

## NSG 3100: UNIT 3 HEMODYNAMICS

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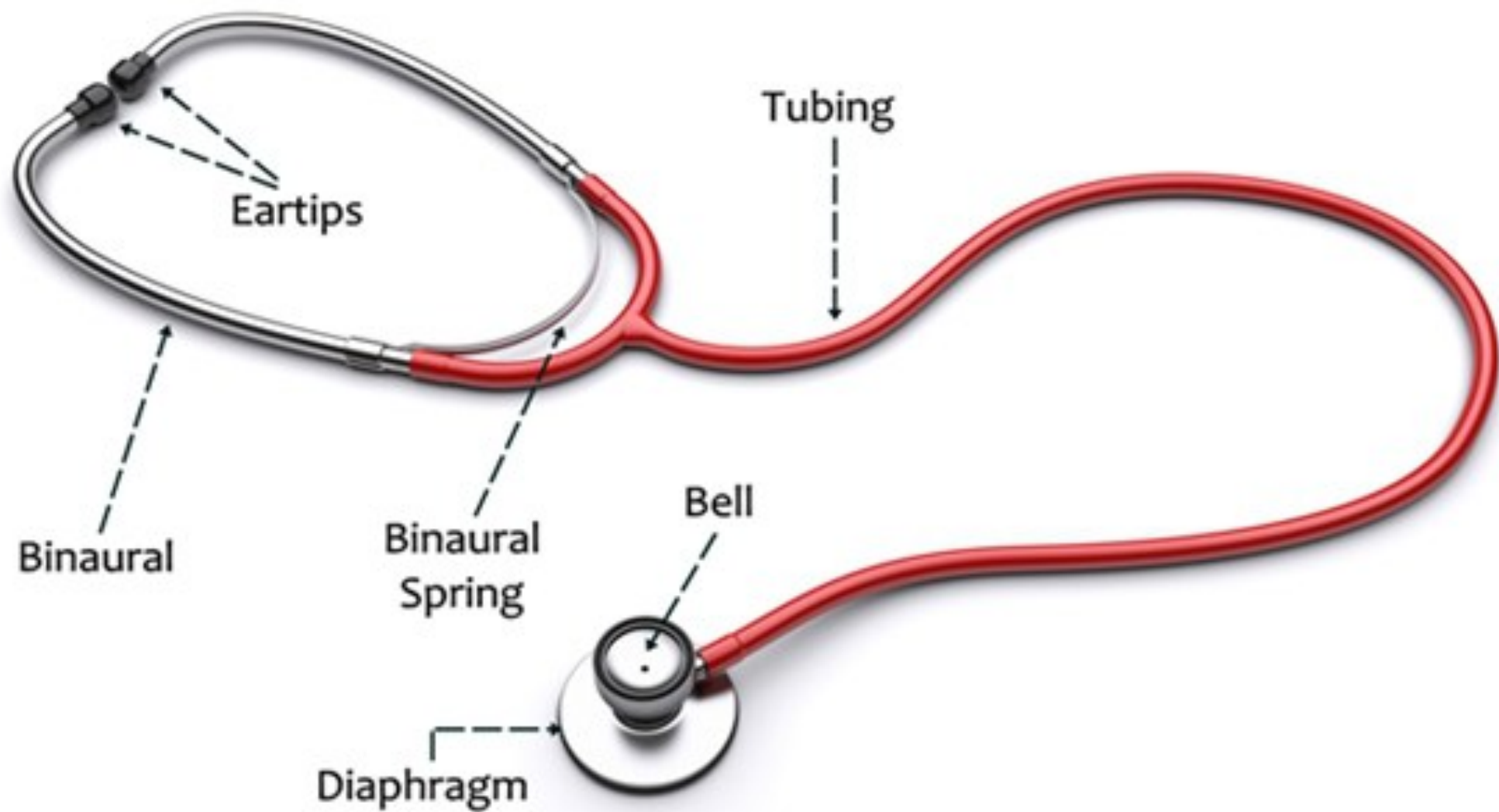
# Guiding Principle

Don't treat the number, treat the patient!

(many patients can be asymptomatic with VS, so its best to treat the patient's problems not based on the machines).



