Interpreting Vital Signs

Learning Objectives

Cognitive

- Discuss the importance of collecting a proper set of vital signs.
- Discuss the methods used as well as specific parameters for assessing respirations.
- Discuss the methods used, as well as specific parameters for, assessing blood pressure and corresponding that assessment to the assessment of the pulse.

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Learning Objectives

Cognitive (continued)

- Discuss how the proper recognition and assessment of skin color, condition, and temperature has a direct impact on a patient's overall status.
- Discuss briefly the different meanings behind the assessments revealed.

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Learning Objectives

Psychomotor

- Demonstrate the assessment of a patient's respirations.
- Demonstrate the assessment of a patient's blood pressure.
- Demonstrate the assessment of a patient's skin color, condition, and temperature and apply that information to overall patient status.

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Key Vocabulary

- Bradycardia
- Bradypnea
- Capnography
- Cyanosis
- Diastolic Pressure
- Edema
- Erythma
- Hemodynamic Status
- Jaundice
- Pallor
- Pulse Oximetry

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Key Vocabulary

- Pulsus Paradoxus
- Respiration
- Shock
- Symptom
- Systolic Pressure
- Tachycardia
- Tachypnea
- Turgor

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Called to a residence for a man “not feeling well”. 59 y/o male, 100 kg.

ABC	Airway open, breathing unlabored, thready radial pulse
D	GCS 15, **A**VPU
S	“Sick” for 5 days, had diarrhea yesterday and today, denies pain or dyspnea, c/o feeling weak
A	No allergies to medication
M	Takes metoprolol, lisinopril, atorvastatin, Plavix
P	Hypertension, high cholesterol, CAD with stent 2008
L	Frequent diarrhea has made him too weak to eat or drink
E	Sick for 5 days following return from Mexico (all-inclusive resort)
Vitals	BP 100/56 (MAP 71), P 128 W/R, R 24 N/R, eyes 5 mm PERL, RA SpO_2 93%, sinus tachycardia @ 130,
Skin	Pale, warm to touch, dry feel with tenting
Lungs	Clear and =

Critical Thinking

- Vital signs are one window into a patient's physiological status.
- The full meaning of the patient’s status, as related by the vital signs and other physical exam findings, is revealed only when the emergency responder is fully engaged in the assessment process.

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Strong Observational Skills

- Strong observational and critical thinking skills are essential elements of a responder's assessment.
- Recognize and understand the concepts behind vital signs.
- Pre-hospital emergency medicine training and preparation does not always emphasize the significance of correct vital sign procedures and interpretations.
  - Clinicians appear nonchalant about taking vitals, but vitals are significant.

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Called to a residence for a man “not acting normal”. 68 y/o male, 150 kg.

ABC	Airway open, breathing unlabored, strong radial pulse
D	GCS 13 (4/3/6)
S	Slurred speech and L arm much weaker strength/movement than R
A	No allergies to medication
M	Takes metoprolol, lisinopril, atorvastatin
P	Hypertension, high cholesterol
L	Ate normal breakfast this morning
E	Woke up 30 minutes ago with normal appearance, while eating breakfast developed slurred speech and L sided arm weakness
Vitals	BP 140/86 (104), P 88 S/R, R 14 N/R, eyes 5 mm PERL, RA SpO_2 93%, sinus rhythm @ 90
Skin	Normal color, temperature, moisture
Lungs	Clear and =

Correct Assessments

- Correctly assessing and interpreting vital signs can assist an EMS provider in many ways:
  - Identify a life-threatening emergency
  - Predict the severity of a patient's hemodynamic status
  - Gauge a clinician's treatment
  - Alter or correct treatment as needed
  - Understand a patient's overall condition and status

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Respiratory Assessment

- Assessment encompasses several elements, many can be assessed together at the same time:
  - Rate
  - Depth
  - Quality
  - Chest wall movement
  - Oxygen saturation
  - Capnography

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Respiratory Rate

- As you approach the patient, utilize your eyes, ears, and nose to assess for obvious problems or clues in the environment.
- Listen for symptoms like audible wheezes heard without a stethoscope.

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Ask Questions

- Consider the following questions to provide assessment clues:
  - How is the patient positioned?
    - Tripod
    - Leaning back
    - Tucked up into a ball
    - Sitting upright

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Ask Questions (cont'd)

- How many words can the patient speak without having to take a breath?
- Is the chest wall moving or has the diaphragm taken over?
- Does the patient make eye contact or is he or she more focused on breathing?
- Are there unusual odors in the air?

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Called to a residence for a unconscious male. 72 y/o male, 80 kg.

