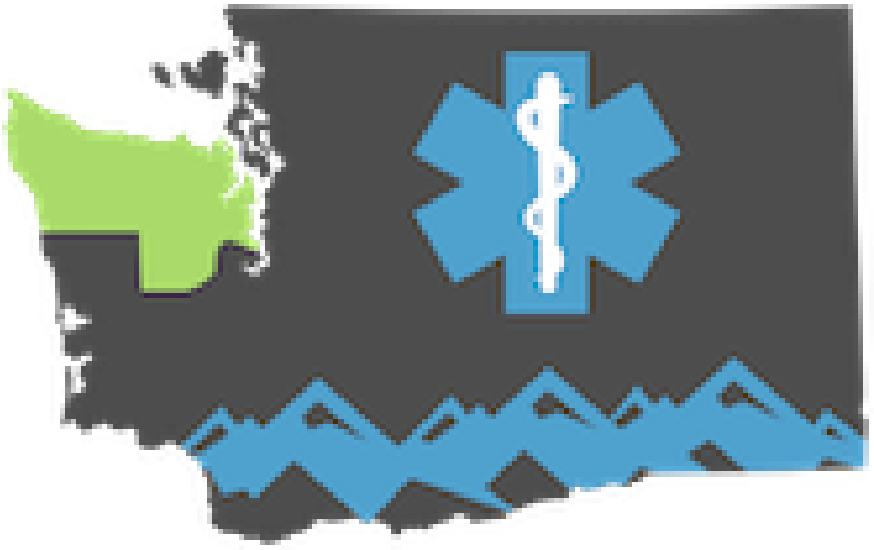
Northwest Region EMS Protocols



Clallam, Mason, Kitsap & Jefferson Counties

MPD Approved March 2, 2020
Washington State DOH approved March 2, 2020
Edits approved 5/6/2020

March 2020 (Washington state DOH approved March 2, 2020

The following protocols and procedures have been approved for use by pre-hospital care providers in Clallam, Mason, Kitsap and Jefferson Counties.

These protocols will be reviewed and revised, as necessary to reflect the changes in standards.

Dr. Joseph Hofman, MPD Mason and Kitsap Counties

Dr. Sandra Smith-Poling MPD Jefferson County, West Olympic Peninsula

Dr. Danielle Whitley, MPD Clallam County

Northwest Region EMS and Trauma Care Council would like to extend a special thank you to the EMS professionals from the five different EMS councils who dedicated their time to the Northwest Regional EMS protocols. These protocol members worked with the Regional MPD's to ensure that patient care within the Northwest Region is of the highest standard. It is with their commitment to excellence and personal expertise in the field of EMS that we were able to produce a Regional Protocol.

Keith Bogues, Chairman NW Region EMS

René Ralston, Executive Director NW Region EMS

Sections are color coded as follows:

Introduction

Protocols

Cardiac

Respiratory

Medical

OB / GYN

Environmental

Pediatric Protocols

Pediatric Procedures

Procedures

Drug Formulary

Miscellaneous

Regional Guidelines

PREHOSPITAL PROVIDER SCOPE OF PRACTICE

Level of Certification Washington DOH	Medical Control & Skills Capabilities	Medication Administration
Emergency Medical Responder	MPD protocols, patient assessment, CPR, AED, BVM, Bandaging, splinting, trauma, triage, medical, and pediatrics.	0_2, IN Naloxone, Asprin, Oral Glucose, Pre-loaded Epinephrine IM
Emergency Medical Technician	Above plus supraglottic airway with endorsement, IV therapy with endorsement NIPPV, OB/GYN. ECG/12-Lead can read only.	Above plus IM/IN Naloxone, Aspirin, Epinephrine IM, Activated Charcoal, Oral Glucose, assist with patient's own Diastat, nitroglycerin and metered dose inhaler prescribed, end-tidal capnography. With specialized training Albuterol SVN, Zofran ODT.
Advanced Emergency Medical Technician	Above plus IV Therapy skills, Supraglottic Airway.	Above plus naloxone, dextrose 50/25/10, albuterol EP for cardiac arrest, Zofran IV/IM with specialized training
Paramedic	Above plus, capnography, advanced airway control, ACLS w/ manual defibrillation, and advanced patient assessment, trauma and medical skills.	Above plus MPD protocol

NORTHWEST REGION PATIENT CARE PROCEDURES

These procedures have been developed by the Northwest Regional EMS & Trauma council in conjunction with local councils. The Patient Care Procedures define how the EMS system operates within the Northwest Region of Washington State, by identifying the level of medical care personnel who participate in the system, their roles in the system, and participation of the hospital facilities in the system. They also address the issue of inter-hospital transfer, transfer agreements for identification, and transfer of critical care patients.

The Prehospital Trauma Triage Procedure and the Regional Patient Care Procedures outline an EMS system structure which effectively reduces morbidity and mortality. A full copy of the Northwest Regional Patient Care Procedures may be accessed on our website at www.nwrems.org .

CDC National Trauma Triage

Measure vital signs and level of consciousness

1

Glasgow Coma Scale <14 or
Systolic blood pressure <90 mmHg or
Respiratory rate <10 or > 29 breaths/minute (<20 in infant < one year)

YES → **Take to a trauma center**. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the trauma system

No

Assess anatomy of Injury

2

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee
- Flail chest
- Two or more proximal long-bone fractures
- Crushed, degloved, or mangled extremity vascular injury
- Amputation proximal to wrist and ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis
- **Burns**
  - Without other trauma mechanism: Triage to burn facility
  - With trauma mechanism: Triage to trauma center

YES → **Take to a trauma center**. Steps 1 and 2 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of care within the trauma system

No

Assess mechanism of Injury and evidence of high-energy impact

3

Falls
- Adults: > 20ft. (one story is equal to 10 ft.)
- Children: > 10ft. or 2-3 times the height of the child

High-Risk Auto Crash
- Intrusion: > 12in. Occupant site; > 18in. Any site
- Ejection (partial or complete) from automobile
- Death in same passenger compartment
- Vehicle telemetry data consistent with high risk of injury

Auto v. pedestrian/Bicyclist Thrown, Run Over, or with Significant (> 20 mph) Impact

Motorcycle Crash > 20 mph

YES → **Transport to closest appropriate trauma center,** which depending on the trauma system, need not be the the highest level trauma center

No

Assess special patient or system considerations

4

Age
- Older Adults: Risk of injury death increases after age 55 years
- Children: Should be triaged preferentially to pediatric capable trauma center

Ground level falls in elderly

SBP<110 in 65 yr and older

Anticoagulation and Bleeding Disorders

Time Sensitive Extremity Injury

End-Stage Renal Disease Requiring Dialysis

Pregnancy > 20 Weeks

EMS Provider Judgment

YES → **Contact medical control and consider transport to a trauma center or a specific resource hospital.**

No

Transport according to protocol

see supplements for County specific guidelines

insert County Operating Procedures here and number as follows:

PREHOSPITAL PROVIDER CONDUCT

1. Northwest Region EMS Providers must maintain the highest standard of professional conduct.
2. Competent medical care must be provided with compassion and dignity for all persons regardless of nationality, race, creed, religion, sex or status.
3. Providers must refuse to participate in unethical activities and/or activities which may impair professional judgment and the ability to act competently.
4. Matters of disagreement between prehospital providers regarding patient care must be handled professionally without alarming anyone on the scene. Medical Control contact will be made for immediate direction. Providers should not threaten, degrade, insult or verbally abuse each other.
5. Patient Confidentiality will be maintained at all times in compliance with Health Insurance Portability and Accountability Act (HIPAA) of 1996.

INFECTION CONTROL STANDARDS

1. Infection Control Standards assume that all contact with blood, other bodily fluids and potentially infectious materials is infectious.
2. The standards of use of Universal Precautions / Body Substance Isolation, which includes safe work practices, correct use of engineering controls and personal protective equipment is mandated by WISHA, and must be adhered to.
3. EMS Providers must protect themselves at all times from “reasonably anticipated potential for exposure”. The following is a list of mandated items: Gloves, Masks, Face Shields, Safety Glasses, High Efficiency Particulate Air (HEPA) Filters, Resuscitation Equipment, and Protective Clothing.

PATIENT REFUSAL OF MEDICAL EVALUATION

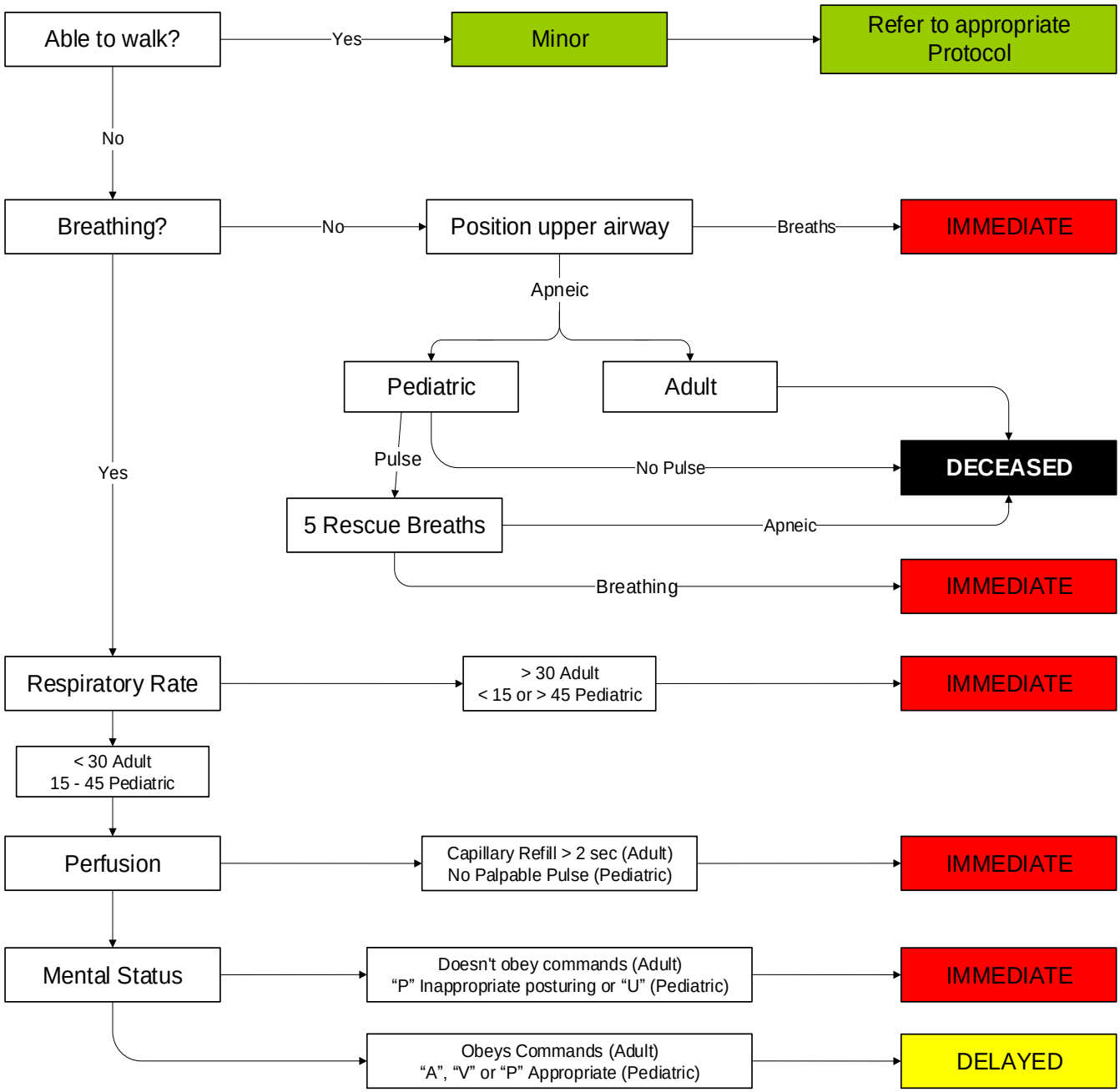
1. Consent

a. The patient has responsibility to consent to or refuse treatment. If the patient is unable to do so, a responsible relative or guardian has this right.
b. If waiting to obtain lawful consent from the authorized person would present a serious risk of death, serious impairment of health, or would prolong severe pain or suffering to the patient, treatment may be undertaken to avoid these risks without consent. In no event should legal consent procedures be allowed to delay immediately required treatment.
c. The patient must be eighteen years of age or emancipated to legally refuse treatment.
d. If the patient is under age, consent should be from a natural parent, adopted parent, or legal guardian only.

2. Mental competence

a. A person is mentally competent if:
    1. Capable of understanding the nature and consequence of the proposed treatment.
    2. Sufficient emotional control, judgment, and discretion to manage their own affairs are present.
b. A person is not mentally competent if he/she has impaired cerebral perfusion, presents in shock, is postictal, or under the influence of drugs or alcohol.
c. Medical Control contact with the Base physician is necessary for all patients refusing transport in those counties requiring it.
d. Nurses may speak for the Medical Control physician if the physician is unable to come to the telephone. The nurse must give the prehospital care provider the name of the Base physician who is directing the nurse

Adult/Pediatric START/JumpSTART Triage



AVPU Infant / Child		
Response	**Infant**	**Child**
A - Alert	Curious / Recognizes parents	Alert / Aware of surroundings
V – Responds to Voice	Irritable / Cries	Opens eyes
P – Responds to Pain	Cries in response to pain	Withdrawals from pain
U - Unresponsive	No Response	Opens eyes

Universal Patient Care Protocol Adult / Child

Consider ALS Evaluation and/or Transport if:

- Suspected Coronary chest pain
- Shortness of breath not relieved by initial interventions
- Abdominal pain
- Altered mental status
- Abnormal vital signs

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Scene Safety / BSI

↓

Initial Assessment
Pediatric Assessment
Procedure Pg. 76

Cardiac Arrest → **Cardiac Arrest Protocol**
Adult Pg. 18
Pediatric Pg. 54

↓

Vital Signs
BP, Pulse, Respiratory

↓

E | Temperature PRN
Blood Sugar
Pulse Oximetry | E

↓

R | Oxygen
O_2 sat > 94-98% | R

↓

E | *Consider
Cardiac Monitor/12
Lead ECG | E

↓

P | Capnography | P

↓

Appropriate Protocol(s)

↓

M | Doesn't fit protocol?
Contact Medical Control | M

Notes:

- A pediatric patient is defined by a length based tape. If the patient does not fit on the tape, they are considered adult.
- Exam: Minimal exam if not noted on the specific protocol is vital signs, mental status, and location of injury or complaint.
- Any patient contact which does not result in an EMS transport shall be documented.
- *EMT can acquire 12-lead ECG and read/report text printout but cannot interpret.

Suspected Abuse

Transport all patients

Physical findings:
- Unexplained bruises
- Numerous/mulitple bruises
- Burns:
  Cigarette, Immersion, Rope, Infected
- Torn, stained, bloody underclothes
- Bleeding, irritation or pain of the genitals
- Poor hygiene/malnourished
- Child with repeated injuries/multiple calls to the same address
- Flat/bald spots on head (infants)
- Unexplained wet clothing/body

Behavioral:
- History of minor incident inconsistent with major injury
- MOI inconsistent with developmental age
- Inappropriate fear of parent
- Inconsistent explanation for injury
- Nervous disorders (rash, hives, stomachaches)
- Age-inappropriate behaviors (bedwetting)
- Lack of adult supervision
- Delay in seeking medical care
- Caregiver who refuses treatment or transport

Contact LE/CPS/APS should caretaker not allow transport to hospital

END HARM
(1-800-562-5624)

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Universal Patient Care Protocol

↓

Oxygen PRN
Advanced Airway Management

↓

Consider other treatment Protocol as necessary

↓

Documentation:
- Carefully document caretakers description of event
- Note environment including temperature
- Note clothing, stains, and conditions

↓

M **Contact Medical Control** M

Sexual abuse:
- May be present without apparent signs of physical abuse
- Discourage patient from going to the bathroom
- Don't allow patient to change clothes or wash
- Bring clothing to hospital
- EMS are mandatory reporters

High Threat

Inclusion Criteria:
- Patient care in the presence of an active threat, where greater than normal conditions exist that are likely to cause damage or danger to the provider or patient, including:
  - Technical Rescue Incident
  - Water Rescue/Marine Operations
  - Hazardous Materials Incident
  - Active Shooter

Exclusion Criteria:
- Patients not meeting inclusion criteria.

Ensure provider safety

EMS personnel operating in the hot or warm zone should follow the direction of competent technical personnel in regards to safe movement through the environment, i.e. law enforcement, hazardous materials, or technical rescue personnel

Providers should defer in depth medical interventions if engaged in ongoing direct threat, e.g. active shooter, unstable building, improvised explosive device(s), or hazardous materials

In an active threat MCI, START Triage should be deferred until a later phase of care and prioritization for extraction or extrication should be based on resources available and the situation presented

Encourage patients to provide self-first aid or instruct aid from uninjured bystanders

In an active threat MCI, initial providers should create a Casualty Collection Point (CCP) in conjunction with competent technical personnel

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

Manage bleeding per **Hemorrhage Control Protocol** pg.45
Consider providing bleeding control with early tourniquet application. Bleeding control is often the only intervention provided in the hot zone

Manage airway per **Airway Management Protocol** pg. 27

Consider prioritizing patient movement and evacuation over medical procedures beyond immediate bleeding control
C Spine precautions should be foregone if their completion may pose a risk to providers, law enforcement personnel, or patients

In an active threat MCI, deceased subjects should be placed prone with their arms and legs crossed

A Consider foregoing ALS procedures until the patient has been removed to the warm zone, cold zone, or a CCP A

A Consider Airway Management using supraglottic rather than endotracheal intubation to facilitate speed of completion and down-stream BLS management and transport A

P Consider **Pain and Sedation Management** Pg. 38 P

Narcotic pain management should be avoided in operational personnel who may be needed to mitigate the incident

Treat other conditions in accordance with appropriate protocol or procedure

M **Contact Medical Control** M

End of Life/Palliative Care

Inclusion Criteria:
- Patient diagnosed with a terminal illness or condition, AND
- Suffering from symptoms related to such terminal condition, AND
  - Currently enrolled in hospice or palliative care, OR
  - Having advance care directives indicating "comfort measures only" or similar, OR
  - For who transport and/or condition correcting treatment has been refused by competent patient or family members.

Exclusion Criteria:
- Complaints unrelated to the underlying terminal illness or condition AND/OR
- Patients not meeting inclusion criteria.

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Universal Patient Care Protocol

Oxygen maintain 94-98% or as indicated by clinical presentation

Encourage PO fluid intake as appropriate if patient is able to swallow. Consider ice chips or water soaked swabs if difficulty swallowing

Assist patient and family in finding a position of comfort

A Obtain IV/IO access A

A Consider Fluid Bolus if signs of dehydration or hypovolemia A

P Consider **Pain and Sedation Management** Pg. 38 P

P Atropine Sulfate IV solutions 2-5 drops in oral cavity for secretions P

Respiratory distress?

P consider **Midazolam** 2.5-5 mg IV/IN/IM OR **Fentanyl** 25 mcg SVN, mixed in 2Ml normal saline P

Nausea relief, **General Illness** Pg. 36

Anxious?

P consider **Lorazepam** 0.5-4 mg IV/IN/IM OR **Midazolam** 2.5-5 mg IV/IN/IM OR **Diazepam** 2-5 mg IV/IN/IM P

M **Contact Medical Control** M

Notes:
- Social interactions with family may affect end-of-life care
- Generally, patients receiving palliative or end-of-life care for their underlying terminal illness or condition should not be transported. Careful consideration must be given prior to transport in collaboration with the patient, hospice or palliative care provider, guardian, power of attorney, or other accepted healthcare proxy. ALS Providers are authorized to medicate these patients in accordance with this protocol and to leave them in their home or palliative care setting.
- Base physician shall be consulted prior to the palliative management of pediatric patients

Code Sepsis

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

SUSPECTED/KNOWN Infection?

EMS TRIAGE	3	2	1	0	1	2	3
Respiratory Rate		< 8		9-20		21 - 29	≥30
Heart Rate		≤ 40	41-59	60 - 89		90 - 119	≥120
Temperature (F)		<96.8		96.8-100.4		>100.4	
Age				≤ 54	55-64	65-74	≥ 75
Pre-existing Factors				none	2	3	≥ 4
GCS	≤ 6	7 - 11	12 - 14	15			
SBP		≤ 90		≥ 91			
EtCO2	<25	25-32	32-37	>37			
Sub-TOTAL		**Score ≥ 9 = CODE SEPSIS**					

Yes

Pre-existing factors :
-Cancer with recent treatment (chemo, radiation)
-Diabetes Mellitus
-Renal Failure
-Liver Failure
-Hypertension (HTN)
-Cardiac Disease (CHF and vascular disease)
-Known Infection
-Implanted Ports
-Feeding Tube
-Urinary Tube (Foley, suprapubic cath, or urostomy)
-Colostomy
-Surgical Sites
-Implanted Devices
-Pressure Ulcers
-Antibiotic therapy within 30 days
-Surgery within 30 days
-HIV

M Contact Medical Control
Declare Code Sepsis
Limit scene time
ALS transport or ALS rendezvos **M**

E ECG / 12 lead **E**

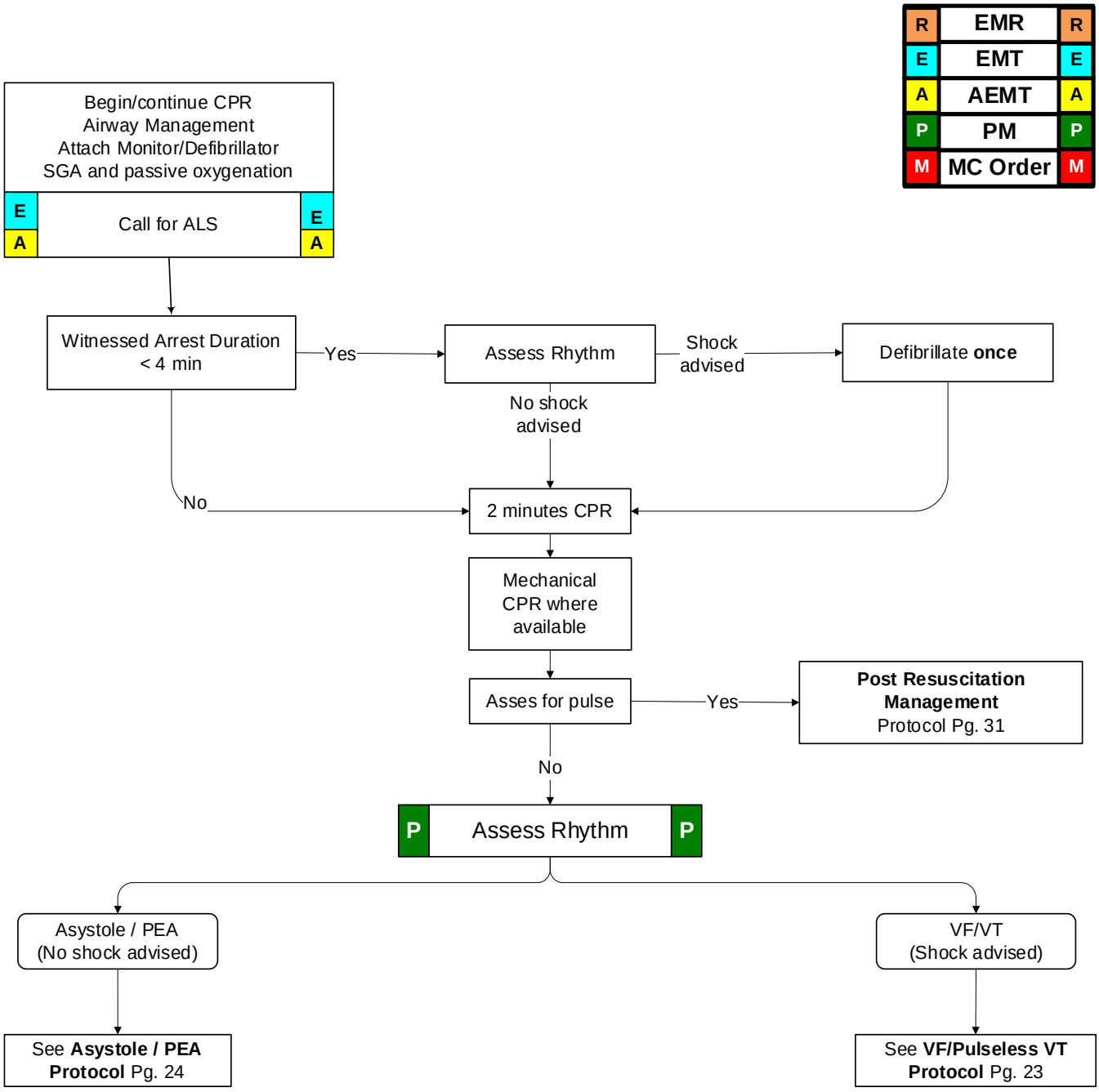
A Obtain IV/IO access **A**

A **Isotonic IVF**
250cc-1,000cc may repeat x 1 if not in Pulmonary Edema
Goal SBP > 100
Treat for shock
SBP > 90, MAP > 65 **A**

P **Acetaminophen**
15 mg/kg IV, up to 1,000 mg
AND/OR
Ketorolac
15-30 mg IV **P**

P **Norepinephrine** PRN
Titrate drip 2-20 mcg/min IV/IO
SBP > 100
Or
Epinephrine
Titrate drip 2-10 mcg/min IV/IO
SBP > 100
additional
1 mL of 1:10,000
in 10 mL NS IV push **P**

Cardiac Arrest



Notes:

- All shocks Monophasic 360 J or the Biphasic device specific equivalent. If Biphasic equivalent unknown deliver shock at 200 J.
- Consider **discontinuing CPR** pursuant to **Procedure** page 121
- For spontaneous resuscitation refer to **Post Resuscitation Management protocol** page 31
- **High Performance CPR** page 119

Non-Traumatic Shock

History:	Signs/Symptoms:	Differential:
• Cardiac ischemia (MI, CHF) • Medications	• Hypotension • Rales & pulmonary edema on exam • Altered mental status • Weakness, dizziness • Weak, rapid pulse • Pale, cool, clammy skin	• Dysrhythmias • Vasovagal • Allergic reaction • Anaphylaxis • Sepsis • Neurogenic

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Universal Patient Care Protocol

Is your patient septic?

Yes → Go to **Code Sepsis** Pg. 17

No

E — ECG / 12 lead — E

A — Obtain IV/IO access — A

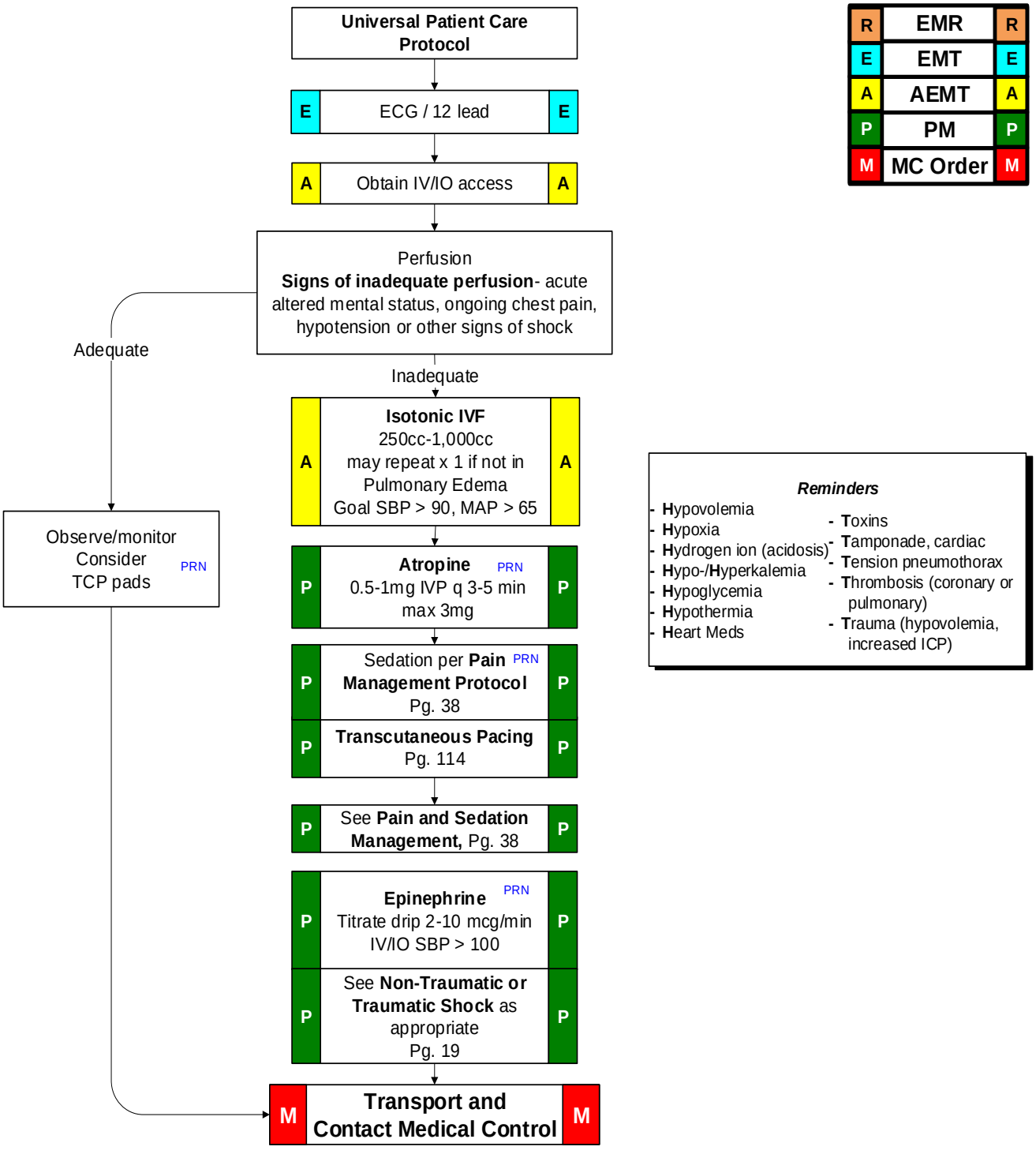
A — **Isotonic IVF**
250cc-1,000cc may repeat x 1 if not in Pulmonary Edema
Goal SBP > 100 — A

P — **Norepinephrine** PRN
Titrate drip 2-20 mcg/min
IV/IO SBP > 100
Or
Epinephrine
Titrate drip 2-10 mcg/min
IV/IO SBP > 100
additional
1 mL of 1:10,000
in 10 mL NS IV push — P

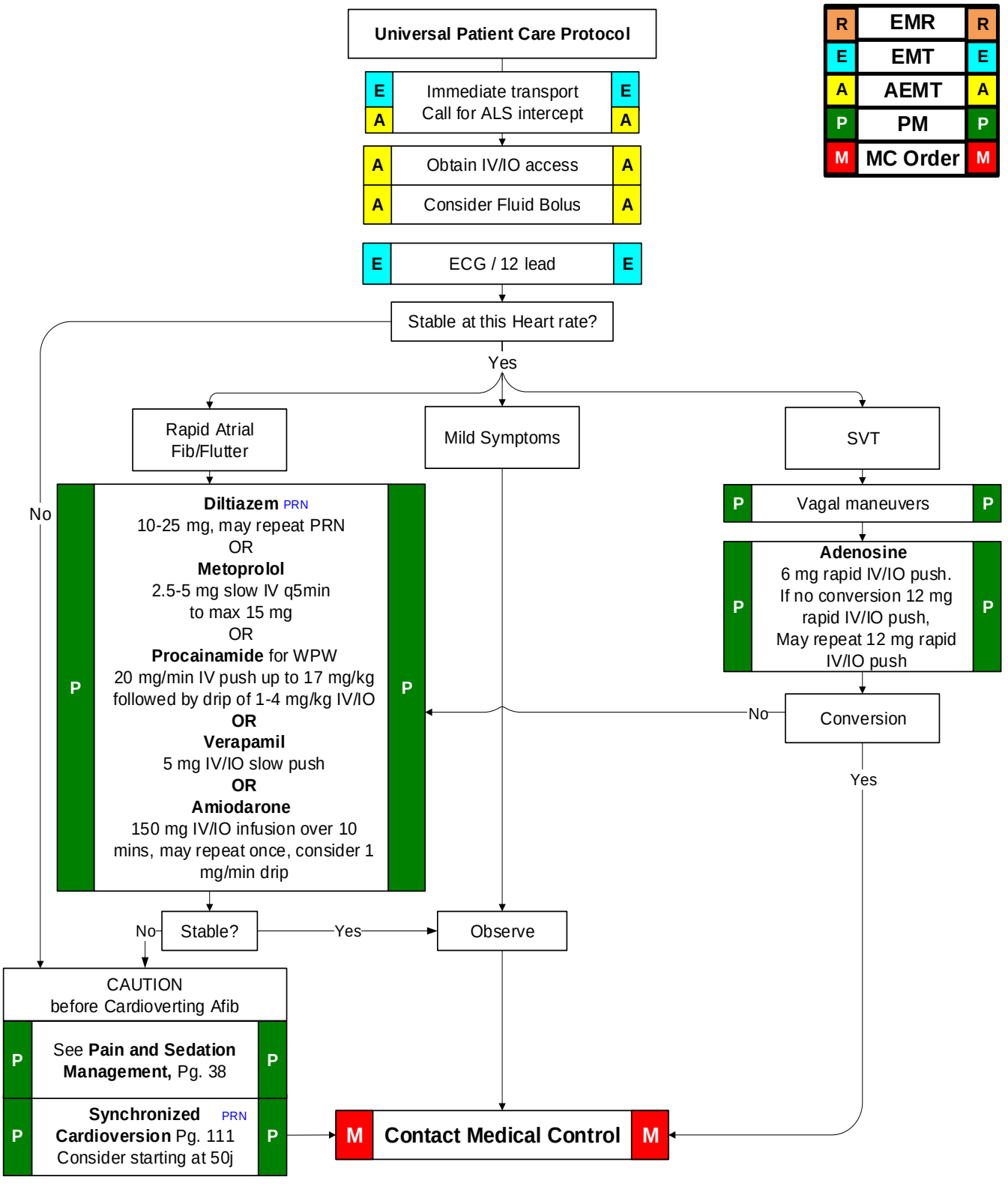
M — **Contact Medical Control** — M

Bradycardia

History:	Potential causes:	Signs/Symptoms:
• Past medical history • Medications Beta-Blockers Calcium channel blockers Clonidine Digitalis • Pacemaker	• Acute myocardial infarction • Sinus bradycardia • Athletes / non pathologic • Stroke • Sick sinus Syndrome • Heartblock	• HR < 60/min and symptomatic • Chest pain • Respiratory distress • Hypotension or Shock • Altered mental status • Syncope



Narrow Complex Tachycardia



Notes:

- Use β-blockers with caution in pulmonary disease or CHF
- If patient already on a β-blocker, give **Metoprolol**
- WPW (Wolff Parkinson White): pre-existing syndrome which can lead to paroxysmal tachydysrhytmias. Caution must be used when treating WPW with rabid atrial fibrilation.

