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# Recommended curriculum to teach and train resuscitation to school children in Germany

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This curriculum is a joint initiative of the following societies and organisations which are members of the „Deutscher Rat für Wiederbelebung – German Resuscitation Council“:

- ASB** Arbeiter-Samariter-Bund Deutschland
- BAND** Bundesvereinigung der Arbeitsgemeinschaften der Notärzte Deutschlands
- Die Johanniter** Johanniter-Unfall-Hilfe
- DGAI** Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin
- DGIIN** Deutsche Gesellschaft für internistische Intensivmedizin und Notfallmedizin
- DGK** Deutsche Gesellschaft für Kardiologie - Herz- und Kreislaufforschung
- DGU** Deutsche Gesellschaft für Unfallchirurgie
- DLRG** Deutsche Lebens-Rettungs-Gesellschaft
- GNPI** Gesellschaft für Neonatologie und pädiatrische Intensivmedizin
- DRK** Deutsches Rotes Kreuz
- Malteser** Malteser Hilfsdienst

“Deutscher Rat für Wiederbelebung – German Resuscitation Council (GRC)“ is the national body of the „European Resuscitation Council (ERC)“, the scientific society for all issues grouped around resuscitation. Further informations may be obtained from <http://www.grc-org.de>.

ASB, Die Johanniter, DLRG, DRK und Malteser collaborate in the „Bundesarbeitsgemeinschaft Erste Hilfe (BAGEH)“ the “national working group for first aid“ – <http://www.bageh.de>.

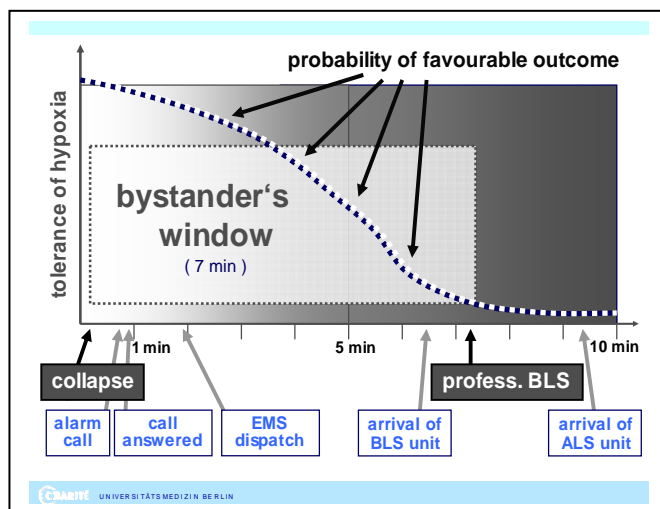
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## Background

After a sudden cardiac arrest outside of a hospital chances of survival are low. Since brain tissue tolerates no more than 4 to 5 minutes of oxygen deficiency, the emergency medical services (EMS) arrive too late in the majority of cases. In fact, under realistic conditions it takes a minimum of 7 minutes from the moment of collapse until EMS arrival (see figure).



The greatest improvement of survival rates is therefore achieved by provision of basic resuscitation by a witnessing bystander. This has been proven in a great number of studies, stating a 2 to 4-fold rise of survival rates with good neurologic quality.

In Germany the rate of bystander initiated resuscitation is low if compared to other developed countries (Scandinavia 40-70%, US 40-50%, Germany 10-15%). Hence, a substantial potential for development may be stated. From an expert point of view improvements will only be possible, if at least 20% of a population are trained. This may only be accomplished if the competence of basic life support is introduced into the course of life long learning at a very early stage. This has been done since many years in the Scandinavian countries, Great Britain, the US and Canada.


Therefore, the German Resuscitation Council proposes a mandatory basic curriculum for school children. It seems important to repeat teaching of these competencies several times during the school career to anchor them at different ages in the sense of a "spiral curriculum".

The amount of time needed to teach this social core competency is very modest. Between 6 and 12 teaching units (of 45 min) distributed over the whole school career would serve. Immersion into subject fields as biology, physical education or health seems reasonable, since cardiac arrest do not belong to the typical experiences of children and adolescents.

