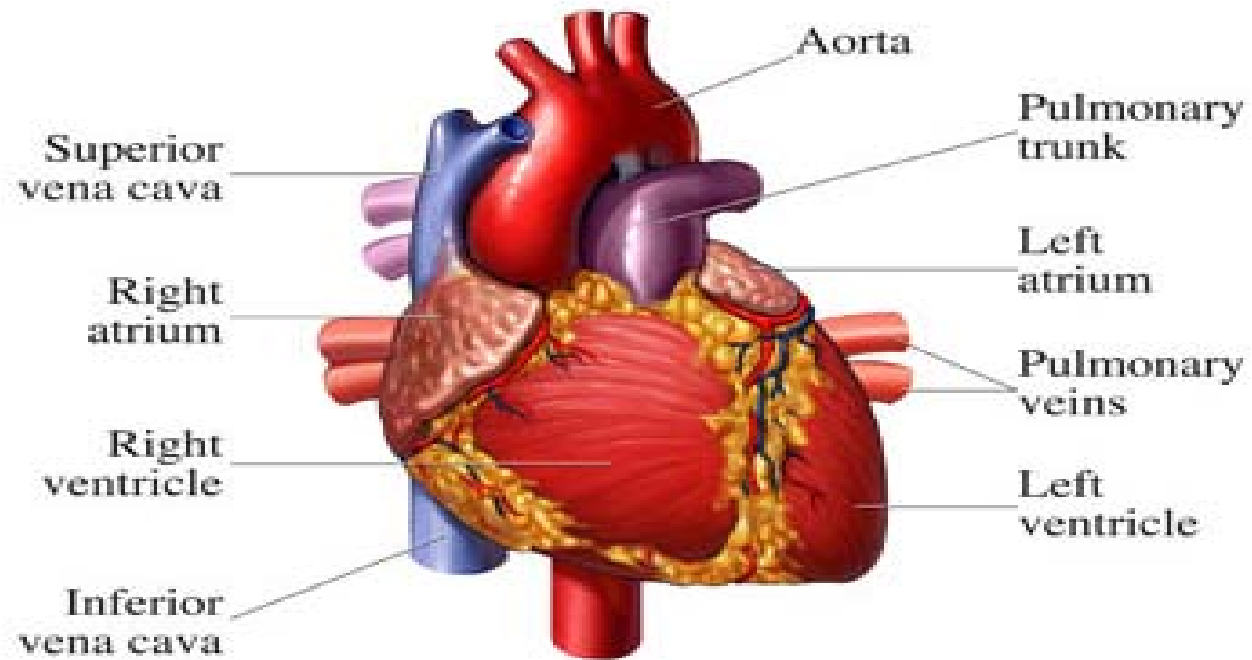
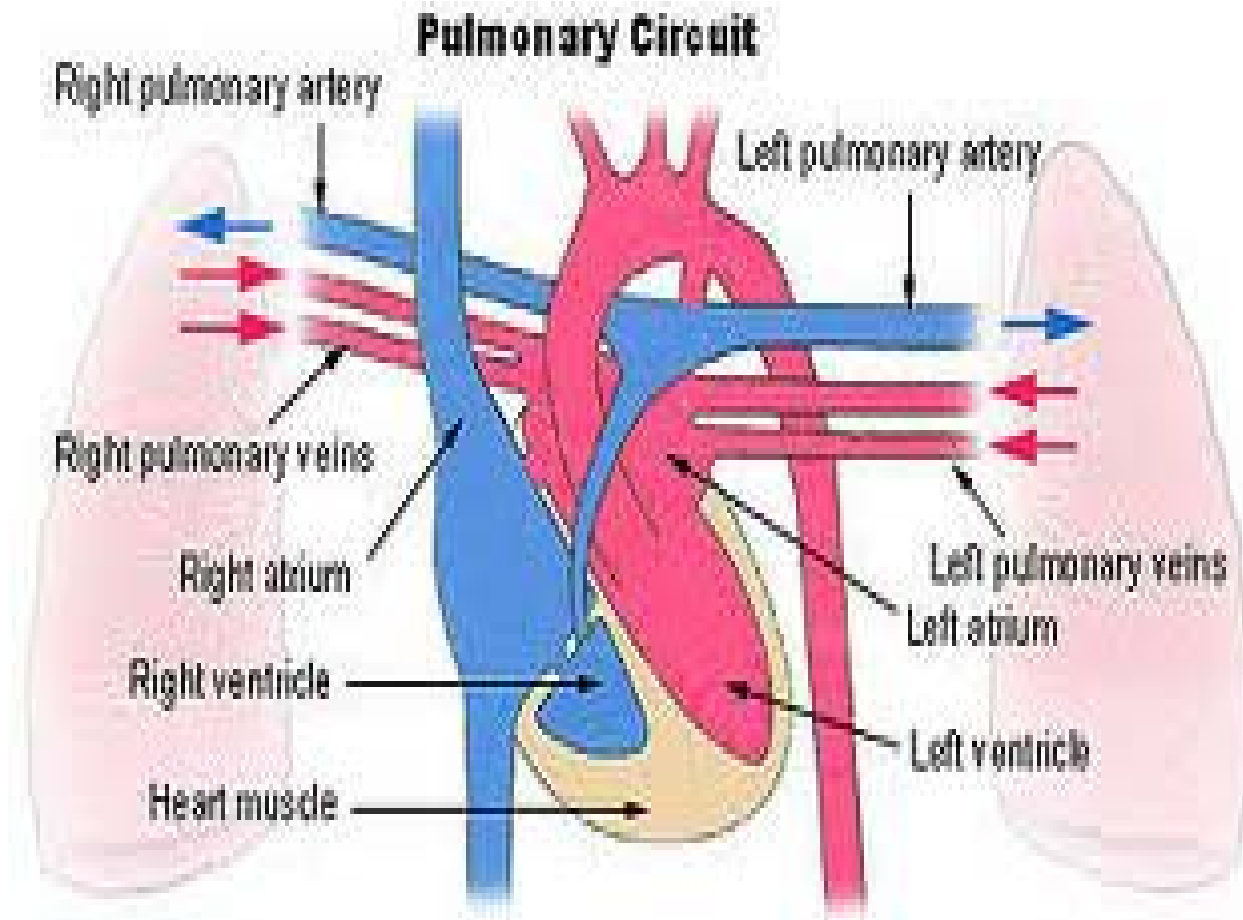