ABC	Snoring respirations, no radial pulse, weak carotid
D	GCS 8 (2/1/5)
S	Unconscious, no speech, pale skin, weak pulse
A	No allergies to medication
M	Takes metoprolol, lisinopril, atorvastatin
P	Hypertension, high cholesterol
L	Ate normal breakfast this morning (3 hours ago)
E	Unknown initially
Vitals	BP 70/Palp, P 104 W/I, R 14 S/R, eyes 6 mm PERL but sluggish, RA SpO_2 87%, atrial fib @ 90
Skin	Pale, cool, dry/normal
Lungs	Diffuse bilateral wheezes, low volume

“Full Set” of Vital Signs

- BLS
  - GCS (preferred to AVPU)
  - pulse
  - respirations
  - blood pressure
  - skin color
  - skin condition / moisture
  - skin temperature
  - breath sounds
  - pupils
- ALS
  - SpO2 (System-specific BLS?)
  - capnography (System-specific)
  - blood sugar (ALOC, BLS?)

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Other Assessment Findings

- OPQRST for all pain
  - Onset
  - Provokes / Relieves
  - Quality
  - Region / Radiation
  - Severity (0-10)
  - Time (since onset, constant?)
- Wong-Baker as age appropriate
- Cincinnati Stroke Scale
- Rule of 9's

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Respiratory Status

- Assessing a patient's respiratory status actually begins when you approach your patient.
- When assessing for respiratory rate, it is common to count how many times a patient is breathing in a timespan of 15-60 seconds, and then multiplying that to get a per/minute rate.
    - 15 sec – multiply x 4
    - 30 sec – multiply x 1
    - 60 sec – no math needed

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Assessing Respiratory Rate

- For maximum accuracy, assessing respiratory rate and quality when abnormalities exist is best done over a full minute
- Except in the case of respiratory or cardiac arrest, where a <u>maximum</u> of 10 seconds is adequate

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Respiratory Rate Ranges

- When considering respiratory rates, it is beneficial to be familiar with the “normal” ranges for a given age group:
  - Newborns to 6 months of age: 30-60 breaths per minute
  - Infants 6-12 months old: 24-30 breaths per minute
  - Children 1-5 years old: 20-30 breaths per minute
  - Older children 6-12 years old: 12-20 breaths per minute
  - Adults: 12-20 breaths per minute

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Alterations From Normal Ranges

Alterations from these “normal” ranges of respiratory rate can signify a critical illness.

- Tachypnea or rapid respiratory rate is one of the first signs of decline in a patient’s hemodynamic status.
  - Correlates with illnesses, injuries, or conditions such as pneumonia, fever, sepsis, congestive heart failure (CHF), pneumothorax, anxiety, or fear.

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Alterations From Normal Ranges (cont'd)

- Bradypnea or slow respiratory rate is usually a late and ominous sign of hemodynamic status
  - Illnesses
  - Injuries
  - Conditions such as late stage CHF, uremia, increased intracranial pressure (IICP), intoxication, or toxic overdoses or other causes of CNS depression
- Respiratory rate is only part of the assessment procedure; treatment should not be rendered or omitted based solely on this information

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Depth and Quality

- Assess depth and quality of a patient's respirations.
  - Listen for amount of words patient is able to speak without taking another breath.
    - Amount of breath (tidal volume) is not in direct correlation to oxygenation status of patient.

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Depth and Quality (cont'd)

- How much effort is required to get a full breath?
- Does the patient's chest expansion seem normal?
- Does the movement of the chest feel flexible and elastic?

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Pulse

- Assess a pulse for the following:
  - Rate
  - Rhythm
  - Quality
- Unusually rapid or slow heart rates, known respectively as tachycardia and bradycardia, are associated with a broad range of conditions.

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Pulse Rhythm

- Assessment of the rhythm of a pulse refers to the spacing of beats.
  - Regular pulse rate
  - Irregular pulse rate
    - May not necessarily indicate disease or an acute problem, as breathing rate can have a direct effect on the regularity or irregularity of a pulse rate.
    - Can indicate an arrhythmia or an impending life-threatening condition such as a tension pneumothorax, if it is associated with a condition known as pulsus paradoxus.

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Pulsus Paradoxus

- Pulsus paradoxus is when the radial pulse goes away during inspiration and returns during exhalation.
- May be noticed when a patient suffers from tension pneumothorax, bronchial asthma, pulmonary embolism, cardiac tamponade, etc.

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Pulse Quality

- Assessment of the quality of pulse refers to volume.
  - Strong (normal)
    - Felt easily and regularly, with no dropoff relative to respiration
  - Bounding
    - Typically indicates fluid overload and may be seen in pregnant patients, or patients exhibiting fear, anxiety, or fever.
  - Weak and thready
    - Can indicate patient is dehydrated, in a state of shock such as hypovolemic or cardiogenic; generally barely palpable, usually seen in advanced, shock-like states.

