



EMC 340 Introduction to Clinical Medicine

Vital Signs

David Trigg, MD



Outcomes

At the completion of this lecture, the learner will be able to:

- Describe the importance and benefits of reliability and variability in VS
- Describe obtaining and interpreting normal and abnormal (“stable or unstable?”) VS
- Describe techniques of obtaining VS and sources of variability
- Define, discuss, and recognize the importance of qualitative and quantitative Vital Signs



Vital Signs

- Pulse
- Respiration
- Blood Pressure
- Temperature
- Oxygen Saturation*



Vital Sign Measurements

- Early and often
 - in critically ill patients
 - even in perfectly stable patients
- In the comprehensive assessment
 - at the end of (A/C, B, C, D, E, VS₁)
 - by the end of the "COME BIG"
 - early in the initial focused PE



Stable vs Unstable

- Referring to stable or unstable status
 - initial assessment and
 - vital signs
- Guides intervention



Trends

- Improving
- Deteriorating
- Staying constant
- Developing life-threatening complications
 - e.g. hypovolemic shock



Reliability

These seemingly "hard and fast" numbers may have:

- Substantial variability
- Interrater reliability
- Inaccurate technique
- Controversial interpretation



Improving Reliability

- Sources of variability
- Techniques and methods to improve accuracy
- Interpreting vital sign data
 - Pitfalls
 - False positive tests
 - Sensitivity
 - Specificity and negative predictive value



Temperature

- Often omitted
- If one **always** remembers to check, will not overlook potentially life-threatening disorders
 - Heatstroke
 - Hypothermia
- These diagnoses often suspected by simply remembering to check skin temperature



Capillary Refill

Capillary refill assessments:

- Mistakenly positive (abnormal) in healthy subjects
- Reliability problem (observer inconsistency)
- Validity problem (no measurable intraarterial insufficiency)
- Healthy normal subjects may have abnormal positive test:
 - False positive
 - Lowers the specificity
 - Lowers the positive predictive value



O₂ Saturation

In potentially unstable or critically ill patients

- Often not obtained until after :
 - Patient initially assessed and
 - Stabilized (oxygen therapy already initiated).
- O₂ saturation utility :
 - An easy to measure valuable parameter to "trend your patient "
- O₂ saturation pitfalls
 - Measurement done in a fingertip capillary
 - Subject to same pitfalls as capillary refill.



The Five Vital Signs

- If O₂ saturation is added, than the 5 Vital signs are:
 - Blood Pressure
 - Pulse
 - Respirations
 - Temperature (to touch)
 - O₂ Saturation (oxygen saturation measured by pulse oximetry)



Quantitative Vital signs

- BP
- O2 Saturation



Both Qualitative and Quantitative

Other assessments are both qualitative and quantitative:

- Pulse
- Respirations
- Temperature



Qualitative Assessments

- Pulse characteristics
 - Rate (Quantitative)
 - Rhythm (Quantitative)
 - Quality → thready → shock
- Respiration characteristics
 - Rate (Quantitative)
 - Rhythm or pattern (Qualitative)
 - Quality or depth (tidal volume)
- Temperature characteristics
 - Prehospital (usually by skin to touch)



Summary

- Importance of first determining vital signs
 - Stable or unstable
- Techniques of obtaining vital signs and sources of variability
 - Importance of recognizing problems of reliability and variability
 - Possible benefit to the patient of appreciating reliability and variability in vital signs
- We have discussed both qualitative and quantitative vital signs.
