Achieving Consensus on Resuscitation Science

The American Heart Association and other member councils of International Liaison Committee on Resuscitation (ILCOR) complete review of resuscitation science every 5 years.
ILCOR: Mission Statement

- Review the international science and knowledge relevant to CPR and ECC
- Publish consensus statements on resuscitation science
- When possible, also publish treatment recommendations applicable to all member organizations around the world.
- Encourage coordination of guideline development and publication by its member organizations around the world.

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Process from Question to Guidelines

1. ILCOR Task Forces formulate questions
2. Worksheet authors perform structured evidence evaluation (with help from experts), present to Task Force
3. Task Forces debate, discuss, reach consensus, draft manuscripts
4. International Editorial Board, Councils review consensus, provide input to writing groups
5. Circulation obtains peer reviews
6. Consensus on Science published
7. Councils develop Guidelines

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# AHA Evidence Classification

<table>
<thead>
<tr>
<th>Size of Treatment Effect</th>
</tr>
</thead>
</table>
| **CLASS I**  
Benefit >> Risk  
Procedure/Treatment SHOULD be performed/administered |
| **CLASS IIA**  
Benefit >> Risk  
Additional studies with focused objectives needed  
IT IS REASONABLE to perform procedure/administer treatment |
| **CLASS IIB**  
Benefit ≥ Risk  
Additional studies with broad objectives needed; additional registry data would be helpful  
Procedures/Treatment MAY BE CONSIDERED |
| **CLASS III**  
Risk ≥ Benefit  
Procedure/Treatment should NOT be performed/administered SINCE IT IS NOT HELPFUL AND/OR MAY BE HARMFUL |

<table>
<thead>
<tr>
<th>Estimate of Certainty (Precision) of Treatment Effect</th>
</tr>
</thead>
</table>
| **LEVEL A**  
Multiple populations evaluated*  
Data derived from multiple randomized clinical trials or meta-analyses |
| **LEVEL B**  
Limited populations evaluated*  
Data derived from a single randomized trial or nonrandomized studies |
| **LEVEL C**  
Very limited populations evaluated*  
Only consensus opinion of experts, case studies, or standard of care |

<table>
<thead>
<tr>
<th>Suggested phrases for writing recommendations*</th>
</tr>
</thead>
</table>
| should  
is recommended  
is indicated  
is useful/effective/beneficial |
| is reasonable  
can be useful/effective/beneficial  
is probably recommended or indicated |
| may/might be considered  
may/might be reasonable  
usefulness/effectiveness is unknown/unclear/uncertain or not well established |
| is not recommended  
is not indicated  
should not  
is not useful/effective/beneficial  
may be harmful |
Evidence Evaluation Process

- 411 scientific evidence reviews on 277 topics
- 313 participants at 2010 Consensus Conference, (46% from outside US)
- COI questionnaires completed by all participants (802 collected and reviewed)
- Writing group members voted on each recommendation

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Management of Potential Conflicts

- COI information posted with worksheets on website
- Industry employees excluded
- No industry support accepted for C2005 or C2010
- COI for each speaker projected during meetings
- COI printed in C2010 program and final Guidelines publication
- COI questionnaires completed by all participants
The ILCOR 2010 International Consensus on CPR and ECC Science With Treatment Recommendations

- Simultaneously published in Circulation and Resuscitation
- Documented review of tens of thousands of peer-reviewed resuscitation studies.

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CPR & ECC Guidelines

- Guidelines available online October 18, 2010 at 12:30 a.m. EDT.
- Printed Guidelines supplement published November 2, 2010 in Circulation.
- Can be downloaded free of charge at www.heart.org/cpr

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Key Changes

2010 AHA Guidelines for CPR and ECC
New AHA Adult Chain of Survival

- New 5th link – post-cardiac arrest care
- Links in the new adult Chain of Survival:
  - Immediate recognition and activation of emergency response system
  - Early CPR, w/emphasis on chest compressions
  - Rapid defibrillation
  - Effective advanced life support
  - Integrated post-cardiac arrest care
CPR Sequence

- **Change:**
  - From A-B-C to C-A-B
  - Initiate chest compressions before ventilations

- **Why?**
  - Goal: To reduce delay to CPR, sequence begins with skill that everyone can perform
  - Emphasize primary importance of chest compressions for professional rescuers

