the patient's assets. Briefly mention patient's positive attributes, such as talents, compliance, supportive people in the patient's life, insurance status, education, job status, housing, wealth that may contribute to the patient's treatment.

X. "REVIEW OF SYSTEMS":
The chief function of the ROS in a psychiatric case history is to provide a systematic investigation of symptoms of nonpsychiatric illnesses. The ROS does not serve to extend the HPI (i.e. filling in gaps which may have been left in the HPI).

Report positive findings here, not usually seen in psychiatric illness (hemoptysis, melena, orthopnea, etc.). It should be noted that when the patient's psychiatric diagnosis is hysteria (i.e. Briquet’s Syndrome, Conversion Disorder), the special symptom review for that illness becomes part of the HPI. It is incorrect to say "within normal limits" or “non-contributory.” Instead one
should list the specific symptoms that were evaluated. At a minimum one should evaluate functions in the following systems to be compliant with Medicare regulations:

- Constitutional
- Eyes
- Ears, Nose, Throat, and Mouth
- Cardiovascular
- Respiratory
- Gastrointestinal
- Genitourinary
- Musculoskeletal
- Integumentary (skin and/or breast)
- Neurological
- Endocrine
- Hematological/Lymphatic
- Allergic/Immunologic

XI. "PHYSICAL EXAMINATION" (with complete neurological examination):

For inpatient admissions patients need a complete physical examination. The Mental Status Examination (MSE) is an amplification of the examination of neurological function. As amplified, it is rendered separately and placed after the Physical Examination. In both the physical and the mental status exam, be specific with your findings. For instance, don't simply say that something is "normal" or "within normal limits", state what you found. You cannot state "CN II-XII intact.” You must list each cranial nerve and what the results of the exam were. Do not state deferred unless that part of the exam is in fact deferred and you intend to complete it later. If you cannot or are unable to do a portion of the exam, state that it was "not done" and indicate the reason why it was not done. Similarly, in the mental status exam, when you assess memory, you need to state exactly which tests you performed. For example: "three simple items recalled immediately and at five minutes" would be adequate. For 'fund of knowledge' testing, state what you tested and the specific answer. For example: “presidents were: Bush, Clinton, Bush, Reagan, Nixon.”

NOTE: Medicare considers certain elements of the physical examination to be critical to the “Psychiatric Examination.” These include the Constitutional Elements (Vital Signs: BP, pulse, RR, temperature, height, and weight – MDs are not required to obtain their own vital. They may use those obtained by the ancillary staff.), General Appearance Elements (e.g. development, nutrition, body habitus, deformities, and grooming), and Musculoskeletal Elements (muscle tone, station, and gait). In the inpatient setting listing these elements in the physical examination is appropriate and meets Medicare requirements. Some prefer to list some of these elements in the MSE (e.g. General Appearance Elements in GAB). Either way is fine. When examining a patient in the outpatient setting where a complete physical examination is usually not conducted make sure you include these non-MSE elements in your work-up.
XII."MENTAL STATUS EXAMINATION":
As its name and location imply it is intended to be an objective description of signs. It covers those aspects of CNS functioning that tend to be abnormal in psychiatric disorders. We have attempted to use generally accepted terms. Their formal definitions are given in the glossary at the end of this document. Since the CNS is not divided into neurological and psychiatric parts, several items that other services place in neurological section are placed in the MSE when conducted by a psychiatrist.

NOTE: Medicare compliant exams must include a description of Thought Processes. As defined by Medicare, this includes “rate of thoughts, content of thoughts (e.g. logical vs. illogical, tangential); abstract reasoning and computation.” The Flow of Thought and Thought Content categories of a traditional mental status exam include most of these elements. For logical reasons and ease of remembering, this document lists abstract reasoning and computation under Sensorium and Intellect.

Medicare compliant exams also require a Description of Associations (defined by Medicare as “loose, tangential, circumstantial, intact”). The Flow of Thought category described involves a detailed description of associations (how ideas are connected to each other). For descriptive purposes, this document uses the better-defined terms of “derailment”, “tangentiality” and “flight of ideas” to describe what has sometimes been called “loose associations” (see the Mental Status Glossary at the end of the document for standard definitions of these terms).

Ordinarily the MSE is divided into eight parts.

1. "General Appearance and Behavior" (GAB): Does the patient appear his/her stated age? Describe facial expression as well as condition, dress and grooming. Is the patient unkempt, or malnourished? Does he/she smell? Evidence for tattoos, scars, and lacerations should be recorded here or in the dermatological parts of the PE. Does the patient use a wheelchair, a cane, glasses or a hearing aid? Describe the observed motor activity (overactive, underactive, give evidence of neurologic disturbance). Evidence for tardive dyskinetic movements and cogwheel rigidity are listed here. Is the patient cooperative, calm, or agitated? Does he/she regard the examiner during the interview, does he/she avert eye contact, or are his/her eyes fixated in space (on an apparent object that is not present)? Does his/her mouth move when he/she is not talking?

2. "Speech": This section is concerned only with the mechanics of talking. What is the rate and volume? Is it monotone? What is the rhythm? Is there dysarthria? Is there an increase in latency (normal time to respond is 3-5 secs)? Is the amount of speech increased or decreased (e.g. mute, poverty of speech)? Is it spontaneous or does the patient only talk when a question is asked? Is the speech stilted? What is the level of the vocabulary? Are there neologisms, word approximations, phonemic or semantic paraphasias?
3. "Flow of Thought" (FOT): This section describes how thoughts are connected to each other. When normal, thoughts are logical, sequential and goal directed (i.e. one can answer questions directly). This area of the MSE is difficult and requires constant work. It involves observations about verbal patterns, which one does not ordinarily make. This area of the MSE is the least precise but can be done well with the use of verbatim examples from the patient. A general rule of thumb is that if you have to ask the patient to explain himself or if you find yourself saying, "I think he means this" then the patient probably has a thought disorder and is having difficulties in explaining himself. Also describe the rate at which one thought follows the previous thought. Several patterns of thought flow have been noted to occur in patients and are described below.

- Circumstantial speech involves inclusion of too many trivial details. For the most part it is logical and sequential. Thus the connection between ideas is easily understood. In addition if the patient is given enough time he/she will also reach the goal (usually the answer to your question). Circumstantial speech is not necessarily pathological. It tends to be seen more commonly in the elderly (e.g. a patient starting back in 1914 and going through his/her whole life story to tell you why he/she looks both ways when crossing the street.)

- Tangential speech is used to refer to the situation in which a patient’s response to specific questions is oblique or irrelevant. It should not be used to refer to abnormalities in spontaneous speech.

- Derailment (a.k.a. LOA) is used to describe spontaneous speech in which ideas slip off the track and onto another one that is obliquely related. Thus, it is comparable to tangential speech, but tangential is used to describe the phenomenon when it occurs as the immediate response to a question. Loosening of Associations is an older term for derailment, but is no longer recommended.

- Flight of Ideas describes derailment in which one idea is quickly followed by another (e.g. in the context of pressured speech). Use of this term, historically, is used to indicate the FOT in a manic and thus one should be careful in its use in non-manics, lest it be misinterpreted by others.

- Incoherence (a.k.a. word salad, jargon aphasia, schizophasia, paragrammatism) denotes a pattern of speech that is more severely affected than derailment. In contrast to derailment, where the slippage occurs between ideas or sentences, the slippage in incoherence occurs between words or phrases. At times it can be difficult to differentiate incoherence from Wernicke's aphasia.

- Clanging (choice of words based on their sounds), rhyming, puns may be present.

- Echolalia (repeating what is said by others in an echoing fashion).

- Perseveration (repeating the same word, phrase, or idea over and over again).
4. "Content of Thought" (COT) or Thought Content (TC): This section describes predominant ideas and thoughts that the patient is discussing or is occupied by. One should not simply record patient complaints (e.g. "I am seeing things" or "I want to kill myself"). Such statements are subjective and are symptoms and thus belong in the HPI. Instead when evaluating a patient's COT one should be probing and examining several aspects of a belief, for example, in order to offer evidence for or against it being a delusion. COT can be subdivided into 4 components. Each should be commented on.

a) Suicidal and homicidal thoughts
Every patient must be evaluated for the presence of suicidal or homicidal ideas. Ideation should be delineated from intent and plan. Findings should be explicitly recorded in the note. It is not adequate or appropriate to just take at face value what a patient says (e.g. "I'm suicidal") and list the patient as suicidal or homicidal. Such statements are symptoms and by themselves do not belong in the MSE but instead should be placed in the HPI or listed as a chief complaint. Not uncommonly such statements by patients are just attempts at inducing somebody to do something (i.e. manipulative). Suicidal or homicidal statements should be explored to determine the degree of intent. For example, is the patient planning for the future, is the statement conditional (e.g. "I will only kill myself if you discharge me"). Also include in this section any statements about the patient doing harm to him/herself or others that would not result in death (i.e. any form of violence to self or others).

b) Thoughts associated with psychosis
Delusions, ideas of reference, feelings of derealization and depersonalization are reported in this section of the mental status examination. They are reported here if they were found to occur on examination. Past experiences would be in the HPI. Traditionally, hallucinations are also recorded here since they occur frequently with other psychotic phenomena like delusions. However, the observable signs of hallucinations are usually behavioral and should be recorded in GAB. All this said, almost all psychiatrist record hallucinations here.

Hallucinations are false sensory perceptions. Sometimes an attempt is made to distinguish between illusions (the misinterpretation of real sensory stimuli) as opposed to hallucinations, which occur in the absence of real, external, sensory stimuli. For practical purposes, one cannot always distinguish between illusions and hallucinations. It is likely that most patients with delirium are experiencing illusions. Hallucinations can occur in any of the five sensory modalities. Auditory hallucinations are the most common. Visual hallucinations are also common. Tactile hallucinations are sometimes called haptic hallucinations (not to be confused with hypnagogic hallucinations which occur in the state between wakefulness and sleep). Olfactory and gustatory hallucinations may sometimes occur.

A delusion is a fixed false belief outside of the norm of the patient’s culture. When evaluating whether a particular false belief is delusional or not, one needs to determine whether the thought is fixed (i.e. in the face of evidence that the belief is
false the patient persists in believing it.). Also determine whether the fixed false belief is a normal for the patient’s culture (e.g. voodoo in somebody from Haiti). Such beliefs are not necessarily an indication of psychosis. Persecutory delusions are obviously those of persecution (note that they should NOT be referred to as paranoid. Paranoid means delusional). Delusions of megalomania are those of being a great person. One kind of delusion, which has its own name because it occurs so frequently, is the delusion of passivity (see First Rank Symptoms below). This is the belief that one's thoughts or one's motor behavior is under the control of an outside agent. The outside agent may be either animate or inanimate. It may be close at hand or at a distance. The patient may believe that his mind is being controlled, that thoughts are being put in his mind, taken out of his mind, being broadcasted, or somehow molded (thought insertion/withdrawal/broadcasting). He may believe that his body is being controlled, marionette-like. This experience of passivity is often accompanied by a complex array of other delusions and hallucinations so that it can be difficult to determine at what point one pathological phenomenon ends and another begins.

‘Delusion of reference’. This term is source of confusion because it covers such a variety of experiences. Normal people have ideas of reference in embarrassing social situations (feeling that somebody is talking about you). These beliefs are short-lived and are quickly recognized as lacking veracity. On the other hand, patients who are psychotic may experience delusions of reference in a bizarre and pronounced fashion. A delusion of reference is the unwarranted idea based upon a trivial occurrence (e.g. the person at the next table looked at the patient) that a person is talking about you, watching you, or noticing you. The belief continues in spite of no evidence supporting the belief. It also is used to describe the phenomenon where a patient reports that an event was meant as a special message to the patient (e.g. the death of the horse in The Godfather had a hidden message for the patient from God -- that horses should be killed because they are the messengers of Satan).

‘Derealization’ is the feeling that the world has changed, usually in some alien way. The patient may or may not know that this feeling is abnormal. ‘Depersonalization’ is a similar feeling, however it applies to the patient's own body. The patient feels that his/her body is somehow changed or that his/her identity has somehow changed or become lost. The patient may or may not believe the feeling is abnormal.

‘Schneiderian First Rank Symptoms’. Kurt Schneider believed that several psychotic symptoms only occurred in patients with schizophrenia (i.e. are pathognomonic) and thus argued that their presence always indicated the presence of schizophrenia. Schneider called these symptoms, First Rank Symptoms (Second Rank Symptoms were symptoms that occur frequently in schizophrenia and in other illnesses). Subsequent work has shown that while First Rank Symptoms are seen frequently in schizophrenia they can occur in patients whose course of illness is not consistent with schizophrenia. Thus, their presence suggests a high likelihood that a
patient may have schizophrenia but this likelihood is not 100%. This fact accounts for why the presence of certain psychotic symptoms qualify outright for the A criterion of schizophrenia whereas other psychotic symptoms must occur in the presence of other symptoms in order for the A criterion of schizophrenia to be met. Psychotic patients should be evaluated for these specific symptoms. Schneiderian symptoms revolve around the concept that the patient has lost control of his body and is being controlled by others. First Rank Symptoms are:

- Hearing one’s own thoughts out loud
- 3rd person voices commenting on the actions of the patient
- Voices arguing among themselves

- Thought insertion – insertion of a thought into one’s mind by an outside agent
- Thought withdrawal – having one’s thought withdrawn from one’s mind
- Thought broadcasting – being able to broadcast one’s thoughts

- Attributing one’s feelings to others (delusion of passivity – feelings)
- One’s drive is controlled from outside (delusion of passivity – impulses)
- Experiencing one’s actions as controlled from outside (volitional passivity)
- Having bodily sensations imposed from outside (somatic passivity)

- Attributing special delusional significance to one’s perceptions (delusional perceptions). Delusional perceptions combine a real perception with a delusional idea about its meaning. It, thus, is similar to a delusion of reference, e.g., “when the doctor rubbed his nose, it meant I should leave the room.”

c) Non-psychotic thoughts
Phobias and obsessions are included here if patient speaks of these phenomena as occurring at the present time (they are otherwise described in the HPI). A phobia is an intense, unreasonable fear associated with some situation or object; i.e. fear of heights, closed places, etc. An obsession is a recurrent or persistent idea or thought which is recognized as foreign or alien to the individual and which is accompanied by the desire to resist it. A compulsion is a recurrent act recognized as foreign or alien to the individual and which is accompanied by the desire to resist it. As such compulsions should not be placed in COT and if observed should be in GAB and if reported as a symptom in the HPI. However, some do record compulsions here since they are seen with obsessions.

d) Paucity/abundance of thoughts
Finally one should be evaluating whether there is Poverty of Content. This is different than Poverty of Speech, which is recorded in the speech section. Poverty of Speech describes a decrease in the amount of words. A patient who only answers yes or no would be an example. Poverty of Content describes a decrease in the informational content. This sign is seen frequently in patients suffering from
schizophrenia. A patient may have Poverty of Speech, Poverty of Content, both, or neither.

5. "Mood": As defined by DSM-IV mood is “a pervasive and sustained emotion that colors the perception of the world.” This is usually accomplished by asking the patient how he/she is (or has been) feeling, the goal being to have the patient “average” his/her mood over a certain amount of time. Strictly speaking, since the patient is providing a subjective report of his emotional state, mood is really a symptom and it should be recorded in the HPI section of the H&P (or in the subjective section of the SOAP note). It is recorded here in order to allow comparison with the observed affect. For clinical utility (especially on the inpatient unit) “sustained” is usually interpreted to mean what the predominant emotion has been on the day of the exam. Not uncommonly the patient’s stated mood is given between quotation marks (e.g. “angry,” “sad,” “depressed,” “happy”). In addition for patients with an affective disorder, a Likert scale is used (0 to 10; 0=suicidal/worse mood imaginable, 5=normal, 10=high as a kite), since this allows one to chart over time changes in the reported mood.

6. “Affect”: As defined by DSM-IV affect is “a pattern of observable behaviors that is the expression of a subjectively experienced feeling state (emotion).” Affect, thus, is a sign (“observable”) and describes a person’s emotional state at the time of the exam. There are four basic qualities that should be detailed about a person’s affect.

   a) Type of affect
      Is it depressed, normal or elevated/euphoric/happy? What is its range? Can it be evoked with prompting (e.g. laughs after a joke)? An appropriate description of a patient suffering from depression might be: "Affect is depressed and restricted to the lower range though the patient will laugh to jokes." Other possible descriptors are anxious and irritable.

   b) Stability of affect
      Is the patient's affect labile? Does it remain stable, or does it change noticeably and quickly in response to small changes in the conversation?

   c) Appropriateness of affect
      Is the patient's affect appropriate to the conversation? Is it congruent to his stated mood? A patient's affect may be judged to be inappropriate for a number of reasons. Examples should be given.

   d) Amount of affect
      Blunted and flat affect is used to describe patients in whom the amount of affect is decreased (blunted) or non-existent (flat). This phenomenon is frequently seen in patients with schizophrenia. Usually patients with depression do have affect. It is just restricted to the negative emotions. In such instances a depressed patients should not be described as having a blunted or flat affect.
7. **Sensorium and Intellect**: (*N.B.* In evaluating the following tests of intellectual functioning, factors such as the patient's educational level, ability to concentrate, anxiety, and willingness to cooperate should be considered.) Most of these tests are included in the 30 point MMSE.

a) "Sensorium":
- Orientation to person, place and time (day of month, month, year, day of week, season). If not oriented, give patient's answers and correct information.

b) "Recent and Remote Memory":
- Retention and immediate recall - give three items and test in five minutes. If patient is unable to actively recall all three items at 5 minutes, provide hints. Recorded at 3/3 at 0 minutes and x/3 at 5 minutes without prompting and y/3 with prompting.
- Recent memory - date of admission, brought to hospital by whom.
- Remote memory - when and where born, date of marriage, names and ages of children.

c) "Attention Span and Concentration":
- Serial Subtractions - subtract 7 from 100 and 7 from the answer and each succeeding answer (average adult has less than four errors and finishes within 60 seconds). If too difficult, use serial 3s starting at 20. Easiest is counting from 20 backwards to 1.
- Other - If the patient cannot do the mathematical tasks, try verbal ones. Saying the months of the year in reverse order is a reasonably difficult task that is sensitive to abnormalities in attention. Other possibilities are: spelling WORLD backwards, listing days of the week backwards, and citing strings of numbers forwards and backwards.

d) “Language”:
- Naming objects, ability to repeat phrases and overall vocabulary are examples of language function. Reading the paper or other material intended for the general public is another way to evaluate language. NOTE: Assessment of “Language” is NOT the same as assessment of “Speech” and must be listed separately in the Mental Status Exam.

e) “Computation”:
- Simple mathematical skills: multiply 7 x 8, divide 75 by 3. If too easy, try more difficult skills like square and square roots. If too difficult, test subtraction and addition skills.

f) "Fundamentals of Knowledge":
- Is patient aware of current events, past history and vocabulary? Can he/she name five large cities and the last five presidents?
g) “Abstract Reasoning”
- Ask the patient to describe the meaning of proverbs - "Don't cry over spilled milk"; "All that glitters is not gold"; "A bird in the hand is worth two in the bush"; "A rolling stone gathers no moss". Is the patient able to identify the abstractions involved in the proverbs? Contrasts and comparisons like, “How are an apple and an orange alike? or “What is the difference between a cow and a pig?” can also be used to evaluate abstract reasoning.

h) “Constructional Ability”
- Ask the patient to draw a clock face or to copy intersecting pentagons. This can detect constructional apraxia, hemineglect and perseveration.

