

Supplementary Online Content

Shields AD, Vidosh J, Minard C, et al. Obstetric Life Support education for maternal cardiac arrest: a randomized clinical trial. *JAMA Netw Open*. 2024;7(11):e2445295. doi:10.1001/jamanetworkopen.2024.45295

eFigure 1. Prehospital Advanced Megacode Checklist

eFigure 2. Prehospital Basic Megacode Checklist

eFigure 3. In-Hospital Megacode Checklist

eFigure 4. Orientation Checklist for In-Person Training

This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. Prehospital Advanced Megacode checklist.

OBLS MEGACODE CHECKLIST - Out-of-Hospital Advanced



Name of Team Leader _____

Scenario _____

Directions: For each participant, use the scale provided and circle the number indicating the extent to which they completed the action. Items with * are critical components. Participants must have no (0) critical fails in order to pass.

Step	Assessment/Action	Done Correctly = 5 Done Poorly or Delayed = 3 Not Done = 0 N/A				
RESUSCITATION						
1	Performs primary survey	5	3	0	N/A	1 min
2	Recognizes cardiac arrest*	5	3	0	N/A	
3	Calls for additional resources as needed	5	3	0	N/A	
4	Places patient on hard surface/safe location	5	3	0	N/A	
5	Initiates high-quality chest compressions*	5	3	0	N/A	
6	Establishes and maintains effective ventilation (as staffing allows)*	5	3	0	N/A	
7	Ventilates at an appropriate rate	5	3	0	N/A	
8	Assesses possibility of pregnancy/assesses uterine fundus relationship to umbilicus	5	3	0	N/A	
9	Performs left uterine displacement*	5	3	0	N/A	2-5 mins
10	Anticipates potential need for resuscitative cesarean delivery	5	3	0	N/A	
11	Places defibrillation pads avoiding breast tissue	5	3	0	N/A	
12	Assesses cardiac rhythm immediately after pads placed	5	3	0	N/A	
13	Defibrillates if indicated, clears patient prior to shock*	5	3	0	N/A	
14	Inserts IV or IO above diaphragm	5	3	0	N/A	
15	Administers epinephrine					
	a. non-shockable: immediately	5	3	0	N/A	
	b. shockable: after two shocks	5	3	0	N/A	
16	Recognizes and treats reversible etiologies for maternal cardiac arrest, if applicable (e.g., Narcan for opioid overdose, etc.)	5	3	0	N/A	
17	Directs preparation for and transport of patient to most appropriate facility (OB Arrest Alert)*	5	3	0	N/A	
18	Applies ACCD correctly, if used	5	3	0	N/A	
A. Resuscitation SUBTOTAL (Items 1-18)						
POST-ROSC CARE						
19	Verifies return of spontaneous circulation (ROSC)	5	3	0	N/A	POST-ROSC CARE
20	Evaluates AVPU	5	3	0	N/A	
21	Maintains airway and gives breaths every 6 seconds, as needed	5	3	0	N/A	
22	Maintains left uterine displacement	5	3	0	N/A	
23	Obtains and transmits 12-lead ECG	5	3	0	N/A	
24	Maintains vascular access and administers fluids	5	3	0	N/A	
25	Evaluates for causes	5	3	0	N/A	
B. Post-ROSC SUBTOTAL (Items 19-25)						

Step	Assessment/Action	Done Correctly = 5 Done Poorly or Delayed = 3 Not Done = 0 N/A			
TEAM PERFORMANCE					
26	Performs continuous LUD throughout resuscitation	5	3	0	N/A
27	Rotates personnel performing chest compressions and LUD every 2 min	5	3	0	N/A
28	Minimizes chest compression interruptions (< 10 sec delay)	5	3	0	N/A
29	Designated team member guides resuscitation with OBLS cognitive aid (ALIVE at 5)	5	3	0	N/A
30	Keeps time of cardiac arrest and log of times/interventions	5	3	0	N/A
31	Performs continuous high-quality CPR/OBLS until ROSC or higher level of care transfer achieved	5	3	0	N/A
32	Uses BAACC TO LIFE for differential diagnosis	5	3	0	N/A