Wide Complex Tachycardia

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

E A — Immediate transport
Call for ALS intercept — E A

A — Obtain IV/IO access — A

E — ECG / 12 lead — E

Stable

Unstable

Ventricular Tachycardia or uncertain rhythm

SVT with aberrancy

A-Fib

P — See **Pain and Sedation Management** Pg. 38 — P

P — **Adenosine**
6 mg rapid IV/IO push.
If no conversion 12 mg rapid IV/IO push, may repeat 12 mg rapid IV/IO push — P

P — **Synchronized Cardioversion** per AHA Guidelines Pg. 111 — P

P — **Lidocaine**
Initial bolus 1-1.5 mg/kg
IV/IO repeat bolus
0.5 - 0.75 mg/kg q 5 min
to max 3 mg/kg
OR
Procainamide for WPW
20 mg/min IV push up to
17 mg/kg followed by
drip of 1-4 mg/min IV/IO
OR
Amiodarone
150 mg IV/IO infusion
over 10 mins, may
repeat once, consider 1
mg/min drip
AND/OR
Magnesium Sulfate
2 gram IVP — P

Go to **Narrow complex tachycardia Protocol** Pg. 21

P — **Lidocaine**
Initial bolus 1-1.5 mg/kg
IV/IO repeat bolus
0.5 - 0.75 mg/kg q 5 min
to max 3 mg/kg
OR
Procainamide for WPW
20 mg/min IV push up to
17 mg/kg followed by
drip of 1-4 mg/min IV/IO
OR
Amiodarone
150 mg IV/IO infusion
over 10 mins, may
repeat once, consider 1
mg/min drip
AND/OR
Magnesium Sulfate
2 gram IVP — P

M — **Contact Medical Control** — M

V-Fib/Pulseless V-Tach (shock advised)

Arrive here from **Cardiac Arrest Protocol Pg. 15**

Defibrillate once

High Performance CPR Pg. 119
Airway Management and confirm effective oxygenation and ventilation

A | Obtain IV/IO access | A

Assess Rhythm

VF/VT (Shock Advised)

Asystole Or PEA (No Shock Advised)

Go to **Asystole or PEA (NSA)** Protocol Pg. 24

A | **Epinephrine**
If EtCO2 > 20 hold Epinephrine
If arrest from BRONCHOSPASM, ANAPHYLAXIS OR HYPOTENSION then
1 mg 1:10,000 IV/IO q 3-5 min.
EtCO2 10-19, 100 to 300 mcg
1:10,000 IV/IO q3-5 min
EtCO2 9 or less, 300 to 700 mcg
1:10,000 IV/IO q 3-5 min | A

Resume attempts to **defibrillate** High Performance CPR between defibrillations

P | **Lidocaine**
Initial bolus 1-1.5 mg/kg
IV/IO repeat bolus
0.5 -0.75 mg/kg q 5 min to max 3 mg/kg
OR
Amiodarone
300 mg IVP, repeat once at 150mg IVP | P

P | Consider **Sodium Bicarbonate** 1 mEq/kg IV/IO | P

Resume attempts to **defibrillate** High Performance CPR between defibrillations

P | If Torsades des Pointes- **Magnesium Sulfate** 2gm IVP, may repeat | P

M | **Contact Medical Control And Transport** | M

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

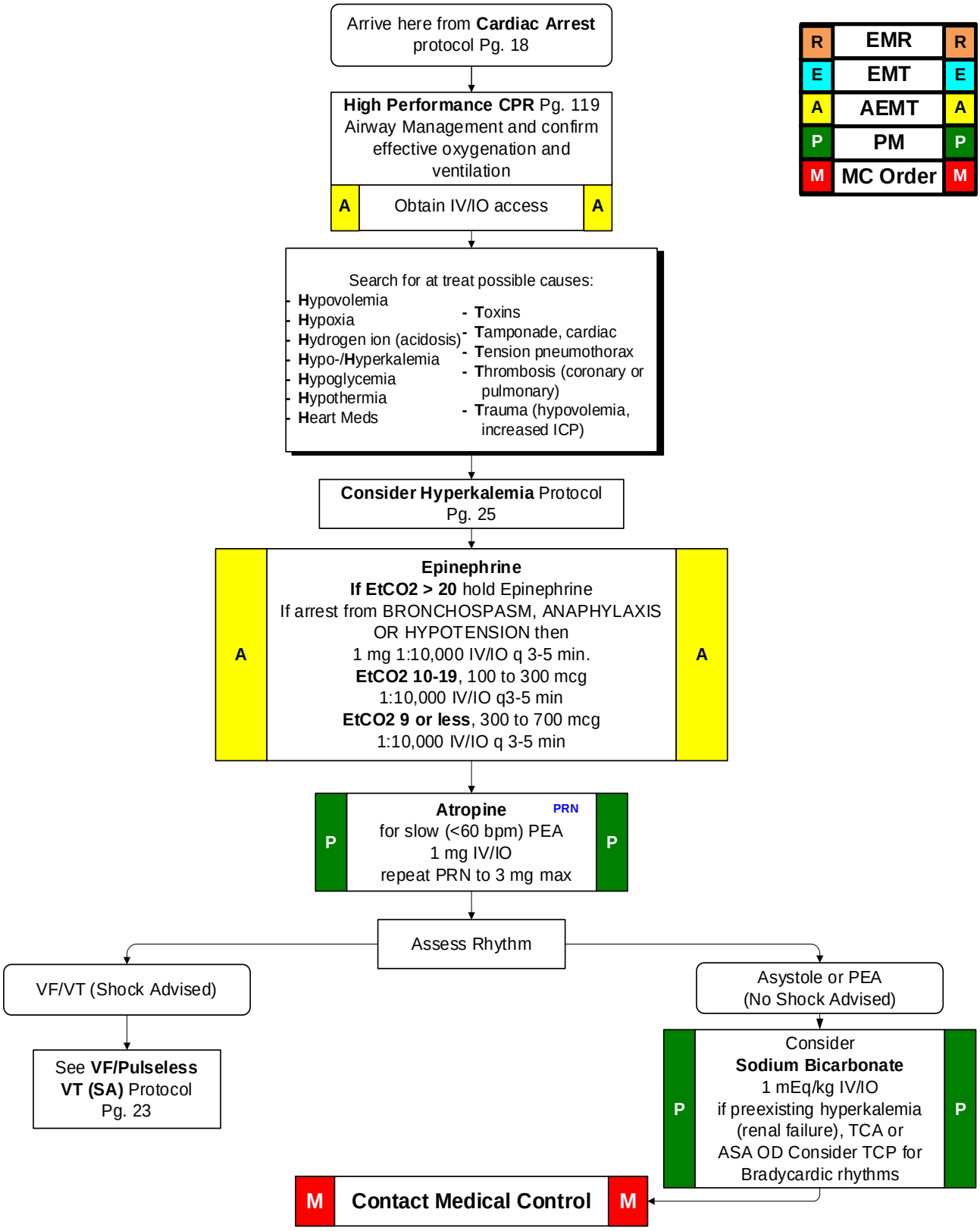
Reminders

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/**H**yperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **H**eart Meds
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis (coronary or pulmonary)
- **T**rauma (hypovolemia, increased ICP)

Notes:

- Guidelines for **Discontinuation of Resuscitation** Pg. 121

Asystole / PEA (no shock advised)



Notes:

- Guidelines for **Discontinuation of Resuscitation** Pg. 121

Hyperkalemia

Consider in patients with History of:
- Chronic dialysis patient (typically due for dialysis or late)
- Suspected Rhabdomyolysis or crush injury
- Extensive Burn Injury
- ACE or Potassium sparing diuretics (recent)
- Extensive Hemolysis
- Tumor Lysis Syndrome
- Severe Acdiosis
- Extensive physical activity
- Depolarizing paralytic (Succ)
- Consider in Excited Delirium

With EKG Changes of:
- Peaked T-Waves (without suspected MI)
- Loss of P-Waves (with peaked T-Waves)
- Wide QRS (IVCD Pattern)
- Sine wave pattern VT or VF
- Bradycardia or Bradyasystolic Rhythm Asystole

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Universal Patient Care Protocol

E — ECG / 12 lead — E

A — IV/IO access and start **Isotonic IVF bolus** — A

Symptomatic Arrhythmia?

Yes

P — **Calcium Chloride** 1000 mg IV over 2-5 min or as a drip — P

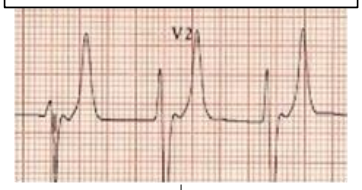
P — **Sodium Bicarbonate** 1 mEq/kg IV/IO — P

A — Continuous **Albuterol** — A

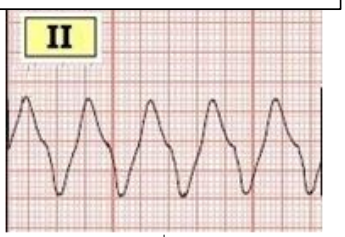
A — Consider **Normal Saline** Bolus 500-1000 cc — A

P — with **Furosemide** 40 mg IV — P

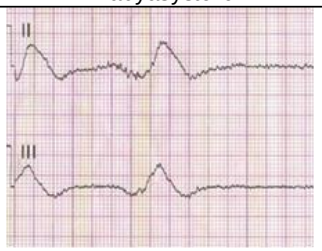
Peaked T, Loss of P Waves



IVCD Sine Wave VT



IVCD Sine Wave Bradyasystolic



No

A — Consider **Albuterol** 10 mg SVN Consider **Normal Saline** PRN — A

P — Consider **Furosemide** 40 mg IV — P

M — **Contact Medical Control** — M

Notes:
- Guidelines for **Discontinuation of Resuscitation** Pg. 121
- Line must be flushed after administration of calcium chloride to avoid precipitation of subsequent medications.

Chest Pain / Acute Coronary Syndrome

ALS evaluation and/or transport if:

Cardiac Risk Factors:	History:	Signs/Symptoms:	Differential:
• Previous MI / Known Cardiac disease • Hypotention • Diabetes • Smoking tobacco use • Family History • High Cholesterol • Hyperlipidemia • Major stress • Takatsobu cardiomyopathy	• **Viagra, Cialis, Levitra** (Male or Female) • **O**nset • **P**alliation / **P**rovocation • **Q**uality (crampy, constant, sharp, dull, etc.) • **R**egion / **R**adiation / **R**eferred • **S**everity (1-10) • **T**ime (duration / repetition)	• **CP (pain, pressure, aching, tightness)** • **Radiation of pain** • **Pale, diaphoresis** • **Shortness of breath** • **Nausea, vomiting, dizziness** • **Abnormal vital signs**	• Aortic dissection or aneurysm • Trauma vs. Medical • Pericarditis • Pulmonary embolism • Asthma / COPD • Pneumothorax • GE reflux or Hiatal hernia • Esophageal spasm • Chest wall injury or pain • Pleural pain

Universal Patient Care Protocol

Suspect Acute Coronary Syndrome

R	**Aspirin** 325 mg chewable PO	R
E	**Nitroglycerin** If BP > 100 systolic per patient Rx, 0.4 mg SL q 3-5 min Beware if HR < 60 bmp	E
A	**Nitro Paste** 1 inch to chest wall	A
P	**Nitroglycerin Infusion**	P
P	**Pain and Sedation Management** Pg. 38	P
A	Obtain IV/IO access	A
E	ECG / 12 lead	E
P	***Metroprolol** HR > 100 2.5 - 5 mg IV, over 2 mins q 3-5 mins to max 15 mg Hold if SBP < 120 or Heart rate < 75	P

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

If suspected CNS stimulant

P	consider **Lorazepam** 0.5-4 mg IV/IN/IM OR **Midazolam** 2.5-5 mg IV/IN/IM OR **Diazepam** 2-5 mg IV/IN/IM OR **Labetalol** 10-20 mg IV	P

P	consider **Morphine** 2 mg IV q 3-5 min to 20mg max OR **Fentanyl** 25 mcg IV q 3-5 min to 200 mcg max OR **Hydromorphone** 0.5mg IV q 3-5 min to 4mg max	P
E	Consider repeat ECG / 12 lead	E

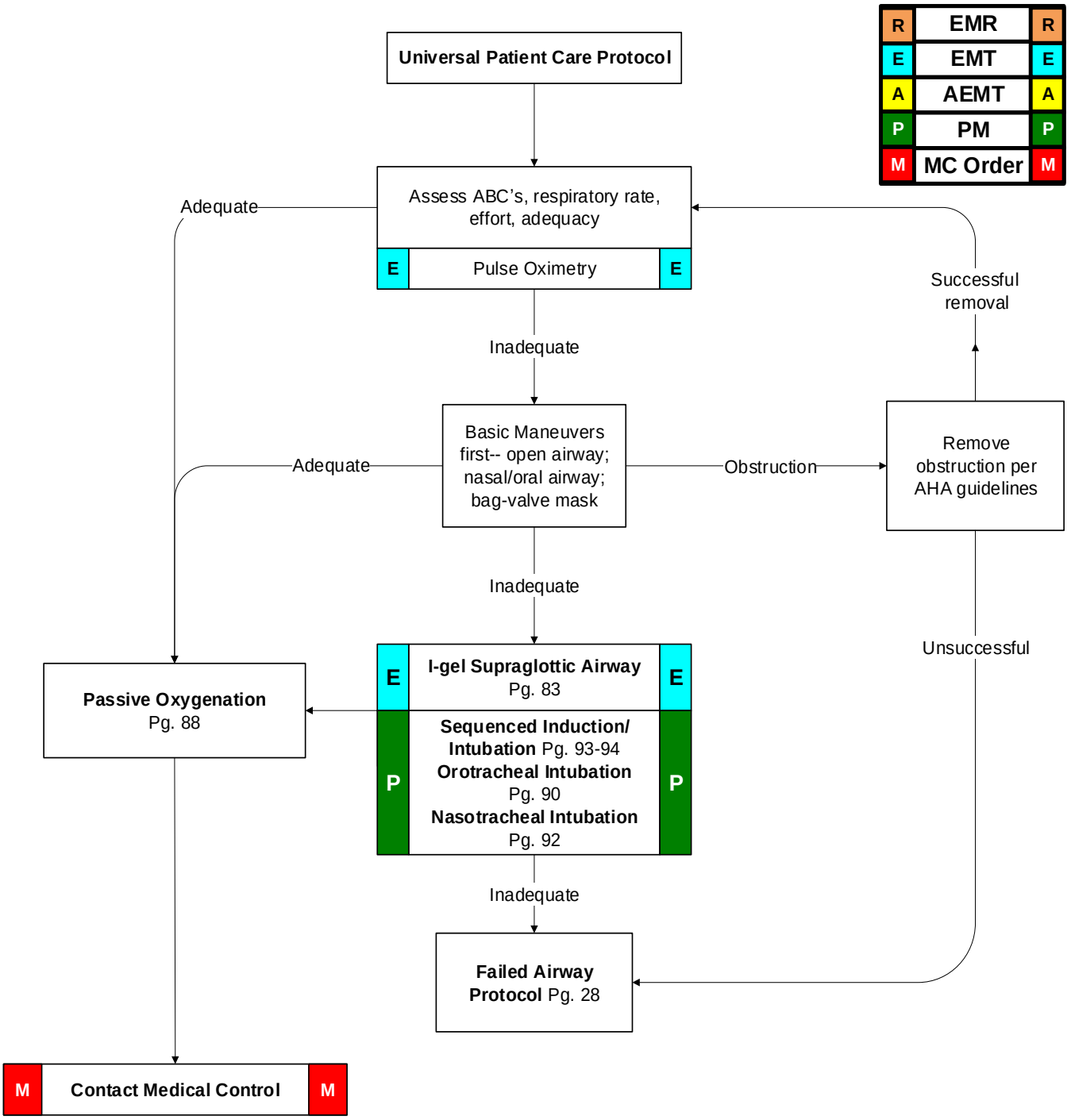
M **Contact Medical Control** M

P	See **STEMI** Follow **County Operating Procedure** Appendix Pg. 10	P
P	**Heparin** 60 units/kg to max of 4,000 units IV	P

Notes:

- **Avoid Nitroglycerin in any patient (man or woman) who has used sexual performance enhancement drugs (ie Viagra, Levitra, etc.) in the past 24 hours due to possible severe hypotension.**
- If positive ECG changes, establish a second IV while en route to the hospital.
- Monitor for hypotension after administration of nitroglycerin and morphine.
- *Metroprolol - contraindicated with CNS stimulant, consider ½ doses for elderly, asthma & COPD

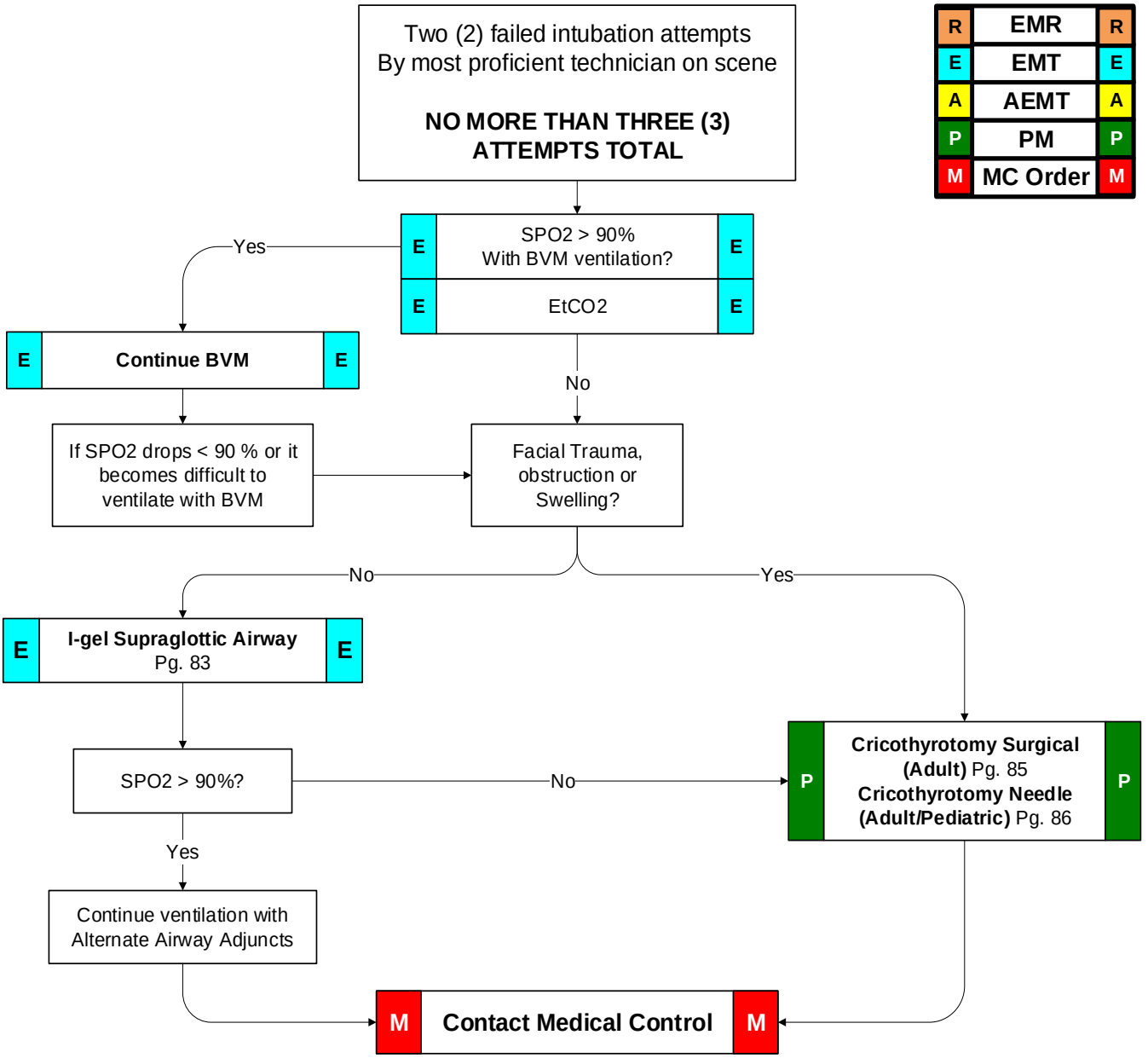
Airway, Adult



Notes:

- **Capnometry or capnography is mandatory with all methods of intubation. Document results.**
- For this protocol, adult is defined any person who does not fit the length based tape
- **EMT's must have multi-lumen airway training to use Supraglottic Airway Adjuncts.**
- Maintain C-spine immobilization for patients with suspected spinal injury
- Paramedics should consider Supraglotic Airway Adjuncts.
- Reconfirm ETT placement each time patient is moved
- Continuous pulse oximetry should be utilized in all patients with compromised respiratory function

Airway, Adult Failed



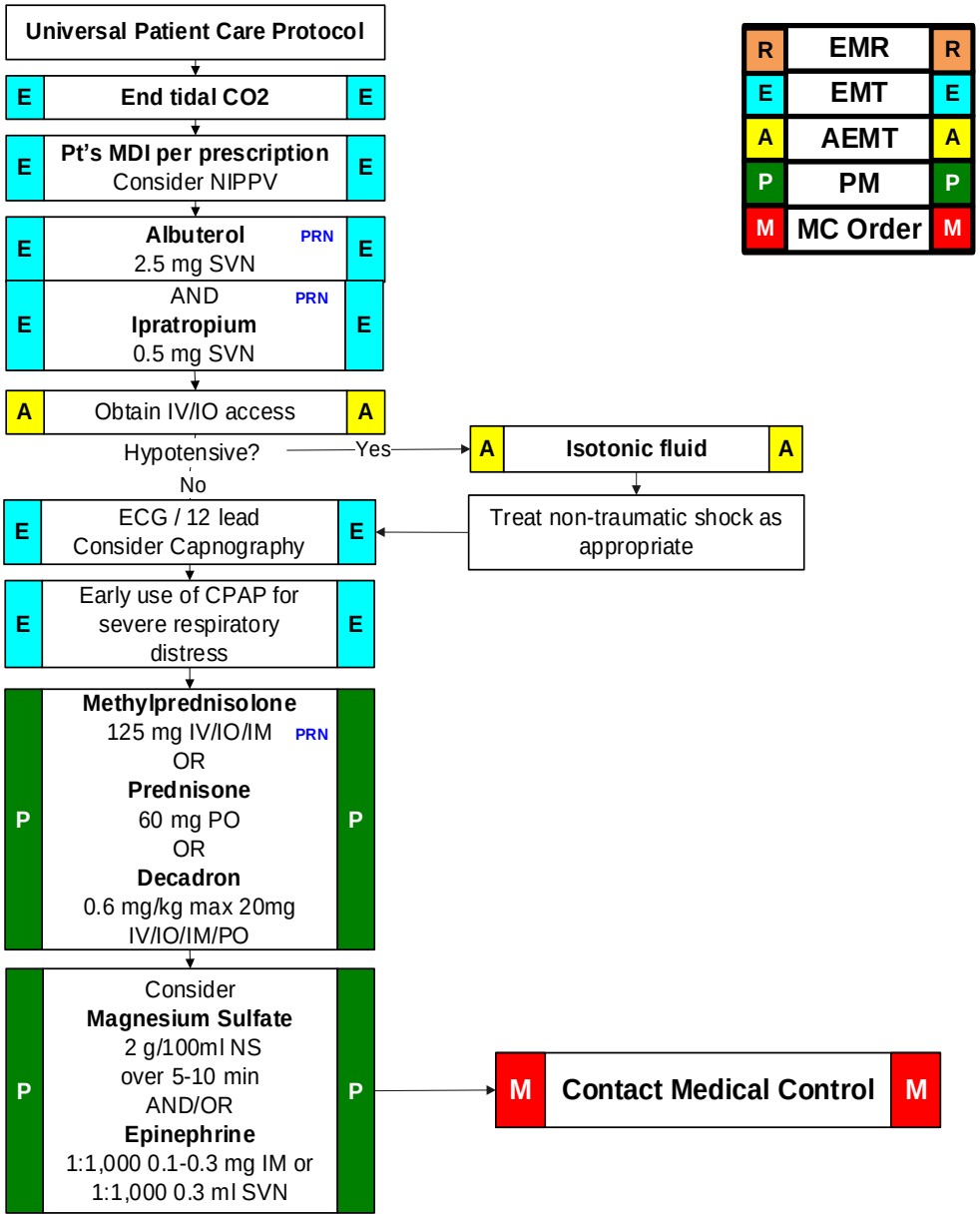
Notes:

- **Difficult Airway Assessment** Pg. 87
- If first intubation attempt fails, make an adjustment and then try again:
  - Different laryngoscope blade
  - Different ETT size
  - **Eschmann Catheter** Pg. 91
  - **Video Assisted Laryngoscopy** Pg. 97 if available and appropriate
  - Change cricoid pressure
  - Apply BURP maneuver (push trachea Back [posterior], Up, and to patient's Right)
  - Change head positioning
- Continuous Pulse Oximetry and ETCO2 should be utilized in all patients with inadequate respiratory function
- **Notify Medical Control AS EARLY AS POSSIBLE about the patients difficult/failed airway.**

Reactive Airway Disease

ALS evaluation and/or transport if available:

History:	Signs and Symptoms:	Differential:
• Asthma • COPD- emphysema, chronic bronchitis • Congestive heart failure • Home treatment (O_2, nebulizer) • Medications (theophylline, steroids, inhalers) • Toxic exposure • Smoking • **No improvement with initial treatment**	• Shortness of breath • **Pursed-lip breathing** • **Decreased ability to speak** • **Increased respiratory rate and effort** • Wheezing, rhonchi, rales • **Use of accessory muscles** • Fever, cough • Tachycardia • **Suspected PE**	• Asthma • Anaphylaxis • Aspiration • COPD (Emphysema, Bronchitis) • Pleural effusion • Pneumonia • Pulmonary Embolus • Pneumothorax • Cardiac (MI or CHF) • Pericardial Tamponade • Hyperventilation • Inhaled Toxin (Carbon monoxide, etc.)



Notes:

- Barotrauma is often caused by the over-ventilation of Reactive airway patients. Allow for a prolonged expiratory time when ventilating such patients.

Pulmonary Edema

ALS evaluation and/or transport if available:

History:
- Congestive heart failure
- Past medical history
- Medications (digoxin, lasix, HCTZ)
- Viagra, Levitra, Cialis
- Cardiac history- past myocardial infarction

Signs/Symptoms:
- Respiratory distress, rales
- Apprehension, orthopnea
- Jugular vein distention
- Pink, frothy sputum
- Peripheral edema, diaphoresis
- Hypotension, shock
- Chest pain

Differential:
- Myocardial infarction
- Congestive heart failure
- Asthma
- Anaphylaxis
- Aspiration
- COPD
- Pleural effusion
- Pneumonia
- Pulmonary Embolus
- Pericardial tamponade

Mild-Moderate- able to speak sentences, crackles base only, O_2 sat ≥ 92%
Severe- respiratory distress, crackles throughout, O2 sat < 92%
Near Death- Decreased LOC, cyanosis, dropping sats, ineffective respiratory drive

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

- E: ECG / 12 lead
- E: End tidal CO2
- A: Obtain IV/IO access
- E: Non-Invasive positive pressure ventilation NIPPV if available
- P: Consider mild sedation **Pain and Sedation Management** Pg. 38

Fever or Purulent Sputum?

Yes → Support **Adult Airway** Protocol Pg. 27

No

Nitroglycerin Indicated of SBP >100

- E: 0.4 mg tablet/spray SL may repeat q 5 min.
- A: Paste 1 inch to chest wall
- P: Consider **Nitroglycerin drip** Hold if SBP <100 Nitro Paste 1-2' to chest wall May repeat q 1 min.
- P: Consider for transports longer than 30 mins. **Furosemide** 40-80 mg IV
- P: See **Pain and Sedation Management** Pg. 38, For CP refractory to nitroglycerin

M: **Contact Medical Control**

Notes:
- **Avoid Nitroglycerin in any patient (man or woman) who has used sexual performance enhancement drugs (ie Viagra, Levitra, etc.) in the past 24 hours due to possible severe hypotension.**
- If patient has taken nitroglycerin without relief, consider potency of the medication.
- **Consider myocardial infarction in all these patients.**
- Allow the patient to be in their position of comfort to maximize their breathing effort.

