

**PERFORMANCE EVALUATION - #29**

STUDENT NAME: \_\_\_\_\_

**PULSE OXIMETRY**

DATE: \_\_\_\_\_

INITIAL EVALUATOR: \_\_\_\_\_

**Initial Evaluation: Pass** \_\_\_\_ **or Remediate** \_\_\_\_

SECOND EVALUATOR: \_\_\_\_\_

**Second Evaluation: Pass** \_\_\_\_ **or Remediate** \_\_\_\_**SCORING SYSTEM:**

3 points	Describes and/or performs objectives perfectly without prompting and in appropriate time interval.
2 points	Describes and/or performs objectives satisfactorily without prompting or with minimal assistance/or completes step slower than expected.
1 point	Describes and/or performs objectives with assistance or prompting. Appears unsure of task.
0 point	Unable to perform objective adequately
NA	Objective not appropriate or unnecessary. Some steps may not be done at all clinical agencies.

<b>The student will be able to...</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>NA</b>
1. <b>**Select and gather appropriate equipment.</b> a Pulse oximeter b Probe c Power cord d Alcohol swab e Paperwork & pen & watch					
2. <b>**Clean hands in patient room and implement standard precautions</b>					
3. <b>Prepare the patient and verify conditions for monitoring</b> a. Patient position b. Oxygen therapy c. Ventilator settings d. Airway patency					
4. <b>**Prepare oximeter following department policy and procedure</b> a. Clean reusable probe with alcohol b. Plug in electrical outlet. c. Connect probe to monitor. d. Turn on unit. e. Verify calibration					
5. <b>Apply the monitor to the patient</b> a. Select a well perfused sensor site (nail bed, ear lobe, forehead...) b. Select a site with minimal movement (non-dominant hand) c. Prepare the site (clean and free from polish and hair) d. Properly apply the probe to the selected area. (do not use excessive pressure and line up emitter and detector) e. Allow monitor to stabilize					
6. <b>**Evaluate accuracy of results</b> a. Observe signal strength indicator (blip, Signal IQ). b. Observe waveform c. Verify matching heart rate d. Verify clinical correlation					

The student will be able to...	0	1	2	3	NA
7. **Obtain a SpO <sub>2</sub> measurement and properly document the following information: <ol style="list-style-type: none"> <li>Date</li> <li>Time</li> <li>SpO<sub>2</sub></li> <li>Pulse rate</li> <li>Patient position</li> <li>Activity level</li> <li>FiO<sub>2</sub> and oxygen delivery device</li> <li>Probe placement site and probe type</li> <li>Type or model of device used</li> <li>Results of simultaneously obtained arterial sample and directly measured COHB, MetHB, and SaO<sub>2</sub></li> <li>Clinical appearance of patient (cyanosis, skin temp.ect.)</li> <li>Ventilator settings</li> <li>Agreement between the patient heart rate as determined by the pulse oximeter and by palpation, auscultation or by cardiac monitor</li> </ol>					
8. Demonstrate the ability to correlate the SpO <sub>2</sub> with a blood gas result and a co-oximetry result					
9. **For continuous monitoring, set the following alarms and settings and be able to explain all data provided on screen: (if available) <ol style="list-style-type: none"> <li>High/low SpO<sub>2</sub> alarm setting (based on patient type)</li> <li>High/low pulse alarm setting. (+/- 10 – 20 bpm)</li> <li>Alarm volume setting</li> <li>Alarm silence (60 – 120 sec)</li> <li>Alarm delay (based on patient situation)</li> <li>Pulse volume (usually off)</li> <li>Averaging time</li> <li>APOD &amp; Max Sens.</li> <li>PVi</li> <li>Fast Sat</li> </ol>					
10. Maintains and processes equipment as necessary <ol style="list-style-type: none"> <li>Rotates probe sites per department policy (approx. Q 4 hrs)</li> <li>**Clean or dispose of the probe after use</li> <li>Clean monitor after use per departmental policy</li> </ol>					
11. Knowledge/Comprehension Level <ol style="list-style-type: none"> <li>Can the student answer all oral review questions?</li> </ol>					

Students must pass all critical steps with a score of 2 or 3

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### ORAL REVIEW QUESTIONS

- Describe some clinical conditions that will affect the accuracy of the pulse oximeter.