CIRCULATION

HEART



Pulmonary Circulation



- Circulation consist of the heart, blood vessels and blood.
- Its major task is to bring oxygen to organs and tissues, also vital nutrients and hormones is carried by the blood.
- At the same time blood collects waste products from tissues, such as carbon dioxide, and lactic acid.

- Serious injury or illness may impair heart function, changing in the pressure, volumes and flows in vascular paths so that the blood oxygenation in the lungs and perfusion of organs deteriorates.
- **Risk for inadequate tissue oxygenation**

How do we assess Circulation ?

Whats normal ?

When shall we react ?

ASSESS CIRCULATION

Pulse

Peripheral circulation

Capillary refill time

Blood Pressure

Color of the skin

ECG

NORMAL CIRCULATION

- Heart rate 50 – 80 per minute
Bloodpressure 120/80 mmHg
Warm peripheral circulation
Capillar refille time less than 2 seconds
Color
Normal breathing
Normal diuresis
Happy patient, moves, talks and behave normal

REACTION VALUES

Respiratory rate more than 30

Saturation below 90%

Pulse over 100 ?

Capillary refill time more than 2 seconds

Systolic bloodpressure below 90 mmHg

Urine below 30 ml/hour

Conscious level AVPU

SHOCK

- Hypovolemic shock
- Sepsis / Septic shock
- Neurogen shock
- Cardiogenic shock
- Anaphylactic shock

Shock – signs and symptoms

- Cold and clammy skin
- Weak pulse and fast
- Changes in the color of the skin
- Restlessness, worried
- Shortness of breath (fast breathing)
- Low bloodpressure, or variations
- Reduce diuresis
- Low saturation

We have to react because.....

- Risk for ineffective organperfusion
- Risk for ineffective cerebral perfusion
- Risk for ineffective tissue perfusion

We have to react because....

- Septic shock and multiple organ failure is today a common reason for cause of death on the ICU

Shock

- Important is that in the early stage, the patient may seem to have a good circulation, despite fall in blood pressure, and this may change very fast and its to late to save the patient.....

REASSESS

Continuous monitoring, Follow vital parameters

A B C D Airway, breathing, circulation, disability

- Pulsoxymetri
- Check pulse and Bloodpressure
- Check breathing rate
- ECG
- Capillary refill time and skin
- Conscious level
- Check urine output
- Bloodgas ABG ! SVO2 ?

- GIVE FLUID – Crystalloid + Colloid ?
- Continue to give fluid !!!!
- **Raise the legs**
- **GIVE FLUID**
- Antibiotics if its a septic shock
- Adrenalin 0,3 mg if its an anafylactic shock
- Buffer supply?
- Norephrinefrine, phenylefrin, dobutamine , other ? Is there any kontraindikation ?

REASSESS

- Did the patient respond to your treatment ?

TRAUMA / INJURY/SURGERY

- Those who dies on the incident site dies a large part of bleeding. Headinjury at the same may worsen the injury.
- Early treatment saves life and changes the outcome
- Suspected bleeding should be examined immediately
- Assess the amount of bleeding

- Pressure bandage, stop external bleeding
- Internal bleeding ?
- Head down legs up, raise the bleeding point, cannulas , give fluid, blood/plasma, monitor respiratory rate, saturation, pulse, bloodpressure, skin, disability A B C D..... inspection of the body
- X-ray , surgery

ICU

- Every minute and hour is important, status as often as required, continuous monitoring
- Changes may happen fast, and early signs is very important so treatment can start before its get to serious

CASE

- 35 year old male
- Headache and have not feeling well at home in the morning. When wife arrives home in the afternoon, her husbands behavior is not normal, and what he says make no sense. Looks like he has fever.
- The wife calls for an ambulance

- Status at arrival;
 - Bloodpressure 110 /60
 - Heartrate 120 / per minute
 - Breathing 35 / per minute
 - Clammy skin
 - Fever 39,8
 - Very stressed out

What should we do?

10 minutes later

Bloodpressure 80/40

Heart rate 140, weak pulse

Breathing – Respiratory 15 x 480 , Peep 5,

Oxygen 40%

Diuresis 10 ml last hour (urinary catheter)

Cold and clammy skin

Lactate 9

ASANTE

- $U=RI$ (Ohms lag: volt = resistens x ström)
- $Bltr = SVR * CO$ (tryck = resistens x flöde)
- $Bltr = SVR * HR * SV$