CALS Mission: CALS improves patient care by providing advanced life support education to rural healthcare providers.

Enclosed is a summary outline of the curriculum covered in the CALS Provider Manual, Provider Course, Trauma Module and Benchmark Skills Lab. CALS curriculum covers a full spectrum of emergency and critical care concepts using a Universal Approach algorithm. The curriculum includes management of the trauma, cardiac, neurological, medical, and airway compromised adult and pediatric patients, as well as, obstetric patients and neonatal resuscitation. Participants study the CALS Provider Manual, complete a study guide, take pre- and post-tests, experience realistic scenario-based stations, practice critical skills and attend a hands-on trauma module or benchmark skills laboratory for rural emergency care management.

Goals and Objectives

The primary goal of the CALS Provider Course is to improve patient care by:

1. Presenting an educational experience in advanced life support that encompasses all critical areas of emergency care.
2. Developing a team approach to patient management.
3. Providing material in a variety of instructional formats to allow for self-directed learning and to provide a balance of cognitive, affective, and psychomotor skills.
4. Providing an information resource and rapid retrieval system with the use of algorithms and treatment plans.
5. Providing means for updating and maintaining knowledge and skills of advanced life support providers.

On completion of the course, the health professional will be able to:

1. Demonstrate the ability to problem solve in a variety of clinical situations.
2. Identify key threats and demonstrate therapeutic interventions.
3. Discuss roles of each team member involved in patient evaluation and treatment.
4. Perform skills consistent with the provider’s role on advanced life support team.
**Activate Team: Team Leader and Member Roles**

**Team Leader Role**
- Assignment of team members
- Directs team and relays information to whole team
- Initial Survey: Identify and treat all life threats-airway, breathing, and circulation AVPU, DON’T and SAMPLE history
- Focused Survey
- Develop working diagnosis
- Continue ongoing assessment and resuscitation of the patient
- Determine a plan for patient disposition

**Team Member Role**
- Immediate control of patient
  - Appropriate workstation
  - Patient interventions to consider
  - Airway control
  - Expose and look for medic alert information
  - Vital signs including temperature and SaO₂
  - ECG monitor placement
  - Start 2 large bore IVs and obtain labs
  - Obtain O-negative blood
  - Insert orogastric tube
  - Insert urinary catheter as needed
  - Relay information to team leader and document on patient record
  - Anticipate next steps and equipment needed
  - Patient transfer guidelines

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**Resuscitation of the Trauma Patient**

**Airway, Breathing and Circulation Procedures**

**Airway**
- Intubation
  - In-line immobilization
  - Use of different types of laryngoscope blades
  - Use of ET tube introducer
  - Use of different video laryngoscopes
- Pre-oxygenation techniques
- Post intubation cares
- Rescue airway – King/Combitube™
- Rapid sequence intubation for adults and pediatrics
- Laryngeal mask airway (nonintubating/intubation)
- Transtracheal needle ventilation/Moonlighter’s device
- Foreign body removal: adult & child
- Retrograde intubation*
- Cricothyrotomy
- Tracheostomy*

Adjunct airway equipment
- Esophageal intubation detector
- Big Stick oropharyngeal suction
- Suction bracket
- CO2 monitoring
- Bag valve mask technique
- Nasal / Oral airways

Airway cart/Airway equipment
- Replacement of a faulty endotracheal tube
- Determination of the proper airway management option
- Rapid sequence intubation (RSI)
  - Drug selection
  - 9 P’s of RSI

**Breathing**
- Detecting stomach and breath sounds
- Chest wall palpation
- Tracheal shift detection
- Distended neck veins
- Needle thoracostomy
- Chest tube insertion
  - Chest drainage collection
  - Heimlich valve
  - Banding of chest tubes
  - Autotransfusion

**Circulation**
- Fluid resuscitation
  - Use of warm fluids
  - Use of a pressure bag
Peripheral line placement
- Ultrasound guided peripheral venous access
- Converting to a large bore IV using an introducer

Intraosseous placement
- Manual insertion
- EZ IO® device

Central line placement
- CVP measurement and monitoring
- Internal jugular & subclavian technique

Arterial line placement*

Internal hemorrhage
- Transfusion: use of O negative / O positive blood
- Transexamic Acid

External hemorrhage control
- Raney Clips
- Quik Clot

Lab test decisions and use of prepackaged patient identification
Saphenous vein cut down

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Resuscitation of the Trauma Patient
Adult and Pediatric

Disability assessment and management
Complete trauma patient assessment including primary and secondary survey
Helmet removal
Mechanism of Injury
Prioritization in multiple casualty events
Determination of Glasgow coma scale
Warming measures for a trauma patient
FAST exam: Introduction to the use of ultrasound in trauma care
Ultrasound examination of the heart and aorta*
C-spine immobilization techniques
Trauma series x-rays
C-spine x-ray evaluation
- SCIWORA = spinal cord injury without radiographic abnormalities
- Recognition of central cord syndrome
- Recognition for need of cervical spine reduction
Pericardiocentesis
Emergency thoracotomy
  • Pericardiotomy*
  • Aortic compression*
  • Cardiac massage*
  • Internal defibrillation*
  • Stapling cardiac wounds*
Extremity injury
  • Amputation and use of tourniquets
  • Compartment syndrome
  • Splinting and traction devices
Management of Pelvis fracture evaluation
  • X-ray interpretation
  • Pelvic stabilization devices
  • Suprapubic catheterization in a disrupted urethra*
Management of a head injury patient
  • Neurological Exam
  • Recognition of a herniation syndrome
  • Intubation and airway control
  • Treatment of increased intracranial pressure (ICP)
  • Seizure management
    - Use of benzodiazepines – route administration
    - Fosphenytoin or phenytoin infusion
  • Signs of an acute epidural hematoma
    - CT interpretation
    - Skull trephination
Management of the Multi-trauma patient
  • Altered mental status
  • Airway management
  • Chest trauma
    - Pneumothorax
    - Penetrating wound (i.e. sucking chest wound)
  • Management of shock, hypovolemic shock
  • Fluid Resuscitation
    - Warm IV fluids, avoid hypothermia in the trauma patient
  • Blood transfusion: Packed Red Blood Cells or auto transfuser
  • Identification of wide mediastinum
  • Intra-abdominal bleeding
Management of Shock
• Recognition of shock
• Differential of shock (i.e. obstructive, distributive, hypovolemic, and cardiogenic)
• Treatments for specific types of shock