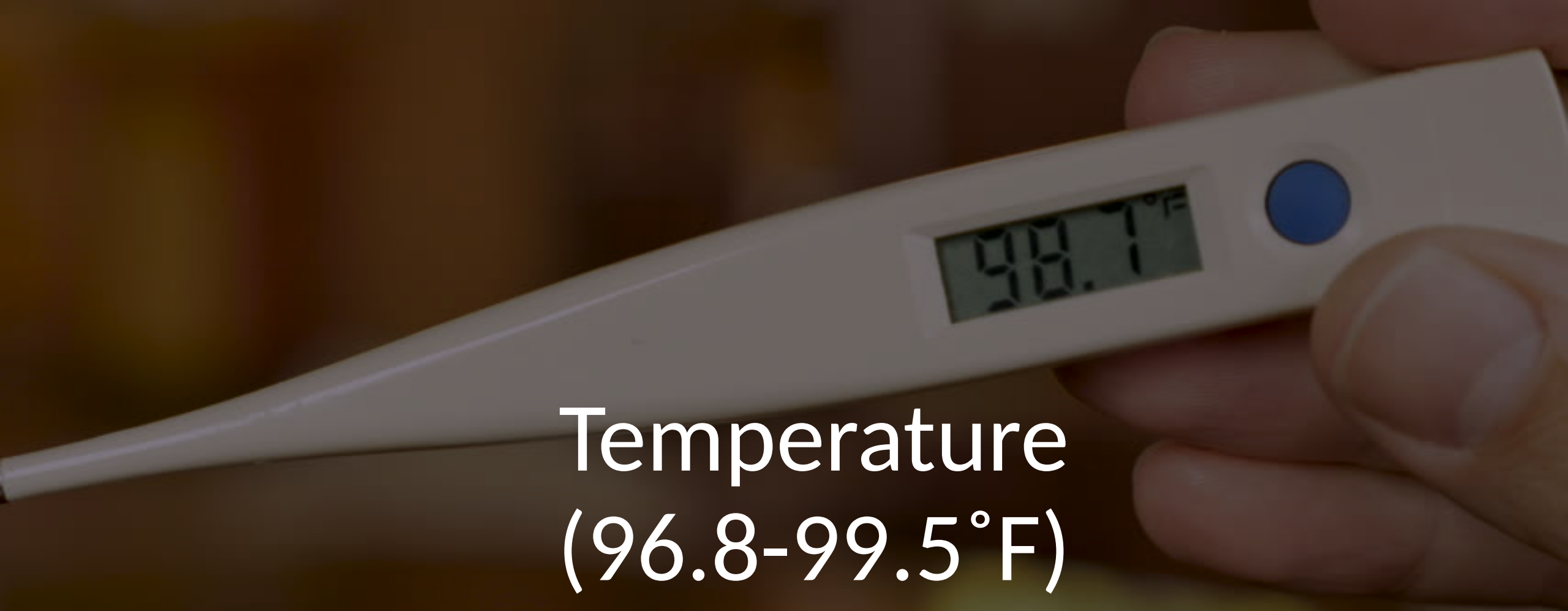
# Stethoscope



## **BOX 29-1**

## **Times to Assess Vital Signs**


- On admission to a health care agency to obtain baseline data
- When a client has a change in health status or reports symptoms such as chest pain or feeling hot or faint
- Before and after surgery or an invasive procedure
- Before and/or after the administration of a medication that could affect the respiratory or cardiovascular systems; for example, before giving a digitalis preparation
- Before and after any nursing intervention that could affect the vital signs (e.g., ambulating a client who has been on bed rest)



Temperature  
(96.8-99.5°F)



# Factors Affecting Temperature

1. **Age**- very young & very old have issues with extreme changes
  2. **Diurnal variations** (circadian rhythms)- temp varies during the day with the highest temp between 4-6pm and the lowest temp between 4-6am.
  3. **Exercise**- can increase temp up to 101-104 degrees rectally
  4. **Hormones**-progesterone secretion at time of ovulation raises body temp by 0.5-1 degree above baseline
  5. **Stress**- elevation in temp d/t sympathetic nervous system activation
  6. **Environment**- appropriate dress
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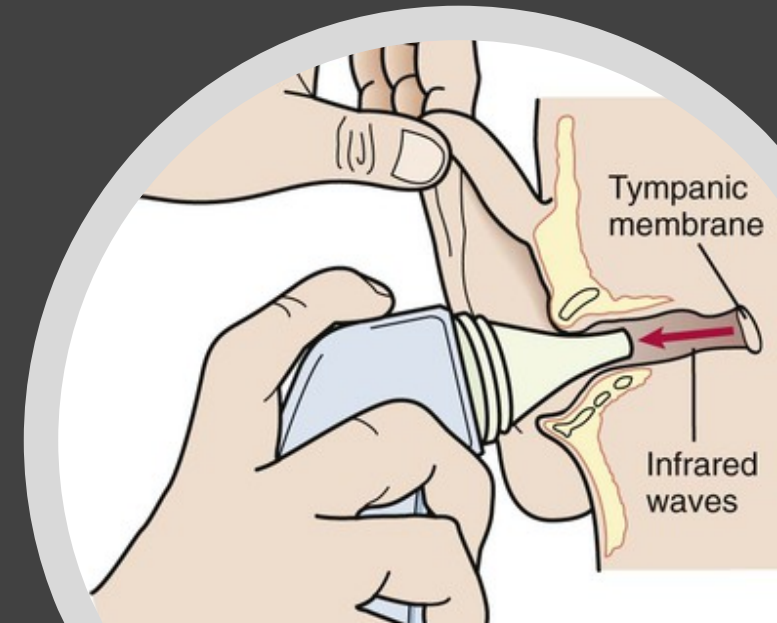
# Temperature Regulation

- When the **body becomes too cold:**
  1. Shivering increases heat production
  2. Sweating is inhibited to decrease heat loss
  3. Vasoconstriction decreases heat loss
- When the **body becomes too hot:**
  1. Sweating is initiated
  2. Vasodilation occurs

# Routes

change the site, if doubt!

- Oral (most common site)
- Rectal (most reliable result)
- Axillary
- Tympanic
- Temporal



# Clinical Manifestations

## Hyperthermia

- **Onset (Chill):** ↑HR, ↑RR, Shivering, Cold skin  
Complaints of feeling cold, Cyanotic nail beds, “Gooseflesh” appearance, Cessation of Sweating
- **Course (Plateau):** absence of chills, skin that feels warm, photosensitivity, glassy-eye appearance, ↑ HR, RR, thirst, mild to severe dehydration, drowsiness, restlessness, delirium, lesions of the mouth, loss of appetite, malaise, weakness, aching muscles
- **Defervescence (Flush):** skin is flushed and warm, sweating, decreased shivering, possible dehydration

## Hypothermia

- ↓temp. pulse, respirations, UO
- Severe shivering (initially)
- Feels of cold and chills
- Pale, cool, waxy skin
- Frostbite
- Hypotension
- Lack of muscle coordination
- Disorientation
- Drowsiness progressing to coma

# Nursing Interventions

## Hyperthermia

- Remove excess blankets
- Adequate nutrition and fluids to meet increase metabolic demand
- Reduce physical activity to limit heat production
- Administer antipyretics
- Provide oral hygiene to keep mucous membranes moist
- Provide a tepid sponge bath

## Hypothermia

- Warm environment
- Warm blankets
- Keep limbs close to body
- Cover head and feet
- Warm oral or IV fluids
- Warming pads/devices

A close-up photograph of a person's hand with a pulse being checked. Another hand is visible on the right, with fingers positioned to feel the pulse on the wrist of the first hand. The background is a solid, light gray.