8. "Insight and Judgment":
Insight and judgment are important components to determine not only in patients with psychiatric disorders but also in patients with “medical” illnesses. Studies have shown that good insight and judgment correlates with improved long-term outcome.
- Insight signifies that the patient realizes that he/she is ill and understands something of the nature of his/her illness. In addition it also refers to a patient’s ability to recognize his/her symptoms. It does not refer to etiology or psychodynamic aspects of the illness. Evaluating the patient’s responses to the following questions may assess insight: What kind of problems are you currently having? Are you sick in any way? What sort of sickness? Do you need help? What sort of sickness do people have here? In describing their insight one should be specific about the object of their insight. For example a patient might have good insight into the fact that he/she has a major depressive disorder and is having problems with sleep and appetite but has little to no insight into the fact that his/her thoughts about guilt are also symptoms of the illness.

- Judgment may be assessed by evaluating the patient's ability to understand social context. This can be based on observation, e.g. you observe patient punching a security guard, and on responses to the following questions: What would you like to do next? What do you plan to do when you leave? Why were you brought here? Again as with insight one must specify precisely the object or symptoms on which one is evaluating the judgment. Questions about mailing a stamped letter, a house on fire, or a idiom offer little in the way of significant information about a patient's judgment and really reflect a patient's intellectual functioning and schooling. Physicians may be particularly interested in the patient’s judgment about treatment – does the patient actively participate in discussions of treatment and assist in a helpful way with treatment choices? While a physician should focus on these aspects of judgment Medicare emphasizes a patient’s judgment concerning everyday activities and social situations.

XIII."LABORATORY DATA":
In addition to typical medical tests, one should record the results of any psychometric tests here.
XIV. "DIAGNOSTIC FORMULATION":

Medicare requires a listing of the five axes for psychiatric patients according to the current Diagnostic and Statistical Manual (DSM). Thus, state your assessment in this format (Axes I-V) according to DSM criteria. If you do not make a diagnosis in an axis but may possibly do so in the future, state, "none formulated" on that axis. Remember, if you happen to state "rule out, or deferred", at some point during the hospitalization you must go back to this issue and change it from "deferred" to having a specific diagnosis or "no diagnosis". Axis I is devoted to Clinical Disorders and Other Conditions That May Be A Focus of Attention. Axis II is for notation of Personality Disorders and Mental Retardation. Axis III is for physical disorders. Axis IV is for Psychosocial Stressors and their degree of severity. Axis V denotes Global Assessment of Functioning (GAF). It is not appropriate to list diagnoses here and then not discuss in the A/P how you arrived at the diagnoses.

XV. "ASSESSMENT AND PLAN":

In the majority of cases when one is doing an initial evaluation this section probably will be the longest. On follow-up patients this section can be substantially abbreviated unless a change in Dx or plan is being documented. This is the one section in which people try to skimp and which can lead to unpleasant outcomes (i.e. loss in law suits -- remember no documentation means it didn't happen, no matter what you say in the courtroom). A separate number should be assigned for each problem. For each, one should:
- Briefly review the pertinent information from the HPI, PMH and FamHx as well as the important findings on exam and labs. Assessment of whether the elicited signs indicate pathology should also be done here.
- A differential diagnosis should be discussed and the pros/cons for each Dx given and weighed and the most likely explanation highlighted.
- An appropriate plan should be formulated given the assessment. Justify the patient's admission. Reasons for doing or not doing certain tests or treatments should be substantiated. For inpatients, include nursing and social work interventions. Be specific (e.g. if the patient has been violent and agitated, you need to provide specific interventions for the nursing staff, such as placing patient on assault precautions, provide 1-on-1 coverage, write orders for prn lorazepam, start antipsychotic treatment).
- Documentation of discussions with the patient should also be done with a notation of the patient's consent or lack thereof being noted. In addition one must document that the consequences (including side effects and bad outcomes) of following or not following the recommendations have been discussed with the patient.

Note: For private admission: you need to include a minimal number of behavioral problems, which you have identified, based on you evaluation and physical examination. These don't need to be lengthy but they ought to include both medical interventions and nursing or social work interventions that need to be addressed in the next 24 hours. You should consider your problem list as a bridge until the private generates his/her own list.
MENTAL STATUS GLOSSARY

This glossary is meant to provide succinct definitions of common terms used in psychiatry. The definitions below are derived from two sources listed below. More extensive descriptions can be found in the two primary sources. Note also that the grouping of items is arbitrary and meant to serve as aids in remembering rather than as formal categories.


2. DSM-IV – Appendix C. Glossary of Technical Terms

1. **Defects in the Amount of Speech**
   - **Poverty of Speech** – restriction in the amount of spontaneous speech
   - **Poverty of Content of Speech** – speech that conveys little information even though amount is adequate. Often uses language that is overabstract, overconcrete, vague, repetitive and stereotyped
   - **Pressure of Speech** – increase in the amount of spontaneous speech compared to what is considered ordinary or socially customary. In addition to an increase in the amount of speech, the patient talks rapidly and is difficult to interrupt.

2. **Defects in Achieving the Goal of Speech (Flow of Thought)**
   - **Distractible Speech** – repeatedly stops talking in mid-sentence or idea and changes the subject in response to a nearby stimulus
   - **Tangentiality** – replies to a question in an oblique or even irrelevant manner
   - **Derailment** (Loose Associations) – pattern of spontaneous speech in which ideas slip off track onto one another; defect occurs between clauses and sentences
   - **Flight of Ideas** – a nearly continuous flow of accelerated speech with abrupt changes from topic to topic that are usually based on understandable associations, distracting stimuli or plays on words
   - **Incoherence** (Word Salad, Jargon Aphasia, Schizophrenia) – pattern of speech that is incomprehensible at times in which rules of syntax and grammar are ignored; defect occurs at level of the clause or word.
   - **Illogicality** – pattern of speech in which conclusions are reached that do not follow logically; non-sequitors; faulty inductive inferences
Circumstantiality – pattern of speech that is very indirect and delayed in reaching its goal; tedious details and parenthetical remarks are frequently included

Loss of Goal – failure to follow a chain of thought to its natural conclusion

Blocking – interruption of a train of speech before a thought or idea has been completed; person cannot recall what he had been saying or meant to say

Self-reference – individual repeatedly refers the subject under discussion back to self when someone else is talking; refers apparently neutral subjects to self when talking

3. Defects Involving the Use of Words
Clanging – pattern of speech in which sounds rather than meaning govern word choice

Neologisms – new word formations; completely new word or phrase whose derivation cannot be understood

Word Approximations (Paraphasia, Metonyms) – old words used in a new an unconventional way, or new words formed by conventional rules of word formation (e.g. gloves = “handshoes”)

Perseveration – persistent repetition of words, ideas or subjects in the course of speaking

Echolalia – pattern of speech in which subject echoes words or phrases of the interviewer

Stilted Speech – speech that has excessively formal quality; pompous, stiff

Phonemic paraphasia – recognizable mispronunciation of words because sounds or syllables have slipped out of sequence

Semantic paraphasia – substitution of inappropriate words during effort to say something specific; words used with wrong meaning

4. Descriptions of Mood and Affect (a la DSM-IV)
Affect – pattern of observable behaviors that is the expression of a subjectively experienced feeling state (emotion)

DSM-IV: “In contrast to mood, which refers to a more pervasive and sustained emotional ‘climate’, affect refers to more fluctuating changes in emotional ‘weather.’” Common examples of affect are sadness, elation and anger. Disturbances of affect include: blunted, flat, inappropriate, labile and restricted.

Mood – pervasive and sustained emotion that colors perception of the world.
Common examples of mood include depression, elation, anger, anxiety
Types of mood include dysphoric, elevated, euthymic, expansive and irritable

5. **Terms Used in Content of Thought**

**Delusion** – a fixed false belief that is out of character for the individual’s culture

**Hallucination** – sensory perception that has compelling sense of reality but that occurs without external stimulation of the relevant sensory organ

**Idea of Reference** – feeling that casual incidents and external events have a particular and unusual meaning that is specific to the person

**Delusions of Reference** – persistence of IOR in face of evidence to the contrary

**Psychosis** – no definition has achieved universal acceptance. The narrowest definition of psychotic implies the presence of delusions or prominent hallucinations, with hallucinations occurring in the absence of insight into their pathological nature. Broader definitions can include the presence of disorganized speech and behavior.
Identification: This is the third psychiatric admission of this 44 yo separated AAM who was brought to the hospital by his mother. He enters as a voluntary pt on Dr. Benington’s service.

Source: patient (cooperative, appeared reliable), patient's mother, chart

CC: "depression"

HPI: Mr. B has two previous admissions to MPC for depression and a long-standing history of ethanol abuse. He was brought to the ER by his mother secondary to intoxication and suicidal ideations. He does not have a specific plan, but says there are “1001 ways” of committing suicide. The patient did attempt suicide two years ago with an overdose of sleeping pills. The patient’s mother indicated that there may be guns at home, though the patient denies knowledge of their location.

Mr. B complains of gradually worsening low mood, most of the day, nearly every day x ~8 mos. He also describes decreased appetite, weight loss, difficulty sleeping, episodes of crying, difficulty concentrating (“forgetting a lot”), decreased energy, and anhedonia.

The patient also experiences “paranoia” irrespective of EtOH use in the presence of crowds or people standing/walking behind him, dating to 1998, when he was stabbed in the back with a knife. He is not convinced anyone is trying to hurt him. He denies feelings of hopelessness or guilt at present. The patient denies homicidal ideations, auditory or visual hallucinations, and ideas of reference. He denies intrusive thoughts, panic attacks, and other symptoms of anxiety. He does not recall any episodes characterized by decreased need for sleep, elevated activity, excessive irritability, or grandiosity.

The patient indicates that he consumes EtOH primarily when feeling “down”. Most recent use was two days ago. He denies tremor, perspiration, palpitations, and loss of consciousness. He has not had major depression during periods of sobriety.

Mr. B reports medical compliance and has taken citalopram, bupropion, paroxetine, and risperidone for depression, with no relief of symptoms. He was most recently discharged from MPC on 12-05-03.

PMH/PTH/PSH: MDD, polysubstance abuse, Brown-Sequard syndrome secondary to knife wound since 1998, HTN, arthritis, cataracts, traumatic amputation of R 1st and 2nd toes by lawn mower c/b osteomyelitis 2000, childhood seizures

Medicines: bupropion 150 mg qam and 100 mg qpm, paroxetine CR 25 mg qd, risperidone 0.5 mg qhs, metoprolol 50 mg bid, captopril 12.5 mg tid, vioxx 25 mg qd, ambien 10 mg qhs

Allergies: NKA

Fam Hx: No family history of psychiatric or neurological illness per pt.

Soc Hx: The patient lives with his mother and father. He has been separated from his second wife for 2 years, with whom he does not have children. He has two children from his first marriage ages 16 and 17 who live with their mother. He has a high school plus vocational education, and has worked as a medical technician. In the Army, he was a heavy equipment operator, with an honorable discharge in
1988. Currently he is unemployed. He has applied for disability and been refused 3 times. He says his mother has called him a "burden".

Polysubstance abuse beginning at 15 yo. Drinks of choice are bourbon, gin, and cognac. Drinking pattern is binging, consuming up to a fifth/day at peak. He did not drink from 1994-1998, and resumed after his stabbing. He has failed an inpatient rehabilitation program in the past. He was found DWI in the summer of 2003. He also uses marijuana 1-2x per year, the last use two weeks ago. He smokes 1-2 packs of tobacco cigarettes per day.

Mr. B denies any legal problems except for his DWI. The patient was a licensed gun owner, but has not used a gun for several years.

**Assets:** Mr. B has worked as a medical technician and as an equipment operator. His mother is supportive. As a veteran, he may qualify for care from the VA system.

**ROS:** blurry vision due to cataracts in both eyes, glaucoma, arthritis, difficulty walking
All other ROS negative

**Physical Exam:**

**General:** AAM appearing stated age, NAD, A and O x 3, cooperative.

**VS:** T 97.2F, HR 70, RR 18, BP 140/70

**Skin:** old healed scars on back

**HEENT:** head: NCAT; eyes: R>L cataracts; ears: nl hearing; nose, mouth, throat: no sores, exudates, erythema, mucous membranes moist

**Neck:** supple, no masses, non-tender

**Chest:** CTAB

**CV:** S1S2, RRR, no M/R/G; pulses 2+ bilat; no bruits; no JVD

**Abd:** non-distended, nl bowel sounds. Clear to percussion. No hepatosplenomegaly. No guarding or rebound tenderness.

**Lymph:** no lymphadenopathy.

**Extrem:** no C/C/E; R 1st and 2nd toes amputated

**Musc:** nl muscle strength and ROM

**Neuro:**

CN I: not tested, CN II: decreased acuity bilaterally, PERRLA, CN III,IV,VI: EOMI, CN V: nl sensation, CN VII: facial muscles symmetric, CN VIII: hearing intact, CN IX,X: bilat palatal elevation, CN XI: symmetric shrug and head turn, CN XII: tongue midline

**Musculoskeletal:** RLE>LLE spasticity, decreased LLE muscle tone

Sensory: decreased pain, temp RLE. Decreased vibration LLE.

**Gait:** paretic gait

**Coordination:** intact

**Reflexes:** symmetric bilat, except Babinski present left side

**Mental Status Exam:**

**GAB:** Pt is calm, cooperative, well-groomed, and makes eye contact with examiner. Reduced psychomotor activity.

**Speech:** slightly slow with regular rate and rhythm, somewhat quiet. High-school level vocabulary

**FOT:** logical and sequential

**COT:** Denies hallucinations, delusions, ideas of reference. Pt endorses SI and intent without having a plan ("1001 ways"). Pt denies HI. Pt also endorses anxiety in crowds or with persons walking or standing behind him.

**Affect:** sad, stable, appropriate to conversation, with mildly decreased range

**Mood:** "depressed"

**S/I:** Oriented x 3, recall 3/3 at 0 min and 2/3 at 5 min, 2/3 with prompting. Concentration: can recite 12/12 months backward. Performs serial 7s quickly and accurately. Abstract reasoning intact by
interpretation of “the grass is always greener….” Language: intact naming, repetition, crossed commands. Constructional ability: not tested.

I/J: Good insight into need for treatment of depression, but poor regarding his EtOH abuse. Pt demonstrates fair judgment: did agree to hospitalization but did not seek out medical care or help with addiction.

**Labs**

**BMP:**

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67

Ca 9.0

Prot 7.7 Alb 4.6 Bili 0.2
Alk phos 95 AST 40 ALT 40

UDS: negative

EtOH: 245 (2-19-04), <10 (2-20-04)

**Diagnostic Formulation:**

**Axis I:** Major Depressive Disorder, recurrent, moderate; Alcohol Dependence; r/o Posttraumatic Stress Disorder

**Axis II:** no diagnosis

**Axis III:** h/o childhood sz; see also PMH

**Axis IV:** unemployed, chronic family stress

**Axis V:** GAF=45

**Assessment and Plan:**

Impression:

Mr. B is a 44 yo AAM with a history of MDD, EtOH dependence, who presents with a depressive episode that has been unresponsive to medical management. Given suicidal ideations, factors placing him at high suicide risk (single male, drinking, possible access to firearms), and his inability to contract not to harm himself, the patient needs inpatient admission.

The differential diagnosis of the patient’s mood disorder includes MDD, substance-induced mood disorder, dysthymic disorder, bipolar disorder (depressed episode), and mood disorder due to a general medical condition. The time course is insufficient for dysthymia, and bipolar disorder cannot be diagnosed in the absence of manic or hypomanic episodes. However, substance-induced mood disorder should be considered given the time course and the history of EtOH dependence. The most likely nonpsychiatric causes of depression in this patient include beta-blocker use, hypothyroidism, epilepsy, syphilis, and HIV disease. The neurological exam and the history suggest low likelihood for the last three.

The patient meets criteria for Alcohol Dependence: (1) continuing use despite awareness that it complicates depression and his recent DWI conviction; (2) tolerance, with alert mental status despite EtOH level of 0.245; (3) consumption of large amounts of EtOH per history; and (4) a failed attempt to cease use after his stabbing.

Based on the initial evaluation, the patient may meet criteria for PTSD related to his stabbing in 1998. He was exposed to a traumatic event that involved serious injury, has made efforts to avoid situations associated with the trauma, had the disturbance for several years, and is hypervigilant. The
disturbance appears to affect his social interactions. Further questioning will reveal whether the patient meets all criteria for PTSD.

Treatment Plan:
1. Admit to prevent suicide; suicide precautions
2. Vital signs q6h to monitor for signs of EtOH withdrawal
3. Trial of an antidepressant with lower seizure risk and from a different pharmacological class—consider venlafaxine. If he is still unresponsive to treatment, he may benefit from ECT. He will also need outpatient psychiatric followup after discharge.
4. Serum TSH
5. Thiamine and multivitamin
6. Counsel patient to stop drinking, referral to AA. Consider naltrexone as adjunctive treatment for EtOH dependence.
7. Reevaluate possible PTSD symptoms as outpatient after depressive symptoms improve.
8. The patient’s medical problems also contribute to his poor functional status. The patient will require ophthalmology followup for his cataracts after discharge, and neurology followup for his Brown-Sequard syndrome after discharge. We will continue his current regimen for HTN while in-house.
Chief Complaint: Abdominal pain

HPI: The patient is a 65 year old male referred for evaluation of symptomatic cholelithiasis. He has a history of postprandial abdominal pain that is exacerbated by eating fatty foods. The pain is severe and has prompted two visits to the emergency department. The pain is located in the right upper quadrant and radiates around like a belt. It lasts 1-2 hours. He denies jaundice or pancreatitis. He has had nausea with it.

