2.12 PEDIATRIC ADVANCED LIFE SUPPORT

Introduction

The American Academy of Pediatrics (AAP) and the American Heart Association (AHA), in conjunction with International Liaison Committee on Resuscitation (ILCOR), developed the Pediatric Advanced Life Support (PALS) curriculum. The PALS curriculum teaches healthcare providers to more effectively recognize potential respiratory failure and shock in infants and children and to respond with early appropriate interventions to prevent cardiopulmonary arrest. The curriculum utilizes a 4-tiered Pediatric Assessment scheme, involving a recurring cycle of "assess-categorize-decide-act," focused on simplicity and graduated to provoke timely and appropriate early interventions. This scheme funnels emergency decision-making into respiratory (distress or failure) and circulatory (compensated or hypotensive) categories, which can be further defined based upon additional information gathered in the assessment process. The PALS curriculum further emphasizes the importance of the Resuscitation Team Concept, which encourages clear, collaborative communication. Pediatric hospitalists frequently encounter clinical situations that require immediate or emergent intervention and should be prepared to provide care within the context of PALS guidelines.

Knowledge

Pediatric hospitalists should be able to:

- List the common etiologies and describe early signs of respiratory failure and all forms of shock, attending to variations in presentation due to patient age.
- Explain how respiratory failure and shock can lead to cardiopulmonary arrest when early signs of distress are not recognized or acted upon.
- Describe how basic airway, breathing, circulation, disability, and exposure (ABCDE) life support maneuvers differ with age from newborns to infants and older children.
- Summarize the modalities commonly available to support the airway, breathing, and circulation in children with worsening respiratory distress, in increasing intensity/invasiveness.
- Compare and contrast the advantages and disadvantages of bag mask ventilation versus advanced airway management and describe proper selection of equipment and technique based on patient scenario.
- Differentiate the pathophysiology of hypovolemic, distributive, cardiogenic, and obstructive shock.
- Propose an approach toward management and stabilization of hypovolemic, distributive, cardiogenic, and obstructive shock, attending to differences by age.
- List common pediatric cardiac dysrhythmias and describe the most appropriate algorithm to apply for each.
- Describe the appropriate context and use of automated external defibrillators in children.
- Discuss the basic pharmacology of drugs most commonly utilized in PALS.
- Explain how assessment tools and interventions should be customized for special resuscitation situations, such as trauma, toxicological emergencies, rapid sequence intubation, procedural sedation, children with special health care needs, and others.
- Review the management of post resuscitation care and transport.
- Discuss the utility of early warning systems/pediatric rapid assessment tools designed to anticipate significant clinical instability, attending to the local context.
- Define the roles, team composition, and responsibilities of rapid response and code teams, attending to the local context.

Skills

Pediatric hospitalists should be able to:

- Complete the Pediatric Advanced Life Support course and maintain certification.
- Identify patients requiring institution of PALS techniques, accurately perform rapid assessment, and apply appropriate interventions.
- Identify early warning signs of acute respiratory distress and cardiac compromise and institute corrective actions to avert further deterioration.
- Perform effective basic life support and cardiopulmonary resuscitation skills, using appropriate weight/size-based resuscitation tools.
- Stabilize the airway, using noninvasive techniques (including bag-mask ventilation and oral airway insertion) and invasive airway management techniques in collaboration with other services, according to local context.
- Formulate a differential for tension pneumothorax and perform decompressive needle thoracostomy.
- Identify and treat common pediatric cardiac dysrhythmias.
- Utilize an Automated External Defibrillator under appropriate circumstances.
- Obtain peripheral or central vascular access by placement of intravenous, intraosseous, or central venous catheters in collaboration with other services, according to local context.
- Apply PALS principles to special resuscitations, such as toxicological emergencies, procedural sedation, or trauma.
- Lead or participate as a member of a rapid response and/or resuscitation team, arranging for transfer to a higher level of care or transport to another facility as appropriate.
- Manage a clinical team debrief immediately following a resuscitation.

Attitudes

Pediatric hospitalists should be able to:

- Advocate for presence of the family/caregivers during resuscitation when appropriate.
- Realize the importance of effective and compassionate communication with the family/caregivers.
- Acknowledge the value of collaboration with social work, chaplain, the primary care provider, and others to enhance support for the family/caregivers.
- Appreciate the importance of situation monitoring, lead-

ership, direct and closed-loop communication, and mutual support in effective team functioning during resuscitation events.

Systems Organization and Improvement

In order to improve efficiency and quality within their organizations, pediatric hospitalists should:

- Lead, coordinate, or participate in the development and implementation of a local Pediatric Advanced Life Support training program.
- Lead, coordinate, or participate in the development and implementation of pediatric mock code training at their local institution.
- Collaborate with hospital administration to ensure code carts are pediatric-specific and contain adequate, appropriate equipment.
- Collaborate with hospital administration to create inter-facility transport and affiliation agreements between community hospitals and pediatric tertiary care centers to foster effective and appropriate triage of sick and injured children.
- Advocate for a statewide Emergency Medical Systems (EMS) for Children program which places pediatric emergency care in its proper place within the EMS system.

References

1. American Heart Association. Pediatric Advanced Life Support. https://cpr.heart.org/AHAECC/CPRAndECC/Training/HealthcareProfessional/Pediatric/UCM_476258. Accessed August 26, 2019.