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Pulse Quality

- The quality of a pulse is a much more reliable indicator of shock than the rate.
- Putting these findings together can reflect a more accurate account of hemodynamic status.

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Called to a residence for a man who “can’t breathe”. 54 y/o male, 120 kg.

ABC	Airway open, breathing unlabored, weak radial pulse
D	GCS 15 (4/5/6)
S	Obvious respiratory distress, audible rales, pink frothy sputum
A	No allergies to medication
M	Takes metoprolol, lisinopril, atorvastatin, ASA, Plavix
P	Hypertension, high cholesterol, CABG x 3 vessels in 2003, recently diagnosed with heart failure. BP taken at fire station yesterday, 142/92.
L	Ate normal breakfast this morning
E	While arguing with neighbor over politics, patient suddenly because dizzy and short of breath. Passed out for a few moments, but then awoke and couldn’t catch his breath unless sitting upright.
Vitals	BP 104/62 (76), P 108 S/R, R 28 S/R, eyes 5 mm PERL, RA SpO_2 83%, sinus tach @ 110
Skin	Normal color, temperature, moisture
Lungs	Bilateral crackles in bases to about 1/3 up, diffuse wheezes also heard

What is called for?

Adult Pulmonary Edema

(due to heart failure)

Our

September 2012

SOP of the Month

24-7 EMS

REGION 8 EMS SYSTEMS

ADULT PULMONARY EDEMA
(DUE TO HEART FAILURE)

BLS/ALS

STABLE: Alert, normotensive or hypertensive

1. **Initial Medical Care**
   - Place patient in high Fowlers position, if SBP > 100 mmHg
   - Consider administration of CPAP as primary oxygen delivery if indicated

2. If SBP > 100 mmHg , **NTG 0.4 mg SL**

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ALS

STABLE: Alert, normotensive or hypertensive

3. Administer CPAP, if available, per System-specific Procedure. If patient becomes unstable, remove CPAP and treat per appropriate SOP

   CPAP Inclusion Criteria:

   - alert, normotensive or hypertensive
   - Respiratory Distress – 2 or more of the following;
     - Retractions / accessory muscle use
     - Respiratory rate > 25
     - SPO_2 < 90%
     - Exam consistent with pulmonary edema
     - Bilateral or diffuse rales / crackles

4. If SBP > 100 mmHg, repeat **NTG 0.4 mg SL;** may repeat q five minutes if SBP > 100 mmHg

5. If SBP > 100 mmHg and history of pulmonary edema, **LASIX 40 mg IV.**

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Discussion Points

1. SBP > 100 mmHg, but pt takes anti-hypertensive x 2 (metoprolol, lisinopril). Should you give NTG?
2. Pt takes a beta blocker (4 hours prior, hasn't missed any) but is tachycardic. Does this concern you?
3. Plenty of indications for CPAP but patient is relatively hypotensive.

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- IMC
- You started him on CPAP, and contact Medical Control for guidance on the NTG. They want you to hold off on the NTG for now.
- Even though the patient has a recent diagnosis of CHF, he hasn't had pulmonary edema before. MC also says to hold off on the Lasix.
- Patient's work of breathing is improved after 5 min, repeat assessment on next page

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ABC	Airway open, breathing unlabored, weak radial pulse
D	GCS 15 (4/5/6)
S	Work of breathing improved, no more froth
……	……
……	……
E	On CPAP for 5 min, WOB improved, patient appears less dyspneic
Vitals	BP 100/54 (69), P 96 S/R, R 24 N/R, eyes 5 mm PERL, CPAP SpO_2 98%, sinus tach @ 110
Skin	Normal color, temperature, moisture
Lungs	Crackles still heard in bases, but finer / quieter

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UNSTABLE: Altered Mental Status or signs of hypoperfusion

1. **Initial Medical Care. HIGH FiO_2 OXYGEN or VENTILATION**

2. Pulse < 60: treat per Bradycardia SOP, p. 13
   Pulse ≥ 60: treat per Cardiogenic Shock SOP, p. 22

Note:
Oral medications for erectile dysfunction (Viagra®, Levitra®, Cialis®, etc.) or pulmonary hypertension (Revatio™), may potentiate the effect of nitrates. Consult Medical Control prior to administering NTG in these situations.

- He's breathing better
- But his BP ↓
- What to do?

- Transport
- Closely monitor

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Blood Pressure

- Correct determination of blood pressure is an essential basic skill.
- When assessing blood pressure, the proper size cuff should be chosen; one size does not fit all.
- Place the correct size of cuff around the upper arm.

