

# **History and Physical Examination**

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## Opening the Interview

It is important to begin each interview with a *patient-centered* approach. Every effort should be made to listen attentively with eyes focused. No phone calls. Turn the computer screen off.

### 1. Set the Stage

- Welcome the patient (and family if appropriate)
- Introduce and identify yourself and ensure comfort and privacy
- Know and use the patient's name; Best to have some knowledge of the patient's condition

### 2. Set the Agenda

- Use open-ended questions initially
- Use the patient's history form and have pertinent previous medical records on the desk if possible
- Negotiate a list of all issues - avoid detail at this point!
  - Chief complaint(s) and other concerns
  - Specific requests (i.e., type of treatment)

- Clarify the patient's priorities and expectations for this visit
3. Elicit the Patient's Story
- Return to open-ended questions directed at the major problem(s)
  - Encourage with silence, nonverbal cues, and verbal cues
  - Focus on paraphrasing and summarizing
4. Make the Transition
- Summarize the interview up to that point
  - Verbalize your intention to make a transition to the practitioner-centered interview

## History of Present Illness

### Primary History

Begin the practitioner-centered phase of the interview with "WH" questions (where? what? when?) directed at the chief complaint(s). Build on the information the patient has already given you. Flesh out areas of the story you don't fully understand. Try to quantify whenever possible (pain on a scale of 1 to 10, number of days instead of "a while," etc.). Be as specific as possible and try to record what the patient says accurately, without interpretation. Address as many of these details as appropriate:

1. Location/Radiation
2. Quality
3. Quantity
4. Duration
5. Frequency
6. Aggravating Factors/ Relieving Factors
7. Associated Symptoms
8. Effect on Function
9. Patient's Explanation

### Secondary History

The secondary history expands on the primary history, especially any associated symptoms. It is useful to think of secondary history as a focused review of systems. These questions often bring out information that supports certain possible causative factors or helps you gauge the severity of the disorder. Unlike primary history, a certain amount of interpretation (and experience) is necessary. Here are some examples:

## **Headache**

**Ask about nausea and vomiting.**

**Ask about visual changes.**

**Ask about the relationship with stress, work, weekends, and emotions.**

**Ask about dental issues.**

**Ask about hormonal changes.**

## **Ear Problems**

**Ask about hearing loss or ringing in the ears.**

**Ask about dizziness or vertigo.**

**Ask about dental issues.**

**Ask about Hx of UTI and or kidney problems.**

## **Tertiary History**

**The tertiary history brings in elements of the family, social influences, environmental factors, and past medical history. Continue to formulate a more detailed timeline of health events. By the time you get to the tertiary history, you may already have a good idea of what might be going on. (This will be fine-tuned by the physical exam.) Here are a few examples:**

### **Any Hx ENT or Chest Disorder**

Does the patient smoke? How much? How long?

For children, does someone smoke in the home?

Dental problems?

Cough? Sinus drainage?

Allergies? What if known? Hx of allergy testing? Skin IgE, RAST, ELISA?

Dairy use?

### **Breast Problems**

Is there a family history of breast cancer?

On birth control or HRT? Hx of estrogen dominance symptoms?

Dental problems? Amalgams?

Last mammogram, ultrasound, thermography, MRI, and or breast exam?

The daily duration of bra usage

Touch on the status of the current intimate relationship

### **Abdominal Pain**

How much alcohol does the patient consume?

Typical daily diet

Prior surgery? Has the appendix or GB been removed?

List all supplements and meds if not already recorded.

## **Review of Systems**

**The following list illustrates the content of a classic review of systems. Every effort should be made to connect and integrate information into the whole. Example: Skin to lungs to the colon to sense of smell to thumbs etc.**

### **General/Constitutional**

Average weight, weight loss or gain, general state of health, sense of well-being, strength, ability to conduct usual activities, exercise tolerance

### **Skin/Breast**

Rash, itching, pigmentation, moisture or dryness, texture, changes in hair growth or loss, nail changes

Breast lumps, tenderness, swelling, nipple discharge

### **Eyes/Ears/Nose/Mouth/Throat**

Headaches (location, time of onset, duration, precipitating factors), vertigo, lightheadedness, injury

Vision, double vision, tearing, blind spots, pain

Nose bleeding, colds, obstruction, discharge

Dental difficulties, gingival bleeding, dentures

Neck stiffness, pain, tenderness, masses in the thyroid or other areas

### **Cardiovascular**

Precordial pain, substernal distress, palpitations, syncope, dyspnea on exertion, orthopnea, nocturnal paroxysmal dyspnea, edema, cyanosis, hypertension, heart murmurs, varicosities, phlebitis, claudication

### **Respiratory**

Pain (location, quality, relation to respiration), shortness of breath, wheezing, stridor, cough (time of day, of productivity, amount in tablespoons or cups per day, and color of sputum), hemoptysis, respiratory infections, tuberculosis (or exposure to tuberculosis), fever or night sweats

### **Gastrointestinal**

Appetite, dysphagia, indigestion, food idiosyncrasy, abdominal pain, heartburn, eructation, nausea, vomiting, hematemesis, jaundice, constipation, or diarrhea, abnormal stools (clay-colored, tarry, bloody,

greasy, foul-smelling), flatulence, hemorrhoids, recent changes in bowel habits

### **Genitourinary**

Urgency, frequency, dysuria, nocturia, hematuria, polyuria, oliguria, unusual (or change in) color of urine, stones, infections, nephritis, hesitancy, change in the size of the stream, dribbling, acute retention or incontinence, libido, potency, genital soreness or sores, discharge, venereal disease.

(Female) Age of onset of menses, regularity, last period, dysmenorrhea, menorrhagia, or metrorrhagia, vaginal discharge, post-menopausal bleeding, dyspareunia, number, and results of pregnancies (gravida, para)

### **Musculoskeletal**

Pain, swelling, redness or heat of muscles or joints, limitation, of motion, muscular weakness, atrophy, cramps

### **Neurologic/Psychiatric**

Convulsions, paralyzes, tremors, incoordination, paresthesia, difficulties with memory or speech, sensory or motor disturbances, or muscular coordination (ataxia, tremor)

Predominant mood "nervousness" (define), emotional problems, anxiety, depression, previous psychiatric care, unusual perceptions, hallucinations

### **Allergic/Immunologic/Lymphatic/Endocrine**

Reactions to drugs, food, insects, skin rashes, trouble breathing

Anemia, bleeding tendency, previous transfusions and reactions, Rh incompatibility

Local or general lymph node enlargement or tenderness. -Polydipsia, polyuria, asthenia, hormone therapy, growth, secondary sexual development, intolerance to heat or cold

## **Patient Profile**

**The patient profile is essentially background information related to the patient's health status and well-being. A brief profile often includes elements of the family, social, environmental, and past medical history:**

- 1. Allergies and Reactions to Drugs (What happened?)**
- 2. Current Medications (Including "Over-the-Counter" and supplementation)**

3. **Medical/Psychiatric Illnesses (Diabetes, Hypertension, Depression, etc. DETAILS)**
4. **Surgeries/Injuries/Hospitalizations (Appendectomy, Car Accident, etc.)**
5. **Vaccine history**
6. **Tobacco/Alcohol/Cannabis/ Drug Use**
7. **Reproductive Status for Females**
  - **Last Menstrual Period**
  - **Last Pelvic Exam/Pap Smear**
  - **Pregnancies/Births/Contraception**
8. **Birth History/Developmental Milestones for Children**
9. **Marital/Family Status**
10. **Occupation/Toxic Exposures**
11. **Traumas – when?**

**Complete Tentative Timeline**

**Proceed to the Physical Exam, Microscopy, or other Examinations**

## The Physical Exam

For more information refer to *Bates Guide to Physical Examination and History Taking, Twelfth Edition*.

### Examination of the Head, Ears, Nose, and Neck

#### Equipment Needed

- An Otoscope
- Tongue Blades
- Cotton Tipped Applicators
- Latex Gloves

#### General Considerations

The head and neck exams are not a single, fixed sequence. Different portions are included depending on the examiner and the situation.

#### Head

1. Look for scars, lumps, rashes, hair loss, or other lesions.
2. Look for facial asymmetry, involuntary movements, or edema.
3. Palpate to identify any areas of tenderness or deformity.

#### Ears

1. Inspect the auricles and move them around gently. Ask the patient if this is painful.
2. Palpate the mastoid process for tenderness or deformity.
3. Hold the otoscope with your thumb and fingers so that the ulnar aspect of your hand makes contact with the patient.
4. Pull the ear upwards and backward to straighten the canal.
5. Insert the otoscope to a point just beyond the protective hairs in the ear canal. Use the largest speculum that will fit comfortably.
6. Inspect the ear canal and middle ear structures noting any redness, drainage, or deformity.
7. Repeat for the other ear.



