

European Paediatric Immediate Life Support

INSTRUCTOR' S MANUAL V202104_3



EUROPEAN
RESUSCITATION
COUNCIL

European Paediatric Immediate Life Support

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European Paediatric Immediate Life Support Course Manual

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This manual is the successor of the 2015 EPALS instructor manual. We sincerely thank the other authors of that manual, Christos Apostolidis, Fotini Danou, Anne Debeer, Annick De Jaeger, Christoph Eich, Mojca Groselj-Grenc, Monika Grunfeld, Balázs Hauser, Hrafnhildur Jonsdottir, Sylvia Hunyadi-Anticevic, Jesus Lopez-Herce, Ovidiu Popa, Corsino Rey, Frédéric Tits, Zeinab Salah, Wim Thies, Andras Szell, Michal Wojdak, Antonio Rodríguez-Núñez, Elizabeth Norris.

Acknowledgements

We thank Kathleen Pitches and Dominique Hendrickx (ERC) for the administrative co-ordination.

Cover page and lay-out by Studio Grid, Belgium (info@studiogrid.be).

Published by European Resuscitation Council vzw, Emile Vanderveldelaan 35, 2845 Niel, Belgium.

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CHAPTER 1

ABOUT THIS MANUAL + COURSE PROGRAM

This instructor manual gives the instructor a clear structure for each session; the answers to the given questions in the course are in the CoSy EPILS provider manual as well as all abbreviations used in this manual (these should be known to all instructors). Stick closely to the content of the instructor manual and the EPILS provider manual. *Do not overload the sessions with details but take sufficient time to teach the core issues and predefined goals for each session.*

- Content that is on CoSy but not further described in this instructor part should always be considered as **'optional'**. It is the course director who will decide how much 'optional' content is taught as part of their EPILS course, depending on the abilities of the participants.
- Questions mentioned in this manual should be used only as aids during demonstrations when appropriate and not during hands-on practice because they risk interfering with or interrupting the flow of teaching. However, as part of their pre-course preparation, instructors must be prepared to answer these questions (and to consider others that might arise during their session).
- At the end of each session, candidates should be given a formal opportunity to ask any questions. When these have been answered, the session can be closed by repeating the learning outcomes of that session. *However, if certain questions are beyond the scope of the EPILS course or take too much time to answer, these might be postponed to breaks or mentoring moments.*
- As an instructor you give advice and, by means of focused feedback (*'the learning conversation'*, see appendix 1 for more detail) direct the candidate toward the **predefined goals** of each session. Each instructor must be able to assess the extent to which the predefined goals have been achieved by every individual candidate. Such assessment is part of the overall formative assessment of the candidate throughout the course (see appendix 2). Even if a formal summative assessment is considered needed, the formative assessment should be part of the overall evaluation.
- Given the maximum length of the LIVE course – ideally no longer than 9h, one day, minimal 5 hours (without breaks)– good time management is essential so stick closely to the time scheduled. There should always be sufficient time for lunch and coffee breaks as these are also group moments (as far as possible within the context of the pandemic), time for questions, faculty meeting... Mentor-Mentee meetings are often linked to these breaks but they should have a specific place and time within the program schedule.

A standard one-day program is usually promoted, but alternative programs may be used at the discretion of the course director as long as general ERC course rules are respected and the proposed course format is confirmed to be acceptable by the paediatric SEC. Given the modular approach to the course, candidates who fail EPILS assessment but performed well during the BLS part of the course can therefore be certified as EPBLS provider.

1-DAY COURSE PROGRAM (WITHOUT SUMMATIVE ASSESSMENT)

TIME	GROUP 1	GROUP 2	GROUP 3	GROUP 4
8.30 - 8.45	INTRODUCTION			
8.45 - 9.15	RECOGNITION OF THE CRITICALLY ILL CHILD			
9.15 - 10.30	EMBEDDED KNOWLEDGE & SKILLS ABC			
	ROOM 1	ROOM 2	ROOM 3	ROOM 4
10.30 - 10.50	COFFEE BREAK - mentor/mentee			
10.50 - 11.10	DEMO ABC SCENARIO'S			
11.10 - 12.40	ABC SCENARIOS			
	ROOM 1	ROOM 2	ROOM 3	ROOM 4
12.40 - 13.30	LUNCH - FACULTY MEETING			
13.30 - 13.50	BLS DEMO			
13.50 - 15.40	BLS			
	ROOM 1	ROOM 2	ROOM 3	ROOM 4
15.50 - 16.00	COFFEE BREAK - mentor/mentee 2			

Depending on the profile of the candidates, the course director can decide to lengthen certain topics and decrease time allocated for others. This is acceptable as long as the rationale of the chronology and the learning goals are respected. An EPILS course should be at least five hours in length (excluding the breaks) but no more than 1 day.

***1:** Candidates stay in room as much as possible (especially during the pandemic but also otherwise. If sufficient material, then no need to make a switch in room for embedded knowledge and skills. Obviously, instructors do change per session per room.

CHAPTER 2

INTRODUCTION TO THE EPILS COURSE

In this 20' introduction, information is given to the candidates about:

- The focus of the course and the learning objectives: being able to stabilize a sick child during the *first 5' after initial encounter, awaiting the arrival of a resuscitation team*.
- The format of the course: interactive and performance-based; building upon the knowledge from the pre-course training and the candidates' previous experiences.
- Instructors and participants should present themselves in short (name, background).
- Candidates are clustered in groups, each has a maximum of six candidate. Each candidate will have at least one mentor (instructor or instructor candidate, who in turn is coached by another instructor), who will be available for advice, open for questions, and able to provide help if there are any relevant problems relating to the course. The mentor will be the one who follows up on the candidate's trajectory and presents this at the faculty meetings.
- The 1-day course teaches the candidate skill levels, going from basic to intermediate skills. Still, it is only a 1-day course, not a 5-year training. Clear choices are made in terms of what is trained (in view of the course objectives and associated predefined goals). To be able to meet these goals, time management is crucial. Additional questions, not part of the sessions, can always be discussed in the breaks or might be answerable by going onto the learning platform.
- The EPALS course is part of a continuum. *Knowledge and skills rapidly decline if not regularly retrained*. Retraining should be done at the local level (in-hospital mock codes) but ERC offers as part of this course and certification **COSY** a platform for on-going learning – retraining and recertification.
- It is also important to remember that the well-known Formula for Survival (see *background learning materials*) incorporates Science and Education but also Implementation. Implementation is region, hospital or department specific, with every healthcare working in that setting having shared responsibility.

Before joining the hands-on part, we expect everybody to be fully prepared in terms of knowledge. A final check about the candidate's preparedness is done by completing the pre-course test. Knowledge, skills and importantly attitudes and performance are further evaluated during the hands-on course in a continuous and structured way. For this, each of the sessions has predefined learning goals which we expect the candidate to attain before the end of the course. The faculty will closely follow each candidate's learning trajectory and provide structured feedback during the different mentor-mentee meetings.

CHAPTER 3

RECOGNITION OF THE CRITICALLY ILL CHILD

! **Whole group - day 1: 30' (minimal 20') - start of the course**
Material/class: Flipchart or board (optional: a few supporting slides or CoSy materials)

The whole session is build up around a clinical case. The instructor guides the candidates to identify the questions they need to ask themselves when confronted with a severely ill child and come to a final algorithm, highlighting the acronyms used as memo- technical aids and the continuum of compensation and decompensation physiologies. This is not a discussion session. The instructor builds on the knowledge the candidates already have from the pre-course preparation. If this preparation was not sufficient, then more time might be needed to finish this session.

