Be a Hero!

...rescuing patients from complications in the CTICU

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Critical Care Medicine
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Cardiac Surgery Patients Expected to Have Functional Recovery

Your Mission: Recue patients from postoperative complications!

[Image of a rescue team logo]
Cardiac Surgery Physiology

1. Oxygen-poor blood leaves the heart to enter the heart-lung machine.
2. Heart-lung machine pumps and adds oxygen to the blood before it returns to the body.
3. Oxygen-rich blood returns to the body, skipping the heart and lungs.

Blood bypasses heart chambers and lungs.
Aorta.
Location of heart.
Physiologic sequelae of cardiac surgery

• Vasoplegia / decreased CO

Blood Meets Pump / Circuit

Filling The Tank...

Total Volume

Stressed Volume

Unstressed Volume

Pmcf
Post Op Volume Overload

Coagulopathy of Cardiac Surgery
Herparinization
Nonpulsatile Flow
Consumption of Clotting Factor
RBC Destruction
Platlet Destruction
Hypothermia
Systemic Inflammation
Acidosis
Hypocalcemia
Rescuable Complications

1. Respiratory Failure
2. Rate & Conduction Problems
3. Arrhythmias
4. Post Operative Bleeding
5. Vasoplegic Syndrome
6. Tamponade
7. Pump Failure
8. SAM
9. AV Groove Disruption
10. Cardiac Arrest

Your Mission:
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Respiratory Failure

Atelectasis

Pulmonary Edema

Aspiration

Diaphragm Paralyis

ARDS

Hemothorax

Bradycardia/ Conduction Problems
Atrial Fibrillation

V-Tach/V-Fib

Ischemia?
Too Much Bleeding?

>200 cc /hour
>1500cc in 8 hours
Sudden Increase or Cessation
Stop the Bleeding!

Fibrin + Platlet + Factors = Clot

Amicar

Fibrinogen > 150

Factor VII?

ddAVP?

SBP drives bleeding

Massive Transfusion

Team

1:1:1

Rapid Infuser

Take Back to OR
Vasoplegic Syndrome

Low SVR

Vasodilation

Exaggerated SIRS Response

ACEi & ARB

Vasoplegic Syndrome

Vasopressors

Methylene Blue?
Pump Failure

Stunning

MV Surgery

Ischemia?

Inotropes

Mechanical Circulatory Support

Control Afterload
Avoid in RV Failure:

- Hypercarbia
- Hypoxia
- Acidosis
- High PEEP
- Hypervolemia
- Hypotension
Support the RV:

Diuresis

MAP>>PAP

Inodilators

iNO

ECMO

RVAD

First Rule Out Tamponade!
Not Medical Tamponade!
SAM
Dynamic
LVOT
Obstruction
Beta Block
Increase Preload

Avoid Inotropes
AV Groove Disruption

Massive Bleeding

Mitral Valve Surgery

Back to OR

Postoperative Cardiac Arrest
Cardiac Arrest After Cardiac Surgery

50-79% Survival

V-Fib/V-Tach

Tamponade

Bradycardia

Heart Block

Hemorrhage

Infusions Disrupted?

CARDIAC ARREST

assess rhythm

ventricular fibrillation or tachycardia
DC shock (3 attempts)
asystole or severe bradycardia
pace (if wires available)
pulseless electrical activity

start basic life support

amiodarone 300mg via central venous line
atropine 3mg consider external pacing
if paced, turn off pacing to exclude underlying VF

prepare for emergency resternotomy

continue CPR with single DC shock every 2 minutes until resternotomy
continue CPR until resternotomy
continue CPR until resternotomy
Resternotomy

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