ACLS PROVIDER Study Guide/Class Handout



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PLEASE NOTE: We cannot issue participant eCards until receipt of payment (large employers may take up to 30 days to make payment) so don't expect your eCard immediately. When payment has been received, you will get an email from the AHA to claim your eCard.

*source: American Heart Association ACLS Provider Manual supplementary material http://ahainstructornetwork.americanheart.org/idc/groups/ahaecc-public/@wcm/@ecc/documents/downloadable/ucm_479382.pdf You are registered for **American Heart Association** training with **Heartland CPR**. All participants must provide a functioning email (that can be accessed from your device) and cell number upon arrival, which will be needed for both digital tests and claiming AHA course completion eCards.

You must provide a copy of current, unexpired AHA cards to take this course!

- BLS Provider is a prerequisite for *both* full & refresher ACLS and PALS classes
- ACLS Provider is a prerequisite for ACLS-R <u>refresher</u>
- PALS Provider is a prerequisite for PALS-R *refresher*

These can be uploaded through the "confirm preferences" button in your reservation or emailed to us at <u>contact@HeartlandCPR.com</u> prior to class; if unable to do either of those methods, you may show your valid unexpired AHA card(s) at class by emailing directly to your instructor at <u>instructor@HearlandCPR.com</u>, but please note that if that is invalid or unavailable, you will not be allowed to attend class per AHA rules. We strive to spot those issues in advance to rectify whenever possible so uploading/emailing in advance gives us that opportunity to assist.

Take this pretest prior to class!

Please print the completion certificate and bring it to class with you; alternately, you may email to us at <u>contact@HeartlandCPR.com</u> prior to your class. AHA guidelines require a score of >70% to attend the class (unlimited attempts allowed).

- Pretest for ACLS: <u>https://elearning.heart.org/course/423</u>
- Pretest for PALS: <u>https://elearning.heart.org/course/427</u>

Bring your textbook/ebook and smart phone/device to class with you!

Written tests are now administered digitally, so make sure to maintain a charge on your phone, tablet, or laptop. Additionally, it will save you time to create your online account prior to arrival using the email you provide us at https://elearning.heart.org.

Need a study guide to help you prepare?

Unlike BLS training, ACLS and PALS require <u>significant pre-study</u> and success should not be expected without it. The AHA recommends at least a week with your materials and plenty of time set aside; for this reason, many choose to allocate even more time when work schedule or other commitments exist. We have created a helpful study guide to assist in your preparation, which will also be referenced and used as a visual teaching tool at class. <u>Please print this off and bring to class</u> with you as well.

Study Guides: <u>https://www.HeartlandCPR.com/studyguides</u>

Post class: You will receive a couple of automated emails with CEUs and other information from **Heartland CPR** in the days following your class. Additionally, once payment has been made (in the event we are awaiting payment from your employer), you will receive an email directly from the AHA email address <u>eCards@Heart.org</u>. This is a link to claim your eCard and will be available by the next business day following training and receipt of payment. Thanks for training with **Heartland CPR**!

Mandatory in class written test:

50 questions. Must be proctored. Passing score is >84% (miss no more than 8), with two attempts allowed. Skills portion must also be passed with competency. AHA has moved to an "open resource" policy in the past few years, meaning you can use your textbook and class notes for testing.

You may note that AHA classes are being taught differently than they were years ago. With a focus on **teamwork** and supporting one another. I've attended countless 'codes,' but the one thing they did have in common was the fact that I never took on this task by myself. It would be foolish, plus, we happen to think you should 'play like you practice' and that learning, mastering, and passing the class will be fun, challenging, and not at all like what you've come to expect from a traditional PALS class.

We have developed the following study guide to assist in your preparation for training. Please print it off, use to study, and bring it with you to class.