An overview of the program is shown on the next page (fig 2):

<b>G R C - recommended curriculum for resuscitation training in schools</b> - overview - <small>learning content: delivered in age-related formats</small>		
<b>Step 1</b> <b>8.-10. Ly.</b>	basic understanding of circulation call for help activation of professional help understanding of the principle of chest compressions use of an AED*	<small>unit = 45 min</small>  <b>2- 4 units</b>
<b>Step 2</b> <b>12.-14. Ly.</b>	basic understanding of circulation and cardiac arrest detection of cardiac arrest activation of professional help structured communication with EMS dispatch understanding of effectiveness of chest compressions use of AED*	<b>2- 4 units</b>
<b>Step 3</b> <b>16.-18. Ly.</b>	basic understanding of circulation and cardiac arrest detection of cardiac arrest activation of professional help structured communication with EMS dispatch delivering effective chest compressions (CCs) use of AED* delivering of effective ventilations (incl. knowledge of value in relation to CCs)	<b>2- 4 units</b>

\* AED = automated external defibrillator


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On the following pages suggestions are given for the specific design of teaching sessions, which may serve as an orientation. Contents and learning objectives represent the best possible state of evidence of the current guidelines (in this cases from 2010). Instructors could well be school teachers, for whom equivalent quality has been shown if compared to emergency physicians [Bohn 2012]. This could be the class teachers as well as teachers in biology or physical exercise.

## Literature

See appendix

## GRC – curriculum for "Resuscitation training for school children"

**Step 1** 8 -10 yrs. (3<sup>rd</sup>/ 4<sup>th</sup> grade), 2 teaching units of 45 min

### General learning objectives / Outcome-orientated competencies:

- Detection / identification of a potential cardiac arrest
- Activating competent and professional help
- Initiation or instruction of high quality chest compressions and adequate positioning of the victim

### Specific learning objectives (knowledge / skills / attitudes)

At the end of this teaching/learning session students are able to ...		dimension of learning
1	... understand the <b>time dependency of vital support</b> to help a person in a life-threatening situation	acquire attitude
2	... explain the <b>necessity to act</b> oneself (bearing in mind <b>one's own safety</b> ).	explain
3	... recognise the state of conscious of a victim and to detect <b>unconsciousness</b> .	apply <sup>2)</sup>
4	... assess breathing and <b>detect abnormal breathing</b> ("odd" or unusual sounds, slow frequency, change of skin colour) <b>and respiratory standstill</b> .	apply <sup>2)</sup>
5	... explain, that <b>simultaneous occurrence of unconsciousness and abnormal breathing</b> implicates <b>immediate action</b> .	explain
6	... state the correct <b>emergency phone number</b> .	know
7	... conduct and/or advise to undertake an <b>emergency call</b>	apply <sup>2)</sup>
8	... know about the <b>possibility</b> to use an <b>AED <sup>1)</sup></b> .	explain
9	... send someone for getting an <b>AED <sup>1)</sup></b> .	explain
10	... position a person in cardiac arrest in a <b>supine position</b> and on a <b>firm surface</b> and to <b>clear their chest</b> (or to advise an adult to do so).	apply <sup>2)</sup>
11	... perform <b>chest compressions</b> with adequate depth, frequency and hand position <sup>3)</sup> (or to advise an adult to do)	apply <sup>2)</sup>
12	... <b>maintain a „tilt head“ position</b> while performing chest compressions.	apply <sup>2)</sup>
13	... handle an <b>AED <sup>1)</sup></b> .	apply <sup>2)</sup>