Past medical history: CAD, HTN, GERD

Past surgical history: CABG, Appy, cervical spine fracture and fusion

Allergies: penicillin, seafood, “mycins”

Medications: Plavix 75 mg po daily
Diovan 80 mg po daily
Toprol XL 50 mg po daily
Aspirin 81 mg po daily
Prevacid 30 mg po daily
Ibuprofen 400 mg po three times daily

Social History: He is married and retired. No tobacco or alcohol.

Family history: cancer, heart disease, and stroke

Review of systems: He denies cough, chest pain, shortness of breath, fevers, or changes in bowel habits.

Physical examination:
VS 140/80, 75, 14, 37C, 240 lbs.
HEENT: anicteric, EOMI intact, OP clear
Neck: no LN
Chest: Clear, RRR, well healed median sternotomy and left radial artery scars
Abdomen: soft, nondistended, no masses, mild RUQ tenderness
Extremities: no clubbing, cyanosis or edema.
Neurological: WNL

Labs: WNL

Ultrasound: Cholelithiasis, no wall thickening, no pericholecystic fluid, no ductal dilatation

Assessment and plan: This is a 65 year old male with symptomatic cholelithiasis. Plan laparoscopic cholecystectomy. We discussed the risks and benefits including bleeding, infection, and bile duct injury. He understands and is willing to proceed.
Clerkship Templates

During clinical rotations many students use H&P templates and patient tracking forms. Here are some examples submitted by various students. Please note:

- These have not been vetted by any faculty; they are student-generated materials.
- Using an elaborate template can be quite distracting when trying interview a patient and can interfere with establishing rapport.
- The beginning student sometimes worries too much about keeping track of every little detail and loses sight of the big picture (can’t see the forest for the trees).

The following templates are included:

- H&P – brief template
- H&P – long template
- Medicine Patient tracking
- Newborn H&P
- Peds Pt Tracking
- Neuro Phys Exam
- Neuro Phys Exam 2 - brief
- Neuro Phys Exam 3
- OB-Gyn notes
- Surgery Notes
- Surgery Pt Tracking
- Psych Pt tracking
- Psych Pt tracking 2
H&P - Brief Template

History

Patient info  Name:  Age:  DOB:  Race:  Sex:
S&R:  

CC:  

HPI  (Location/Char/Onset/Duration/Association/Radiation/Relief)  

PMH  
• Angina  MI  HTN  valve  CAD  CVA  DM  COPD  CA  PUD  
• Childhood Illnesses:  
• Trauma:  
• Transfusions:  
• Date of most recent physical exam:  

PSH  CABG  Gyn  GI  Urinary CA  Back  CCK  Appy  

Meds  Prescription, OTC, Supplements:  

Allergies  Drugs, (PCN?), Food, Insect, Animal, Occupational  

FH  
• FH of dz:  DM  HTN  Cardio  CA  Lipid  CVA  Kidney  Psych  Arthritis  
• Father:  Living / Deceased  Age / age at death:  cause:  illnesses:  
• Mother:  Living / Deceased  Age / age at death:  cause:  illnesses:  
• Siblings:  #Brothers:  #Sisters:  # still alive:  illnesses:  

• Children:  Ages:  illnesses:  

SH  
• Place of Residence:  
• Occupation:  
• Hobbies:  
• Marriage:  
• Habits:  EtOH  Tobacco  IVDU  Caffeine  Diet  Exercise  
• Potential Exposures:  


**ROS**
- **Constitutive:** F/C NS HA Nausea anorexia/wt loss fatigue weakness dizziness
- **HEENT**
  - Eye: diplopia blurring cataracts glaucoma
  - Ear: hearing loss tinnitus vertigo dizziness pain
  - Nose: post nasal drip polyps stuffed pain
  - Mouth: sores/ulcers growths discoloration tonsils teeth/gums pain
  - Throat: sore throat hoarseness
- **Pulm:** Cough sputum hemoptysis SOB Asthma wheezing infections occupational last CXR TB
- **CV:** CP palpitation orthopnea PND SOB edema rheumatic fever Murmur MVP HTN hyperlipidemia
- **GI:** abd pain N/V diarrhea constipation hematemesis BRBPR melena Hemorrhoids Stool caliber hepatitis gas abd pain appetite
- **Urinary:** Dysuria hematuria nocturia freq polyuria stream force hesitancy stones UTI incontin.
- **Male genital:** Hernia STD testicular/pain discharge sores STDs Prostatitis ED STD Last PSA
- **Female genital:** Menarche: Menopause: menstrual irreg PMS/Dysmenorrhea postme bleeding vag d/c STD Endometriosis birth control breast lumps nipple/discharge # preg # live birth # abortions last PAP last mammo
- **Neuro:** syncope sz vertigo parasthesias weakness tremor
- **Rheum:** Arthritis stiffness gout Lyme back pain myalgia
- **Vascular:** Phlebitis varicose claudication cramping Reynaud's
- **Endo:** Polyuria/polydipsia/polyphagia heat/cold intolerance Thyroid DM osteoporosis
- **Heme:** Anemia bruising bleeding LNs
- **Derm:** Rashes dryness itching change in mole lumps pigment change

**PE:**
- **Vitals:** T/Tmax HR: RR: BP: O2 sat wt
- **Gen:** healthy / unhealthy NAD / distress apparent age?
- **HEENT:** Skin/scalp TM EOMI? PERRL? OP/NP
- **Neck:** LNs SCM / trapezius Carotid bruits JVD goiter
- **Cardio/chest:** reg/irreg S1: S2: S3 S4 murmur rub PMI
- **Pulm/back:** crackles Wheezes Rhonchi egophony border fremitus CVAT Spinal tenderness
- **Abdomen:** Obese? Scars? BS Aorta/renal bruits Tenderness/guarding Liver edge: Palpable spleen: Fluid wave:
- **UE:** Axillary / epitrochlear lymph nodes: Muscle tone: radial pulse: skin/nails:
  - **LE:** Pulses: Fem DP PT Popl Edema Skin/nails:
  - **Brief Neuro:** Orientation: Person Place Time CNs
  - Strength:
    - Reflexes: BR biceps triceps patellar Achilles Babinski
    - Sensory: UE LE
H&P - Long Template

**History**

**Patient information**
Name: 
Age: DOB: Race: Sex: 
S&R: 

**CC:** 

**HPI**
- Character: Sharp / dull localized / diffuse deep / superficial 
- Location: 
- Onset: 
- Duration: 
- Association: 
- Radiation: 
- Relief: 

**PMH**
- Adult Medical Illnesses: 
  *Angina MI HTN valve athero CVA DM COPD CA PUD* 
- Childhood Illnesses: 
- Trauma: 
- Date of most recent physical exam: 

**Surgical History**
*CABG Gyn GI Urinary CA Back CCK*

**Medications**
- Prescription: 
- OTC, Supplements: 

**Allergies**
- Drugs: (PCN?) 
- Food: 
- Insect, Animal, Occupational:
**Family History**

- **Marital:** Single / married / widowed / divorced  
  how long:
- **Father:** Living / Deceased  
  Age / age at death:  
  cause:  
  illnesses:
- **Mother:** Living / Deceased  
  Age / age at death:  
  cause:  
  illnesses:
- **Siblings:**  
  #Brothers:  
  #Sisters:  
  # still alive:  
  illnesses:
- **Children:**  
  Ages:  
  illnesses:
- **Family History of disease:**
  DM  
  HTN  
  Cardio  
  CA  
  Lipid  
  Colon  
  CVA  
  Kidney  
  Psych  
  Sickle  
  MEN  
  Arthritis
- **Genetic Disease:**

**Social History**

- **Habits:** EtOH  
  Tobacco  
  IV  
  Caffeine  
  Diet  
  Exercise
- **Occupation? Marriage? Hobbies?:**
- **Potential Exposures:**
- **Place of Residence:**
- **Sexual Preference:**

**ROS**

- **Constitutive:**
  Fever  
  Headache  
  Nausea anorexia/wt loss  
  fatigue  
  weakness
- **HEENT**
  - Headache
  - Eye: diplopia  
    blurring  
    cataracts  
    glaucoma  
    loss of field  
    pain
  - Ear: hearing loss  
    tinnitus  
    vertigo  
    dizziness  
    pain
  - Nose: post nasal drip  
    polyps  
    stuffed  
    pain
  - Mouth: sores/ulcers  
    growths  
    discoloration  
    tonsils  
    teeth/gums  
    pain
  - Throat: sore throat  
    hoarseness
- **Pulmonary**
  - Cough
  - Sputum
  - Hemoptysis
  - Dyspnea
  - Pain
  - Asthma
  - Wheezing
  - Infections
  - Occupational
  - Last CXR
  - TB

- **Cardiac**
  - CP
  - Palpitation
  - Orthopnea
  - PND
  - SOB
  - Edema
  - Rheumatic fever
  - Murmur
  - MVP
  - HTN
  - Lipid

- **GI:**
  - Weight gain/loss
  - Nausea/vomit
  - Diarrhea
  - Constipation
  - Diet pattern
  - PUD
  - Dysphagia
  - Hematemesis
  - Blood in stool
  - Hemorrhoids
  - Stool caliber
  - Hepatitis
  - Gas
  - Abdominal pain
  - Appetite

- **Urinary:**
  - Dysuria
  - Hematuria
  - Nocturia
  - Freq
  - Polyuria
  - Stream force
  - Hesitancy
  - Incontinence
  - Stones
  - Infection

- **Male genital:**
  - Hernia
  - Testicular mass
  - Testicular pain
  - Discharge
  - Sores
  - Prostatitis
  - Erectile
  - STD
  - Prior PSA

- **Female genital:**
  - Menarche
  - Menopause
  - Menstrual irregularities
  - PMS
  - Dysmenorrhea
  - Postmenopausal bleeding
  - Vaginal discharge
  - STD
  - Endometriosis
  - Birth control method
  - Breast lumps
  - Nipple/discharge
  - # preg
  - # live birth
  - # abortions
  - PAP
  - Mammogram

- **Neuro:**
  - Dizzy
  - Syncope
  - Seizure
  - Vertigo
  - Parasthesias
  - Weakness
  - Tremor

- **Rheum:**
  - Arthritis
  - Stiffness
  - Gout
  - Lyme
  - Back pain
  - Myalgia

- **Vascular:**
  - Phlebitis
  - Varicose
  - Claudication
  - Cramping
  - Reynaud's
• **Endocrine:**
  Polyuria  polydipsia  polyphagia  heat/cold intolerance  Thyroid  DM
  osteoporosis

• **Heme:**
  Anemia  bruising  bleeding  transfusions  lymph nodes  Fatigue
  fever  chills  night sweats

• **Derm**
  Rashes  change in mole  dryness  itching  lumps  Pigment change

**Physical Exam:**

- **General appearance:**  healthy / unhealthy  NAD / distress  apparent age?
- **Vitals:**  HR:  RR:  BP:  weight:
- **HEENT:**  Skin/scalp  Ear  Eye  Nose  Oropharynx

- **Neck:**
  Lymph nodes  SCM / trapezius  Carotid bruits  Jugular Distention  Thyroid

- **Cardio/chest:**
  PMI:  Thrill  Lift  Tachy  Brady
  Heart auscultation:  S1:  S2:  murmur  rub  gallop  S3  S4

- **Pulmonary/back:**
  Lung auscultation:  crackles  Wheezes  Rhonchi  Aeration:
  Border:  CVA tenderness

- **Upper Extremities:**
  Axillary / epitrochlear lymph nodes:  Muscle tone:  radial pulse:  skin/nails:
  Strength:

<table>
<thead>
<tr>
<th></th>
<th>fingers</th>
<th>wrists</th>
<th>elbows</th>
<th>shoulder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensor</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Abductor</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adductor</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Abdomen:

Tenderness/guarding: Obese? Skin: Aorta?

Scars: Liver edge: Palpable spleen: Fluid wave:

Auscultation:

Lower Extremities:

Femoral pulse: DP pulse: Popliteal pulse: Edema: Skin/nails:

Strength:

<table>
<thead>
<tr>
<th></th>
<th>Hip</th>
<th>Knee</th>
<th>Ankle</th>
<th>Toes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexor</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extensor</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Abductor</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adductor</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Neurological exam:

I. Mental status:

Consciousness:

Mini-mental status exam

Orientation: Date:

Day of week:
Month:
Season:
Year:
Floor:
Hospital:
Town:
State:

Registration: “Moon”:

“Piano”:

“Shoe”:

Attention/Calculation: Serial 7’s: 93…86…79…72…65

Serial 3’s: 97…94…91…88…85

D-L-R-O-W:

Days of week backward:

Recall: “Moon”:

“Piano”:

“Shoe”: 
Repeat “no ifs, ands, or buts”:
Write a sentence
Take paper in R hand:
Fold in half:
Give back:
Obey written “close your eyes”:
Name “pen”:
Name “watch”:
Draw intersecting pentagons:

II. Skull and Spine:

III. Meningeal signs: Kernig: Brudzinski:

IV. Cranial Nerves
   I:
   II: Acuity:
       Fields:
       Color:
   III, IV, VI: 6 principle directions:
       Vergence:
       Nystagmus:
       Pupil size, shape:
       Pupillary reaction:
       Ptosis:
   V: 3 sensory fields:
       Masseter, temporalis:
       Corneal reflex:
   VII: Eye brow strength:
       Periorbital muscle strength:
       Perioral muscle strength:
   VIII: Hear fingers rubbing
       Rinne
       Weber
   IX, X: Phonation
       Palate elevation:
       Gag reflex
   XI: SCM:
       Trapezius:
   XII: Tongue strength/bulk:
       Tongue movement
       Deviation:
V. Motor

Strength:
- Biceps
- Triceps grip
- arm abduction
- Iliopsoas
- Leg abduction
- Leg adduction
- Hamstrings
- Quadriceps
- Tibialis anterior
- Gastrocnemius

Tone:

Bulk:

Involuntary Movements: Pronator drift:

VI. Coordination:

<table>
<thead>
<tr>
<th></th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finger-nose-finger</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heel-knee-shin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid alternation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finger tap</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

VII. Sensory

<table>
<thead>
<tr>
<th></th>
<th>Touch</th>
<th>pin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shoulders</td>
<td>L:</td>
<td>L:</td>
</tr>
<tr>
<td></td>
<td>R:</td>
<td>R:</td>
</tr>
<tr>
<td>Forearms</td>
<td>L:</td>
<td>L:</td>
</tr>
<tr>
<td></td>
<td>R:</td>
<td>R:</td>
</tr>
<tr>
<td>Thumbs</td>
<td>L:</td>
<td>L:</td>
</tr>
<tr>
<td></td>
<td>R:</td>
<td>R:</td>
</tr>
<tr>
<td>Pinkies</td>
<td>L:</td>
<td>L:</td>
</tr>
<tr>
<td></td>
<td>R:</td>
<td>R:</td>
</tr>
<tr>
<td>Thigh front</td>
<td>L:</td>
<td>L:</td>
</tr>
<tr>
<td></td>
<td>R:</td>
<td>R:</td>
</tr>
<tr>
<td>Medial / lateral calves</td>
<td>L:</td>
<td>L:</td>
</tr>
<tr>
<td></td>
<td>R:</td>
<td>R:</td>
</tr>
<tr>
<td>Little / big toe</td>
<td>L:</td>
<td>L:</td>
</tr>
<tr>
<td></td>
<td>R:</td>
<td>R:</td>
</tr>
</tbody>
</table>

- vibration
- position (up/down):
- stereognosis
- graphesthesia
VIII. Reflexes

<table>
<thead>
<tr>
<th>Reflex</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biceps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triceps</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachioradialis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patellar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foot</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Babinski</td>
<td></td>
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</tr>
</tbody>
</table>

IX. Station and gait

- Roll up pants
- Romberg
- Walk, turn, come back
- Tip-toes
- Heels
- 1 leg balance/hop
# Medicine Patient Tracking

<table>
<thead>
<tr>
<th>Name</th>
<th>PMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOB</td>
<td>Age</td>
</tr>
<tr>
<td>Allergies</td>
<td></td>
</tr>
<tr>
<td>Admitted</td>
<td>Discharged</td>
</tr>
</tbody>
</table>

## HPI

## PMH/PSH

## Admission Meds

## SH

## FH

## ROS

### Admission

<table>
<thead>
<tr>
<th>T</th>
<th>P</th>
<th>R</th>
<th>BP</th>
<th>O2</th>
<th>Wt</th>
<th>Ht</th>
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<td></td>
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### Previous Labs:

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<tr>
<th>Ca</th>
<th>T bili</th>
<th>PTT</th>
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<tbody>
<tr>
<td>Mg</td>
<td>D bili</td>
<td>PT</td>
</tr>
<tr>
<td>Phos</td>
<td>AST</td>
<td>INR</td>
</tr>
<tr>
<td>TP</td>
<td>ALT</td>
<td>Amyl</td>
</tr>
<tr>
<td>Alb</td>
<td>Alk Ph</td>
<td>Lipase</td>
</tr>
</tbody>
</table>

### Previous Studies:

### Problems:

### Brief Course

## Discharge

- □ Placement
- □ Home care
- □ D/C orders
- □ Transport
<table>
<thead>
<tr>
<th>Date</th>
<th>Overnight Complaints</th>
</tr>
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<tbody>
<tr>
<td>CP</td>
<td>SOB</td>
</tr>
<tr>
<td>N/V</td>
<td>Abd</td>
</tr>
<tr>
<td>urine</td>
<td>Ap/wt</td>
</tr>
<tr>
<td>Fatig</td>
<td>BM</td>
</tr>
<tr>
<td>HA</td>
<td>Vis</td>
</tr>
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<table>
<thead>
<tr>
<th>Meds</th>
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<tbody>
<tr>
<td>N/V</td>
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<td>urine</td>
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<td>Fatig</td>
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<td>HA</td>
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<table>
<thead>
<tr>
<th>Relevant Tests</th>
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<tbody>
<tr>
<td>T (Tmax)</td>
</tr>
<tr>
<td>P</td>
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<tr>
<td>R</td>
</tr>
<tr>
<td>BP</td>
</tr>
<tr>
<td>SaO2</td>
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<td>I/O</td>
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<table>
<thead>
<tr>
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<table>
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<tr>
<th>Other Labs</th>
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<tbody>
<tr>
<td>Tasks</td>
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<table>
<thead>
<tr>
<th>A/P</th>
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</table>
Newborn H&P

History
Maternal – Age, Race as needed, Parity, PMH
OB – Abnl wt gain, Infection (inc. screens), Drug use (legal and not), DM, HTN, SC or other blood dyscrasia, Previous abnormal pregnancies, Fetal monitoring, Drugs during L&D, Mode of delivery

Initial Exam
Meconium
Apgars
Congenital anomalies
Birth injuries
Abnormalities of placenta and cord

Physical

VS – wt, length, head & chest circumference, RR, HR, axillary temp, BP (prn)

General
Skin – no rashes, bruising or jaundice, milia, lanugo, mongolian spots
HEENT – size & shape, molding, cephalhematoma, caput, AFSF & size, sutures, no dysmorphic features, nares patent, ears soft, canals patent, ears normally placed, periauricular sinuses and skin tags, palate intact, epithelial pearls, natal teeth, + RR bilaterally, retinal hemorrhage
Neck – supple & without masses, fistulas, cysts, torticollis, clavicular fracture
Chest – symmetric, breast buds, areola, pectus excavitum
Lungs – Good aeration, equal BS bilat, no retractions, bowel sounds
CV – nl S1 & S2, reg, no murmurs, PMI, pulses 2+, cap refill 2s
Abd – __ vessel cord, soft, non-distended, no HSM or masses, anus
GU – Tanner 1, nl phallus, testes down, location of meatus, vaginal bleeding or discharge, ambiguous genitalia
Back – No defects, spinal defects, hair tufts
Ext – edema, nl digits, tone, + grasp, warm, hip clicks, deformities of foot
Neuro – arousable, responds appropriately to noxious stimuli, opens eyes, + suck, + Moro, + root, + Babinski, posture, muscle tone & activity, MAEW
## Peds Patient Tracking

<table>
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<tr>
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<tr>
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<td>Allergies</td>
<td></td>
</tr>
<tr>
<td>Admitted</td>
<td>Discharged</td>
</tr>
</tbody>
</table>

### CC

### HPI

**Birth H** Born on ________ at ___________ in ____________. Birth wt ____. +/- spontaneous resp. Apgars ___, ___.

Vag. C/S for ______________________________.

