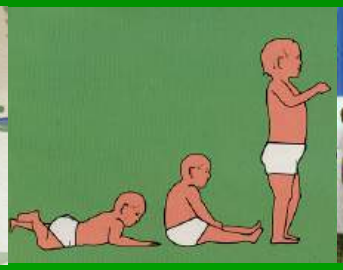
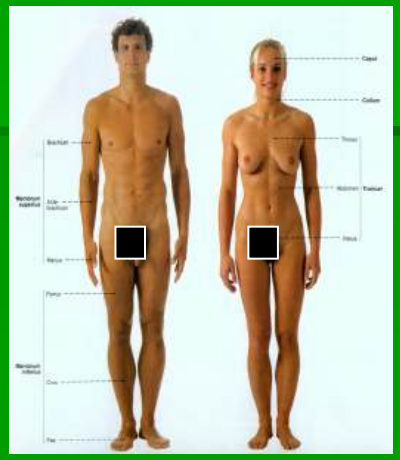
# Obstetric Shock
## *renjatan obstetri*

*Mochamad Ma'roef*
*Fakultas Kedokteran*
*Universitas Muhamadiyah Malang*

# LIFE CYCLE





# DEFINITIONS

Shock: Inadequate perfusion resulting in $O_2$ debt at cellular level

# Etiologic Classification of Shock

1. Hemorrhagic/Hypovolemic
2. Cardiogenic
3. Distributive (SIRS, septic, high output failure, spinal cord injury, anaphylactic)

# Obstetric Hemorrhage and Maternal Deaths

- Abruptio placenta – 19 percent
- Uterine rupture – 16 percent
- Uterine atony – 15 percent
- Coagulation disorder – 14 percent
- Placenta previa – 7 percent
- Placenta accreta – 6 percent
- Retained placenta – 4 percent

Chichaki, et al, 1999

# Causes of Maternal Deaths due to Hemorrhage

- Inadequate resources and personnel – home delivery attempts.
- Failure to prepare for obstetric hemorrhage – no IV site started on admission.
- Delay in recognition of hemorrhage.
- Delay in treatment of hemorrhage.
- Treatment failures.

# Antepartum Hemorrhage

- **Abruptio placenta**
- **Placenta previa**
- **Uterine rupture**

  Definitive treatment is cesarean section for each of these conditions. If heavy bleeding continues after the cesarean section, treat as postpartum hemorrhage.

# “Obstetrics is Bloody Business”*

*Cunningham, et. al: Williams Obstetrics, 23st ed., 2012

# Categorization of Acute Hemorrhage

| | Class 1 | Class 2 | Class 3 | Class 4 |
|---|---|---|---|---|
| **Blood loss (% blood volume)** | 15% | 15%-30% | 30%-40% | >40% |
| **Pulse rate** | <100 | >100 | >120 | >140 |
| **Pulse pressure** | Normal | Decreased | Decreased | Decreased |
| **Blood pressure** | Normal or increased | Decreased | Decreased | Decreased |

# Hemorrhagic Shock

**Clinical Presentation**

***Early Phase***

Tachycardia, narrow pulse pressure, may exhibit orthostatic changes in HR/AP

Healthy patient with 25-30% loss may exhibit only these signs

# Hemorrhagic Shock

**Later Phase**

Cool moist skin, hypotensive, anxious, disoriented, oliguric

**KEY: EARLY RECOGNITION**

# Management of Hypovolemic Shock

- A-B-C, ask for help!!!!
- Insert at least two large catheters. Start saline infusion. Apply compression cuff to infusion pack. Monitor central venous pressure (CVP) and arterial pressure.
- Alert blood bank. Take samples for transfusion and coagulation screen.
- Place patient in the Trendelenburg position
- Warm the resuscitation fluids
- Call extra staff, including consultant anesthesiologist and obstetrician.
- Rapidly infuse 5% dextrose in lactated Ringer's solution while blood products are obtained.