C. Team Performance SUBTOTAL (Items 26-32)

COMMUNICATION/TEAMWORK

Step	How well <u>did the TEAM</u>	Perfect = 5 Good = 4 Average = 3 Poor = 2 Unacceptable = 1				
33	Use SBAR to orient team members as they arrived?	5	4	3	2	1
34	Call for ADDITIONAL ASSISTANCE in a timely manner?	5	4	3	2	1
35	Utilize CLOSED-LOOP communication?	5	4	3	2	1
36	Maintain SITUATIONAL AWARENESS?	5	4	3	2	1
37	Utilize PATIENT FRIENDLY language and tone	5	4	3	2	1
Step	Rate					
38	OVERALL team communication	5	4	3	2	1
39	OVERALL team performance	5	4	3	2	1

D. Communication/Teamwork SUBTOTAL (Items 33-39)

SCORING		
Subtotals		
A	Resuscitation	
B	Post-ROSC	
C	Team Performance	
D	Total Communication/Teamwork	
E	Subtotal (add A + B + C + D)	
F	Total points possible	200
G	N/A adjustment (multiply # of N/A by 5)	
H	Adjusted total points (F minus G)	
I	Overall weighted score (divide E by H)	
J	Number of critical components* scored 0 (#1-21)	

SUMMARY

PASS = Overall score > 74% and no critical components scored 0.
Circle YES or NO.

YES	NO
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Instructor Signature: _____

Instructor Name and Date: _____

Instructor potential? YES NO

eFigure 2. Prehospital Basic Megacode checklist.

OBLS MEGACODE CHECKLIST - Out-of-Hospital BASIC



Name of Team Leader _____ Scenario _____

Directions: For each participant, use the scale provided and circle the number indicating the extent to which they completed the action. Items with * are critical components. Participants must have no (0) critical fails in order to pass.

Step	Assessment/Action	Done Correctly = 5 Done Poorly or Delayed = 3 Not Done = 0 N/A				
RESUSCITATION						
1	Performs primary survey	5	3	0	N/A	1 min
2	Recognizes cardiac arrest*	5	3	0	N/A	
3	Calls for additional resources as needed	5	3	0	N/A	
4	Places patient on hard surface/safe location	5	3	0	N/A	
5	Initiates high-quality chest compressions*	5	3	0	N/A	
6	Establishes and maintains effective ventilation (as staffing allows)*	5	3	0	N/A	
7	Ventilates at an appropriate rate and depth	5	3	0	N/A	
8	Assesses possibility of pregnancy/assesses uterine fundus relationship to umbilicus	5	3	0	N/A	
9	Performs LUD*	5	3	0	N/A	2-5 mins
10	Anticipates potential need for RCD	5	3	0	N/A	
11	Places defibrillation pads avoiding breast tissue	5	3	0	N/A	
12	Assesses cardiac rhythm with AED immediately after pads placed	5	3	0	N/A	
13	Defibrillates if indicated by AED, clears patient prior to shock*	5	3	0	N/A	
14	Directs preparation for and transport of patient to most appropriate facility (OB Arrest Alert)*	5	3	0	N/A	
15	Applies ACCD correctly, if used	5	3	0	N/A	
A. Resuscitation SUBTOTAL (Items 1-15)						
POST-ROSC CARE						
16	Verifies ROSC	5	3	0	N/A	POST-ROSC CARE
17	Evaluates AVPU scale (alert, verbal, pain, unresponsive)	5	3	0	N/A	
18	Maintains airway and gives breaths every 6 seconds, as needed	5	3	0	N/A	
19	Maintains LUD	5	3	0	N/A	
20	Obtains and transmits 12-lead ECG	5	3	0	N/A	
21	Maintains vascular access and administers fluids	5	3	0	N/A	
22	Evaluates for causes	5	3	0	N/A	
B. Post-ROSC SUBTOTAL (Items 16-22)						