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CPR Starts with Compressions

- Many adults with witnessed arrest have ventricular fibrillation (VF)/pulseless ventricular tachycardia (VT), and require
  - chest compressions
  - early defibrillation
- Chest compressions can be started immediately (no equipment needed)
- Opening airway, providing ventilation may significantly delay other actions
- Ventilation delayed by 18 seconds or less
Primary Emphasis on Chest Compressions

- All rescuers should, at a minimum, provide chest compressions.
- If bystander not trained (adult arrest): Hands-Only CPR
- If bystander trained and able: perform compressions and ventilations at rate of 30:2
- Healthcare provider: perform compressions and ventilations at rate of 30:2

Note: For all pediatric arrest, compressions and ventilations still recommended
Emphasis on Chest Compressions

Why?

- Hands-Only CPR is easy to perform for adult victims and can be readily guided by EMS dispatchers over phone.
- When all adult cardiac arrests reported, survival rates similar whether bystander provides Hands-Only CPR or traditional CPR

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Universal Algorithm for Adult CPR

- Traditional algorithm updated
- Alternative graphic provided
- All graphics emphasize importance of uninterrupted periods of CPR
Adult Chest Compression Depth

- **Change:**
  - Compress at least 2 inches
    - 2005 recommendation was 1½ to 2 inches.
- **Why?**
  - Compressions of at least 2 inches are more effective than those of 1½ inches.
  - Rescuers often do not “push hard” enough.
  - Confusion may result when range of depth is recommended.

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Chest Compressions Critical

- Without effective chest compressions
  - Oxygen flow to brain stops
  - Oxygen flow to heart stops
  - Drugs go nowhere.
Chest Compression Rate

Change:
- Compression rate *at least* 100 per minute.
  - 2005 recommendation: Compression rate about 100/min

Why?
- Absolute number of compressions delivered/minute has been linked with survival
- Actual compression rate is often well below 100/min.
Elimination of “Look, Listen, and Feel” for Breathing

• Change:
  • This action removed from the CPR sequence
  • After delivery of 30 compressions, lone rescuer opens airway and delivers 2 breaths.

• Why?
  • Rescuer checks for response and “no breathing or no normal breathing” in adult before beginning CPR
  • Starting CPR with compressions minimizes delay to action
<table>
<thead>
<tr>
<th>Component</th>
<th>Adults</th>
<th>Children</th>
<th>Infants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Recognition</strong></td>
<td>Unresponsive (for all ages)</td>
<td>No breathing or only gasping</td>
<td>No breathing or only gasping</td>
</tr>
<tr>
<td></td>
<td>No pulse palpated within 10 seconds for all ages (HCP only)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CPR sequence</strong></td>
<td>C-A-B</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression rate</strong></td>
<td>At least 100/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression depth</strong></td>
<td>At least 2 inches (5 cm)</td>
<td>At least 1/4 AP diameter About 2 inches (5 cm)</td>
<td>At least 1/3 AP diameter About 11/2 inches (4 cm)</td>
</tr>
<tr>
<td><strong>Chest wall recoil</strong></td>
<td>Allow complete recoil between compressions HCPs rotate compressors every 2 minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression Interruptions</strong></td>
<td>Minimize interruptions in chest compressions Attempt to limit interruptions to &lt;10 seconds</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Airway</strong></td>
<td>Head tilt-chin lift (HCP suspected trauma: jaw thrust)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Compression-to-ventilation ratio (until advanced airway placed)</strong></td>
<td>30:2 1 or 2 rescuers</td>
<td>30:2 Single rescuer 15:2</td>
<td>2 HCP rescuers</td>
</tr>
<tr>
<td><strong>Ventilations: when rescuer untrained or trained and not proficient</strong></td>
<td>Compressions only</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ventilations with advanced airway (HCP)</strong></td>
<td>1 breath every 6-8 seconds (8-10 breaths/min) Asynchronous with chest compressions About 1 second per breath Visible chest rise</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Defibrillation</strong></td>
<td>Attach and use AED as soon as available. Minimize interruptions in chest compressions before and after shock; resume CPR beginning with compressions immediately after each shock.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: AED, automated external defibrillator; AP, anterior-posterior; CPR, cardiopulmonary resuscitation; HCP, healthcare provider.
*Excluding the newly born, in whom the etiology of an arrest is nearly always asphyxial.
Healthcare Provider