9-month-old Lucy has 'breathing difficulties'. She is crying and breathing rapidly. Temperature 37.8° C	
How to start?	<ul style="list-style-type: none"> • Observation 'Quick Look' (Behaviour – Breathing – Bodily Colour) identifies a child at risk. Any case that is potentially 'in danger' should be further evaluated using SSS-ABCDE.
What if this child was unconscious?	Check for cardiac arrest (see BLS later today)
How to evaluate Airway patency?	<ul style="list-style-type: none"> • Look, listen, feel: when is the airway likely to be patent? • Clear airway & stable? At risk? Obstructed?
What is typical for children?	
How to support?	<ul style="list-style-type: none"> • Open [Position - head tilt – chin lift] – aspirate (if necessary e.g. thick secretions) – airway adjuncts? • Assess – treat – reassess. Anticipate problems!
<i>Lucy's airway is free, some secretions in the nasopharynx</i>	
What is 'breathing'?	Oxygenation & ventilation are two interacting but separate parts of B

How will a child look when it has early signs of respiratory failure?	<p>Look for RWTO:</p> <ul style="list-style-type: none"> • Rate (normal values - evolution); too fast or too slow (fatigue, neurological disorders) • Work of Breathing (signs); Respiratory failure can be present without respiratory distress • Tidal Volume (including auscultation: symmetry of chest wall movement, breath sounds...) – A rising chest does not guarantee air-entry • Oxygenation (colour, SpO₂)
What is typical for children?	
Additional bedside information can be obtained from capnography – blood gas – ultrasound	
<i>Lucy has a RR of 45/min, increased work of breathing, good air entry, some crepitations and slight wheezing on auscultation, SpO₂ is 92% on air.</i>	
How and when to support oxygenation here?	Initial 100 % oxygen, and then titrate oxygen in view of SpO ₂ . No details here on how to deliver FiO ₂ (next session: AB).
How and when to support ventilation here?	Assess – treat – reassess. Anticipate! No details on BMV here, comes in AB session later.
What will happen if Lucy decompensates? How then to support her respiration?	<ul style="list-style-type: none"> • Signs of decompensated respiratory failure • Importance of early support to avoid decompensation
What is 'Circulation'?	Perfusion – Tissue oxygenation
How will a child look when it has early signs of circulatory failure?	<p>5P:</p> <ul style="list-style-type: none"> • Pulse/Heartrate (normal values - evolution) • Pulse Volume (distal vs. central) • Peripheral perfusion (signs, including renal output). Circulatory failure can exist with normal capillary refill and bounding pulses (vasodilation). • Preload (signs of 'backward failure') • Blood pressure (normal values, importance of 'mean')
What is typical in children?	
Additional bedside information can be obtained from capnography (non-invasive, via nasal cannula) – blood gas (indications?)– ultrasound. (if competent) ...	

<i>Lucy has a HR of 170/min, no signs of decreased perfusion or increased preload, BP is normal for age.</i>	
What will happen if this worsens? How then to support her circulation?	<ul style="list-style-type: none"> • Signs of decompensation • Anticipate! • Assess – treat – reassess. • No details on treatment possibilities...
How to evaluate 'Disability': the endangered brain?	<p>Evaluate level of consciousness: GCS, GCS-motor, AVPU?</p> <ul style="list-style-type: none"> • Asymmetry? Posture? • Evaluate pupils • Are there convulsions? Signs of imminent herniation? • Check blood glucose <p>No further detail about neuroprotective care here</p>
What is typical in children?	
'Environment - Exposure': What is the minimal information needed to assist stabilization?	<ul style="list-style-type: none"> • What is the reason for presentation? Why are the parents worried? • Does the child have pain or discomfort? • AMPLE (relevant for trauma, but also for other cases)
What is typical in children?	
<i>The final evolution is towards cardiorespiratory failure:</i>	
<ul style="list-style-type: none"> • At the level of the tissues and organ, this evolving picture will lead to a mismatch between O₂ delivery and O₂ consumption. This results in anaerobic metabolism and lactic acidosis. • Initially the brain and heart are protected by physiological compensatory mechanisms but when these fail, there is progression to decompensation with agonal breathing (gasping) & bradycardia (which ultimately, without treatment, results in cardiac arrest). • Thus, the prognosis depends on the prevention of seriously illness, its early recognition & the delivery of appropriate resuscitation. 	

CHAPTER 4

ABC EMBEDDED KNOWLEDGE AND SKILLS

! **Small group 75' (or 2 classes of 35' each, switching one time; minimal duration 60').**

Material/class: Board or flipchart; ALS baby and/or junior or pediatric intubation head (to accommodate airway adjunct, LMA...); various sizes of bags and masks; sizes of oropharyngeal and nasopharyngeal airways (or shorten tracheal tubes with safety pins); suction equipment; different types of oxygen devices (nasal prongs, masks, non-rebreathing masks with valves...); IO needles (optional); Peripheral catheters, syringes, fluids (250 mL or 500 mL Ringer's Lactate); Gloves/aprons – cleaning material.

A story line is used (to place the learning in context and increase motivation) and when needed, the instructor calls for a time-out to practice a skill (this can be done in smaller groups). Keep using the systematic ABCDE approach as explained in the introductory session but do not repeat what was already explained, unless there are specific questions suggesting major misunderstandings about the ABCDE-approach! The focus of these sessions should be on the predefined learning goals, listed below.

Stick closely to the content. Do not overload the session with details but take sufficient time to teach the core issues and the predefined goals for each session. Keep to the course program's timing. You can always use the videos from the CoSy VLE as additional didactic material.

! **LEARNING GOALS**

At the end of this session the candidate should know (and be able to):

- **how and when to deliver oxygen;**
- **how to open and maintain an airway, according to age, including the use of an oropharyngeal airway;**
- **how and when to perform bag-mask ventilation, both the single-handed and the 2-person ventilation techniques**
- **what to consider and how to react when bag-mask ventilation fails (DOPES);**
- **what different types of shock exist and how they each affect subsequent treatment;**
- **how and when to give fluid in shock and what kind of fluids;**
- **how to recognise and respond to arrhythmia;**
- **how to prepare and administer adrenaline during resuscitation**

3-year-old Tony is diagnosed with pneumonia. He has some difficulty with breathing. The general practitioner refers him to the ED.

As in the introductory session: Quick look – ABCDE – Airway – Breathing....

Airway opening is conditional for subsequent B: positioning, suctioning, airway adjuncts...

- Suctioning careful in young children to avoid vagal responses vs young children nosebreathers...

Oxygenation & ventilation are two interacting but separate parts of B

How to support oxygenation: FiO₂ – PEEP

- devices (flow – FiO₂ – PEEP): nasal prongs – mask – non-rebreathing – HFNC (advanced e.g. NIV) ...
- monitoring: SpO₂ (! Once possible to measure SpO₂ (or paO₂): titrating FiO₂ to 94-98% and frequent clinical reassessment)
- other measures: ABCDE (interaction) - positioning – comfort e.g. need for IV access (agitation induces oxygen consumption but might also be a sign of hypoxia) – causal treatments (*see scenarios later*)

How to support ventilation: MV = TV * RR

- devices: BMV - SGA/TT ventilation (competent providers – *see further in the session*) ...
- monitoring: ETCO₂, (SpO₂) – clinical parameters
- other measures: ABCDE (interaction) - positioning – identifying and treating the cause

! TIME OUT CRUCIAL SKILL: BMV

- bags, valve, masks...: (dis)advantages of different devices, choice of mask; role of valve
- risk of hyperventilation? hypoventilation?
- how to allow spontaneous breathing with bag (difference between self-inflating and anaesthetic bags)?
- how to evaluate effectiveness of ventilation?
- potential reasons for ineffective ventilation?