To a ___ yo G P mom who took __________________________ during pregnancy at _____ wks. Meds during delivery included ___________________________. Complication s of pregnancy included ____________________________.

**Neonatal H** +/- cyanosis +/- pallor +/- jaundice +/- birthmarks or deformities. Went to ____________ nursery and went home.

**Nutrition** Breast or Bottle. Always? Vitamins started __________. Started solids @ __________. History of Pica?

**Current diet**

**Development** Smiled @ Head up @ Sat @ Cruised @ Walked @ 1st meaningful words @

Toilet trained @ Started school @ Scholastic Learning disabilities ADD

**Habits** To bed @ Up @ Dreams Nightmares Exercise

Favorite game Thumb sucking Tantrums Breath holding Enuresis

Encopresis Friends Best friend Interactions

Discipline methods

**Immunizations**

**Admission Meds**

**PMH**

**PSH**

**FH** Mom in. lbs. Dad in. lbs.

Cancer, CAD, HTN, Kidney dz, DM, Hereditary, Blood dyscrasias, Mental retardation, Dystrophies, Congenital anomalies

**SH** Lives with ___________ in a(n) ________. +/- smoking in home. Well/City water.

Day care @ , ______ days a week. ________ other kids there.

_______ work. Insurance _____________. +/- Medicaid

**Neighborhood**

After school: TV, Nintendo, pets,

Travel

**ROS**

<table>
<thead>
<tr>
<th>Admission</th>
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<th>P</th>
<th>R</th>
<th>BP</th>
<th>O2</th>
<th>Wt</th>
<th>Ht</th>
<th>OFC</th>
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<td>Name:</td>
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<td><strong>Overnight Complaints</strong></td>
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**Meds**

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<tr>
<th>Relevant Tests</th>
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<td><strong>T (Tmax)</strong></td>
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<td><strong>P</strong></td>
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<td><strong>R</strong></td>
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<td><strong>BP</strong></td>
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<td><strong>SaO2</strong></td>
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<td><strong>In</strong></td>
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<td><strong>Out</strong></td>
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<td><strong>Cc/kg/d</strong></td>
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<td><strong>Kcal/kg/d</strong></td>
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<td><strong>Accu</strong></td>
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</table>

**Physical Exam**

<table>
<thead>
<tr>
<th>Labs</th>
</tr>
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<tbody>
<tr>
<td>Tasks</td>
</tr>
<tr>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Notes in chart</td>
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<tr>
<td>□ Call consults</td>
</tr>
<tr>
<td>□ Vitals</td>
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<tr>
<td>□ Meds</td>
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<tr>
<td>□ Labs</td>
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<tr>
<td>□ Micro</td>
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<tr>
<td>□ PE</td>
</tr>
<tr>
<td>□ Note</td>
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<tr>
<td>□ Chat with pt</td>
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<tr>
<td>□ AM Labs</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>A/P</th>
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<tbody>
<tr>
<td>□ Feeding</td>
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<td>□ Feeding</td>
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<td>□ Feeding</td>
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<td>□ Feeding</td>
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<td>□ Feeding</td>
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</tbody>
</table>
Neurologic Physical Exam

I. Mental status:

**Consciousness:**

**Senator?**

**President?**

**Orientation:**

**How long have you been here?**

**Have you been able to keep track of the date?**

Date: __________

Day of week: __________

Month: __________

Season: __________

Hospital: __________

City/State: __________

**Registration:**

“Moon”: __________

“Piano”: __________

“Shoe”: __________

**Attention/Calculation:**

Serial 7’s: 93...86...79...72...65

Serial 3’s: 97...94...91...88...85

**Days of week backward:**

“Moon”: __________

“Piano”: __________

“Shoe”: __________

**Language:**

Repeat “no ifs, ands, or buts”:

Write a sentence

Take paper in R hand:

Fold in half:

Give back:

Obey written “close your eyes”:

Name “pen”:

Name “watch”:

Draw intersecting pentagons:

---

PT STANDING

**IX. Station and gait** (Roll up PT’s pants)

- **Walking:**
  - **Walk** (foot drag, drop; pelvic tilt)
  - **Turn** (block of marble, fall/stagger)
  - **Come back** (look for arm asymm)

- **Tip-toes** (tests gastrocs)

- **Heels** (tests anterior compartment, checks asymm of arm swing)

- **1 leg balance/hop**
  - Cannot keep L leg up → L pelvic girdle weakness
  - Can keep up but is unsteady → R extensors may be weak

- **Walk in straight line, heel-toe** (tandem gait; does fall to one side?):

- **Romberg** (PT w/ eyes closed; can keep balance?)

---

PT SITTING

**II. Skull and Spine:**

Run hands over each side of calvarium in saw-tooth fashion

Examine/percuss spine

**IV. Cranial Nerves**

**I:**

**L:**

**II:**

**Acuity** (can read a sentence?):

**Fields**

_**Count fingers in 4 quads**_

Hold up _fingers on each side simultaneously_—neglect?

Bring in _fingers from periphery_—can see at same time as you?

**Color** (bright color, separate to each eye):

**Funduscopic** exam—count vessels crossing disk margin (NL = 16-22)

**III, IV, VI:**

**6 principle directions:**

**Vergence:**

**Pupil size, shape; pupillary reaction:**

(Ptosis?)

(Nystagmus): +/-, gaze & fast-phase directions, rate
V: 3 sensory fields (V1/2/3): (pin, both sides—sharp or dull?)
Masseter, temporalis (PT clenches teeth; palpate these):
Pterygoids (depress jaw, move side/side)
Corneal reflex: (ask PT if equal in both sides)

VII: Eye brow strength:
Frown (Perioral muscle strength):
Close both eyes tightly, don’t let you open (Periorbital muscle strength):
Puff out cheeks

VIII: Hear fingers rubbing
Rinne (fork on mastoid; when sound stops, pull away; should hear again):
Weber (256 fork on cn of forehead; should hear sound symmetrically):

IX, X: Phonation (clear, slurred, nasal, weak, strangled, ataxic)
Palate elevation (X—say ah!):
Gag reflex (afferent IX, efferent X)

XI: SCM (L turns head R): Trapezius (shoulder shrug):
(shoulder shrug): (do these against your resistance)

XII: Tongue bulk (atrophy, macroglossia, fibrillation, fasciculation):
Tongue strength (poke tongue into cheek, you palpate it)
Tongue movement (protrude, move side/side)

V. Motor
Involuntary Movements:
Pronator drift?: Hands drift down: Tremor:

Strength:
Deltoids:
Arms abducted:
Biceps:
Triceps:
Wrist flexion:
Finger abduction:
Tone (normal contour):
Bulk:

VI. Coordination

<table>
<thead>
<tr>
<th></th>
<th>Left</th>
<th>Right</th>
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</thead>
<tbody>
<tr>
<td>Finger-nose-finger</td>
<td></td>
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<tr>
<td>Rapid alternation</td>
<td></td>
<td></td>
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<tr>
<td>Finger tap (tap DIP of thumb w/ fingertip)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heel-knee-shin</td>
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<td></td>
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</tbody>
</table>

VII. Sensory

<table>
<thead>
<tr>
<th></th>
<th>Touch</th>
<th>pin</th>
</tr>
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<tbody>
<tr>
<td>Shoulders</td>
<td></td>
<td></td>
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<tr>
<td>L:</td>
<td></td>
<td>L:</td>
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<tr>
<td>R:</td>
<td></td>
<td>R:</td>
</tr>
<tr>
<td>Forearms</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L:</td>
<td></td>
<td>L:</td>
</tr>
<tr>
<td>R:</td>
<td></td>
<td>R:</td>
</tr>
<tr>
<td>Thumbs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L:</td>
<td></td>
<td>L:</td>
</tr>
<tr>
<td>R:</td>
<td></td>
<td>R:</td>
</tr>
<tr>
<td>Pinkies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L:</td>
<td></td>
<td>L:</td>
</tr>
<tr>
<td>R:</td>
<td></td>
<td>R:</td>
</tr>
<tr>
<td>Thigh front</td>
<td></td>
<td></td>
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<tr>
<td>L:</td>
<td></td>
<td>L:</td>
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<tr>
<td>R:</td>
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<td>R:</td>
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</table>
Medial / lateral calves

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<thead>
<tr>
<th></th>
<th>L:</th>
<th>R:</th>
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<tbody>
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<td>L:</td>
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<tr>
<td>R:</td>
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</tbody>
</table>

Little / big toe

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<thead>
<tr>
<th></th>
<th>L:</th>
<th>R:</th>
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<tbody>
<tr>
<td>L:</td>
<td></td>
<td></td>
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<tr>
<td>R:</td>
<td></td>
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</tbody>
</table>

vibration

<table>
<thead>
<tr>
<th></th>
<th>L DIP of thumb:</th>
<th>R DIP of thumb:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L big toe</td>
<td>R big toe</td>
</tr>
</tbody>
</table>

position (up/down):

<table>
<thead>
<tr>
<th></th>
<th>L index:</th>
<th>R index:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>L big toe</td>
<td>R big toe</td>
</tr>
</tbody>
</table>

stereognosis (can recognize an object handed to them w/ eyes closed):

graphesthesa (can recognize a letter or number written on hand):

VIII. Reflexes

<table>
<thead>
<tr>
<th>Reflex</th>
<th>Left</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jaw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biceps C5,6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triceps C8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brachioradialis C5,6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patellar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ankle(Achille’s tendon)</td>
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<td></td>
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<tr>
<td>Babinski</td>
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<tr>
<td>Clonus (if reflexes hyperactive)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PT LYING

II. Skull and Spine:

- Palp/Auscultate carotids
- Examine/percuss spine

III. Meningeal signs:

- Flex head and neck
- Brudzinski (resistance; involuntary flexion of legs at hips/knees)
- Kernig: (flex leg @ hip and knee; straighten knee→ shouldn’t cause pain):

V. Motor

<table>
<thead>
<tr>
<th>Strength</th>
<th>iliopsoas (hip flexion; have PT raise leg against hand):</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Leg abduction (push out against hands):</td>
</tr>
<tr>
<td></td>
<td>Leg adduction (in against hands):</td>
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<tr>
<td></td>
<td>Quads (support knee; PT to straighten leg):</td>
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<tr>
<td></td>
<td>Hamstrings (support knee from above; you try to straighten PTs leg)</td>
</tr>
<tr>
<td></td>
<td>Tibialis anterior (push up):</td>
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<tr>
<td></td>
<td>Gastrocnemius (pull down):</td>
</tr>
</tbody>
</table>
# Neurologic Physical Exam 2

## I. Mental status:

<table>
<thead>
<tr>
<th>Consciousness:</th>
<th>Date:</th>
<th>Day of week:</th>
<th>Month:</th>
</tr>
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<tbody>
<tr>
<td>Orientation:</td>
<td>Year:</td>
<td>Hospital:</td>
<td>City/State:</td>
</tr>
<tr>
<td>Season:</td>
<td>Registration:</td>
<td>“Moon”:</td>
<td>“Piano”:</td>
</tr>
<tr>
<td>Attention/Calculation:</td>
<td>Serial 7’s:</td>
<td>93...86...79...72...65</td>
<td></td>
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<tr>
<td></td>
<td>Serial 3’s:</td>
<td>97...94...91...88...85</td>
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</tr>
</tbody>
</table>

**Days of week backward:**

<table>
<thead>
<tr>
<th>Recall/Memory:</th>
<th>Language:</th>
<th>Repeat “no ifs, ands, or buts”:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Write a sentence</td>
<td></td>
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<tr>
<td>Take paper in R hand:</td>
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<tr>
<td>Fold in half:</td>
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<tr>
<td>Give back:</td>
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<td></td>
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<tr>
<td>Obey written “close your eyes”:</td>
<td></td>
<td></td>
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<tr>
<td>Name “pen”:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name “watch”:</td>
<td></td>
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</tr>
</tbody>
</table>

## II. Skull and Spine:

- Run hands over each side of calvarium in saw-tooth fashion
- Examine/percuss spine
- Palp/auscultate carotids
- Examine/percuss spine

## IV. Cranial Nerves

- **II:** Acuity (can read a sentence?):
  - Fields
  - Count fingers in 4 quads
  - Hold up fingers on each side simultaneously—neglect?
  - Bring in fingers from periphery—can see at same time as you?
- **III:** Color (bright color, separate to each eye):
- **IV:** Fundus—count vessels crossing disk margin
- **V:**
  - Head and neck:
  - Brudzinski (resistance; involuntary flexion of legs at hips/knees)
  - Kernig: (flex leg @ hip and knee; straighten knee shouldn’t cause pain):
- **VI:**
  - Shoulder, forearm, hand:
  - Thigh:
  - Position (up/down): L index: R index: L big toe R big toe
- **VII:**
  - Stereognosis (can recognize an object handed to them w/ eyes closed):
  - Graphesthesia (can recognize a letter or number written on hand):
- **VIII:**
  - Jaw, biceps C5,6; triceps C8; BR C5/6
  - Patellar, ankle; clonus (if reflexes hyperactive)

## V. Motor

- **Involuntary Movements:**
  - Pronator drift?:
  - Hands drift down: Tremor:
  - Strength:
  - Deltoids: Arms abducted:
  - Biceps: Triceps:
  - Wrists flexion:
  - Wrists extension:
  - Finger abduction:
  - Opposition of thumb:
- **II:**
  - Iliopsoas: Leg abduction; Leg adduction
  - Quadriceps: Hamstrings
  - Tibialis anterior; Gastrocnemius
- **III:** Tone (normal contour):
  - Bulk:

## VI. Coordination

- Finger-nose—finger, Rapid alternation, Finger tap, heel-knee-shin

## VII. Sensory

- Shoulders, forearms, thumbs, pinkies
- Thigh font, medial/lateral calves, little/big toe
- Position (up/down):
- Stereognosis (can recognize an object handed to them w/ eyes closed):
- Graphesthesia (can recognize a letter or number written on hand):

## VIII. Reflexes

- Jaw, biceps C5,6; triceps C8; BR C5/6
- Patellar, ankle; clonus (if reflexes hyperactive)

## IX. Station and gait

- **Roll up PT’s pants**
- **Walking:**
  - Walk (foot drag; drop; pelvic tilt)
  - Turn (block of marble, fall/stagger)
  - Come back (look for arm asymm)
- **Tip-toes** (tests gastrocs)
- **Heels** (tests ant. compartment, checks asymm of arm swing)
- **1 leg balance/hop**
  - Cannot keep L leg up → L pelvic girdle weakness
  - Can keep up but is unsteady → R extensors may be weak
- **Walk in str line, heel-toe** (tandem gait; does fall to one side?):
- **Romberg** (PT w/ eyes closed; can keep balance?)

## PT STANDING

- **Walking:**
  - Walk (foot drag; drop; pelvic tilt)
  - Turn (block of marble, fall/stagger)
  - Come back (look for arm asymm)
- **Tip-toes** (tests gastrocs)
- **Heels** (tests ant. compartment, checks asymm of arm swing)
- **1 leg balance/hop**
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- **Walk in str line, heel-toe** (tandem gait; does fall to one side?):
- **Romberg** (PT w/ eyes closed; can keep balance?)

## PT LYING

- **Roll up PT’s pants**
- **Walking:**
  - Walk (foot drag; drop; pelvic tilt)
  - Turn (block of marble, fall/stagger)
  - Come back (look for arm asymm)
- **Tip-toes** (tests gastrocs)
- **Heels** (tests ant. compartment, checks asymm of arm swing)
- **1 leg balance/hop**
  - Cannot keep L leg up → L pelvic girdle weakness
  - Can keep up but is unsteady → R extensors may be weak
- **Walk in str line, heel-toe** (tandem gait; does fall to one side?):
- **Romberg** (PT w/ eyes closed; can keep balance?)