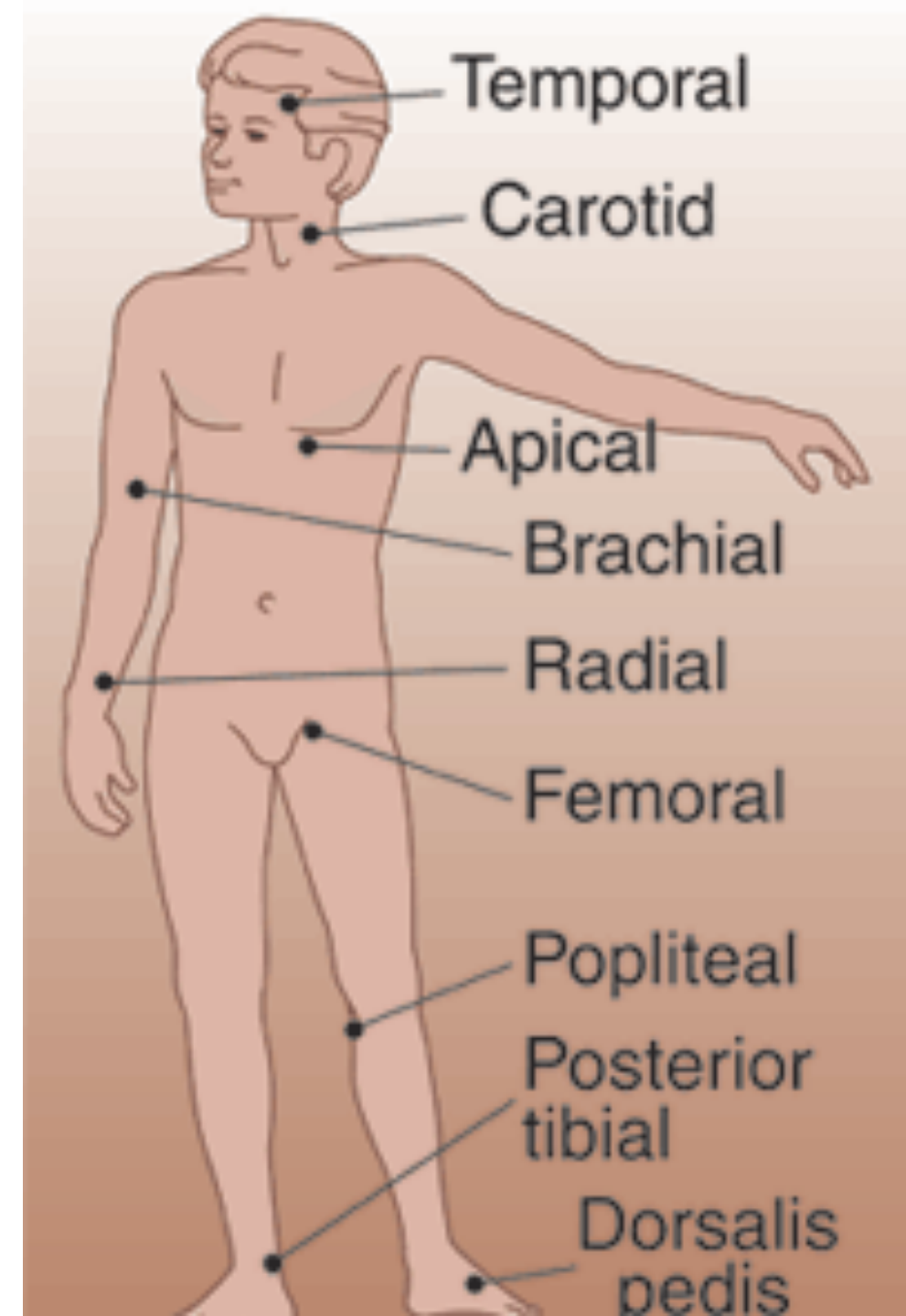
Pulse  
(60-100 bpm)

# Factors Affecting Pulse

- **Age:** HR decreases with age
- **Sex:** males have lower HR after puberty
- **Exercise:** HR increases with activity
- **Fever:** HR increases with fever
- **Medications:** Digoxin
- **Hypovolemia/dehydration:** HR increases
- **Stress:** HR increases
- **Position:** HR increases with standing
- **Pathology:** heart conditions and those that impair oxygenation