ADULT BLS Sequence

- Recognize unresponsive adult with no breathing or no normal breathing (ie, only agonal gasps)
- Activate emergency response, retrieve AED (or send someone to do this)
- Check for pulse (no more than 10 seconds)
- If no pulse, begin sets of 30 chest compressions and 2 breaths
- Use AED as soon as available

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Healthcare Provider

CHILD BLS Sequence

• Recognize unresponsive child with no breathing or only agonal gasps
• Send someone activate emergency response, retrieve AED
• Check for pulse (no more than 10 seconds)
• If no pulse, begin sets of 30 chest compressions and 2 breaths
• Lone rescuer activates emergency response after 2 minutes of CPR
• Use AED as soon as available

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Cricoid Pressure

- Change:
  - Routine use of cricoid pressure during CPR is generally NOT recommended.

- Why:
  - Cricoid pressure can interfere with ventilation and advanced airway placement.
  - Not proven to prevent aspiration or gastric insufflation during cardiac arrest.
Team Resuscitation

- **Change:**
  - Increased focus on using a team approach during resuscitations

- **Why:**
  - Many CPR interventions performed simultaneously
  - Collaborative work minimizes interruption in compressions
  - Clear communication minimizes errors
Resuscitation Systems Must Institute CQI Processes

- Outcomes vary widely
- Each system must evaluate and improve outcomes
Devices for CPR

- The impedance threshold device (ITD) may be considered by trained personnel as a CPR adjunct in adult cardiac arrest (Class IIb, LOE B).
- Insufficient evidence to support or refute the routine use of mechanical piston devices (e.g. LUCAS) in the treatment of cardiac arrest.
- Insufficient evidence to support the routine use of load distributing band device (e.g. AutoPulse) in treatment of cardiac arrest.
Precordial Thump

- The precordial thump should not be used for unwitnessed out-of-hospital cardiac arrest.
- The precordial thump may be considered for patients with witnessed, monitored, unstable VT (including pulseless VT) if a defibrillator is not immediately ready for use, but it should not delay CPR and shock delivery.
Electrical Therapies

- Practice needed to minimize interruption in chest compressions to deliver shock.
- In-hospital use of AEDs may facilitate early defibrillation (goal: ≤ 3 minutes, monitor results).
- AEDs can now be used in infants if a manual defibrillator is not available.
- Defibrillation doses unchanged, adult cardioversion doses provided.
Advanced Cardiovascular Life Support (ACLS)

- Foundation of successful ACLS is good BLS.
- Traditional cardiac arrest algorithm simplified and alternative conceptual design (both emphasize importance of high-quality CPR.)
- Increased emphasis on continuous waveform capnography to
  - verify endotracheal tube placement
  - optimize CPR quality and detect ROSC.
CPR Quality
- Push hard (>2 inches [5 cm]) and fast (>100/min) and allow complete chest recoil
- Minimize interruptions in compressions
- Avoid excessive ventilation
- Rotate compressor every 2 minutes
- If no advanced airway, 30:2 compression-ventilation ratio
- Quantitative waveform capnography
  - If PETCO₂ <10 mm Hg, attempt to improve CPR quality
  - Intra-arterial pressure
    - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Shock Energy
- Biphasic: Manufacturer recommendation (120-200 J); if unknown, use maximum available. Second and subsequent doses should be equivalent, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy
- Epinephrine IV/IO Dose: 1 mg every 3-5 minutes
- Amiodarone for refractory VF/VT

Consider Advanced Airway
- Quantitative waveform capnography

Treat Reversible Causes
- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-/hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary
CPR 2 min
- IV/IO access

Rhythm shockable?

Yes

Shock

5

CPR 2 min
- Epinephrine every 3-5 min
- Consider advanced airway, capnography

Rhythm shockable?

Yes

Shock

7

CPR 2 min
- Amiodarone
- Treat reversible causes

No

10

CPR 2 min
- IV/IO access
- Epinephrine every 3-5 min
- Consider advanced airway, capnography

Rhythm shockable?

Yes

11

CPR 2 min
- Treat reversible causes

No

Rhythm shockable?