## PT SITTING

- **Skull and Spine:**
  - Run hands over each side of calvarium in saw-tooth fashion
  - Examine/percuss spine
  - Palp/auscultate carotids
  - Examine/percuss spine

## IV. Cranial Nerves

- **II:**
  - Acuity (can read a sentence?):
  - Fields
  - Count fingers in 4 quads
  - Hold up fingers on each side simultaneously—neglect?
  - Bring in fingers from periphery—can see at same time as you?
- **III:** Color (bright color, separate to each eye):
- **IV:** Fundus—count vessels crossing disk margin
- **V:**
  - 3 sensory fields (V1/2/3): (pin, both sides)
  - Masseter, temporalis
  - Pterygoids (depress jaw, move side/side)
- **VI:**
  - Eye brow strength:
  - Frown (Perioral muscle strength):
  - Close both eyes tightly, don’t let you open (Periorbital muscle strength):
  - Puff out cheeks
- **VII:**
  - Hear fingers rubbing
  - Rinne (fork on mastoid; sound stops, pull away)
  - Weber (256 fork on cn of forehead; symmetr?)
- **IX:**
  - Phonation (clear, slurred, nasal, weak, strangled, ataxic)
  - Palate elevation (X—say ah!):
  - Gag reflex (afferent IX, efferent X)
- **X:**
  - SCM (L turns head R):
  - Trapezius (shoulder shrug):
- **XII:**
  - Tongue bulk (atrophy, macroglossia, fibrillation, fasciculation):
  - Tongue movement (protrude, move side/side)
Neurologic Physical Exam 3

PE
General – include race
VS T P RR BP SaO2
Head trauma
Lungs – crackles
Neck – bruits
Heart – regular, valves, size
Abd – acute?
Ext – c/e/e
Neuro
Mental status
Awake, alert, attentive

Mini-Mental Status Exam
“Can you tell me the date?” Year, season, date, day, month (ask for those omitted) (5)
“Where are you?” State, county, town, hospital, floor (ask for those omitted) (5)
Name three objects slowly and clearly. Ask pt to repeat them. Ball, apple, purple. (3)
Serial 7s. Stop after five answers. OR “Spell WORLD backward.” (5)
Ask for the names of the objects repeated above. (3)
Show a watch and ask for its name. Repeat with a pencil. (2)
Ask pt to repeat, “No ifs, ands, or buts.” (1)
Offer plain, blank paper. “Take this paper in your right hand, fold it in half, and put it on the table.” (3)
Show pt paper with CLOSE YOUR EYES printed on it. Ask the pt to read and do it. (1)
Ask the pt to write a sentence of his or her own. (1)
Ask the pt to copy a pair of intersecting pentagons onto a piece of blank paper. (1)

Skull and Spine
Meninges
Brudzinski’s sign
Kernig’s sign
Photophobia

CN
Acuity, PERRL, color, fields, discs (esp sharp edges)
EOMI – full range, Smooth tracking, Conjugate, nystagmus
Face equal superior and inferior
V1,2,3
Palatte up symmetrically
Protrude tongue in midline, strength, rapidly back & forth
SCM & trapezius

Sensory
Light touch
Pain/Temp
Joint position or kinesthetic sense
Vibration
Discriminative
Stereognosis (identify object by feeling it)
Graphesthesia
Two-point discrimination
Extinction (stimulate both sides, ask which is felt or seen)

Motor
Drift
Proximal vs distal – patterns of weakness
Tone – UE, pull up knee
Bulk, atrophy, fasciculations
Reflexes
DTR – symmetry & absolutes
  Absent or brisk
Babinski
Hoffman
Jaw jerk
Clonus

Coordination
Resting
Postural – hold index fingers close together
Axial instability
Fine finger movements
  Ability is related to pyramidal tract
  Accuracy is related to cerebellum
Rapidly alternating movements
Tremor – intention, resting, action

Gait
Base, steady, stride
Heels – strength & balance
Tandem – balance
Romberg – vestibular, proprioception and strength
Pull test – Parkinson’s

Rectal tone if suspect spinal problem
Anal wink

Labs
CBC
BMP – Na, K, kidneys for renal failure, glucose (important for stroke recovery, hypoglycemia can give focal signs)
Liver
Ca
Mg
ESR
EKG – past ischemia, arrhythmia
CXR – big heart, massive failure
UA
Head CT
OB-Gyn Notes

L&D H&P

Form
A/P: Age, GxPx, gestational age (method & certainty), presenting complaint.

Problem List:
1) Presenting complaint
2) Complications of pregnancy
3) Medical conditions
4) Fetal well being

INTRAPARTUM NOTE (every 12h or prn)

Date & Time
S: c/o ctx, requests epidural. SROM @ 1015, clear. No HA, visual changes, RUQ pain.
O: TPRBP, urine dip.
  FHT = rate, R (reactive)
  Toco q8h, mod or 40 mmHg on OT = 10mIU/min.
  SVE: 4cm/80%/+1
  RRR
  CTAB
  DTR’s 2+ B
A/P: 25 yo GxPx WF IUP @ 32 2/7 wks by LMP+US
  1) FWB – rate, R
  2) Active labor – inadequate ctx on OT. FSE/IUPC placed without difficulty to monitor ctx on OT. No CS x 2 hours.
  3) Pain – place epidural.
  4) BP ____ -- May be due to pain. No sxs of PIH, DTR’s nl, dip negative. Monitor BP, check labs if elevated.

Have cosigned

C-SECTION PATIENT
BON
Post-op orders
Birth Certificate form
PCA order
Discharge summary
Path sheet

BRIEF OP NOTE

1) Pre-op dx
2) Post-op dx
3) Procedure – including consults
4) Surgeon
5) Assistants
6) Anesthesia
7) IVF
8) UOP
9) EBL
10) Specimens
11) Complications
12) Condition
13) Drains
14) Counts
15) Findings

POST PARTUM NOTE

M3PN PPD#1
S: c/o ____, Tolerating ____ diet.
VS: Tm, Tc, HR range, RR range, BP range
PE: Lungs
CV
Breasts – not engorged
Abd – NABS. NTND.
Fundus – Firm, 2cm below umb., NT
Ext – no edema
Perineum – episiotomy repair intact, minimal lochi rubra
Labs: PP Hct (baseline)
O+ | RI
ND | NR
A/P: Age, GxP2→3, PPD#1, s/p NSVD @ term over 2nd degree ML episiotomy
1) GI – Tolerating ___ diet
2) Heme – Tolerating anemia. No lightheadedness or SOB when ambulating.
3) Rh -, Infant Rh + – Rhogam before d/c.
4) RNI – for MMR before d/c.
5) Contraception –
6) Bottle feeding

POST-OP/ICU NOTE

Date & Time
Allergies, Meds, IVFs
O: VS with ranges
   Vent AC/ TV 800/ FiO2 100% / VR 10/ PEEP 5
   Gen: Chest CV Abd Wound
   Ext – no c/c/e. Negative Homan’s. Thromboguards on.
   UOP (last 3 shifts), color
   JP (last 3 shifts), color
   NGT (last 3 shifts), color
Labs:
A/P: Age s/p ___, POD#, etc.
   ID – s/p abx.
   CV – Stable with VSS. UOP adequate.
   GI –
   GU –
   Heme –
   F/E/N –
   Pain –
   Wound –
   Other –
M3PN POD#

S: Pt without c/o SOB or CP.

VS: Tm, Tc, HR range, RR range, BP range

I/O:

PE: Chest
  CV
  Breasts – not engorged
  Abd – NABS. ND. Appropriately tender at incision
  Fundus – firm, 2 cm below umbilicus, NT
  Incision – Clean, no drainage
  Ext – 1+ LE edema
  Perineum – minimal lochia rubra

Labs: CBC

A/P: age, GxP2→3, POD# s/p urgent primary LTCS at 34 wks (secondary to abruption)
  1) GI – NABS. Will start clear liquids.
  2) ID – Afebrile. s/p abx
  3) GU – Good UOP. D/C foley
  4) Contraception – Depo provera
  5) Bottle feeding

Remove dressing POD1
Remove foley POD1
Ambulate on POD1
Cleans on POD1 if +BS and nondistended.
Regular diet on POD2 if flatus.
Staples out on POD3

DISCHARGE SUMMARY

Admitted on: Discharge On: (leave blank):
Diagnosis
32 yo GxPx F
Active labor at term
MVP
Undesired fertility

Treatment:
Vacuum-assisted NVD over 2nd degree ML episiotomy
Epidural
Oxytocin augmentation
SBE proph with _____
PPTL (post-partum tubal)

Hospital Course:

Laboratory Results: Postpartum H/H=
B+ | RI
ND | NR

Discharge Exam and Condition: (blank)

Discharge Meds:

Plan for follow-up:
**Surgery Notes**

**BRIEF OP NOTE**

1) Pre-op dx
2) Post-op dx
3) Procedure – including consults
4) Surgeon
5) Assistants
6) Anesthesia
7) IVF
8) UOP
9) EBL
10) Specimens
11) Complications
12) Condition
13) Drains
14) Counts
15) Findings

**POST OP NOTE**

Date & Time

Allergies, Meds, IVFs
O: VS with ranges
   Vent AC/ TV 800/ FiO2 100% / VR 10 / PEEP 5
   Gen:
   Chest
   CV
   Abd
   Wound
   Ext – no c/c/e. Negative Homan’s. Thromboguards on.
   UOP (last 3 shifts), color
   JP (last 3 shifts), color
   NGT (last 3 shifts), color
   Labs:
   A/P: Age s/p ___, POD#, etc.
      ID – s/p abx.
      CV – Stable with VSS. UOP adequate.
      GI –
      GU –
      Heme –
      F/E/N –
      Pain –
      Wound –
      Other –

Remove dressing POD1
Remove foley POD1
Ambulate on POD1
Clears on POD1 if +BS and nondistended.
Regular diet on POD2 if flatus.
Staples out on POD3
## Surgery Patient Tracking

<table>
<thead>
<tr>
<th>Name</th>
<th>PMD</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOB</td>
<td>Age</td>
</tr>
<tr>
<td>Admitted</td>
<td>Discharged</td>
</tr>
</tbody>
</table>

### HPI

### PMH

### PSH

### Admission Meds

### SH

### FH

### ROS

### Admission

<table>
<thead>
<tr>
<th>T</th>
<th>P</th>
<th>R</th>
<th>BP</th>
<th>O2</th>
<th>Wt</th>
<th>Ht</th>
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### Previous Labs:

<table>
<thead>
<tr>
<th>Ca</th>
<th>T bili</th>
<th>PTT</th>
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</thead>
<tbody>
<tr>
<td>Mg</td>
<td>D bili</td>
<td>PT</td>
</tr>
<tr>
<td>Phos</td>
<td>AST</td>
<td>INR</td>
</tr>
<tr>
<td>TP</td>
<td>ALT</td>
<td>Amyl</td>
</tr>
<tr>
<td>Alb</td>
<td>Alk Ph</td>
<td>Lipase</td>
</tr>
</tbody>
</table>

### Previous Studies:

### EKG

### Admission: 

### Previous:

### CXR

### Admission: 

### Previous:

### Discharge

<table>
<thead>
<tr>
<th>Admit orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview</td>
</tr>
<tr>
<td>H&amp;P</td>
</tr>
<tr>
<td>Schedule tests</td>
</tr>
</tbody>
</table>

| D/C orders |
| Transport |

| Placement |
| Home care |

| DVT Proph |

### Problems:

### Brief Course
<table>
<thead>
<tr>
<th>Date</th>
<th>POD</th>
<th>s/p</th>
</tr>
</thead>
</table>

### Overnight Complaints

<table>
<thead>
<tr>
<th>N/V</th>
<th>Pain</th>
<th>N/V</th>
<th>Pain</th>
<th>N/V</th>
<th>Pain</th>
<th>N/V</th>
<th>Pain</th>
</tr>
</thead>
</table>

### Meds

### Relevant Tests

<table>
<thead>
<tr>
<th>T (Tmax)</th>
<th>P</th>
<th>R</th>
<th>BP</th>
<th>SaO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>In</td>
<td>Iv</td>
<td>TPN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Out</td>
<td>UOP</td>
<td>NGT</td>
<td>Int</td>
<td>JP1</td>
</tr>
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<td></td>
<td>UOP</td>
<td>NGT</td>
<td>Int</td>
<td>JP1</td>
</tr>
</tbody>
</table>

### Accu

### Physical Exam

![Physical Exam Diagram]

### Other Labs

### Tasks

<table>
<thead>
<tr>
<th>Pre-round</th>
<th>Notes in chart</th>
<th>Orders</th>
<th>AM Labs</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-round</td>
<td>Notes in chart</td>
<td>Orders</td>
<td>AM Labs</td>
<td>Test results</td>
</tr>
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<td>Notes in chart</td>
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<td>AM Labs</td>
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<td>Pre-round</td>
<td>Notes in chart</td>
<td>Orders</td>
<td>AM Labs</td>
<td>Test results</td>
</tr>
</tbody>
</table>

### A/P

![A/P Diagram]
Psychiatry Patient Tracking

<table>
<thead>
<tr>
<th>Name</th>
<th>Rm:</th>
<th>Attending:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DOB</th>
<th>Age</th>
<th>Admit Date:</th>
<th>Allergies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

CC:

HPI (S&R, time course, functionality):

<table>
<thead>
<tr>
<th>MDD</th>
<th>Bipolar</th>
<th>Schizophrenia</th>
<th>Substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>↓ mood</td>
<td>↑ or irritable mood</td>
<td>delusions</td>
<td>how long</td>
</tr>
<tr>
<td>anhedonia</td>
<td>↑ self-esteem, grandiosity</td>
<td>hallucinations</td>
<td>age at start</td>
</tr>
<tr>
<td>wt. loss/gain</td>
<td>↓ need for sleep</td>
<td>disorganized speech (e.g., derailment, LOA, incoherence)</td>
<td>attempt to stop</td>
</tr>
<tr>
<td>insomnia/hypersomnia</td>
<td>more talkative</td>
<td></td>
<td>withdrawal sx</td>
</tr>
<tr>
<td>↓ energy</td>
<td>flight of ideas, racing thoughts</td>
<td></td>
<td>rx program</td>
</tr>
<tr>
<td>fatigue, ↓ energy</td>
<td>distractability</td>
<td></td>
<td>used recently</td>
</tr>
<tr>
<td>worthlessness/guilt</td>
<td>↑ goal-directed activity</td>
<td></td>
<td>money</td>
</tr>
<tr>
<td>↓ concentration</td>
<td>↑ pleasurable activities w/ potential bad consequences</td>
<td></td>
<td>related to current</td>
</tr>
<tr>
<td>thoughts of death, suicide</td>
<td></td>
<td></td>
<td>episode?</td>
</tr>
</tbody>
</table>

PMH/PSH:

<table>
<thead>
<tr>
<th>Admission Meds:</th>
<th>Previous meds</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SH (childhood, family structure, education, marriage, occupation, $, substance, tobacco):

FH:

Assets:

ROS:

PE:

Neuro:
**MSE:**
- **GAB:** grooming (+/-), tattoos, motor activity/EPS, responsive/cooperative/hostile, looking at examiner/eyes fixed, agitated/calm

**Speech:** rate (rapid/slow/halting), rhythm, fluency, latency, vocab level, monotone/poverty/neologisms

**COT:** phobias/obsessions/delusions/hallucinations/ideas of reference/depersonalization/derealization/poverty/SI/HI

**FOT** logical/sequential/goal-directed/tangential/cirumstantial/LOA/FOI/echolalia/perserveration/derailment:

**Mood:**

**Affect:** (depressed/nl/elevated/ flat?  labile/stable?  (in)appropriate?  congruent?)

**I&J:** aware/unaware of illness, aware/unaware of tx needed, does/does not have plan for future

**Sensorium:**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>5</td>
<td>Orientation: What is the year season date day month? (1 pt each)</td>
</tr>
<tr>
<td>5</td>
<td>Where are we? state country town hospital floor? (1 pt each)</td>
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<tr>
<td>3</td>
<td>Registration: book chair rose (1 pt each only if right on first try, but repeat until pt learns them; record # of trials)</td>
</tr>
<tr>
<td>5</td>
<td>Attention/Calculation: serial 7s (1 pt each for 93, 86, 79, 72, 65) OR World backwards (1 pt each letter in right order)</td>
</tr>
<tr>
<td>3</td>
<td>Recall: book chair rose (1 pt each)</td>
</tr>
<tr>
<td>2</td>
<td>Language: Name a pencil and a wristwatch</td>
</tr>
<tr>
<td>1</td>
<td>Repeat “No ifs, ands, or buts”</td>
</tr>
<tr>
<td>1</td>
<td>Follow “Take a paper in your right hand, fold it in half, and put it on the floor”</td>
</tr>
<tr>
<td>1</td>
<td>Read and obey “Close your eyes”</td>
</tr>
<tr>
<td>1</td>
<td>Write a sentence</td>
</tr>
<tr>
<td>1</td>
<td>Copy a design (2 intersection pentagons)</td>
</tr>
</tbody>
</table>

**Total:** /30

**Intellect:** Name 5 large cities and last 5 presidents; pt does/does not understand proverbs

**Labs:**

<table>
<thead>
<tr>
<th>Ca</th>
<th>T bili</th>
<th>Alb</th>
<th>Alk Ph</th>
<th>TSH</th>
<th>UDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mg</td>
<td>D bili</td>
<td>AST</td>
<td>Amyl</td>
<td>B-hCG</td>
<td></td>
</tr>
<tr>
<td>Phos</td>
<td>Tprot</td>
<td>ALT</td>
<td>Lipase</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**U/A:**

**A/P:**

**Axes:**

1. (Clinical syndromes)
2. (PDs and Dev. d/o’s)
3. (Physical d/o’s)
4. (Psychosocial stressors)
5. (GAF):
<table>
<thead>
<tr>
<th>Date</th>
<th>Overnight Complaints</th>
</tr>
</thead>
<tbody>
<tr>
<td>Med changes</td>
<td>Relevant Tests/ Exams/ Labs</td>
</tr>
<tr>
<td>Tasks</td>
<td></td>
</tr>
<tr>
<td>□ Pre-round</td>
<td>□ Check nursing notes</td>
</tr>
<tr>
<td>□ Check nursing notes</td>
<td>□ Change meds</td>
</tr>
<tr>
<td>□ Call consults</td>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Talk to SW</td>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Meds</td>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Labs</td>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Chat w/ pt</td>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Test results</td>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Note</td>
<td>□ Pre-round</td>
</tr>
<tr>
<td>□ Order tests</td>
<td>□ Pre-round</td>
</tr>
</tbody>
</table>

A/P
### Psychiatry Patient Tracking 2

<table>
<thead>
<tr>
<th>Name</th>
<th>Rm:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>DOB</th>
<th>Age</th>
<th>Admit Date:</th>
<th>Attending:</th>
<th>Allergies</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CC:**

