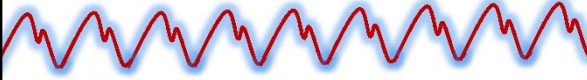


**HEMODYNAMIC MONITORING**  
*For the Respiratory Therapist*



---

---

---

---

---

---

---

---

**Cardiopulmonary System**

Main Purpose	Oxygen Delivery
Main Function	Adequate Perfusion (deliver adequate oxygen and nutrients; remove metabolic waste)
Main Goal	Tissue Oxygenation

---

---

---

---

---

---

---

---

**Respiratory Therapist's Job**

**USED TO BE:**  
Get O<sub>2</sub> into lungs and hope Cardiovascular System picks it up and delivers

**NOW:**  
Ensure that O<sub>2</sub> not only gets to the lungs, but is effectively delivered to the tissue

---

---

---

---

---

---

---

---

**Monitoring !**

**Pulmonary:**  
Monitor O<sub>2</sub> from air to circulation

**Cardiovascular:**  
Monitor O<sub>2</sub> from circulation to tissue  
*(Psst . . . This is Hemodynamic Monitoring!)*

---

---

---

---

---

---

---

**Hemodynamics**  
The *study*  
of blood flow to the body

**Hemodynamic Monitoring**  
The *monitoring*  
of the blood flow to the body

---

---

---

---

---

---

---

**Hemo Monitoring: Purpose**

- 1. Assess blood flow –**  
Ensure adequacy of tissue perfusion/oxygenation
- 2. Early detection –**  
of life threatening derangements of vital functions
- 3. Titrate therapy –**  
Ensure adequacy of tissue perfusion/oxygenation  
and correct derangements

---

---

---

---

---

---

---

- What do all people die from?  
*Hypoxia !*
- #1 cause of death in ICU ? -  
Multi-System Organ Dysfunction  
(due to hypoxia)  
*RTs can be and should be the first to detect hypoxia*