12

- If no signs of return of spontaneous circulation (ROSC), go to 10 or 11
- If ROSC, go to Post-Cardiac Arrest Care

Go to 5 or 7
ACLS: Waveform Capnography

- Change:
  - Quantitative waveform capnography is most reliable method to confirm and monitor correct ET tube placement (Class I, LOE A).

- Why:
  - Unacceptably high incidence of unrecognized ET tube misplacement or displacement.
  - Capnography has high sensitivity and specificity to identify correct endotracheal tube placement in cardiac arrest.
ACLS: Waveform Capnography

- After intubation, exhaled carbon dioxide is detected, confirming tracheal tube placement.
- Highest value at end-expiration.
ACLS: Medications for Pulseless Arrest

- Atropine: deleted from pulseless arrest algorithm
- Epinephrine: dose, interval unchanged
- Vasopressin: dose, use unchanged
- Amiodarone: dose, indications unchanged
- Lidocaine: dose, indications unchanged
- Sodium Bicarbonate: Routine use not recommended (Class III, LOE B).
- Calcium: Routine administration for treatment of cardiac arrest not recommended (Class III, LOE B).
B. Capnography to monitor effectiveness of resuscitation efforts. This second capnography tracing displays the PETCO₂ in mm Hg on the vertical axis over time. This patient is intubated and receiving CPR. Note that the ventilation rate is approximately 8 to 10 breaths per minute. Chest compressions are given continuously at a rate of slightly faster than 100/min but are not visible with this tracing. The initial PETCO₂ is less than 12.5 mm Hg during the first minute, indicating very low blood flow. The PETCO₂ increases to between 12.5 and 25 mm Hg during the second and third minutes, consistent with the increase in blood flow with ongoing resuscitation. Return of spontaneous circulation (ROSC) occurs during the fourth minute. ROSC is recognized by the abrupt increase in the PETCO₂ (visible just after the fourth vertical line) to over 40 mm Hg, which is consistent with a substantial improvement in blood flow.
ACLS: De-emphasis of Devices, Drugs and other Distracters

- Focus on high-quality CPR and defibrillation
- Atropine no longer recommended for routine use in management of PEA/asystole.
- Chronotropic drug infusions now recommended as alternative to pacing in symptomatic and unstable bradycardia.
- Adenosine recommended as safe and potentially effective for treatment and diagnosis in initial management of undifferentiated regular monomorphic wide-complex tachycardia.
Adult Bradycardia (With Pulse)

1. Assess appropriateness for clinical condition. Heart rate typically <50/min if bradycardia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IV access
   - 12-Lead ECG if available; don’t delay therapy

3. Persistent bradycardia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. Monitor and observe
   - No

5. Atropine
   - If atropine ineffective:
     - Transcutaneous pacing OR
     - Dopamine infusion OR
     - Epinephrine infusion

6. Consider:
   - Expert consultation
   - Transvenous pacing

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Adult Tachycardia (With Pulse)

1. Assess appropriateness for clinical condition. Heart rate typically ≥150/min if tachyarrhythmia.

2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry

3. Persistent tachyarrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?

4. Synchronized cardioversion
   - Consider sedation
   - If regular narrow complex, consider adenosine

5. Wide QRS? ≥0.12 second
   - No
     - IV access and 12-lead ECG if available
     - Vagal maneuvers
     - Adenosine (if regular)
     - β-Blocker or calcium channel blocker
     - Consider expert consultation
   - Yes
     - IV access and 12-lead ECG if available
     - Consider adenosine only if regular and monomorphic
     - Consider antiarrhythmic infusion
     - Consider expert consultation

6. Doses/Details
   - Synchronized Cardioversion
     - Initial recommended doses:
       - Narrow regular: 50-100 J
       - Narrow irregular: 120-200 J biphasic or 200 J monophasic
       - Wide regular: 100 J
       - Wide irregular: defibrillation dose (NOT synchronized)
   - Adenosine IV Dose:
     - First dose: 6 mg rapid IV push; follow with NS flush.
     - Second dose: 12 mg if required.
   - Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia
     - Procainamide IV Dose:
       - 20-50 mg/min until arrhythmia suppressed, hypotension ensues, QRS duration increases >50%, or maximum dose 17 mg/kg given.
       - Maintenance infusion: 1-4 mg/min. Avoid if prolonged QT or CHF.
     - Amiodarone IV Dose:
       - First dose: 150 mg over 10 minutes. Repeat as needed if VT recurs. Follow by maintenance infusion of 1 mg/min for first 6 hours.
     - Sotalol IV Dose:
       - 100 mg (1.5 mg/kg) over 5 minutes. Avoid if prolonged QT.