Technique: One-person (E-C clamp); Two-person **PRACTICE**

Sudden rapid deterioration during BMV: consider DOPES + what can you do?:

- Displacement e.g. mask leak
- Obstruction e.g. airway positioning
- Pneumothorax
- Equipment
- Stomach

! TIME OUT CRUCIAL SKILL: AIRWAY ADJUNCTS

- In case of decreased consciousness...to keep A & improve B
 - Oro- or naso- pharyngeal airway
- Technique - indications and (dis)advantages; sizing and insertion **PRACTICE**

One-year-old Lucy is brought to the Emergency department by her parents. She is unwell, irritable and crying and has a high fever (39 °C).

Observation 'Quick Look' (BBB) identifies a child at risk. This child is potentially in danger, so the only way to approach is ABCDE.

The instructor starts with the evaluation of AB; A is patent but at risk; the child shows rapid but sufficient breathing, respiratory rate is 40/min, SpO₂ is 95% in air. There is no need to give oxygen at this stage.

A candidate then evaluates C (5P): HR 170/min, BP 85/40 mmHg, capillary refill 2s, warm skin, bounding pulse.

CIRCULATORY FAILURE: HOW TO MONITOR? HOW TO SUPPORT?

Compensation – Decompensation continuum

- Anticipate problems
- Assess – treat – reassess..
- Oxygen, when to give and how much (availability of SpO₂ or not- aim to 94-98%)
- Vascular access
- Fluid: which? How much (being cautious – reassess after)?
- Monitoring: clinical, ECG, blood gas - lactate, urinary output...

In the case of decompensated shock, BMV is often needed and there might be an indication for rapid-sequence intubation. This is, however, a dangerous thing to do. *The case continues with evaluation of D, which is still normal. There is hyperglycaemia (PS this is not diabetes). Finally, E is considered. Causal emergency treatments are part of this evaluation.*

What are the most important causes of shock (in this case but also in general) and how do they affect treatment?

- Distributive with the accent on
 - Septic (both with vasoconstriction or vasodilation): importance of early vasoactive drugs; which? how to calculate/prepare? (according to protocol: early antibiotics, ? steroid...)
 - Anaphylaxis: Adrenaline IM
- Hypovolaemic/Haemorrhagic
- Cardiogenic –
- Obstructive
- Dissociative

What if it is instead Lilly who presents with being unwell, inconsolable and with mottled skin (and rather sudden in onset)?

An instructor starts the case (quick look) and quickly walks through AB. SpO₂ is 94 %, which improves with oxygen. The case is continued with the evaluation of circulation. There is tachycardia 240/min, a prolonged capillary refill time of 4 sec., cool extremities, mottled skin (decrease of peripheral perfusion), palpable distal pulses, hepatomegaly (palpable liver 1-2 cm).

Recognise shock. How to support the circulation? What might be the cause and how would this affect treatment?

- See other cases - Importance of ECG

How to differentiate causes of arrhythmia: core questions?

- Are there signs of life (otherwise arrest algorithms)?
- Are there signs of impaired circulation, shock?
- Is the heart rate fast or slow?
- Are QRS complexes narrow or wide?

Examples of ECG prints are shown to clarify. To recognise abnormal values, one needs to know what is normal (table, ...)

This case is a SVT. How would you know?:

- Sinus tachycardia versus SVT
- Adequate support as above is needed but also early help in view of cardioversion...
- In case of any arrhythmia always first evaluate whether or not there are any signs of life!!

What if it was Lola 10 years who came in with signs of decompensated shock after a traffic accident (having e.g. a splenic rupture), developing progressive shock)?

Airway is patent (but at risk if decreasing consciousness). Respiration is shallow and the respiratory rate is 30; Oxygen needs to be started. C is then evaluated: HR 150/min, BP 80/-mmHg, capillary refill 5 sec, the skin is pale and cold, distal pulses weaken.

What are the potential causes of shock in trauma? Does this have consequences for treatment?

- Haemorrhagic >> – Obstructive - Cardiogenic– Spinal – Neurogenic
- internal or external bleeding is actively searched for (clinical, imaging...). Importance of early surgical input and early blood products..

CHAPTER 5

MENTOR – MENTEE 1

This first intervision between the mentees and their mentor is a **10 minute** conversation.

The mentor will initially use an open question approach to ascertain how comfortable the mentees are with the amount of knowledge and skills needed for this EPILS course.

By giving focused feedback about the results of the final pre-course test, the mentor will then more specifically try to identify gaps in knowledge and skills (as perceived by either the mentor or the candidates themselves).

If needed, a plan of action can be proposed to improve the learning trajectory and how this will be assessed during the coming 2 days.

Specifically, given the current pandemic, the mentor should also check how safe the candidate feels regarding COVID. Does he or she has any concerns? Does he or she fully understand the safety measures to be taken during the course?

!! CONTINUOUS ASSESSMENT

It is the task of the mentor to keep track of the learner's trajectory throughout the course (via the evaluation sheet) and whether or not a candidate attained the goals defined for each session and showed to have sufficient knowledge and skills, to perform in an adequate way and to have an appropriate attitude while attaining the learning goals. To do so, the mentor will also have to obtain the necessary information from the other instructors who worked with the mentee throughout the course. The mentor will present the candidate's progression at each of the faculty meetings.

CHAPTER 6

DEMO + INTERMEDIATE ABC SCENARIOS

! **Demo 15-20' whole group; afterwards scenarios up to 4 parallel classes of 90' (minimal 60');** this session always comes after the ABC knowledge and skill stations.

Material/class: BLS-ALS manikins (size according to the scenario), gloves- gowns – surgical masks, non-rebreathing masks, oro-/nasopharyngeal airways, bag and masks, peripheral catheters, syringes, Balanced crystalloid 500 ml, supraglottic airway (optional), SpO₂ probe – monitoring.

Ideally, you have the availability of simulation monitors to guide the scenarios – if not you will have to use a white board and write parameters down.

! **LEARNING GOALS**

At the end of this session the candidate should be able:

- to assess a critically ill child in a structured way and remember to reassess regularly;
- to identify the need for and start up vital treatments (oxygen, BMV, fluids, medications);
- to communicate in a good way between the team;
- to correctly identify the need for and to adequately perform specific technical procedures (BMV);
- to interpret the knowledge they (should) have about specific pathologies within the context of a specific scenario.

All scenarios are built on the ABCDE assessment. The candidate receives a short clinical scenario, and before starting the scenario (waiting the child's arrival into the ER), the candidate has the opportunity to estimate the weight (e.g. by using a length-base tape or a memory card / app), check relevant drugs dosages and vital sign parameters.... This helps the candidate to prepare themselves for the scenario. In subsequent scenario's this 'preparation' should be kept short and concise, in view of the overall time management of the session.

Candidates should further ask questions or ask for monitoring to obtain additional information or clinical parameters (that are not visible...). Parameters will be available once the candidate monitors the patient or acts to obtain them (e.g. auscultation, blood pressure...). Safe approach in-hospital means airway barriers, gown, gloves, and/or masks if required.

Scenarios and their circumstances should be plausible (healthcare roles and clinical situation) and feasible. Don't correct during scenarios and avoid too much talking on behalf of the instructor as this will disturb the candidate and the flow for the scenario.

To do so, we divide the work between 2 instructors:

- one leading the scenario, giving both the info that is not visible 'clinically or on screen' (take care to avoid 'prompting') and writing down on a dashboard (electronic e.g. iPad – PC or on a white board) all 'monitor' information. He or she will further alter this info according to the scenario progression. *In case there are more than 2 instructors, the above tasks can be divided between two instructors.*
- The other instructor observes (no other distracting tasks) the scenario and then facilitates the debrief – feedback process.

