Family Medicine for English language students of Medical University of Lodz

Seminar 16

Reanimation in GP practice
• European Resuscitation Council Guidelines for Resuscitation 2015
Emergency medical dispatcher, CPR and AED
Guidelines 2015 highlights

• An effective, coordinated community response
• CPR providers trained and able to perform rescue breaths should combine chest compressions and rescue breaths.
• CPR remains essential to improving outcomes.
• CPR providers should ensure chest compressions of adequate depth (at least 5 cm but no more than 6 cm) with a rate of 100–120 compressions minimum.
• After each compression allow the chest to recoil completely and minimise interruptions in compressions.
Chest Compression Depth - updated

2010: > 5 cm
2015: 5 – 6 cm

Push Hard!

Class I, LOE C-LD
Chest Compression Rate - updated

2010 > 100

2015 100 – 120

Class IIa, LOE C-LD

Push Fast!
Fully Recoil!

do not leaning on chest

Class IIa, LOE C-LD
Guidelines 2015 highlights

• Providing rescue breaths/ventilations spend approximately 1s inflating the chest with sufficient volume (500-600ml) to ensure the chest rises visibly.

• The ratio of chest compressions to ventilations remains 30:2.

• Do not interrupt chest compressions for more than 10s to provide ventilations.
Yes, I am superhuman, but, even I should only do chest compressions for 2 minutes.
Guidelines 2015 highlights

- Defibrillation within 3–5 min of collapse can produce survival rates as high as 50–70%.
- The adult CPR sequence can be used safely in children who are unresponsive and not breathing normally.
- Chest compression depths in children should be at least one third of the depth of the chest (for infants that is 4 cm, for children 5 cm).
Guidelines 2015 highlights

• There are a variety of approaches to airway management during CPR and a stepwise approach based on patient factors and the skills of the rescuer is recommended.
The Chain of Survival

- Early recognition and call for help
  - to prevent cardiac arrest
- Early CPR
  - to buy time
- Early Defibrillation
  - to restart the heart
- Post resuscitation care
  - to restore quality of life

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The Chain of Survival

1. Early recognition and call for help – unresponsiveness and not breathing normally
2. Early bystander CPR – The immediate initiation of CPR can double or quadruple survival from cardiac arrest.
The Chain of Survival

• Early defibrillation

• Early advanced life support and standardised post-resuscitation care – Advanced life support with airway management, drugs and correcting causal factors.
Potentially reversible causes of cardiac arrest

- **4H**
  1. H...
  2. H...
  3. H...
  4. H...

- **4T**
  1. T...
  2. T...
  3. T...
  4. T...
Causes of cardiac arrest in GP practice

### Etiology of Cardiac Arrest

<table>
<thead>
<tr>
<th>Cardiac disease</th>
<th>Respiratory causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Ischaemic heart disease</td>
<td>• Hypoxia (usually causes asystole)</td>
</tr>
<tr>
<td>• Acute circulatory obstruction</td>
<td>• Hypercapnia</td>
</tr>
<tr>
<td>• Fixed output states</td>
<td></td>
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<tr>
<td>• Cardiomyopathies</td>
<td></td>
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<tr>
<td>• Myocarditis</td>
<td></td>
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<tr>
<td>• Trauma and tamponade</td>
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<tr>
<td>• Direct myocardial stimulation</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Circulatory causes</th>
<th>Drug effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Hypovolaemia</td>
<td>• Direct pharmacological actions</td>
</tr>
<tr>
<td>• Tension pneumothorax</td>
<td>• Secondary effects</td>
</tr>
<tr>
<td>• Air or pulmonary embolism</td>
<td></td>
</tr>
<tr>
<td>• Vagal reflex mechanisms</td>
<td><strong>Miscellaneous causes</strong></td>
</tr>
<tr>
<td></td>
<td>• Electrocution</td>
</tr>
<tr>
<td></td>
<td>• Drowning</td>
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</tbody>
</table>

**Metabolic changes**

- Potassium disturbances
- Acute hypercalcaemia
- Circulating catecholamines
- Hypothermia
Opening the Airway

- Jaw thrust

Head tilt–chin lift
Anaphylaxis

Anaphylactic reaction?