1) AED: automated external defibrillator

2) on a training manikin

3) in dependence of own body weight

## GRC – curriculum for "Resuscitation training for school children"

### Step 1    8 -10 yrs. / course of session: contents and formats

	content	Details on contents	Teaching / learning format	time
1	<b>introduction</b>	„Story“ / video (adequate to age) / definition of learning goals	Presentation or (better) discussion	8 min
2	<b>Detection of arrest</b>	Check for safety ! Shake and shout / call for help Assess breathing Related conditions: sudden event, unconsciousness, agonal breathing/ arrest of breathing change of skin colour (cyanosis)	Demonstration and practical training	8 min
3	<b>Emergency call</b>	Inform about location first („where“?) further advice is given by dispatcher, hang on until dispatcher ends the call; Dispatch will provide support !	Simulation of emergency call (e.g. via cell phone in another room)	8 min
4	<b>Chest compressions (CC)</b>	Supine position, firm surface hand position, compression depth 5-6 cm, compression frequency 100-120/min, no pauses, regular change of CC providers	Demonstration and practical training 1 manikin per 2-3 students - <b>Feedback</b>	30 min
5	<b>Ventilation</b>	(not reasonable at this point of knowledge, therefore only: ) Tilt head while performing CC		0 min
6	<b>AED</b>	Principle of function, check for safety, switch on, electrode positions	Demonstration and practical training; 1 training device per 10-15 participants	15 min
7	<b>Securing Learning results</b>	What was the most important point I learned in this session ? Alignment with learning objectives of the course	Group discussion blackboard / moderating cards	6 min
8	<b>Assessment (Test)</b>	Theoretically and in practice	Scenario assessment, MCQ	6 min
9	<b>Feedback</b>	In which skills do I feel competent?	Open questions / questionnaire	5 min
Total duration				86 Min

### **Ressources** for 25 students / pupils:

1	Adequate space (possibility to clear from tables and chairs)
1 - 4	Instructors (according to conditions, e.g. involvement of "student first aiders")
8 - 12	Chest compression manikins (simple torsos)
1 - 2	AED-training module (could also be self made)
1 - 2	Whole body manikins (not essential, but recommended to resemble a more realistic scenario)

## GRC – curriculum for "Resuscitation training for school children"

**Step 2** 12 - 14 yrs. (7<sup>th</sup> /8<sup>th</sup> grade), 2 teaching units of 45 min

### General learning objectives / Outcome-orientated competencies:

- detection / identification of a potential cardiac arrest
- activating competent and professional help
- initiation or instruction of high quality chest compressions and adequate positioning of the victim
- handling of AED <sup>1)</sup>
- (if competence level is high enough) application of Mouth-mouth or mouth-to-nose ventilation
- follow instructions of dispatch centre

### Specific learning objectives (knowledge / skills / attitudes)

At the end of this teaching/learning session students are able to ...		dimension of learning
1	... explain the <b>necessity to act</b> oneself (bearing in mind <b>one's own safety</b> ).	acquire attitude
2	... recognise the state of conscious of a victim and to detect <b>unconsciousness</b> .	apply <sup>2)</sup>
3	... assess breathing and <b>detect abnormal breathing</b> ("odd" or unusual sounds, slow frequency, change of skin colour) <b>and respiratory standstill</b> .	apply <sup>2)</sup>
4	... explain, <b>why simultaneous occurrence of unconsciousness and abnormal breathing</b> implicates <b>immediate action</b> .	explain
5	... conduct and/or advise to undertake an <b>emergency call</b>	apply <sup>2)</sup>
6	... know, that <b>instructions for first aid and resuscitation may be given by the dispatcher</b>	know
7	... know about the <b>functioning principle</b> of an AED <sup>1)</sup> .	explain
8	... send someone for getting an AED <sup>1)</sup> and operate an AED <sup>1)</sup>	apply <sup>2)</sup>
9	... position a person in cardiac arrest in a <b>supine position</b> and on a <b>firm surface</b> and to <b>clear their chest</b> (or to advise an adult to do so).	apply <sup>2)</sup>
10	... perform <b>5 Min. of adequate chest compressions</b>	apply <sup>2)</sup>
11	... (if adequate) perform rescue breathing (mouth-to-mouth or mouth-to-nose) <sup>3)</sup> , or consider its minor importance if compared to chest compressions	explain, apply <sup>2)</sup>
12	... when performing rescue breathing to keep up a compression – ventilation ratio of <b>30:2</b> .	apply <sup>2)</sup>
13	... when performing CPR with rescue breathing to perform the change between chest compressions and ventilations <b>without any time loss</b> .	apply <sup>2)</sup>
14	... handle an AED <sup>1)</sup> .	apply <sup>2)</sup>