# Sites

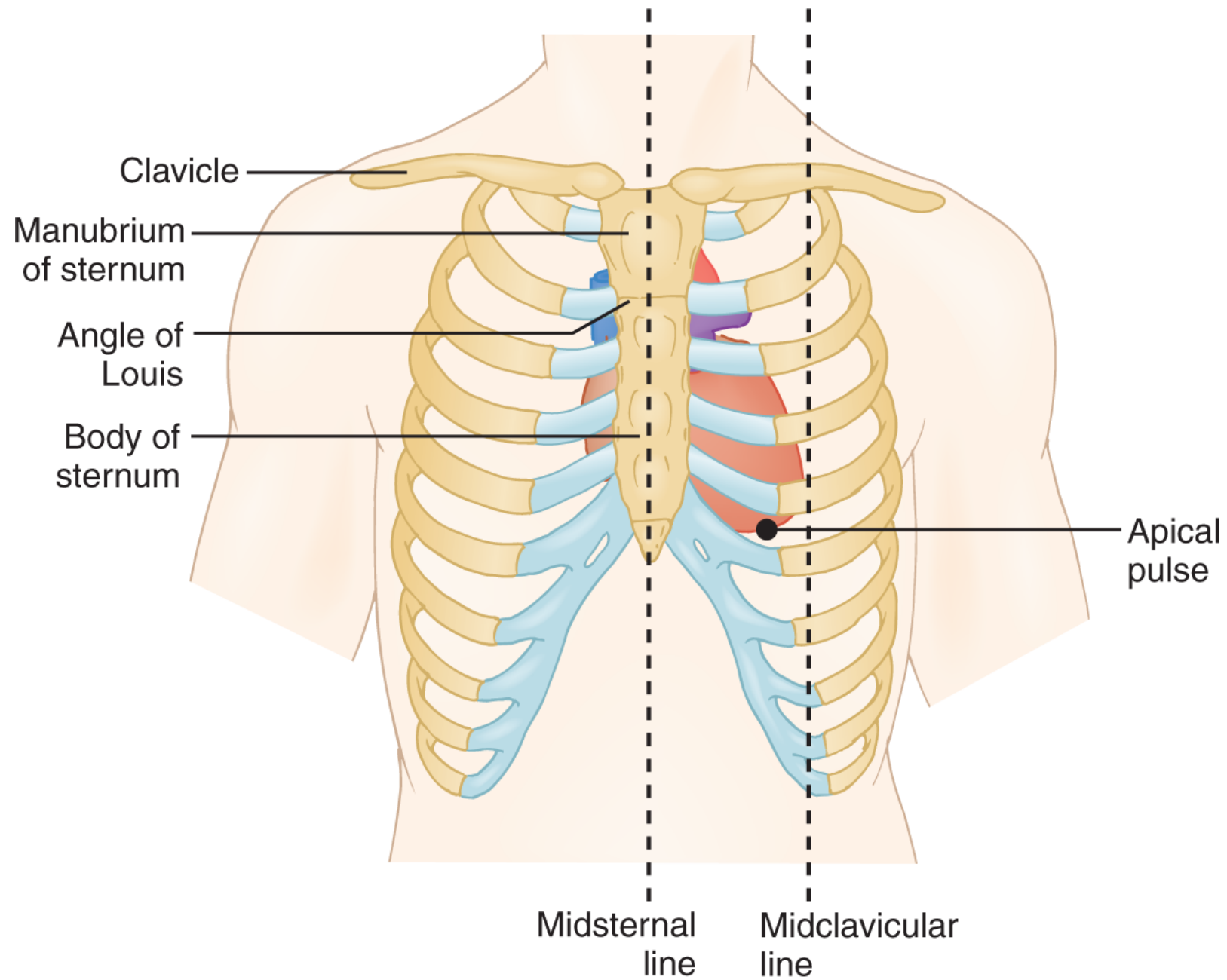
- Temporal-head
- Carotid-neck
- Apical-chest
- Brachial-arm
- Radial-wrist
- Femoral-thigh/groin
- Popliteal-knee
- Posterior Tibial-ankle
- Dorsalis Pedis-foot



# Pulse Assessment

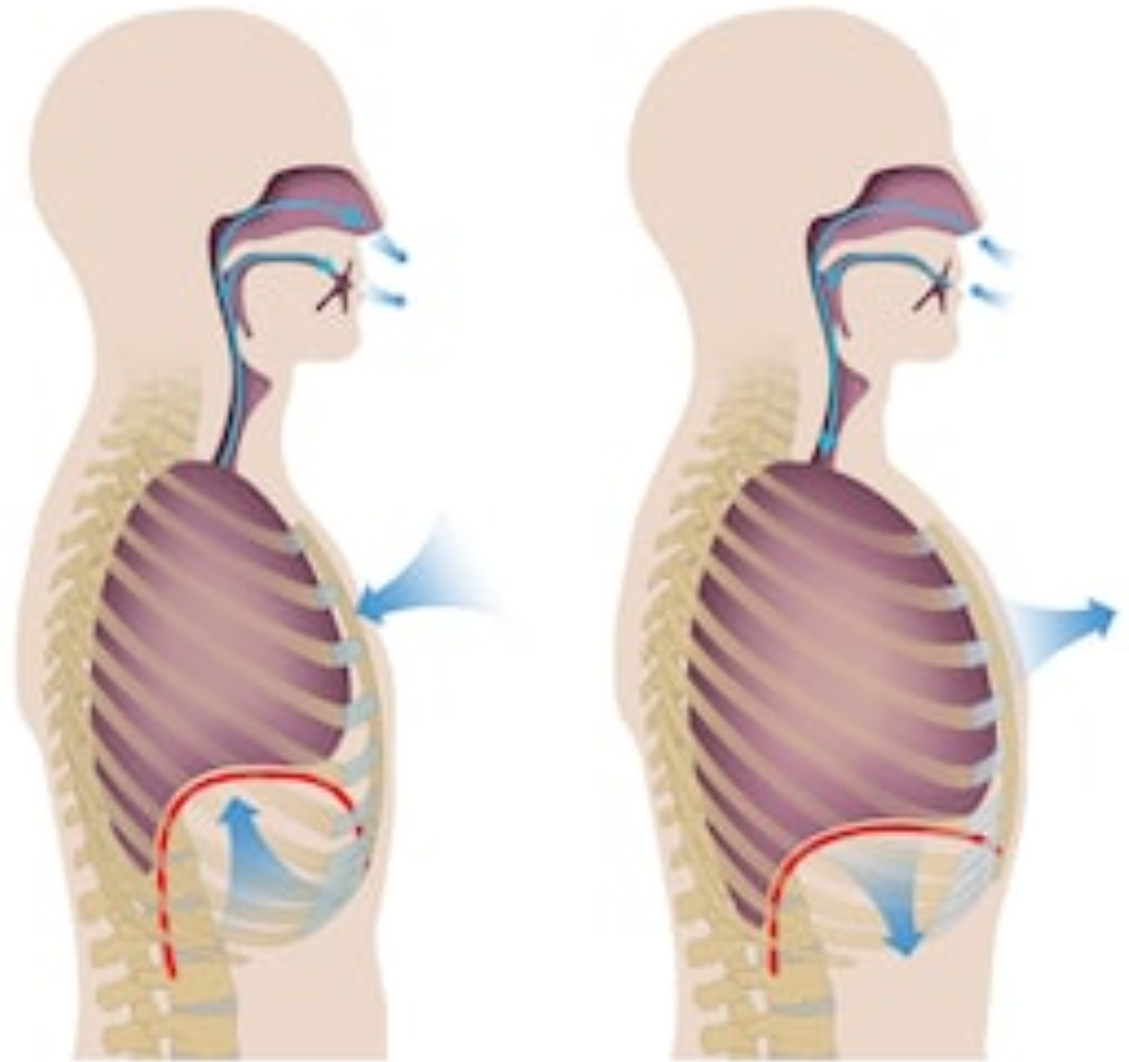
- If you can't feel a pulse, move up and assess one more proximal to the one you were trying to feel or use a Doppler to locate it.
- If pulse is irregular or this is your first time assessing, count for 1 full minute
- **Tachycardia is a pulse >100**
- **Bradycardia is a pulse <60**
- Always use fingers, not thumb to assess pulse
- Keep fingers in independent position when feeling for pulse so you don't accidentally mistake your pulse for the client's.