## Nose

It is often convenient to examine the nose immediately after the ears using the same speculum.

1. Tilt the patient's head back slightly. Ask them to hold their breath for the next few seconds.
2. Insert the otoscope into the nostril, avoiding contact with the septum.
3. Inspect the visible nasal structures and note any swelling, redness, drainage, or deformity.
4. Repeat for the other side.

## Throat

It is often convenient to examine the throat using the otoscope with the speculum removed.

1. Ask the patient to open their mouth.
2. Using a wooden tongue blade and a good light source, inspect the inside of the patient's mouth including the buccal folds and under the tongue. Note any ulcers, white patches (leucoplakia), or other lesions.
3. If abnormalities are discovered, use a gloved finger to palpate the anterior structures and floor of the mouth.
4. Inspect the posterior oropharynx by depressing the tongue and asking the patient to say "Ah." Note any tonsillar enlargement, redness, or discharge or scar if removed.

## Neck

1. Inspect the neck for asymmetry, scars, or other lesions.
2. Palpate the neck to detect areas of tenderness, deformity, or masses.
3. The musculoskeletal exam of the neck is covered elsewhere...

## Lymph Nodes

1. Systematically palpate with the pads of your index and middle fingers for the various lymph node groups.
  1. Preauricular - In front of the ear
  2. Postauricular - Behind the ear

3. Occipital - At the base of the skull
  4. Tonsillar - At the angle of the jaw
  5. Submandibular - Under the jaw on the side
  6. Submental - Under the jaw in the midline
  7. Superficial (Anterior) Cervical - Over and in front of the sternomastoid muscle
  8. Supraclavicular - In the angle of the sternomastoid and the clavicle
2. The deep cervical chain of lymph nodes lies below the sternomastoid and cannot be palpated without getting underneath the muscle:
    1. Inform the patient that this procedure will cause some discomfort.
    2. Hook your fingers under the anterior edge of the sternomastoid muscle.
    3. Ask the patient to bend their neck toward the side you are examining.
    4. Move the muscle backward and palpate for the deep nodes underneath.
  3. Note the size and location of any palpable nodes and whether they were soft or hard, non-tender or tender, and mobile or fixed.

### Thyroid Gland

1. Inspect the neck looking for the thyroid gland. Note whether it is visible and symmetrical. A visibly enlarged thyroid gland is called a goiter.
2. Move to a position behind the patient.
3. Identify the cricoid cartilage with the fingers of both hands.
4. Move downward two or three tracheal rings while palpating for the isthmus.
5. Move laterally from the midline while palpating for the lobes of the thyroid.
6. Note the size, symmetry, and position of the lobes, as well as the presence of any nodules. The normal gland is often not palpable.

### Special Tests

#### Facial Tenderness

1. Ask the patient to tell you if these maneuvers cause excessive discomfort or pain.
2. Press upward under both eyebrows with your thumbs.
3. Press upward under both maxilla with your thumbs.
4. Excessive discomfort on one side or significant pain suggests sinusitis.

### **Sinus Transillumination**

1. Darken the room as much as possible.
2. Place a bright otoscope or other point light source on the maxilla.
3. Ask the patient to open their mouth and look for an orange glow on the hard palate.
4. A decreased or absent glow suggests that the sinus is filled with something other than air.

### **Temporomandibular Joint**

1. Place the tips of your index fingers directly in front of the tragus of each ear.
2. Ask the patient to open and close their mouth.
3. Note any decreased range of motion, tenderness, or swelling.

### **Dental Exam**

**Have the Patient Open their Mouth and Look for the following:**

- Existing restorations – record dental materials used – amalgams, gold or composite restorations and associated tooth numbers – record crowns
- Check the galvanicity of metal restorations with a galvanometer
- Existing prosthetic replacements, record tooth number
- Decay (Caries), if apparent
- Record missing teeth – potential cavitations
- Dental Abscesses
- Gums - evaluate with a periodontal probe and general appearance
  - Soft Tissue Pockets
  - Mobility of the teeth
  - Oral Hygiene
  - Recession and Sensitivity
- Any other pertinent information

## Notes

1. The line of hairs in the external ear is a good approximation of where the bony canal begins. Inserting the speculum beyond this point can be very painful.
2. Insufflation means to change the pressure in the outer ear. The tympanic membrane normally moves easily in response to this pressure change. Lack of movement is a sign of negative pressure or fluid in the middle ear. Bates refers to this procedure as pneumatic otoscopy.

## Examination of the Extremities and Back

### General Considerations

- The patient should be undressed and gowned as needed for this examination.
- Some portions of the examination may not be appropriate depending on the clinical situation (performing range of motion on a fractured leg for example).
- The musculoskeletal exam is all about anatomy. Think of the underlying anatomy as you obtain the history and examine the patient.
- When taking a history for an acute problem always inquire about the mechanism of injury, loss of function, onset of swelling (< 24 hours), and initial treatment.
- When taking a history for a chronic problem always inquire about past injuries, past treatments, effects on function, and current symptoms.
- The cardinal signs of musculoskeletal disease are pain, redness (erythema), swelling, increased warmth, deformity, and loss of function.
- Always begin with inspection, palpation, and range of motion, regardless of the region you are examining. Specialized tests are often omitted unless a specific abnormality is suspected.

## Regional Considerations

- Remember that the clavicle is part of the shoulder. Be sure to include it in your examination.
- The patella is much easier to examine if the leg is extended and relaxed.
- Be sure to palpate over the spinous process of each vertebra.
- It is always helpful to observe the patient standing and walking.
- Always consider referred pain, from the neck or chest to the shoulder, from the back or pelvis to the hip, and from the hip to the knee.
- Pain with, or limitation of, rotation is often the first sign of hip disease.
- Diagnostic hints based on the location of pain:

|               | Back         | Side                     | Front              |
|---------------|--------------|--------------------------|--------------------|
| Shoulder Pain | Muscle Spasm | Bursitis or Rotator Cuff | Glenohumeral Joint |
| Hip Pain      | Sciatica     | Bursitis                 | Hip Joint          |

## Inspection

1. Look for scars, rashes, or other lesions. – associated TCM meridian
2. Look for asymmetry, deformity, or atrophy.
3. Always compare with the other side.

## Palpation

1. Examine each major joint and muscle group in turn.
2. Identify any areas of tenderness.
3. Identify any areas of deformity.
4. Always compare with the other side.

## Range of Motion

Start by asking the patient to move through an active range of motion (joints moved by the patient). Proceed to passive range of motion (joints moved by the examiner) if active range of motion is abnormal.

## Active

1. Ask the patient to move each joint through a full range of motion.
2. Note the degree and type (pain, weakness, etc.) of any limitations.
3. Note any increased range of motion or instability.
4. Always compare with the other side.
5. Proceed to passive range of motion if abnormalities are found.

## Passive

1. Ask the patient to relax and allow you to support the extremity to be examined.
2. Gently move each joint through its full range of motion.
3. Note the degree and type (pain or mechanical) of any limitation.
4. If increased range of motion is detected, perform special tests for instability as appropriate.
5. Always compare with the other side.

## Specific Joints

- Fingers - flexion/extension; abduction/adduction
- Thumb - flexion/extension; abduction/adduction; opposition
- Wrist - flexion/extension; radial/ulnar deviation
- Forearm - pronation/supination (function of BOTH elbow and wrist)
- Elbow - flexion/extension
- Shoulder - flexion/extension; internal/external rotation; abduction/adduction (2/3 glenohumeral joint, 1/3 scapulo-thoracic)
- Hip - flexion/extension; abduction/adduction; internal/external rotation
- Knee - flexion/extension
- Ankle - flexion (plantarflexion)/extension (dorsiflexion)
- Foot - inversion/eversion
- Toes - flexion/extension
- Spine - flexion/extension; right/left bending; right/left rotation

## Vascular

### Pulses

1. Check the radial pulses on both sides. If the radial pulse is absent or weak, check the brachial pulses.
2. Check the posterior tibial and dorsalis pedis pulses on both sides. If these pulses are absent or weak, check the popliteal and femoral pulses.
3. TCM 'Twelve Radial Pulses'

### Capillary Refill

1. Press down firmly on the patient's finger or toenail so it blanches.
2. Release the pressure and observe how long it takes the nail bed to "pink" up.
3. Capillary refill times greater than 2 to 3 seconds suggest peripheral vascular disease, arterial blockage, heart failure, or shock.

### Edema, Cyanosis, and Clubbing

1. Check for the presence of edema (swelling) of the feet and lower legs.
2. Check for the presence of cyanosis (blue color) of the feet or hands.
3. Check for the presence of clubbing of the fingers.

### Lymphatics

1. Check for the presence of epitrochlear lymph nodes.
2. Check for the presence of axillary lymph nodes.
3. Check for the presence of inguinal lymph nodes.