<sup>1)</sup> AED: automated external defibrillator      <sup>2)</sup> on a manikin, during training scenario  
<sup>3)</sup> if competence level is adequate

## GRC – curriculum for "Resuscitation training for school children"

### Step 2    12 -14 yrs. / course of session: contents and formats

	content	Details on contents	Teaching / learning format	time
1	<b>introduction</b>	intro video (adequate to age) / definition of learning goals	Presentation or (better) discussion	5 min
2	<b>Detection of arrest</b>	Check for safety! Shake and shout / call for help Assess breathing Related conditions: sudden event, unconsciousness, agonal breathing/ arrest of breathing change of skin colour (cyanosis)	Demonstration (learning conversation) and practical training	8 min
3	<b>Emergency call</b>	Inform about location first („where“?) further advice is given by dispatcher, hang on until dispatcher ends the call; dispatch will provide support: follow instructions of dispatcher	Simulation of emergency call (e.g. via cell phone in another room)	7 min
4	<b>Chest compressions (CC)</b>	Supine position, firm surface hand position, compression depth 5-6 cm, compression frequency 100-120/min, no pauses, regular change of CC providers	Demonstration and practical training; 1 manikin per 2-3 students - <b>Feedback</b>	30 min
5	<b>Ventilation</b>	Mouth-mouth or mouth-to-nose, head tilt; prompt alternation with CCs (30 compressions, 2 ventilations)	Demonstration and practical training; 1 manikin per 2-3 students - <b>Feedback</b>	10 min
6	<b>AED</b>	Principle of function, check for safety, switch on, electrode positions	Demonstration and practical training; 1 training device per 10-15 students	10 min
7	<b>Securing Learning results</b>	What was the most important point I learned in this session ? Alignment with learning objectives of the course	Group discussion blackboard / moderating cards	5 min
8	<b>Assessment (Test)</b>	Theoretically and in practice	Scenario assessment, MCQ	6 min
9	<b>Feedback</b>	In which skills do I feel competent?	Open questions / questionnaire	2 min
Total duration				83 Min

**note:** The **recovery position** has no value for resuscitation. Therefore recovery position should be taught only after all evidence based interventions have been understood well.

#### **Ressources** for 25 students / pupils:

1	Adequate space (possibility to clear from tables and chairs)
1 - 4	Instructors (according to conditions, e.g. involvement of “student first aiders”)
8 - 12	Chest compression manikins (simple torsos)
1 - 2	AED-training module (could also be self made)
1 - 2	Whole body manikins (not essential, but recommended to resemble a more realistic scenario)

## GRC – curriculum for "Resuscitation training for school children"

**Step 3** 16 -18 yrs. (11<sup>th</sup>/12<sup>th</sup> grade), 2 teaching units of 45 min

### Grob-Lernziele / Outcome-orientierte Kompetenzen:

- detection of a potential cardiac arrest
- have an understanding of circulation and ventricular fibrillation
- activation of professional help
- principle knowledge of the working process within a dispatch centre
- understanding of the significance of chest compressions
- initiation or instruction of high quality chest compressions over 10 Min time
- adaequate positioning of the victim
- handling of AED <sup>1)</sup>
- application of Mouth-mouth or mouth-to-nose ventilation
- follow instructions of dispatch centre

