Patient monitoring in ICU
lec 2

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M.B.CH.B

- The goal of monitoring the patient is to detect problems and manage them as early as possible
- Important parameter should be monitored at regular intervals in systematic manner
- Record on the monitoring chart.
- When a new signs or symptoms or a finding appear on routine monitoring a search for possible cause should immediately begin.
- The following parameters should be monitored:

- Behaviors of patient:

Anxiety ,fear

Due to response to new environment and ventilator so reassure patient or use of sedatives

Restlessness ,agitation:

Due to decrease pao2 or pain ….

Decrease pao2 :check spo2 ,patient-ventilator system

Pain: check pain medication

Conscious state (disorientation to person and place and time with or without response to stimuli)

So use GCS to determine conscious state of patient.

Causes of alteration in conscious state:

- Direct trauma to brain like in case of road traffic accident or post neurological operation.
- Decrease pao2 :check spo2 ,patient-ventilator system
- Decrease perfusion to brain:evaluate fluid balance, check BP and exam for any acute event (stroke)

- Rising paCo2: obtain ABG
- Drugs :check medication record
- In adequate sleep

- GCS ….

TABLE 38-2

Glasgow Coma Scale

BEHAVIOR	RESPONSE	SCORE
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score:	*Best response*	15
	Comatose client	8 or less
	Totally unresponsive	3

Twitching and convulsion:

Due to :

- Decrease serum level of anticonvulsant in a patient with known convulsive disorder
- Decrease paCo2 with rising PH

Breathlessness :

Due to anxiety or decrease paO2 or decrease ventilation or pneumothorax

Vital signs:

Blood pressure monitoring:

2 types :

1- non invasive Bp monitoring

2- invasive BP monitoring

hypotension:

When systolic BP less than 90 mmHg or mean BP less than 65 mmHg

Causes of hypotension:

1-decrease intravascular volume

2- high PEEP

3- cardiac failure

4-drugs ….sedative and vasodilators

5- check drainage system

Look for inadvertent disconnection of inotropes or leak from intravenous line.

Hypertension:

When systolic BP more than 160 and diastolic BP more than 110 mmHg

Low Blood Pressure Range			
Sign	Comment	Systolic	Diastolic
	Dangerous Low Blood Pressure	50 mmHg	33 mmHg
	Too Low Blood Pressure	60 mmHg	40 mmHg
	Low Blood Pressure	90 mmHg	60 mmHg
	Normal Blood Pressure	120 mmHg	80 mmHg

Hypertension:

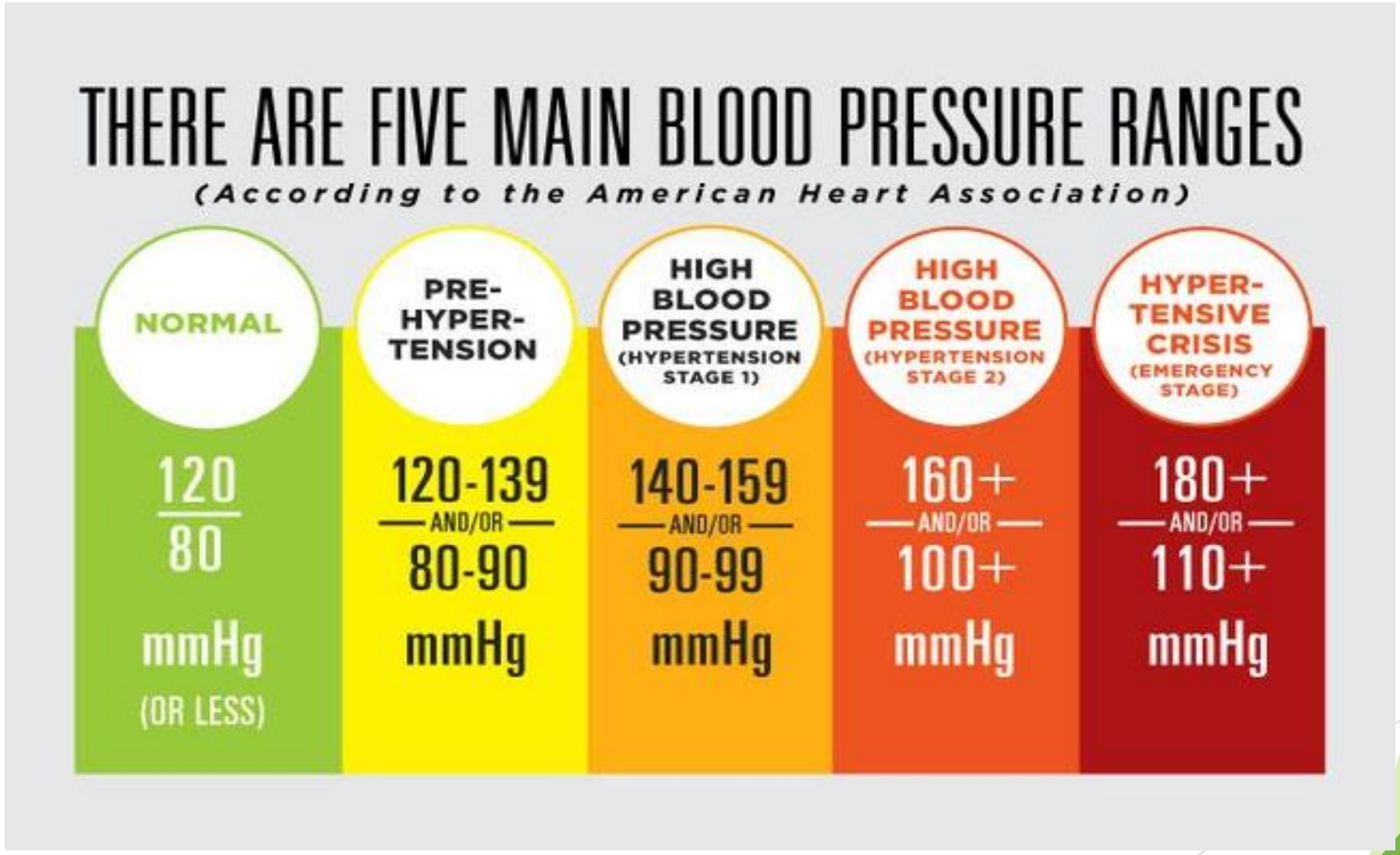
When systolic BP more than 160 and diastolic BP more than 110 mmHg