### Special Tests

### Upper Extremities

### **Snuffbox Tenderness (Scaphoid)**

1. Identify the "anatomic snuffbox" between the extensor pollicis longus and brevis (extending the thumb makes these structures more prominent).
2. Press firmly straight down with your index finger or thumb.
3. Any tenderness in this area is highly suggestive of scaphoid fracture.

### **Drop Arm Test (Rotator Cuff)**

1. Start with the patient's arm abducted 90 degrees.
2. Ask the patient to slowly lower the arm.
3. If the rotator cuff (especially the supraspinatus) is torn, the patient will be unable to lower the arm slowly and smoothly.

### **Impingement Sign (Rotator Cuff)**

1. Start with the patient's arm relaxed and the shoulder in neutral rotation.
2. Abduct the arm to 90 degrees.
3. Significant shoulder pain as the arm is raised suggests impingement of the rotator cuff against the acromion.

### **Flexor Digitorum Superficialis Test**

1. Hold the fingers in extension except the finger being tested.
2. Ask the patient to flex the finger at the proximal interphalangeal joint.
3. If the patient cannot flex the finger, the flexor digitorum superficialis tendon is cut or non-functional.

### **Flexor Digitorum Profundus Test**

1. Hold the metacarpophalangeal and proximal interphalangeal joints of the finger being tested in extension.
2. Ask the patient to flex the finger at the distal interphalangeal joint.
3. If the patient cannot flex the finger, the flexor digitorum profundus tendon is cut or non-functional.



## Vascular and Neurologic Tests

### Allen Test (Radial/Ulnar Arteries)

1. Ask the patient to make a tight fist.
2. Compress both the ulnar and radial arteries to stop blood flowing to the hand.
3. Ask the patient to open the hand.
4. Release pressure on the ulnar side. The hand should "pink" up in a few seconds unless the ulnar artery is occluded.
5. Repeat the process for the radial artery as indicated.

### Phalen's Test (Median Nerve)

1. Ask the patient to press the backs of the hands together with the wrists fully flexed (backward praying).
2. Have the patient hold this position for 60 seconds and then comment on how the hands feel.
3. Pain, tingling, or other abnormal sensations in the thumb, index, or middle fingers strongly suggest carpal tunnel syndrome.

### Tinel's Sign (Median Nerve)

1. Use your middle finger or a reflex hammer to tap over the carpal tunnel.
2. Pain, tingling, or electric sensations strongly suggest carpal tunnel syndrome.

## Lower Extremities

### Collateral Ligament Testing

1. The patient should be supine with the legs resting on the exam table.
2. Hold the leg to be examined at 20-30 degrees of flexion.
3. Place one hand laterally just below the knee. Grasp the leg near the ankle with your other hand.
4. Gently push with both hands in opposite directions to stress the knee.
5. If the knee joint "opens up" medially, the medial collateral ligament may be torn.
6. Reverse your hands and repeat the stress.

7. If the knee joint "opens up" laterally, the lateral collateral ligament may be torn.

### **Lachman Test (Cruciate Ligaments)**

1. Ask the patient to lie supine on the exam table.
2. Grasp the thigh with one hand and the upper tibia with the other. Hold the knee in about 15 degrees of flexion.
3. Ask the patient to relax and gently pull forward on the tibia.
4. The normal knee has a distinct endpoint. If the tibia moves out from under the femur, the anterior cruciate ligament may be torn.
5. Repeat the test using posterior stress.
6. The normal knee has a distinct endpoint. If the tibia moves back under the femur, the posterior cruciate ligament may be torn.

### **Anterior/Posterior Drawer Test (Cruciate Ligaments)**

1. Ask the patient to lie supine on the exam table with knees flexed to 90 degrees and feet flat on the table.
2. Sit on or otherwise stabilize the foot of the leg being examined.
3. Grasp the leg just below the knee with both hands and pull forward.
4. If the tibia moves out from under the femur, the anterior cruciate ligament may be torn.
5. Without changing the position of your hands, push the leg backward.
6. If the tibia moves back under the femur, the posterior cruciate ligament may be torn.

### **Ballotable Patella (Major Knee Effusion)**

1. Ask the patient to lie supine on the exam table with leg muscles relaxed.
2. Press the patella downward and quickly release it.
3. If the patella visibly rebounds, a large knee effusion (excess fluid in the knee) is present.

### **Milking the Knee (Minor Knee Effusion)**

1. Ask the patient to lie supine on the exam table with leg muscles relaxed.

2. Compress the suprapatellar pouch with your thumb, palm, and index finger.
3. "Milk" downward and laterally so that any excess fluid collects on the medial side.
4. Tap gently over the collected fluid and observe the effect on the lateral side, or ballot the patella as outlined above.
5. A fullness on the lateral side indicates that a small knee effusion is present.

## **Back**

### **Straight Leg Raising (L5/S1 Nerve Roots)**

1. Ask the patient to lie supine on the exam table with knees straight.
2. Grasp the leg near the heel and raise the leg slowly towards the ceiling.
3. Pain in an L5 or S1 distribution suggests nerve root compression or tension (radicular pain).
4. Dorsiflex the foot while maintaining the raised position of the leg.
5. Increased pain strengthens the likelihood of a nerve root problem.
6. Repeat the process with the opposite leg.
7. Increased pain on the opposite side indicates that a nerve root problem is almost certain.

### **FABER Test (Hips/Sacroiliac Joints)**

**FABER** stands for Flexion, Abduction, and External Rotation of the hip. This test is used to distinguish hip or sacroiliac joint pathology from spine problems.

1. Ask the patient to lie supine on the exam table.
2. Place the foot of the affected side on the opposite knee (this flexes the abducts, and externally rotates the hip).
3. Pain in the groin area indicates a problem with the hip and not the spine.
4. Press down gently but firmly on the flexed knee and the opposite anterior superior iliac crest.
5. Pain in the sacroiliac area indicates a problem with the sacroiliac joints.

## Notes

1. *For more information refer to Examination of the Spine and Extremities* , by Stanley Hoppenfeld published in 2019.
2. Holding the knee in flexion helps isolate the collateral ligaments. Secondary stabilizers (anterior cruciate ligament, joint capsule) come into play when the knee is in full extension. If the knee "opens up" in full extension, these secondary structures may also be damaged.
3. The Lachman Test is used by athletic trainers on the field to check for cruciate ligament injury. It is very accurate and can be done on an acutely injured knee (when the patient cannot tolerate bending the knee for a drawer test).
4. The Drawer Test is the "classic" technique to check for cruciate ligament injury. It is less accurate and cannot be done on an acutely injured knee (when the patient cannot tolerate bending). The Lachman Test is preferred in most situations.

## Examination of the Chest and Lungs

### Equipment Needed

- A Stethoscope
- A Peak Flow Meter

### General Considerations

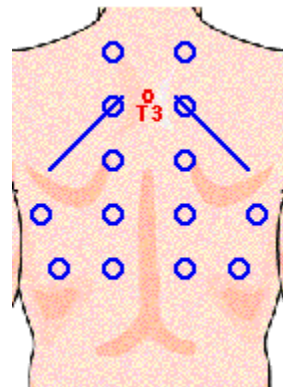
- The patient must be properly undressed and gowned for this examination.
- Ideally the patient should be sitting on the end of an exam table.
- The examination room must be quiet to perform adequate percussion and auscultation.
- Observe the patient for general signs of respiratory disease (finger clubbing, cyanosis, air hunger, etc.).
- Try to visualize the underlying anatomy as you examine the patient.

### Inspection

1. **Observe the rate, rhythm, depth, and effort of breathing. Note whether the expiratory phase is prolonged.**
2. **Listen for obvious abnormal sounds with breathing such as wheezes.**
3. **Observe for retractions and use of accessory muscles (sternomastoids, abdominals).**
4. **Observe the chest for asymmetry, deformity, or increased anterior-posterior (AP) diameter.}**
5. **Confirm that the trachea is near the midline**

### Palpation

1. **Identify any areas of tenderness or deformity by palpating the ribs and sternum.**
2. **Assess expansion and symmetry of the chest by placing your hands on the patient's back, thumbs together at the midline, and ask them to breath deep breathe**
3. **Check for tactile fremitus.**



### Percussion

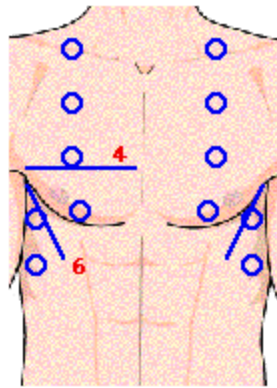
#### Proper Technique

1. **Hyperextend the middle finger of one hand and place the distal interphalangeal joint firmly against the patient's chest.**
2. **With the end (not the pad) of the opposite middle finger, use a quick flick of the wrist to strike the first finger.**
3. **Categorize the size of what you hear as normal, dull, or hyper resonant.**

4. Practice the hyper resonant technique until you can consistently produce a "normal" percussion note on your (presumably normal) partner before you work with patients.