Monitoring of blood pressure can be accomplished by several means. It was previously taught that the presence of only a carotid pulse indicates a SBP between 60-70 mmHg, the presence of carotid and femoral pulses indicates a SBP of 70-80 mmHg, and the presence of a radial pulse indicates a minimum SBP of 80 mmHg. However, a study comparing physical findings with intra-arterial BP measurements revealed that these findings consistently overestimated or did not correlate at all with the patient's actual BP.[64]

http://www.bmj.com/content/321/7262/673?tab=responses

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Normal Blood Pressure Ranges

- According to the National Institute of Health, normal adult ranges for blood pressure are as follows:
  - Less than 120 systolic
  - Less than 80 diastolic
- Normal blood pressures in children are usually guided by age, height, gender, and then measured against a blood pressure table.

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Blood Pressure

- BP = Cardiac Output x Peripheral Vascular Resistance
- CO = Heart Rate x Stroke Volume

- Bad Stuff for BP
  - ↓ preload / SV (hypovolemia, peripheral vasodilation like spinal shock)
  - ↓ afterload / SV (ditto)
  - ↓ SV from obstruction (tamponade, tension PNO)
  - ↓ HR (unusual bradycardia)
  - ↑ HR (extreme tachycardia)

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Causes of Blood Pressure Changes

Hypotension

- Pregnancy
- Ventricular failure
- Bradycardia
- Tachycardia
- Endocrine problems
- Hypovolemia
  - Dehydration
  - Hemorrhage
- Septicemia
- Anaphylaxis
- ?????

Hypertension

- Primary (essential)
  - 95% of HTN
  - Develops only in societies with intake of salt > 5.8 grams daily
  - Genetic factors
    - Higher among African Americans
    - One or more parents with HTN = 2x risk
    - Arterial stiffness
- Secondary
  - Specific disease of a organ or blood vessel, such as kidney, adrenal gland, or aorta.
- Lab Coat / Uniform

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Mean Arterial Pressure

- MAP = ((2 x diastolic) + systolic) / 3
- 120 / 80 = 93.3
- 92 / 50 = 64
- 80 / 54 = 62.7
- 70 / 46 = 54

Maintain mean arterial pressure (MAP) ≥ 65 mmHg or as needed to achieve adequate end-organ perfusion (e.g. cerebral perfusion pressure, abdominal perfusion pressure, urinary output).

Conclusions

In this series of patients with septic shock, increasing MAP above 65 mmHg with NE was associated with increased cardiac output, improved microvascular function, and decreased blood lactate concentrations. The microvascular response varied among patients suggesting that individualization of blood pressure targets may be warranted.

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Dopamine

- Classified as an adrenergic agonist
- Depending on dosage and patient receptivity, can be:
  - + Inotrope
  - + Chronotrope
- Used by EMS to:
  - Treat hypotension not from hypovolemia
  - Treat symptomatic bradycardia refractory to atropine
  - Increase MAP in septic shock after volume replacement (best use)

24-7 EMS

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Dopamine

- Dopaminergic effects (< 2.5 mcg/kg/min in most patients, range of 0.5-5) causes increased blood flow to gut, to stimulate urine output / kidney function. Some studies suggest this function is overstated.
- Beta effects (5-10 mcg/kg/min, range 2-15) may cause increase in renal perfusion / urine output, increase in cardiac output by + chronotropic and + inotropic effects
- Alpha dose (10-20 mcg/kg/min, range of 10-50) may increase blood pressure by increasing cardiac output, plus may stimulate vasoconstriction

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Dopamine Calculation

Take weight in lbs	222
Drop last digit	22
Subtract 2	- 2
Result = drip rate in microdrops per min	20 mcgtts / min

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Called to a residence for a sick, unconscious male. 75 y/o male, 80 kg.

ABC	Snoring respirations, no radial pulse, weak carotid
D	GCS 9 (3/1/5)
S	Unconscious, no speech, pale skin, weak pulse
A	Allergic to fish oil tablets and Oreos
M	Takes lisinopril, atorvastatin
P	Hypertension, high cholesterol
L	No food intake in past 6 hours
E	Patient has 3 day history of increasing dyspnea, lethargy and weakness, has 102.1° fever per wife.
Vitals	BP 76/38 (51), P 144 W/I, R 14 S/R, eyes 6 mm PERL but sluggish, RA SpO_2 81%, atrial fib @ 140
Skin	Pale, warm/hot to touch, tenting of skin
Lungs	Diffuse bilateral wheezes, localized crackles in R mid-field.

Skin

- Skin color, condition, and temperature can be key diagnostic tools.
- Normally, skin color ranges from pinkish white to various shades of brown.
  - If ill or injured, patient skin color can change to cyanosis, pallor, jaundice, and erythema.
- Skin assessment is single most important and accurate factor in determining level of perfusion for children.
  - Peripheral vs central cyanosis
  - Capillary refill can assist in assessing children's perfusion

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Skin Condition

- Skin condition (moisture, vascularity, turgor, and edema) provides key insights into body temperature, bleeding or bruising, and fluid movement.
- Perform skin diagnosis while you are doing the respiratory status.