Know your BLS

- Make sure scene is safe
- Tap/shout for responsiveness
- Agonal respirations (is *not* normal breathing) leading to cardiac arrest
- Call for help and get an AED
- Check pulse and breathing for 5-10 sec
 - PEtCO2. Needs to be > 10 or <u>optimize compressor</u>
 - Interruptions should be limited to <10 seconds
- Begin CPR
 - Compressions:
 - Place on a firm surface
 - Swap compressors every 2 minutes
 - Compress at least 1/3 depth of the chest
 - Rate of 100-120 beats/min (tune of "Staying Alive")
 - Allow full chest recoil between compressions
 - o Breaths:
 - Each breath should make the chest rise and fall
 - Give breath over one second; every 6 seconds for rescue breathing
 - Excessive ventilations cause:
 - \Rightarrow Decreases venous return to the heart
 - \Rightarrow Decreases cardiac output
 - \Rightarrow Increases thoracic pressure
 - Ratios:
 - 30:2 all single rescuer scenarios
 - 15:2 two/multi-rescuer scenarios with pediatric victim
 - ETT asynchronously every 2-3 seconds with continuous compressions

Waveform capnography

- Confirmation of advanced airway, effectiveness of compressions, ROSC
- If PEtCO2 is < 10mmHg, verify effectiveness of CPR
- Sp02 < 94% needs to be Rx with 02 or BVM where appropriate

OPA (unresponsive w/o a gag), NPA placement

- Allow for full exhalation
- Excessive ventilation <u>decreases</u> cardiac output
- OPA measured from corner of mouth to angle of jaw

<u>Stroke</u>

- Know where to transfer patient to
- Know two types of strokes
- Know diagnostic tests for strokes

<u>ACS</u>

- Time to PCI (percutaneous coronary intervention)
- Know when a 12 Lead is indicated
 - \circ MS
 - o Oxygen
 - o Nitro
 - o ASA
 - MONA greets all ACS patients
 - Minimum BP is 90 mmHg
 - Know diagnostics

Meds

- Know medication dosages for:
 - o ASA
 - Adenosine
 - o Amiodarone both with and without a pulse
 - o Lidocaine
 - o EPI
 - o Narcan
 - o D50
 - Sodium Bicarb

<u>Rhythms</u>

- Focus on VF/VT management
 - o Stable/unstable VT
 - Stable/unstable SVT
 - \circ ASYS
 - \circ PEA

Effective Team Dynamics

- Clear roles; team lead should delegate tasks
- Know your limitations:
 - Stay in scope of practice or ask for new role if inappropriately assigned
- Constructive criticism (to be addressed immediately if concerning patient care)
- Summarizing and Re-evaluation
- Knowledge sharing
- Closed loop communication
- Mutual respect

IV/IO access

- IV's are preferred route except in cases of circulatory collapse (shock/cardiac arrest)
- IO's provide best practice for rapidly achieving vascular access in hemodynamically unstable patients, rapid fluid or medication administration

ROSC

- New patient reevaluate oxygenation ventilation
- Reevaluate V/S
 - o <u>12 Lead</u>
 - o <u>Sp02</u>
 - <u>HR</u>
 - \circ Bp
 - o Rhythm
 - \circ Labs
- Know who is a candidate for targeted temperature management
- 32° 36° for 24 hours



Cardiac Arrest

- Reversible Causes
 - o Hypovolemia
 - o Hypothermia
 - \circ Hypoxia
 - Hydrogen ion (acidosis)
 - o Hypo/hyperglycemia
 - o Hypo/hyperkalemia
 - Tension hemo/pneumo
 - Tamponade (cardiac)
 - Thrombosis (pulmonary or coronary)
 - \circ Toxins



mm/mV 1 square = 0.04 sec/0.1 mV

PR interval:	Measures from the beginning of the P wave to the beginning of the QRS complex Normal: 0.12 - 0.20 sec
QRS complex:	Measures from the beginning of the Q wave to the end of the S wave Normal: <0.12 sec
QT interval:	Measures from the beginning of the Q wave to the end of the T wave Normal: Needs to be corrected for heart rate – usually 0.44 to 0.32 sec (heart rate of 60 – 100 bpm for both men and women)

Intrinsic Rates:

SA Node 60 - 100

AV Node 40 - 60

PF 15 – 40 Heartland CPR, Ilc

Method for estimating heart rate

To estimate heart rate, memorize the rate intervals: 300, 150, 100, 75, 60, 50, 40, and 30. This method estimates heart rate. Although there are other methods and tools available, this method does not require a 3-second or 6-second strip and it can be used easily at the bedside.