### Posterior Chest

1. Percuss from side to side and top to bottom using the pattern shown in the illustration. Omit the areas covered by the scapulae.
2. Compare one side to the other looking for asymmetry.
3. Note the location and quality of the percussion sounds you hear.
4. Find the level the diaphragmatic dullness on both sides.



### Diaphragmatic Excursion

5. Find the level of the diaphragmatic dullness on both sides.
6. Ask the patient to inspire deeply.
7. The level of dullness (diaphragmatic excursion) should go down 3-5cm symmetrically.

### Anterior Chest

1. Percuss from side to side and top to bottom using the pattern shown in the illustration.
2. Compare one side to the other looking for asymmetry.
3. Note the location and quality of the percussion sounds you hear.

## Interpretation

| Percussion Notes and Their Meaning |                                     |
|------------------------------------|-------------------------------------|
| Flat or Dull                       | Pleural Effusion or Lobar Pneumonia |
| Normal                             | Healthy Lung or Bronchitis          |
| Hyperresonant                      | Emphysema or Pneumothorax           |

## Auscultation

Use the diaphragm of the stethoscope to auscultate breath sounds.

### Posterior Chest

1. Auscultate from side to side and top to bottom using the pattern shown in the illustration. Omit the areas covered by the scapulae.
2. Compare one side to the other looking for asymmetry.
3. Note the location and quality of the sounds you hear.

### Anterior Chest

1. Auscultate from side to side and top to bottom using the pattern shown in the illustration.
2. Compare one side to the other looking for asymmetry.
3. Note the location and quality of the sounds you hear.

## Interpretation

Breath sounds are produced by turbulent airflow. They are categorized by the size of the airways that transmit them to the chest wall (and your stethoscope). The general rule is, the larger the airway, the louder and higher pitched the sound. Vesicular breath sounds are low-pitched and normally heard over most lung fields. Tracheal breath sounds are heard over the trachea. Bronchovesicular and bronchial sounds are heard in between. Inspiration is normally longer than expiration ( $I > E$ ).

Breath sounds are decreased when the normal lung is displaced by air (emphysema or pneumothorax) or fluid (pleural effusion). Breath sounds shift from vesicular to bronchial when there is fluid in the lung itself (pneumonia). Extra sounds that originate in the lungs and airways are

referred to as "adventitious" and are always abnormal (but not always significant). (See Table Below)

| Adventitious (Extra) Lung Sounds |   |
|----------------------------------|---|
| Crackles                         | These are high pitched, discontinuous sounds similar to the sound produced by rubbing your hair between your fingers. (Also known as Rales)   |
| Wheezes                          | These are generally high pitched and "musical" in quality. Stridor is an inspiratory wheeze associated with upper airway obstruction (croup). |
| Rhonchi                          | These often have a "snoring" or "gurgling" quality. Any extra sound that is not a crackle or a wheeze is probably a rhonchi.                  |

### Special Tests

#### Peak Flow Monitoring

Peak flow meters are inexpensive, hand-held devices used to monitor pulmonary function in patients with asthma. The peak flow roughly correlates with the FEV1.

Ask the patient to take a deep breath.

1. Then ask them to exhale as fast as they can through the peak flow meter.
2. Repeat the measurement 3 times and report the average.

#### Voice Transmission Tests

These tests are only used in special situations. This part of the physical exam has largely been replaced by the chest x-ray. All these tests become abnormal when the lungs become filled with fluid (referred to as consolidation).

#### Tactile Fremitus

1. Ask the patient to say "ninety-nine" several times in a normal voice.



2. Palpate using the ball of your hand.
3. You should feel the vibrations transmitted through the airways to the lung.
4. Increased tactile fremitus suggests consolidation of the underlying lung tissues.

### Bronchophony

1. Ask the patient to say "ninety-nine" several times in a normal voice.
2. Auscultate several symmetrical areas over each lung.
3. The sounds you hear should be muffled and indistinct. Louder, clearer sounds are called bronchophony.

### Whispered Pectoriloquy

1. Ask the patient to whisper "ninety-nine" several times. ++
2. Auscultate several symmetrical areas over each lung.
3. You should hear only faint sounds or nothing at all. If you hear the sounds clearly this is referred to as whispered pectoriloquy. {9}

### Egophony

1. Ask the patient to say "ee" continuously.
2. Auscultate several symmetrical areas over each lung.
3. You should hear a muffled "ee" sound. If you hear an "ay" sound this is referred to as "E -> A" or egophony.

### Notes

1. A prolonged expiratory phase ( $E > I$ ) indicates airway narrowing, as in asthma.
2. AP diameter increases somewhat with age; however, a round or "barrel" chest is often a sign of advanced emphysema.
3. The trachea will deviate to one side in cases of tension pneumothorax.
4. Decreased or asymmetric diaphragmatic excursion may indicate paralysis or emphysema.
5. It has been said that "a peak flow meter is to asthma as a thermometer is to fever." Peak flow measurements are used to

- gauge severity of asthma attacks and track the disease over time. Ideally new readings are compared to the patient's current "personal best." Readings less than 80% of "best" may indicate a need for additional therapy. Readings less than 50% may indicate an emergency situation.
6. Increased fremitus indicates fluid in the lung. Decreased fremitus indicates sound transmission obstructed by chronic obstructive pulmonary disease (COPD), fluid outside the lung (pleural effusion), air outside the lung (pneumothorax).

## Cardiovascular Examination

### Equipment Needed

- A Double-Headed, Double-Lumen Stethoscope
- A Blood Pressure Cuff
- A Moveable Light Source or Pen Light

### General Considerations

- The patient must be properly undressed and in a gown for this examination.
- The examination room must be quiet to perform adequate auscultation.
- Observe the patient for general signs of cardiovascular disease (finger clubbing, cyanosis, edema, etc.).

### Arterial Pulses

#### Rate and Rhythm

1. Compress the radial artery with your index and middle fingers.
2. Note whether the pulse is regular or irregular.
3. Count the pulse for 60 seconds.
4. Record the rate and rhythm.

|  |
|--|
| Pulse Classification in Adults (At Rest) |
|--|

| Normal   | Bradycardia                                  | Tachycardia   |
|--|--|---|
| 60 to 100 bpm  | less than 60 bpm                             | more than 100   |
|  |  |   |
| Regular  | Regularly Irregular                          | Irregularly Irregular   |
| Evenly spaced beats may vary slightly with respiration | Regular pattern overall with "skipped" beats | Chaotic, no real pattern, very difficult to measure rate accurately {2} |

### Amplitude and Contour

1. Observe for carotid pulsations.
2. Place your fingers behind the patient's neck and compress the carotid artery on one side with your thumb at or below the level of the cricoid cartilage. Press firmly but not to the point of discomfort.
3. Assess the following:
  - o The amplitude of the pulse.
  - o The contour of the pulse wave.
  - o Variations in amplitude from beat to beat or with respiration.
4. Repeat on the opposite side.

### Auscultation for Bruits

If the patient is late middle-aged or older, you should auscultate for bruits. A bruit is often, but not always, a sign of arterial narrowing and the risk of a stroke.

1. Place the bell of the stethoscope over each carotid artery in turn. You may use the diaphragm if the patient's neck is highly contoured.
2. Ask the patient to stop breathing momentarily.
3. Listen for a blowing or rushing sound--a bruit. Do not be confused by heart sounds or murmurs transmitted from the chest.

### Blood Pressure

The patient should not have eaten, smoked, taken caffeine, or engaged in vigorous exercise within the last 30 minutes. The room should be quiet and the patient comfortable.

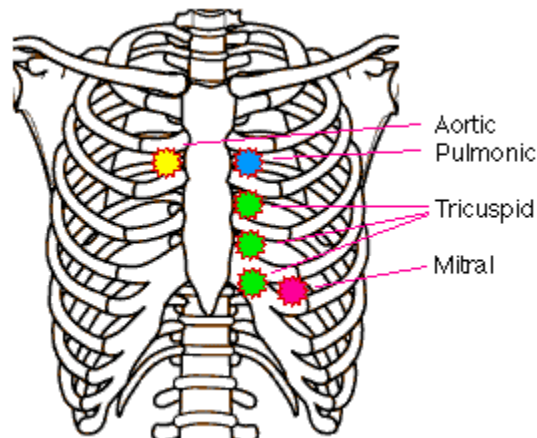
1. Position the patient's arm so the anticubital fold is level with the heart.
2. Center the bladder of the cuff over the brachial artery approximately 2 cm above the anticubital fold. Proper cuff size is essential to obtain an accurate reading. Be sure the index line falls between the size marks when you apply the cuff. Position the patient's arm so it is slightly flexed at the elbow.
3. Palpate the radial pulse and inflate the cuff until the pulse disappears. This is a rough estimate of the systolic pressure.
4. Place the stethoscope over the brachial artery.
5. Inflate the cuff 20 to 30 mmHg above the estimated systolic pressure.
6. Release the pressure slowly, no greater than 5 mmHg per second.
7. The level at which you consistently hear beats is the systolic pressure.
8. Continue to lower the pressure until the sounds muffle and disappear. This is the diastolic pressure.
9. Record the blood pressure as systolic over diastolic (120/70).
10. Blood pressure should be taken in both arms on the first encounter.