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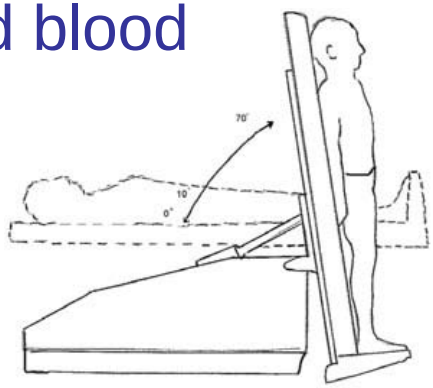
Vital Signs Trending

- "Trending" a patient involves taking vital signs repeatedly during assessment and treatment to determine if there is improvement or deterioration.
  - This can help responders see if the treatment they render is effective.
  - Wait a minimum of 60 seconds before re-inflating the cuff to prevent venous congestion and a false-high reading.

http://www.jems.com/article/patient-care/trend-alert-trending-and-inter

Orthostatic Vitals

- Start with patient supine (preferably for at least 3 minutes) – take pulse and blood pressure
- Sit patient up with legs dangling – retake pulse and blood pressure after 1 minute
- Stand patient up (optional) – retake pulse and blood pressure after 1 minute
- "Tilt test" considered positive if:
  - Pulse ↑ by 20-30 bpm
  - SBP ↓ by ≥ 20 mmHg
  - Patient has increase in dizziness, weakness, nausea or other symptoms



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Critical Evaluation

- Evaluating vital signs is a critical step in the overall treatment of any patient.
  - It takes minimal skill to perform each of these tasks, but a great deal of critical thinking to interpret the correct message.
- Responders can get rushed when evaluating vital signs and miss essential information or completely negate the task altogether.
- Be methodical in your evaluation and review of vitals, to prevent overlooking vital information

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Correct Evaluation

- The correct evaluation of a patient's vital signs will enhance the ability of any responder to appropriately and correctly identify underlying patient conditions, as well as to make challenging and prudent patient care decisions.

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Importance of Thorough Assessment

- It is generally the piece of information that a responder does not get that makes the difference in success or failure of response.
  - The information gained through assessment will help fill in the blanks if a patient cannot give it directly to the responder.
- Never stop listening to the story your patient's vital signs are telling you.

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Key Points

- Vital signs are the emergency responder's window into a patient's physiological status.
- The full meaning of the patient’s status, as related by the vital signs, is revealed only when the emergency responder is fully engaged in the assessment process.
- Strong observational and critical thinking skills are essential elements of a responder’s assessment.

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Key Points

- As you approach the patient, utilize your eyes, ears, and nose to assess for obvious problems or clues in the environment.
- A full set of vital signs includes the assessment of a pulse, respirations, blood pressure, skin color, condition and temperature, and pulse oximetry, capnography, and blood sugar assessments when available or included in the scope of practice.

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Summary

- Assessing these vital signs is a critical step in the overall evaluation of any patient. While each of these tasks may require only the most basic skills, a great deal of critical thinking is required to interpret the assessment findings. Your awareness, critical thinking, and interpretive skills combine to provide the best chance the patient has for arriving at a favorable treatment outcome.

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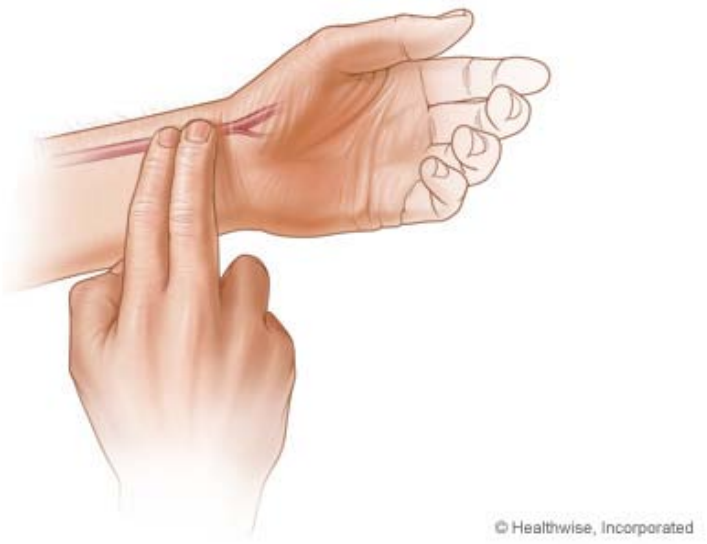

Cardiac Rhythm of the Month

P E A

The Artist Formerly Known As EMD

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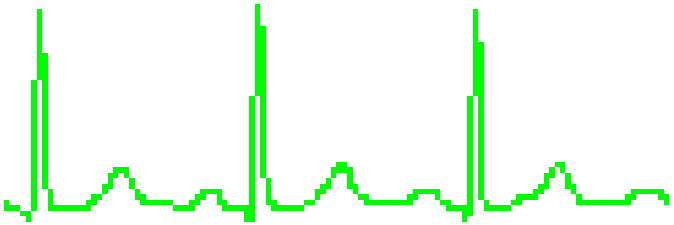
What is the pulse rate?