**HPI** (S&R, time course, functionality; describe sx, ?counseling/tx; previous hospitalizations/meds):

<table>
<thead>
<tr>
<th>MDD (SIG E CAPS)</th>
<th>Bipolar (DIG FAST)</th>
<th>Schizophrenia</th>
<th>Substance</th>
<th>Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>↓ mood</td>
<td>↑ or irritable mood x 2 wks</td>
<td>delusions/hallucinations</td>
<td>how long</td>
<td>doom/panic</td>
</tr>
<tr>
<td>anhedonia (↓ pleasure/enjoyment in life)</td>
<td>Distractability (changing from activity to activity)</td>
<td>1) paranoid?</td>
<td>age at start</td>
<td>1) apprehension, worry, fear, nervous</td>
</tr>
<tr>
<td>wt. loss/gain</td>
<td>Insomnia: ↓ need for sleep</td>
<td>2) AH/VH</td>
<td>attempt to stop</td>
<td>irritability</td>
</tr>
<tr>
<td>insomnia/hypersomnia</td>
<td>Grandiosity, ↑ self-esteem</td>
<td>3) ideas others thought unusual?</td>
<td>withdrawal s/sx</td>
<td>fatigue</td>
</tr>
<tr>
<td>φ-motor ↑/↓</td>
<td>Flight of ideas, racing thoughts</td>
<td>4) ideas of reference</td>
<td>rx program</td>
<td>2) fixated on s.t.</td>
</tr>
<tr>
<td>fatigue, ↓ energy</td>
<td>Agitation/↑ goal-directed Activity</td>
<td>5) thought broadcast/insertion</td>
<td>used recently</td>
<td>felt compelled to do</td>
</tr>
<tr>
<td>worthlessness/guilt</td>
<td>Speech: pressured (more talkative)</td>
<td>disorganized speech</td>
<td>money</td>
<td>s.t. repetitively</td>
</tr>
<tr>
<td>↓ concentration</td>
<td>Thoughtlessness: seeks pleasure w/o regard to consequences</td>
<td>affective flattening, atatonic</td>
<td>related to current episode?</td>
<td></td>
</tr>
<tr>
<td>thoughts of death, suicide</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**PMH/PSH:**

**Admission Meds:**

**Previous meds**

**SH** (childhood, family, education, job/hobbies, relationships, $, substances, legal, support syst):  
**FH (esp psych illness):**

**ROS:**

**PE/Neuro:**
MSE:

**GAB:** appearance (grooming, hygiene, tattoos, EC) motor (nl/incr/decr, agitatied/calm, tremor, tics, repetitive acts, posturing,EPS) behavior (responsive/cooperative/hostile/withdrawn/evasive/manipulative/dramatic/passive/aggressive/irritable/angry outburts)

**Speech:** rate (rapid/slow/halting), amount (nl/excessive/reduced), tone (monotone, singsong, childish, slurred), rhythm, fluency, latency, vocab level, monotone/poverty/neologisms

**COT:** phobias/obsessions/delusions/hallucinations/ideas of reference/depersonalization/derealization/thought insertion/withdrawal/broadcasting/poverty/SI/HI/plan; poverty of content; ideas of helplessness/hopelessness/worthlessness

**FOT:** logical/sequential/goal-directed/tangential/circumstantial/LOA/FOI/echolalia/perserveration/derailment

**Mood:**

**Affect:** depressed/nl/elevated? full/restricted? flat? labile/stable? (in)appropriate? congruent?

**I&J:** aware/unaware of illness, aware/unaware of tx needed, does/does not have plan for future

**Sensorium:** hyperalert / alert / lethargic / stupor / coma
time/place/person disorientation, clouding of consciousness, amnesia, poor recent/immediate/remote memory

<table>
<thead>
<tr>
<th>5</th>
<th>Orientation: What is the year season date day month? (1 pt each)</th>
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<tr>
<td>1</td>
<td>Copy a design (2 intersection pentagons)</td>
</tr>
</tbody>
</table>

**Total:** /30

**Intellect:** Presidents =

How many nickels in a dollar?

**Labs:**

<table>
<thead>
<tr>
<th>TSH:</th>
</tr>
</thead>
<tbody>
<tr>
<td>UDS:</td>
</tr>
</tbody>
</table>

**A/P:**

<table>
<thead>
<tr>
<th>Axes: I (Clinical syndromes):</th>
</tr>
</thead>
<tbody>
<tr>
<td>II (PDs and Dev. d/o’s):</td>
</tr>
<tr>
<td>III (Physical d/o’s):</td>
</tr>
<tr>
<td>IV (Psychosocial stressors):</td>
</tr>
<tr>
<td>V (GAF):</td>
</tr>
<tr>
<td>Date</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Guide to Researching Drug Information

When you start your clinical rotations, it will be essential to know how to rapidly find reliable drug information. Commonly needed facts include: dosage, cost, indications, contra-indications and warnings, adverse effects, drug interactions, and mechanism of action. You may find that some sources are awkward to use or not clinically relevant. Here are some commonly used sources:

- The Physicians’ Desk Reference (PDR) is the classic. It is a huge red or blue book that you may see sitting around the nurses’ station or in the clinic. Note that the content is submitted at the manufacturers’ discretion (and expense) so old generic drugs are often not listed. The information about each drug is basically a copy of the FDA approved drug packaging insert. It can be a bit tedious to wade through, but it gives you the official FDA version of the information (ie, no off-label indications) and includes mechanism of action and details about pharmacokinetics.

- A searchable on-line PDR can be found at www.pdr.net. As a medical student you may register for free.

- Most residents carry a PDA (Palm, Clie, Windows CE, etc) or smart phone with assorted useful medical programs. One of the favorites is Epocrates, found at www.epocrates.com. The free Epocrates Rx is quite useful; some splurge and buy the Epocrates Rx Pro with more features.

- Another classic is the Tarascon Pocket Pharmacopoeia, a tiny shirt-pocket-size handbook that is chock-full of useful information. It is available at the bookstore for only about 10 bucks. There is an amazing amount of information in this tiny book, but the entries are not exhaustive – they just highlight the most essential clinical facts (including off-label indications). If you follow it blindly you can get into big trouble. Tarascon also has a PDA version.

- The Becker Library (becker.wustl.edu) has on-line resources that can be accessed by web from anywhere in the medical center (or by a proxy server from home). For this Case Development session you will use the Clinical Pharmacology resource to research medication information. (See below for details.)

- Modern medications can be incredibly expensive; it is important to be aware of drug costs when prescribing. Some of the above resources list price estimates. (Note that the “Manufacturer’s Wholesale Price” has as little bearing on reality as the “Suggested Retail Price” does in stores.) One quick source for actual drug costs is www.drugstore.com.

- UpToDate is a wonderful source of concise yet thorough, constantly updated, clinically relevant information. It is very popular with residents. The Becker Library finally got a subscription and it is available at www.utdol.com when at a medical center computer (doesn’t work via proxy).
For this Case Development session you will need to use Clinical Pharmacology. Here’s how:

- Go to the Becker library site (becker.wustl.edu); on the left is a pull-down list of Quick Links – choose Clinical Pharmacology (direct URL is www.clinicalpharmacology-ip.com/Default.aspx). **You must be at a medical center computer or on the Becker proxy.**

- The home page shows all the useful information you can get. (For example you can try to get a drug name when the patient says, “you know, that purple pill” – Just click on the Drug Identifier icon in the upper right.)  
  (Trivia – Did you know that there are 2 apple-shaped pills?)

Our patient’s symptoms seemed to have started when new medications were added to her regimen. First let’s see if her Zoloft (sertraline) could have contributed to her diarrhea.

Certain very common symptoms are listed as potential side effects for most medications: nausea, constipation, diarrhea, dizziness, insomnia, headache, etc. These are all common symptoms, even when not taking medications, so they are likely to appear on symptom surveys of medication users too. It is important to see if symptom frequencies are compared to a control or placebo group.

- On the home page, go to the search box at the top, type in “Zoloft” and hit GO. On the next page choose Monographs, Zoloft.

- Take a brief look at the information provided in Description/Classification and in Indications/Dosage.
• Now go to the Adverse Reactions page and read the first couple of paragraphs.

• Next try the pull down menu on the yellow box labeled “Jump to Adverse Reaction.” Choose Diarrhea and click. See how it finds that symptom in the text?

• Now click on Contraindications/Precautions button and skim that information.

• Repeat this process for Levsin, Lomotil and Librax (clindinium). Skim the information for information that seems pertinent to our patient and make notes. Could these medications be playing a role in her mental changes?? (In Adverse Reactions, search for “confusion” and in Contraindications/Precautions search for “elderly.”)

Now consider the issue of drug-drug interactions.

• Type Levsin, then Lomotil and Librax (clindinium). Add them to your report then click Run Report (lower right).

• In the panel on the left you can also choose whether to also check interactions with caffeine, alcohol, etc.; for now check “none.”

• Do you see any interesting information? Note the “Severity” ranking in red.
Bernard Becker Medical Library
Electronic Information Resources
For
Clinical Questions

Becker Medical Library (http://becker.wustl.edu)
Main website for all resources and services available from the Becker Medical Library. Includes links to electronic journals, books, databases, departments, services, websites, and other information sources. The following resources are available from this site.

Beckerproxy
Many of the electronic journals and books offered by the Library are accessible only from Washington University networked computers. In order to bypass site restrictions the Library offers a proxy service. An account on Beckerproxy allows access to all electronic resources from non-university computers.

E-Catalog
Lists all of the library’s books, journals (print and electronic) and selected websites and links to other Medical Center library collections.

Ovid Online (http://gateway.ovid.com/)
The Becker Library’s fee-based subscription service (free for students) offering access to a suite of health sciences bibliographic databases, full-text journals, evidence-based medicine resources, clinical information products and reference texts including:

Medline
MEDLINE® (Medical Literature, Analysis, and Retrieval System Online) is the U.S. National Library of Medicine’s (NLM) premier bibliographic database that contains over 12 million references to journal articles in the life sciences with a concentration on biomedicine. Coverage: 1966-present

HAPI (Health and Psychosocial Instruments)
Provides ready access to information on measurement instruments (e.g. questionnaires, interview schedules, checklists, index measures, coding schemes/manuals, rating scales, projective techniques, vignettes/scenarios, tests) in the health fields, psychosocial sciences, and organizational behavior. Coverage: 1985-present (with many earlier measures)

Your Journals@Ovid
A collection of 267 full-text health sciences journals. May be searched directly or linked to from Ovid Medline.

Clinical Evidence*
A directory that summarizes the latest research evidence on the effects of treatment and preventive interventions for conditions encountered in daily practice. Includes medical, surgical, nursing, and complementary interventions.
Clinical Pharmacology (includes calculators under clinical tools)
Designed to provide timely, concise drug information and clinical reports for medical professionals and health care consumers. Includes descriptions, mechanisms of action, pharmacokinetics, indications/dosage, administration guidelines, and interactions for over 5,000 generic and brand name, investigational, and herbal products. PIER is included in CP.

PIER*
The Physicians’ Information and Education Resource, is a tool from the American College of Physicians that provides evidenced-bases guidelines. Structured in a layered format, PIER Modules are designed to allow the clinician to drill down from more general to specific, targeted information, with immediate access to underlying supporting evidence from the medical literature.

Cochrane Library*
Includes the Cochrane Database of Systematic Reviews, a collection of structured, systematic reviews of health care interventions including adverse effect information. The Cochrane Controlled Trials Register, also in the Cochrane Library, contains 300,000 reports of randomized controlled trials in health care.

Isabel
Isabel is a clinical decision support system featuring a diagnosis reminder system. It instantly gives the clinician a checklist of likely diagnoses. Isabel integrates knowledge from respected medical textbooks, annotated images, journal abstracts categorized into “What’s New” and “Lessons Learnt from Error” and algorithms all linked together through a comprehensive diagnosis taxonomy.

MDConsult
A clinical information service that features 40 online reference books including Braunwald’s Heart Disease, Rosen’s Emergency Medicine and Cecil Textbook of Medicine, patient handouts, practice guidelines, and drug information and updates. MDConsult also provides the latest findings and developments in medical news, key contents of the current issues of major journals, and online CME credits.

Medline Plus
Covers health topics (information on conditions, diseases, and wellness plus a medical encyclopedia) and includes drug information, dictionaries, directories and links to other resources. Excellent source of reputable consumer-oriented health information.

PubMed
PubMed Medline is the National Library of Medicine’s search service that provides access to over 11 million citations in Medline, Premedline, and other related databases. Coverage: 1966-present
SKOLAR MD* (includes Clineguide)
SKOLAR MD, originally created at the Stanford University School of Medicine, allows users to search a variety of source materials simultaneously to make proper clinical decisions. SKOLAR MD is a question-driven resource that features content from multiple publishers and multiple sources and can be used in the course of clinical practice. It includes Clineguide, a point-of-care clinical decision support system intended for the general practice setting.

Stat!Ref (includes MedCalc 3000 and Anatomy TV)
A collection of 44 online textbooks and reference books including Degowin’s Diagnostic Examination, Griffith’s 5 Minute Clinical Consult, Stein’s Internal Medicine and William’s Obstetrics. Books can be searched one at a time or grouped together.

*Denotes evidence-based medicine resources

July 2005
For RCT or Cohort Study

What is the “event”? (e.g., MI, death, hospitalization) (Note – must consider the time frame too)

Is it “dichotomous”? That is, is it in yes/no format (eg, MI or no MI; dead or not dead)
Continuous values can be presented as dichotomous (eg, lung volume declined 10%? – yes or no)

Make a 2x2 table:

<table>
<thead>
<tr>
<th></th>
<th>Event</th>
<th>No event</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental</strong> group</td>
<td>a</td>
<td>b</td>
</tr>
<tr>
<td><strong>Control group</strong></td>
<td>c</td>
<td>d</td>
</tr>
</tbody>
</table>

Then fill in the numbers:

<table>
<thead>
<tr>
<th></th>
<th>Event</th>
<th>No event</th>
<th>Totals</th>
<th>Event Rates (proportions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental</strong> group</td>
<td>a</td>
<td>b</td>
<td>a + b</td>
<td>EER = Pe = a / (a + b)</td>
</tr>
<tr>
<td><strong>Control group</strong></td>
<td>c</td>
<td>d</td>
<td>c + d</td>
<td>CER = Pc = c / (c + d)</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>a + c</td>
<td>b + d</td>
<td>a + b + c + d</td>
<td></td>
</tr>
</tbody>
</table>

Experimental Event Rate (risk) = EER = a / (a + b)  
(also called Pe)

Control Event Rate (risk) = CER = c / (c + d)  
(also called Pc)

Absolute risk reduction = ARR = CER – EER

Relative Risk = Risk Ratio = RR = \( \frac{\text{EER}}{\text{CER}} = \frac{a}{a + b} \frac{c}{c + d} \)

(Relative Risk is risk of the event in the experimental group as a % of the original (control) risk)

Relative Risk Reduction = RRR = \( \frac{\text{CER} – \text{EER}}{\text{CER}} = \frac{\text{ARR}}{\text{CER}} \)  
(also RRR = 1 – RR)

Number Needed to Treat = NNT = \( \frac{1}{\text{ARR}} \)

Note: You can rename the terms …

- If the intervention increases a good outcome: Absolute Benefit Increase (ABI), Relative Benefit Increase (RBI)
- If the intervention increases a bad outcome: Absolute Risk Increase (ARI), Relative Risk Increase (RRI)
**THERAPY**

Absolute Risk Reduction = \( \text{ARR} = \left| \frac{\text{CER} - \text{EER}}{} \right| \)

Relative Risk = Risk Ratio = \( \text{RR} = \frac{\text{EER}}{\text{CER}} \)

Relative Risk Reduction = \( \text{RRR} = \frac{\text{CER} - \text{EER}}{\text{CER}} = \frac{\text{ARR}}{\text{CER}} \)

Number Needed to Treat = \( \text{NNT} = \frac{1}{\text{ARR}} \)

**HARM**

Abs risk increase = \( \text{ARI} = \left| \frac{\text{CER} - \text{EER}}{} \right| \)

Relative Risk = \( \text{RR} = \frac{\text{EER}}{\text{CER}} \)

Relative Risk Increase = \( \text{RRI} = \frac{\text{CER} - \text{EER}}{\text{CER}} = \frac{\text{ARI}}{\text{CER}} \)

Number needed to harm = \( \text{NNH} = \frac{1}{\text{ARI}} \)

---

**Worksheet:**

<table>
<thead>
<tr>
<th>Exposure – yes or no</th>
<th>Adverse outcome – yes or no</th>
<th>Totals</th>
<th>Event Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Event</td>
<td>No event</td>
<td>a + b</td>
</tr>
<tr>
<td>Experimental group</td>
<td>a</td>
<td>b</td>
<td>a + b</td>
</tr>
<tr>
<td>Control group</td>
<td>c</td>
<td>d</td>
<td>c + d</td>
</tr>
<tr>
<td>Totals</td>
<td>a + c</td>
<td>b + d</td>
<td>a + b + c + d</td>
</tr>
</tbody>
</table>

Absolute risk reduction = \( \text{ARR} = \text{CER} - \text{EER} = \)

Relative Risk = Risk Ratio = \( \text{RR} = \frac{\text{EER}}{\text{CER}} = \)

Relative Risk Reduction = \( \text{RRR} = \frac{\text{CER} - \text{EER}}{\text{CER}} = \frac{\text{ARR}}{\text{CER}} = \)

Number Needed to Treat = \( \text{NNT} = \frac{1}{\text{ARR}} = \)
For Case-Control Study

Make a 2x2 table and fill in the numbers:

<table>
<thead>
<tr>
<th></th>
<th>Event (case)</th>
<th>No event (control)</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposed to factor</td>
<td>a</td>
<td>b</td>
<td>a + b</td>
</tr>
<tr>
<td>Not exposed to factor</td>
<td>c</td>
<td>d</td>
<td>c + d</td>
</tr>
</tbody>
</table>

- EER = a / (a+b)
- Experimental event odds = a / b
- CER = c / (c+d)
- Control event odds = c / d
- Odds of exposure = a / c = b / d

Absolute harm increase = AHI = EER – CER = [ a / (a + b) ] - [ c / (c + d) ]

Relative Risk = Risk Ratio = RR = EER / CER = a / (a + b) / c / (c + d)

The “odds” of an event occurring is the probability of the event occurring divided by the probability of an event not occurring.