---

---

---

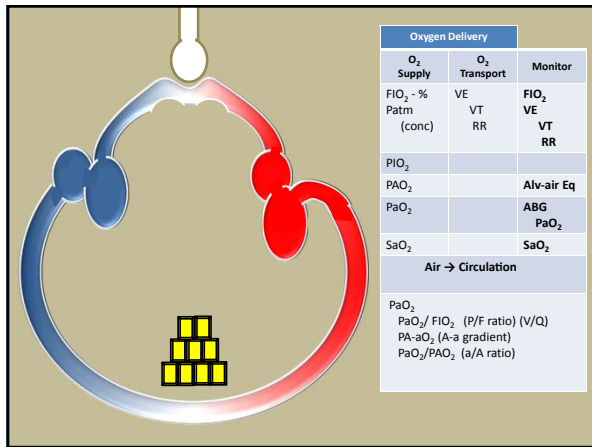
---

---

---

---

---




---

---

---

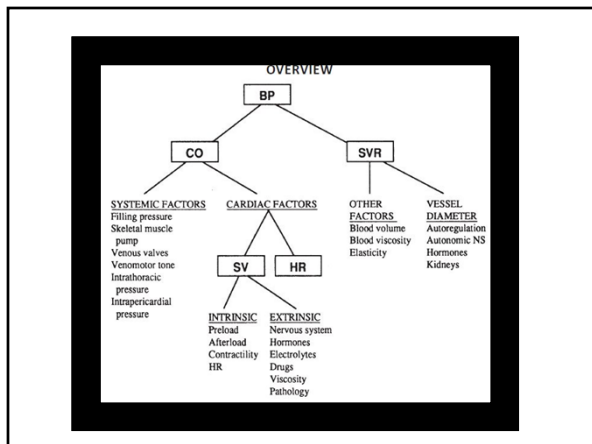
---

---

---

---

---




---

---

---

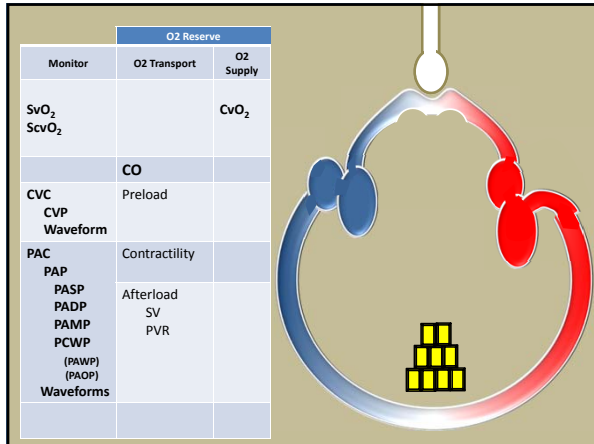
---

---

---

---

---




---

---

---

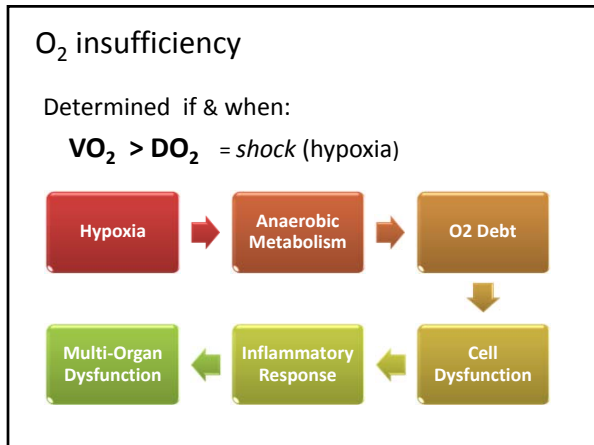
---

---

---

---

---




---

---

---

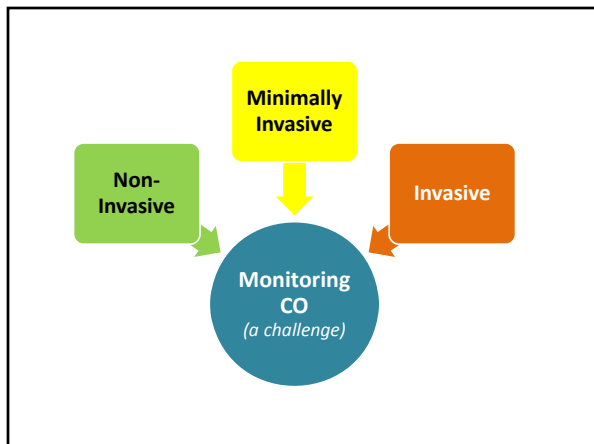
---

---

---

---

---




---

---

---

---

---

---

---

---

### Non-Invasive Signs of CO

Sign	↓ tissue perfusion/oxygenation
BP	↓ = ↓ CO
HR (maybe ↑)	
Pulse Strength	
Capillary Refill	
Skin Temperature	
Urinary Output (UO)	
Mental Status	
Skin Color	Pale = ↓ CO
Lactate	↑ = ↓ CO
Less Specific: RR, ECG	

---

---

---

---

---

---

---

---

---

---

### Pulmonary Artery Catheter (Swan-Ganz)

#### Measured or Derived Parameters

*(mostly left heart values)*

CO	RAP	CvO <sub>2</sub>	RVS	DO <sub>2</sub>
CI	(RVEDP)	LV	RVS	MDO <sub>2</sub>
CVP	SvO <sub>2</sub>	(function, curve)	SV	MVO <sub>2</sub>
HR	SvO <sub>2</sub>	LVS	SVI	O <sub>2</sub> ER
PADP	PvCO <sub>2</sub>	LVS	SW	QS/QT
PASP	PvCO <sub>2</sub>	LVS	SWI	SVR
PAWP	PvO <sub>2</sub>	PAMP	a-vDO <sub>2</sub>	SVRI
(LAP, LVEDP)	PvO <sub>2</sub>	PVR	Ca-vO <sub>2</sub>	VO <sub>2</sub>
	pHv	PVRI		CPP

---

---

---

---

---

---

---

---

---

---

### SvO<sub>2</sub>

Reflects metabolism

$SaO_2 - SvO_2 = O_2$  metabolism

**Norm** = 75% (range 60 - 80%)

< 50% = anaerobic metabolism and global hypoxia

**Goal = 70%**

---

---

---

---

---

---

---

---

---

---