- The heart rate of this 3 second strip is about 60
- You don’t get a pulse rate from a monitor tracing

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Pulseless Electrical Activity

- Pulseless Electrical Activity (PEA) is a clinical condition characterized by unresponsiveness and lack of palpable pulse in the presence of organized cardiac electrical activity.
- Pulseless electrical activity has previously been referred to as electromechanical dissociation (EMD).

http://emedicine.medscape.com/article/161080-overview

- Lack of ventricular electrical activity always implies a lack of ventricular mechanical activity (asystole), the reverse is not always true
- In cardiac arrest, the presence of organized ventricular electrical activity is not necessarily accompanied by meaningful ventricular mechanical activity
  - “meaningful” = sufficient to generate a palpable pulse

http://emedicine.medscape.com/article/161080-overview

- Pseudo-PEA - may have weak ventricular contractions and recordable aortic pressure without palpable pulse
  - This is why we do CPR immediately after defibrillation, even though an organized electrical rhythm might have returned
- True PEA is a condition in which cardiac contractions are absent in the presence of coordinated electrical activity.
- PEA encompasses a number of organized cardiac rhythms, including supraventricular rhythms (sinus versus nonsinus) and ventricular rhythms (accelerated idioventricular or escape).

http://emedicine.medscape.com/article/161080-overview

Takeaway for PEA

- PEA is not a cardiac rhythm. It is a clinical condition that is present when an organized electrical rhythm exists without a palpable pulse
- Treatment is sometimes generic (asystole / PEA) and sometimes focused (pulseless VT, Vf)
- Because PEA encompasses so many rhythms, PEA should be documented along with the actual rhythm seen (Idioventricular with PEA)

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Enrichment Material

Ventricular Assist Devices (VAD)

- What is a VAD?
  - A mechanical pump that's used to support heart function and blood flow in people who have weakened hearts
- How does a VAD work?
  - The device takes blood from the ventricle and helps pump it to the body and vital organs, just as a healthy heart would.

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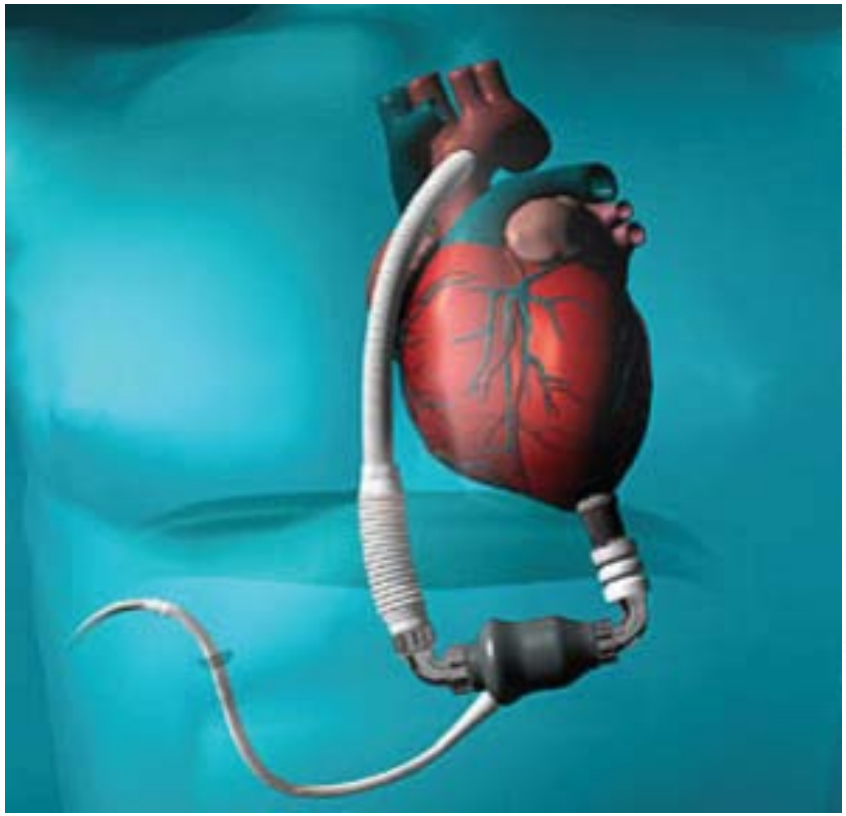
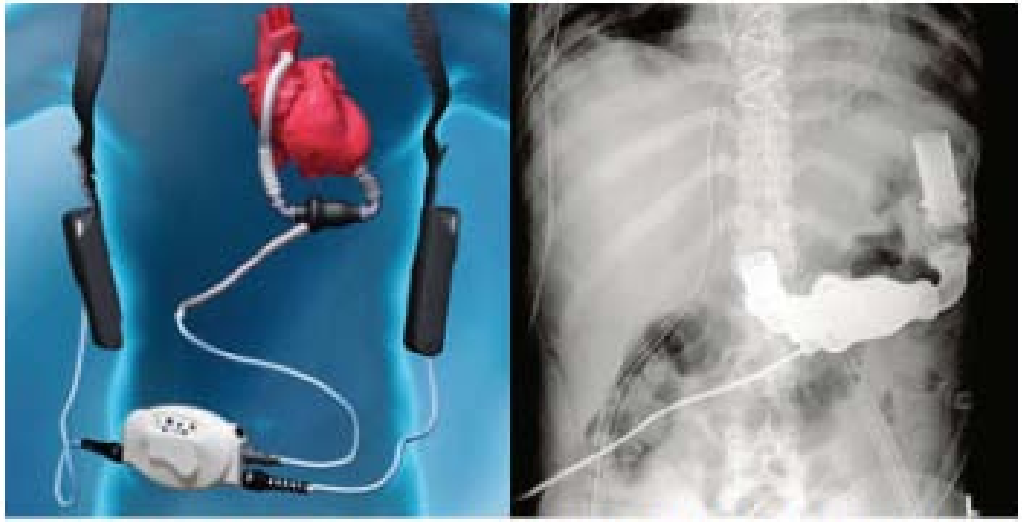
- What are the parts of a VAD?
  - The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver the blood to your body; and a power source.
- What is the power source?
  - The power source is either batteries of AC power. The power source is connected to a control unit that monitors the VAD's functions. The batteries are carried in a case usually located in a holster in a vest wrapped around the patients shoulders.
- What does the control unit or controller do?
  - The control unit gives warnings, or alarms, if the power is low or if it senses that the device isn't working right. It is a computer.