<b>MRI</b>	Interfere with each others accuracy
<b>DEFIBRILLATION</b>	Inaccurate for a short while
<b>NEARBY ELECTRICAL EQUIPMENT</b>	May interfere with eachother
<b>MOTION (noise)</b>	False low
<b>CARBOXYHEMOGLOBIN [COHB]</b>	False high
<b>MET-HEMOGLOBIN [METHB])</b>	False high

<b>Hb F</b>	No affect
<b>Hb S</b>	No affect
<b>INTRAVASCULAR DYES</b>	False low
<b>AMBIENT LIGHT</b>	Inaccurate HR & SpO <sub>2</sub>
<b>LOW PERFUSION STATES</b>	False low
<b>NAIL POLISH OR NAIL COVERINGS</b>	inaccurate
<b>SATURATIONS BELOW 83%</b>	Inaccurate
<b>SKIN PIGMENTATION</b>	False low
<b>ANEMIA</b>	<b>False high</b>
<b>HYPEROXEMIA</b>	Unable to detect high PaO <sub>2</sub> states
<b>HYPERBILIRUBINEMIA</b>	No affect

2. What will happen if the LED is not positioned across from the light detector on the pulse oximeter probe (except for reflectance technology)? *The pulse ox will not get a signal or the readings will be erratic*
3. Explain what will occur if the finger is not in the finger clip far enough or is in too far. *Misaligned finger probe could allow ambient light interference and/or compression and damage to the finger.*
4. During continuous monitoring, how often should you assess and change the reusable and disposable probe site? *Reusable sensors – change site Q4 hours  
Single use sensors – check Q8 hours and change PRN*
5. Where should the high and low SpO<sub>2</sub>/pulse alarm limits be set?  
Refer to department policies for specific levels. Examples may be:
  - A. FOR NON-COPD ADULTS A LOW ALARM OF 90% AND A HIGH VALUE OF 100% or OFF IS USUALLY ACCEPTABLE.
  - B. FOR COPD ADULTS A LOW ALARM OF 85% AND A HIGH VALUE OF 91% IS USUALLY ACCEPTABLE
  - C. FOR INFANTS (especially premature) LOW ALARM OF 90% AND A HIGH ALARM OF 95% (attempt to prevent hyperoxemia)
6. What is the expected correlation when a SpO<sub>2</sub> reading of an oximeter is compared to an arterial blood gas saturation run on a CO-oximeter? **THE ACCURACY OF A PULSE OXIMETER DEPENDS ON THE MONITOR BEING USED, THE SITE SELECTED AND THE SENSOR BEING USED. MOST MONITOR/SITE/SENSOR COMBINATIONS ALLOW FOR AN ACCURACY OF ± 2 TO 3%.**
7. What are the sites available for noninvasive SpO<sub>2</sub> monitoring? **MONITORING SITES INCLUDE ALL FINGERS ON THE NON-DOMINANT HAND (NOT THE THUMBS), THE BALL OF THE FOOT (NEONATE), THE TOES (PRIMARILY PEDIATRIC), THE BRIDGE OF THE NOSE (ADULT), THE PINNA OF THE EAR (SPECIAL SENSOR REQUIRED), AND THE FOREHEAD (SPECIALTY SENSOR/MONITOR REQUIRED).**
8. Give clinical examples of when an arterial blood gas may be indicated: **WHEN VENTILATION OR ACID BASE STATUS NEEDS TO BE ASSESSED, POOR PERFUSION. POOR CLINICAL CORRELATION WITH PULSE OX RESULTS, CPR**
9. Give clinical examples of when co-oximetry may be indicated: **ANEMIA, CO POISONING OR METHb PROBLEMS (NITRATE POISONING)**
10. Why can't a pulse oximeter be used as an apnea monitor? **PULSE OXIMETERS DO NOT ASSESS VENTILATION AND HAVE A SLOW RESPONSE TIME. THEY MAY NOT DETECT HYPOPNEA ESPECIALLY WHEN FIOS ARE BEING INCREASED TO COMPENSATE FOR LOW SATS DUE TO HYPOVENTILATION**