Step	Assessment/Action	Done Correctly = 5 Done Poorly or Delayed = 3 Not Done = 0 N/A				
TEAM PERFORMANCE						
23	Performs continuous LUD throughout resuscitation	5	3	0	N/A	
24	Rotates personnel performing chest compressions and LUD every 2 min	5	3	0	N/A	
25	Minimizes chest compression interruptions (< 10 sec delay)	5	3	0	N/A	
26	Designated team member guides resuscitation with OBLS cognitive aid (ALIVE at 5)	5	3	0	N/A	
C. Team Performance SUBTOTAL (Items 23-26)					TEAM PERF	
COMMUNICATION/TEAMWORK						
Step	How well <u>did the TEAM</u>	Perfect = 5 Good = 4 Average = 3 Poor = 2 Unacceptable = 1				
27	Use SBAR to orient team members as they arrived?	5	4	3	2	1
28	Call for ADDITIONAL ASSISTANCE in a timely manner?	5	4	3	2	1
29	Utilize CLOSED-LOOP communication?	5	4	3	2	1
30	Maintain SITUATIONAL AWARENESS?	5	4	3	2	1
31	Utilize PATIENT FRIENDLY language and tone	5	4	3	2	1
Step	Rate					
32	OVERALL team communication	5	4	3	2	1
33	OVERALL team performance	5	4	3	2	1
D. Communication/Teamwork SUBTOTAL (Items 27-33)						

SCORING		
		Subtotals
A	Resuscitation	
B	Post-ROSC	
C	Team Performance	
D	Total Communication/Teamwork	
E	Subtotal (add A + B + C + D)	
F	Total points possible	165
G	N/A adjustment (multiply # of N/A by 5)	
H	Adjusted total points (F minus G)	
I	Overall weighted score (divide E by H)	
J	Number of critical components* scored 0 (#1-22)	

SUMMARY

PASS = Overall score > 74% and no critical components scored 0.
Circle YES or NO.

YES	NO
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Instructor Signature: _____

Instructor Name and Date: _____

Instructor potential? YES NO

eFigure 3. In-hospital Megacode checklist.

OBLS MEGACODE CHECKLIST - In-Hospital

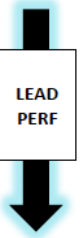


Name of Team Leader _____ Scenario _____

Directions: For each participant, use the scale provided and circle the number indicating the extent to which they completed the action. Items with * are critical components. *Participants must have no (0) critical fails in order to pass.*

Step	Assessment/Action	Done Correctly = 5 Done Poorly or Delayed = 3 Not Done = 0 N/A				
		5	3	0	N/A	
RESUSCITATION						
1	Recognizes unstable vital signs in pregnant patient	5	3	0	N/A	1 min
2	Recognizes cardiac arrest*	5	3	0	N/A	
3	Activates MCAT	5	3	0	N/A	
4	Positions patient flat and places backboard	5	3	0	N/A	
5	Initiates high-quality chest compressions*	5	3	0	N/A	
6	Establishes and maintains effective ventilation*	5	3	0	N/A	
7	Ventilates at appropriate rate	5	3	0	N/A	
8	Assesses possibility of pregnancy/assesses uterine fundus relationship to umbilicus	5	3	0	N/A	
9	Performs and maintains LUD throughout resuscitation*	5	3	0	N/A	
10	Gathers equipment for RCD	5	3	0	N/A	2-5 mins
11	Places defibrillation pads avoiding breast tissue	5	3	0	N/A	
12	Assesses cardiac rhythm immediately after placing pads*	5	3	0	N/A	
13	Removes fetal monitors	5	3	0	N/A	
14	Defibrillates if indicated, clears patient before shock*	5	3	0	N/A	
15	Inserts IV or IO above diaphragm	5	3	0	N/A	
16	Administers epinephrine: a. non-shockable: immediately b. shockable: after two shocks	5 5	3 3	0 0	N/A N/A	
17	Assesses cardiac rhythm and performs pulse check every 2 minutes*	5	3	0	N/A	
18	Recognizes and treats reversible etiologies for MCA, if applicable (e.g., calcium gluconate for magnesium toxicity, Narcan for opioid overdose)	5	3	0	N/A	
19	Completes RCD by 5 min at site of arrest*	5	3	0	N/A	
20	Maintains chest compression effectiveness throughout, minimizes chest compression interruptions (< 10 sec delay)	5	3	0	N/A	5+ mins
21	Timely notification of contingency teams (i.e., ECPR, MAST, vascular surgeon)	5	3	0	N/A	
22	Verifies ROSC	5	3	0	N/A	
A. Resuscitation SUBTOTAL (Items 1-21)						
POST-ROSC CARE						
23	Discusses post-arrest care elements following ROSC to establish next steps in management	5	3	0	N/A	POST-ROSC CARE
24	Secures airway and gives breaths every 6 seconds, as needed	5	3	0	N/A	
25	Maintains LUD, if pregnant	5	3	0	N/A	
26	Maintains vascular access and administers fluids	5	3	0	N/A	
27	Uses BAACC TO LIFE to consider potential etiology(ies)	5	3	0	N/A	
28	Manages wounds (closure, antibiotics)	5	3	0	N/A	
29	Orders head CT prior to transfer to ICU, if indicated	5	3	0	N/A	
B. Post-ROSC Care SUBTOTAL (Items 22-28)						