The portability of the HeartMate II enables patients to resume many of their normal daily activities.

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Region VIII EMS Systems
September 2012 CE – Vital Signs
Post-Quiz

1. You are evaluating a 38-year-old you suspect is having an asthma attack. The patient presents with expiratory shortness of breath and is in a tripod position. His vital signs are BP 138/92, P 124 and strong, R 28 & shallow, baseline SpO2 93 percent. What should be your first indication of the patient's severity?
    a. Lung sounds
    b. Position
    c. Color
    d. Audible wheezing

2. You have been taking the respiratory rate of a patient for 15 seconds. There were 12 breaths in that time frame. What is the patient's respiratory rate per minute?
    a. 48
    b. 36
    c. 24
    d. 12

3. A patient's blood pressure is 148/94. What does the number 148 represent?
    a. Systolic pressure
    b. Diastolic pressure
    c. Pulse pressure
    d. Osmotic pressure

4. Which of the following has an impact on a patient's blood pressure reading?
    a. Cuff size
    b. Stethoscope style
    c. Inflation pressure
    d. Rate of deflation

5. You are assessing a patient after a 10-foot fall from a ladder. The patient's current vital signs are BP 102/60, P 126 weak and thready, R 22. What is the <u>most reliable</u> indicator of shock in this patient?
    a. Blood pressure
    b. Pulse rate
    c. Respiratory rate
    d. Pulse quality

6. In instances of normothermic cardiac arrest, what time period is it appropriate to assess circulation?
    a. 5-10 seconds
    b. 10-15 seconds
    c. 15-20 seconds
    d. 20-30 seconds

7. You are assessing a patient with obvious increased work of breathing, with audible wheezing, the use of accessory muscles, and an irregular breathing pattern. What is the <u>most accurate</u> method of obtaining a respiratory rate per minute on this patient?
    a. Count breaths over 10 seconds and multiply by six
    b. Count breaths over 15 seconds and multiply by four
    c. Count breaths over 30 seconds and multiply by two
    d. Count breaths over one full minute

8. You are assessing a patient complaining of shortness of breath. The patient has obvious increased work of breathing and is cyanotic. The patient's vital signs are BP 124/76, P 122, R 30, with poor chest excursion and distant breath sounds. Which of these is the <u>most likely</u> cause of the difficulty breathing?
    a. Congestive heart failure
    b. Asthma
    c. Renal failure
    d. Myocardial infarction

9. Hand flapping, walking in circles, toe walking, ordering objects, and echolalia are all examples of what common autistic trait?
    a. Seizure disorders
    b. Self-stimulation behavior
    c. OCD
    d. Elopement

10. If an autistic person is missing, which of the following would be the <u>LOWEST PRIORITY</u> place to look for them?
    a. In tight or restricted areas
    b. Places they are familiar with
    c. Anywhere water can be found, especially moving water
    d. In a loud environment such as a construction site or artillery range

- - - - - - - - - BLS STOP HERE - - - - - - - - -

11. You are called to an elementary school for a sick child. The child is found unconscious after wandering off from his class, and was found by a janitor in a corner of the library. The teacher responsible for the student is off in another part of the school looking for him, and is unavailable to you at this time, but he has a special needs aid who identifies him as having an Autism Spectrum disorder.