Relative Odds = Odds Ratio = OR = odds of exposure in the case group / odds of exposure in the control group = a / c = b / d = ad / bc

The RR and OR approximate each other when event rates are low or when the treatment effect is small.

\[
RR = \frac{EER}{CER} = \frac{a / (a + b)}{c / (c + d)}
\]

\[
OR = \frac{a/c}{b/d} = \frac{ad}{bc}
\]

If a and c are very small then (a + b) ≈ b and (c + d) ≈ d

\[
RR = \frac{a / (a + b)}{c / (c + d)} \Rightarrow \frac{a}{c} / \frac{~b}{d} = \frac{ad}{bc}
\]
Number Needed to Harm (NNH)

For RCT or Cohort Study

NNH = 1 / AHI

For Case-Control Study

PEER = patient expected event rate (the event rate among non-exposed individuals)

If OR < 1 then
NNH = 1 – [ PEER (1-OR)] / PEER (1-PEER) (1- OR)

If OR > 1 then
NNH = 1 + [ PEER (OR - 1)] / PEER (1-PEER) (OR - 1)

Rough rule of thumb for strength of association:

<table>
<thead>
<tr>
<th>Strength</th>
<th>&gt; 10</th>
<th>&lt;0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>5 - 10</td>
<td>0.1 - 0.2</td>
</tr>
<tr>
<td>Small</td>
<td>2 - 5</td>
<td>0.2 - 0.5</td>
</tr>
<tr>
<td>Very small</td>
<td>1-2</td>
<td>0.5 - 1</td>
</tr>
</tbody>
</table>
Confidence Intervals

95% CI = (value) +/- 1.96 SE

SE = standard error

For the mean of a group – use the SEM = Standard Error of the Mean

SEM = standard error of the mean = \(\frac{\text{std dev}}{\sqrt{N}}\)

95% CI = mean +/- 1.96 SEM

A proportion – use the Standard Error of the proportion

Where p is proportion (= event rate) of one event & 1-p is proportion of the alternative event (such as MI or no MI)

\[\text{Std Error of Proportion} = \sqrt{\frac{p(1-p)}{N}}\]

95% CI = p +/- 1.96 SE

Absolute risk reduction (ARR) – comparison of the event rate (proportion) between 2 groups

\[\text{SE} = \sqrt{\frac{p_c(1-p_c)}{n_c} + \frac{p_e(1-p_e)}{n_e}}\]

95% CI = ARR +/- 1.96 SE

Number Needed to Treat (NNT)

\[95\% \text{ CI for NNT} = \frac{1}{\text{reciprocal of 95\% CI for ARR}} = \frac{1}{95\% \text{ CI for ARR}}\]

(Formulae are in back of stats book)
An example of calculating the 95% CI for ARR:

<table>
<thead>
<tr>
<th></th>
<th>MI, Stroke, or Death from Cardiovascular Event, Number (%)</th>
<th>No Event number (%)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>534 (6.8)</td>
<td>7268 (93.2)</td>
<td>7802  Pe = 0.068</td>
</tr>
<tr>
<td>Control</td>
<td>573 (7.3)</td>
<td>7228 (92.6)</td>
<td>7801  Pc = 0.073</td>
</tr>
<tr>
<td>Total</td>
<td>1107 (7.1)</td>
<td>14496 / (92.9)</td>
<td>15603</td>
</tr>
</tbody>
</table>

ARR = 0.005
95% CI of ARR = ARR +/- 1.96 SE

Calculate the SE: \[\sqrt{\frac{p_c(1-p_c)}{n_c} + \frac{p_e(1-p_e)}{n_e}}\]

\[\begin{align*}
&= \sqrt{\left\{\frac{(0.073)(1 - 0.073)}{7801} + \frac{(0.068)(1 - 0.068)}{7802}\right\}} \\
&= \sqrt{\frac{0.0676}{7801} + \frac{0.0633}{7802}} \\
&= \sqrt{0.0000086655 + 0.0000081133} = 0.004096 \\
\]

95% CI of ARR = ARR +/- 1.96 x SE
= 0.005 +/- 1.96 x (0.004096)
= 0.005 +/- 0.008028
= -0.003 to 0.013

CI for NNT = 1 / CI for ARR \[\rightarrow\] -333 to 77 ***

---

With percentages:
Be very careful about whether you are using “7.3%” or “0.073” – consistently use decimals or percentages throughout

\[P_c = 7.3\%\quad Pe = 6.8\%\quad ARR = 0.5\%\]

95% CI of ARR = ARR +/- 1.96 SE

Calculate the SE: \[\sqrt{\frac{p_c(1-p_c)}{n_c} + \frac{p_e(1-p_e)}{n_e}}\]

\[\begin{align*}
&= \sqrt{\left\{\frac{(7.3\%)(100\% - 7.3\%)}{7801} + \frac{(6.8\%)(100\% - 6.8\%)}{7802}\right\}} \\
&= \sqrt{\left\{\frac{676}{7801} + \frac{633}{7802}\right\}} \\
&= \sqrt{0.086655 + 0.081133} = 0.4096\% \\
\]

95% CI of ARR = ARR +/- 1.96 x SE
= 0.5\% +/- 1.96 x (0.4096)
= 0.5\% +/- 0.8%
= -0.3\% to 1.3\% ***
The number needed to treat (NNT) is the estimated number of patients who need to be treated with the new treatment (rather than the standard treatment) for one additional patient to benefit.

If the NNT is negative, it indicates that the treatment has a harmful effect (so it is the “number needed to harm,” NNH).

If the absolute risk reduction is zero (= no difference between experimental and control groups), then the number needed to treat is infinity (∞). In the case of a non-significant difference, the confidence interval must include ∞.

For the case above, the confidence interval calculated as −333 to 70 must include ∞. The confidence interval is therefore peculiar, apparently encompassing two disjoint regions – values of the NNT from 77 to ∞ and values of the NNT (NNH) from −333 to −∞.

Some statisticians say that in the case of a non-significant difference it is not possible to get a useful confidence interval, and so only a point estimate is available.
Card 1A DIAGNOSIS

Is this evidence about diagnosis valid?
1. Was there an independent, blind comparison with a reference ("gold") standard of diagnosis?
2. Was the diagnostic test evaluated in an appropriate spectrum of patients (like those in whom it would be used in practice)?
3. Was the reference standard applied regardless of the diagnostic test result?
4. Was the cluster of tests validated in a second, independent group of patients?

Is this valid evidence about diagnosis important?

<table>
<thead>
<tr>
<th>Diagnostic test result (serum ferritin)</th>
<th>Target disorder (iron deficiency anemia)</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive (&lt;65 mmol/L)</td>
<td>Present: 731 a</td>
<td>Absent: 270 b</td>
</tr>
<tr>
<td></td>
<td>a + b = 1001</td>
<td>a + b</td>
</tr>
<tr>
<td>Negative (≥65 mmol/L)</td>
<td>Present: 78 c</td>
<td>Absent: 1500 d</td>
</tr>
<tr>
<td></td>
<td>c + d = 1578</td>
<td>c + d</td>
</tr>
<tr>
<td>Totals</td>
<td>a + c = 809</td>
<td>b + d = 1770</td>
</tr>
</tbody>
</table>

Sensitivity = a/(a + c) = 731/809 = 90%.
Specificity = d/(b + d) = 1500/1770 = 85%.

Likelihood ratio for a positive test result = LR+ = sensitivity/(1 – specificity) = 90%/10% = 9.
Likelihood ratio for a negative test result = LR− = (1 – sensitivity)/specificity = 10%/85% = 0.12.
Positive predictive value = a/(a + b) = 731/1001 = 73%.
Negative predictive value = d/(c + d) = 1500/1578 = 95%.
Pre-test probability (prevalence) = (a + c)/(a + b + c + d) = 906/2579 = 35%.
Pre-test odds = prevalence/(1 – prevalence) = 35%/65% = 0.54.
Post-test odds = pre-test odds × likelihood ratio.
Post-test probability = post-test odds/(post-test odds + 1).

Can we apply this valid, important evidence about a diagnostic test in caring for our patient?
1. Is the diagnostic test available, affordable, accurate, and precise in our setting?
2. Can we generate a clinically sensible estimate of our patient’s pre-test probability?
   * From personal experience, prevalence statistics, practice databases, or primary studies
   * Are the study patients similar to our own?
   * Is it unlikely that the disease possibilities or probabilities have changed since this evidence was gathered?
3. Will the resulting post-test probabilities affect our management and help our patient?
   * Could it move us across a treat–treatment threshold?
   * Would our patient be a willing partner in carrying it out?
   * Would the consequences of the test help our patient reach his or her goals in all this?

Card 1B DIAGNOSIS

Diagnostic usefulness of five levels of a test result

<table>
<thead>
<tr>
<th>Diagnostic test result</th>
<th>Serum ferritin (mmol/L)</th>
<th>Target disorder (iron deficiency) present</th>
<th>Target disorder absent</th>
<th>Likelihood ratio</th>
<th>Diagnostic impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Very positive</td>
<td>&lt;15</td>
<td>474</td>
<td>59%</td>
<td>(47/809)</td>
<td>20</td>
</tr>
<tr>
<td>Moderately positive</td>
<td>15–34</td>
<td>175</td>
<td>22%</td>
<td>(175/809)</td>
<td>79</td>
</tr>
<tr>
<td>Neutral</td>
<td>35–64</td>
<td>82</td>
<td>10%</td>
<td>(82/809)</td>
<td>171</td>
</tr>
<tr>
<td>Moderately negative</td>
<td>65–94</td>
<td>36</td>
<td>3.7%</td>
<td>(36/960)</td>
<td>168</td>
</tr>
<tr>
<td>Extremely negative</td>
<td>≥95</td>
<td>48</td>
<td>5.9%</td>
<td>(48/809)</td>
<td>1332</td>
</tr>
<tr>
<td>Totals</td>
<td>809</td>
<td>100%</td>
<td>1770</td>
<td>106% (1770/809)</td>
<td></td>
</tr>
</tbody>
</table>
Card 2B  DIAGNOSIS

PRE-TEST PROBABILITY

Is this evidence about pre-test probability valid?

1. Did the study patients represent the full spectrum of those who present with this clinical problem?
2. Were the criteria for each final diagnosis explicit and credible?
3. Was the diagnostic work-up comprehensive and consistently applied?
4. For initially undiagnosed patients, was follow-up sufficiently long and complete?

Is this valid evidence about pre-test probability important?

1. What were the diagnoses and their probabilities?
2. How precise were these estimates of disease probability?

SCREENING AND CASE-FINDING

Guides for deciding whether a screening or case-finding maneuver does more good than harm

1. Is there RCT evidence that early diagnosis really leads to improved survival, or quality of life, or both?
2. Are the early-diagnosed patients willing partners in the treatment strategy?
3. How do benefits and harms compare in different people and with different screening strategies?
4. Do the frequency and severity of the target disorder warrant the degree of effort and expenditure?
Card 3A THERAPY (single trials)

Is this evidence about therapy valid?
1. Was the assignment of patients to treatment randomized?
2. Was the randomization concealed?
3. Were the groups similar at the start of the trial?
4. Was follow-up of patients sufficiently long and complete?
5. Were all patients analyzed in the groups to which they were randomized?
Some other points:
6. Were patients, clinicians and study personnel kept blind to treatment?
7. Were groups treated equally, apart from the experimental therapy?
Is this valid evidence about therapy important?

<table>
<thead>
<tr>
<th>Event rate = stroke (mean follow-up 5 years)</th>
<th>Relative risk reduction (ARR)</th>
<th>Absolute risk reduction (ARR)</th>
<th>Number needed to treat (NNT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control rate (CER)</td>
<td>Experimental event rate (EER)</td>
<td>CER - EER</td>
<td>CER</td>
</tr>
<tr>
<td>MRC trial</td>
<td>5.7%</td>
<td>4.3%</td>
<td>5.7% - 4.3%</td>
</tr>
<tr>
<td>Hypothetical, trial case</td>
<td>0.000057%</td>
<td>0.000043%</td>
<td>0.000057% - 0.0000043%</td>
</tr>
</tbody>
</table>

1. What is the magnitude of the treatment effect?
2. How precise is the estimate of the treatment effect?

Can we apply this valid, important evidence about therapy in caring for our patient?
1. Is our patient so different from those in the study that its results cannot apply?
2. Is the treatment feasible in our setting?
3. What are our patient’s potential benefits and harms from the therapy?
4. What are our patient’s values and expectations for both the outcome we are trying to prevent and the treatment we are offering?

Card 3B THERAPY

Guides for whether to believe apparent qualitative differences in the efficacy of therapy in some subgroups of patients

A qualitative difference in treatment efficacy among subgroups is likely only when all the following questions can be answered “yes”:
1. Does it really make biological and clinical sense?
2. Is the qualitative difference both clinically (beneficial for some but useless or harmful for others) and statistically significant?
3. Was it hypothesized before the study began (rather than the product of dredging the data)?
4. Was one of just a few subgroup analyses carried out in the study?
5. Has the result been confirmed in other independent studies?

The likelihood of help vs. harm (LHH)

In applying a systematic review or RCT to an individual patient, we need to consider:
- Our patient’s risk, relative to patients in the trial, of the event we hope to prevent with the treatment: \( f_p \)
- Our patient’s risk, relative to patients in the trial, of the side-effect we might cause from the treatment: \( f_e \)
- Our patient’s perception of the severity of the event we’re trying to prevent relative to the side-effect we might cause: \( s \)

The likelihood of help vs. harm is \( (1/\text{NNT}) \times f_p \times s \) vs. \( (1/\text{NHH}) \times f_e \)

For example, suppose we’re applying a trial with an NNT of 9 and an NHH of 12 and we think our patient is at just half the risk of the event but at twice the risk of the side-effect, then the “raw” LHH before we adjust it for our patient’s perception of relative severity is \( 1/9 \times 0.5 \) vs. \( 1/12 \times 2 = 1/18 \) vs. \( 1/6 \), or three times as likely to harm vs. help the patient. However, if our patient regards the severity of the event that the treatment might prevent to be six times worse than the side-effect it might cause, then the final LHH = \( 1/18 \times 6 \) vs. \( 1/6 \), or two times as likely to help vs. harm.
Card 4A  THERAPY: SYSTEMATIC REVIEWS
Are the results of this systematic review of therapy valid?
1. Is this a systematic review of randomized trials?
2. Does it describe a comprehensive and detailed search for relevant trials?
3. Were the individual studies assessed for validity?
A less-frequent point:
4. Were individual patient data (or aggregate data) used in the analysis?
Are the valid results of this systematic review of therapy important?
1. Are the results consistent across studies?
2. What is the magnitude of the treatment effect?
3. How precise is the treatment effect?
Translating odds ratios (ORs) to NNTs
1. When the odds ratio (OR) < 1: The numbers in the body of the table are the NNTs for the corresponding odds ratios at that particular patient's expected event rate (PEER). This table applies when a bad outcome is prevented by therapy.

<table>
<thead>
<tr>
<th>Patient's expected event rate (PEER)</th>
<th>OR &lt; 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td></td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td>0.7</td>
</tr>
<tr>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td></td>
<td>0.5</td>
</tr>
<tr>
<td>0.05</td>
<td>209</td>
</tr>
<tr>
<td>0.10</td>
<td>110</td>
</tr>
<tr>
<td>0.20</td>
<td>61</td>
</tr>
<tr>
<td>0.30</td>
<td>46</td>
</tr>
<tr>
<td>0.40</td>
<td>40</td>
</tr>
<tr>
<td>0.50</td>
<td>38</td>
</tr>
<tr>
<td>0.70</td>
<td>44</td>
</tr>
<tr>
<td>0.90</td>
<td>101</td>
</tr>
</tbody>
</table>

2. When the odds ratio (OR) > 1: The numbers in the body of the table are the NNTs for the corresponding odds ratios at that particular patient's expected event rate (PEER). This table applies when a good outcome is increased by therapy and when a side-effect is caused by therapy.

<table>
<thead>
<tr>
<th>Patient's expected event rate (PEER)</th>
<th>OR &gt; 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.1</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>1.3</td>
</tr>
<tr>
<td></td>
<td>1.4</td>
</tr>
<tr>
<td></td>
<td>1.5</td>
</tr>
<tr>
<td>0.05</td>
<td>212</td>
</tr>
<tr>
<td>0.10</td>
<td>112</td>
</tr>
<tr>
<td>0.20</td>
<td>64</td>
</tr>
<tr>
<td>0.30</td>
<td>49</td>
</tr>
<tr>
<td>0.40</td>
<td>43</td>
</tr>
<tr>
<td>0.50</td>
<td>42</td>
</tr>
<tr>
<td>0.70</td>
<td>51</td>
</tr>
<tr>
<td>0.90</td>
<td>121</td>
</tr>
</tbody>
</table>

*The relative risk reduction (RRR) here is 10%.
*The RRR here is 49%.
*The RRR here is 16%.
*The RRR here is 9%.

Card 4B  SYSTEMATIC REVIEWS
Formulae to convert odds ratios (ORs) and relative risks (RRR) to NNTs

For RR < 1:
NNT = \frac{1}{(1 - RR) \times PEER}

For RR > 1:
NNT = \frac{1}{RR - 1} \times PEER

For OR < 1:
NNT = \frac{1}{(PEER \times (1 - OR))/((1 - PEER) \times (1 - OR))}

For OR > 1:
NNT = \frac{1}{PEER \times (OR - 1)/(1 - PEER) \times (PEER) \times (OR - 1)}

Can we apply this valid, important evidence about therapy in caring for our patient?
1. Is our patient so different from those in the study that its results cannot apply?
2. Is the treatment feasible in our setting?
3. What are our patient's potential benefits and harms from the therapy?
4. What are our patient's values and expectations for both the outcome we are trying to prevent and the adverse effects we may cause?
Card 4B  **SYSTEMATIC REVIEWS**

Formulas to convert odds ratios (ORs) and relative risks (RRs) to NNTs

For RR < 1:
\[ NNT = \frac{1}{1 - RR} \times PEER \]

For RR > 1:
\[ NNT = \frac{1}{RR - 1} \times PEER \]

For OR < 1:
\[ NNT = 1 - \frac{PEER \times (1 - OR)}{(1 - PEER) \times (1 - OR)} \]

For OR > 1:
\[ NNT = 1 - \frac{PEER \times (OR - 1)}{(1 - PEER) \times (OR - 1)} \]

Can we apply this valid, important evidence about therapy in caring for our patient?
1. Is our patient so different from those in the study that its results cannot apply?
2. Is the treatment feasible in our setting?
3. What are our patient’s potential benefits and harms from the therapy?
4. What are our patient’s values and expectations for both the outcome we are trying to prevent and the adverse effects we may cause?