# Parameters of Adequate Resuscitation

Urine output (0.5 - 1.0 ml/kg/hr)

acceptable renal perfusion

Reversal of lactic acidosis (nl. pH)

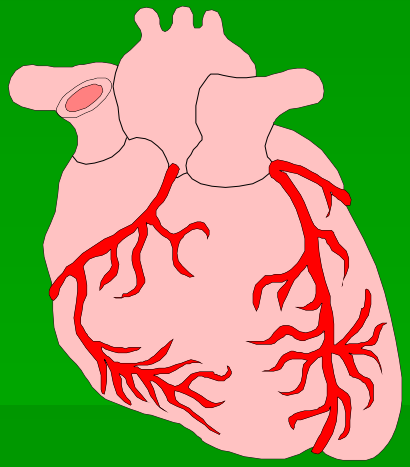
improved perfusion

Normal mental status

adequate cerebral perfusion

# Cardiogenic Shock

- Pump Failure
  - Ductal dependent lesions
  - Myocardial failure
    - myocarditis
    - cardiomyopathy
    - electrolyte abnormalities
    - ischemia
- Restrictive: Tamponade
- Abnormalities in heart rate



# PHYSIOLOGIC PRINCIPLES

- Frank-Starling Phenomenon
- Cardiac Output
- Oxygen delivery and utilization

# Cardiogenic Shock

- Cardiac output is inadequate to meet tissue demands
- Phases:
  - Early, compensated
  - Late, uncompensated
- Symptomatology varies
- Hypotension and bradycardia are late signs

# Cardiogenic Shock
## High Afterload

- Tamponade:
  - pulsus paradoxus
  - at risk: chronic renal failure, vasculitides
- **Pulmonary hypertension**
  - **massive PE**
- High or low SVR
  - Septic shock
  - LV failure from chronic hypertension

# Signs and Symptoms

- Shocky, but no history of volume loss
- Vital signs: tachycardia, hypotension
- Poor perfusion
- WHEEZING
- Metabolic acidosis
- Hypoglycemia
- Heart size on CXR may be normal

# Management
## ABC's

- Airway and Breathing
- Circulation
  - fluid bolus ?
  - inotropic support

# Septic Shock

**Etiology**

Gram neg bacteria (gm. neg rods)

Most common (E. coli, 31% all cases)

**Incidence** - 12.8%/1000 hosp. adm.

**Mortality**

25%; 30-50% if shock present

30% if Resp./GI/unkn. Source

15% if Biliary/GU/GYN source

# Epidemiology of Sepsis

- 751K cases annually in the United States and rising
- Most common cause of death in non-coronary ICU
- 30% Mortality when shock present

# Definitions

**The ACCP/SCCM consensus conference committee. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. Chest 1992.**

- SIRS
  - Widespread inflammatory response
  - Two or more of the following
    - Temp>38 C<36 C
    - Heart Rate >90 bpm
    - Tachypnea RR>20 or hyperventilation $PaCO_2$ <32 mmHg
    - WBC >12,000<4000 or presence of >10% immature neutrophils.
- **Sepsis: SIRS + definitive source of infection**
- Severe Sepsis: Sepsis + organ dysfunction, hypoperfusion, or hypotension

# Definitions

**The ACCP/SCCM consensus conference committee. Definitions for sepsis and organ failure and guidelines for the use of innovative therapies in sepsis. Chest 1992.**