Other conditions of the trauma patient
Assessment and management of Environmental injuries
Hypothermia
• Rewarming techniques
• Frozen limb
Hyperthermia/heat stroke
Burns**
Near-drowning**
High altitude illness**

Resuscitation equipment
Proper use of the equipment
Resources for obtaining equipment

Resuscitation of the Cardiac Patient

Detection and treatment of cardiac rhythm disturbances
• Ventricular fibrillation
• Ventricular tachycardia
• Pulseless electrical activity
• Tachycardia
• Bradycardia
• Asystole

Management of acute coronary syndrome
• ECG interpretation in myocardial infarction
• Treatment algorithm based on initial 12-lead ECG
• Therapeutic agents / procedures in acute coronary syndrome
• Transfer guidelines

Management of hypertension
Management of Digitalis toxicity**
Management of CHF / pulmonary edema (airway in addition to topics covered in trauma)
- Noninvasive ventilatory support
- Invasive ventilatory support
- CPAP/BiPAP
- Initial ventilator settings
- Drug therapy

Resuscitation of the Adult Neurological Patient

Management of acute neurological event
- Subarachnoid hemorrhage
- Status epilepticus
Management of stroke
- NIH scale
- Blood pressure control
- Fibrinolytic therapy, according to AHA guidelines

Resuscitation of the Adult Medical Patient

Management of asthma
- Heliox
- Drug therapy
Management of anaphylaxis
- Use of transtracheal needle ventilation
- Drug therapy
Management of diabetes**
- Fluid resuscitation
- Drug therapy
- Blood gas analysis
Management of Shock
- Causes – SHRIMPCAN
Management of acid-base imbalance**
- Causes**
Management of endocrine disorders**
- Thyroid Storm
- Myxedema

Management of infection
- Pneumonia**
- Urosepsis
- Meningitis
  - Drug therapy
- Sepsis
  - Early treatment Goals in Sepsis

Management of toxicology, a systematic approach and essential antidotes
- Acetaminophen
- Alcohol
- Aspirin
- Cocaine
- Flumazenil
- Organophosphate
- Tricyclic Antidepressants
- Calcium Channel Blocker
- Beta Blocker
- Narcotic overdose
- Carbon Monoxide
- Cyanide
- Iron

Management of patient with altered LOC
- DON’T
- TIPS from the VOWELS

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**Resuscitation of the Pediatric Medical Patient**

Resources
- Broselow tape
- Hennepin pediatric emergency manual
- Modified Lund Browder Chart**
- Physiologic and anatomic considerations
- Pediatric assessment triangle

Assessment and Management of Airway problems
- Identification of respiratory distress and failure
- Intubation
- Pediatric RSI
- Tracheal atresia
- Tracheal foreign body
- Croup**
• Epiglottitis**
• Asthma
• Tracheitis**
• Bronchiolitis*
• Pneumonia**
• Diphtheria**

Assessment and management of Medical problems
• Altered mental status
• Seizure
  – Drug therapy
  – Atomized intranasal medication administration
• Dehydration
• New onset of diabetes/DKA
  – Fluid Resuscitation
  – Acid-base balance and related lab results
  – Airway control
  – Drug therapy
  – Monitor urinary output

Resuscitation of the Obstetric Patient

Physiologic considerations
Use of ultrasound**
Bleeding in early pregnancy**
  • Miscarriage**
  • D&C**
Third stage and postpartum emergencies
Thromboembolic disease and pregnancy
Fetal heart tone monitoring and interpretation
Bleeding in the second half
Hypertension in pregnancy
Preterm labor
Trauma in pregnancy
OB deliveries skills
  • Prolapsed cord
  • Normal delivery
  • Nuchal cord
  • Shoulder dystocia and HELPER mnemonic
• Cord disconnected from placenta, and retrieval of the placenta
• Breech delivery

Resuscitation of the Neonatal Patient

Assessment and management of the neonatal patient with physiologic and anatomical considerations

• Use of O₂
• Intubation
• Proper use of BVM
• Meconium suctioning
• Transtracheal needle ventilation
• Tracheostomy*

• Intraosseous
• Fluid bolus
• Peripheral IVs*
• Blood glucose determination
• Temperature control
• Use of chemical warming
• Umbilical catheterization

Neonatal ALS evaluation and resuscitation

• Treatment algorithm
• Resuscitation technique
• Resuscitation medications
• Chest tube insertion in the newborn*
• Pre Ductal SpO₂ for Neonate

Due to the broad scope of Comprehensive Advanced Life Support, not all content is covered in every format. Content that is covered only in the laboratory is designated by an *. Content covered only in the manual is designated by **.