# Respirations (12-20 BPM)

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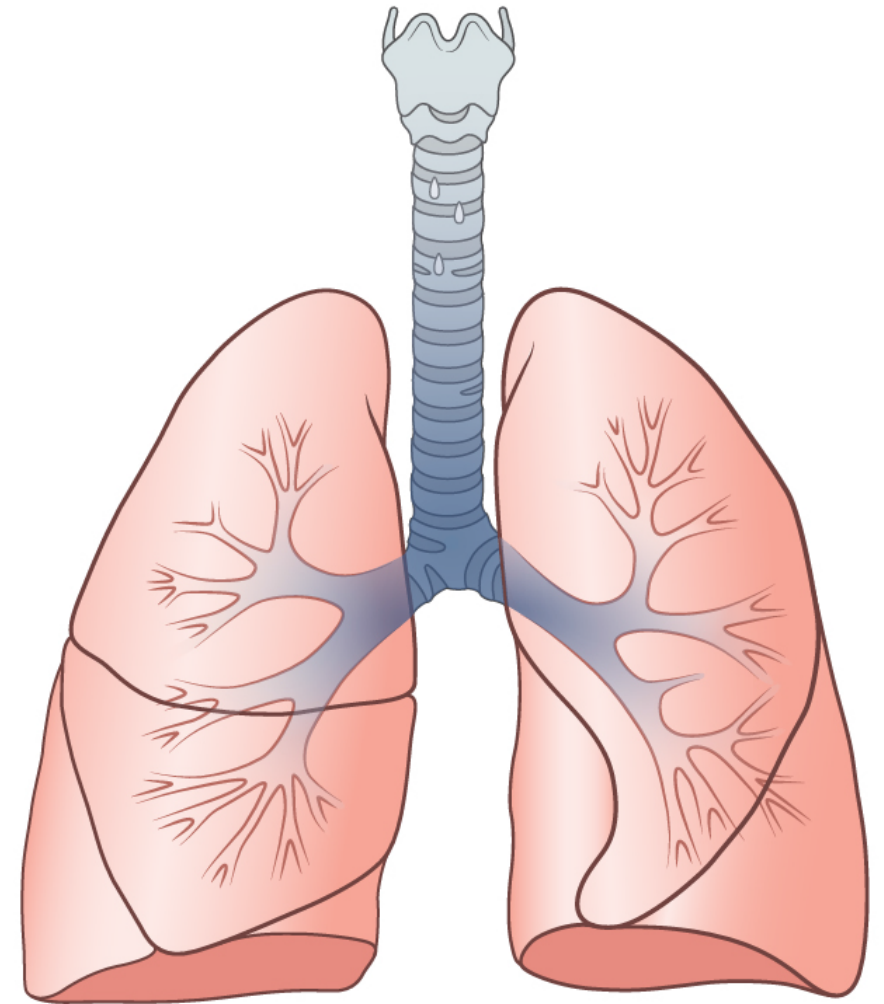
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# Assessing Respirations

1. Rate
  - Recorded in breaths per minute
  - **Bradypnea=slow breathing**
  - **Tachypnea=fast breathing**
2. Depth
  - Deep vs Shallow
3. Rhythm
  - Regular vs Irregular
4. Quality
  - Labored vs unlabored
  - Any adventitious breath sounds
5. Effectiveness
  - Pulse ox reading
  - ABG's
  - HGB

# Adventitious Breath Sounds & Abnormal Airway Findings

- **Stridor** (foreign body in the trachea)
- **Rhonchi** (mucous build up)
- **Wheeze** (inflammation)
- **Crackles** (fluid build up)
- **Friction rub** (lose of mucous fluid)
- **Retractions**
- **Grunting** (found in children and infants)
- **Nasal Flaring** (found in children)
- **Head Bobbing** (found in children)