Causes of hypertension:

1-anxiety

2-in adequate sedation

3-drugs …vasopressors

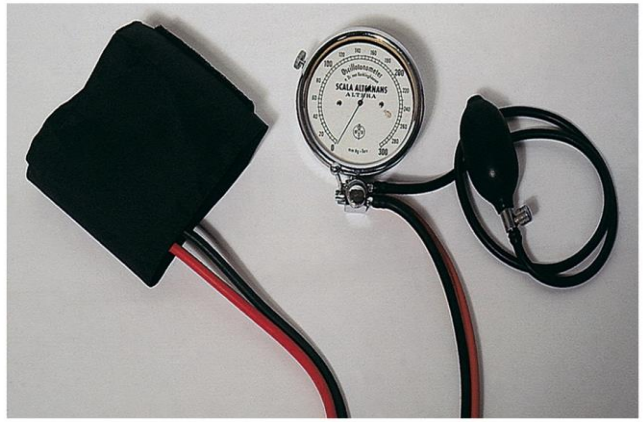

THERE ARE FIVE MAIN BLOOD PRESSURE RANGES
(According to the American Heart Association)
NORMAL
120
80
mmHg
(OR LESS)
PRE-HYPER-TENSION
120-139
AND/OR
80-90
mmHg
HIGH BLOOD PRESSURE (HYPERTENSION STAGE 1)
140-159
AND/OR
90-99
mmHg
HIGH BLOOD PRESSURE (HYPERTENSION STAGE 2)
160+
AND/OR
100+
mmHg
HYPER-TENSIVE CRISIS (EMERGENCY STAGE)
180+
AND/OR
110+
mmHg

Non invasive blood pressure (Bp)