Figure 4. Tachycardia Algorithm.

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Post-Cardiac Arrest Care

- **Change:**
  - New 5th link in the chain of survival

- **Why:**
  - Emphasize importance of comprehensive multidisciplinary care through hospital discharge and beyond

- **Includes:**
  - Optimizing vital organ perfusion
  - Titration of FiO₂ to maintain O₂ sat ≥ 94%
  - Transport to comprehensive post-arrest system of care
  - Emergent coronary reperfusion for STEMI or high suspicion of AMI.
  - Temperature control
  - Anticipation, treatment, and prevention of multiple organ dysfunction

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Acute Coronary Syndromes (ACS)

- Support for STEMI systems of care
- Continue to implement prehospital 12-lead ECG program
- Triage to hospitals capable of performing PCI
- Supplementary oxygen is not needed for patients without evidence of respiratory distress if the oxyhemoglobin saturation is ≥ 94%.
- Use morphine with caution
Stroke

- Goal: minimize acute brain injury and maximize patient recovery
- Treatment is time sensitive: guidelines again emphasize the “D’s of Stroke Care” (important steps and times of potential delays)
- Stroke systems of care significantly improve stroke outcome
Ethics

- Prehospital BLS and ALS termination of resuscitation rules provided, require contacting online medical control
- Indicators of poor outcome after cardiac arrest used in the past may not be valid when therapeutic hypothermia used
- Assessment of clinical neurologic signs, electrophysiologic studies, biomarkers and imaging recommended where available 3 days after cardiac arrest.
Termination of Efforts in the Field-BLS

- Arrest not witnessed by emergency medical services personnel
- No return of spontaneous circulation (prior to transport)
- No AED shock was delivered (prior to transport)

If ALL criteria are present, consider termination of resuscitation
If ANY criteria are missing, continue resuscitation and transport

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BLS Termination Rules
1. Arrest NOT witnessed
2. No ROSC after 3 rounds of CPR with AED
3. No AED Shocks

“…recommend regional or local use of BLS termination rules to develop local protocols (Class I LOE A)
Termination of Efforts in the Field-ALS

- Arrest not witnessed
- No bystander CPR
- No return of spontaneous circulation (prior to transport)
- No shock was delivered (prior to transport)

If ALL criteria are present, consider termination of resuscitation

If ANY criteria are missing, continue resuscitation and transport

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ALS Termination Rules
1. Arrest NOT witnessed
2. No Bystander CPR
3. No ROSC after full ACLS
4. No AED Shocks

(Class 2a LOE B)
Important: READ the text

- The algorithms are simpler, but do not completely reflect the treatment protocols.
- “The tachycardia algorithms seems to have left out the problem of using adenosine with wide complex IRREGULAR rhythms”

If the etiology of the rhythm cannot be determined, the rate is regular, and the QRS is monomorphic, recent evidence suggests that IV adenosine is relatively safe for both treatment and diagnosis (Class IIb, LOE B). However, adenosine should not be given for unstable or for irregular or polymorphic wide-complex tachycardias, as it may cause degeneration of the arrhythmia to VF (Class III, LOE C). If the wide-complex...
Pediatric Resuscitation

- Revised pediatric chain of survival
- New post-arrest care link
Pediatric Basic Life Support

Similarities in pediatric BLS and adult BLS

- C-A-B rather than A-B-C sequence
- Continued emphasis on high-quality CPR
- Removal of “look, listen and feel”
- De-emphasis of pulse check for HCPs
- Use AEDs as soon as available
- AEDs may be used in infants, although manual defibrillation preferred

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Pediatric Basic Life Support

Some differences between pediatric BLS and adult BLS

- Chest compression depth – at least 1/3 of the anterior-posterior diameter of chest
  - Infants: about 1½ inches
  - Children: about 2 inches
- Lone rescuer provides 2 minutes of CPR before activating emergency response
- Two rescuers use 15:2 compression to ventilation ratio
- Traditional CPR (compressions and ventilations) by bystanders associated with higher survival than chest compressions alone

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Pediatric Advanced Life Support (PALS)

- Optimal energy dose for defibrillation of children unknown.
  - Initial dose 2-4 J/kg.
  - Subsequent dose ≥ 4 J/kg
- Post-ROSC: titrate oxygen to limit hyperoxemia.
- Therapeutic hypothermia (to 32°C to 34°C) may be beneficial (studies in progress)
- Young victims of sudden, unexpected cardiac arrest should have a complete autopsy with genetic analysis of tissue to look for inherited channelopathy.