    The 7 year old male is unconscious and responds to painful stimuli, weight 30 kg. BP 108/56, P 88, R 18, lungs clear, pupils 4 mm PERL. Which of the following <u>would not be</u> part of your initial care?
    a. Assess for possible injuries during time when child was missing
    b. Give Versed 0.5 mg/kg IV for apparent seizure
    c. Peds Initial Medical Care
    d. Assess blood sugar, if < 60 give D-25%

12. The usual dosing for IV administration of Versed to adults is 2 mg increments every 2 min up to a total of 10 mg. Which of the following SOPs <u>DOES NOT</u> have that dosing?
    a. Induction of hypothermia for ROSC
    b. Muscle spasm for long bone fracture
    c. Adult psychiatric / behavioral emergency
    d. Synchronized cardioversion

13. Your 58 Y/O M patient presents pale, diaphoretic and confused. His friend tells you he has a cardiac history, but she doesn't know what it is. You place him on a monitor and see V-tach at a rate of 160. Following IMC and high FiO2 oxygen, which of the following would be <u>most appropriate</u>?
    a. Versed 2mg increments up to 10mg, synchronized cardioversion, Lidocaine 1mg/kg IV/IO
    b. Amiodarone 150mg IVPB
    c. Adenocard 6mg rapid IVP
    d. synchronized cardioversion, Amiodarone 150 mg IVPB, if V-tach converts rebolus with 0.5 mg/kg Lidocaine

14. Which of these is the <u>most important</u> component of patient assessment?
    a. Blood pressure to determine hemodynamic status
    b. Heart rate to determine compensatory response
    c. Respiratory rate to determine ventilator status
    d. Critical thinking to evaluate the assessment findings and determine the proper course of treatment

15. You are assessing an adult trauma patient who is anxious and confused. The patient's vital signs are BP 104/62, HR 132, R 28 and shallow, RA SpO2 91 percent. What is this patient's hemodynamic status?
    a. Normal (no compensation)
    b. Compensated shock
    c. Decompensated reversible shock
    d. Decompensated irreversible shock

16. What term is used to describe repeated vital signs used to determine the effectiveness of treatment?
    a. Trending
    b. Ongoing assessment
    c. Detailed exam
    d. Focused history

17. You are assessing a patient with obvious shortness of breath from congestive heart failure. The patient's skin is cool and diaphoretic. Vital signs are GCS 10, BP 86/60, P 124 thready, R 10, breath sounds diminished. What is this patient's hemodynamic status?
    a. Normal (no compensation)
    b. Compensated shock
    c. Decompensated shock
    d. Irreversible shock

18. You are evaluating a patient complaining of general weakness. The patient has dry skin with poor turgor. Vital signs are BP 92/50, P 126, R 24, blood glucose reads HI. Along with hyperglycemia, which of the following is <u>most likely</u> to be occurring?
    a. Heart failure
    b. Dehydration
    c. Renal disease
    d. Shock

19. Your patient is seated in a tripod position. What is the most likely cause of this patient's distress?
    a. Shortness of breath
    b. Chest discomfort
    c. Abdominal pain
    d. Stroke

20. While assessing a patient, you discover that her radial pulse disappears each time the patient breathes. By what name is this symptom known?
    a. Pulsus bisferiens
    b. Pulsus paradoxus
    c. Pulsus parvus
    d. Pulsus alternans

21. You are evaluating a patient that has been involved in a motor vehicle crash. The patient has potentially life threatening injuries. Which of the following would likely be the first sign of compensated shock?
    a. Hypotension
    b. Bradypnea
    c. Tachycardia
    d. Confusion

Match the following sets of vital signs with the adult patient complaint and SOP they are most likely to be compatible with:

22. GCS 7, BP 130/66, P 104, R 14	a. Myocardial infarction, symptomatic bradydysrhythmia
23. GCS 6, BP 214/112, P 36, R 6	b. Altered mental status, hypoglycemia
24. GCS 15, BP 146/78, P 44, R 18	c. Unconscious from closed head/brain injury
25. GCS 12, BP 76/Palp, HR 190, R 20	d. "Racing heart", symptomatic narrow complex tachycardia

CDEMSS CONTINUING EDUCATION RECORD

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