TEAM LEADER PERFORMANCE					
Step	Assessment/Action	Done Correctly = 5 Done Poorly or Delayed = 3 Not Done = 0 N/A			
30	Effectively guides resuscitation, focusing on high-quality chest compressions and continuous LUD	5	3	0	N/A
31	Effectively delineates responsibilities to team members	5	3	0	N/A
32	Ensures team member keeps time of cardiac arrest and logs times/interventions	5	3	0	N/A
33	Ensures contingency teams are present and working together effectively	5	3	0	N/A
34	Recommends debrief w/ OBLS debrief tool	5	3	0	N/A
C. Team Leader Performance SUBTOTAL (Items 29-33)					



COMMUNICATION/TEAMWORK						
Step	How well <u>did the TEAM</u>	Perfect = 5 Good = 4 Average = 3 Poor = 2 Unacceptable = 1				
35	Use SBAR to orient team members as they arrived?	5	4	3	2	1
36	Call for ADDITIONAL ASSISTANCE in a timely manner?	5	4	3	2	1
37	Utilize CLOSED-LOOP communication?	5	4	3	2	1
38	Maintain SITUATIONAL AWARENESS?	5	4	3	2	1
39	Utilize PATIENT FRIENDLY language and tone	5	4	3	2	1
	Rate					
40	OVERALL team communication	5	4	3	2	1
41	OVERALL team performance	5	4	3	2	1
D. Communication/Teamwork SUBTOTAL (Items 34-40)						

SCORING		
		Subtotals
A	Resuscitation	
B	Post-ROSC	
C	Team Performance	
D	Total Communication/Teamwork	
E	Subtotal (add A + B + C + D)	
F	Total points possible	210
G	N/A adjustment (# of N/A _____ multiplied by 5)	
H	Adjusted total points (F minus G)	
I	Overall weighted score (divide E by H)	
J	Number of critical components* scored 0 (#1-22)	

SUMMARY

PASS = Overall score > 74% and no critical components scored 0.
Circle YES or NO.

YES	NO
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Instructor Signature: _____

Instructor Name and Date: _____

Instructor potential?	YES	NO
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eFigure 4. Orientation checklist for In-Person Training.

RCT IH MORNING
Pre-RCDP Orientation Checklist

Checklist Purpose: To guide instructors as they introduce the OBLS in-person course.

Timing: In the morning, before starting the rapid-cycle deliberate practice training scenarios.