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Neonatal Resuscitation

- For babies born at term, begin resuscitation with room air rather than 100% oxygen.
- Any oxygen administered should be blended with room air, titrated based on oxygen saturation measured from right upper extremity.
- Suctioning after birth reserved for infants with obvious airway obstruction, those requiring ventilation or non-vigorous babies with meconium.
- Therapeutic hypothermia recommended for babies near term with evolving moderate to severe hypoxic-ischemic encephalopathy.
Education, Implementation, and Teams (EIT)

- New section focusing on methods to improve bystander willingness to act, education techniques, teamwork and leadership
- Key Issues:
  - Current 2-year certification period for BLS, ACLS and PALS should include periodic refresher courses
  - Hands-Only CPR should be taught for those unable or unwilling to perform conventional CPR
  - Practice-while-watching is effective for BLS
  - Training should not be required for lay rescuers but it does improve performance
  - Debriefing is effective

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First Aid

- First Aid Guidelines again co-sponsored with ARC
- Unchanged: Oxygen administration (not recommended), aspirin for chest discomfort (recommended)
- Change in Epinephrine for anaphylaxis (allergic reaction)
  - If symptoms persist despite epinephrine administration, first aid providers should seek medical assistance before administering second dose
- Pressure dressing now recommended for all types of venomous snakebites
- Tourniquets still not recommended for first aid use (they are effective in battlefield)
- Recommendations added for jellyfish stings
First Aid

- **Hemostatic agents (new):**
  - Routine use of hemostatic agents to control bleeding as a first aid measure not recommended at this time.

- **Snakebites:**
  - Applying a pressure immobilization bandage with pressure between 40-70 mm Hg in upper extremity and between 55 and 70 mm Hg in lower extremity around entire length of bitten extremity is an effective way to slow lymph flow and dissemination of venom.

- **Jellyfish stings (new):**
  - To inactivate venom load and prevent further envenomation, liberally wash stings with vinegar as soon as possible and for at least 30 seconds.
  - Pain from stings should be treated with hot water immersion when possible.
Systems of Care

- **Change:**
  - Communities and hospital-based resuscitation programs should monitor quality of care and outcomes.

- **Why:**
  - Provides information necessary to optimize care
  - Narrow gaps between ideal and actual resuscitation performance
Summary of 2010 Guidelines

- Many resuscitation systems and communities have documented improved survival from cardiac arrest.
- Too few victims of cardiac arrest receive bystander CPR.
- CPR quality must be high.
- Victims require excellent post–cardiac arrest care by organized, integrated teams.
- Education and frequent refresher training key to improving resuscitation performance.
- We must rededicate ourselves to improving the frequency of bystander CPR, the quality of all CPR and the quality of post–cardiac arrest care.
2010 AHA Guidelines Reprint

• Can be purchased through www.heart.org/cpr
Guidelines Highlights

- Summarizes key changes in the 2010 AHA Guidelines for CPR and ECC
- Available electronically in English and 12 other languages at: heart.org/cpr
2010 Handbook of Emergency Cardiovascular Care for Healthcare Providers

- Valuable quick reference tool that incorporates the latest science and includes updated algorithms as well as information on therapeutic agents, stroke, and acute coronary syndromes.
- Available at AHA Sessions and heart.org/cpr
Educational and Training Materials

- Materials are being updated to reflect the new science.
- Currently in pilot testing with release planned in 2011:
  - CPR Anytime
  - Heartsaver First Aid, CPR & AED
  - Basic Life Support for Healthcare Professionals
  - Advanced Cardiovascular Life Support
  - Pediatric Advanced Life Support
Questions

To view a copy of this presentation please go to www.heart.org/cprscience. To learn more about upcoming products and information related to CPR and ECC visit www.heart.org/cpr

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