# Tripod Position

Tripod position suggests distress, resting weight on knees helps with chest expansion



Blood Pressure  
SBP (90-120)/  
DBP (60-80)

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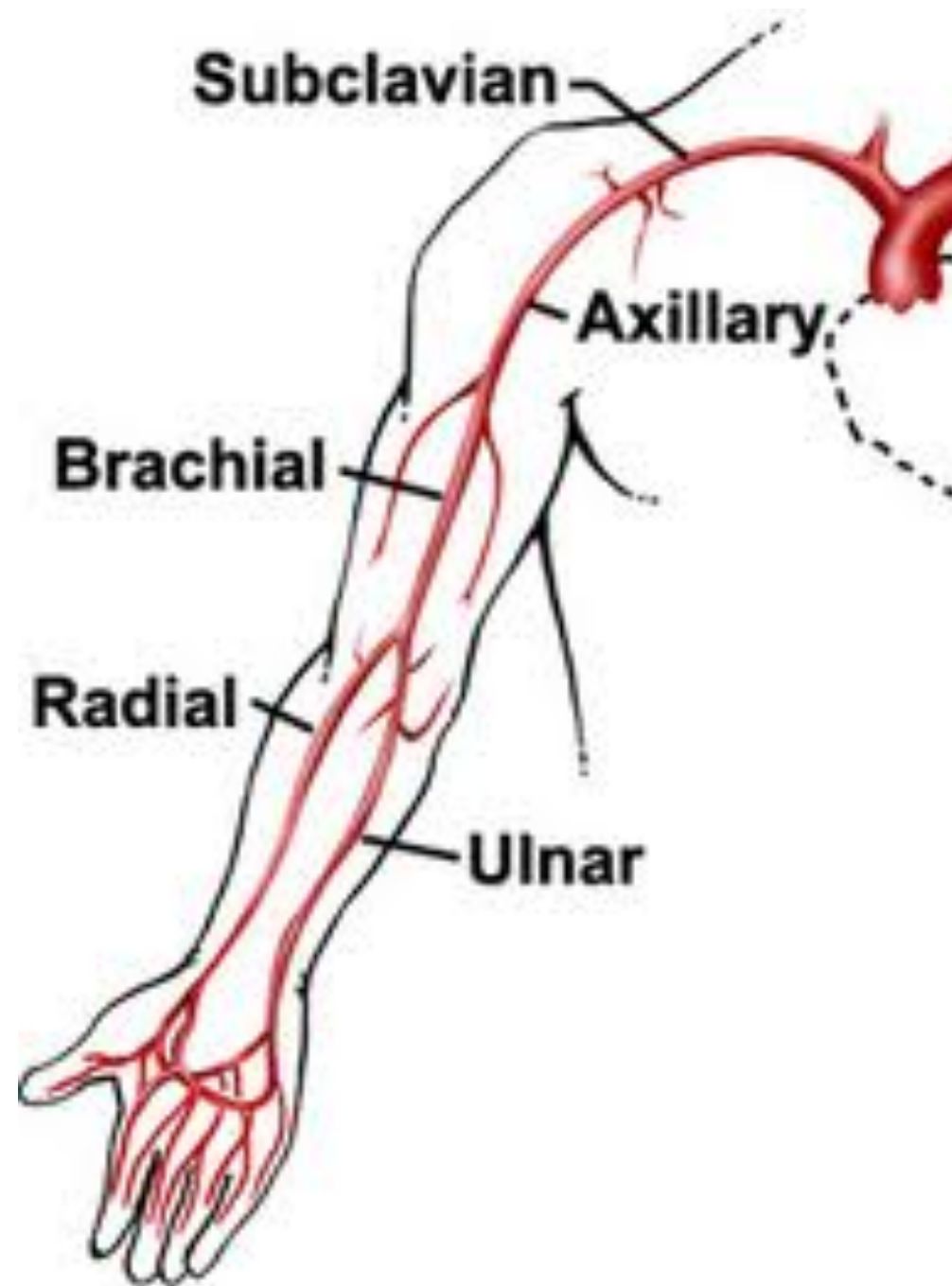


# Factors Affecting BP

- **Age**- rises with age
- **Exercise**- increases CO and causes increase in BP
- **Stress**- Sympathetic nervous system increase CO and causes vasoconstriction which increase BP
- **Race**- African Americans have higher BP's
- **Sex**-after puberty females have lower BP's but after menopause they have higher
- **Medications**- caffeine increases BP
- **Obesity**-predisposes a person to increase BP
- **Diurnal variations**-BP lowest early in the morning, and highest late in the afternoon
- **Medical Conditions**-Heart Failure, atherosclerosis, valve issues, ventricle hypertrophy
- **Temperature**- vasodilation vs vasoconstriction

# Assessing BP

- The bladder cuff is measured according to patient size, not age
  - If the cuff is too small, your reading will be falsely high
  - If the cuff is too big, your reading will be falsely low
  - Width should be 40% of arm circumference
  - Length should cover at least 2/3 of the limb circumference
- **Do not measure BP in the following areas:**
  - Shoulder, arm, or hand is injured
  - Cast or bulky bandage is on the limb
  - Surgical removal of breast or axillary lymph nodes on that side
  - IV infusion on that side
  - AV fistula for dialysis in that limb
- When taking a manual BP, **your systolic is the point at which you first hear a tapping sound, and your diastolic is the point at which sounds become inaudible**
- **Position client sitting with feet on the floor, legs uncrossed, elbow slightly flexed, palm facing up.**



# Variations in BP

## Hypertension

- BP above the normal limits for at least 2 readings at 2 different times
- HTN= systolic BP is higher than 140 or diastolic is higher than 90
- “Silent Killer”
  - **Only s/s sometimes is a headache**

## Hypotension

- A systolic reading consistently between **85-110 in a adult whose normal pressure is higher than this**
- **Orthostatic Hypotension:** BP decreases when the client sits or stands as a result of peripheral vasodilation. Causes person to feel faint.