Card 5A  **CLINICAL DECISION ANALYSIS**

Is this evidence from a CDA valid?
1. Were all important therapeutic alternatives (including no treatment) and outcomes excluded?
2. Are the probabilities of the outcomes valid and credible?
3. Are the utilities of the outcomes valid and credible?

Is this valid evidence from a CDA important?
1. Did one course of action lead to clinically important gains?
2. Was the same course of action preferred despite clinically sensible changes in probabilities and utilities?

Can we apply these valid, important results of the CDA to our patient?
1. Do the probabilities in this CDA apply to our patient?
2. Can our patient state his/her utilities in a stable, usable form?

Card 5B  **ECONOMIC ANALYSIS**

Is this evidence from an economic analysis valid?
1. Are all well-defined courses of action compared?
2. Does it provide a specified view from which the costs and consequences are being viewed?
3. Does it cite comprehensive evidence on the efficacy of alternatives?
4. Does it identify all the costs and consequences we think it should and select credible and accurate measures of them?
5. Was the type of analysis appropriate for the question posed?

Is this valid evidence from an economic analysis important?
1. Are the resulting costs or cost/unit of health gained clinically significant?
2. Did the results of this economic analysis change with sensible changes to costs and effectiveness?

Can we apply the valid, important results of this economic analysis to our patient?
1. Do the costs in the economic analysis apply in our setting?
2. Are the treatments likely to be effective in our setting?
Card 6A  GUIDELINES

Are the recommendations in this guideline valid?
1. Did its developers carry out a comprehensive, reproducible literature review within the past 12 months?
2. Is each of its recommendations both tagged by the level of evidence upon which it is based and linked to a specific citation?

The killer facts:
1. Is the burden of illness (frequency in our community, or our patient’s pre-test probability or expected event rate [PEER]) too low to warrant implementation?

Card 6B  QUALITATIVE RESEARCH

Is the evidence from this qualitative study valid, important and applicable?
Is the evidence from this qualitative study valid?
1. Was the selection of participants explicit and appropriate?
2. Were the methods for data collection and analysis explicit and appropriate?

Is the valid evidence from this qualitative study important?
1. Are the results impressive?

Card 7A  PROGNOSIS

Is this evidence about prognosis valid?
1. Was a defined, representative sample of patients assembled at a common point in the course of their disease?
2. Was follow-up of study patients sufficiently long and complete?
3. Were objective outcome criteria applied in a “blind” fashion?

If subgroups with different prognoses are identified:
- Were there adjustment for important prognostic factors?
- Was there validation in an independent group of “test-set” patients?

Is this valid evidence about prognosis important?
1. How likely are the outcomes over time?
2. How precise are the prognostic estimates?

Can we apply this valid, important evidence about prognosis to our patient?
1. Is our patient so different from those in the study that its results cannot apply?
2. Will this evidence make a clinically important impact on our conclusions about what to offer or tell our patient?
Card 7B USEFUL URLs

- The book: www.celt.utoronto.ca
- Netting the evidence (list of EBM resources, including websites, etc.): http://www.shoaf.ac.uk/~scharl/mhrmoteca/
- The Cochrane Library: www.cochrane.org
- ACP Journal Club: www.acpjc.org
- EBIM Journal: http://ebim.bmjournals.com/
- NHS R&D Centre for EBM in Oxford (including a schedule of EBM workshops): www.cebm.net
- EPD: http://www.epd.co.nz
- Ovid: http://www.ovid.com
- For health services research topics (the appropriateness, process, and outcomes of health services, and clinical practice guidelines): http://www.nlm.nih.gov/nichsr/hades/search.html

Card 8A HARM/ETIOLOGY

Is this evidence about harm valid?

1. Were there clearly defined groups of patients, similar in all important ways other than exposure to the treatment or other cause?
2. Were treatment/exposures and clinical outcomes measured in the same ways in both groups? Was the assessment of outcomes either objective or blinded to exposure?
3. Was the follow-up of the study patients sufficiently long (for the outcome to occur) and complete?
4. Do the results of the harm study fulfill some of the diagnostic tests for causation?
   - Is it clear that the exposure preceded the onset of the outcome?
   - Is there a dose-response gradient?
   - Is there any positive evidence from a “rechallenge–rechallenge” study?
   - Is the association consistent from study to study?
   - Does the association make biological sense?

<table>
<thead>
<tr>
<th>Adverse outcome</th>
<th>Adverse (controls)</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present (case)</td>
<td>b</td>
<td>a + b</td>
</tr>
<tr>
<td>Absent (controls)</td>
<td>c + d</td>
<td>c + d</td>
</tr>
<tr>
<td>Exposed to treatment (RCT or cohort)</td>
<td>2</td>
<td>2 + b</td>
</tr>
<tr>
<td>Not exposed to treatment (RCT or cohort)</td>
<td>c + d</td>
<td>c + d</td>
</tr>
<tr>
<td>Totals</td>
<td>a + c</td>
<td>a + b + c + d</td>
</tr>
</tbody>
</table>

Is this valid evidence about harm important?

- In a randomized trial or cohort study, relative risk (RR) = (a/c + b)/
  [c/(c + d)].
- In a case-control study, relative odds = ad/bc.

1. What is the magnitude of the association between the exposure and outcome?
2. What is the precision of the estimate of the association between the exposure and the outcome?

To convert odds ratio (or relative odds) to an NNH:

NNH = 1 + (PEER × (OR – 1)) / [(1 – PEER) × (PEER) × (OR – 1)]
Card 8B  HARM/ETIOLOGY

INH derived from typical PEERs and CIBA

<table>
<thead>
<tr>
<th>Patient expected event rate (PEER)</th>
<th>For odds ratios LESS than 1</th>
<th>For odds ratios GREATER than 1</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>0.05</td>
<td>205</td>
<td>104</td>
</tr>
<tr>
<td>0.10</td>
<td>110</td>
<td>54</td>
</tr>
<tr>
<td>0.20</td>
<td>61</td>
<td>22</td>
</tr>
<tr>
<td>0.30</td>
<td>46</td>
<td>14</td>
</tr>
<tr>
<td>0.40</td>
<td>40</td>
<td>12</td>
</tr>
<tr>
<td>0.50*</td>
<td>38</td>
<td>11</td>
</tr>
<tr>
<td>0.70</td>
<td>44</td>
<td>13</td>
</tr>
<tr>
<td>0.90</td>
<td>101</td>
<td>46</td>
</tr>
</tbody>
</table>

*Adapted from John Geckies, 1999

Can we apply the valid, important results of this harm study to our patient?

1. Is our patient so different from those included in the study that its results cannot apply?
2. What is our patient’s risk of benefit and harm from the agent?
3. What are our patient’s preferences, concerns and expectations from this treatment?
4. What alternative treatments are available?
## TELEPHONE DIRECTORY

<table>
<thead>
<tr>
<th>ACT-NOW (Rapid Response Team)</th>
<th>362-2700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admitting (Future Reservations)</td>
<td>362-1167</td>
</tr>
<tr>
<td>Admitting (to speak to med. person)</td>
<td>747-4021</td>
</tr>
<tr>
<td>Ambulatory Care Beeper</td>
<td>579-5248</td>
</tr>
<tr>
<td>Asthma Center</td>
<td>996-8670</td>
</tr>
<tr>
<td>Barnes Home Health</td>
<td>362-0200</td>
</tr>
<tr>
<td>Barnes-Jewish Hospital Info</td>
<td>0 or 362-5000</td>
</tr>
<tr>
<td>Barnes-Jewish Hospital Central Page</td>
<td>362-1242</td>
</tr>
<tr>
<td>Cardiology</td>
<td></td>
</tr>
<tr>
<td>Cath Lab - Scheduling</td>
<td>362-2284</td>
</tr>
<tr>
<td>Cath Lab - Test Results</td>
<td>4536</td>
</tr>
<tr>
<td>Cath Lab - To request a cath on CD</td>
<td>3800</td>
</tr>
<tr>
<td>CDL – Cardiac Diagnostic Lab (echo)</td>
<td>5441</td>
</tr>
<tr>
<td>Central Telemetry</td>
<td>362-4141</td>
</tr>
</tbody>
</table>

### CODE 7 – CARDIAC ARREST 362-2700

<table>
<thead>
<tr>
<th>CLINICS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy / Immunology</td>
<td>454-8917</td>
</tr>
<tr>
<td>Dermatology</td>
<td>362-5058</td>
</tr>
<tr>
<td>ENT</td>
<td>362-1434</td>
</tr>
<tr>
<td>Medicine (Wohl 5 Clinic)</td>
<td>362-5060</td>
</tr>
<tr>
<td>Medicine – fax</td>
<td>362-6959</td>
</tr>
<tr>
<td>Medicine – Firm A conf rm</td>
<td>362-4873</td>
</tr>
<tr>
<td>Medicine – Firm C conf rm</td>
<td>362-4754</td>
</tr>
<tr>
<td>Medicine Subspec (Endo, Rheum, Renal)</td>
<td>362-7601</td>
</tr>
<tr>
<td>Neurology</td>
<td>362-5262</td>
</tr>
<tr>
<td>Pulmonary (Lung Center)</td>
<td>454-8917</td>
</tr>
<tr>
<td>Oncology</td>
<td>747-4222</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>362-5312</td>
</tr>
<tr>
<td>Computer Support - Barnes-Jewish</td>
<td>362-4700</td>
</tr>
<tr>
<td>Computer Support - WUSM</td>
<td>362-2165</td>
</tr>
</tbody>
</table>

## CONSULTS

<p>| Allergy / Immunology                         | 362-1242   |
| Cardiology                                   |            |
| Days                                         | 362-7986   |
| Evenings &amp; Weekends                          | 362-1242   |
| Dermatology                                  | 491-9987   |
| ENT                                          |            |
| Days                                         | 362-7509   |
| Evenings &amp; Weekends                          | 362-1242   |
| EP                                           | 454-7834   |
| Gastroenterology, General                    | 747-6999   |
| Gastroenterology, Biliary &amp; Liver            | 253-2464   |
| Hematology / Oncology                        | 362-1242   |
| Infectious Disease                           | 73535      |
| Metabolism                                   | 855-4376   |
| Neurology                                    | 294-1326   |
| Ophthalmology – days                         | 362-3937   |
| Ophthalmology – Evenings &amp; Weekends          | 362-1242   |
| Pain                                         | 424-PAIN   |
| Psych                                        | 848-2402   |
| Pulmonary – Consult                          | 362-1242   |
| Pulmonary – 83 ICU                           | -5360      |
| Renal – days                                 | -0135      |
| Renal – after 4pm &amp; weekends                 | -1242      |
| Rheumatology                                 | 855-0353   |
| Urology – days                               | 253-0747   |
| Urology – evenings &amp; weekends                | 362-1242   |
| Dialysis – acute inpatient (14300)           | 362-5351   |
| Dialysis Outpatient - Chromalloy             | 362-7224   |
| Dialysis Outpatient – Forest Park            | 60800      |
| Dictation                                    | 362-1720   |
| Dictation (to report problems)               | 362-1903   |
| Emergency Room                               | 362-9123   |
| Endoscopy Suite                              | 362-5680   |
| Geriatrics                                   | 286-2700   |
| GME Office                                   | 362-1935   |</p>
<table>
<thead>
<tr>
<th>Service</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LABORATORIES</strong></td>
<td></td>
</tr>
<tr>
<td>Lab – Customer Service</td>
<td>362-1470</td>
</tr>
<tr>
<td>Lab – Blood Bank / Hepatitis – South</td>
<td>362-3384</td>
</tr>
<tr>
<td>Lab – Blood Bank / Hepatitis – North</td>
<td>747-2427</td>
</tr>
<tr>
<td>Lab – Chemistry – South</td>
<td>362-5257</td>
</tr>
<tr>
<td>Lab – Chemistry – North</td>
<td>454-7511</td>
</tr>
<tr>
<td>Lab – Cytology</td>
<td>362-0123</td>
</tr>
<tr>
<td>Lab – Hematology (BJH) – South</td>
<td>362-5203</td>
</tr>
<tr>
<td>Lab – Hematology (BJH) – North</td>
<td>454-7511</td>
</tr>
<tr>
<td>Lab – Hematology (Wash U)</td>
<td>362-7575</td>
</tr>
<tr>
<td>Lab – Microbiology</td>
<td>362-3898</td>
</tr>
<tr>
<td>Lab – Neurophysiology – EEG</td>
<td>362-7174</td>
</tr>
<tr>
<td>Lab – Neurophysiology – EMG</td>
<td>362-3326</td>
</tr>
<tr>
<td>Lab – Neurophysiology – Sleep</td>
<td>362-4342</td>
</tr>
<tr>
<td>Lab – Neurophysiology – VER/AER</td>
<td>362-7732</td>
</tr>
<tr>
<td>Lab – Pulmonary Function</td>
<td>454-8917</td>
</tr>
<tr>
<td>Lab – Pheresis</td>
<td>362-1254</td>
</tr>
<tr>
<td>Lab – Serology / Immunology</td>
<td>454-6155</td>
</tr>
<tr>
<td>Lab – Vascular – (5106 QT)</td>
<td>362-7405</td>
</tr>
<tr>
<td>Library, Becker – Main #</td>
<td>362-7080</td>
</tr>
<tr>
<td>Library, Becker – Help Desk</td>
<td>362-7798</td>
</tr>
<tr>
<td>Library, Becker – Reference</td>
<td>362-7085</td>
</tr>
<tr>
<td>Medical Records – House Staff Paychecks</td>
<td>362-1932</td>
</tr>
<tr>
<td>Medical Records – Inpatient</td>
<td>362-1892</td>
</tr>
<tr>
<td>Medical Staff Office</td>
<td>454-8080</td>
</tr>
<tr>
<td>Medicine Consult</td>
<td>294-5716</td>
</tr>
<tr>
<td>Pathology – Autopsy</td>
<td>362-7423</td>
</tr>
<tr>
<td>Pathology – Hot Seat</td>
<td>362-0103</td>
</tr>
<tr>
<td>Patient Accounts – Fax</td>
<td>362-0018</td>
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<tr>
<td>Paycheck Question’s (WU Business Office)</td>
<td>286-1013</td>
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<tr>
<td>Pharmacy – Inpatient (South)</td>
<td>362-5339</td>
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<tr>
<td>Pharmacy – Outpatient (CAM)</td>
<td>454-7666</td>
</tr>
<tr>
<td>Pharmacy – IV Additive Room</td>
<td>362-1229</td>
</tr>
<tr>
<td>Procedure Team</td>
<td>294-4853</td>
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| **RADIOLOGY**           |             |
| Radiology – Central Scheduling (outpt GI/GU N&S, Ultrasound N&S; CT North ONLY) | 362-7111 |
| Radiology, North        |             |
| Radiol, North – Main Scheduling | 454-7230 |
| Radiol, North – Breast Diagnostic Center | 454-7500 |
| Radiol, North – Film Library | 454-8930 |
| Radiol, North – Reports, Retrieval | 454-8222 |
| Radiol, North – Ultrasound – Maternity | 454-8181 |
| Radiology, South        |             |
| Radiol, South – Bone / Joint | 362-7110 |
| Radiol, South – Breast Screening | 747-6470 |
| Radiol, South – CT (Inpt & Outpt) | 362-7115 |
| Radiol, South – Cath Lab | 362-9300 |
| Radiol, South – Chest– (Inpt. Diagnostic) | 362-7112 |
| Radiol, South – ER Reading Room | 8-6895 |
| Radiol, South – Main Film Library, 1st Flr | 362-2850 |
| Radiol, South – Gastrointestinal (Inpt) | 362-7114 |
| Radiol, South – Genitourinary (Inpt) | 362-7123 |
| Radiol, South – MRI    | 362-1636    |
| Radiol, South – MSK Specials | 747-0238 |
| Radiol, South – Neuro-interventional | 362-7113 |
| Radiol, South – Nuclear Medicine | 362-1952 |
| Radiol, South – Outpatient Diagnostic | 362-7110 |
| Radiol, South – PET Scan | 362-7418 |
| Radiol, South – Radiation Oncology | 747-7236 |
| Radiol, South – Reports | 362-9211 |
| Radiol, South – Ultrasound -General | 362-7096 |
| Radiol, South – Vascular & Interventional | 362-6681 |

<p>| PT/OT – Physical/Occupational Therapy |             |
| PT/OT – Inpatient - South | 362-2381 |
| PT/OT – Outpatient (Forest Park) | 454-7070 |
| PT/OT – Speech Therapy | 362-2370 |
| PT/OT – Rehab Inst. Of St. Louis | 658-3950 |
| PT/OT – Neuro-Rehab | 454-7755 |
| PT/OT – Brain Treatment Center | 531-1614 |</p>
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<th>Nursing Units – South</th>
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<td>9100 (Firm Card)</td>
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<td>9100 fax</td>
<td>747-3652</td>
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<tr>
<td>9200 (Firm Card)</td>
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<td>10100 (Gold)</td>
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<td>10200 (Gold)</td>
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<tr>
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<td>11100 fax</td>
<td>747-2285</td>
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<tr>
<td>11200 (Medicine II)</td>
<td>362-5141</td>
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<td>11200 fax</td>
<td>747-1630</td>
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<tr>
<td>12100 (Medicine I)</td>
<td>362-5272</td>
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<tr>
<td>12100 fax</td>
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<td>12200 fax</td>
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<tr>
<td>13100 Queeny Tower Suites</td>
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<td>14400 (Hospitalist)</td>
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Nursing Units – Non-medical

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<td>4300 MPA</td>
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<td>4400 OB/GYN</td>
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<td>5200 CREU</td>
<td>362-6620</td>
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<td>5300 Rehab</td>
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<tr>
<td>5400 Labor &amp; Delivery</td>
<td>362-5178</td>
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<tr>
<td>8100 Telemetry</td>
<td>362-5280</td>
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<tr>
<td>9400 Postpartum/Nursery</td>
<td>362-5164</td>
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<tr>
<td>11400 Neuro Med</td>
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<td>11500 Neuro Med/Surg</td>
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**IMPORTANT NUMBERS**

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<td>ACT-NOW (Rapid Response Team)</td>
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<td>CODE 7 – CARDIAC ARREST</td>
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