### Jugular Venous Pressure

1. Position the patient supine with the head of the table elevated 30 degrees. ++
2. Use tangential, side lighting to observe for venous pulsations in the neck.
3. Look for a rapid, double (sometimes triple) wave with each heartbeat. Use light pressure just above the sternal end of the clavicle to eliminate the pulsations and rule out a carotid origin.
4. Adjust the angle of table elevation to bring out the venous pulsation.
5. Identify the highest point of pulsation. Using a horizontal line from this point, measure vertically from the sternal angle. {10}
6. This measurement should be less than 4 cm in a normal healthy adult.

## Precordial Movement

1. Position the patient supine with the head of the table slightly elevated.
2. Always examine from the patient's right side.
3. Inspect for precordial movement. Tangential lighting will make movements more visible.
4. Palpate for precordial activity in general. You may feel "extras" such as thrills or exaggerated ventricular impulses.
5. Palpate for the point of maximal impulse (PMI or apical pulse). It is normally located in the 4th or 5th intercostal space just medial to the midclavicular line and is less than the size of a quarter.
6. Note the location, size, and quality of the impulse.



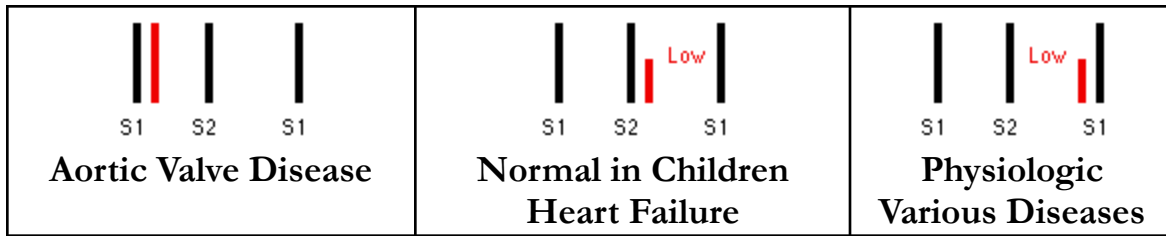
## Auscultation

1. Position the patient supine with the head of the table slightly elevated.
2. Always examine from patient's right side. A quiet room is essential.
3. Listen with the diaphragm at the right 2nd interspace near the sternum (aortic area).
4. Listen with the diaphragm at the left 2nd interspace near the sternum (pulmonic area).

5. Listen with the diaphragm at the left 3rd, 4th, and 5th interspaces near the sternum (tricuspid area).
6. Listen with the diaphragm at the apex (PMI) (mitral area).
7. Listen with the bell at the apex.
8. Listen with the bell at the left 4th and 5th interspace near the sternum.
9. Have the patient roll on their left side.
  - o Listen with the bell at the apex.
  - o This position brings out S3 and mitral murmurs.
10. Have the patient sit up, lean forward, and hold their breath in exhalation.
  - o Listen with the diaphragm at the left 3rd and 4th interspace near the sternum.
  - o This position brings out aortic murmurs.
11. Record S1, S2, (S3), (S4), as well as the grade and configuration of any murmurs ("two over six" or "2/6", "pansystolic" or "crescendo").

### Interpretation

| Murmurs and Extra Sounds  |  |  |
|---|--|--|
| <p><b>Systolic Ejection</b></p> <p>S1 S2 S1</p> <p><b>Innocent/Physiologic<br/>Aortic/Pulmonic<br/>Stenosis</b></p> | <p><b>Pansystolic</b></p> <p>S1 S2 S1</p> <p><b>Mitral/Tricuspid<br/>Regurgitation</b></p> | <p><b>Systolic Click<br/>Late Systolic</b></p> <p>S1 S2 S1</p> <p><b>Mitral Valve<br/>Prolapse</b></p> |
| <p><b>Early Diastolic</b></p> <p>S1 S2 S1</p> <p><b>Aortic Regurgitation</b></p>                                    | <p><b>Mid Diastolic</b></p> <p>S1 S2 S1</p> <p><b>Mitral/Tricuspid Stenosis</b></p>        | <p><b>Opening Snap<br/>Diastolic Rumble</b></p> <p>S1 S2 S1</p> <p><b>Mitral Stenosis</b></p>          |
| <b>Ejection Sound</b>   | <b>S3</b>  | <b>S4</b>  |



| Murmur Grades |   |        |
|---------------|---|--------|
| Grade         | Volume  | Thrill |
| 1/6           | very faint, only heard with optimal conditions      | no     |
| 2/6           | loud enough to be obvious                           | no     |
| 3/6           | louder than grade 2                                 | no     |
| 4/6           | louder than grade 3                                 | yes    |
| 5/6           | heard with the stethoscope partially off the chest  | yes    |
| 6/6           | heard with the stethoscope completely off the chest | yes    |

## Notes

1. With an irregular pulse, the beats counted in any 30 second period may not represent the overall rate. The longer you measure, the more these variations are averaged out.
2. Avoid compressing both sides at the same time. This could cut off the blood supply to the brain and cause syncope. Avoid compressing the carotid sinus higher up in the neck. This could lead to bradycardia and depressed blood pressure.
3. Bell or Diaphragm? - Even though Korotkoff sounds are low frequency and should be heard better with the bell, it is often difficult to apply the bell properly to the anticubital fold. For this reason, it is common practice to use the diaphragm when taking the blood pressure.
4. Maximum Cuff Pressure - When the baseline blood pressure is already known or hypertension is not suspected, it is acceptable in adults to inflate the cuff to 200 mmHg and go directly to auscultating the blood pressure. Be aware that there could be an auscultatory gap (a silent interval between the true systolic and diastolic pressures).

5. **Systolic Pressure** - In situations where auscultation is not possible, you can determine systolic blood pressure by palpation alone. Deflate the cuff until you feel the radial or brachial pulse return. The pressure by auscultation would be approximately 10 mmHg higher. Record the pressure indicating it was taken by palpation (60/palp).
6. **Diastolic Pressure** - If there is more than 10 mmHg difference between the muffling and the disappearance of the sounds, record all three numbers (120/80/45).
7. **Pressure Differences** - If there is more than 10 mmHg difference between the two arms, use the arm with the higher reading for subsequent measurements.
8. **Sternal Angle** - The sternal angle is taken to be 5cm above the right atrium. A jugular pulse 10cm above the sternal angle equates to a central venous pressure of 15cm of water.
9. **Left Sternal Border** - The left 3rd, 4th, and 5th interspaces are considered the tricuspid area and are referred to as the Lower Left Sternal Border or LLSB.

## The Neurological Examination

### Equipment Needed

- Reflex Hammer
- 128 and 512 (or 1024) Hz Tuning Forks
- A Snellen Eye Chart or Pocket Vision Card
- Pen Light or Otoscope
- Wooden Handled Cotton Swabs
- Paper Clips

### General Considerations

- Always consider left-to-right symmetry
- Consider central vs. peripheral deficits
- Organize your thinking into seven categories:
  1. Mental Status
  2. Cranial Nerves
  3. Motor
  4. Coordination and Gait



5. Reflexes
6. Sensory
7. Special Tests

## **Mental Status**

## **Cranial Nerves**

### **Observation**

- Ptosis (III)
- Facial Droop or Asymmetry (VII)
- Hoarse Voice (X)
- Articulation of Words (V, VII, X, XII)
- Abnormal Eye Position (III, IV, VI)
- Abnormal or Asymmetrical Pupils (II, III)

### **I - Olfactory**

Not Normally Tested – orange or lemon smell, alcohol

### **II - Optic**

- Examine the Optic Fundi
- Test Visual Acuity
  - Allow the patient to use their glasses or contact lens if available. You are interested in the patient's best-corrected vision.
  - Position the patient 20 feet in front of the Snellen eye chart (or hold a Rosenbaum pocket card at a 14-inch "reading" distance).
  - Have the patient cover one eye at a time with a card.
  - Ask the patient to read progressively smaller letters until they can go no further.
  - Record the smallest line the patient read successfully (20/20, 20/30, etc.) {2}
  - Repeat with the other eye.
- Screen Visual Fields by Confrontation
  - Stand two feet in front of the patient and have them look into your eyes.