During the first day, none of the scenarios should deteriorate to a cardiac arrest. If the candidate's approach means that the scenario continues to deteriorate rapidly towards becoming a cardiac arrest, then the instructor should call for a time-out to feedback, looking for clues and reasons why this is happening (as by '*learning conversation*'). From an educational point of view, it is never wise to let a scenario get 'out-of-control'.

DEMONSTRATION

The session starts with a demonstration for the whole group, using the same approach as per the subsequent scenario training, but with an instructor as 'candidate'. Use **scenario 1** for this.

Demonstrations are presented in a way to diminish barriers such as fear, to make the candidate at ease with the format and to emphasize important knowledge and skills used during the scenarios, looking to fulfill predefined goals.

Demonstrations should be delivered as close as possible to being perfect examples of how to manage an optimal scenario. Rehearsal is therefore mandatory before the demonstration (*or alternatively, especially during the pandemic, the instructors can use a controlled scenario recorded on video, provided this is of high quality for what concerns both recording and performance*). The demonstration should end with a summary of the situation by the instructor playing the role of the candidate but not with an evaluation of their actions him. *However, if happens certain things are done 'suboptimally' during the demonstration, these need to be pointed out so that there is no incorrect learning.*

INTERMEDIATE ABC SCENARIOS

In respiratory and circulatory failure scenarios, each candidate acts as team leader with only a small team (max. two 'helping hands'). The team leader will make most decisions and coordinate the scenario whilst the other candidates will act on direct orders from the team leader. The focuses in these ABC intermediate scenarios are on the recognition, assessment, and initial stabilization and less on team interactions. However, at least the communication between team leader and team members should be done according to the close loop model, both during the demonstration and during the scenarios.

One instructor tells the story and will be both giving the information that is not visible when asked for or when the candidate acts to obtain them, as well as adding the visible 'monitor' information to an electronic screen or a whiteboard. Each scenario has different pre-defined states e.g. vital signs or clinical features, which can be reached when certain actions are done or not done. In reality parameters would be more variable, but we can make abstraction of this and use semi-continuous states instead, without diminishing plausibility and feasibility of the scenario as such.

Scenarios are mostly happening at the ED, but depending on your local reality the context and setting and the possible and/or wanted actions might be adjusted in some scenarios. Try to stay as generic as possible, we want candidates to reach the learning goals of the EPALS course, not of a dedicated course focused on only one specific healthcare context.

As far as feasible, end the scenario with a structured handover using the RSVP model. Scenarios should last 5 to 7' minutes with an additional 5' for structured feedback (*see addendum 'learning conversation'*).

N.B. In the quick look "-" means clearly abnormal and "+" normal

RSVP is proposed for handover in the context of 'emergencies'.

Do not forget to start with an Identification of yourself and the patient.

The **R** stands for **reason**: why are you calling, what's the acute problem.

The **S** then stands for **story**: the short history and circumstances leading to the current incident; actions performed by the team up till now...

V for **vitals** identifies the current vital parameters and relevant patient results.

Finally, **P** indicates the need for a **plan**: what is expected from the accepting team, what the referring team can do in the meantime.

SCENARIO 1 = 6W OLD JULIE		NORMAL VALUES
<p>A mother brings in her baby who has been sniffy, had a cough and been off feeds for 3 days. The mother is worried because Julie is less responsive. She arrives at the ED.</p>		5 kg RR 25-60 HR 110-180 BP syst 75 (> 50) BP mean 55 (> 40)
<p>LEARNING POINTS Case of acute bronchiolitis with decompensated respiratory failure and mild hypovolaemia</p> <ul style="list-style-type: none"> • emphasis on quality of BMV; importance of reassessment • discuss need for, and risks of intubation, how to prepare, what are the risks... <p>Optional: place of blood gas analysis, Glucose, electrolytes</p>		
<p>SCENARIO 1 INITIAL STATE</p> <p>A partially obstructed, lots of secretions B bilateral wheezing, tachypnoea; distress++ C pale and mottled; CR 4sec.; cold extremities; weak distal pulses; liver 1 cm, jugular flat. D AVPU, M5, less interaction</p>	<p>B- B- B-</p>	<p>ONCE MONITOR ATTACHED: RR 70/min SpO₂ in air 70 % HR 180/min BP 80 / 50D</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: safe approach, help; open AW & keep open (including suctioning secretions) B: FiO₂ 100 %; inspection, percussion and auscultation; deliver BMV and assess effectiveness C: IV access; crystalloid 10ml/kg D: glycaemia 135 mg/dl</p>	<p>If no AB stabilization: parameters remain the same (eventually time-out, because cardiac arrest is near)</p> <p>If AB stabilization but no fluid bolus: more alert; less WOB, SpO₂ to 94 %; HR 172/' BP 80/45mmHg, CR remains 4 sec.</p>	
<p>RSVP</p>	<p>call medical emergency team</p>	

SCENARIO 2 = 5M OLD GINNY		NORMAL VALUES
<p>A 5-month-old infant arrives at the ED with fever, cough and tachypnoea. During assessment in the examination room, she progressively deteriorates. There is no history of choking or trauma.</p>		7 kg RR 20-60 bpm HR 105-175 bpm BP syst. 85 (> 60) mmHg BP mean 65 (> 45)mmHg
<p>LEARNING POINTS Case of Pneumonia with decompensated respiratory failure</p> <ul style="list-style-type: none"> • Oxygen therapy for oxygenation but here also need for ventilation • Importance of adequate BMV • Identify need for intubation and how to prepare 		
<p>SCENARIO 6 INITIAL STATE</p> <p>A at risk B shallow, irregular, symmetric, cyanotic, grunting C cool extremities, mottled, CR3-4sec. D obtunded, AVPU, M4</p>	<p>B- B- B-</p>	<p>ONCE MONITOR ATTACHED: RR 60 bpm SpO₂ in air 69% HR 200 bpm BP 90 /47</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: AW open but at risk, FiO₂ 100 %; auscultation; BMV C: IV access, 10 ml/kg crystalloid</p>	<p>If airway opening and 100 % oxygen: SpO₂ goes up to 76 % but no further improvement in state and followed by a progressive decline – decreasing heart rate and resp. rate (might end with instructor calling for time-out)</p> <p>If also accurate BMV: progressive normalization, remaining tachycardia unless also fluid bolus</p> <p>Determine need for intubation and expert help; prepare...</p>	
<p>RSVP</p>	<p>call medical emergency team; Chest X-Ray, IV antibiotics</p>	