<input type="checkbox"/>	Introduce yourself
<input type="checkbox"/>	Invite participants to introduce themselves and current profession
<input type="checkbox"/>	Emphasize that the simulated environment allows for mistakes
<input type="checkbox"/>	<p>Set the stage</p> <ul style="list-style-type: none"> • Remind participants that everyone is capable, smart, and desires to learn. • State that you will interrupt them and give specific feedback about what you see. • Normalize mistakes and let them know that they'll repeat tasks. <ul style="list-style-type: none"> ○ "You will make mistakes. If you were teaching and I were the student, I would be making mistakes." <p>Ask participants to</p> <ul style="list-style-type: none"> • treat the scenario as real as possible • take care of patients within their current scope of practice (i.e., RN does not do RCD) • participate as fully as possible • remain focused on the training
<input type="checkbox"/>	<p>Introduce rapid-cycle deliberate practice</p> <ul style="list-style-type: none"> • Real-time corrections to create new skills through repetition and practice • Maximizes learning by reinforcing learning in real-time, while emphasizing teamwork • "I'll be calling timeouts to provide immediate feedback and correct the mistake. Then, we'll rewind 30 seconds to repeat the scenario so you can practice the appropriate action." • Request participants to ask questions and call time outs when something isn't clear
<input type="checkbox"/>	<p>Introduce the manikin's features and technology, as applicable</p> <ul style="list-style-type: none"> • Recognize the limitations of manikin <ul style="list-style-type: none"> ○ "Skin doesn't change color or feel or look real, and she has no extremities" • Demonstrate left uterine displacement (LUD) from manikin's left and show indicator color change <ul style="list-style-type: none"> ○ Invite participants to briefly practice LUD • Note chest compressions monitor on iPad • Demonstrate resuscitative cesarean delivery and how to place backboard • Indicate defibrillator pad placement avoiding breast tissue • Note intubatable airway, demonstrate head-tilt/chin lift, jaw thrust, capnography • Demonstrate rotation of compressor and LUD participants
<input type="checkbox"/>	Instruct participants to do everything at/to the manikin (e.g., ask questions, physical exam, procedures)
<input type="checkbox"/>	<p>Orient participants to</p> <ul style="list-style-type: none"> • resuscitative cesarean delivery kit • hemorrhage cart • simulated blood products • crash cart with simulated medications

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RCT IH MORNING
Pre-RCDP Orientation Checklist

	<ul style="list-style-type: none"> ○ participants should locate meds and place beside manikin; do not need to draw them up ● airway equipment ● defibrillator and pads <ul style="list-style-type: none"> ○ participants should place pads on manikin and turn on and charge machine; instructors will show rhythm strips
<input type="checkbox"/>	<p>Introduce participant roles</p> <ul style="list-style-type: none"> ● 6 participants <ol style="list-style-type: none"> 1. Team lead 2. Compressor 3. LUD 4. Crash cart 5. Airway 6. Recorder* <p>*if <6 participants, combine crash cart and recorder</p> <ul style="list-style-type: none"> ● Participants activate MCAT, provide SBAR, and assist team leader
<input type="checkbox"/>	<p>Introduce instructor roles</p> <ul style="list-style-type: none"> ● will pause training scenarios to provide rapid cycle deliberate practice ● will end the scenario and guide participants ● during megacode <ul style="list-style-type: none"> ○ One instructor leads the simulation, acts as the patient, ensures proper case flow, and both grade the team leader with the megacode checklist
<input type="checkbox"/>	<p>Introduce scenario flow</p> <ul style="list-style-type: none"> ● Three training scenarios with timeouts to correct action <ul style="list-style-type: none"> ○ Prearrest ○ arrest ○ post-ROSC using post-ROSC checklist ○ debrief using megacode checklist ○ sharing difficult news ● Each training scenario will be different and each megacode different from the training scenarios ● Each participant will be a team lead in the morning and afternoon ● If 6 participants, each morning scenario will have 2 team leads who switch in scenario middle ● Instructors will <ul style="list-style-type: none"> ○ give 1st participant HPI/initial scenario ○ stop and correct mistakes ● Scenarios will progress into arrest and end in ROSC once the team completes various steps

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6/6/2023