Assess using ABCDE approach

Diagnosis - look for:
- Acute onset of illness
- Life-threatening Airway and/or Breathing and/or Circulation problems
- And usually skin changes

Call for help
- Lie patient flat with raised legs (if breathing allows)

Adrenaline

When skills and equipment available:
- Establish airway
- High flow oxygen
- IV fluid challenge
- Chlorphenamine
- Hydrocortisone

Monitor:
- Pulse oximetry
- ECG
- Blood pressure

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*Life-threatening problems:
Airway: swelling, hoarseness, stridor
Breathing: rapid breathing, wheezes, paroxysms, respiratory rate > 30, confusion
Circulation: pale, clammy, low blood pressure, tachycardia, oliguria/oliguria

*Adrenaline (1:1000 solution) is preferred to adrenaline (1:100000 solution)
- Adult: 1 mg (0.1 mL)
- Child 1-12 years: 0.3 mg (0.03 mL)
- Child < 12 years: 0.15 mg (0.015 mL)

*Adrenaline is administered by injection into a visible muscle of the upper arm. Adults: 50 mg; Children: 1 mg/kg.

*IV fluid challenge (crystalloid):
- Adult: 500 - 1000 mL
- Child: 20 mL/kg

*Chlorphenamine (Mepyramine):
- Adult or child more than 1.2 years: 10 mg
- Child 6 - 12 years: 4 mg
- Child 6 months to 6 years: 2.5 mg
- Child less than 6 months: 1 mg/kg

*Hydrocortisone
- Adult: 200 mg
- Child: 10 mg
In-hospital Resuscitation

Collapsed / sick patient

Shout for HELP & assess patient

No

Signs of life?

Yes

Call resuscitation team

CPR 30:2 with oxygen and airway adjuncts

Apply pad/monitor
Attempt defibrillation if appropriate

Advanced Life Support when resuscitation team arrives

Assess ABCDE
Recognise & treat
Oxygen, monitoring, IV access

Call resuscitation team if appropriate

Handover to resuscitation team
Unresponsive?

Shout for help

Open airway

Not breathing normally?

5 rescue breaths

No signs of life?

15 chest compressions

2 rescue breaths
15 compressions

Call cardiac arrest team or Paediatric ALS team after 1 minute of CPR
<table>
<thead>
<tr>
<th><strong>ABCDEF Assessment</strong></th>
<th><strong>Initial assessment</strong></th>
<th><strong>Measure</strong></th>
<th><strong>Action</strong></th>
<th><strong>Consider</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(look, listen, feel)</td>
<td></td>
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</tr>
<tr>
<td><strong>A</strong> Airway</td>
<td>Is the airway patent - can the patient talk?</td>
<td>Respiratory rate</td>
<td>Non-patent airway: - Head tilt, chin lift, jaw thrust - Suction - Naso/oropharyngeal airway O² (15 L/min)</td>
<td>ABG Chest X-ray</td>
</tr>
<tr>
<td></td>
<td>Snoring, stridor, obstruction (e.g. foreign body, vomit, blood, edema)</td>
<td>SpO²</td>
<td>Positioning of patient Bag/pocket mask ventilation Decompression of pneumothorax Inhalations</td>
<td></td>
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<tr>
<td></td>
<td>Cervical spine</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td><strong>B</strong> Breathing</td>
<td>Cyanosis, use of accessory muscles, breathing depth and rhythm, tracheal position, symmetrical chest expansion Breath sounds and auscultation Chest percussion</td>
<td>Capillary refill time Pulse Blood pressure ECG</td>
<td>Stop bleeding IV/IO access Fluids/blood</td>
<td></td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>12-lead ECG Blood tests Urinary catheter ECHO/FAST/FATE</td>
</tr>
<tr>
<td><strong>C</strong> Circulation</td>
<td>Bleeding Skin: - Color (pale, red, mottled) - Cool/warm/dry/sweaty Auscultation</td>
<td>Blood glucose</td>
<td>Recovery position</td>
<td></td>
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<td>Lumbar puncture Focused neurologic assessment Rectal examination (sphincter tonus)</td>
</tr>
<tr>
<td><strong>D</strong> Disability</td>
<td>AVPU Pupils (reaction, size, equal) Neck stiffness</td>
<td>GCS</td>
<td></td>
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<tr>
<td><strong>E</strong> Exposure</td>
<td>Head-to-toe assessment: - Trauma, fractures, wounds, lesions - Bleeding - Infection, petechiae, rash</td>
<td>Temperature</td>
<td>Prevent hypo-/hyperthermia Stabilize fracture</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Blood cultures Culture from wound Antibiotics</td>
</tr>
</tbody>
</table>
AVPU