Post Resuscitation Management

ALS evaluation and/or transport if available:

History:	Signs/Symptoms:	Differential:
• Respiratory arrest • Cardiac arrest	• Return of Spontaneous Circulation refer to **Cardiac Triage Tool,** Pg. 10	• Continue to address specific differentials associated with the original dysrhythmia

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Repeat Primary Assessment

Continue ventilatory support with 100% oxygen
PEEP after oxygen and saturations between 94-98 %

A — Obtain IV/IO access — A

E — Monitor ECG / 12 lead Capnography — E

Vital Signs / Pulse oximetry

Hypotension

A — **Consider fluid bolus** — A

P — **Norepinephrine**
Titrate drip 2-20 mcg/min IV/ IO SBP > 120
Or
Epinephrine
Titrate drip 2-10 mcg/min IV/ IO SBP > 120

Treat non-traumatic shock as appropriate,
MAP > 65, SBP > 90 — P

Stable

Bradycardia

Treat per **Bradycardia Protocol** Pg. 20

If arrest reoccurs, revert to approriate protocol and/or initial successful treatment

P — Consider mild sedation
See **Pain and Sedation Management** Pg. 38 — P

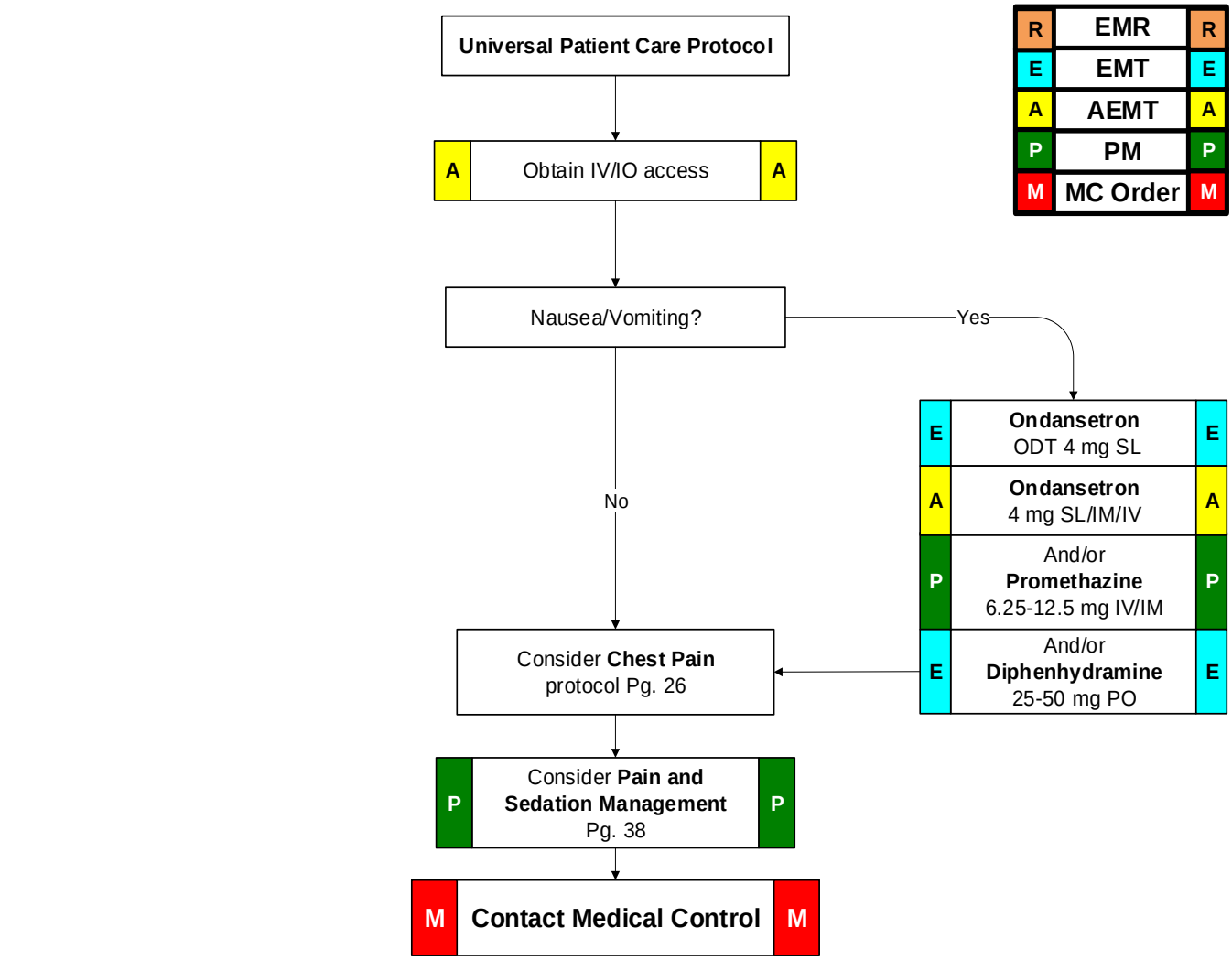
M — **Contact Medical Control** — M

Notes:
- Sedate as needed
- Continue antiarrhythmic infusions from previous resuscitation protocol PRN

Abdominal Pain

ALS evaluation and/or transport if available:

History:	Signs/Symptoms:	Differential:
• Age • Past medical / surgical history • Medications • Onset • Palliation / Provocation • Quality (crampy, constant, sharp, dull, etc.) • Region / Radiation / Referred • Severity (1-10) • Time (duration / repetition) • Fever • Last meal eaten • Last bowel movement / emesis • Menstrual history (pregnancy)	• Pain (location / migration) • Tenderness • Nausea • Vomiting • Diarrhea • Dysuria • Constipation • **Vaginal bleeding** • **Pregnancy** • **Pulsating mass** • **Chest pain** • **Shortness of breath** • **Abnormal vital signs**	• AAA • Ectopic pregnancy • Bowel obstruction • Cardiac • Pregnancy (ectopic?) • **GI bleed** • Appendicitis • Cholecystitis • Pancreatitis • Kidney stones



Notes:

- Document the mental status and vital signs prior to administration of **Promethazine (**Phenergan) and **Droperidol**.
- Abdominal pain in women of childbearing age should be treated as an ectopic pregnancy until proven otherwise.
- The diagnosis of abdominal aneurysm should be considered with abdominal pain in patients over 50.
- Appendicitis presents with vague, peri-umbilical pain which migrates to the RLQ over time.

Allergic Reaction

ALS evaluation and/or transport if available:

History:	**Signs/Symptoms:**	
• Onset and Location	• Anxiety	• Hypotension
• Insect bite/sting	• Nausea / Vomiting	• Rash
• New clothing, soap, detergent	• Altered Mental Status	• Hives
	• Pale Diaphoresis	• Angioedema
		• Shortness of breath

Universal Patient Care Protocol

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Hives/ Rash only
No respiratory component

E — May assist patient with own meds – Benadryl, Allegra™, Claritin™, Dramamine™, Pepcid™, Zantac™, and Tagamet™ (Dipenhydramine, cetirizine, fexofenadine, loratadine, dimenhydrinate) — E

E — **Diphenhydramine** 25-50 mg PO — E

Reassess patient

M — **Contact Medical Control** — M

Evidence of impending
Respiratory distress or shock

R — **Epinephrine** 1:1,000 0.3 mg Auto-injector IM — R

E — **Epinephrine** 1:1,000 0.1 – 0.3 mg IM
Repeat Epinephrine PRN — E

E — **Albuterol** 2 puffs Pt's MDI — E

A — Obtain IV/IO access — A

A — Isotonic IVF — A

P — **Diphenhydramine** 25-50 mg PO/IM/IV — P

P — **Famotidine** 20 mg IV/IO — P

P — **Methylprednisolone** 125 mg IV/IO/IM
OR
Prednisone 60 mg PO
OR
Decadron 0.6 mg/kg max 20mg IV/IO/IM/PO — P

E — ECG / Consider 12 lead — E

E — **Albuterol** 2.5 mg SVN PRN — E

E — **Ipratropium** 0.5 mg SVN — E

P — consider **Epinephrine** 1:1,000 0.3 ml SVN — P

P — Treat non-traumatic shock as appropriate — P

P — Consider anti-emetic — P

Notes:

- Signs of shock include SBP < 90
- The shorter the onset from contact to symptoms, the more severe the reaction
- A single dose of **epinephrine** may not reverse the effects of anaphylaxis. Administer additional doses as needed
- EMT may assist with patients own MDI
- Be watchful for possible secondary allergic response, after apparent resolution of initial S/S and patient should continue to be monitored by responsible adult for 30-60 minutes.

Diabetic Emergency

ALS evaluation and/or transport if available:

History:
- Known diabetic, medic alert tag
- Drugs, drug paraphernalia
- Report of illicit drug use or toxic ingestion
- Past medical history
- Medications
- History of trauma
- GI History
- Syncope

Signs/Symptoms:
- Decreased mental status
- Change in baseline mental status
- Bizarre behavior
- Hypoglycemia (cool, diaphoretic skin)
- Hyperglycemia (warm, dry skin; fruity breath; Kussmal resps; signs of dehydration)
- Diabetic
- Syncope
- Abnormal vital signs persist
- Shortness of breath

Differential:
- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ions (acidosis)
- **Hypo-/H**yperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis, coronary or pulmonary
- **T**rauma

R — If glucose check unavailable, for suspected hypoglycemia, give oral glucose — R

Universal Patient Care Protocol

E — End tidal CO2 — E

E — Blood Glucose check — E

A — Obtain IV / IO access — A

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Blood Glucose < 60 mg/dL with symptoms

R — **Administer Oral Glucose** If possible — R

Patient Malnourished / ETOH?

Yes → P — Consider **Thiamine** 100 mg IV/IM — P

No

A — **Dextrose** D50/25/10 25-50 g IV/IO Consider starting with 25g — A

P — **Glucagon** PRN 1 mg IM/IN — P

Blood Glucose 60-250 mg/dL

Blood Glucose > 250 mg/dL

A — Isotonic IVF — A

P — If blood glucose too high to read and EtCO2 below 20, then **Sodium Bicarbonate 50 mEq IV/IO** followed by a **drip** — P

E — Blood Glucose check PRN — E

E — ECG / 12 lead — E

If suspected **OD**, see Pg. 37
If positive **BEFAST** exam, see Pg.142
Possible **Sepsis**, see Pg. 17

M — **Contact Medical Control** — M

Notes:
- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.
- Low glucose (< 60), normal glucose (60 - 120), high glucose (> 250).
- Consider Restraints if necessary for patient's and/or personnel's protection per the restraint procedure.
- Repeat blood glucose for any change in mental status after treatment has begun.

Altered Mental Status

ALS evaluation and/or transport if available:

History:	Signs/Symptoms:	Differential:
• Known diabetic, medic alert tag • Drugs, drug paraphernalia • Report of illicit drug use or toxic ingestion • Past medical history • Medications • History of trauma • GI History • Syncope	• Decreased mental status • Change in baseline mental status • Bizarre behavior • Hypoglycemia (cool, diaphoretic skin) • Hyperglycemia (warm, dry skin; fruity breath; Kussmal resps; signs of dehydration) • Diabetic • Syncope • Abnormal Vital signs persists • Shortness of breath	• A- Alcohol/ Acidosis • E- Endocrine/ Epilepsy/ Electrolytes/ Encephalopathy • I- Insuline • O- Opiates/ Overdose/ Oxygen • U – Uremia • T- Trauma • I- Infection • P- Poisoning/ Psychosis/ Pharmacology • S- Stroke/ Seizure/ Syncope

Universal Patient Care Protocol

- E | End tidal CO2 | E
- E | ECG / 12 lead | E
- E | Blood Glucose check | E
- A | Obtain IV / IO access | A

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

- **Trauma** Pg. 51
- **Overdose** Pg. 37
- **CVA** Pg.41
- **Sepsis** Pg. 17
- **Blood Glucose** Pg. 127

P | If blood glucose too high to read and EtCO2 below 20, then **Sodium Bicarbonate 50 mEq IV/IO** followed by a **drip** | P

M | **Contact Medical Control** | M

Notes:

- Be aware of AMS as presenting sign of an environmental toxin or Haz-Mat exposure and protect personal safety.
- It is safer to assume hypoglycemia than hyperglycemia if doubt exists.
- Do not let alcohol confuse the clinical picture. Alcoholics frequently develop hypoglycemia.
- Low glucose (< 60), normal glucose (60 - 120), high glucose (> 250).
- Consider Restraints if necessary for patient's and/or personnel's protection per the **Restraint** procedure. Pg. 137
- Repeat blood glucose for any change in mental status after treatment has begun.

General Illness

Fever / Nausea / Vomiting / Unknown

ALS evaluation and/or transport if available:

History:	Signs/Symptoms:	Differential:
• Age • Duration • Past medical history • Last oral intake • Medications • Immunocompromised • Bloody emesis/diarrhea • Menstrual history • Past surgical history • Environmental exposure/travel history	• Warm • Sweaty • Flushed • Pain • Radiation • Abdominal distension • Chills/Rigors • Constipation • Diarrhea • Persistent Abnormal Vital signs • ALOC • Shortness of Breath	• Infections / Sepsis • Cancer / Tumors / Lymphomas • GI or Renal disorders • Heat Stroke • Medication or drug reaction • Vasculitis • Hyperthyroid • CNS disease/trauma • Myocardial infarction • Diabetic ketoacidosis • Gynecologic disease (ovarian cyst, PID) • Electrolyte abnormalities • Pregnancy • Psychologic

Universal Patient Care Protocol

- R — **Sepsis** screening tool Pg. 17 — R
- R — Perform **BEFAST Assessment** Pg. 142 — R
- E — Check blood glucose — E
- A — Obtain IV access PRN — A
- A — **Isotonic IVF** PRN — A
- E — ECG / 12 lead — E
- Nausea/vomiting? — Consider → E **Diphenhydramine** 25-50 mg PO — E
  - E — **Ondansetron** 4 mg SL *with specialized training* — E
  - A — **Ondansetron** 4 mg SL/IM/IV — A
  - P — **Ondansetron** 4-8 mg IV/IM/SL And/or **Promethazine** 6.25-12.5 mg IV/IM And/or **Diphenhydramine** 25-50 mg IV/IM/PO — P
- No
- Fever?
  - Yes → P — Consider **Acetaminophen** 500-1000 mg IV/PO — P
    - No → M — **Contact Medical Control** — M
  - No → M — **Contact Medical Control** — M

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Notes:

- Individuals' normal body temperatures differ, with 98.6°F (37°C) being average. Generally a temperature over 100.4° F (38°C) is considered a fever.

Overdose/Poisoning

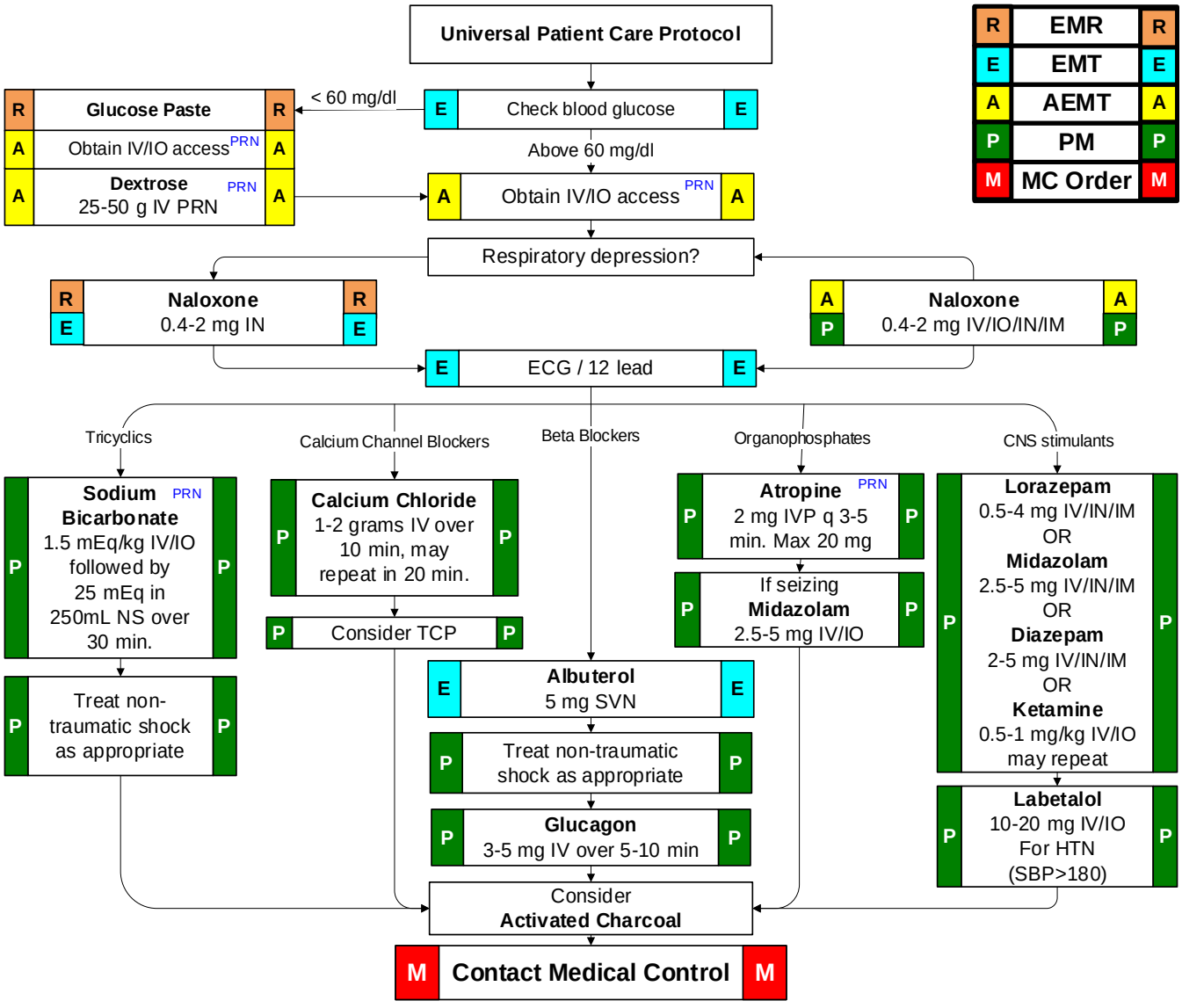
ALS evaluation and/or transport if available:

History:
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Reason (suicidal, accidental, criminal)
- Available medications in home
- Past medical history, medications
- Home remedies given to patient prior to aid arrival

Signs/Symptoms:
- Mental status changes
- Hypotension / hypertension
- Decreased respiratory rate
- Tachycardia, dysrhythmias
- Seizures

Poison Control 800-222-1222

Differential:
- Tricyclic antidepressants (TCAs)
- Acetaminophen (Tylenol)
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)



Notes:
- Do not rely on patient history of ingestion, especially in suicide attempts.
- Bring bottles, contents, emesis to ED.
- Treat medication overdoses if symptomatic including ECG changes SPB <100, ALOC, HR >100
- Document case number from Poison Control on the PCR.
- Activated charcoal is ineffective for ingestions beyond 1 hour.
- Recommendations from Poison Control Center, verify with Medical Control

Pain and Sedation Management

ALS transport if patients given a sedating medication.

Inclusion Criteria:	Exclusion Criteria:
• Patients who are experiencing pain	• Pregnancy with active labor • Patients with care plans that prohibit use of parenteral analgesics by EMS (Relative) • Patients with chronic pain who aren't part of a hospice/palliative care plan AND who are not experiencing an acute injury or illness resulting in pain (Relative)

Universal Patient Care Protocol

R — Provide oxygen as appropriate to maintain an oxygen saturation of 94-98% or as indicated by clinical presentation — R

R — Ice/cool packs and positioning as appropriate to manage pain — R

A — Obtain IV/IO access PRN — A

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Moderate to severe discomfort

P — **Nitrous Oxide** if available PRN — P
Contraindicated in pregnancy

P — **Acetaminophen** — P
15 mg/kg PO/IV, max adult dose 1 gram

P — **Ketorolac** — P
30 mg IM or 15 mg IV in non-pregnant patients
OR
Fentanyl
1 mcg/kg IV/IM/IO/IN, repeat PRN q 5 min
max initial dose 100 mcg,
max cumulative dose 2 mcg/kg
OR
Morphine sulfate
0.1 mg/kg IM/IV/IO, repeat PRN q 5 min
max initial dose of 15 mg IM or 10 mg IV,
max cumulative dose 0.3 mg/kg
OR
Ketamine
0.5 mg/kg IM or 0.1-0.3 mg/kg IV, repeat PRN q 5 min
max initial dose of 50 mg IM/25 mg IV,
max cumulative dose 1.5 mg/kg
OR
Hydromorphone
0.5 mg IV/IO/IM q 5 min to max of 4 mg

Anxiety Sedation

P — Consider — P
Lorazepam PRN
0.5 -2 mg IV/IO/IN/IM
OR
Midazolam PRN
2.5-5 mg IV/IO/IN/IM
OR
Diazepam PRN
2-5 mg IV/IO/IN/IM
OR
Ketamine
0.5 to 2 mg/kg/hr
OR
Etomidate
0.1 mg IV/IO

Nausea?

P — Consider **Ondansetron** — P
4-8 mg IV/IM/PO/SL,
max dose of 16 mg

M — **Contact Medical Control** — M

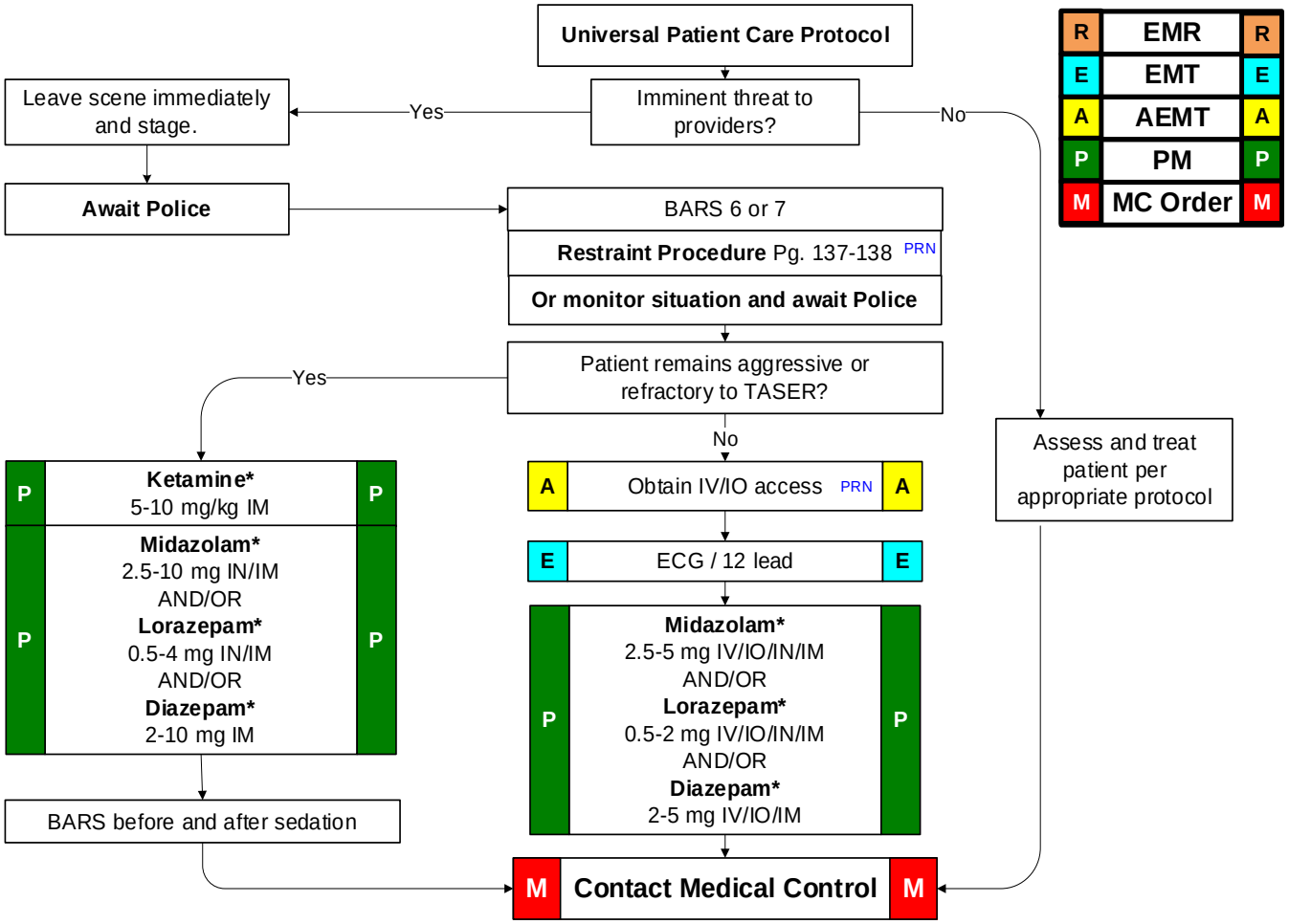
Notes:
- Consider reduced medication doses when given concomitantly with benzodiazepenes
- The goal of pain management should be to sustain patient comfort while maintaining the alertness and the ability to communicate with the care provider/team
- For elderly, consider Ketamine infusion over 10 min.

Psychological/Emotional/Excited Delirium

ALS transport if patients given a sedating medication.

History:	Signs/Symptoms:	Differential:
• Situational crisis • Psychiatric illness • Medications • Injury to self or threats to others • Medic alert tag • Substance abuse / overdose • Diabetes	• Anxiety, agitation, confusion • Affect change, hallucinations • Delusional thoughts, bizarre behavior • Combative violent • Expression of suicidal / homicidal thoughts	• Alcohol Intoxication • Toxin / Substance abuse • Medication effect / overdose • Withdrawal syndromes • Sepsis / Meningitis • See Altered Mental Status differential

BARS Scoring	Score – Descriptor
	1 – Difficult or unable to arouse **2** – Asleep but responds normally to verbal or physical contact **3** – Drowsy, appears sedated **4** – Quiet and awake (normal level of activity) **5** – Signs of overt verbal or physical activity, but calms with instructions **6** – Extremely or continuously active, not requiring restraint **7** – Violent, requires restraint

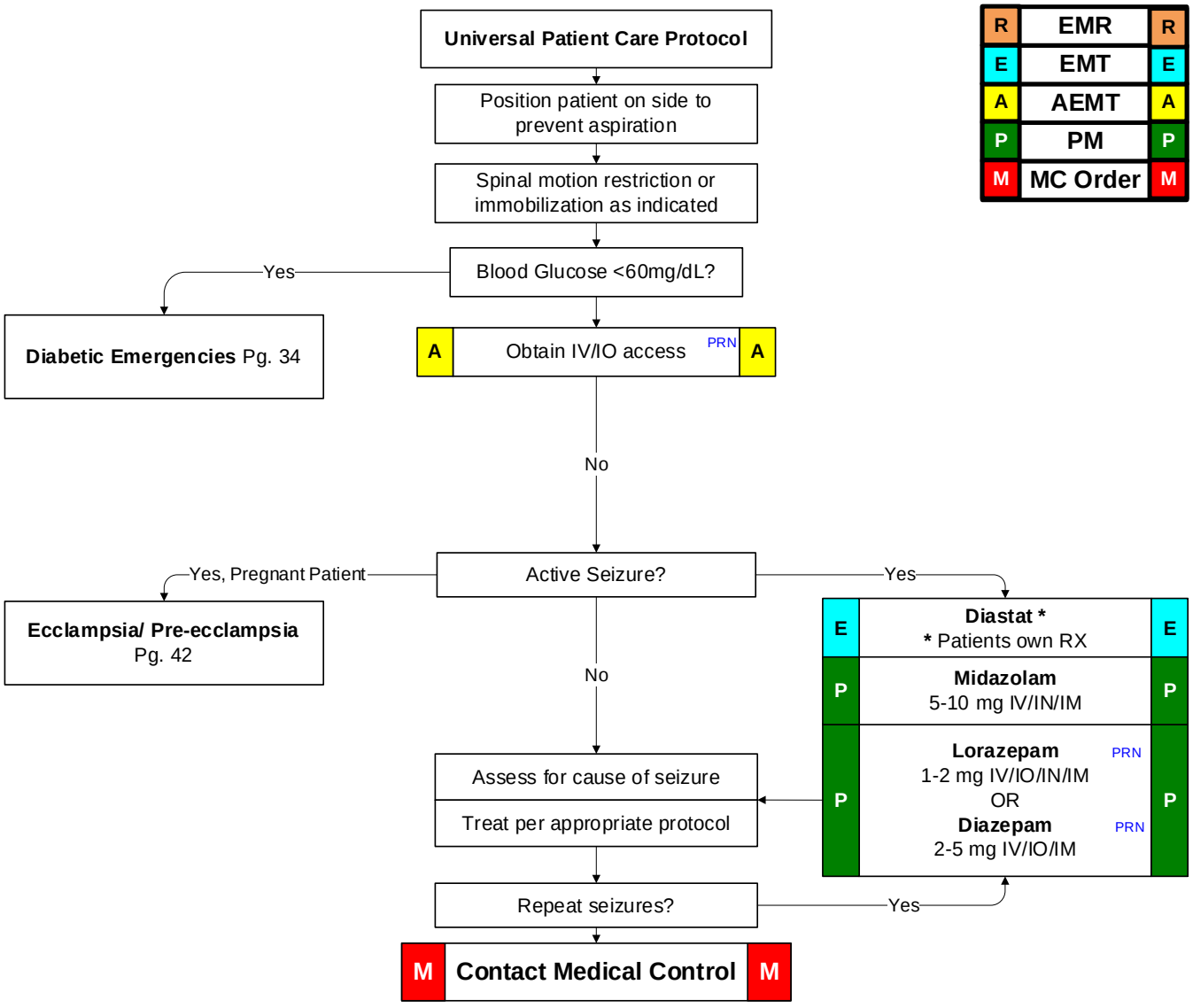


Notes:
- Be sure to consider all possible medical/trauma causes for behavior.
- Do not overlook the possibility of associated domestic violence or child abuse.
- *Doses may be repeated for the immediate safety of the provider or the patient.

Seizure

ALS transport if patients given a sedating medication and / or:

History:	Signs/Symptoms:	Differential:
• Prior history of seizures • Seizure medications • Reported seizure activity • History of recent head trauma • Congenital abnormality • Pregnancy (see Pregnancy Induced Hypertension - Eclampsia) • Medical alert tag • If given sedation medication by EMS	• Observed seizure activity • Altered mental status • Tonic / clonic activity • Status epilepticus • Incontinence • Mouth trauma • First time Seizure	• **H**ypovolemia • **H**ypoxia • **H**ydrogen ions (acidosis) • **Hypo-/H**yperkalemia • **H**ypoglycemia • **H**ypothermia • **T**oxins • **T**amponade, cardiac • **T**ension pneumothorax • **T**hrombosis, coronary or pulmonary • **T**rauma



Notes:

- Be prepared to assist ventilations especially if a benzodiazepine is used.
- If evidence or suspicion of trauma, spine should be immobilized.
- Consider nasopharyngeal airway and elevate head of bed to 30 degrees.
- * Clallam County Versed IM or IN for seizures.