- 1. Pick a complex that falls on a heavy line
- 2. Estimate the rate by counting heavy boxes
- 3. Using 300, 150, 100, 75, 60, 50, 40, 30

Other heart rate measurements that can be used:

- Count the number of QRS complexes (R waves) on a 6-second strip and multiply by 10
- Divide 300 by the number of large boxes between 2 consecutive QRS complexes (R waves)
- Divide 1500 by the number of tiny boxes between 2 consecutive QRS complexes (R waves)

For atrial rate measurements, use the methods indicated above with P waves substituted for QRS complexes (R waves).

Normal atrial rate: 60 – 100 Normal ventricular rate: 60 – 100

Atrial rhythm/rate: Regular; P to P is regular, 60 – 100 bpm Ventricular rhythm/rate: Regular; R to R is regular, 60 - 100 bpm P waves: P wave before every QRS complex remains unchanged unless aberrant conduction or rate change QRS: Intervals: PRI: 0.12 - 0.20 sec QRS: <0.12 sec heartland cpr Regular or irregular: _____ P waves present: Atrial rate: ______ Ventricular rate: PR interval: QRS interval: Notes:

Atrial rhythm/rate: Regular; P to P is regular, <60 bpm Ventricular rhythm/rate: Regular; R to R is regular, <60 bpm P waves: P wave before every QRS complex remains unchanged unless aberrant conduction or rate change QRS: Intervals: PRI: 0.12 - 0.20 sec QRS: <0.12 sec heartland cpr Regular or irregular: _____ P waves present: Atrial rate: Ventricular rate: PR interval: QRS interval: Notes:

Atrial rhythm/rate: Regular; P to P is regular, >100 bpm Ventricular rhythm/rate: Regular; R to R is regular, >100 bpm P waves: P wave before every QRS complex remains unchanged unless aberrant conduction or rate change QRS: Intervals: PRI: 0.12 - 0.20 sec QRS: <0.12 sec heartland cpr Regular or irregular: _____ P waves present: Atrial rate: Ventricular rate: PR interval: QRS interval: Notes:

Atrial rhythm/rate: Ventricular rhythm/rate: P waves: QRS: Intervals: Regular; P to P is regular if P waves can be identified, 150 – 250 bpm Regular; R to R intervals are regular, 150 - 250 bpm if present, difficult to detect or hidden because of the fast heart rate remains unchanged unless aberrant conduction or rate change PRI: not measureable QRS: <0.12 sec



Atrial rhythm/rate:	Obscured (see discussion below)
Ventricular rhythm/ate:	Regular; R to R intervals are regular, >150 bpm
P waves:	Obscured (see discussion below)
QRS:	Wide and bizarre; remains unchanged unless aberrant conduction or rate change
Intervals:	PRI: absent* QRS: ≥0.12 sech

*Learn More-Advanced ECG. The rhythm strip here emphasizes the regular wide complex tachycardia (WCT) aspect of VT. In most patients a WCT will be ventricular tachycardia, especially with older age and history of cardiac disease or acute chest discomfort. In these settings, presume and treat as VT. With advanced rhythm training, you will learn that WCTs may be abnormally conducted supraventricular rhythms and "look like" VT. Careful examination of a rhythm strip attempts to identify atrioventricular dissociation (not shown here). The atria in VT continue to contract in most instances, and the atrial and ventricular impulses are dissociated. This leads to the "footprints" identifying VT on rhythm strips. These are (1) AV dissociation observed as P waves "marching" through the wide complexes and occasional fusion or Dressler's beats. Fusion beats occur when the atrial contraction by chance conducts part of the QRS complex. This also is an indication of independent atrial depolarization and AV dissociation.