- A...
- V...
- P...
- U...
AVPU

A: The patient is awake.
V: The patient responds to verbal stimulation.
P: The patient responds to painful stimulation.
U: The patient is completely unresponsive.
Glasgow Coma Scale

<table>
<thead>
<tr>
<th>EYE OPENING</th>
<th>VERBAL RESPONSE</th>
<th>MOTOR RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spontaneous  &gt; 4</td>
<td>Orientated  &gt; 5</td>
<td>Obey commands &gt; 6</td>
</tr>
<tr>
<td>To sound     &gt; 3</td>
<td>Confused       &gt; 4</td>
<td>Localising  &gt; 5</td>
</tr>
<tr>
<td>To pressure  &gt; 2</td>
<td>Words          &gt; 3</td>
<td>Normal flexion &gt; 4</td>
</tr>
<tr>
<td>None         &gt; 1</td>
<td>Sounds          &gt; 2</td>
<td>Abnormal flexion &gt; 3</td>
</tr>
<tr>
<td></td>
<td>None            &gt; 1</td>
<td>Extension      &gt; 2</td>
</tr>
<tr>
<td></td>
<td>None &gt; 1</td>
<td></td>
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</table>

GLASGOW COMA SCALE SCORE

- Mild: 13-15
- Moderate: 9-12
- Severe: 3-8

#1 EMT & PARAMEDIC EXAM PREP
Drugs:

**Adrenaline**
- The first drug used in cardiac arrest of any cause: it is included in the ALS algorithm for use every 3–5 min of CPR (alternate cycles).
- Preferred in the treatment of anaphylaxis
- A second-line treatment for cardiogenic shock.
- 1 mg dose
Drugs:

- **Amiodarone – indications:**
- Refractory VF/pVT
- Haemodynamically stable ventricular tachycardia (VT) and other resistant tachyarrhythmias
- Initial intravenous dose of 300 mg amiodarone, diluted in 5% glucose to a volume of 20 ml.
Drugs:

- **Amiodarone:**
  - Should be given after three defibrillation attempts irrespective
- **Lidocaine**
- Is recommended for use during ALS when amiodarone is unavailable.
### Clinical scenario

**Clinical scenario**

You are working on a medical assessment ward.

Mr Gerald Smith is a 45 year old gentleman has just been admitted via his General Practitioner (GP) with shortness of breath.

The nurse in charge has asked you to undertake the initial assessment of this patient.

<table>
<thead>
<tr>
<th>Clinical scenario</th>
<th>A-airway</th>
<th>B-breathing</th>
<th>C-circulation</th>
<th>D-disability</th>
<th>E-exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Check airway to ascertain if clear. A clear verbal response indicates a patent airway. Listen for sounds that may indicate a partially obstructed airway, such as snoring, gargling, coughing, wheeze or stridor. If any partially or fully obstructed treat or call for expert help.</td>
<td>Assess depth, rate and rhythm of breathing. Observe effort of breathing and use of accessory muscles and symmetrical chest expansion. Monitor oxygen saturations. If patient is showing signs of respiratory distress and/or saturation compromised apply high flow oxygen and consider calling for expert help.</td>
<td>Feel skin temperature and observe skin colour. Assess pulse for rate, rhythm and strength. Monitor blood pressure and capillary refill. Monitor output from urinary catheter and/or any wounds or wound drains. Assess the need for intravenous access and/or IV fluids. If required call for expert help.</td>
<td>Monitor brain function by assessing conscious level using the Alert, Voice, Pain, Unresponsive (AVPU) scale. Assess pupils for shape, size and reaction to light. Assess blood glucose. If required call for expert help and treat any abnormalities.</td>
<td>Maintaining patients privacy and dignity expose the patient and observe for any signs that might indicate the cause of deterioration e.g. rashes, wounds, oedema, signs of sepsis. Record temperature. Check any notes, drug charts, events leading up to deterioration for possible causes. Call for expert help if required and treat any abnormalities. Continue to assess using ABCDE until improvements and/or expert help arrives.</td>
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</tbody>
</table>