# How to Assess for Orthostatic Hypotension

1. Lay the patient supine for 10min
2. Record BP
3. Assist the client to slowly sit and/or stand
4. Immediately recheck in the same site
5. Repeat the HR and BP after 3min
6. Record the results. A drop in BP of **20 systolic** or **10 diastolic** indicates orthostatic hypotension



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# Oxygen Saturation (>95%)

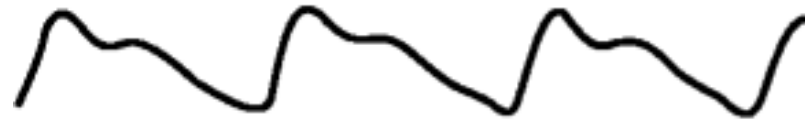


# Pulse Oximetry

- Normal O<sub>2</sub> sats are 95-100%
- Below 70% is life-threatening
- Rotate signs of the **adhesive ones every 4 hrs** and the **spring-tension ones every 2hrs** to prevent tissue irritation
- May need to cover area with a blanket to prevent excessive light from interfering with the reading
- Choose a warm finger or toe to get your reading
- Factors Affecting the Reading:
  - Hemoglobin (low Hgb)
  - Circulation (poor circulation)
  - Activity (physical activity causing increase O<sub>2</sub> demand)
  - CO poisoning (monoxide competing with O<sub>2</sub>)
  - Nail polish (alcohol interpretation)



# Pulse Oximeter Waveform



**Normal Signal**



**Low Perfusion**

excessive light and/or nail polish



**Noise Artifact**

equipment interferes



**Motion Artifact**



6th vital sign..... don't forget to ask and assess every time for pain.

# Mnemonics for pain assessment

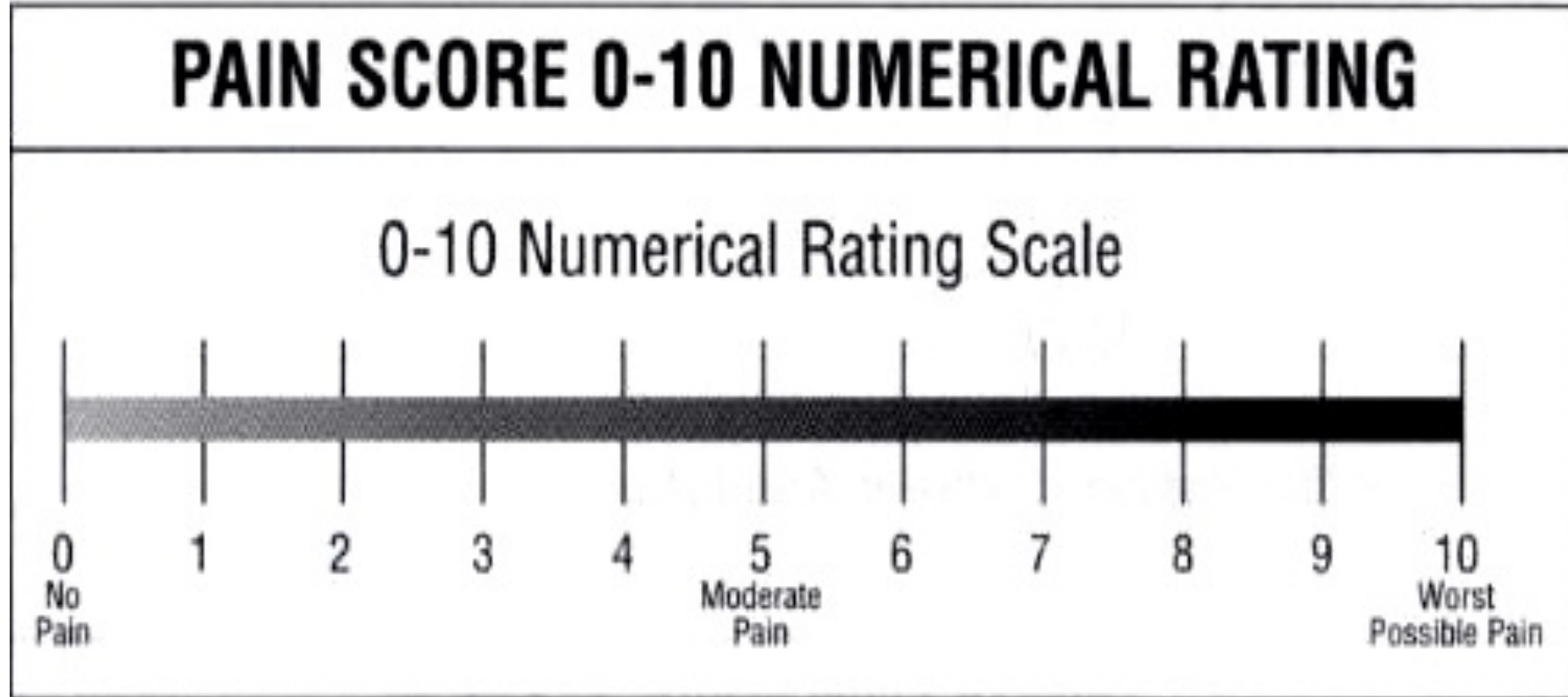
## **OLD CART**

- O- Onset
- L- Location
- D- Duration
- C- Characteristics
- A- Aggravating factors
- R- Radiation
- T- Treatment