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Atrial rhythm/rate: Ventricular rhythm/rate: P waves: QRS: Intervals:	No P to P interval (no P waves, fibrillation "f" waves only); rate can't be measured R to R intervals are irregularly irregular (no pattern); rate varies Small f waves create a wavy baseline remains unchanged unless aberrant conduction or rate change PRI: not measureable QRS: <0.12 sec						
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Regular or irregular:							
P waves present:							
Atrial rate:							
Ventricular rate:							
PR interval:							
QRS interval:							

Notes:

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Atrial rhythm/rate: Ventricular rhythm/rate: P waves: QRS: Intervals:	Regular; F to F is regular (no P waves - "F" or flutter waves), 250 – 400 bpm R to R intervals are regular or irregular based on fixed or variable block, 60 – 150 bpm (usually 2:1 AV block) Absent; more F's than QRS's; Flutter waves have sawtooth appearance remains unchanged unless aberrant conduction or rate change PRI: not measureable QRS: <0.12 sec					
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Regular or irregular:						
P waves present:						
Atrial rate:						
Ventricular rate:						
PR interval:						
QRS interval:						
Notes:						



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Atrial rhythm/rate: Ventricular rhythm/;rate: P waves: QRS: Intervals:	Regular; P to P is regular, 60 – 100 bpm Regular; R to R is regular, 60 – 100 bpm P wave before every QRS complex remains unchanged unless aberrant conduction or rate change PRI: >0.20 sec QRS: <0.12 sec						
	heartland cpr						
Regular or irregular:							
P waves present:							
Atrial rate:							
Ventricular rate:							
PR interval:							
QRS interval:							
Notes:							

Atrial rhythm/rate: Ventricular rhythm/rate: P waves: QRS: Intervals:	Regular; P to P is regular, 60 – 100 bpm R to R intervals decrease progressively; until QRS is dropped, rate is variable more P waves than QRS complexes remains unchanged unless aberrant conduction or rate change; irregular but has a cyclic pattern PRI: <i>increase with each beat</i> QRS: <0.12 sec							
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Regular or irregular:								
P waves present:								
Atrial rate:								
Ventricular rate:								
PR interval:								
QRS interval:								
Notes:								

10/11.

Atrial rhythm/rate: Ventricular rhythm/rate: P waves: QRS: Intervals: Regular; P to P is regular, rate is variable Regular; until QRS is blocked, rate is less than atrial rate more P waves than QRS complexes remains unchanged unless aberrant conduction or rate change *when present, PRI is always the same* QRS: may be wide or narrow



10/11. (continued)

Regular or irregular:
P waves present:
Atrial rate:
Ventricular rate:
PR interval:
QRS interval:
Notes:



12/13. (continued)

Regular or irregular:
P waves present:
Atrial rate:
Ventricular rate:
PR interval:
QRS interval:
Notes:

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Atrial rate: Ventricular rate: P waves: QRS: Intervals:	Absent Absent Absent Absent PRI: absent QRS: absent				
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Regular or irregula	ar:				
P waves present:					
Atrial rate:					
Ventricular rate: _					
PR interval:					
QRS interval:					
Notes:					

Atrial rhythm/rate:ObscuredVentricular rhythm/rate:Irregular and chaotic; 250 - 350 bpmP waves:ObscuredQRS:Variable, wide and bizarre, not identical (twisting pattern)Intervals:PRI: absentQRS: ≥ 0.12 sec

WWWWWWWWWWW **************************
Regular or irregular:
P waves present:
Atrial rate:
Ventricular rate:
PR interval:
QRS interval:
Notes:

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Atrial rate: Ventricular rate: P waves: QRS: Intervals:	Absent Absent Absent Absent PRI: absent QRS: absent						
Begular or irregular			Ø	hea	rtla	nd	cpr
	•						
Atrial rate:		 	 				
Ventricular rate:		 	 				
PR interval:		 	 				
QRS interval:		 	 				
Notes:							