Stroke

ALS evaluation and/or transport if available:

History:	Signs/Symptoms:	Differential:
• Previous CVA, TIA's • Previous cardiac / vascular surgery • Associated diseases: diabetes, hypertension, CAD • Atrial fibrillation • Medications (blood thinners) • History of trauma	• Altered mental status • Weakness / Paralysis • Blindness or other sensory loss • Aphasia / Dysarthria • Syncope • Vertigo / Dizziness • Vomiting • Headache • Seizures • Respiratory pattern change • Questionable airway • Abnormal vital signs	• **H**ypovolemia • **H**ypoxia • **H**ydrogen ions (acidosis) • **Hypo-/H**yperkalemia • **H**ypoglycemia • **H**ypothermia • **T**oxins • **T**amponade, cardiac • **T**ension pneumothorax • **T**hrombosis, coronary or pulmonary • **T**rauma

Los Angeles Motor Scale (LAMS)[22]		
Face	0	Both sides move normally
	1	One side is weak or flaccid
Arm	0	Both sides move normally
	1	One side is weak
	2	One side is flaccid/doesn't move
Grip	0	Both sides move normally
	1	One side is weak
	2	One side is flaccid/doesn't move
Total	0–5	

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

A / E — Obtain IV/IO access; Blood Glucose

≤ 60 mg/dL → Treat hypoglycemia as appropriate

> 60 mg/dL

R — **Stroke BEFAST assessment** Pg. 142 — R

LAMS

Prehospital **Thrombolytic Screening** Pg. 145

Make destination decision

P — See **Stroke** Follow **County Operating Procedure Pg. 10** — P

Consider other appropriate protocol as needed

P — **Labetalol** 10 mg IV/IO over 1-2 min for SBP > 180 And/or DBP > 105, May repeat once in 5 min. — P

M — **Contact Medical Control** — M

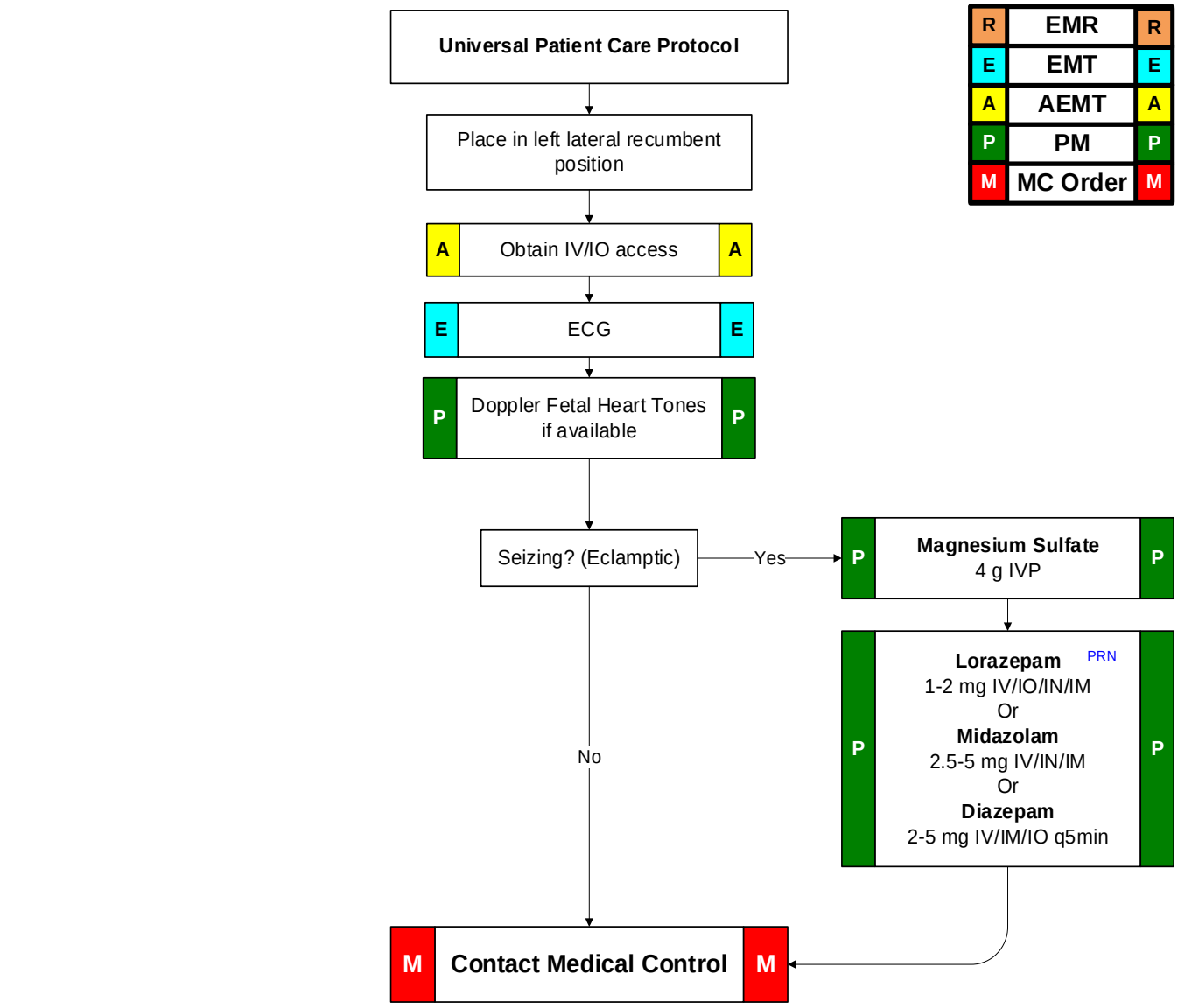
Notes:

- Onset of symptoms is defined as the last witnessed time the patient was symptom free (i.e. awakening with stroke symptoms would be defined as an onset time of the previous night when patient was symptom free)
- The differential listed on the Altered Mental Status Protocol should also be considered.
- Be alert for airway problems (swallowing difficulty, vomiting).
- Hypoglycemia can present as a localized neurologic deficit, especially in the elderly.
- Elevate head of bed to 30 degrees.

Ecclampsia/Pre-ecclampsia

ALS evaluation and/or transport if available gently and quietly:

History:	Signs/Symptoms:	Differential:
• Past medical history • Prenatal care • Medications/drugs • Familial incidence • Primigravida • Renal disease	• Seizure • Hypertension • Tachycardia • Edema • Headache • Visual disturbance • Abdominal pain • Amnesia and/or other change in mental status	• Hypertension • Multiple fetuses • Gestational diabetes • Microthrombi • Improper placental implantation



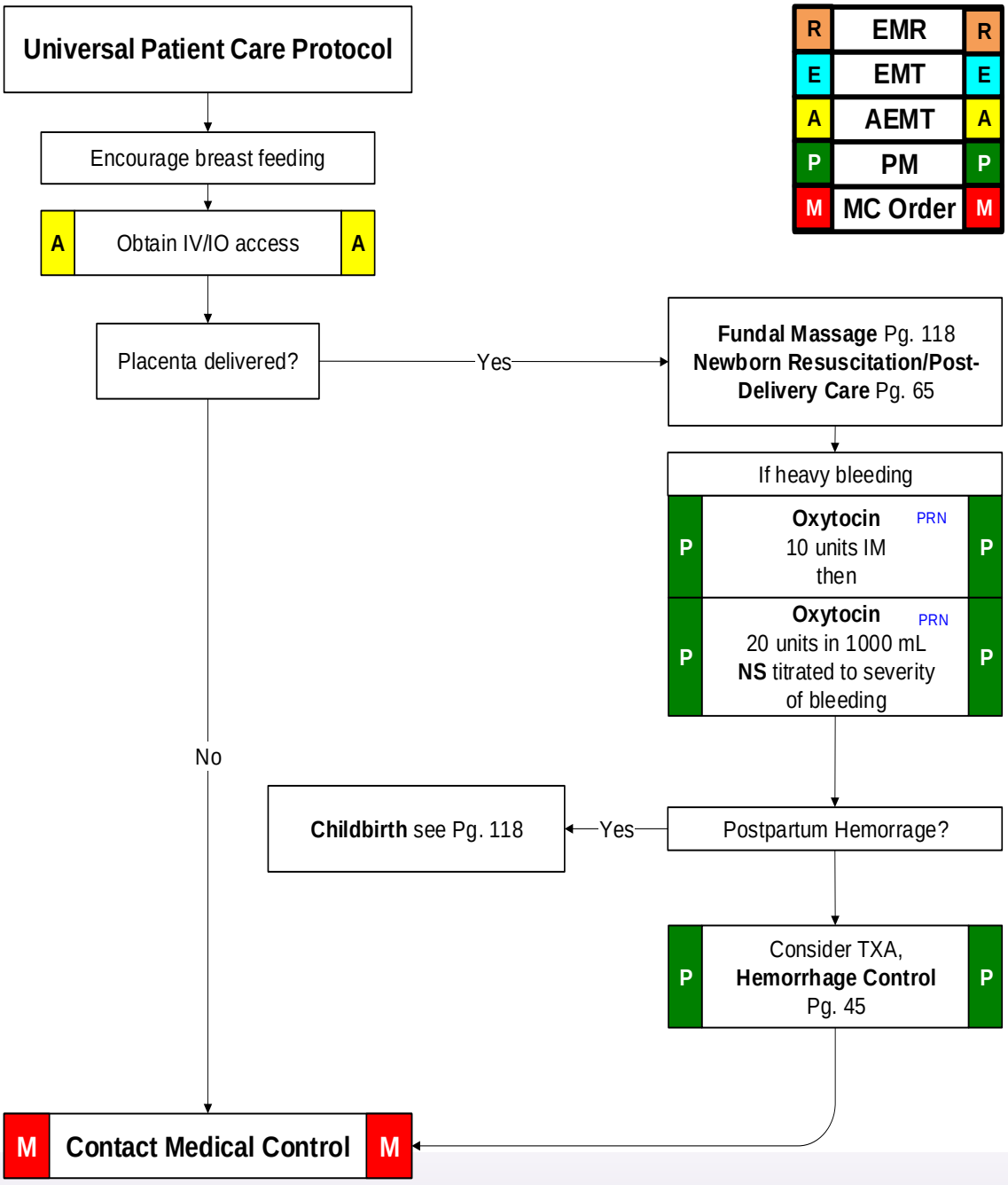
Notes:

- Eclampsia can present up to two months postpartum
- Severe headache, vision changes, or RUQ pain may indicate preeclampsia.
- In the setting of pregnancy, hypertension is defined as a BP greater than 140 systolic or greater than 90 diastolic, or a relative increase of 30 systolic and 20 diastolic from the patient's normal (pre-pregnancy) blood pressure.
- Maintain patient in a left lateral position to minimize risk of supine hypotensive syndrome.

Postpartum

ALS evaluation and/or transport if available:

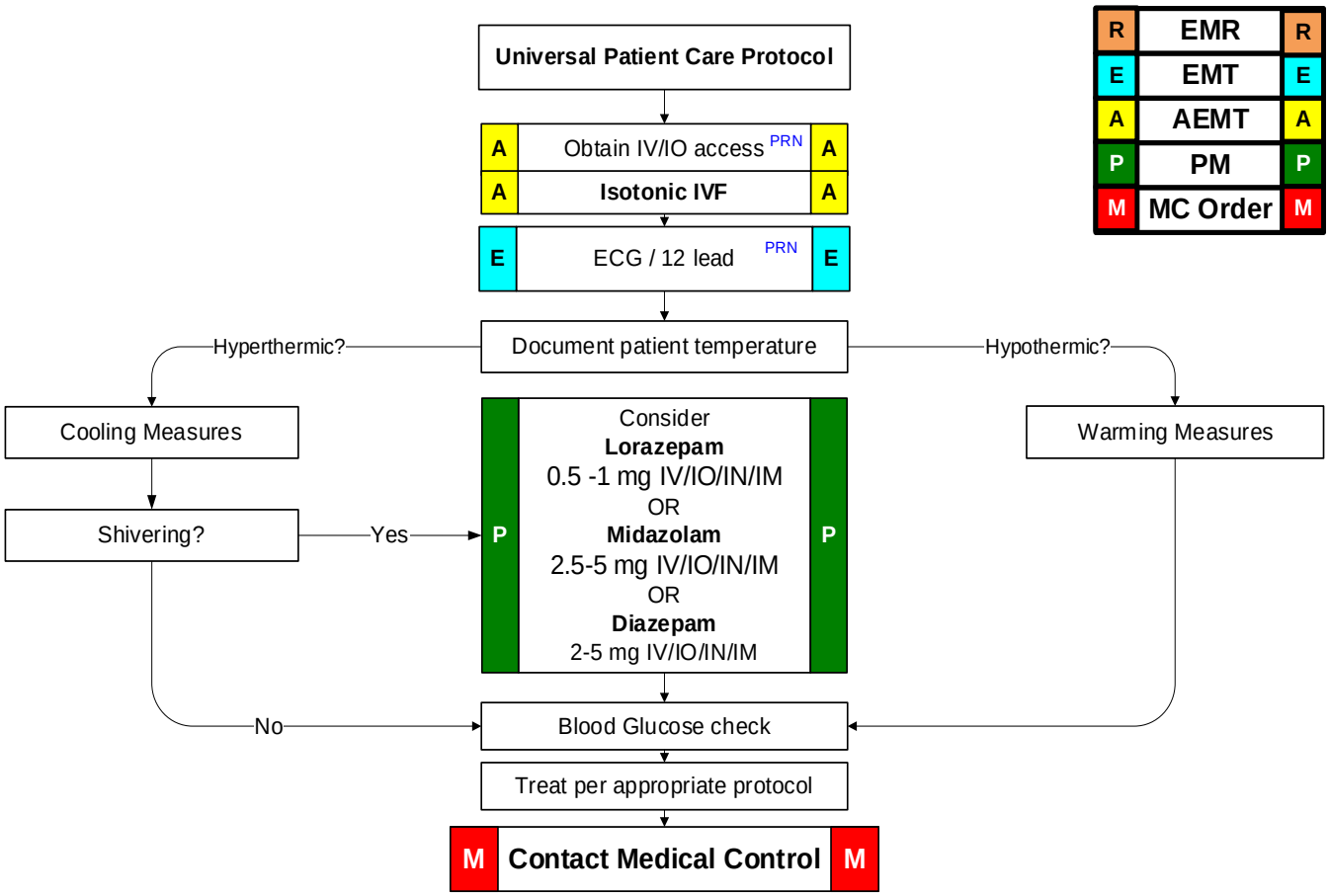
History:	Signs/Symptoms:	Differential:
• Prenatal care? • Due date and gestational age • Multiple gestation (twins etc.) • Meconium • Delivery difficulties • Medications (maternal) • Maternal risk factors • Substance abuse	• Excess vaginal bleeding • Signs of shock	• Secretions • Infection • Hypovolemia • Hypoglycemia



Environmental Emergencies

ALS evaluation and/or transport if available:

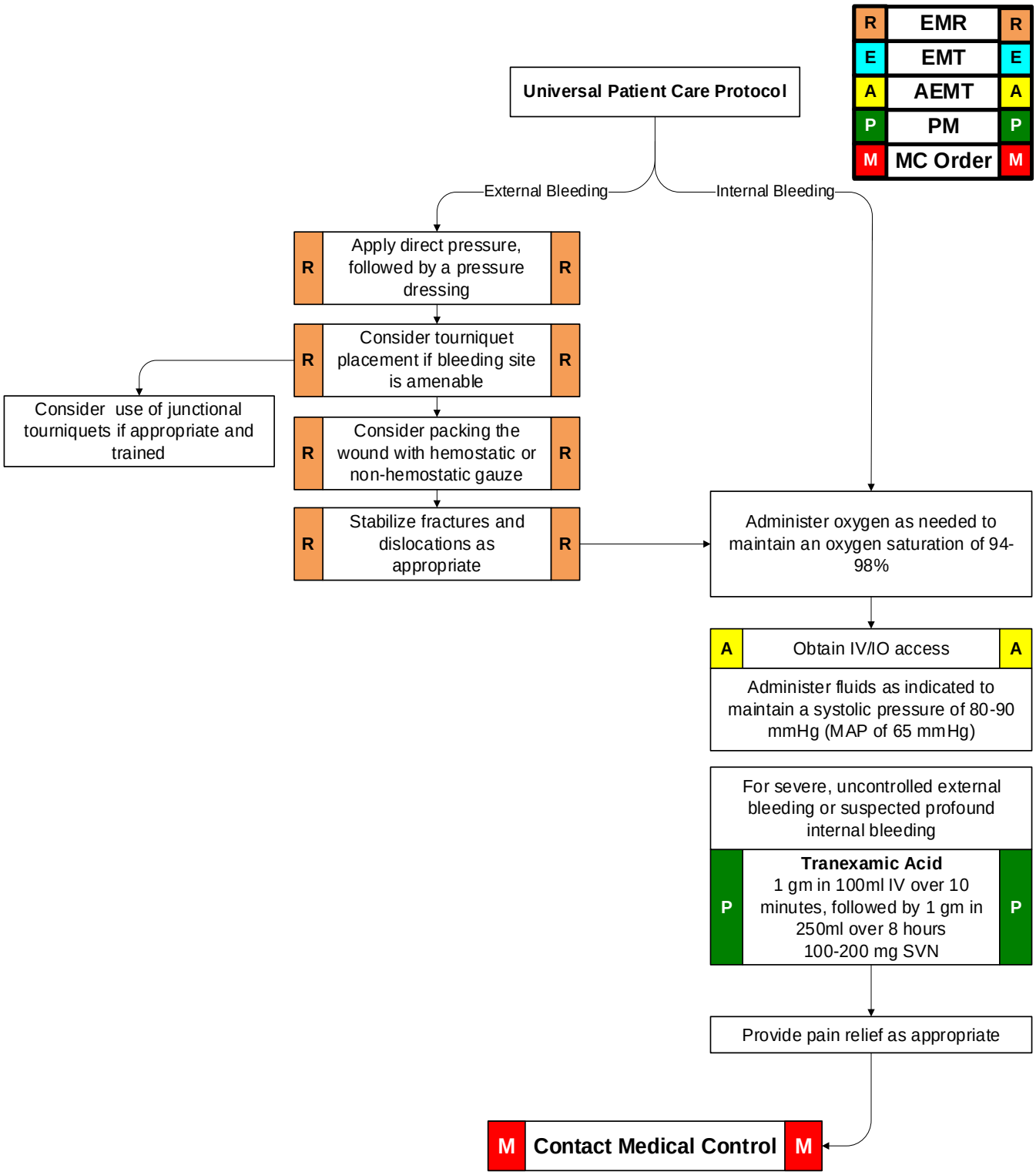
History:	Signs/Symptoms:	Differential:
• Age • Exposure to increased/decreased temperatures and/or humidity • Past medical history/medications • Extreme exertion • Time and length of exposure • Poor PO intake	• Altered mental status or unconsciousness • Hot, dry or sweaty skin • Hypotension or shock • Seizure • Nausea • Fatigue and / or muscle cramping	• Fever (Infection) / Sepsis • Dehydration • Medications • Hyperthyroidism (Storm) • Delirium tremens (DT's) • Heat exhaustion • Heat stroke • Hypoglycemia • Poisoning/overdose



Notes:

- **ATTEMPT REWARMING BEFORE CEASING RESUSCITATION EFFORTS.**
- Extremes of age are more prone to temperature emergencies (i.e. young and old).
- Core temperature is the most reliable measure- for pts with ALOC and pts < 2 years old this should be the method of measurement.
- Heat emergencies can be precipitated by use of: tricyclic antidepressants, phenothiazines, anticholinergic medications, and alcohol.
- Cocaine, Amphetamines, and Salicylates may elevate body temperatures.
- Shivering stops below 32° C (90° F).
- Sweating generally disappears as body temperature rises above 104° F (40° C).
- With temperature less than 31° C (88° F) ventricular fibrillation is common cause of death. Handling patients gently may prevent this (rarely responds to defibrillation).
- Hypothermia may produce severe bradycardia.

Hemorrhage Control



Notes:

- TXA may also be administered via nebulizer for hemoptysis, or applied to cotton for epistaxis

Burns

ALS evaluation and/or transport if available:

History:	Signs and Symptoms:	Differential:
• Type of exposure (heat, gas, chemical) • Inhalation injury • Other trauma • Loss of consciousness	• Burns, pain, swelling • Dizziness • Loss of consciousness • Shock / Hypotension • Airway compromise / distress • Singed facial or nasal hair • Hoarseness / wheezing	• Chemical • Thermal • Electrical • Radiation

Universal Patient Care Protocol

Oxygen PRN
Advanced Airway Management

Stop the burning process:
Remove jewelry and clothing that may be burned, covered in chemicals or restricting.

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Thermal / Electrical

Cover burn with a dry clean sheet or dressing

Keep warm

Use Rule of 9's

>10% then
TBSA 2nd/3rd degree burns

A — Obtain IV/ IO access PRN
TBSA x weight in kg/8
Volume of Isotonic IVF in 1st hour — A

Pain and Sedation Management Protocol Pg. 38

If burn < 10 % body surface area **Cool down the wound with Normal Saline**

Cover burn with a dry clean sheet or dressing

Outlying areas may use burn gel for comfort in burns < 10% BSA

M **Contact Medical Control** M

Chemical

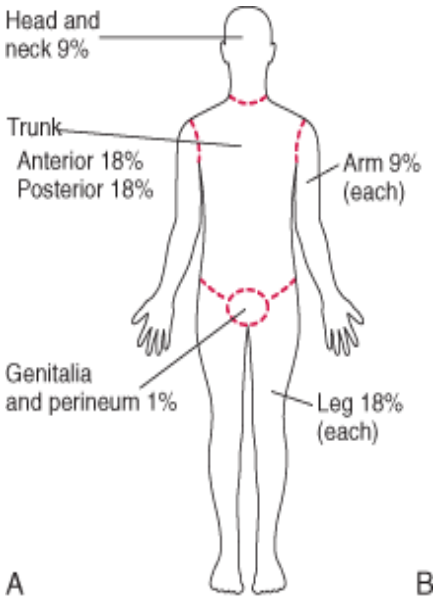
Brush off any excess chemical or powder

Flush area with water or Normal Saline (except materials that react with H2O) Keep warm

Eye involvement?
Saline flush in the affected eye

Needs a Burn Unit

1. Partial and/or Full Thickness (2nd and/or 3rd degree burn >10% TBSA
2. 2nd and/or 3rd burns to face, hands, or genitals
3. Circumferential burns or burns at groin, axilla, or over major joints.

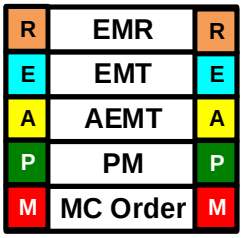


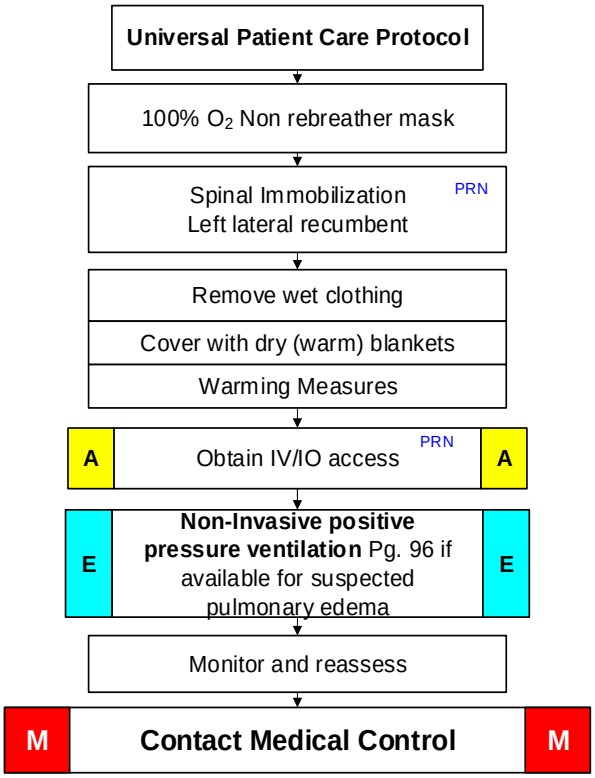
Notes:
- Brooke Burn formula for IVF requirement for 1st hour

SCUBA

Transport ALL near drowning Patients/ALS if:

History:	Signs and Symptoms:	Differential:
• Aspiration of fluid • Possible history of trauma • Duration of immersion • Temperature of water • Depth of dive • Know history of dive (tank pressure / gas content) • Recent air travel • Salt vs. Fresh water • Repetitive dives • Free diving is same as SCUBA	• Unresponsive • Changes in mental status • Coughing • Joint pain or tooth pain • Ear pain/hearing loss • Stroke like symptoms • Itching • Rash	• Trauma • Pre-existing medical problem • Pressure injury (diving) Barotrauma Decompression sickness • Near Drowning





Notes:

- Exam: Check Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro for Trauma
- Transport dive computer with patient
- For dive deaths, gear is evidence
- What type of gas used? Any seizures in the history? Mixed gas?
- **Scene safety!** Drowning is a leading cause of death in would-be rescuers.
- With cold water there is no time limit- resuscitate all.
- All near drowning victims should be transported- conditions may deteriorate during the next several hours
- Activate Trauma system. Consider Airlift Transport. Contact early
- For Air Embolism symptoms patient should be placed on high flow oxygen, and lie patient down on left side with head and feet neutral.
- **Diver's Alert network (DAN) (877) 595-0625**

Hyperbaric Chambers capable of taking patients with the Bends or Carbon Monoxide poisoning on an emergency basis:

Harborview Medical Center
Phone (206) 731-3000

US Naval Undersea Warfare Center (Active duty/dependants)
Phone 24 hours (360) 396-2111 Daytime (360) 396-2522
*Call for availability

Drowning / Near Drowning

Transport ALL near drowning Patients/ALS if:

History:	Signs and Symptoms:	Differential:
• Aspiration of fluid • Submersion in water- regardless of depth • Possible history of trauma • Duration of immersion • Temperature of water • Salt vs. Fresh water	• Unresponsive • Changes in mental status • Coughing • Respiratory compromise	• Trauma • Pre-existing medical problem • Pressure injury (diving) Barotrauma Decompression sickness

Universal Patient Care Protocol

Oxygen to keep sat 94-98%

Spinal Motion Restriction PRN
Pg. 140

Remove wet clothing
Cover with dry (warm) blankets
Warming Measures

A — Obtain IV/IO access PRN — A

E — Non-Invasive positive pressure ventilation for Pulmonary Edema — E

E — ECG / 12 lead PRN — E

Monitor and reassess

Treat per appropriate protocol

M — **Contact Medical Control** — M

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Notes:

- **Exam : Check Head, Neck, Chest, Abdomen, Pelvis, Back, Extremities, Skin, Neuro for Trauma**
- With cold water there is no time limit- resuscitate all.
- **Scene safety!** Drowning is a leading cause of death in would-be rescuers.

Crush Injury

History:	Inclusion Criteria:	Exclusion Criteria:
• Determine the duration of crush • Examine extent of tissue involvement	• Traumatic crush mechanism of Injury	• Non-crush injuries

Universal Patient Care Protocol

Manage bleeding as appropriate in accordance with Extremity Trauma/ **External Hemorrhage Control** Protocol Pg. 45

Administer High flow Oxygen

A Obtain IV/IO access A

A **Fluid bolus** 10-15 ml/kg Preferably prior to extrication A

P Consider **Pain and Sedation Management** Pg. 38 PRN P

P For significant crush injuries or prolonged entrapment (more than 30 min) of an extremity consider P

Yes →

P **Sodium Bicarbonate** 1 mEq/kg IV Max dose 50 mEq over 5 min. P

E **Albuterol** 5 mg SVN E

Monitor carefully for dysrhythmia and signs of hyperkalemia immediately after release of pressure and during transport

Consider the following post extrication

P Continued isotonic crystalloid resuscitation (500-1000 ml/hr for adults, 10 ml/kg/hr for children) P

For indications of Hyperkalemia →

P **Calcium Chloride** 1 gm IV/IO, over 5 minutes for infusion rate not to exceed 1 ml/minute P

P **Sodium Bicarbonate** 1 mEq/kg IV Max dose 50 mEq over 5 min. if not already administered P

E **Albuterol** 5 mg SVN E

M **Contact Medical Control** M

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

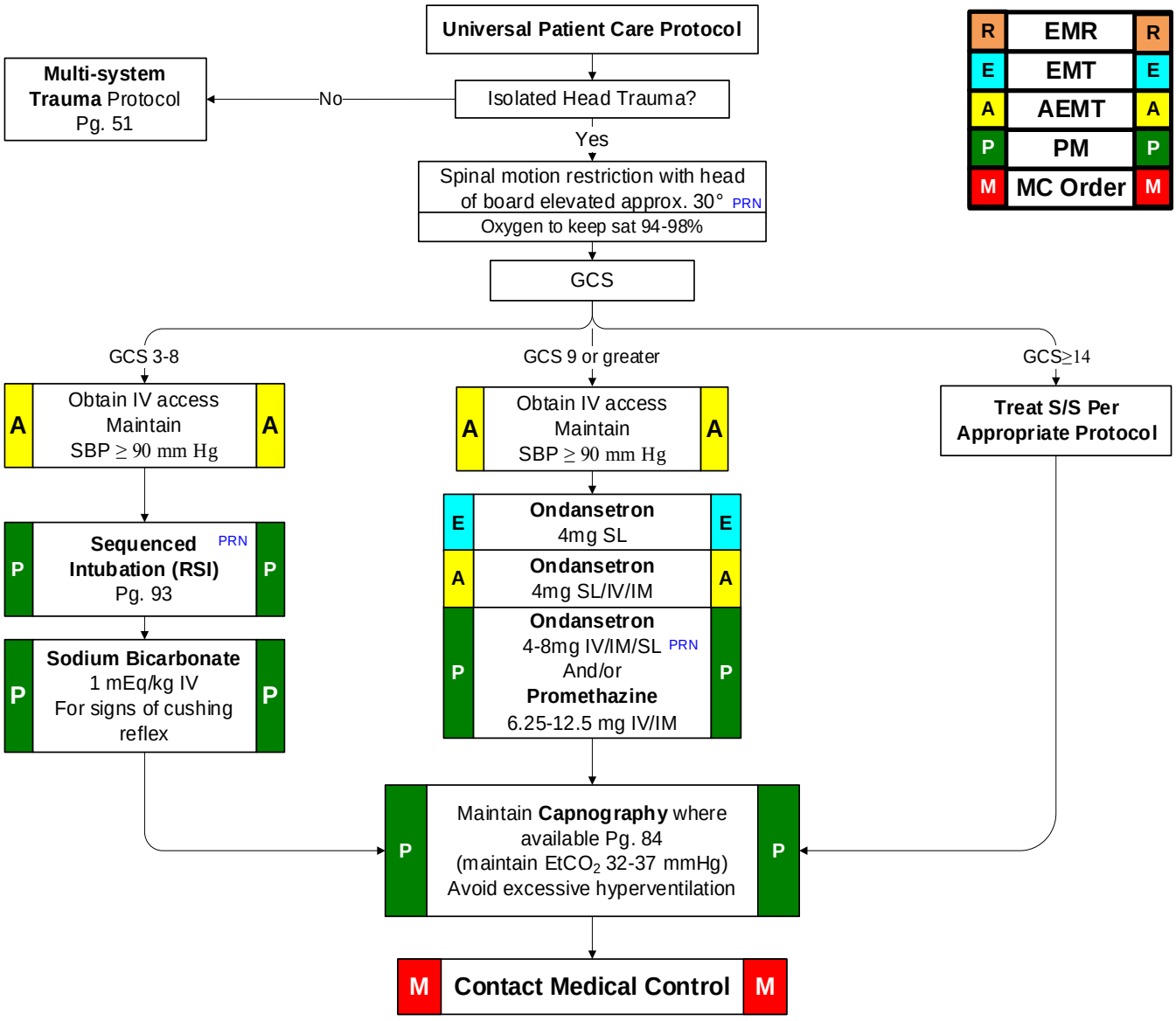
Notes:

- Crush patients should be considered high priority for transport or transfer in accordance with the Washington State Trauma Triage tool.