- Hold your hands about one foot away from the patient's ears and wiggle a finger on one hand.
- Ask the patient to indicate which side they see the finger move.
- Repeat two or three times to test both temporal fields.
- If an abnormality is suspected, test the four quadrants of each eye while asking the patient to cover the opposite eye with a card.{4}
- Test Pupillary Reactions to Light
  - Dim the room lights as necessary.
  - Ask the patient to look into the distance.
  - Shine a bright light obliquely into each pupil in turn.
  - Look for both the direct (same eye) and consensual (other eye) reactions.
  - Record pupil size in mm and any asymmetry or irregularity.
  - If abnormal, proceed with the test for accommodation.
- Test Pupillary Reactions to Accommodation
  - Hold your finger about 10cm from the patient's nose.
  - Ask them to alternate looking into the distance and at your finger.
  - Observe the pupillary response in each eye.

### III - Oculomotor

- Observe for Ptosis
- Test Extraocular Movements
  1. Stand or sit 3 to 6 feet in front of the patient.
  2. Ask the patient to follow your finger with their eyes without moving their head.
  3. Check gaze in the six cardinal directions using a cross or "H" pattern.
  4. Pause during upward and lateral gaze to check for nystagmus. {6}
  5. Check convergence by moving your finger toward the bridge of the patient's nose.
- Test Pupillary Reactions to Light

### IV - Trochlear

Test Extraocular Movements (Inward and Down Movement)



## V - Trigeminal

- **Test Temporal and Masseter Muscle Strength**
  1. Ask the patient to both open their mouth and clench their teeth.
  2. Palpate the temporal and masseter muscles as they do this.
- **Test the Three Divisions for Pain Sensation**
  1. Explain what you intend to do.
  2. Use a suitable sharp object to test the forehead, cheeks, and jaw on both sides. {7}
  3. Substitute a blunt object occasionally and ask the patient to report "sharp" or "dull."
- **If you find an abnormality then:**
  1. Test the three divisions for temperature sensation with a tuning fork heated or cooled by water.
  2. Test the three divisions for sensation to light touch using a wisp of cotton.
- **Test the Corneal Reflex**
  1. Ask the patient to look up and away.
  2. From the other side, touch the cornea lightly with a fine wisp of cotton.
  3. Look for the normal blink reaction of both eyes.
  4. Repeat on the other side.
  5. Use of contact lens may decrease this response.

## VI - Abducens

Test Extraocular Movements (Lateral Movement)

## VII - Facial

- **Observe for Any Facial Droop or Asymmetry**
- **Ask the Patient to do the following, and note any lag, weakness, or asymmetry:**
  1. Raise eyebrows

2. Close both eyes to resistance
  3. Smile
  4. Frown
  5. Show teeth
  6. Puff out cheeks
- Test the Corneal Reflex

## VIII - Acoustic

- Screen Hearing {9}
  1. Face the patient and hold out your arms with your fingers near each ear.
  2. Rub your fingers together on one side while moving the fingers noiselessly on the other.
  3. Ask the patient to tell you when and on which side they hear the rubbing.
  4. Increase intensity as needed and note any asymmetry.
  5. If abnormal, proceed with the Weber and Rinne tests.
- Test for Lateralization (Weber)
  1. Use a 512 Hz or 1024 Hz tuning fork.
  2. Start the fork vibrating by tapping it on your opposite hand.
  3. Place the base of the tuning fork firmly on top of the patient's head.
  4. Ask the patient where the sound appears to be coming from (normally in the midline).
- Compare Air and Bone Conduction (Rinne)
  1. Use a 512 Hz or 1024 Hz tuning fork.
  2. Start the fork vibrating by tapping it on your opposite hand.
  3. Place the base of the tuning fork against the mastoid bone behind the ear.
  4. When the patient no longer hears the sound, hold the end of the fork near the patient's ear (air conduction is normally greater than bone conduction).
- Vestibular Function is Not Normally Tested

## IX - Glossopharyngeal

## X - Vagus

- Listen to the patient's voice, is it hoarse or nasal?
- Ask Patient to Swallow

- **Ask Patient to Say "Ah"**
  - Watch the movements of the soft palate and the pharynx.
- **Test Gag Reflex (Unconscious/Uncooperative Patient)**
  - Stimulate the back of the throat on each side.
  - It is normal to gag after each stimulus.

## **XI - Accessory**

- From behind, look for atrophy or asymmetry of the trapezius muscles.
- Ask the patient to shrug shoulders against resistance.
- Ask the patient to turn their head against resistance. Watch and palpate the sternomastoid muscle on the opposite side.

## **XII - Hypoglossal**

- Listen to the articulation of the patient's words.
- Observe the tongue as it lies in the mouth
- Ask the patient to:
  1. Protrude tongue
  2. Move tongue from side to side – look for any deviation of the tongue

## **Motor**

### **Observation**

- **Involuntary Movements**
- **Muscle Symmetry**
  - Left to Right
  - Proximal vs. Distal
- **Atrophy**
  - Pay particular attention to the hands, shoulders, and thighs.
- **Gait**

### **Muscle Tone**

1. Ask the patient to relax.
2. Flex and extend the patient's fingers, wrist, and elbow.
3. Flex and extend patient's ankle and knee.

4. There is normally a small, continuous resistance to passive movement.
5. Observe for decreased (flaccid) or increased (rigid/spastic) tone.

### Muscle Strength

- Test strength by having the patient move against your resistance.
- Always compare one side to the other.
- Grade strength on a scale from 0 to 5 "out of five":

| <b>Grading Motor Strength</b> |   |
|-------------------------------|---|
| <b>Grade</b>                  | <b>Description</b>  |
| <b>0/5</b>                    | <b>No muscle movement</b>   |
| <b>1/5</b>                    | <b>Visible muscle movement, but no movement at the joint</b>      |
| <b>2/5</b>                    | <b>Movement at the joint, but not against gravity</b>             |
| <b>3/5</b>                    | <b>Movement against gravity, but not against added resistance</b> |
| <b>4/5</b>                    | <b>Movement against resistance, but less than normal</b>          |
| <b>5/5</b>                    | <b>Normal strength</b>  |

- Test the following:
  1. Flexion at the elbow (C5, C6, biceps)
  2. Extension at the elbow (C6, C7, C8, triceps)
  3. Extension at the wrist (C6, C7, C8, radial nerve)
  4. Squeeze two of your fingers as hard as possible ("grip," C7, C8, T1) {10}
  5. Finger abduction (C8, T1, ulnar nerve)
  6. Opposition of the thumb (C8, T1, median nerve)
  7. Flexion at the hip (L2, L3, L4, iliopsoas)
  8. Adduction at the hips (L2, L3, L4, adductors)
  9. Abduction at the hips (L4, L5, S1, gluteus medius and minimus)
  10. Extension at the hips (S1, gluteus maximus)
  11. Extension at the knee (L2, L3, L4, quadriceps)

12. Flexion at the knee (L4, L5, S1, S2, hamstrings)
13. Dorsiflexion at the ankle (L4, L5)
14. Plantar flexion (S1)

### **Pronator Drift**

1. Ask the patient to stand for 20-30 seconds with both arms straight forward, palms up, and eyes closed.
2. Instruct the patient to keep the arms still while you tap them briskly downward.
3. The patient will not be able to maintain extension and supination (and "drift into pronation) with upper motor neuron disease.

### **Coordination and Gait**

#### **Rapid Alternating Movements**

1. Ask the patient to strike one hand on the thigh, raise the hand, turn it over, and then strike it back down as fast as possible.
2. Ask the patient to tap the distal thumb with the tip of the index finger as fast as possible.
3. Ask the patient to tap their hand with the ball of each foot as fast as possible.

#### **Point-to-Point Movements**

1. Ask the patient to touch their index finger to their nose alternately several times.
2. Ask the patient to do this with eyes closed.
3. Ask the patient to place one heel on the opposite knee and run it down the shin to the big toe. Repeat with the patient's eyes closed.

#### **Romberg**

1. Be prepared to catch the patient if they are unstable.
2. Ask the patient to stand with the feet together and eyes closed for 5-10 seconds without support.
3. The test is said to be positive if the patient becomes unstable (indicating a vestibular or proprioceptive problem).