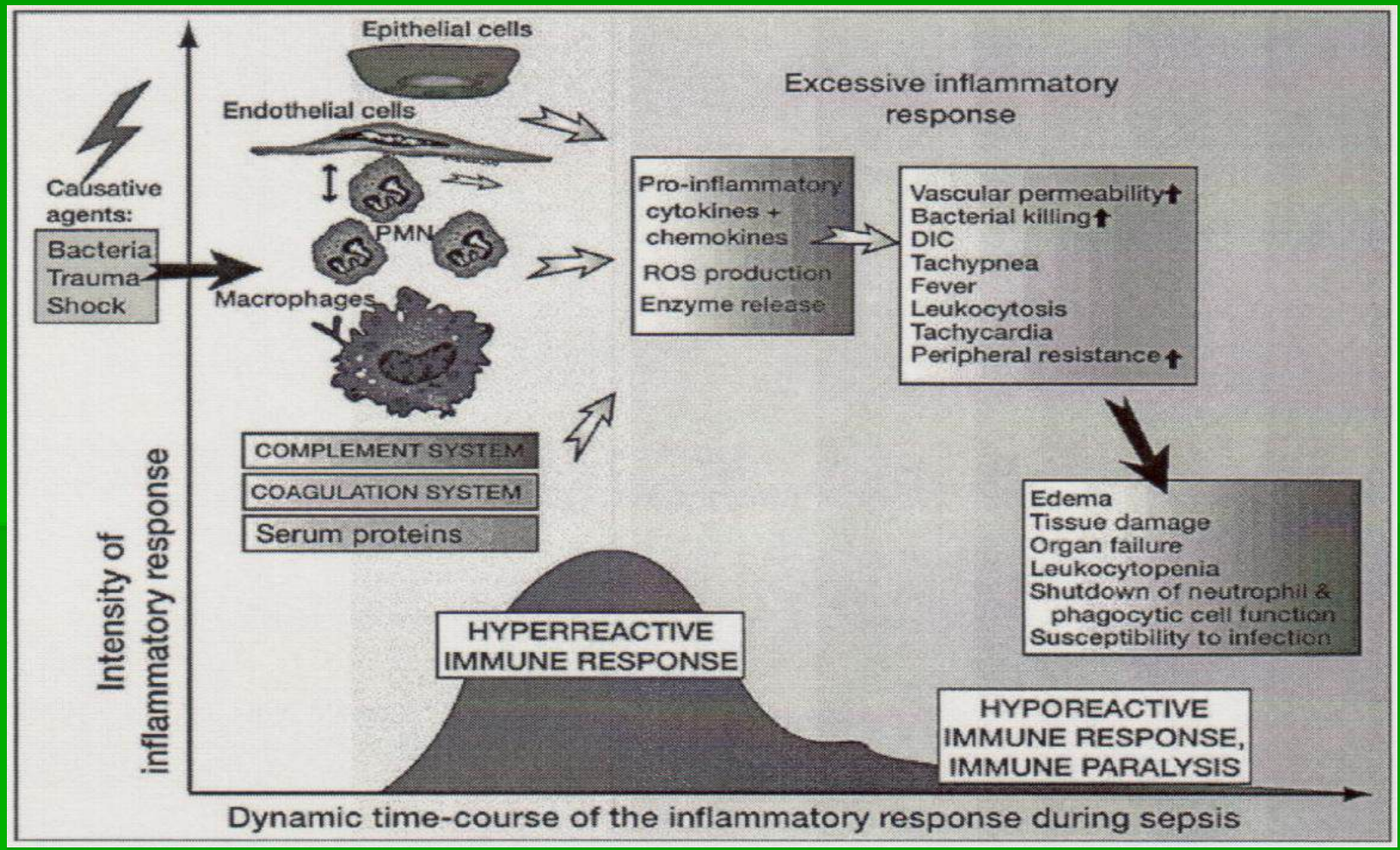
- Septic Shock:
  - Sepsis + hypotension despite fluids
  - Perfusion abnormalities
    - Lactic acidosis
    - Oliguria
    - Acute AMS
- Multiple Organ System Failure: Abnormal function of two or more organs such that homeostasis cannot be achieved without intervention.

# Brief Pathophysiology

- Proinflammatory response to infection
  - Mediators
    - TNF Alpha, IL-1, IL-6
    - Complement system (C5 alpha)
    - Bacterial factors
      - Endotoxin, bacterial cell wall products, bacterial toxins
- Immunosuppressive

# Time-course of inflammatory response during sepsis

(modified from *Management of Severe Sepsis and Septic Shock.* Curr Opin Crit Care 2004;10:354-363)



# Septic Shock

Clinical Presentation

**Early Phase**

Vasodilatation, CO normal or high, fever, agitation/confusion, hyperventilation

Often, fever and hyperventilation are the earliest signs.

Hypotension may not be present.