Head Injury

ALS evaluation and/or transport if available:

History:	Signs and Symptoms:	Differential:
• Onset • Mechanism (blunt / penetrating) • Loss of consciousness • Bleeding • Medical History (ETOH…) • Medications (Coumadin…) • Extremes of age • Step IV trauma	• Pain, swelling, bleeding, oto/rhinorrhea • Altered Level of Consciousness GCS <13 • Respiratory distress/failure • Vomiting • Significant mechanism of injury **Signs of Herniation:** • GCS <8 • Fixed or asymmetric pupils • Neurologic Posturing • Cushings Triad • Intermittent apnea • Neurologic deterioration (decrease in GCS ≥ 2)	• Seizure • Stroke • **A**lcohol • **E**pilepsy Endocrine • **I**nsulin • **O**verdose • **U**remia • Trauma • Infection / sepsis • Psychosis



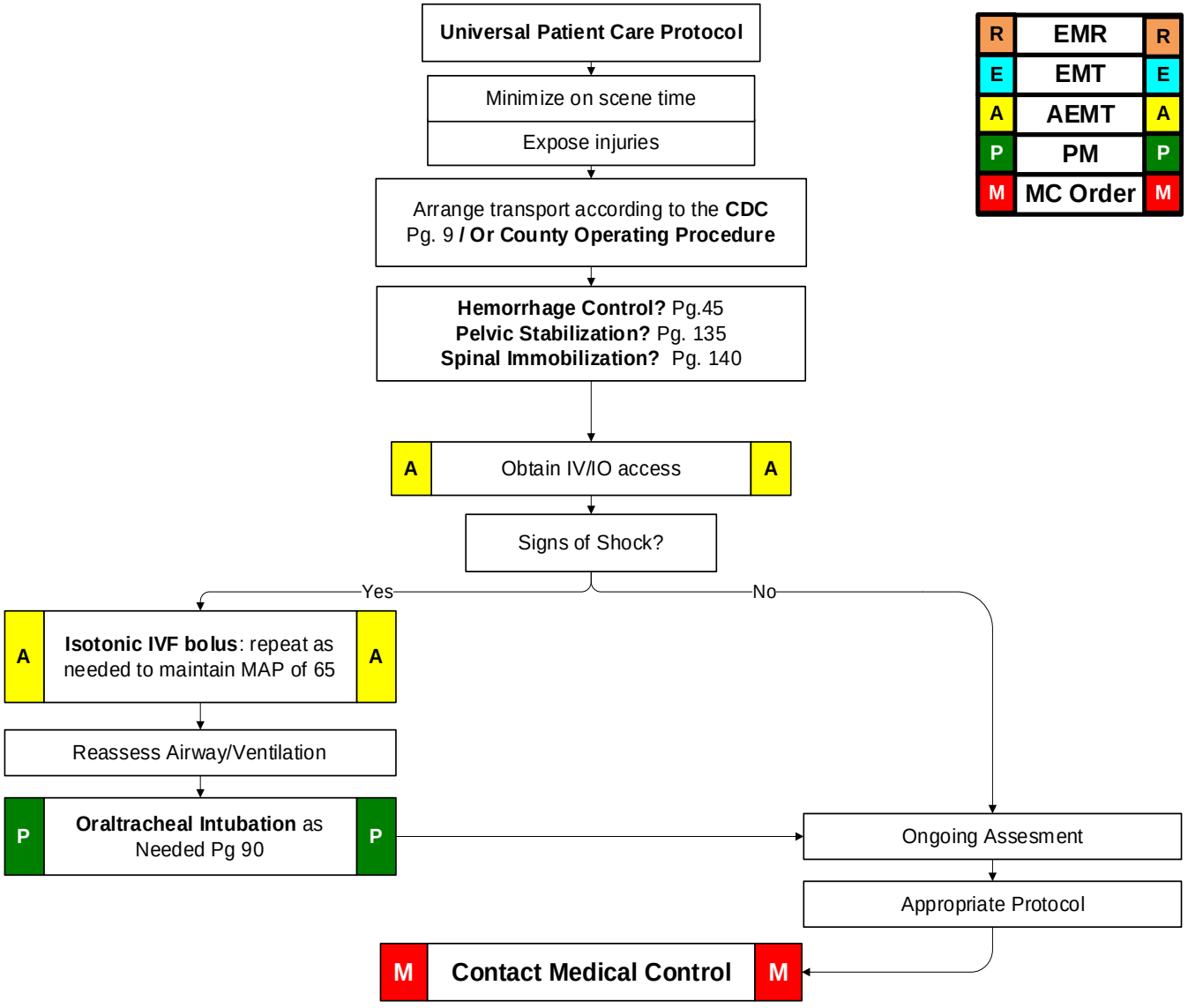
Notes:

- Step IV Trauma for elderly with and without anticoagulation

Multi-system Trauma

ALS evaluation and/or transport if available:

History:	Signs and Symptoms:	Differential:
• Time and Mechanism of injury • Damage to structure or vehicle • Location in structure or vehicle • Others injured or dead • Speed and details of MVA • Restraints / protective equipment • Symptoms preceding incident	• Altered mental status or unconscious GCS<13 • Hypotension or shock	• Chest Tension pneumothorax Flail Chest Pericardial Tamponade Open chest wound Hemothorax • Intra-abdominal bleeding • Pelvis/femur fracture • Spine fracture / Cord injury • Extremity fracture / Dislocation • HEENT (Airway Obstruction) • Hypothermia



Notes:

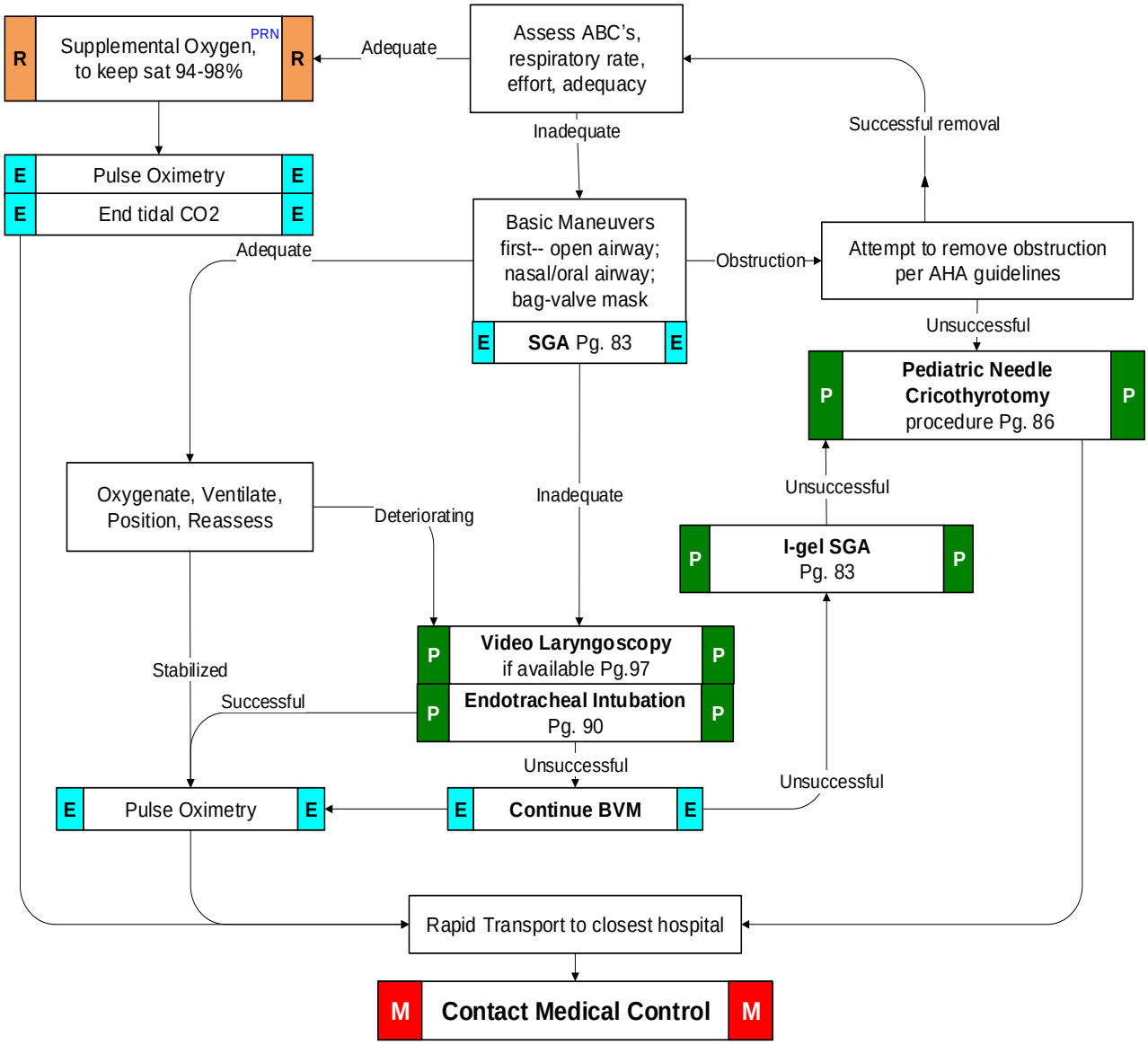
- **Exam : Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- Mechanism is often a good indicator of serious injury
- If domestic violence or abuse is suspected it must be reported to Law Enforcement, receiving facility, airlift.

Pediatric Airway

ALS evaluation and/or transport if available:

History:
• Know difficult Airway
• Neck or head trauma
• Trisomy 21
• Congenital malformations
	Differential:
	• Physical Examination
	  • Small jaw or limited jaw opening
	  • Limited cervical spine movement swollen tongue, oropharynx, or neck, midface hypoplasia

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order



Notes:

- **For this Guideline, child is defined as less than 8 years old.**
- **Limit intubation attempts to 3 per patient**
- Maintain C-spine immobilization for patients with suspected spinal injury
- Reconfirm ETT placement each time patient is moved
- **<u>All</u> choking victims need to be transported to the hospital. Children who have possibly aspirated anything may not be transported POV, but can be transported BLS if stable.**

Pediatric Sequenced Intubation

ALS evaluation and/or transport if available:

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

A — Preoxygenate with 100% FI02 for 5 min. Avoid bag mask ventilation if possible — A

A — Obtain IV/IO access — A

P — Consider **Atropine** 0.02 mg/kg for salivation — P

Shock?

- Yes → P — **Ketamine** 0.5 mg/kg IV Or **Etomidate** 0.3 mg/kg — P
- No → Suspected intracranial hypertension?
  - Yes → P — **Ketamine** 1 mg/kg IV Or **Etomidate** 0.3 mg/kg — P
  - No → P — **Ketamine** 1 mg/kg IV Or **Etomidate** 0.3 mg/kg Or **Fentanyl** 2 mcg/kg And **Midazolam** 0.1 mg/kg — P

P — Apply cricoid pressure — P

Any personal or family history of malignant hyperthermia, known or suspected mitochondrial or skeletal myopathy, glaucoma, penetrating eye injury? Known or suspected Hyperkalemia?

- Yes → P — **Rocuronium** 0.6 to 1.2 mg/kg **OR** **Vecuronium** 0.1 mg/kg — P
- No → P — **Succinylcholine** 2 mg/kg **OR** **Rocuronium** 0.6 to 1.2 mg/kg — P

P — **Orotracheal Intubation** Pg. 90 — P

P — Consider **Atropine** 0.02 mg/kg for Bradycardia And **Rocuronium** 0.2 to 0.5 mg/kg if needed — P

P — **See Pediatric Pain Sedation Management** Pg. 67 — P

M — **Contact Medical Control** — M

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Atropine	**0.1 mg**	**0.12 mg**	**0.16 mg**	**0.2 mg**	**0.24 mg**	**0.30 mg**	**0.38 mg**	**0.48 mg**	**0.60 mg**
Ketamine 0.5mg/kg	**2 mg**	**3 mg**	**4 mg**	**5 mg**	**6 mg**	**7.5 mg**	**9.5 mg**	**12 mg**	**15 mg**
Ketamine 1mg/kg	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Etomidate	**1.2 mg**	**1.8 mg**	**2.4 mg**	**3 mg**	**3.6 mg**	**4.5 mg**	**5.7 mg**	**7.2 mg**	**9 mg**
Fentanyl	**8 mcg**	**12 mcg**	**16 mcg**	**20 mcg**	**24 mcg**	**30 mcg**	**38 mcg**	**48 mcg**	**60 mcg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Succinylcholine	**8 mg**	**12 mg**	**16 mg**	**20 mg**	**24 mg**	**30 mg**	**38 mg**	**48 mg**	**60 mg**
Vecuronium	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Rocuronium	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**

Pediatric Cardiac Arrest

ALS evaluation and/or transport if available:

History:
- Medical history
- Possibility of foreign body
- Respiratory distress or arrest
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

Differential:
- Respiratory effort
- Foreign body obstructions
- **H**ypovolemia (dehydration)
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis (coronary or pulmonary)
- **T**rauma (hypovolemia, increased ICP)

Universal Patient Care Protocol

Begin **High Performance CPR** Pg. 119

Apply AED / ECG monitor / Defibrillator
Access rhythm, shock as advised

Continue **High Performance CPR** Pg. 119
IMMEDIATELY following shock or rhythm analysis

Apply **Mechanical CPR device** (if available) as appropriate Pg.120

Oxygen
Advanced Airway Management

E **SGA** Pg. 83 E

Attach **Impedance Threshold Device** (ITD) and ventilate through ITD Pg. 129

A Obtain IV/IO access A

A Isotonic IVF 20 ml/kg IV/IO
May repeat up to 60 ml/kg A

Ongoing assessment

Consider causes of Cardiac Arrest

Return Of Spontaneous Circulation (ROSC)? —Yes→ **Post Resuscitation** Protocol Pg.31

No

P Consider ventilator if resp etiology of arrest P

M **Contact Medical Control** M

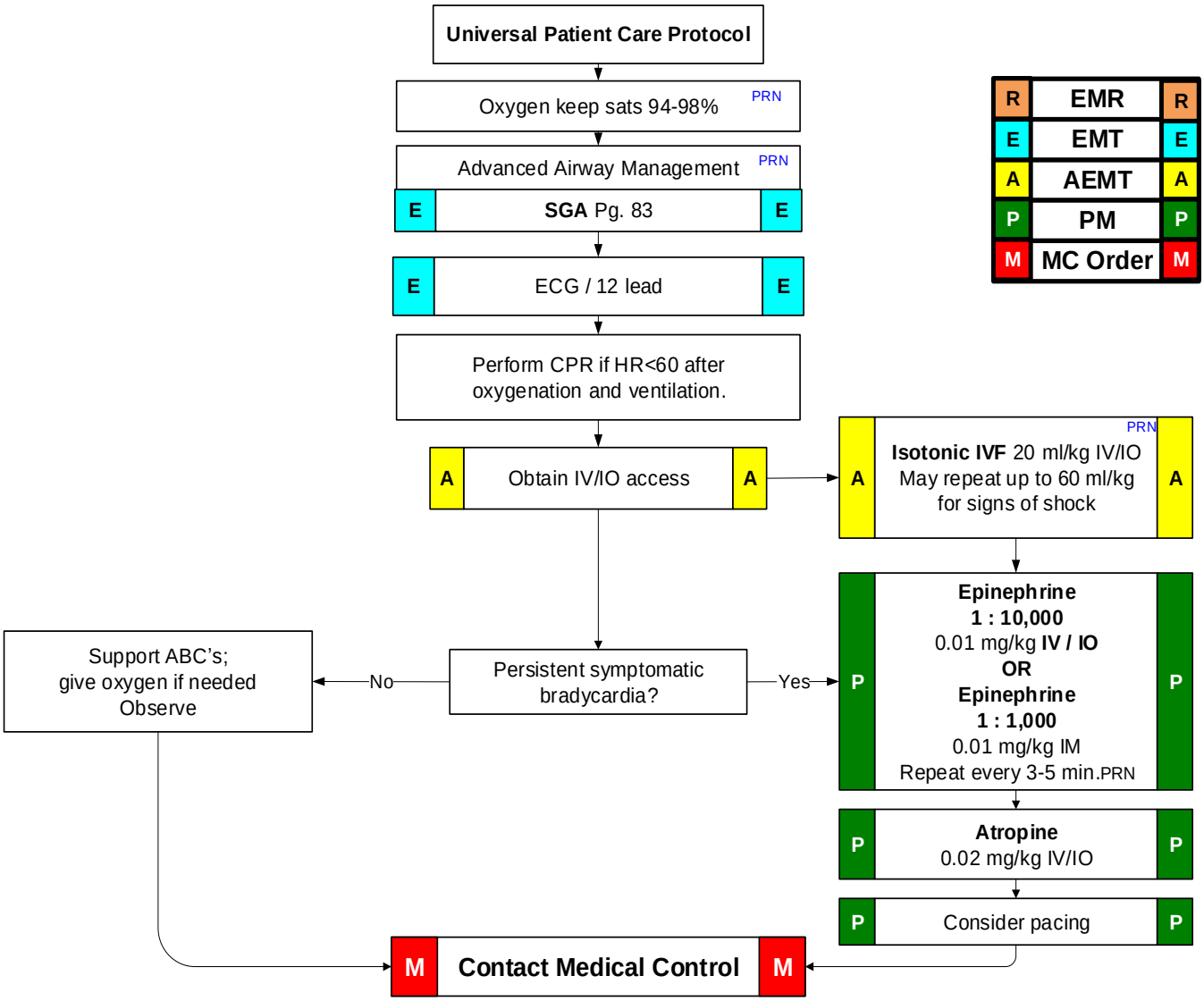
R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Pediatric Bradycardia

ALS evaluation and/or transport if available:

History:
- Medical history
- Possibility of foreign body
- Respiratory distress or arrest
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)

Differential:
- Respiratory failure
- Foreign body obstructions
- **H**ypovolemia (dehydration)
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis (coronary or pulmonary)
- **T**rauma (hypovolemia, increased ICP)



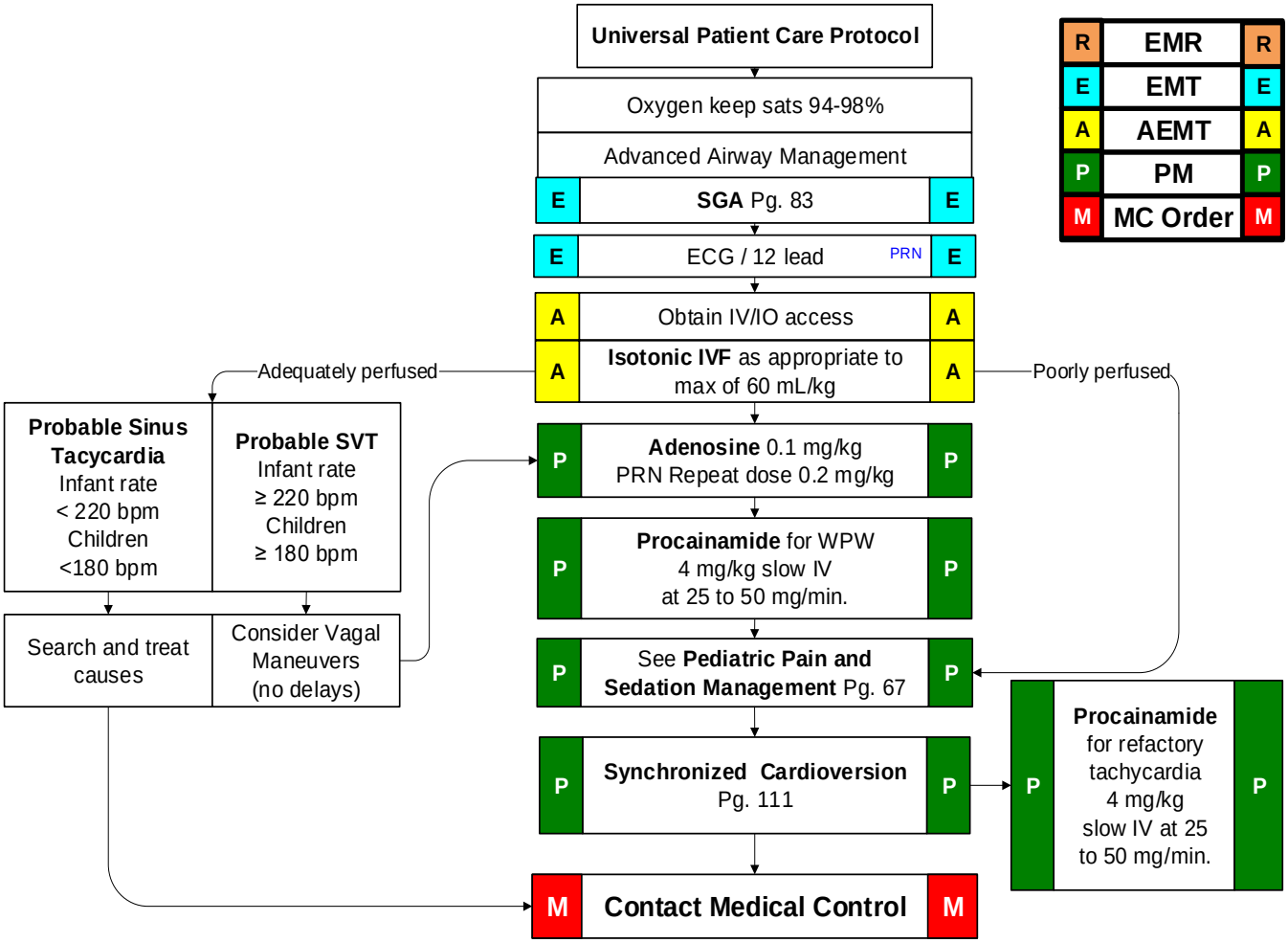
Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Atropine	**0.1 mg**	**0.12 mg**	**0.16 mg**	**0.2 mg**	**0.24 mg**	**0.3 mg**	**0.38 mg**	**0.48 mg**	**0.6 mg**

Pediatric Narrow Complex Tachycardia

ALS evaluation and/or transport if available:

History:
- Medications or toxins
- Congenital heart disease
- Respiratory distress
- Syncope
- Volume loss (diarrhea / vomiting)

Differential:
Sinus Tachycardia vs. SVT
- Heart disease (congenital)
- Electrolyte imbalance
- Hypotension
- Fever / infection / sepsis
- Medication / toxin / drugs
- Pulmonary Embolism
- Tension pneumothorax

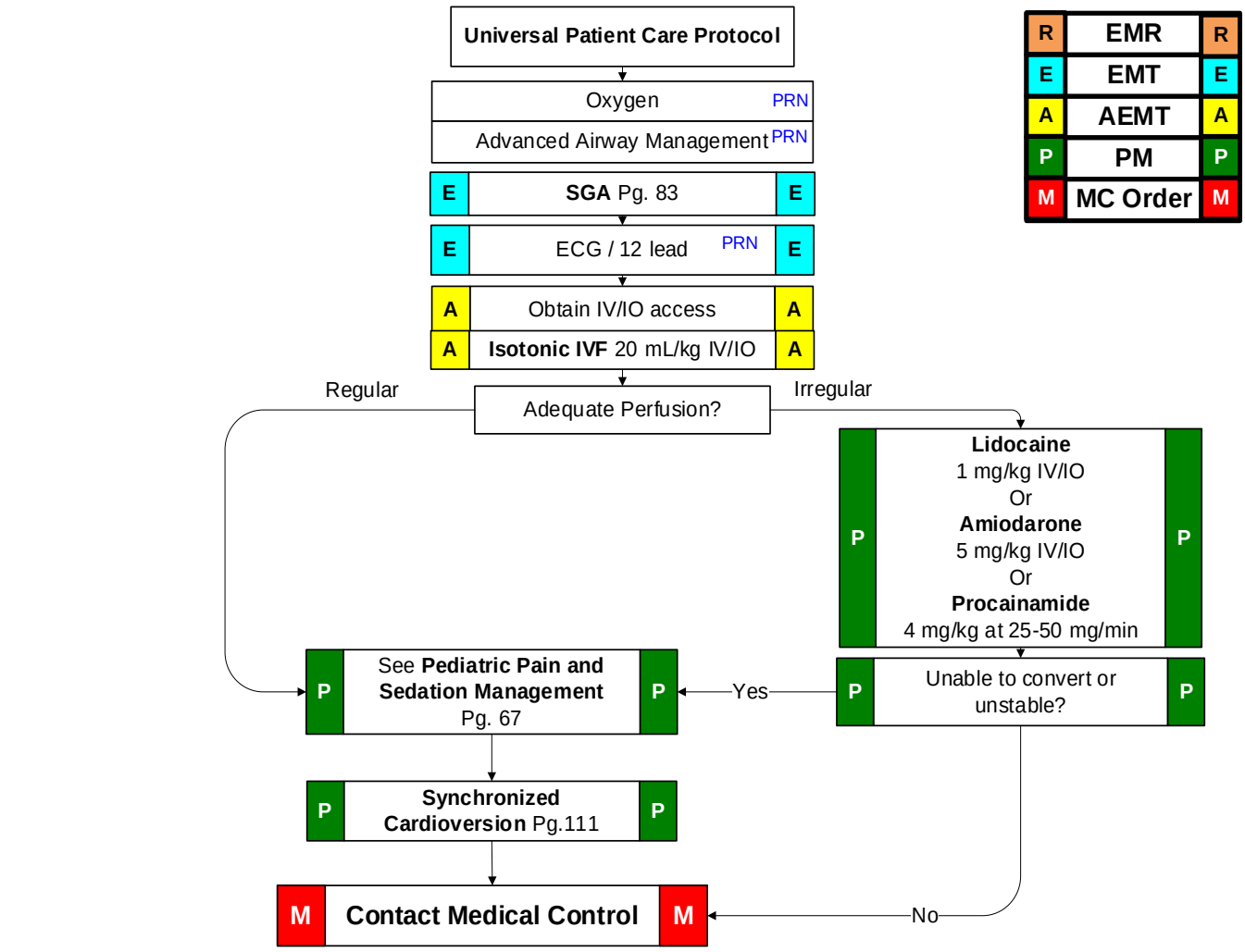


Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Adenosine 0.1 mg/kg – 1st dose	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Adenosine 0.2 mg/kg – 2nd dose	**0.8 mg**	**1.2 mg**	**1.6 mg**	**2 mg**	**2.4 mg**	**3 mg**	**3.8 mg**	**4.8 mg**	**6 mg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Procainamide	**16 mg**	**24 mg**	**32 mg**	**40 mg**	**48 mg**	**60 mg**	**76 mg**	**90 mg**	**120 mg**

Pediatric Wide Complex Tachycardia

ALS evaluation and/or transport if available:

History:		Differential:	
• Medications or toxins	• Syncope	• Heart disease (congenital)	• Anxiety
• Congenital heart disease	• Drugs (cocaine)	• Hypovolemia (dehydration) or anemia	• Hypotension
• Respiratory distress		• Electrolyte imbalance	• Medication / toxin / drugs



Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Lidocaine	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Amiodarone	**20 mg**	**30 mg**	**40 mg**	**50 mg**	**60 mg**	**75 mg**	**95 mg**	**120 mg**	**150 mg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Procainamide	**16 mg**	**24 mg**	**32 mg**	**40 mg**	**48 mg**	**60 mg**	**76 mg**	**96 mg**	**120 mg**

Pediatric V-Fib/Pulseless V-Tach (shock advised)

Arrive here from **Pediatric Cardiac Arrest** Protocol Pg. 54

Defibrillate at 2J/kg

High Performance CPR x2 min.
Pg. 119
Airway Management and confirm effective oxygenation and ventilation

A | Obtain IV/IO access | A

Assess Rhythm

VF/VT (Shock Advised)

Defibrillate at 4J/kg

High Performance CPR x2 min. Between defibrillations

A | **Epinephrine 1 : 10,000**
0.01 mg/kg IV / IO
Repeat every 3-5 min. PRN | A

P | Consider
Lidocaine
1.5 mg/kg
IV/IO repeat bolus
0.5 -0.75 mg/kg q 5 min to max 3 mg/kg
OR
Amiodarone
5mg/kg IV/IO
Max dose 300mg; may repeat x1 to max 450mg | P

P | **Magnesium Sulfate**
50 mg/kg IV/IO | P

If recovery of pulses go to **Pediatric Post Resuscitation Protocol** Pg. 60

M | **Contact Medical Control And Transport** | M

Asystole Or PEA (No Shock Advised)

Go to **Pediatric Asystole or PEA (NSA)** Protocol Pg. 59

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Weight	*4 kg grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**
Lidocaine 1.5 mg/kg	**6 mg**	**9 mg**	**12 mg**	**15 mg**	**18 mg**	**22 mg**	**28 mg**	**36 mg**	**45 mg**
Lidocaine repeat bolus 0.5-0.75 mg/kg	**2-3 mg**	**3-4 mg**	**4-6 mg**	**5-7 mg**	**6-9 mg**	**7-11 mg**	**9-14 mg**	**12-18 mg**	**15-22 mg**
Amiodarone	**20 mg**	**30 mg**	**40 mg**	**50 mg**	**60 mg**	**75 mg**	**95 mg**	**120 mg**	**150 mg**
Magnesium Sulfate	**200 mg**	**300 mg**	**400 mg**	**500 mg**	**600 mg**	**750 mg**	**950 mg**	**1200 mg**	**1500 mg**

Pediatric PEA / Asystole

ALS evaluation and/or transport if available:

History:
- Time of arrest
- Medical history
- Possibility of foreign body
- Hypothermia
- Non-accidental trauma
- SIDS

Differential:
- Respiratory failure
- Foreign body obstructions
- **H**ypovolemia (dehydration)
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-hyperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis (coronary or pulmonary)
- **T**rauma (hypovolemia, increased ICP)

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Universal Patient Care Protocol

Begin High Performance CPR
Pg. 119

Oxygen

E **Supraglottic Airway** E
Pg. 83

E ECG / 12 lead PRN E

A Obtain IV/IO access A → A Fluid bolus 20 ml/kg IV/IO PRN A
May repeat up to 60 ml/kg
For signs of shock

A **Epinephrine** PRN A — OR → P **Epinephrine** PRN P
1 : 10,000
0.01 mg/kg IV / IO
Repeat every 3-5 min. PRN

1 : 1,000
0.1 mg/kg ET
Repeat every 3-5 min. PRN

Resume CPR and treat other associated rhythms, consider differentials

Assess Rhythm after 2 minutes of CPR

M **Contact Medical Control** M

Weight	*4 kg grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**

Pediatric Post Resuscitation Management

ALS evaluation and/or transport if available:

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

Oxygen

E **Supraglottic Airway** Pg. 83 E

A Obtain IV/IO access A

A Fluid bolus 20 ml/kg IV/IO May repeat up to 60 ml/kg PRN A

E ECG / 12 lead PRN E

P Capnography PRN P

E EtCO2 PRN E

P Sedation Post Intubation P

P Consider **Pain & Sedation Management Procedure** Pg. 67 P

Treat other associated signs and symptoms per guideline
Consider temperature control

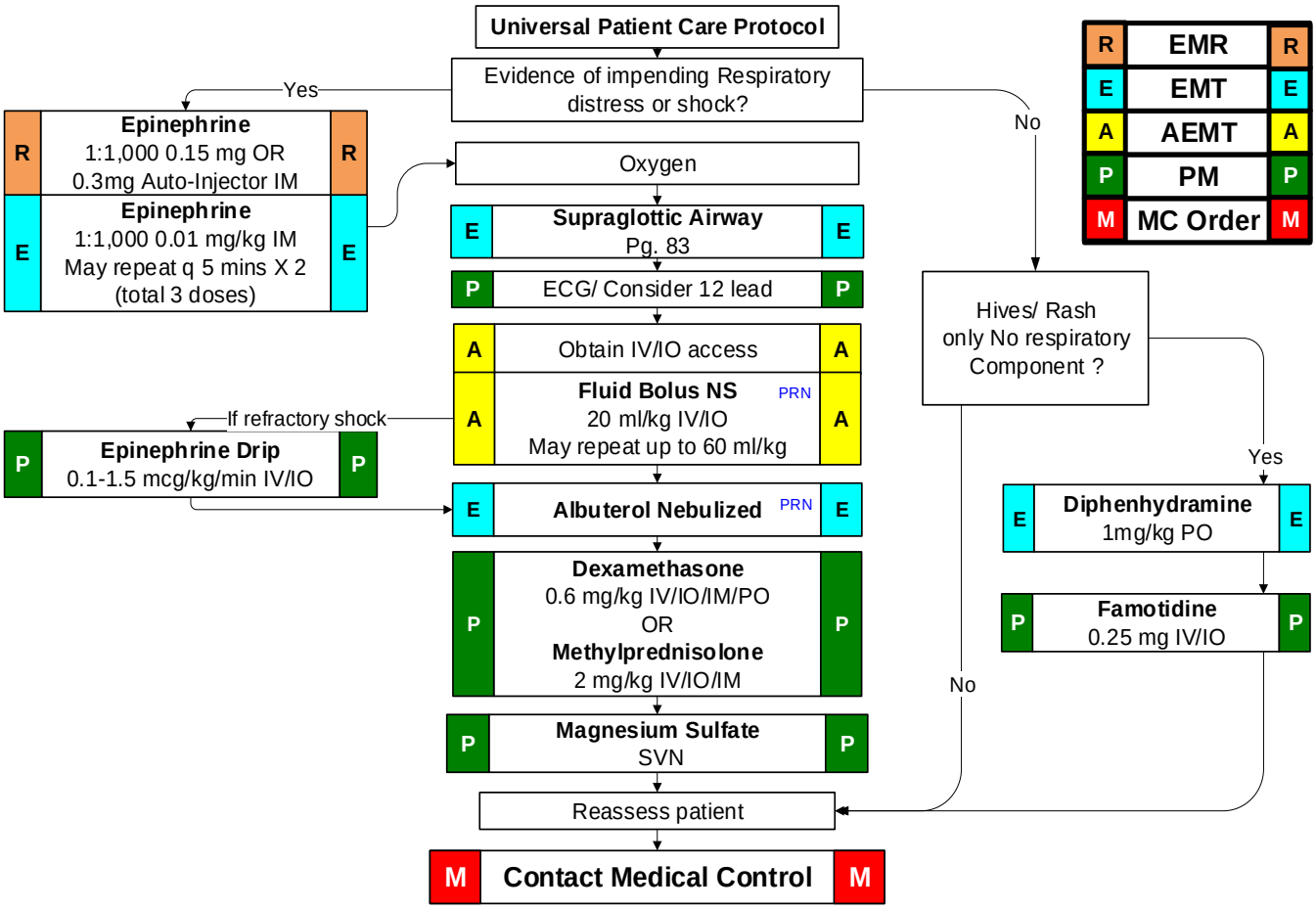
M **Contact Medical Control** M

Pediatric Anaphylaxis

ALS evaluation and/or transport if available:

History:
- Allergies
- Medications
- Past Medical history
- Last oral ingestion
- Event preceding

Differential:
- Acute respiratory failure
- Anxiety
- Aspiration
- Asthma
- Drug reaction
- Shock



Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Diphenhydramine	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Methylprednisolone	**8 mg**	**12 mg**	**16 mg**	**20 mg**	**24 mg**	**30 mg**	**38 mg**	**48 mg**	**60 mg**
Famotidine	**1 mg**	**1.5 mg**	**2 mg**	**2.5 mg**	**3 mg**	**3.75 mg**	**4.75 mg**	**6 mg**	**7.5 mg**
Prednisone	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Dexamethasone	**2.4 mg**	**3.6 mg**	**4.8 mg**	**6 mg**	**7.2 mg**	**9 mg**	**11.4 mg**	**14.4 mg**	**18 mg**
Epinephrine	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**
Magnesium Sulfate	**300 mg**	**300mg**	**300 mg**	**300 mg**	**300 mg**	**300 mg**	**600 mg**	**600 mg**	**600 mg**

Epineprine Drip	**1 mg Epinephrine 1:1,000 in 250 ml = 4 mcg/ml**				**Use 60 gtt tubing**
Mcg/min	2	4	6	8	10
Administer	**30 gtts/min**	**60 gtts/min**	**90 gtts/min**	**120 gtts/min**	**150 gtts/min**
Run gtts/sec	**1 every 2 seconds**	**1 every second**	**1.5 every second**	**2 every second**	**2.5 every second**

Pediatric Brief Resolved Unexplained Event (BRUE)

ALS evaluation and/or transport if available:

History:
- Altered Mental Status
- Cardiac
- Respiratory Failure
- Seizures
- Syncope

Differential:
- **H**ypovolemia (dehydration)
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-hyperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis (coronary or pulmonary)
- **T**rauma (hypovolemia, increased ICP)

Inclusion:
Suspected BRUE: An event in an infant less than 1 year old reported by a bystander as sudden, brief (less than 1 min) event, completely resolved upon EMS arrival that includes one or more of the following:
- Absent, decreased, or irregular breathing
- Color change (central cyanosis or pallor)
- Marked change in muscle tone (hyper- or hypotonia)
- Altered level of responsiveness

Exclusion Criteria:
Identifiable cause for the event, which may include:
- Gastric reflux (spitting up)
- Swallowing dysfunction
- Nasal congestion
- Color change that involved only redness (e.g. in the face) or isolated perioral or hand/feet cyanosis

Universal Patient Care Protocol

Oxygen

E **Supraglottic Airway** Pg. 83 E

Consider other treatment Protocols as necessary
Obtain full history and features of event
Explore medication ingestion/toxin risk

Complete thorough history

• Specifically assess for history of apnea (>15 seconds?), increased or decreased tone?, change of color?, pallor or cyanosis?

No?

Yes to any?

Meets criteria for an BRUE

Patient must be transported for evaluation even if well appearing
Contact medical control if caregiver refusing transport

E ECG / 12 lead PRN E

A Obtain IV/IO access A

A **Isotonic IVF** 20 ml/kg IV/IO PRN
May repeat up to 60 ml/kg A

M **Contact Medical Control** M

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Pediatric Breathing Difficulty

ALS evaluation and/or transport if available:

History:
- Possibility of foreign body
- Cardiac/Respiratory history
- Respiratory infection
- Persistent Symptoms

Differential:
- Asthma
- Aspiration
- Foreign body
- Pneumonia (aspiration)
- Croup
- Epiglottitis (Rare)
- Congenital heart disease
- Medication or Toxin
- Trauma

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

Oxygen

E **Supraglottic Airway** Pg. 83 E

Severe Distress Respiratory Failure — Yes → **Pediatric Airway** Pg. 52

No

Transport in position of minimal agitation

Lower Airway

Wheeze?

Yes

E **Albuterol** 2.5 - 5 mg SVN E

E Consider **Ipratropium** 0.5 mg SVN for greater than 12 kg E

P **Magnesium Sulfate** SVN P

Upper Airway

Stridor and/or Retractions?

Yes

P **Epinephrine** 3 mL 1:1,000 SVN (No saline needed) P

P Consider **Methylprednisolone** 2 mg/kg IV/IM Or **Prednisone** 1 mg/kg PO Or **Dexamethasone** 0.6 mg/kg IV/IO/IM/PO, Max dose of 16 mg P

P **Magnesium Sulfate** 25 – 50 mg/kg IV/IO P

P Repeat appropriate nebulizer Treatment as indicated for continued symptoms P

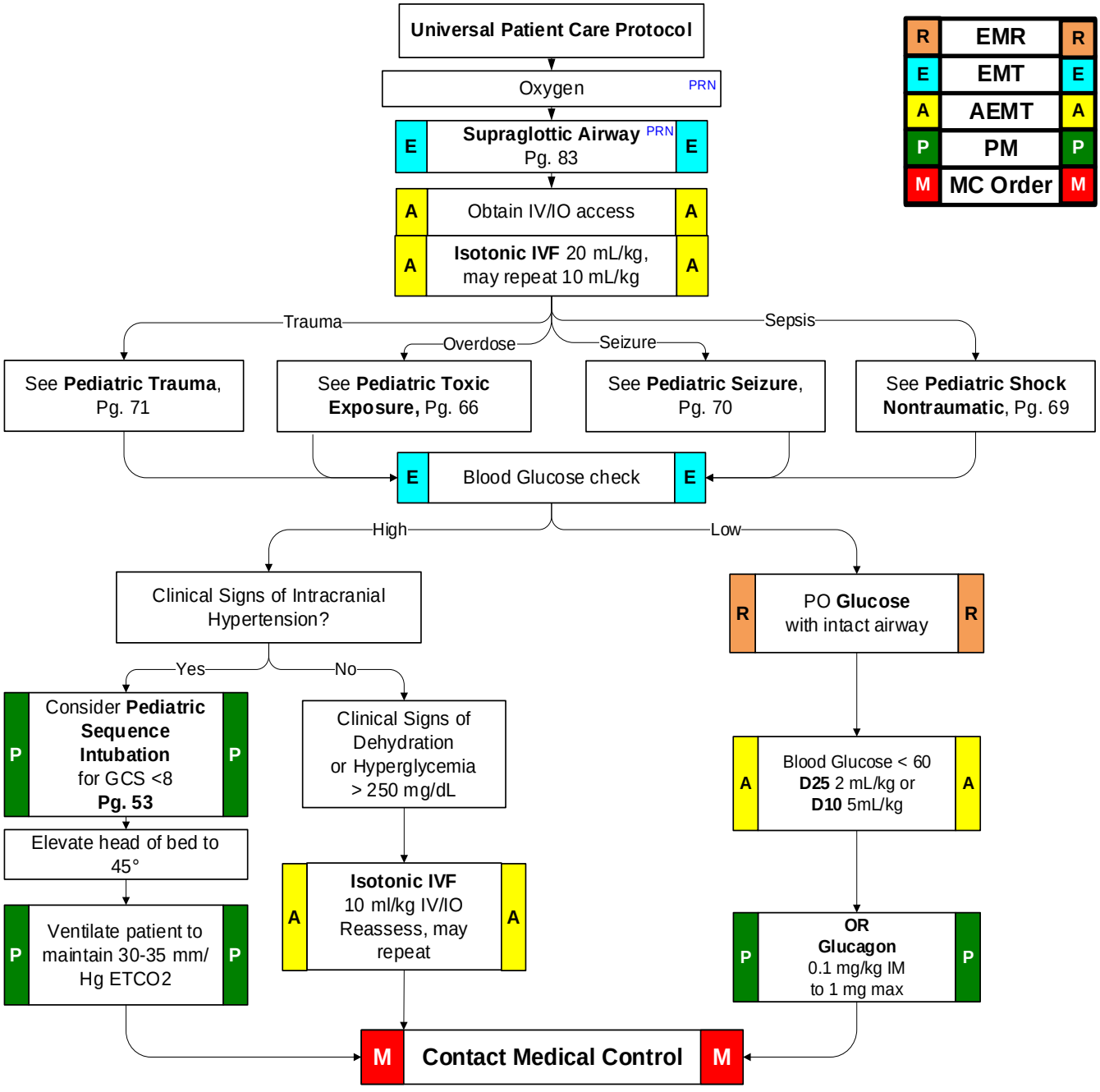
M **Contact Medical Control** M

Weight	4 kg	6 kg	8 kg	10 kg	12 kg	15 kg	19 kg	24 kg	30 kg
Epinephrine	**3 mL SVN**								
Nebulizer	**Albuterol 2.5 mg**				**Ipratropium 0.5 mg**				
Methylprednisolone	**8 mg**	**12 mg**	**16 mg**	**20 mg**	**24 mg**	**30 mg**	**38 mg**	**48 mg**	**60 mg**
Prednisone	**4 mg**	**6 mg**	**8 mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**
Dexamethasone	**2.4 mg**	**3.6 mg**	**4.8 mg**	**6 mg**	**7.2 mg**	**9 mg**	**11.4 mg**	**14.4 mg**	**16 mg**
Magnesium Sulfate SVN	**300 mg**	**300 mg**	**300 mg**	**300 mg**	**300 mg**	**300 mg**	**600 mg**	**600 mg**	**600 mg**
Magnesium Sulfate IV/IO	**200 mg**	**300 mg**	**400 mg**	**500 mg**	**600 mg**	**750 mg**	**950 mg**	**1200 mg**	**1500 mg**

Pediatric Altered Mental Status

ALS evaluation and/or transport if available:

History:	Clinical Signs:
• Polyuria • Polydipsia • Vomiting • Weakness • Confusion	• Dehydration • Kussmaul respirations • Smell of ketones • Change in mental status



Notes:

- Signs of intracranial hypertension include severe headache, lethargy, vomiting, coma.

Newborn Resuscitation/Post Delivery Care

ALS evaluation and/or transport if available:

History:	**Differential:**
• Prenatal care and history • Due date/LMP • Expected multiple births • Meconium • Congenital disease • Medications • Maternal risk factors	• Airway obstruction • Respiratory distress • Infection • Hypovolemia • Hypoglycemia • Congenital heart disease • Hypothermia • Persistent Central Cyanosis

* Consider ceasing resuscitation efforts if fetal foot length is less than 1.3"

Universal Patient Care Protocol *

Suction with bulb syringe PRN
Mouth then nose
Dry infant and keep warm

APGAR Pg. 78

Oxygen Blow-by PRN

Assess breathing and heart rate

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Heart rate > 100

Continue ongoing assessment

Heart rate < 100
Or inadequate respirations

Assist ventilations BVM PRN

No improvement after 30 seconds? begin chest compressions

E — Consider Blood Glucose check If < 60mg/dL then see **Pediatric Altered Mental Status** Pg. 64 — E

R — **Naloxone** 0.1 mg/kg IN — R

A — Consider **Naloxone** 0.1 mg/kg IV/IO/IN/IM — A

P — **Umbilical Access** Pg. 81 — P

A — Obtain IV/IO acess — A

A — **Isotonic IVF** 20 ml/kg IV/IO May repeat up to 60 ml/kg — A

E — ECG / 12 lead — E

P — **Epinephrine 1 : 10,000** 0.01 mg/kg **IV / IO** **OR** **Epinephrine 1 : 1,000** 0.1 mg/kg **ET** Repeat every 3-5 min.PRN — P

P — **Pediatric Intubation** Pg. 53 PRN — P

M — **Contact Medical Control** — M

Weight	2 kg *grey*	3 kg *grey*	4 kg *grey*	5 kg *grey*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.02 mg**	**0.03 mg**	**0.04 mg**	**0.05 mg**
Epinephrine 1 : 1,000 0.1 mg/kg **ET**	**0.2 mg**	**0.3 mg**	**0.4 mg**	**0.5 mg**

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Naloxone	**0.4 mg**	**.06 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**

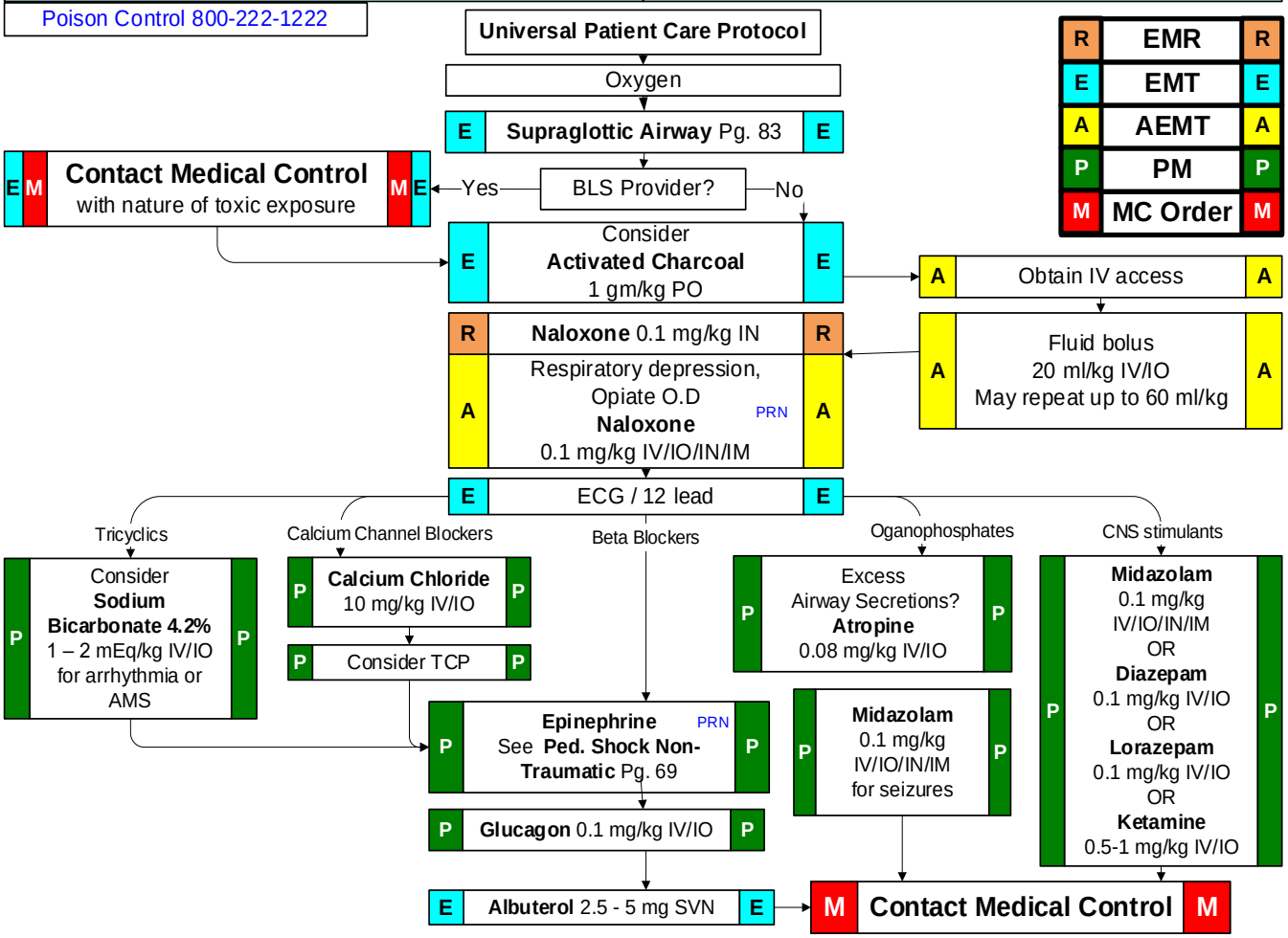
Pediatric Toxic Exposure

ALS evaluation and/or transport if available:

History:
- Ingestion or suspected ingestion of a potentially toxic substance
- Substance ingested, route, quantity
- Time of ingestion
- Altered mental status
- Abnormal vital signs
- Reason (suicidal, accidental, criminal)
- Available medications in home

Differential:
- Tricyclic antidepressants (TCAs)
- Acetaminophen (tylenol)
- Depressants
- Stimulants
- Anticholinergic
- Cardiac medications
- Solvents, Alcohols, Cleaning agents
- Insecticides (organophosphates)

Poison Control 800-222-1222



Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Activated Charcoal	**4 gm**	**6 gm**	**8 gm**	**10 gm**	**12 gm**	**15 gm**	**19 gm**	**24 gm**	**30 gm**
Naloxone	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Sodium Bicarbonate	**4 mEq**	**6 mEq**	**8 mEq**	**10 mEq**	**12 mEq**	**15 mEq**	**19 mEq**	**24 mEq**	**30 mEq**
Calcium Chloride	**40 mg**	**60 mg**	**80 mg**	**100 mg**	**120 mg**	**150 mg**	**190 mg**	**240 mg**	**300 mg**
Glucagon	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2.4 mg**	**3 mg**
Atropine	**0.32 mg**	**0.48 mg**	**0.64 mg**	**0.8 mg**	**0.96 mg**	**1.2 mg**	**1.52 mg**	**1.92 mg**	**2.4 mg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Ketamine	**4 mg**	**6 mg**	**8mg**	**10 mg**	**12 mg**	**15 mg**	**19 mg**	**24 mg**	**30 mg**

Pediatric Pain and Sedation Management

ALS transport if patients given a sedation medication

History:
- Age
- Location
- Duration
- Severity (1 - 10)
- Past medical history
- Medications
- Drug allergies
- Aggravating factors
- Alleviating factors

Differential:
- Per the specific protocol
- Musculoskeletal
- Visceral (abdominal)
- Cardiac
- Pleural / Respiratory
- Neurogenic
- Renal (colic)

Universal Patient Care Protocol

R Rest PRN Ice/Immobilize Compression Elevation R

A Obtain IV/IO access PRN A

E ECG / 12 lead PRN E

High pain level? Burns?

R	EMR R
E	EMT E
A	AEMT A
P	PM P
M	MC Order M

Yes → P Nitrous Oxide if available PRN P

No

Extremely anxious? Yes →

P **Morphine** PRN
0.1 mg/kg IV/IO/IM
Max dose 3 mg,
max cumulative dose 0.3 mg/kg
OR
Fentanyl
1 mcg/kg IV/IO/IM/IN, max initial dose 30 mcg, max cumulative dose 2 mcg/kg
OR
Hydromorphone
0.015 mg/kg IV/IM
OR
Ketamine
0.25 mg/kg IV/IO every 5 min, max cumulative dose 1.5 mg/kg
AND/OR
Acetaminophen
15 mg/kg IV/IO over 15 min P

P **Midazolam** PRN
0.1 mg/kg IV/IO/IN/IM
OR
Diazepam
0.1 mg/kg IV/IO
OR
Lorazepam
0.1 mg/kg IV/IO/IM
OR
Ketamine
0.1 mg/kg IV/IO every 5 min, max cumulative dose 1.5 mg/kg
OR
Ketamine Infusion
0.5 to 2 mg/kg/hr P

No

Nausea? Yes →

P **Ondansetron** PRN
0.1 mg/kg IV
OR
4 mg PO if patient weight > 10kg P

No

M Contact Medical Control M

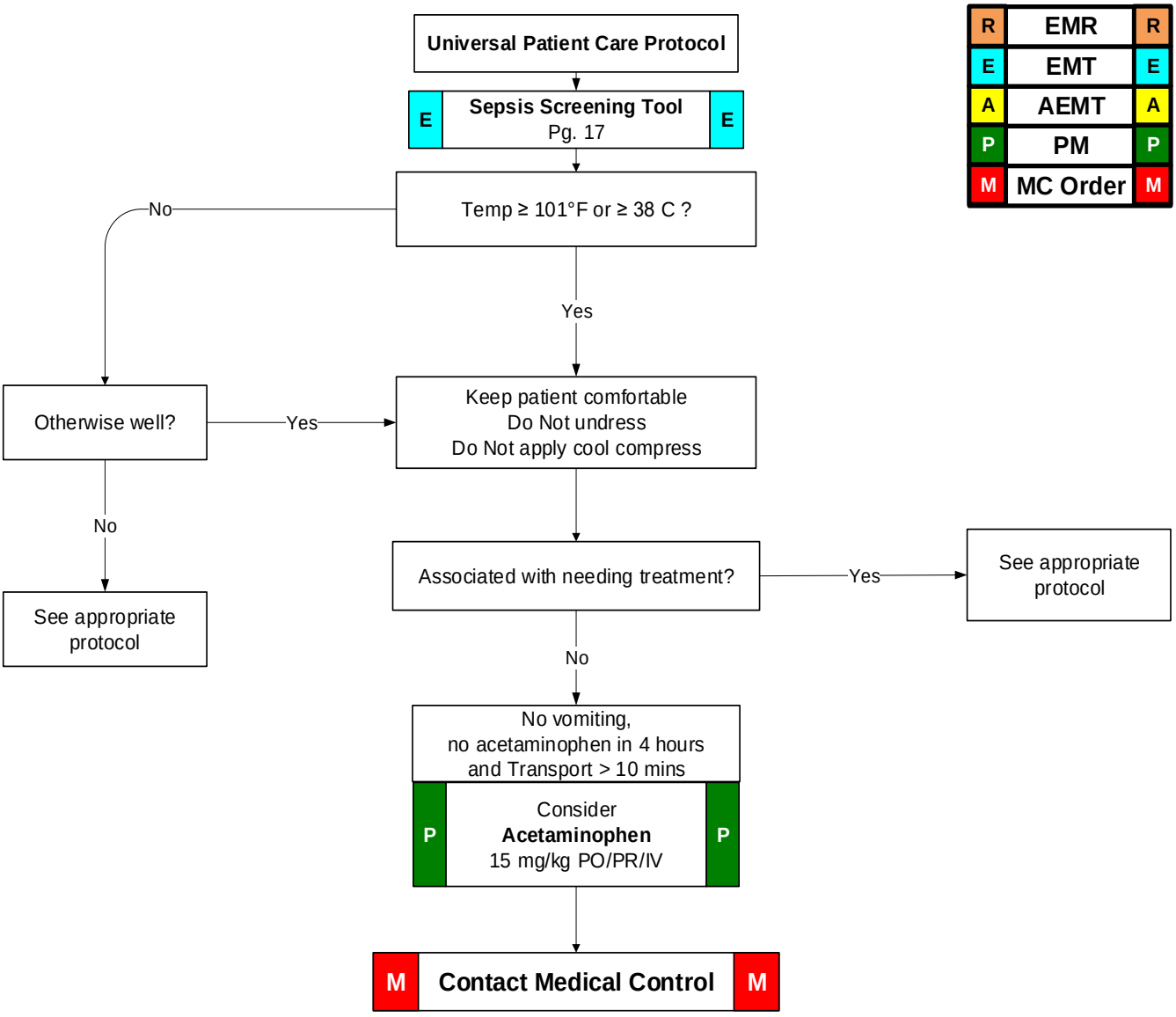
Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Morphine	.04 mg	.06 mg	.08 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2.4 mg	3 mg
Fentanyl max	8 mcg	12 mcg	16 mcg	20 mcg	24 mcg	30 mcg	38 mcg	48 mcg	60 mcg
Hydromorphone	0.06mg	0.09mg	0.12mg	1 mg	1mg	1mg	1mg	1mg	1mg
Midazolam	0.4 mg	0.6 mg	0.8 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2 mg	2 mg
Diazepam	0.4 mg	0.6 mg	0.8 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2 mg	2 mg
Lorazepam	0.4 mg	0.6 mg	0.8 mg	1 mg	1.2 mg	1.5 mg	1.9 mg	2 mg	2 mg
Ondansetron	Contact MC			1 mg	1 mg	1 mg	2 mg	2 mg	3 mg
Ondansetron PO	Contact MC			4 mg ODT					
Ketamine	1 mg	1.5 mg	2 mg	2.5 mg	3 mg	3.75 mg	4.75 mg	6 mg	7.5 mg
Ketamine Infusion (max dose)	8 mg	12 mg	16 mg	20 mg	24 mg	30 mg	38 mg	48 mg	60 mg
Acetaminophen IV	60 mg	90 mg	120 mg	150 mg	180 mg	225 mg	285 mg	360 mg	450 mg

Notes: Avoid polypharmacy and switching between multiple medications.