SCENARIO 3 = 19M OLD TIM		NORMAL VALUES
<p>A 19-month-old infant arrives at the ED. The mother reports that the child is having watery diarrhoea and vomiting the last 2 days. He is sleepy and not eating any more. There is no fever.</p>		13 kg RR 20-40bpm HR 90-165 bpm BP syst. 95 (> 70)mmHg BP mean 70 (> 50) mmHg
<p>LEARNING POINTS <i>Case of hypovolemic shock</i></p> <ul style="list-style-type: none"> • Fluid therapy: place of crystalloids, glucose, bicarbonate and vasoactive drugs? • Risk of hypoglycaemia – electrolyte disorders... • Avoid repeated attempts for IV line – IV line needs to be working appropriately, otherwise an IO is preferable • Need to evaluate blood results / blood gas (in terms of electrolytes, acidosis...) 		
<p>SCENARIO 8 INITIAL STATE</p> <p>A at risk B pale, normal auscultation, some tachypnoea C very weak distal pulses, proximal pulses present, cold extremities, CR5sec., no signs of increased preload D AVPU, M4, no interaction with parent</p>	<p>B- B+ B-</p>	<p>ONCE MONITOR ATTACHED: RR 60 bpm SpO₂ in air 94% (difficult to measure) HR 200 bpm NARROW COMPLEXES BP systolic 65 mmHg mean 45 mmHg</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: AW open, initial FiO₂ 100% (afterwards titrated); auscultation C: Secure and reliable adequate IV access is not possible, so choose IO access to give + 10ml/kg crystalloid bolus. Three boluses needed eventually. CHECK electrolytes - glycaemia</p>	<p>If adequate ABC, <u>including</u> first fluid bolus: HR 180 bpm – SBP 75mmHg – CR 4sec. If <u>subsequent</u> fluid boluses: return to near normal If <u>no</u> fluid bolus: situation remains unchanged If <u>treatment of tachycardia by drugs or cardioversion, if use of inotropes instead of fluids, if use of glucose or bicarbonate instead of fluids</u>: call for time-out</p>	
<p>RSVP</p>	<p>Call medical emergency team. Cultures but no need for antibiotics at this stage.</p>	

SCENARIO 4 = 4Y OLD PHOEBE		NORMAL VALUES
<p>A 4y old girl presents at the consultation with abdominal pain and fever. She is drowsy and her mother is very worried.</p>		16 kg RR 17-30bpm HR 70-145 bpm BP syst. 100 (> 75)mmHg BP mean 75 (> 55)mmHg
<p>LEARNING POINTS <i>Case of septic shock</i></p> <ul style="list-style-type: none"> • Fluid therapy: place of crystalloids, glucose, bicarbonate and vasoactive drugs? • Avoid repeated attempts for IV line – IV line needs to be adequate or IO is preferable • Causal treatments in E (surgeon, antibiotics..) • Differential diagnosis? 		
<p>SCENARIO 9 INITIAL STATE</p> <p>A at risk B Symmetrical air entry. Tachypnoea C cool extremities, mottled, CR5sec., liver at costal margin, weak distal pulses D drowsy, moans when abdomen is touched</p>	<p>B- B+ B-</p>	<p>ONCE MONITOR ATTACHED: RR 35 bpm SpO₂ in air 94% (difficult signal) HR 170 bpm SINUS RHYTHM, BP systolic 65 mmHg BPmean 38 mmHg</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: AW open, initial FiO₂ 100% (afterwards titrated); auscultation; BMV to be considered if ventilation becomes inadequate C: IV access possible; fluid bolus 10ml/kg – to be repeated several times (at least 3 boluses) + consider vasoactive medications <u>Despite adequate ABC, including first fluid bolus: situation initially unchanged</u></p>	<p>If <u>2 subsequent</u> fluid boluses: HR 160 bpm; SBP 75 mmHg mean 43 mmHg; CR4-5sec. (If <u>vasoactive medication used</u>: progressive improvement) <u>If treatment of tachycardia by drugs or cardioversion, use of glucose or bicarbonate instead of fluids and inotropes</u>: call for time-out</p>	
<p>RSVP</p>	<p>Consider early antibiotics – check glucose and electrolytes – take cultures - <u>call for surgical help</u></p>	

SCENARIO 5 = 3M OLD HUGO		NORMAL VALUES
<p>A mother brings in her baby to the ED. He has been sniffy, had a cough and been off feeds since yesterday. Today he seems to be very irritable. When you enter the room the child starts convulsing.</p>		6 kg RR 25-60 bpm HR 10110-180 bpm BP syst. 75 (> 60) mmHg BP mean 55 (> 40) mmHg
<p>LEARNING POINTS Case of status epilepticus in a child with subdural hematoma, presumably due to 'shaken infant'</p> <ul style="list-style-type: none"> • Status epi need for timely and aggressive treatment, both ABC and specific anti-epileptic treatment • Need to look for etiology as this might be important for treatment (incl. glycaemia, electrolytes, imaging...) • Need to include social services and not ignore the risk of 'shaken infant' (+ ophthalmology consult) 		
<p>SCENARIO 12 INITIAL STATE B+ B- B+</p> <p>A at risk B superficial C CR 3sec., other parameters normal D convulsing E 1 ecchymosis left arm; 37°</p>	<p>ONCE MONITOR ATTACHED: RR 40 bpm SpO₂ in air 91% (difficult to measure) HR 170 bpm BP systolic 89 mmHg</p>	
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – AB: airway open; FiO₂ initial 100% (afterwards titrated) C: IV access can be considered but should not delay treatment for convulsions D: 2 doses of benzo needed (first one mucosal or IM, second can be IV) – check glycaemia and electrolytes...</p>	<p>Convulsions will only stop after second dose of benzo – child however remains comatose. Breathing is superficial. Identify need for Bag-mask ventilation. Plan for intubation...</p>	
<p>RSVP</p>	<p>call medical emergency team, ask for intubation. Identify need for imaging. Diagnosis will be subdural hematoma. Identify need for exploring 'shaken infant syndrome'.</p>	

SCENARIO 6 = 3M OLD BILLY		NORMAL VALUES
<p>A mother brings in her baby to the ED. He has been sniffy, had a cough and been off feeds for 3 days. Today he seems to have more difficulty with breathing and sometimes seems to stop breathing.</p>		6 kg RR 25-60 bpm HR 10110-180 bpm BP syst. 75 (> 60) mmHg BP mean 55 (> 40) mmHg
<p>LEARNING POINTS Case of acute bronchiolitis with compensated respiratory failure but apnoea</p> <ul style="list-style-type: none"> • Apnoea can be seen regardless of the severity of respiratory failure and might warrant intensive care monitoring, sometimes Non -Invasive Ventilation (NIV) or intubation 		
<p>SCENARIO 3 INITIAL STATE</p> <p>A patent B some tachypnoea and increased WOB C CR 3sec., other parameters normal D alert E 38°</p>	<p>B+ B- B+</p>	<p>ONCE MONITOR ATTACHED: RR 40 bpm' SpO₂ in air 93 % HR 160 bpm BP 89/38</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – AB: airway open; free flow or nasal oxygen; inspection, percussion, auscultation; no need initially for BMV C: IV access can be considered (consider local analgesia) D: glycemia 69 mg/dl</p>	<p>If too much disturbed: progression to more decompensation (SpO₂ 92-93; more tachypnoea...) At a certain point, the child shows <u>sudden apnoea</u> with progressive bradycardia that responds immediately to a short period of BMV.</p>	
<p>RSVP</p>	<p>call medical emergency team</p>	

SCENARIO 7 = 4M OLD JEAN		NORMAL VALUES
<p>A 4 month-old infant arrives at the ED. The mother reports that the child is irritable since the day before, isn't eating properly, is sweating and is not doing very well. No fever.</p>		6 kg RR 20-55bpm HR 105-175 bpm BP syst. 85 (> 60)mmHg BP mean 65 (> 45)mmHg
<p>LEARNING POINTS <i>Case of SVT (still compensated)</i></p> <ul style="list-style-type: none"> • Indications for cardioversion; in case of severe instability need for electrical cardioversion • Avoid repeated attempts for IV line – IV line needs to be established, appropriate for adenosine administration 		
<p>SCENARIO 7 INITIAL STATE</p> <p>A patent</p> <p>B moderate intercostal retractions, nasal flaring. Symmetrical air entry.</p> <p>C cool extremities, mottled, jugular visible, CR 4sec., liver 2-3 cm</p> <p>D alert, crying</p>	<p>B+/- B- B-</p>	<p>ONCE MONITOR ATTACHED:</p> <p>RR 60 bpm</p> <p>SpO₂ in air 92%</p> <p>HR 230 bpm NARROW COMPLEXES</p> <p>BP systolic/ 80 mmHg</p> <p>MAP 58 mmHg</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: patent, FiO₂ (nasal or free flow as tolerated); auscultation</p> <p>C: IV access, + consider adenosine (rhythm strip running)</p>	<p>Vagal maneuvers can be considered as far as they do not delay other procedures</p> <p><u>If adenosine or electrical cardioversion without proper preparation:</u> call for time-out</p> <p><u>If adenosine with proper preparation:</u> return to sinus rhythm</p> <p><u>Determine need for cardiology input...</u></p>	
<p>RSVP</p>	<p>call medical emergency team / cardiologist advice</p>	

