Resuscitation under Special Circumstances:

Pulmonary Embolism

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Pulmonary Embolism

♥ Aetiology, signs and symptoms
♥ Treatment recommendations
♥ Two personal experiences
♥ Four important take home messages
Pulmonary embolism

Most commonly a pulmonary embolus arises from the calf veins.

The thrombus usually form in venous valve pockets and at other sites of presumed venous stasis (e.g. pelvis).

To reach the lungs, the thrombus travel through the v. Cava, the right atrium, the right ventricle to finally reach the pulmonary artery.
Pulmonary embolism

If big enough - it causes cardio circulatory arrest.
Pulmonary embolism

.. is a common and potentially lethal condition.

.. is the second most common cause of sudden death*.

* Medscape´s Continually Updated Clinical Reference
Pulmonary embolism

.. is the third most common cause of death in hospitalized patients, with at least 650,000 cases annually*.

Autopsy studies of patients in a hospital setting who died unexpectedly have shown that approx. 80% died from massive PE*.

* Medscape´s Continually Updated Clinical Reference
Pulmonary embolism

- Recurrent embolism and death can be prevented with prompt diagnosis and therapy.

- Unfortunately, the diagnosis is often missed because patients with pulmonary embolism present with nonspecific signs and symptoms.
The most common symptoms of pulmonary embolism in a diagnosis study* were dyspnea (73%), pleuritic chest pain (66%), cough (37%), and hemoptysis (13%).

EKG findings in Massive PE

Might resemble Right Ventricular MI.

Non-specific!
Ultrasound findings in Massive PE

- dilatation of right ventricle
- septum deviation to the left
- small left ventricle
- dilatation of pulmonary arteries
- dilatation of vena cava
ILCOR – Question about Cardiac Arrest Caused by Pulmonary Embolus

- In adult cardiac arrest (out of hospital or in-hospital) caused by pulmonary embolus, does the use of etiology-specific interventions, as opposed to standard care (according to treatment algorithm), improve outcome (e.g. ROSC, survival)?
ILCOR - Consensus on Science

- Nine studies of patients with presumed pulmonary embolism and CA showed improvement with fibrinolysis in ROSC and admission to hospital or ICU, but no improvement in survival to discharge*.

ILCOR - Treatment Recommendations

- Routine use of fibrinolytics in undifferentiated cardiac arrest is **not** recommended.

- Fibrinolytic therapy **may be considered** when pulmonary embolism is suspected as the cause of the cardiac arrest.
If a fibrinolytic drug is given, consider CPR for at least 60-90 min. before termination of resuscitation attempts.

Mortality from surgical embolectomy is high if it follows cardiac arrest and should be avoided.
Take home messages ..... 

1. Cardiac arrest due to PE is a **clinical diagnosis**! but ..... 

2. When available for trained clinicians, **ultrasound may be** useful in diagnosing PE and other reversible causes of cardiac arrest. 

3. Use of ultrasound in ACLS requires training to **minimise interruptions in chest compressions**.
Thrombolytic therapy is generally applied by the rescue team in the case of unsuccessful resuscitation as the “last chance” of the patient.
Take home messages ..... 

- Despite a diagnostic uncertainty in one large study*, it provides a rather clear and simple take home message:

“When thrombolysis is considered during CPR, it should be given as early as possible.”


http://www.cprguidelines.eu/assets/downloads/guidelines/S0300-9572(15)00329-9_main.pdf?