# Septic Shock

**Late Phase**

CO decreased, hypotension, vasoconstriction, impaired perfusion, decreased level of consciousness, oliguria, DIC

# Management of Sepsis

- Resuscitate: ABCs
- Restore tissue perfusion
- Identify and eradicate source of infection
- Assure adequate tissue oxygenation
- Activated Protein C
- Steroids
- Glucose Control
- Nutrition

# Septic Shock

**Management**

Fluid resuscitation

Pressor support

- After adequate volume restored
- Dopamine (5-10 ug/kg/min)
- Dobutamine (5-20ug/kg/min)

Airway management

# Septic Shock

Management

Surgical drainage (abscess, infected organ (gangrenous gallbladder, bowel)

Antibiotics

Site established, consider organisms known to occur in such sites

Unknown site in 30% of patients

# Septic Shock Algorithm Example

**(modified from *Septic Shock*. Lancet 2005;365:63-78.)**

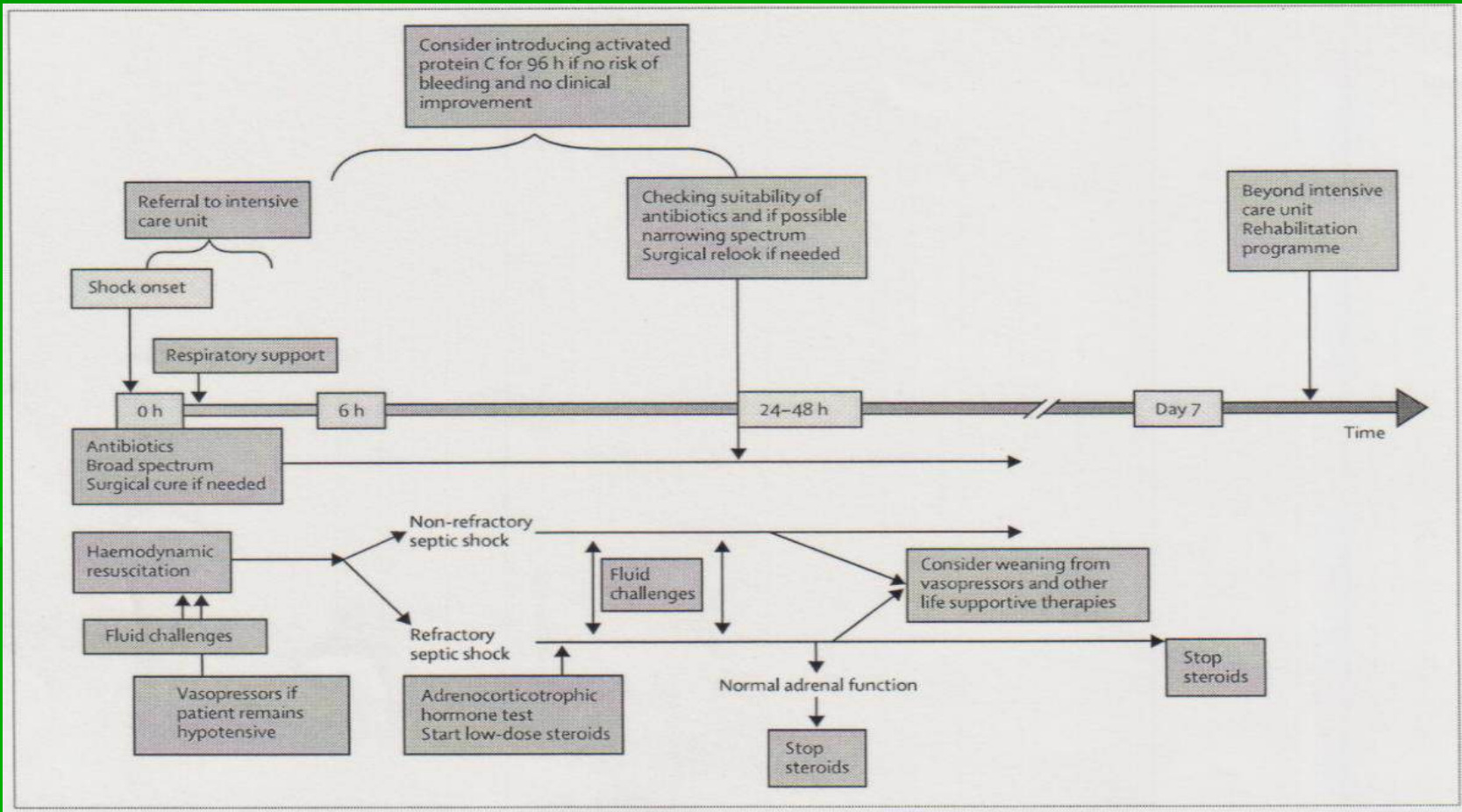



*Figure 5*: Principles of treatment in septic shock

# Matur nuwun....

Secret lovers