## **PQRST**

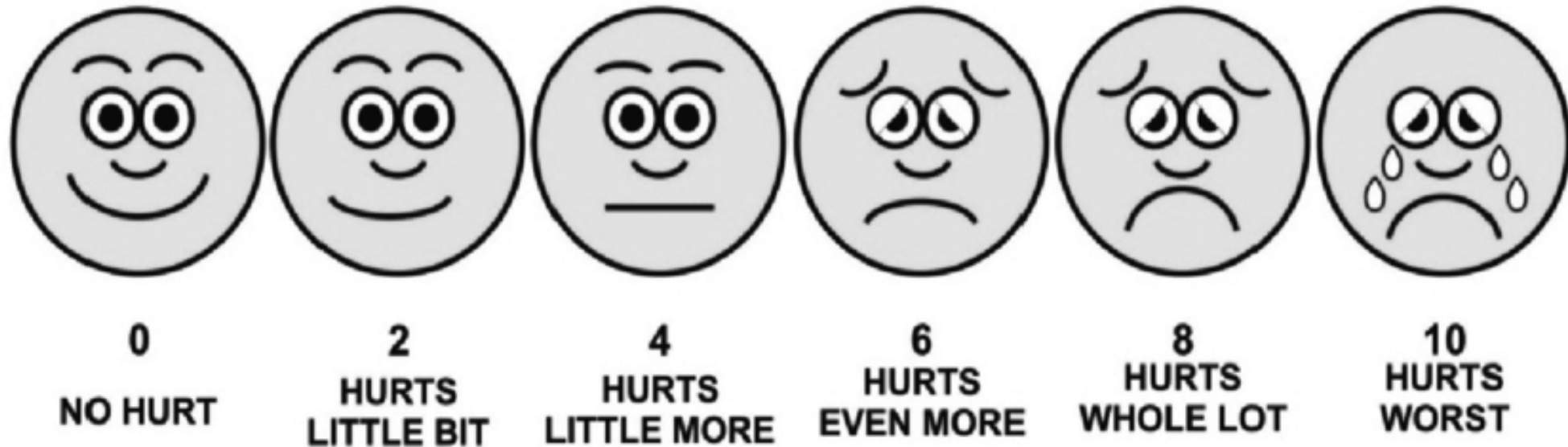
- P- Provoked
- Q- Quality
- R- Region/Radiation
- Severity
- Timing

# Pain Scales-Numeric



# Pain Scales-Wong-Baker Faces

Show the picture and ask the patient what represent them as their pain?



# Pain Scales-FLACC

Used for nonverbal and infants patients.  
This scale is consider objective data.

|               | Scoring                                      |   |  |
|---------------|--|---|--|
| Categories    | 0  | 1   | 2  |
| Face          | No particular expression or smile.           | Occasional grimace or frown, withdrawn, disinterested                       | Frequent to constant frown, quivering chin, clenched jaw |
| Legs          | Normal position or relaxed                   | Uneasy, restless, tense   | Kicking or legs drawn up                                 |
| Activity      | Lying quietly, normal position, moves easily | Squirming, shifting back and forth, tense                                   | Arched, rigid, or jerking                                |
| Cry           | No cry (awake or asleep)                     | Moans or whimpers; occasional complaint                                     | Crying steadily, screams or sobs, frequent complaints    |
| Consolability | Content, relaxed                             | Reassured by occasional touching, hugging, or being talked to; distractable | Difficult to console or comfort                          |

# Pain Scales-NIPS

younger than 2 months  
(objective data)

## Neonatal Infant Pain Scale (NIPS)

| Variable                        | Finding   | Points |
|---------------------------------|---|--------|
| <b>Facial expression</b>        | Relaxed (Restful face, neutral expression)  | 0      |
|                                 | Grimace (Tight facial muscles. Furrowed brow, chin, jaw)  | 1      |
| <b>Cry</b>                      | No cry (Quiet, not crying)  | 0      |
|                                 | Whimper(Mild moaning, intermittent)   | 1      |
|                                 | Vigorous crying (loud scream, shrill, continuous). If Infant is intubated, score silent cry based on facial movement. | 2      |
| <b>Breathing pattern</b>        | Relaxed (Usual pattern for this infant)   | 0      |
|                                 | Change in breathing (Irregular, faster than usual , gagging, breath holding)  | 1      |
| <b>Arms</b>                     | Relaxed ( No muscular rigidity, occasional random movements of arms)  | 0      |
|                                 | Flexed/extended (Tense, straight arms, rigid and /or rapid extension, flexion)  | 1      |
| <b>Legs</b>                     | Relaxed(No muscular rigidity, occasional random movements)  | 0      |
|                                 | Flexed/Extended (Tense, Straight legs, rigid and/or rapid extension, flexion)   | 1      |
| <b>State of Arousal</b>         | Sleeping/Awake (Quiet, peaceful, sleeping or alert and settled)   | 0      |
|                                 | Fussy (Alert, restless and thrashing)   | 1      |
| <b>Heart Rate</b>               | Within 10% of baseline  | 0      |
|                                 | 11-20% of baseline  | 1      |
|                                 | >20% of baseline  | 2      |
| <b>O<sub>2</sub> Saturation</b> | No additional O <sub>2</sub> needed to maintain O <sub>2</sub> saturation   | 0      |
|                                 | Additional O <sub>2</sub> required to maintain O <sub>2</sub> saturation  | 1      |

**Limitations:** A falsely low score may be seen in an infant who is too ill to respond or who is receiving a paralyzing agent.

**(A score greater than 3 indicates pain)**