



COURSE CONTENT

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.

CALS Universal Approach to the Advanced Life Support Patient

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

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
- Tranexamic Acid

External hemorrhage control

- Raney Clips
- Quik Clot

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

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

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|-----------------------------|---------------------------|
| • Acetaminophen | • Calcium Channel Blocker |
| • Alcohol | • Beta Blocker |
| • Aspirin | • Narcotic overdose |
| • Cocaine | • Carbon Monoxide |
| • Flumazenil | • Cyanide |
| • Organophosphate | • Iron |
| • Tricyclic Antidepressants | |

Management of patient with altered LOC

- DON'T
- TIPS from the VOWELS

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

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| • Use of O ₂ | • Intraosseous |
| • Intubation | • Fluid bolus |
| • Proper use of BVM | • Peripheral IVs* |
| • Meconium suctioning | • Blood glucose determination |
| • Transtracheal needle ventilation | • Temperature control |
| • Tracheostomy* | • 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 **.*