### Specific learning objectives (knowledge / skills / attitudes)

At the end of this teaching/learning session students are able to ...		dimension of learning
1	... explain the <b>necessity to act</b> oneself (bearing in mind <b>one's own safety</b> ).	acquire attitude
2	... recognise the state of conscious of a victim and to detect <b>unconsciousness</b> .	apply <sup>2)</sup>
3	... assess breathing and <b>detect abnormal breathing</b> ("odd" or unusual sounds, slow frequency, change of skin colour) <b>and respiratory standstill</b> .	apply <sup>2)</sup>
4	... explain, <b>why simultaneous occurrence of unconsciousness and abnormal breathing</b> implicates <b>immediate action</b> .	explain
5	... conduct and/or advise to undertake an <b>emergency call</b> .	apply <sup>2)</sup>
6	... know, that <b>instructions for first aid and resuscitation may be given by the dispatcher</b>	Wissen
7	... know about the <b>functioning principle</b> of an <b>AED <sup>1)</sup></b> .	explain
8	... send someone for getting an <b>AED <sup>1)</sup></b> and operate an <b>AED <sup>1)</sup></b>	apply <sup>2)</sup>
9	... position a person in cardiac arrest in a <b>supine position</b> and on a <b>firm surface</b> and to <b>clear their chest</b> (or to advise an adult to do so).	apply <sup>2)</sup>
10	... perform <b>10 Min. of adaequate chest compressions</b> .	apply <sup>2)</sup>
11	... instruct unskilled <b>helpers to perform high quality chest compressions</b> .	explain, apply <sup>2)</sup>
12	... (if adaequate) perform rescue breathing (mouth-to-mouth od mouth-to-nose), or consider its minor importance if compared to chest compressions.	explain, apply <sup>2)</sup>
13	... when performing rescue breathing to keep up a compression – ventilation ratio of <b>30:2</b> .	apply <sup>2)</sup>
14	... when performing CPR with rescue breathing to perform the change between chest compressions and ventilations <b>without any time loss</b> .	apply <sup>2)</sup>
15	... handle an <b>AED <sup>1)</sup></b> .	apply <sup>2)</sup>

<sup>1)</sup> AED: automated external defibrillator

<sup>2)</sup> on a manikin, during training scenario



## GRC – curriculum for "Resuscitation training for school children"

### Step 3 16 -18 yrs. / course of session: contents and formats

	content	Details on contents	Teaching / learning format	time
1	<b>introduction</b>	intro video (adequate to age) / definition of learning goals	Presentation or (better) discussion	8 min
2	<b>Detection of arrest</b>	Check for safety! Shake and shout / call for help Assess breathing Related conditions: sudden event, unconsciousness, agonal breathing / arrest of breathing change of skin colour (cyanosis)	Demonstration (learning conversation) and practical training	8 min
3	<b>Emergency call</b>	Inform about location first („where“?) further advice is given by dispatcher, hang on until dispatcher ends the call; dispatch will provide support: follow instructions of dispatcher	Simulation of emergency call (e.g. via cell phone in another room) competence level of real life dispatch	8 min
4	<b>Chest compressions (CC)</b>	Supine position, firm surface hand position, compression depth 5-6 cm, compression frequency 100-120/min, no pauses, regular change of CC providers; guidance of further helpers	Demonstration and practical training; 1 manikin per 2-3 students - <b>Feedback</b>	30 min
5	<b>Ventilation</b>	Mouth-mouth or mouth-to-nose, head tilt; prompt alternation with CCs (30 compressions, 2 ventilations)	Demonstration and practical training; 1 manikin per 2-3 students - <b>Feedback</b>	10 min
6	<b>AED</b>	Principle of function, check for safety, switch on, electrode positions Adequate immersion into BLS	Demonstration and practical training; 1 training device per 10-15 students	10 min
7	<b>Securing Learning results</b>	What was the most important point I learned in this session ? Alignment with learning objectives of the course	Group discussion blackboard / moderating cards	5 min
8	<b>Assessment (Test)</b>	Theoretically and in practice	Scenario assessment, MCQ	6 min
9	<b>Feedback</b>	In which skills do I feel competent?	Open questions / questionnaire	5 min
Total duration				90 Min

**note:** The **recovery position** has no value for resuscitation. Therefore recovery position should be taught only after all evidence based interventions have been understood well.

#### Ressources for 25 students / pupils:

1	Adequate space (possibility to clear from tables and chairs)
1 - 4	Instructors (according to conditions, e.g. involvement of “student first aiders”)
8 - 12	Chest compression manikins (simple torsos)
1 - 2	AED-training module (could also be self made)
1 - 2	Whole body manikins (not essential, but recommended to resemble a more realistic scenario)

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