## Gait

Ask the patient to:

1. Walk across the room, turn and come back
2. Walk heel-to-toe in a straight line
3. Walk on their toes in a straight line
4. Walk on their heels in a straight line
5. Hop in place on each foot
6. Do a shallow knee bend
7. Rise from a sitting position

## Reflexes

### Deep Tendon Reflexes

- The patient must be relaxed and positioned properly before starting.
- Reflex response depends on the force of your stimulus. Use no more force than you need to provoke a definite response.
- Reflexes can be reinforced by having the patient perform isometric contraction of other muscles (clenched teeth).
- Reflexes should be graded on a 0 to 4 "plus" scale:

| Tendon Reflex Grading Scale |                            |
|-----------------------------|----------------------------|
| Grade                       | Description                |
| 0                           | Absent                     |
| 1+ or +                     | Hypoactive                 |
| 2+ or ++                    | "Normal"                   |
| 3+ or +++                   | Hyperactive without clonus |
| 4+ or ++++                  | Hyperactive with clonus    |

- Biceps (C5, C6)
  1. The patient's arm should be partially flexed at the elbow with the palm down.
  2. Place your thumb or finger firmly on the bicep's tendon.
  3. Strike your finger with the reflex hammer.



4. You should feel the response even if you can't see it.
- **Triceps (C6, C7)**
    1. Support the upper arm and let the patient's forearm hang free.
    2. Strike the triceps tendon above the elbow with the broad side of the hammer.
    3. If the patient is sitting or lying down, flex the patient's arm at the elbow and hold it close to the chest.
  - **Brachioradialis (C5, C6)**
    1. Have the patient rest the forearm on the abdomen or lap.
    2. Strike the radius about 1-2 inches above the wrist.
    3. Watch for flexion and supination of the forearm.
  - **Abdominal (T8, T9, T10, T11, T12)**
    1. Use a blunt object such as a key or tongue blade.
    2. Stroke the abdomen lightly on each side in an inward and downward direction above (T8, T9, T10) and below the umbilicus (T10, T11, T12).
    3. Note the contraction of the abdominal muscles and the deviation of the umbilicus towards the stimulus.
  - **Knee (L2, L3, L4)**
    1. Have the patient sit or lie down with the knee flexed.
    2. Strike the patellar tendon just below the patella.
    3. Note the contraction of the quadriceps and extension of the knee.
  - **Ankle (S1, S2)**
    1. Dorsiflex the foot at the ankle.
    2. Strike the Achilles tendon.
    3. Watch and feel for plantar flexion at the ankle.

## Clonus

If the reflexes seem hyperactive, test for ankle clonus:

1. Support the knee in a partly flexed position.
2. With the patient relaxed, quickly dorsiflex the foot.
3. Observe for rhythmic oscillations.



## Plantar Response (Babinski)

1. Stroke the lateral aspect of the sole of each foot with the end of a reflex hammer or key.

2. Note movement of the toes, normally flexion (withdrawal).
3. Extension of the big toe with fanning of the other toes is abnormal. This is referred to as a positive Babinski.

## Sensory

### General

- Explain each test before you do it.
- Unless otherwise specified, the patient's eyes should be closed during the actual testing.
- Compare symmetrical areas on the two sides of the body.
- Also compare distal and proximal areas of the extremities.
- When you detect an area of sensory loss map out its boundaries in detail.

### Vibration

- Use a low-pitched tuning fork (128Hz).
  1. Test with a non-vibrating tuning fork first to ensure that the patient is responding to the correct stimulus.
  2. Place the stem of the fork over the distal interphalangeal joint of the patient's index fingers and big toes.
  3. Ask the patient to tell you if they feel the vibration.
- If vibration sense is impaired proceed proximally:
  1. Wrists
  2. Elbows
  3. Medial malleoli
  4. Patellas
  5. Anterior superior iliac spines
  6. Spinous processes
  7. Clavicles

### Subjective Light Touch

- Use your fingers to touch the skin lightly on both sides simultaneously.
- Test several areas on both the upper and lower extremities.

- Ask the patient to tell you if there is a difference from side to side or other "strange" sensations.

### Position Sense

1. Grasp the patient's big toe and hold it away from the other toes to avoid friction.
2. Show the patient "up" and "down."
3. With the patient's eyes closed ask the patient to identify the direction you move the toe.
4. If position sense is impaired move proximally to test the ankle joint.
5. Test the fingers in a similar fashion.
6. If indicated move proximally to the metacarpophalangeal joints, wrists, and elbows.

### Dermatomal Testing

If vibration, position sense, and subjective light touch are normal in the fingers and toes you may assume the rest of this exam will be normal.

### Pain

- Use a suitable sharp object to test "sharp" or "dull" sensation.
- Test the following areas:
  1. Shoulders (C4)
  2. Inner and outer aspects of the forearms (C6 and T1)
  3. Thumbs and little fingers (C6 and C8)
  4. Front of both thighs (L2)
  5. Medial and lateral aspect of both calves (L4 and L5)
  6. Little toes (S1)

### Temperature

- Often omitted if pain sensation is normal.
- Use a tuning fork heated or cooled by water and ask the patient to identify "hot" or "cold."
- Test the following areas:
  1. Shoulders (C4)
  2. Inner and outer aspects of the forearms (C6 and T1)
  3. Thumbs and little fingers (C6 and C8)

4. Front of both thighs (L2)
5. Medial and lateral aspect of both calves (L4 and L5)
6. Little toes (S1)

### Light Touch

- Use a fine whisp of cotton or your fingers to touch the skin lightly.
- Ask the patient to respond whenever a touch is felt.
- Test the following areas:
  1. Shoulders (C4)
  2. Inner and outer aspects of the forearms (C6 and T1)
  3. Thumbs and little fingers (C6 and C8)
  4. Front of both thighs (L2)
  5. Medial and lateral aspect of both calves (L4 and L5)
  6. Little toes (S1)

### Discrimination

Since these tests are dependent on touch and position sense, they cannot be performed when the tests above are clearly abnormal.

- **Graphesthesia**
  1. With the blunt end of a pen or pencil, draw a large number in the patient's palm.
  2. Ask the patient to identify the number.
- **Stereognosis**
  1. Use as an alternative to graphesthesia.
  2. Place a familiar object in the patient's hand (coin, paper clip, pencil, etc.).
  3. Ask the patient to tell you what it is.
- **Two-Point Discrimination**
  1. Use in situations where more quantitative data are needed, such as following the progression of a cortical lesion.
  2. Use an opened paper clip to touch the patient's finger pads in two places simultaneously.
  3. Alternate irregularly with one-point touch.
  4. Ask the patient to identify "one" or "two."
  5. Find the minimal distance at which the patient can discriminate.

## Notes

1. Visual acuity is reported as a pair of numbers (20/20) where the first number is how far the patient is from the chart and the second number is the distance from which the "normal" eye can read a line of letters. For example, 20/40 means that at 20 feet the patient can only read letters a "normal" person can read from twice that distance.
2. You may, instead of wiggling a finger, raise one or two fingers (unilaterally or bilaterally) and have the patient state how many fingers (total, both sides) they see. To test for neglect, on some trials wiggle your right and left fingers simultaneously. The patient should see movement in both hands.
3. PERRLA is a common abbreviation that stands for "Pupils Equal Round Reactive to Light and Accommodation." The use of this term is so routine that it is often used incorrectly. If you did not specifically check the accommodation reaction use the term PERRL. Pupils with a diminished response to light, but a normal response to accommodation (Argyll-Robertson Pupils) are a sign of neurosyphilis or Lyme disease.
4. Nystagmus is a rhythmic oscillation of the eyes. Horizontal nystagmus is described as being either "leftward" or "rightward" based on the direction of the fast component.
5. Testing Pain Sensation - Use a new object for each patient. Break a wooden cotton swab to create a sharp end. The cotton end can be used for a dull stimulus. Do not go from patient to patient with a safety pin. Do not use non-disposable instruments such as those found in certain reflex hammers. Do not use very sharp items such as hypodermic needles.
6. Central vs Peripheral - With a unilateral central nervous system lesion (stroke), function is preserved over the upper part of the face (forehead, eyebrows, eyelids). With a peripheral nerve lesion (Bell's Palsy), the entire face is involved.
7. The hearing screening procedure presented by Bates on page 181 is more complex than necessary. The technique presented in this syllabus is preferred.
8. Deviation of the tongue or jaw is toward the side of the lesion.
9. Although it is often tested, grip strength is not a particularly good test in this context. Grip strength may be omitted if finger abduction and thumb opposition have been tested.

10. The "anti-gravity" muscles are difficult to assess adequately with manual testing. Useful alternatives to include: walk on toes (plantar-flexion); rise from a chair without using the arms (hip extensors and knee extensors); step up on a step, once with each leg (hip extensors and knee extensors).
11. Subjective light touch is a quick survey for "strange" or asymmetrical sensations only, not a formal test of dermatomes.

## The Breast Examination

### Equipment Needed

- None
- The patient must be properly gowned for this examination. All upper-body clothing should be removed.