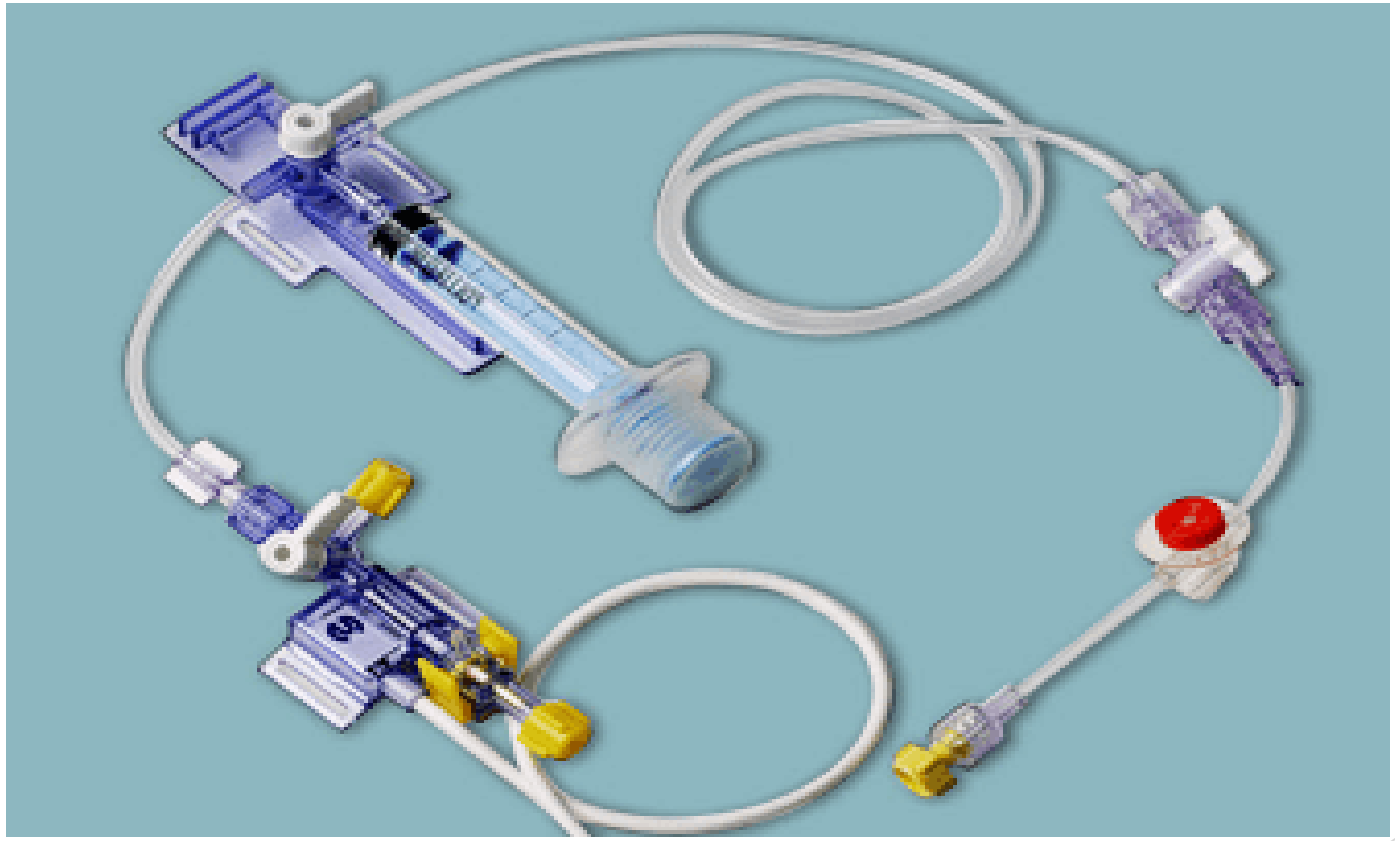


A guide to the correct blood pressure cuff size

Width (cm)	Patient
3	Neonate
5	Infant
6	Child
9	Small adult
12	Standard adult
15	Large adult



- Invasive blood pressure



Heart rate and rhythm (new arrhythmia , tachycardia ,bradycardia)

Causes :

- Anxiety
- Inadequate sedation
- Drugs
- Decrease paO2 and paCO2
- Evaluate other hemodynamic parameters for adequacy of perfusion

Temperature: monitored every 8 hours

Causes of fever :

Temperature over 38 c

- Over heated humidifier
- Atelectasis
- Infection
- Increase metabolic rate caused by increase inspiratory effort

Hypothermia: decrease body temperature less than 35 c

Causes :

1-decrease environmental temperature

2-infection in new born

Sites for measurement body temperature:

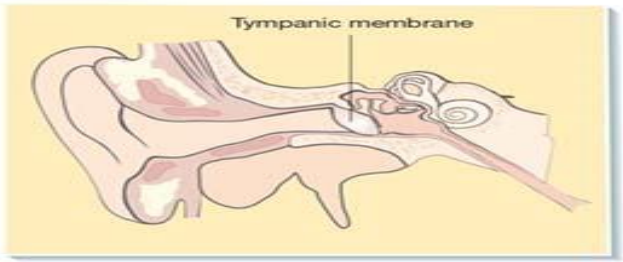
- Various factors which influence the temperature of skin (especially of feet and hands) are perfusion to the extremity ,core temperature of the body and environmental temperature
- Normally the toe temperature should be at least 2 c warmer than ambient temperature
- Cold clammy skin occur as a result of:

❖ sympathetic stimulation and it is a compensatory mechanism for decrease in cardiac out put indicate shock (hypoperfusion)

Tympanic measurement



Tympanic membrane



Tympanic thermometer



Axilla measurement



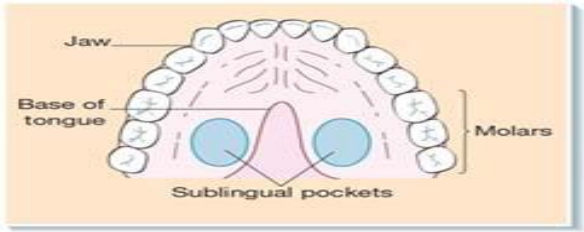
Non-contact infrared thermometer



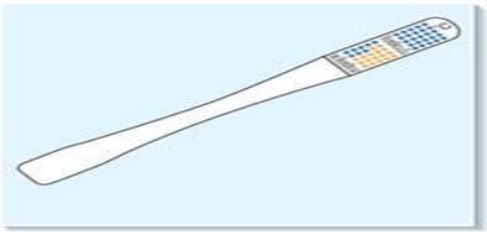
Sublingual thermometer



Sublingual pockets



Chemical dot thermometer



Acceptable temperature ranges and routes of measurement

Location of recording	Type of thermometer	Acceptable range in Celsius
Axilla	Electronic	34.7–37.3
Sublingual	Electronic	35.5–37.5
Tympanic	Infrared	35.6–37.6

Respiratory rate:

- RR may be influenced by altered ventilator setting
- Changes in metabolic needs (anxiety ,stress, infection, heart failure and pulmonary odema
- Decrease paO2

Capillary refill time

- Normally after 5 second compression of the nail bed ,the pink color should return to the blanched area within 3 second
- If it take longer, it indicate vasoconstriction or reduced cardiac out put that cause decrease digital perfusion
- This may not reliable when the room temperature is low.



Capillary refilling time: How to assess?

The 3 steps 5-second check-up

1. PRESS your fingers on the patient's nail bed for 5 seconds (Count the time loudly).
The patien's nail bed will turn white





2. RELEASE your pressure





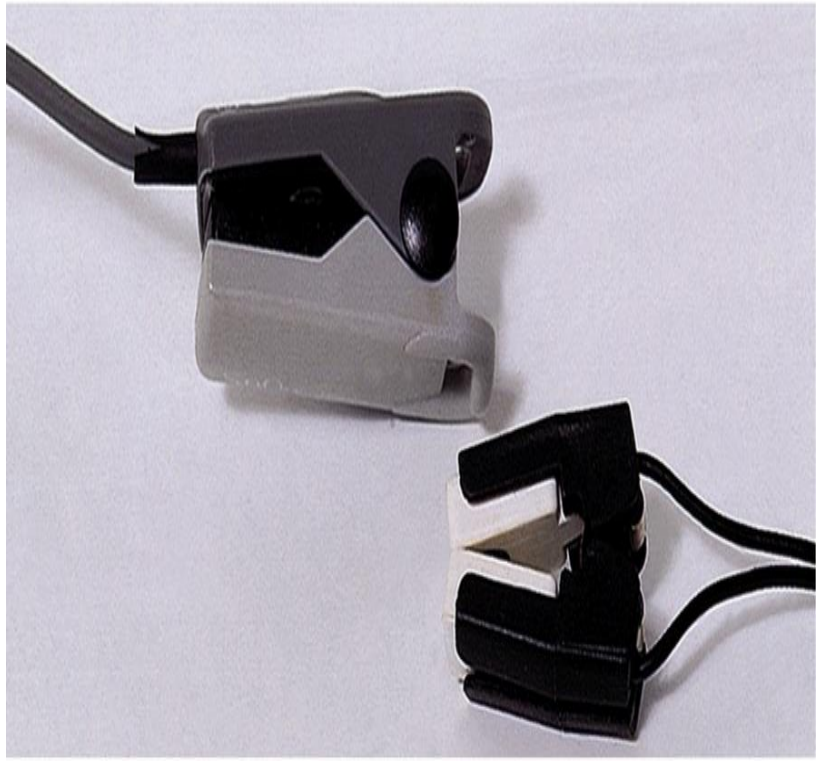
DEHYDRATION if
> 2 seconds
ALARM sign > 3"



3. COUNT the seconds till the patient's nail bed returns pink

Oxygen saturation with pulse oximeter

- ✓ Monitor continuously





thank you

Any question???