Pediatric Fever

ALS evaluation and/or transport if available:

History:	Differential:
• Fever not associated with heat injury does not require rapid temperature reduction	• Infections / Sepsis • Medication or drug reaction • Altered mental status



Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Acetaminophen PO	**60 mg**	**90 mg**	**120 mg**	**150 mg**	**180 mg**	**225 mg**	**285 mg**	**360 mg**	**450 mg**
Acetaminophen IV	**60 mg**	**90 mg**	**120 mg**	**150 mg**	**180 mg**	**225 mg**	**285 mg**	**360 mg**	**450 mg**

Pediatric Shock Non-traumatic

ALS evaluation and/or transport if available:

History:
- Medical history
- Respiratory distress or arrest
- Possible toxic or poison exposure
- Congenital disease
- Medication (maternal or infant)
- Non accidental trauma

Differential:
- Respiratory effort
- **H**ypovolemia (dehydration)
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-hyperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis (coronary or pulmonary)

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

E Oxygen PRN
Early assisted ventilation
Supraglottic Airway
Pg. 83 **E**

E ECG / 12 lead PRN **E**

A Obtain IV/IO access **A**

A PRN
Fluid bolus 20 ml/kg IV/IO
May repeat up to 60 ml/kg **A**

P **Epinephrine Bolus**
1:10,000 0.01 mg/kg IV/IO
Epinephrine Drip
0.1-1.5 mcg/kg/min IV/IO **P**

Ongoing assessment

Consider other treatment Protocol as necessary

M **Contact Medical Control** **M**

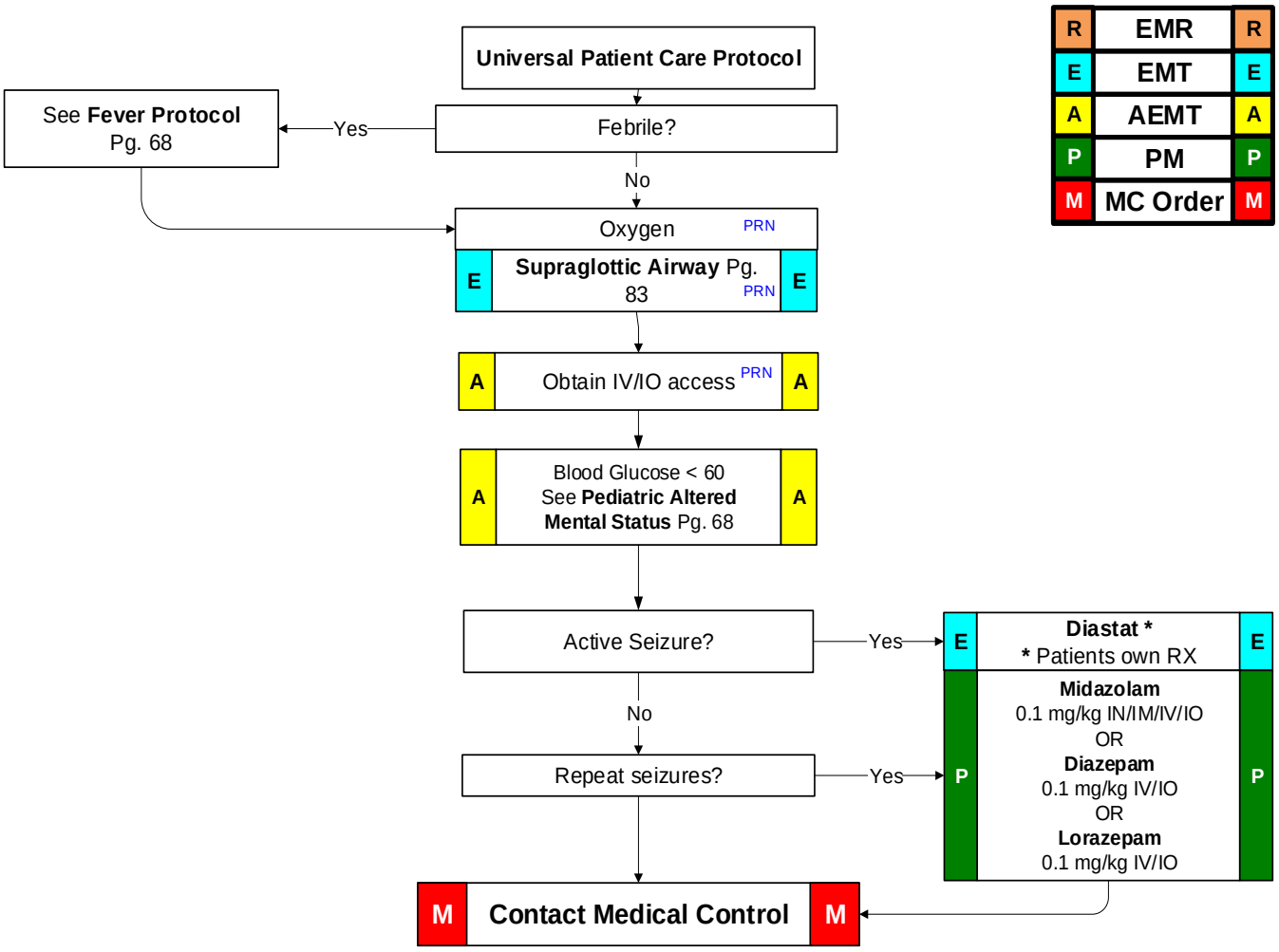
Weight	*4 kg grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Epinephrine 1 : 10,000 0.01 mg/kg **IV / IO**	**0.04 mg**	**0.06 mg**	**0.08 mg**	**0.1 mg**	**0.12 mg**	**0.15 mg**	**0.19 mg**	**0.24 mg**	**0.3 mg**

Epineprine Drip	**1 mg Epinephrine 1:1,000 in 250 ml = 4 mcg/ml**				**Use 60 gtt tubing**
Mcg/min	2	4	6	8	10
Administer	**30 gtts/min**	**60 gtts/min**	**90 gtts/min**	**120 gtts/min**	**150 gtts/min**
Run gtts/sec	**1 every 2 seconds**	**1 every second**	**1.5 every second**	**2 every second**	**2.5 every second**

Pediatric Seizure

ALS evaluation and/or transport if available:

History:	Differential:
• Prior history of seizures • Seizure medications • History of VP Shunt • Fever • Head Trauma	• Medication or Toxin • Hypoxia or Respiratory failure • Hypoglycemia • First time Seizure



Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
D 25	**8 mL**	**12 mL**	**16 mL**	**20 mL**	**24 mL**	**30 mL**	**38 mL**	**48 mL**	**60 mL**
D10	**20mL**	**30 mL**	**40 mL**	**50 mL**	**60 mL**	**75 mL**	**95 mL**	**120 mL**	**150 mL**
Glucagon	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1 mg**	**1 mg**	**1 mg**	**1 mg**	**1 mg**
Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**

Pediatric Multi-system Trauma

ALS evaluation and/or transport if available:

History:	Signs and Symptoms:	Differential:
• Time and Mechanism of injury • Damage to structure or vehicle • Location in structure or vehicle • Others injured or dead • Speed and details of MVA • Restraints / protective equipment • Symptoms preceding incident	• Altered mental status or unconscious • Hypotension or shock	• Chest Tension pneumothorax, Flail Chest, Pericardial Tamponade, Open chest wound, Hemothorax • Intra-abdominal bleeding • Pelvis/femur fracture • Spine fracture / Cord injury • Extremity fracture / Dislocation • HEENT (Airway Obstruction) • Hypothermia

Universal Patient Care Protocol

Expose injuries

Arrange transport according to the **CDC** Pg. 9 **/ Or County Operating Procedure**

Wound Care / Hemorrhage Control? Pg. 150
Pelvic Stabilization? Pg. 135

Patient with mechanism or exam concerning for potential spinal injury
Spinal Motion Restriction Procedure? Pg. 140

A — Obtain IV/IO access — A

Signs of Shock?

Yes:

A — **Isotonic IVF**: 20 mL/kg IV/IO may repeat up to 60 mL/kg — A

Reassess Airway/Ventilation

P — **Advanced Airway Procedures** as needed
Pediatric Sequenced Intubation Pg. 53
Pediatric Airway Pg. 52
Pediatric Pain Management Pg. 67
Chest Decompression Pg. 117 — P

No:

Ongoing Assesment

Appropriate Protocol

M — **Contact Medical Control** — M

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Notes:
- **Exam : Mental Status, Skin, HEENT, Heart, Lung, Abdomen, Extremities, Back, Neuro**
- Mechanism is often a good indicator of serious injury
- If domestic violence or abuse is suspected it is mandatory to report to Law Enforcement, receiving facility, airlift.

Pediatric Near Drowning

Transport ALL near drowning Patients

History:	Differential:
• Submersion in water regardless of depth • Possible history of trauma • Duration of submersion • Temperature of water • Salt vs.Fresh Water	• Trauma • Pre-existing medical problems • Barotrauma • Decompression Sickness

R	EMR
E	EMT
A	AEMT
P	PM
M	MC Order

Universal Patient Care Protocol

↓

Consider **Spinal Immobilization**
Pg. 140

↓

E **Supraglottic Airway** E
Pg. 83

↓

If no pulse or Symptomatic Bradycardia begin CPR
See Appropriate Guideline

↓

Remove wet clothing
Cover with dry (warm) blankets
Warming Measures

↓

Consider other treatment Protocol as necessary

↓

A Obtain IV/IO access A
E ECG / 12 lead PRN E

↓

M **Contact Medical Control** M

Pediatric Burns

ALS evaluation and/or transport if available > 15%:

History:
- Type of exposure
- Inhalation injury
- Time of injury
- Mechanism of Injury
- Non-accidental trauma
- Trauma

Differential:
- Superficial (1°) red and painful
- Partial thickness (2°) blistering
- Full thickness (3°) charred or leathery skin
- Chemical
- Thermal
- Electrical

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

Universal Patient Care Protocol

Oxygen PRN

E **Supraglottic Airway** PRN E
Pg. 83

Stop the burning process:
Remove jewelry and clothing that may be burned, covered in chemicals or restricting.

Thermal / Electrical

Cover burn with a dry clean sheet or dressing

Keep warm

Use Rule of 9's

15% to 10% then

A Obtain IV/ IO access PRN A
Less than 5 yr. old
Isotonic IVF at 125 mL/hr
5-14 yr. old
Isotonic IVF at 250 mL/hr
15 yr. and older
Isotonic IVF at 500 mL/hr

A With better estimate of TBSA, then **TBSA x weight in kg/8 Volume of Isotonic IVF in 1st hour, NS or LR** A

Pain Management Protocol Pg. 67

If burn < 10 % body surface area **Cool down the wound with Normal Saline**

Cover burn with a dry clean sheet or dressing

Outlying areas may use burn gel for comfort in burns < 10% BSA

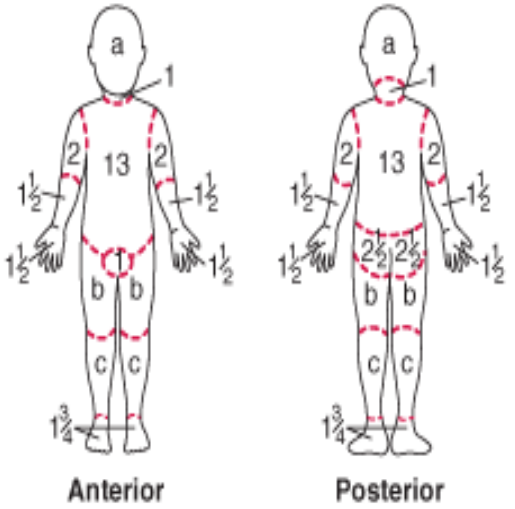
M **Contact Medical Control** M

Chemical

Brush off any excess chemical or powder

Flush area with water or Normal Saline (except materials that react with H2O) Keep warm

Eye involvement?
Saline flush in the affected eye



Relative percentage of body surface area (% BSA) affected by growth

	Age				
Body Part	0 yr	1 yr	5 yr	10 yr	15 yr
a = 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2
b = 1/2 of 1 thigh	2 3/4	3 1/4	4	4 1/4	4 1/2
c = 1/2 of 1 lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4

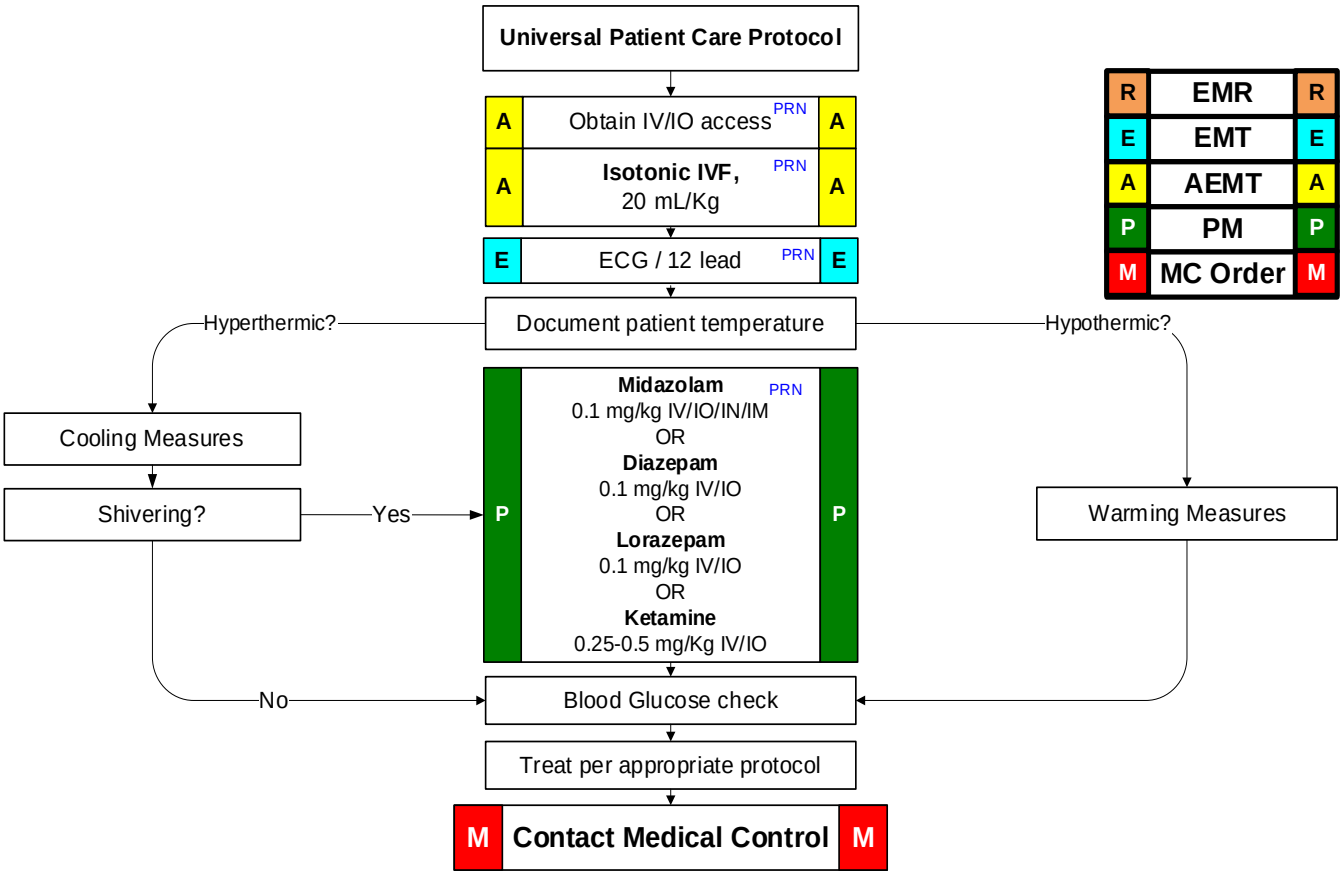
Pediatric Environmental Emergencies

ALS evaluation and/or transport if available:

History:
- Age
- Exposure to increase temperature and/or humidity
- Extreme exertion
- Time and length of exposure
- Fatigue and/or muscle cramping

- Altered Mental Status
- Temp > 104° F or 40 C due to heat
- Abnormal vital signs

Differential:
- Infection
- Dehydration
- Medications
- Thyroid storm



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Midazolam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Diazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Lorazepam	**0.4 mg**	**0.6 mg**	**0.8 mg**	**1 mg**	**1.2 mg**	**1.5 mg**	**1.9 mg**	**2 mg**	**2 mg**
Ketamine max	**2 mg**	**3 mg**	**4 mg**	**5 mg**	**6 mg**	**7.5 mg**	**9.5 mg**	**12 mg**	**15 mg**

Notes:
- Succinycholine not recommended for Hyperthermic patients
- Document patient's rectal temperature
- Rapid cooling to 39° C (103° F) to avoid overshooting and shivering.
- Apply room temperature water to skin and increase airflow around patient if possible.
- Ice packs to axillae and groin
- Be cautions with polypharmacy and using multiple medications

Pediatric Concussion/Traumatic Brain Injury

ALS evaluation and/or transport if available:

Signs observed by Others:
- Appears dazed or stunned
- Confusion
- Forgetfulness
- Unsure
- Moves Clumsily
- Answers Questions slowly
- Loses consciousness
- Behavior or personality Changes
- Can't recall events prior to hit / fall
- Apparent weakness
- Neurological deterioration over time
- Abnormal Vital signs

Symptoms Report by Athlete:
- Headache
- Nausea or vomiting
- Balance problems or dizziness
- Double or blurry vision
- Sensitivity to light
- Sensitivity to noise
- Numbness or weakness in extremities
- Feeling sluggish, hazy, foggy, or groggy
- Concentration or memory problems
- Confusion / Altered Mental Status
- DOES NOT "FEEL RIGHT"

EMS provider will not clear athlete with signs/symptoms of concussion

Universal Patient Care Protocol

Mechanism or Signs / Symptoms of Head Injury

Consider **Spinal Stabilization** Pg. 140

E **End tidal CO2** E

Advanced Airway Management or Focal neurologic abnormalities, or GCS < 8

Yes

P Consider **Delayed Sequence Intubation** for GCS <8 Pg. 53 P

Hypotension?

Yes

A Obtain IV/IO access A

A **Isotonic IVF** 20 ml/kg IV/IO May repeat up to 60 ml/kg A

No

Signs of Intracranial Hypertension?

Yes

P Consider **Sequence Intubation** for GCS <8 Pg. 53 P

Elevate head of bed to 45°

P Ventilate as clinically indicated to maintain 30-35 mm/Hg ETCO2 P

No

Clinical signs of seizure?

Yes

See **Pediatric Seizure** Protocol Pg. 70

No

M **Contact Medical Control** M

No

Support ABC's Monitor
Treat other associated sypmtoms
Consider Differentials

R	EMR	R
E	EMT	E
A	AEMT	A
P	PM	P
M	MC Order	M

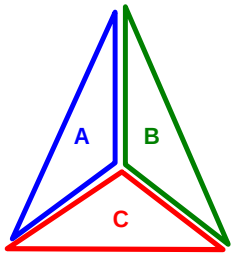
Notes:

Recommended that patient not return to sports until cleared by qualified medical professional

Pediatric Assessment

Airway & Appearance
(Open/Clear – Muscle Tone/Body Position)

Abnormal: **Abnormal** or absent cry or speech. Decreased response to parents or environmental stimuli. Floppy or rigid muscle tone or not moving.
Normal: Normal cry or speech. Responds to parents or to environmental stimuli such as lights, keys, or toys. Good muscle tome. Move extremities well.



Work of Breathing
(Visible movement/Respiratory Effort)

Abnormal: Increased/excessive (nasal flaring, retractions or abdominal muscle use) or decreased/absent respiratory effort or noisy breathing.
Normal: Breathing appears regular without excessive respiratory muscle effort or audible respiratory sounds.

Circulation to skin (Color / Obvious Bleeding)

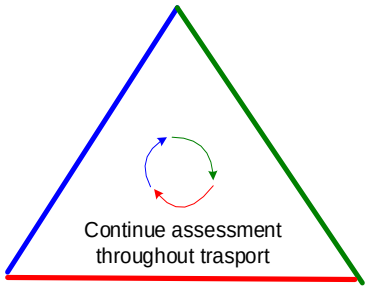
Abnormal: Cyanosis, mottling, paleness/pallor or obvious significant bleeding.
Normal: Color appears normal for racial group of child. No significant bleeding.

Decision/Action Points:
Any abnormal findings or life-threatening chief complaint such as major trauma/burns, seizures, diabetes, asthma attack, airway obstruction, etc (urgent) – proceed to Initial Assessment. Contact ALS if not already on scene/enroute.
All findings normal (non-urgent) – proceed to Initial Assessment.

Initial Assessment (Primary Survey)

Airway & Appearance
(Open/Clear – Mental Status)

Abnormal: Obstruction to airflow. Gurgling, stridor or noisy breathing. **V**erbal, **P**ain or **U**nresponsive on AVPU scale.
Normal: Clear and maintainable. **A**lert on AVPU scale.



Breathing
(Effort / Sounds / Rate / Central Color)

Abnormal: Presence of retractions, nasal flaring, stridor, wheezes, grunting, gasping or gurgling. Respiratory rate outside normal range. Central cyanosis.
Normal: Easy, quiet respirations. Respiratory rate within normal range. No central cyanosis.

Circulation to skin (Color / Obvious Bleeding)

Abnormal: Cyanosis, mottling, or pallor. Absent or weak peripheral or central pulses; Pulse or systolic BP outside normal range; Capillary refill > 2 sec with other **abnormal** findings.
Normal: Color normal. Capillary refill at palms, soles, forehead or central body ≤2 sec. Strong peripheral and central pulses with regular rhythm.

Decision/Action Points:
Any abnormal findings (C,U, or P pg. 74) – Immediate transport with ALS. Open airway & provide oxygen. Assist ventilations, start CPR, suction, or control bleeding as appropriate. Check for causes such as diabetes, poisoning, trauma, seizure, etc. Assist patient with prescribed bronchodilators or epinephrine auto-injector, if appropriate.
All findings on assessment of child normal (S) – Continue assessment, detailed history & treatment at scene or enroute..

Pediatric References

Weight	4 kg *grey*	6 kg *pink*	8 kg *red*	10 kg *purple*	12 kg *yellow*	15 kg *white*	19 kg *blue*	24 kg *orange*	30 kg *green*
Age	Newborn – 3 mos	6 mos	9 mos	1 yr	2 yrs	3 yrs	5 yrs	7 yrs	10 yrs
Pulse	100-160	100-160	100-160	90-150	90-150	80-140	70-120	70-120	70-120
Respiratory Rate	30-60	30-60	30-60	24-40	24-40	22-34	18-30	18-30	18-30
Blood Pressure	40 mmHg	60 mmHg	60 mmHg	70 mmHg	70 mmHg	80 mmHg	80 mmHg	80 mmHg	90 mmHg
Endotracheal uncuffed	3.0	3.5	3.5	4.0	4.5	5.0	5.5	6.0	6.5
Endotracheal cuffed	2.5	3.0	3.0	3.5	4.0	4.5	5.0	5.5	6.0
Nasogastric Tube	5 Fr	5 Fr	8 Fr	8-10 Fr	10 Fr	10 Fr	12 Fr	14 Fr	14 Fr
Defibrillation	8 J	12 J	16 J	20 J	24 J	30 J	38 J	48 J	60 J
Cardioversion	2-4 J	3-6 J	4-8 J	5-10 J	6-12 J	8-15 J	10-20 J	12-24 J	15-30 J
Fluid Challenge	80 mL	120 mL	160 mL	200 mL	240 mL	300 mL	380 mL	480 mL	600 mL
Suction Catheter	6Fr	8Fr	8Fr	10Fr	10Fr	10Fr	10Fr	10Fr	12Fr

APGAR Scale

	0 Points	1 Point	2 Points
A – Appearance (Skin Color)	Blue / Pale	Normal, except for extremities	Normal over entire body
P – Pulse	Absent	Below 100	Above 100
G – Grimace (Reflex Irritability)	No Response	Grimace	Sneeze, cough, pulls away
A – Activity	Absent	Arms and Legs Flexed	Active Movement
R – Respiration	Absent	Slow, irregular	Good, strong cry

AVPU Infant / Child

Response	Infant	Child
A – Alert	Curious / Recognizes parents	Alert / Aware of surroundings
V – Responds to Voice	Irritable / Cries	Opens eyes
P – Responds to Pain	Cries in response to pain	Withdraws from pain
U – Unresponsive	No response	No response

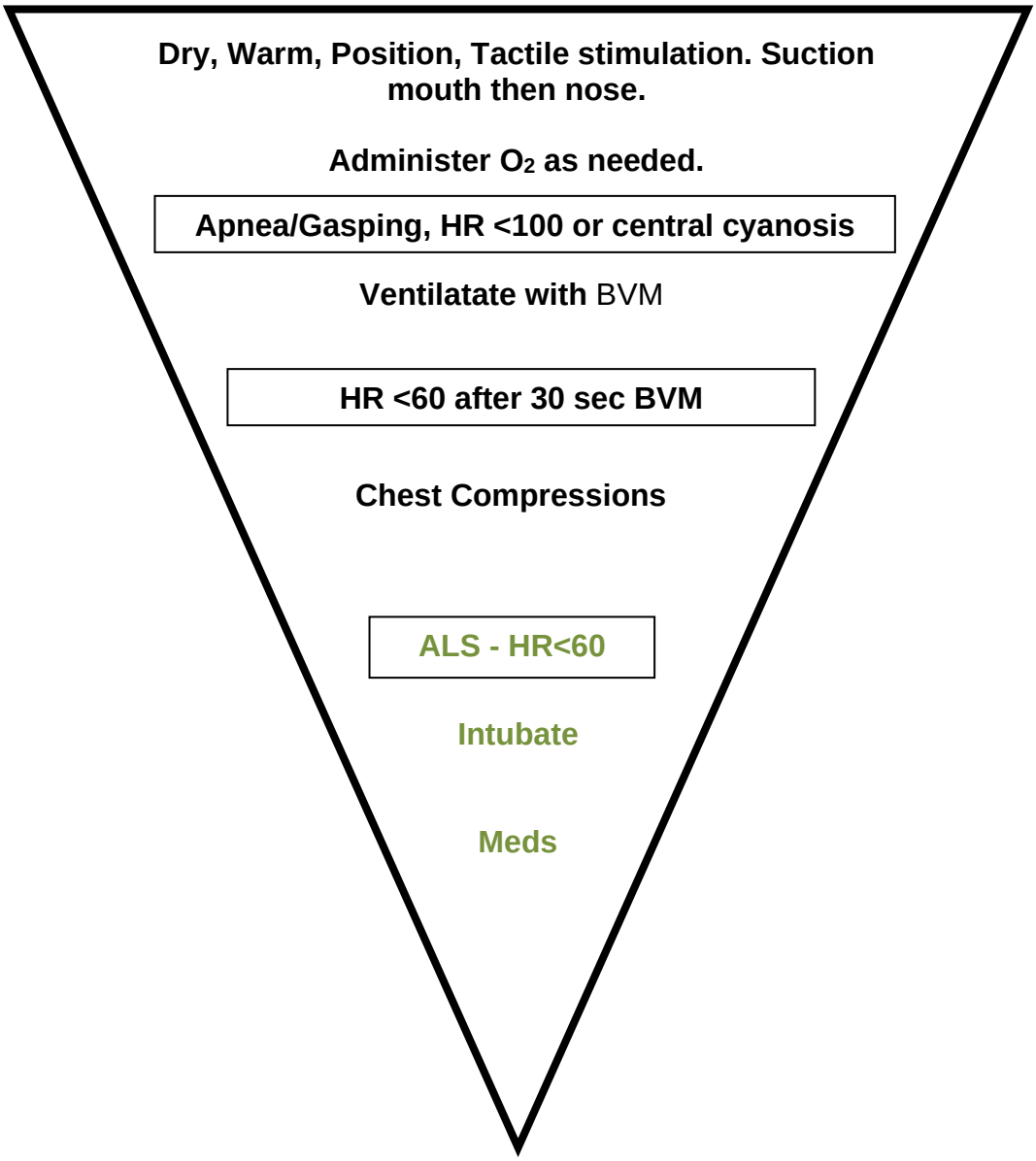
CUPS Pediatric

C – Critical	**Absent airway, breathing or circulation** (cardiac or respiratory arrest or severe traumatic injury)
U – Unstable	**Compromised airway, breathing or circulation** (unresponsive, respiratory distress, active bleeding, shock, active seizure, significant injury, shock, near-drowning, etc.)
P – Potentially Unstable	**Normal airway, breathing & circulation but significant mechanism of injury or illness** (Post-seizure, minor fractures, infant <3 months with fever, etc.)
S – Stable	**Normal airway, breathing & circulation No significant mechanism of injury or illness (small lacerations or abrasions, infant ≥3 months with fever)**

TICLS

T – Tone	Refers to child's muscle tone
I – Interactivity	Refers to degree of interaction the child has with his/her environment or those attempting to interact with the child
C – Consolability	Refers to the child's response to parents or caregivers
L – Look/gaze	Identifies whether the child tracks things appropriately with his/her eyes or has a nonfocused gaze.
S – Speech or cry	Refers to how the child vocalizes.

Neonatal Resuscitation



Pain Assessment and Documentation
Pediatric

Clinical Indications:

- Any pediatric patient with pain

Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

Procedure:

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
2. Pain should be assessed and documented during initial assessment, before starting pain control treatment, and with each set of vitals.
3. Pain should be assessed using the appropriate approved scale.
4. 0 – 10 Scale: the most familiar scale used by EMS for rating pain based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.

Visual Analog Scale

0 1 2 3 4 5 6 7 8 9 10
No Pain Worst pain

5. Wong – Baker "faces" scale: may be used with any patient with a language barrier. The faces correspond to numeric values from 0-10.

From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

BEHAVIORAL TOOL

	0	1	2
Face	No particular expression or smile	Occasional grimace or Frown, withdrawn, disinterested	Frequent to constant frown Clenched jaw, quivering chin
Legs	Normal or relaxed position	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, tense, shifting Back and forth	Arched, rigid or jerking
Cry	No cry (awake or asleep)	Moans or whimpers; occasional complaint	Cries steadily, screams, sobs, frequent complaints
Consol ability	Content, relaxed	Reassured by "talking to, hugging; distractible	Difficult to console or comfort

Umbilical Vein Cannulation
Pediatric

Clinical Indications:

- Emergency resuscitation and stabilization of neonates up to 10 days postpartum when unable to gain venous and/or IO access

Equipment:

- Umbilical clamps/Tape
- Scalpel
- 5 or 3.5 Fr feeding tube
- 10 cc syringe
- IV bag
- IV tubing
- 3 way stopcock

OR Commercially prepared umbilical line kit

Procedure:

1. Clamp and cut cord at least 3-4 inches from neonate's abdomen
2. Tie umbilical tape around base of cord and gently snug it to control bleeding and clean with betadine.
3. Using scalpel, **cut cord** about 2 cm above abdomen (take care not to cut the skin).
4. Wipe cut end of cord with alcohol
5. Measure for depth of insertion by measuring the distance of the cord plus 1-4cm (2cm) to that measurement.
6. Identify umbilical vein:
   a. There are two small arteries small, thick walls
   b. There is one larger, more "floppy" vein, typically at the 12 o'clock position
7. Flush catheter with NS
8. Only put in as far as you need to get blood return, usually 4 to 5 cm max total depth (5 Fr in normal gestation, 3.5 Fr in premature neonate).
9. Gently apply negative pressure on end of feeding tube with syringe, watching for blood return
10. Tape distal portion of catheter to abdomen
11. Disconnect syringe and connect 3 way stopcock, and flushed tubing.
12. Administer fluid and medications in a bolus fashion

Tips:

- It may be helpful to stabilize the cord by holding it at the base and applying gentle traction.
- Angle stump toward feet so catheter is directed toward the head
- Try loosening the umbilical tie just enough to pass the tubing

Venous Access Intraosseous
Pediatric

Clinical Indications:

- Life threatening illness or injury in a child < 8 years of age (>8 years old see Adult Venous Access Intraosseous Adult Pg. 149)

Procedure:

1. Approved sites are the distal femur and proximal tibia
2. Expose the leg.
3. Identify the tibial tubercle (bony prominence below the knee cap) on the proximal tibia. The insertion location will be 1-2 cm (2 finger widths) below this and medially. If using distal femur, have knee slightly flexed with roll behind the knee. Site is anterior midline one finger width above top edge of patella.
4. Prep the site as per peripheral IV site.
5. **If using a commercially prepared device follow manufacturer's recommendation**.
6. Holding the intraosseous needle perpendicular to the skin, twist the needle handle with a rotating grinding motion applying controlled downward force until a "pop" or "give" is felt indicating loss of resistance. Do not advance the needle any further.
7. Remove the trocar and attach the IV.
8. Stabilize and secure the needle.
9. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Airway
I-gel Supraglottic Airway

E A

Clinical Indications: Appropriate intubation is impossible due to patient access or difficult airway anatomy. Apneic children and adults without an intact gag reflex

- Airway, Adult; Airway Rapid Sequence Intubation; Failed Airway, Adult; & Cardiac Arrest
- Newborn Resuscitation
- Pediatric Airway; Pediatric Difficult Airway & Pediatric Rapid Sequence Intubation

Caution: This airway does not prevent or protect against aspiration

Clinical Contraindications:

- Pulmonary Fibrosis
- Tracheostomies, Chronically ventilated patients

Procedure:

1. Select the appropriate size i-gel

		Compatible Endotracheal Tube
Size 1.0	2 – 5 kg	3.0 mm I.D.
Size 1.5	5 – 12 kg	4.0 mm I.D.
Size 2	10 - 25 kg	5.0 mm I.D.
Size 2.5	25 - 35 kg	5.0 mm I.D.
Size 3	30 – 60 kg	6.0 mm I.D.
Size 4	50 – 90 kg	7.0 mm I.D.
Size 5	> 90 kg	8.0 mm I.D.

2. Lubricate with a water-soluble jelly on the middle of the smooth surface and return to the cradle
3. Pre-Oxygenate the patient
4. Grasp the lubricated i-gel along the integral bite block. Position the device so that the i-gel cuff outlet is facing towards the patient's chin (mental region of mandible)
5. The patient should always be in the 'sniffing position' with the head extended and neck flexed prior to insertion unless head/neck movement is inadvisable or contraindicated
6. Introduce the leading soft tip into the mouth of the patient in the direction of the hard palate
7. Glide the i-gel downward and backward along the hard palate with a continuous but gentle push until a definitive resistance is felt
8. Connect the i-gel to a bag-valve-mask and assess for breath sounds, adequate air exchange and end tidal CO2 (EtCO2)
9. Monitor oxygen saturation with pulse oximetry, EtCO2 and heart monitor
10. Re-verify i-gel placement after every move and upon arrival in the Emergency Department
11. Secure the i-gel
12. Document the procedure, time, and result (success) on/with the patient care report (M.I.R./P.C.R.).