SCENARIO 8 = 2Y OLD PRINCESS		NORMAL VALUES
<p>Kathy seems unwell after receiving a dose of antibiotics, which she's taking since yesterday for a cough. She progressively develops urticaria, swelling of the lips and abdominal pain. Her breathing becomes elaborate and noisy. She looks flushed. She arrives at the ED.</p>		12 kg RR 18-40 bpm HR 90-160 bpm BP syst. 95 (> 70)mmHg BP mean 70 (> 50)mmHg
<p>LEARNING POINTS <i>Anaphylaxis with compensated respiratory failure and signs of shock</i></p> <ul style="list-style-type: none"> • Discuss anaphylaxis (how to recognise differential diagnoses) and the need for <u>immediate</u> adrenaline IM; (...) place of steroids - antihistamines. • Discuss difficult airway and the need for early expert help; place of BMV and LMA? 		
<p>SCENARIO 2 INITIAL STATE</p> <p>A partially obstructed, no secretions</p> <p>B wheezing and stridor bilateral; severe WOB</p> <p>C CR 1sec.; warm; weak peripheral pulses</p> <p>D <u>AVPU</u>, GCS M5; drowsy</p>	<p>B- B- B-</p>	<p>ONCE MONITOR ATTACHED:</p> <p>RR 45 bpm</p> <p>SpO₂ in air 93 %</p> <p>HR 155bpm</p> <p>BP 70 / 34</p> <p>mean 47 mmHg</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: open AW & keep open (<i>ask expert help!</i>)</p> <p>B: FiO₂ 100 % (before SpO₂ is attached – afterwards titrated for 94-98%%); (no BMV currently needed); auscultation – IM ADRENALINE</p> <p>C: IV access; crystalloid bolus 10 ml/kg</p> <p>(DE: antihistamines?)</p>	<p>If no adrenaline: further decrease in SpO₂ 83 %, HR 170 bpm; BP 60/30mmHg</p> <p>If adrenaline but no fluid bolus: more alert; less WOB, SpO₂ 98 %; HR 125bpm, BP 80/45mmHg</p>	
<p>RSVP</p>	<p>call medical emergency team</p>	

SCENARIO 9 = 5Y OLD MIKE		NORMAL VALUES
<p>A father presents his child for a consultation. Mike is known to have childhood asthma, but the last few days things have gone progressively worse. The child is lethargic and is progressively more dyspnoeic...</p>		25 kg RR 17-30 bpm HR 70-140 bpm BP syst. 100 (> 75) mmHg BP mean 75 (> 55) mmHg
<p>LEARNING POINTS Case of asthma exacerbation with compensated (to decompensated) respiratory failure</p> <ul style="list-style-type: none"> • Allow Mike to take up a body position the child feels most comfortable in, explaining what is happening in an age-appropriate manner • Oxygen therapy • Specific treatment: bronchodilation (adequate dosing); if needed, back-to-back and interval of SABA); (...) place of other drugs (steroids, Mg...) • Place of blood gas analysis (venous or arterial?) and other blood tests versus the need for minimal disturbance.... – place of topical anaesthesia (as in previous scenario) 		
<p>SCENARIO 4 INITIAL STATE B+ B- B+</p> <p>A patent B bilateral wheezing, tachypnoea, severe distress; answers only with single words C normal D alert, a bit of panic</p>	<p>ONCE MONITOR ATTACHED: RR 40bpm SpO₂ in air 91-92% HR 155 bpm BP 129/73</p>	
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: AW open, FiO₂ 100 % (afterwards titrated)- Nebulized Salbutamol; auscultation - Nebulised Salbutamol C: IV access (depending on the child's condition) - consider rescue medications IV if no rapid improvement</p>	<p>If no AB stabilization or major disturbance: slightly deteriorating towards SpO₂ 88 % and more tachypnoea</p> <p>If AB stabilization including repeated Salbutamol: progressive normalization, remaining slightly tachycardic (because of SABA)</p> <p>Give systemic steroids</p>	
<p>RSVP</p>	<p>call for paediatric respiratory expertise / medical emergency team, and ask for further treatment advice awaiting their arrival</p>	

SCENARIO 10 = 2Y OLD PAT		NORMAL VALUES
<p>A father presents his child to the ED. The child woke up during the night with a barking cough and severe respiratory distress. The child is distressed and anxious.</p>		12 kg RR 18-40bpm HR 90-160 bpm BP sys. 95 (> 70) mmHg BP mean 70 (> 50) mmHg
<p>LEARNING POINTS Case of Croup with compensated respiratory failure</p> <ul style="list-style-type: none"> • Differential diagnosis • Allow comfort-Oxygen therapy • Specific treatment: nebulized adrenaline (adequate dosing); role for steroids 		
<p>SCENARIO 5 INITIAL STATE B+ B- B+</p> <p>A patent B stridor, distress, tachypnoea C normal D alert, a bit of panic</p>	<p>ONCE MONITOR ATTACHED: RR 40 bpm SpO₂ in air 88-90 % HR 165 bpm BP systolic 129 mmHg</p>	
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: AW patent but at risk B: Oxygen initial 100% but titrating according to need (non-threatening way of delivering!); auscultation; Nebulized Adrenaline (and/or steroids); comfort C: IV access is not necessary at this stage - anticipate by applying local anesthetics</p>	<p>If no AB stabilization or major disturbance: slightly deteriorating towards SpO₂ 86 % and more tachypnoea</p> <p>If AB stabilization including nebulized adrenaline: progressive normalization, remaining tachycardia.</p>	
<p>RSVP</p>	<p>if normalization of symptoms after some time the child may be sent to an observation unit or even home. if symptoms recurring, call PICU or observational unit, for further monitoring and treatment if needed.</p>	

SCENARIO 11 = 5M OLD GUS		NORMAL VALUES
<p>A 5-month-old infant suddenly develops severe respiratory distress and tachypnoea on the ward. Gus recently received a trachea cannula because of tracheomalacia (for intermittent CPAP).</p>		7 kg RR 20-60 bpm HR 105-175 bpm BP syst. 85 (> 60) mmHg BP mean 65 (> 45)mmHg
<p>LEARNING POINTS Case of Trachea cannula obstruction</p> <ul style="list-style-type: none"> • Need for rapid intervention – especially if child is depending on this airway for breathing • Consider first letters of DOPES: displacement or obstruction.. • STEP 1 = suction • If this is working, replace with a new canula. In an emergency situation, tracheal intubation via the tracheostomy with a classical endotracheal tube may be needed. Attention should be given to correct positioning (not endobronchial). • If the child's upper airway is patent, it may be possible to provide BMV via the mouth and nose using a conventional bag and mask whilst the tracheal stoma site is occluded. 		
<p>SCENARIO 11 INITIAL STATE B- B- B- A at least partially obstructed B irregular, work of breathing ++, cyanotic; obstructive on auscultation (in- and expiratory); not much air entry C pale D less alert, distress</p>		<p>ONCE MONITOR ATTACHED: RR 60 bpm SpO₂ in air 79% HR 189 bpm BP systolic 80 mmHg</p>
<p>EXPECTED ACTIONS - EVOLUTION (If all OK, evolution to normal)</p> <p>SSS – A: action does not have much effect, need to replace canula with tracheal tube as temporary measure (no duplicate canula yet available)</p> <p>FiO₂ 100 %; auscultation; BMV via the mouth is also effective as a temporary measure</p>	<p>If correct and timely handling of airway and breathing: recovery</p> <p>If only oxygen, no change in status but no improvement</p> <p>If no oxygenation or ventilation support, deterioration and need for time-out</p>	
<p>RSVP</p>	<p>call surgical team / ask for new appropriate canula – medical emergency team; Chest X-Ray (to exclude pneumothorax, check tube position...)</p>	