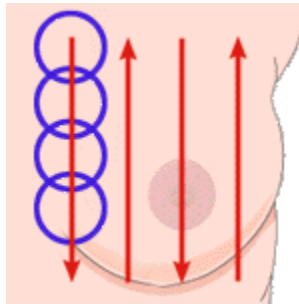
### General Considerations

- The patient must be properly gowned for this examination. All upper-body clothing should be removed.
- Breast tissue changes with age, pregnancy, and menstrual status.
- The procedure described here can also be used for self-examination using a mirror for inspection.

### Inspection

1. Give a brief overview of the examination to the patient.
2. Have the patient sit at end of the exam table.
3. Ask the patient to remove the gown to their waist, assist only if needed.
4. Have the patient relax arms to their side.
5. Examine visually for the following:
  - Approximate symmetry
  - Dimpling or retraction of the skin
  - Swelling or discoloration
  - Orange peel effect on the skin
  - Position of nipple
6. Observe the movement of breast tissue during the following maneuvers:

- Shrug shoulders with hands on hips
  - Slowly raise arms above head
  - Lean forward with hands on knees (large breasts only)
7. Have the patient replace the gown.
  8. Reassure the patient; if the exam is normal so far, say so.



### Palpation

1. Have the patient lie supine on the exam table.
2. Ask the patient to remove the gown from one breast and place their hand behind their head on that side.
3. Begin to palpate at the junction of the clavicle and sternum using the pads of the index, middle, and ring fingers. If open sores or discharge are visible, wear gloves.
4. Press breast tissue against the chest wall in small circular motions. Use very light pressure to assess the superficial layer, moderate pressure for the middle layer, and, firm pressure for deep layers.
5. Palpate the breast in overlapping vertical strips. Continue until you have covered the entire breast including the axillary "tail."
6. Palpate around the areola and the depression under the nipple. Press the nipple gently between the thumb and index finger and make note of any discharge.
7. Lower the patient's arm and palpate for axillary lymph nodes.
8. Have the patient replace the gown and repeat on the other side.
9. Reassure the patient; discuss the results of the exam.

### Notes

1. Some texts refer to circular or clock face patterns. These are considered to be inferior to the "lawn mower" pattern of vertical strips and should not be used.

## Basic Traditional Chinese Tongue Examination

### Tongue Body Color

(Reflects the True Condition of the Body)

Normal: Pink

### Abnormal Color

Pale: A Gauge for Degree of Blood Deficiency or Yang Qi Deficiency

Pale Wet: Yang Qi Deficiency → Kidney Yang

Pale Dry: Blood Deficiency: Yin → Blood and Fluids

Pale Bright and Shiny: Qi and Blood Deficiency; Particularly of Weakness in Stomach and Spleen

### Red Body

Red: Heat from either Deficiency or Excess

Red Tip: Chest, Cardiac, Circulatory; Long Standing Emotional Imbalances, especially Sadness or Depression Allergies affecting Respiratory System

Red Sides: Liver Detoxification Impaired, Possible Gall Bladder or Biliary Stagnancy

Red Center: Stomach, Spleen: Inflammation, Constipation, Irregular Eating Habits, Food Sensitivity

Red Root: Kidney Yin Deficiency, Kidney Filtration Deficiency; Sexual Function Impairment



**Red and Wet: Heat with Deficient Spleen Qi with Dampness; Not so common as Red and Dry**

**Red and Dry: With Coating: Heat with Depletion of Bodily Fluids; Without Coating: Heat with Deficiency of Kidney Yin and Exhaustion of Body Fluids; Check Biological Terrain**

**Red and Scarlet: Lung or Heart Yin Deficiency; Usually Found in Elderly**

### **Red Body**

**Red with Red Points or Spots: Heat with Blood Stasis**

Red Points are raised from the tongue surface and are pointed, these indicate heat in the blood (homotoxins). Often seen in children

Red spots indicate both heat and blood stasis; the larger the spots the more severe the stasis.

The significance of these depends on their location and distribution, as well as the tongue color and tongue coat.

**Red with Purple Spot in Center: Blood Stasis and Heat in Stomach and/or Upper GI**

**Dark Red with a Dry Center: Extreme Stomach Fire; Consider Upper GI Dysbiosis; Stomach Yin Deficiency with Heat – HCL or Pancreatic Enzyme Need**

### **Purple Tongue**

**Reddish Purple: Heat and Blood Stasis**

Reddish Purple Tip: Chest, Cardiac

Reddish Purple Sides: Liver, Gall Bladder

**Reddish Purple and Swollen: Extreme Heat with Blood Stasis and Toxins Injuring Organs - Heart**

**Bluish Purple: Blood Stasis from Internal Cold**

**Bluish Purple Tip**

**Bluish Purple Central Area**

**Bluish Purple Sides**

**Bluish Purple Root**

**Bluish Purple and Moist: Blood Stasis from Internal Cold  
Affecting Bones and Connective Tissues – Tendons**

### **Blue**

**Blue: Severe Internal Cold with Blood Stasis**

**Blue without Coating: Severe Internal Cold with Blood Stasis and  
Exhaustion of Blood**

**Blue Tongue During Pregnancy: Danger of Miscarriage**

### **Tongue Body Shape**

**Normal: Both neither too thin nor swollen, soft and supple without being flabby. Tapers off toward the tip. Surface is unbroken by cracks. The normal tongue can be extended easily and neither trembles nor quivers uncontrollably, nor is it involuntarily stiff or immobile.**

**Thin: Fluids give the tongue body; a thin tongue always suggests a deficiency of yin substances, either blood, lymph or bodily fluids.**

**Thin Pale: Blood Deficiency**

**Thin Red: Yin Deficiency**

**Swollen: Yang Qi Deficiency – Yang Qi transforms and regulates fluids and if deficient will often manifest as a swollen tongue**

### **Five Types of Swollen Tongue**

**Pale and Wet: Spleen and Kidney Yang Deficiency - Dampness**

Normal Color: Damp Heat in Stomach and Spleen

Fresh-looking Red: Heart and Stomach Heat

Purple: Toxins – Consider Alcohol abuse; Environmental Toxins

Dark Bluish Purple: Toxins Causing Blood Stasis

### Partially Swollen

Swollen Edges: Swelling is more concentrated in middle; Spleen Qi deficiency; if edges are wet, then it derives from a deficient spleen yang

Swollen Sides: Evenly distributed along the length of tongue body; usually red or purple - indicates rising liver Yang or liver fire.

Swollen Tip: Cardiac problem

Swollen Between Tip and Central Surface: Lungs Qi deficiency

Swollen Along Central Crack: Heart is overworked and Probably enlarged; red: heart fire; normal color heart deficiency.

Swollen on Half the Tongue: Deficiency of Qi and blood in meridians of that side of the body; usually related to meridians and muscles, usually not organs.

Swollen in Front Part: Chronic retention of phlegm in lungs

### Cracked Tongue Body

Significance depends on tongue body color, the location of the cracks and their shape and depth. Most common cause is from exhaustion of body fluids or yin.

Long Horizontal Cracks: If Red Body then it derives from a Kidney Yin Deficiency; if Tongue is Normal Color, it derives from Stomach and/or Lungs

**Short Horizontal Cracks: With Red Tongue without Coat Indicates Heat From Yin Deficiency**

**Irregular Cracks: Deficiency of Stomach Yin**

**Transverse Cracks on Sides: Longstanding Spleen Qi Deficiency**

**Vertical Cracks in Center: Deficiency of Heart Yin**

**Long Vertical Crack in Center: Longstanding Heart Yin Deficiency**

**Tooth-Marked: Spleen Qi Deficiency; often seen with pale body which indicates blood deficiency**

### **Tongue Coating**

TCM views the tongue coating as a physiological by-product of the GI tract's digestion of fluids and food. Thin white coating is normal.

Clinically, the tongue coating reflects the health of the Yang organs, in particular the stomach or upper GI.

The tongue coating, in contrast to body color and shape, can change quickly in color, thickness and distribution, either as a result of treatment or pathological processes.

The tongue coating can give an immediate and clear indication of the deficient or excess character of a condition: the absence of coating always indicates deficiency, and a thick coating always indicates excess.

The coating provides a clear indication of hot or cold nature of a condition: white signifies cold, and yellow signifies heat.

**Tongue Coating Thickness: Signifies the presence of a pathogenic factor; thick = excess    absence = deficiency**

**Coating Distribution: External = acute "humoral phase"  
Internal = chronic "cellular phase"**

**Coating Moisture:** Normal tongue coating will be slightly moist, indicating good supply and movement of the body fluids.

**Dry Coating**

**Wet Coating**

**Tongue Coating Color**

**White Coating**

**Yellow Coating**

**Gray Coating**

**Black Coating: Chronic illness “cellular phase”**

**Underside of Tongue:** Distended veins: Deficiency and Stagnancy of Qi;  
If Veins are also dark: Blood Stasis – Lymphatic Stasis