CHAPTER 7

BLS

! **Demo whole group 15' - 20'; Then classes parallel 110' minimal 60';** afternoon after ABC scenario

Material/class: at least 2 BLS Manikins (one infant and one junior), cleaning material, 1 Teaching-purpose AED, different types and sizes of self-inflating bags and masks.

Every demo should always be rehearsed. Suboptimal demo's lead to suboptimal candidate performance.

In case there are insufficient manikins for the 4 classes then 2 classes start with the infant and 2 with the junior, after which the manikin switch classes. The same is true for teaching-purpose AED.

! LEARNING GOALS

At the end of this session the candidate should be able:

- to recognise cardiac arrest;
- to perform high quality BLS in an infant and in a child, both as single rescuer or as a team, including the use of BMV;
- to use an AED in paediatric cardiac arrest cases (and know when to do so);
- to react in case of foreign body airway obstruction;
- to place a child in a recovery position.

BLS DEMO:

- **STAGE 1:** Silent demo: Two rescuers perform in hospital BLS of an infant with the use of an AED and of BMV. First helper starts alone – with BMV. Second helper to collect AED, after calling in-hospital resuscitation team. AED applied and 'no shock'. After that 2 person BMV. Switch after 2' with next AED check. Stop here. At all times take care to perform High Quality CPR (rate, depth, hands-off time of compressions – quality of ventilations (1" – avoiding hypo- and hyperventilation).
- **STAGE 2:** The instructors perform a second time the BLS scenario but now with vocal description of the actions performed by one of the instructors (or a third instructor).
- **STAGE 3:** The instructors perform a third time the BLS scenario but now with vocal description of the actions performed by a candidate.

- **STAGE 3bis:** The instructor performs a fourth time the BLS scenario but now of a child, again with **vocal** description of the actions performed by a **candidate**.

- **Short group discussion**

- What are the most frequent causes of cardiac arrest in young children? And what with older children?
- What is different with a child vs an infant?
- What is meant by 'signs of life' and why is this important? What is meant by 'gaspings'?
- The risk of doing harm with chest compressions in patients that are not in cardiac arrest is very low
- Which sequence of EMS activation should be used, with 2 or alone, with or without a mobile phone? What in case of sudden witnessed collapse?
- What to do with mouth-to-mouth ventilation in cases where there is no BMV available?
- The importance of BLS quality -in terms of airway opening; compression rate, depth, recoil; hands-off time- is emphasized.
- What would be different if 2 rescuers prehospital and no BMV or pocket mask available (1 rescuer performs- switch every two minutes)?

The possibility is given to ask 'burning' questions but it is indicated that most of it will clarify itself further during the subsequent sessions.

OPTIONAL: STAGE 3 and 3 bis can also be done in the smaller groups

BLS KNOWLEDGE & SKILLS:

PART 1 (20-25'): The group is split in 2 and candidates practice either BLS of infant or of child, first as a lone rescuer, then with a second rescuer taking over.... The small groups switch after 10'.

Some comments can be given during the candidate's performance provided the candidate is allowed to progress into the sequence (e.g. if the candidate is unable to open the airway and to demonstrate visible chest movement: the instructor may help the candidate to correct head position allowing him to continue progressing into the sequence.) After the candidate has completed the sequence some additional feedback can be added.

The last minutes of the session the group comes back together next to a child that has been resuscitated and starts to breath spontaneously (remaining unconscious). The instructor puts the 'child' (played by an instructor) into the recovery position, explaining each step. The indications for recovery position are mentioned, including

when and how to restart BLS when indicated (do not miss cardiac arrest!). Candidates briefly practice (5').

PART 2: and then comes the AED (20-25')

What are the most frequent causes of cardiac arrest in children and for which of them an AED would be beneficial? The concept of 'sudden witnessed collapse' is explained. The lower priority of AED in traumatic cardiac arrest is also mentioned (unless e.g. electrocution).

What are the risks and limitations of current AED's? Are these age-related (< 1 years, < 8 year...)? Context-specific (e.g. swimming pool...)?

Two instructors repeat a demonstration of a BLS scenario of a child (as a stage 2 demo to allow to for specific explanation). One starts BLS of the child, the second instructor calls for help and brings an AED; the AED is attached. The rhythm is non-shockable and BLS is immediately restarted. BMV with a 2-person approach is used. Professionals should anticipate the phases of the AED and not wait for specific instructions to restart BLS.

Explanation is given during the repeat demo. Attention is given to the timing of AED introduction, the appropriate use, and the related safety issues. BMV is used in a two-person approach. Emphasis on avoidance of hypo- and hyperventilation.

Afterwards candidates practice BLS of an infant/child with use of AED. Rotate so that at the end each candidate has been able to work with the AED.

- **Case 1:** 16 month old baby after a sudden witnessed collapse during cardiology consultation. CPR is started with BMV. An AED is available for use and needs to be attached ASAP. The rhythm is shockable. The case ends after the second shock has been given.

Discuss: etiology of arrest (hypoxic or primary arrhythmia); place of AED; decisions with regard to ventilation (mouth-to-mouth only if willing and able (but not trained in EPALS during the pandemic); preferably 2-person BMV; if needed starting with compressions(-only) until BMV arrives.

- **Case 2:** a 9y old child after drowning in the swimming pool. BMV. An AED is available for use but emphasize should also be placed on quality of CPR given. Once AED attached the rhythm is non-shockable.

Discuss: rescuer safety; airway opening (? trauma patient: 'jaw thrust'; vomit in mouth...); etiology of arrest (hypoxic or primary arrhythmia, priority in drowning resuscitation (discuss electrocution risk)) – place of AED – high Q CPR

Give the candidates the possibility to ask final questions. If somebody indicates to need more practice this should ideally be planned before the beginning of day 2. If one of the candidates has problems with technique or algorithm this needs to be identified and remediated before the candidate can participate in day 2.

Part 3: FBAO 15-20'

What are the causes and what should you do if the chest does not rise?

A 4-year-old child is playing with his 16-month old brother. Suddenly the little boy is coughing then the cough becomes silent. The 4-year-old calls his 'nanny'. An instructor will act as the rescuer/nanny. Once the scenario reaches the state of 'ineffective cough' the instructor starts choking maneuvers according to the child age.

Together with candidates the CHOKING algorithm is completed.

Some additional clarifications are given.

- how to recognize a presumed foreign body aspiration?
- Manoeuvres will depend on: Conscious or not? Effective coughing or not?
- How long to continue the maneuvers? When to try and extract a foreign body from the airway? When to call for help?
- Differences between child and infant?
- What to do when this child presents to the ER? When to use a Magill forceps?

Chest thrusts and back blows are demonstrated for the infant and Abdominal thrusts – back blows for the child. Afterwards candidates practice different scenarios.

CHAPTER 8

MENTOR – MENTEE 2

This second intervention between the mentees and their mentor is again a **10 minute** conversation.

The mentor will use an open question approach to ascertain how comfortable the mentee is with the newly obtained knowledge and skills. How has this progressed over the day? Are there any problems the candidate identifies or things that surprised in a positive way for what concerns knowledge, skills and overall performance?

As a mentor, use learning conversation techniques. Also inform the candidate about the perception of the instructor team about his / her knowledge, skills and performance. If gaps are identified during this mentor-mentee meeting, consider together how to address them.

APPENDIX

APPENDIX 1: LEARNING CONVERSATION

The central aim of the learning conversation is to promote and support greater self-awareness of the individual student and develop competences as part of the learning trajectory of the EPILS course candidate. Learning, particularly in the context of resuscitation, is demonstrated by a change of behavior and is facilitated by feedback (whether during skills teaching, in workshops or in simulation). To this purpose, the learning conversation is an empathic, respectful listening and advising conversation between adults.

Adults are independent learners and generally choose to learn what they feel is relevant to them. They construct their learning on what they read, hear, see, and do and the degree of retention depends on their perspective of what is useful. Adult learners want their learning to be personally significant (where am I now?), relevant (where do I want to be?) and achievable (how can I get there?). All of this has to be achieved in a short space of time on courses.

The learning conversation aims to create meaning from experience using **a facilitator and peers and promotes reflective practice through reflection on action, both by the lead individual and by the team**. Performance during simulation can be reviewed, explored and linked with prior knowledge, promoting higher levels of activity within the cognitive domain leading to deeper learning. Such a structured debriefing is a discussion to identify key points for learning, to correct errors, allow questioning and promote effective understanding. The support of a good team for this process helps maintain the self-esteem of the individual candidate.

THE PROCESS

The process itself needs to be started with an opening remark to encourage the candidate to tell their concerns. Debriefing should promote self-reflection by the candidate and of the whole group and as such, generate ideas, suggestions and collaboration.

The conversation requires both the **facilitator** and the learner to be active listeners, attentive and reflective. The facilitator gains an impression of the learner by inquiry and then offers their frame of understanding back to the learner. This process of 'Advocacy with Inquiry' offers a mirror of understanding with which the candidate can concur or refute.

This exploration requires patience as the candidate needs to reflect and then tell their narrative. Both the facilitator and candidate(s) seek to bring the candidate's (and group) knowledge – skills - attitudes to the surface and find alternative ways of doing things. If necessary, it may be remedial- correcting knowledge or skills or building confidence with regard to their role within the team.

Feedback needs to be empathic in order that self-esteem and confidence is not damaged. Learning is viewed as a spiral curriculum of revisiting and extending knowledge and skills, scaffolding and reinforcing, and with encouragement slowly or swiftly improving progress. Such a spiral approach means the initial focus of instruction is the basic facts of a subject, with further details being introduced as learning progresses. Throughout instruction both the initial basic facts and the relationships to later details are repeatedly emphasized to help enter into long-term memory.

Active listening

Active learning is about hearing what the other person is communicating, both verbally and non-verbally and responding to what has been heard. The facilitator must be enthusiastic and focused as active listening means being aware of one's own emotions, body language and language content as well as those of the candidate. Active listening is non-judgmental and allows the student's view to be heard and understood and it therefore depends a great deal on the attitude of the facilitator.

Thoughts, feelings and irritations concerning candidates can affect our ability to listen actively. Correctly channeled these can show empathy and be supportive to candidates. The learner's feelings, opinions and person should be respected valued with respect for their fears and hesitancy. This will also increase the confidence and trust of all team members to share problems.

Creating the mind set for inquiry

By posing exploratory questions within a responsive, empathic climate one is helping students develop self-directed learning. Learners should be stimulated to participate fully and freely in the learning conversation so that their knowledge and perspective can be explored and modified to achieve learning goals. Adult learners will as such reconstruct their learning needs and find new strategies to achieve those goals. Importantly, adults will resist behavioral change if they feel threatened. Reorganization of thoughts and reframing occurs better when people are relaxed.

A comfortable environment (seated, room temperature etc...) can further help candidates to relax and engage in the process.

THE STEPS

The mnemonic MESSAGE may act as a framework to help instructors develop the skills of a learning conversation. MESSAGE stands for:

Make an opening remark

Explore

Summarise

Share

Advocacy with Inquiry

Gems

Emphasise the key points

1. **Make an opening remark:** We want candidates to start talking, to tell their story and identify their own difficulties by reflecting on their action. It is better to let the narrative phase flow without interruption, the candidate is less likely to bring up new issues later in the debriefing, if they are allowed to start to talk freely. This can be encouraged using certain phrases, for example:

What are your thoughts?" "That looked hard"

"You looked as though you were enjoying the simulation?"

Show empathy using verbal and non-verbal skills but try not to interrupt.

2. **Explore** – Allow the candidate to explore key issues with their team as well as with the instructor. This allows feedback to be candidate-centered. The candidate will have their own:

-- ideas and concerns about their performance

-- expectations of what they wish to achieve

3. **Summarise the issues identified and reflect these back, two to three are enough.**

-- "so you were doubtful whether to give a second dose of adrenaline at the point?"

-- "you felt you lost control of your team then too? Am I right?"

As such you can check whether you have the right impression.

Watch their body language for receptivity.

4. **Share the impression these issues have made – share your understanding by reflecting the comments to the other team members.** "Team, you have heard this, he/she felt she lost control of the team at that point, you were the team, did you have the same impression? If so, what happened, what could have been done instead?"

5. **Advocacy with Inquiry.** Information has now been gathered and the instructor and team now have an understanding or impression of events. The term 'advocacy' means to 'speak for' someone or something (such as a way of doing things), so that 'advocacy with inquiry' is the reflection of an impression gained through questioning.

An example of how Advocacy be expressed is illustrated:

"My impression is, you were uncertain about whether or not to give the 2nd dose of adrenaline and then both you and the team feel you lost your confidence. Is that right?" By making the statement as an offering in this way the candidate now has an opportunity to agree or disagree and correct what has been said.

6. **"Gems".** Sometimes during a teaching session, one hears a statement suggesting something has not been clearly understood, but the time was not appropriate to interrupt. These 'gems' of information need to be remembered (or written down) - by the instructor and brought out in the feedback; if one person in a team did not understand something probably somebody else did not either.
7. **Emphasise the key points.** These should concern both technical and non-technical issues identified that seem crucial to the learning goals of the session and the overall course.

CANDIDATE:		MENTOR:	
TIME PERIOD	GOALS (see instructor manual)	COMMENTS	
VLE:	% completed: Time spent:		
PREMCQ	Attempts: Time spent:	Final score	%
MENTOR session 1	Knowledge: Skills: Performance: Attitude:		
FACULTY MEET 1	Knowledge: Skills: Performance: Attitude:	IP <input type="checkbox"/>	
FACULTY 2 / MENTOR session 2	Knowledge: Skills: Performance: Attitude:	2021 guidelines <input type="checkbox"/>	Paediatric BLS <input type="checkbox"/>
CONCLUSION:		IP <input type="checkbox"/>	

APPENDIX 2: ADDITIONAL BACKGROUND MATERIALS: MANDATORY READING...

- Lefroy Feedback Guidelines.pdf
- The formula for survival in resuscitation.pdf
- rudeness AND performance.pdf

these pdf can be found in COSY as part of the course materials

With the support of...

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