*When using the device after encountering a difficult intubation endotracheal intubation may be accomplished by passing a bougie through the i-gel into the trachea (see above chart for endotracheal tube compatibility). When advancing the bougie you may be able to "rail-road" the bougie to over the cartilaginous rings in the trachea to confirm proper location. Place an endotracheal tube over the bougie and advance into the trachea.

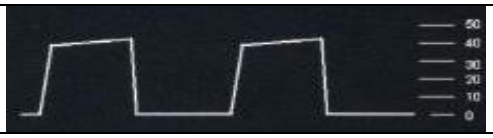
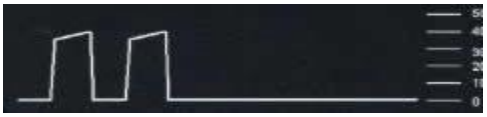
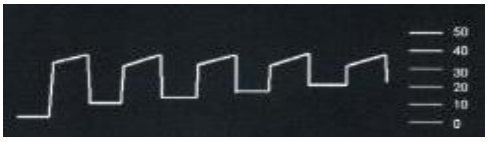
Airway Capnography, End Tidal CO2

Clinical Indications:

- Should be used for suspected sepsis screening
- Capnography shall be used in all patients with endotracheal or supraglottic airways.
- If appropriate cannula-type sensors are available capnography may be used in non-intubated patients.

Procedure:

1. For non-intubated patients with severe respiratory distress/respiratory insufficiency, suspected sepsis, place cannula-type sensor in patient's nares.
2. Attach capnography sensor to supraglottic airway or endotracheal tube.
3. Note CO_2 level and waveform changes. These will be documented on each respiratory failure or cardiac arrest patient.
4. The capnometer shall remain in place with the airway and be monitored throughout the prehospital care and transport.
5. Any loss of CO_2 detection or waveform indicative of an airway problem should be documented.
6. The capnogram should be monitored as procedures are performed to verify or correct the airway problem.
7. Document the procedure and results on/with the Patient Care Report (PCR).

NORMAL: "Square box" waveform; baseline CO2 = 0; ETCO2 = 35-45 mm Hg Management: Monitor	
DISLODGED ETT / ESOPHOGEAL INTUBATION: Loss of waveform, Loss of ETCO2 reading Management: Replace ETT	
"SHARKFIN" with/without prolonged expiration = Bronchospasm (asthma, COPD, allergic rxn): Management: Bronchodilators (Albuterol, Atrovent, or epinephrine)	
RISING BASELINE = Patient is rebreathing CO2: Management: Check equipment for adequate oxygen inflow Allow intubated patient more time to exhale	
HYPERVENTILATION: Rapid RR; shortened waveform; baseline ETCO2 = 0; ETCO2 < 35 mm Hg Management: Biofeedback if conscious, decrease assisted ventilation rate if unconscious/intubated	
PATIENT BREATHING AROUND ET TUBE: angled, sloping downstroke on waveform Broken cuff or tube is too small Management: Assess patient, oxygenation, ventilation; may need to reintubate	

****Important: Severe metabolic acidosis (DKA, sepsis, salicylate poisoning, acute renal failure, methanol ingestion, tricyclic overdose) will cause tachypnea, but ETCO2 will be HIGH.**

THIS IS NOT NORMAL

Airway
Cricothyrotomy Surgical (Adult)

Clinical Indications:

- Failed Airway Protocol
- Management of an airway when standard airway procedures cannot be performed or have failed in a patient > 12 years old

Clinical Contraindications:

- History of prior surgical airway
- Significant trauma to the trachea or larynx suspicious of a tear or fracture
- Massive neck edema obstructing landmark identification
- Children less than 12 years of age
- Ability to effectively ventilate / oxygenate and suction if necessary.

Procedure:

1. Have suction and supplies available and ready.
2. Place patient supine with the neck in a neutral position.
3. Locate the cricothyroid membrane utilizing anatomical landmarks.
4. Prep the area with an antiseptic swab.
5. Stabilize the thyroid cartilage with the non dominant hand.
6. Identify the cricothyroid membrane.
7. Make an incision over the cricothyroid membrane.
8. Visualize the cricothyroid membrane and puncture with the cric introducer or scalpel.
9. Dilate the cricothyroid membrane using any of the following techniques: kit dilator, curved hemostats, or gloved finger. You may insert a skin hook and advance a Bougie thru the incision with a curved tip directed towards the feet.
10. Insert a 5.5-6.5 ID ETT just until the cuff passes into the trachea. Be sure the cuff has cleared the cricothyroid space. If you've inserted a Bougie, pass the endotracheal tube over the top of the Bougie stylet.
11. Inflate the cuff with 5-10cc of air and ventilate the patient while manually stabilizing the tube.
12. All of the standard assessment techniques for insuring tube placement should be performed (auscultation, chest rise & fall, end-tidal CO2 detector, etc.). Esophageal bulb devices are not accurate with this procedure.
13. Secure the tube.
14. Document the time, procedure, and patient response on/with the Patient Care Report (PCR).

Airway
Needle Cricothyrotomy (Adult & Pediatric)

Clinical Indications:

- Failed Airway Protocol.
- Management of an airway when standard airway procedures cannot be accomplished or has failed in a patient.

Procedure:

1. Have suction supplies available and ready.
2. Collect supplies including the endotracheal adapter of a 3.0 mm- ID ET tube.
3. Locate the cricothyroid membrane utilizing anatomical landmarks.
4. Use the non-dominant hand to secure the membrane.
5. Prep the area with antiseptic swab.
6. Using the syringe and the finder needle supplied in the commercial needle cricothyrotomy kit (or a 5-cc syringe attached to a 10 to 14 gauge catheter-over-needle device if needed), insert the needle through the cricothyroid membrane at a 45 to 60 degree caudal angle.
7. Aspirate for air with the syringe throughout the procedure.
8. Once air returns easily, stop advancing the device. If using an over the needle catheter, thread the catheter off the needle gently at a 60 degree caudal angle.
9. Attach the previously sized ET adapter to the end of the catheter and begin ventilation with a Bag Valve Mask connected to high flow oxygen source.
10. Assess breath sounds. Make certain ample time is used not only for inspiration but expiration as well. A 1:6 ratio is not unreasonable.
11. Secure needle by best method available, recognizing that this method may be direct hands-on control of the device throughout the entire transport.
12. If unable to obtain an adequate airway, resume basic airway management and transport the patient as soon as possible.
13. Regardless of success or failure of needle cricothyrotomy, notify the receiving hospital at the earliest possible time of a surgical airway emergency.

    Document time/procedure/confirmation/change in patient condition/time on the patient care record (PCR).

Airway
Difficult Airway Assessment

HEAVEN Criteria		
Physical signs	**Less difficult airway**	**More difficult airway**
H ypoexmia	• SpO2 ≥ **93%** at time of initial laryngoscopy	• SpO2 ≤ **93%** at time of initial laryngoscopy
E xtremes of size	• Adult patients • Normal body habitus	• Age ≤ **8** years of age • Clinically obese • Other size related complications requiring special resources, equipment, or positioning
A natomic challenge	• No facial, head, or neck trauma • No swelling or foreign body, • No other structural abnormality limiting laryngoscopic view	• Facial, head, neck trauma • Airway swelling or foreign body • Other structural abnormality limiting laryngoscopic view
V omit/blood/fluid	• Pharynx and hypopharynx clear of blood, emesis, or other fluid	• Blood, vomit, or other fluid present in pharynx or hypopharynx limiting laryngoscopic view
E xanguination	• No suspected anemia or blood loss	• Suspected or known anemia or blood loss which could accelerate desaturation during apneic periods
N eck	• No suspected neck injury, medical condition, or device limiting cervical range of motion	• Known or suspected neck injury, medical condition, or device limiting cervical mobility

Airway
Passive Pre-oxygenation Procedure

Clinical indications:

- Cardiac arrest
- To support and maintain oxygen saturation throughout airway procedures
- All rapid sequence intubations
- All conscious sedations

Clinical contraindications:

- None

Procedure:

- Place a nasal cannula on all patients while preparing for RSI, with EtCO2 monitoring if available

1. **Low risk patient (96-100%):**
    a. pre-oxygenation: non rebreather mask (NRB) w/ normal flow
    b. induction: NRB and nasal cannula (NC) set to 15L/min
    c. during intubation: NC kept at 15L/min
2. **High risk (91-95%):**
    a. pre-oxygenation: NRB or CPAP or bag valve mask (BVM) with PEEP valve
    b. induction: as above plus NC at 15L/min
    c. intubation: NC at 15L/min
3. **Hypoxemic, Cardiac arrest (<90%):**
    a. pre-oxygenation: CPAP or BVM w/ PEEP
    b. induction: as above plus NC at 15L/min
    c. intubation: NC at 15L/min
    d. Cardiac arrest: NC at maximum output

4. Once advanced airway has been placed the nasal cannula can be removed

5. Document the procedure and results on/with the Patient Care Report (PCR)

Airway
ETT Placement Verification and Monitoring

Clinical Indications:

- Verification and monitoring of endotracheal tube (ET) placement in all intubated patients. The use of waveform capnography in initial confirmation and ongoing placement monitoring is mandatory for all intubated patients.

Procedure:

After successfully intubating the patient:

1. Assess for breath sounds high in axilla, anterior chest and over abdomen.
2. Assess for negative gastric sounds
3. Use inline ETCO2 monitoring for confirmation and continuous monitoring of tube placement. This must be documented in narrative and capnography readings should be included in vitals.
4. Litmus paper CO2 detector may be used at the initial stage of ET intubation, but inline continuous monitoring should occur thereafter.
5. In the perfusing patient, obtain and monitor SPO2. These should be adequate or improving. Record data.

Airway
Orotracheal Intubation

- **Video Laryngoscopy is preferred if available pg. 97**

Clinical Indications:

- An unconscious patient without a gag reflex who is apneic or is demonstrating inadequate respiratory effort.
- Any patient medicated for rapid sequence intubation.

Procedure:

1. Prepare all equipment and have suction ready.
2. Pre-oxygenate the patient **Page 88**.
3. Apply cricoid manipulation.
4. Open the patient's airway and holding the laryngoscope in the left hand, insert the blade into the right side of the mouth and sweep the tongue to the left.
5. If using a Video Assisted Laryngoscope use as manufacturer has suggested and as instructed during training. Record and save for QI purposes if possible
6. Medicate according to appropriate **RSI procedure. Page 93-94**.
7. Use the blade to lift the tongue and epiglottis (either directly with the straight blade or indirectly with the curved blade).
8. Once the glottic opening is visualized, slip the tube through the cords and continue to visualize until the cuff is past the cords.
9. Number of attempts at ventilation shall not further compromise oxygenation. Oxygenate between each attempt and record SPO2. If unable to intubate after two (2) attempts proceed to **Failed Airway protocol Pg. 28**.
10. Remove the stylet and inflate the cuff (5-10cc until no cuff leak).
11. Auscultate for absence of sounds over the epigastrium and bilaterally for equal breath sounds.
12. This should be repeated frequently and after movement or manipulation.
13. Confirm the placement using a minimum of two (2) methods. CO2 detection device mandatory.
14. Secure the tube.
15. Document ETT size, time, result (success), and placement location by the centimeter marks either at the patient's teeth or lips on/with the patient care report (PCR).
16. Document all devices used to confirm initial tube placement. Also document positive or negative breath sounds before and after each movement of the patient.

Airway
Intubation with Eschmann Catheter, Tracheal Tube Introducer or Gum Elastic Bougie

Technique

1. Perform direct video larygoscopy after thorough pre-oxygenation. **Passive Preoxygen Pg. 88**
2. Insert bougie under direct video visualization (grade II) or semi blind (grade III) using epiglottis as a guide. Maintain midline bent end facing anteriorly.
3. With the tip directed anteriorly guide the bougie toward the epiglottis.
4. Advance the bougie posterior to the epiglottis and into the glottic opening.
5. Cricoid pressure may facilitate correct placement (when the tip of the introducer passes the cricoid cartilage and enters the trachea it also may be palpable at the anatomic location).
6. The operator may be able to feel the bougie “click” or “bump” over the anterior tracheal rings (“wash boarding or railroading”) .
7. Use the laryngoscope to elevate the pharyngeal soft tissue.
8. Subtle maneuvering may be required to traverse the vocal cords.
9. Advance to the carina (resistance to passage) to verify placement (approximately 45 cm). Once advanced to the carina, further insertion causes the bougie to rotate on entrance into a bronchus as an additional criterion to confirm correct placement. Failure to meet resistance after inserting nearly the full length of the bougie indicates esophageal placement. Withdraw and align the black “lip-line marker” with the lips (1 cm band located 40 cm (4 stripes) from proximal end).
10. Pass endotracheal tube (larger than 6.0 mm) over the bougie.
11. If the endotracheal tube catches on the arytenoid or aryepiglottic folds, withdraw the tube slightly and rotate it 90° counterclockwise and advance it forward (allows beveled end to pass).
12. For optimal passage of the tube over the bougie into the trachea, the laryngoscope may be left in place as the endotracheal tube is advanced with the bevel facing posteriorly.
13. Secure the tube (remove bougie) and verify tube placement.

Airway
Nasotracheal Intubation

Clinical Indications:

- A spontaneously breathing patient in need of intubation (inadequate respiratory effort, evidence of hypoxia or carbon dioxide retention, or need for airway protection).
- Patient must be 12 years of age or older.
- RSI would impose undue risk to patient

Procedure:

1. Premedicate the patient with nasal spray (oxymetazoline) Afrin®.
2. Select the largest and least obstructed nostril and insert a lubricated nasal airway to help dilate the nasal passage.
3. Pre-oxygenate the patient. Lubricate the tube with water soluble lubricant. **Passive Pre-oxygen Pg. 88**
4. Remove the nasal airway and gently insert the tube keeping the bevel of the tube toward the septum.
5. Insert the tube along the floor of the nasopharynx angling toward the posterior hypopharynx.
6. Continue to pass the tube listening for air movement and looking for vapor condensation in the tube. As the tube approaches the larynx, the air movement gets louder.
7. Open the patient's mouth to assure the tube is centered behind the uvula.
8. Gently and evenly advance the tube through the glottic opening on inspiration. This facilitates passage of the tube and reduces the incidence of trauma to the vocal cords.
9. Upon entering the trachea, the tube may cause the patient to cough, buck, strain, or gag. Do not remove the tube! This is normal, but be prepared to control the cervical spine and the patient, and be alert for vomiting.
10. Auscultate for bilaterally equal breath sounds and absence of sounds at the epigastrium. Observe for symmetrical chest expansion. The 15mm adapter usually rests close to the nostril with proper positioning.
11. Inflate the cuff with 5-10 cc of air. Confirm tube placement using an end-tidal CO_2 monitoring or esophageal bulb device.
12. Medicate patient as per protocol.
13. Secure the tube. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Airway
Sequenced Induction and Intubation

Inclusion Criteria:

- Patients with an intact gag reflex who require proactive airway control and management due to clinical condition

Procedure:

1. Assemble equipment and ensure proper function using the Rapid Sequence Induction and Intubation Checklist
    a. Ensure availability of atropine for all patients
    b. Ensure availability of vasopressors for all patients
2. Preoxygenate with high flow oxygen
3. Assess patient for difficult airway
4. Explain the procedure to the patient as appropriate
5. If the patient displays clinical indications of shock, resuscitate as appropriate before attempting intubation[3], if possible
    a. Hypovolemia: 250-500ml of isotonic crystalloid
    b. Other causes of shock: vasopressors as appropriate.
    c. A higher than normal target pressure (systolic greater than 130mmHg/MAP greater than 85mmHg) may be desirable in the shocked patient prior to intubation attempt(s)
6. Sedate/dissociate as appropriate:

Non-Shock/Normotensive Patient	Shocked/Hypotensive Patient
Ketamine 1mg/kg Or **Midazolam 0.1mg/kg** (Max dose of 10mg) Or **Etomidate 0.1 mg/Kg**	**Ketamine 0.5mg/kg**

7. Consider continuing preoxygenation for up to 3 minutes if patient condition tolerates
8. Position the patient as appropriate
9. Paralyze as appropriate:

Non-Shock/Normotensive Patient	Shocked/Hypotensive Patient
Succinylcholine 1.5mg/kg (Adult) **Succinylcholine 2mg/kg (Pediatric)** Or **Rocuronium 0.6 to1.2 mg/kg**	**Succinylcholine 2mg/kg** Or **Rocuronium 0.6 to 1.2 mg/kg[9]**

Airway
Sequenced Induction and Intubation (continued)

1. Intubate the patient per procedure
    a. Consider using video laryngoscopy and/or bougie on first attempt
2. Consider ongoing sedation as needed:

Non-Shock/Normotensive Patient	Shocked/Hypotensive Patient
Ketamine 1mg/kg Or **Midazolam 0.1mg/kg** (Max dose of 10mg) Or **Diazepam 2-5mg** with **Fentanyl 1mg/kg**	**Ketamine 0.5mg/kg** Or **Diazepam 2-5mg** with **Fentanyl 1mg/kg** **Ketamine drip 0.5-2 mg/kg/hr**

3. Consider ongoing paralysis as needed and clinically indicated:

Non-Shock/Normotensive Patient	Shocked/Hypotensive Patient
Rocuronium 0.1-0.2mg/kg IV (Adult) **Rocuronium 0.075-0.125mg/kg IV (3mos.-14yrs)** **Or** **Vecuronium 0.1 mg/Kg**	

Airway
Nebulizer Inhalation Therapy

Clinical Indications:

- Patients experiencing bronchospasm.

Procedure:

1. Gather the necessary equipment.
2. Assemble the nebulizer kit.
3. Instill appropriate medication into the reservoir well of the nebulizer.
4. Connect the nebulizer device to oxygen at 6 liters per minute or adequate flow to produce a steady, visible mist.
5. Instruct the patient to inhale normally through the mouthpiece of the nebulizer. The patient needs to have a good lip seal around the mouthpiece.
6. If the patient is unable to maintain good lip seal around the mouth piece, nebulizer may be connected to a face mask. For a child, may hold nebulizer as blow by in front of the patient's face.
7. In the intubated patient, patient on NIPPV, or BVM, nebulizer should be placed in-line for effective medication delivery.
8. The treatment should last until the solution is depleted. Tapping the reservoir well near the end of the treatment will assist in utilizing all of the solution.
9. Monitor the patient for medication effects. This should include the patient's assessment of his/her response to the treatment and reassessment of vital signs, ECG, and breath sounds.
10. Document the treatment, dose, and route on/with the patient care report (PCR).

Airway
Non-invasive Positive Pressure Ventilation (NIPPV)

Clinical Indications:

- Near drowning, Asthma/RAD, Passive oxygenation
- Consider in respiratory distress in the conscious patient suffering from:
    - Presumed pulmonary edema
    - Severe reactive airway disease
    - Conditions reactive under medical management (e.g. hypoxemic respiratory failure)
    - Consider use in patients DNR/DNI with signs of respiratory compromise
- **Continue medical management of cardiogenic pulmonary edema while preparing and during use of NIPPV**

Contraindications:

- Respiratory arrest
- Facial trauma/surgery/structural deformity that would affect ability to make a seal
- Known or suspected pneumothorax
- Upper airway obstruction
- Pulmonary fibrosis
    - **Relative contraindications** include inability to protect airway and impaired consciousness

Procedure:

1. Assemble equipment and assure proper function.
2. Ensure adequate oxygen supply to ventilation device.
3. Assess and document initial SpO2, work of breathing and EtCO2 if possible.
4. Explain the procedure to the patient.
5. Calmly and continuously reassure the patient.
    a. Consider placement of a nasopharyngeal airway.
6. Place the delivery mask over the mouth and nose.
7. Secure the mask with provided straps or other provided devices
8. If using BIPAP, select IPAP similar to CPAP pressure and EPAP should be approximately HALF of IPAP. For example IPAP 10 cm H2O and EPAP of 5 cm H2O. Increase/titrate for effect
9. Begin at 7.5 cm H2O with low pressure and increase as patient tolerates and/or the clinical situation dictates by 2.5cm H2O to maximum of 15cm H2O.
10. Frequently reassess patient's respiratory status and vital signs.
    a. If rapid improvement NOT noted, discontinue NIPPV and manage respiratory condition via other means
11. Notify receiving facility of NIPPV use.
12. SVN can be utilized in line in the NIPPV circuit.

Airway
Video Assisted Laryngoscopy

Preferred method if available

Clinical Indications:

- Difficult airways
- Routine airways
- First-use intubations, replacing direct laryngoscopy (DL)
- Normal or restricted oropharyngeal views / visualization and assessment of the oropharynx
- Trauma airways
- Airway management in morbidly obese patients
- Preterm and neonatal intubations
- Patients requiring cervical spine immobilization
- Supervision and documentation of the laryngoscopy
- Nasal tracheal intubation
- Video-guided foreign body removal
- Awake intubation for difficult airway management
- Insertion of double lumen tubes (DLTs)

Procedure:

1. Prepare all equipment, activate video assisted laryngoscope, and have suction ready.
2. Pre-oxygenate the patient.
3. Medicate according to appropriate **Sequenced Intubation procedure. Pg. 93-94**
4. Record and save intubation whenever possible.
5. Instrument oropharynx as manufacturer has suggested and as instructed during training. An endotracheal tube stylet may be recommended by the manufacturer.
6. Using the video laryngoscope, visualize the tube to pass through the vocal cords.
7. Remove the stylet and inflate the cuff (5-10 mL until no cuff leak).
8. Auscultate for absence of sounds over the epigastrium and bilaterally equal breath sounds.
9. This should be repeated frequently and after movement or manipulation.
10. Confirm the placement using a minimum of two (2) methods. CO_2 detection device mandatory.
11. Secure the tube.

Airway
Suctioning-Basic

Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient who cannot maintain or keep the airway clear.

Procedure:

Oropharyngeal

1. Ensure suction device is in proper working order with rigid suction tip in place.
2. Preoxygenate the patient as much as possible.
3. Explain the procedure to the patient if they are coherent.
4. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
5. If applicable, remove airway adjuncts from the airway.
6. Use the suction device to remove any secretions, blood, or other substances.
7. Be aware that a patient with altered mentation may bite on the catheter resulting in a foreign body obstruction.
8. The alert patient may assist with this procedure.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient
10. Record the time and result of the suctioning in the patient care report (PCR).

Nasopharyngeal

1. Ensure suction device is in proper working order with flexible suction tip in place.
2. Lubricate the end of the suction catheter with water soluble lubricant.
3. Preoxygenate the patient as much as possible.
4. Explain the procedure to the patient if they are coherent.
5. Examine the oropharynx and remove any potential foreign bodies or material which may occlude the airway if dislodged by the suction device.
6. If applicable, remove ventilation devices from the airway.
7. Insert the flexible catheter through the largest nare following the floor of the nasal passage angling toward the posterior pharynx.
8. Use the suction device to remove any secretions, blood, or other substance.
9. Reattach ventilation device (e.g., bag-valve mask) and ventilate or assist the patient.
10. Record the time and result of the suctioning in the patient care report (PCR).

Airway
Suctioning-Advanced

Clinical Indications:

- Obstruction of the airway (secondary to secretions, blood, or any other substance) in a patient currently being assisted by an airway adjunct such as:
  - a naso-tracheal tube
  - endotracheal tube
  - supraglottic airway
  - tracheostomy tube
  - cricothyrotomy tube

Procedure:

1. Ensure suction device is in proper working order.
2. Collect supplies including flexible suction catheter, sterile saline in container, clean gloves.
3. Pre-oxygenate the patient as much as possible. Do not over inflate the lungs.
4. Attach suction catheter to suction device, keeping end of catheter aseptic.
5. Measure length of catheter for proper depth of insertion based on the type of device in place.
6. If applicable, remove ventilation devices from the airway.
7. With the thumb port of the catheter uncovered, insert the catheter through the airway device.
8. Once the desired depth (measured in #5 above) has been reached, occlude the thumb port and remove the suction catheter slowly.
9. Interrupt ventilations for no more than 30 seconds.
10. Reattach ventilation device (e.g., bag-valve mask) and ventilate the patient.
11. Clear the suction catheter of thick secretions by aspirating sterile saline.
12. If thick secretions prevent effective suctioning instill 3-5 cc of sterile saline in the ET tube and ventilate the patient 3-4 breaths. Then repeat suctioning as described.
13. Document time and result including SpO_2 readings before and after procedure in the patient care report (PCR).

Airway
Tracheostomy Tube Change

Clinical Indications:

- Presence of Tracheostomy site.
- BLS attempt should only be with mature tracheostomy
- Urgent or emergent indication to change the tube such as:
  - obstruction that will not clear with suction,
  - dislodgement,
  - inability to oxygenate/ventilate the patient without other obvious explanation.

Procedure:

1. Enlist assistance of primary care giver if available
2. Have all airway equipment prepared for standard airway management, including equipment for orotracheal intubation and failed airway.
3. Have airway device (endotracheal tube or tracheostomy tube) of the same size as the tracheostomy tube currently in place as well as 0.5 size smaller available (e.g., if the patient has a #6.0 Shilley, then have a 6.0 and a 5.5 tube).
4. Lubricate the replacement tube(s) and check the cuff.
5. Remove the tracheostomy tube from mechanical ventilation devices and use a bag-valve apparatus to pre-oxygenate the patient as much as possible.
6. Once all equipment is in place, remove devices securing the tracheostomy tube, including sutures and/or supporting bandages.
7. If applicable, deflate the cuff on the tube.
8. Remove the tracheostomy tube.
9. Insert the replacement tube. Confirm placement via standard measures except for esophageal detection (which is ineffective for surgical airways).
10. If there is any difficultly placing the tube, re-attempt procedure with the smaller tube.
11. If difficulty is still encountered, use standard airway procedures such as oral bag-valve mask or endotracheal intubation (as per protocol). **More difficulty with tube changing can be anticipated for tracheostomy sites that are immature – i.e., less than two weeks old.**

➢ **Great caution should be exercised in attempts to change immature tracheotomy sites.**

12. Document procedure, confirmation, patient response, and any complications in the PCR.
13. If transporting patient, bring spare tube from home to hospital

Airway
Ventilator Operation

Clinical Indications:

- Transport of an intubated patient

Procedure:

A. Initial ventilator therapy
   1. Confirm the placement of tube as per airway protocol.
   2. Ensure adequate oxygen delivery to the ventilator device.
   3. Preoxygenate the patient as much as possible with bag-valve mask.
   4. Remove BVM and attach tube to ventilator device.
   5. Per instructions of device, set initial values. For example, set an inspiratory / expiratory ratio of 1:4 with a rate of 12 to 20, tidal volume 6-8 mL/kg.
   6. Assess breath sounds. Allow for adequate expiratory time. Adjust ventilator setting as clinically indicated.
   7. If any worsening of patient condition, decrease in oxygen saturation, or any question regarding the function of the ventilator, remove the ventilator and resume bag-valve mask ventilations.
   8. Document time, SPO2 / ETCO2 trends, complications, and patient response on the patient care report (PCR)

B. Continued ventilation therapy

   Principles of Therapy:

   1. The following guidelines are to decrease work of breathing improve patient-ventilator synchrony, enhance patient comfort, maintain adequate blood gases, and prevent alveolar distension. Contact medical control for complex situations.
   2. The patient and ventilator function as a dynamic system. No one set of ventilator parameters is ideal for all patient situations. Each patient has unique neural respiratory drives.
   3. **"The brain's desire to regulate respirations does not stop."** Dysynchrony occurs when the ventilator settings do not match the patient's needs well. Depending on the clinical situation, one goal of therapy make take precedence over others.
      a. Dynamic hyperventilation
      b. Compliance
      c. Resistance.

   Terms:
   Assist Control – The ventilator delivers to a set tidal volume, or pressure, and rate regardless of whether or not the patient is spontaneously breathing. Best used with apneic patients (i.e. cardiac or respiratory arrest).

Airway
Ventilator Operation (continued)

SIMV – Synchronized Intermittent Mechanical Ventilation. Ventilators with this capability are able to sense the negative pressure caused by a spontaneously breathing patient's inspiration which then triggers ventilation delivery to either a set volume or pressure. The patient's exhalation is also sensed triggering the ventilator to stop inspiration. In addition, a minimum rate can also be set (similar to a cardiac pacemaker on a ventricular demand setting) so that if the patient has a period of apnea, the ventilator will deliver a breath. This setting is quite often used in patients who are being weaned from, or on long-term, mechanical ventilation.
I:E - Ratio of inspiration time to expiration time. Often 1:2 or 1:3, but depending on the patient's needs, it may be more (1:5, 1:6, etc…).
FiO_2 – Fraction of Inspired Oxygen. Percent of oxygen in the ventilation. May be expressed as a decimal or percentage. For instance, 1.0 = 100%, 0.5 = 50%, etc… Room air is 0.21 or 21%.
PEEP – Positive End Expiratory Pressure. The amount of pressure that a patient needs to exhale against. This helps prevent atelectasis by providing a pressure in the airways to 'stent' them open against the increased thoracic pressure during exhalation. Commonly 5cmH_2O, although some patient's may need as much as
PIP – Peak Inspiratory Pressure. The maximum allowable pressure used during the inspiratory phase. Can be adjusted to the patient's condition. However some ventilators may have a hard limit (around 35cmH_2O) that cannot be exceeded.
Ve – Minute ventilation.
Vt – Tidal volume.

Mechanical Ventilation
INDICATIONS:

1. Ventilation of patient with an indwelling tracheal or supraglottic airway
2. Special Considerations
    a. All patients with an artificial airway in place must be accompanied with an appropriate sized Bag Valve and mask and a 10cc syringe during transport
    b. **Continuous monitoring of waveform capnography is required**.
        i. The morphology of the waveform should be documented in the PCR
    c. Lung protective ventilator strategies should be used on all patients. Use the minimum necessary tidal volume &/or pressure to obtain the desired result.
    d. Obstructive ventilator strategies (permissive hypercapnea and prolonged expiratory time) should be used on all patients with concern for, or presence of, autoPEEP. These patients may also have a substantially elevated serum bicarbonate level.
    e. SIMV in the transport of acutely ill patients is rarely indicated
        i. If used, assure adequate pressure support to reduce increased work of breathing for patient triggered breaths.

CONTRAINDICATIONS:

1. None

Airway
Ventilator Operation (continued)

PROCEDURE:

1. Trigger
    a. Volume Control Ventilation is generally the standard breath type unless:
        i. Ventilation is suboptimal due to high PIP alarms
        ii. Poor oxygenation exists, despite appropriate alveolar recruitment with PEEP to 20
        iii. Flow requirements cannot be met with current compliance and inspiratory times.
        iv. The patient is found ventilating well in PRVC or PCV and this modality can be safely continued during transport
    b. Pressure Regulated Volume Control
        i. Breaths are delivered in a decelerating inspiratory flow pattern to a target pressure, calculated from the previous breath, maximizing mean airway pressures when used in concert with PEEP
        ii. The target pressure is adjusted as patient's pulmonary compliance changes, based on the desired volume
        iii. The maximum allowed target pressure should be at least 5 cmH20 less than the set High Airway Pressure Alarm setting
        iv. Caution should be used in spontaneously breathing patients as variability in tidal volumes can be extreme.
        v. Caution should be used in obstructive lung disease patients as rapidly changing compliance can preclude adequate ventilation.
2. Lung Protection
    a. NOTE: Lung size is a function of the height, not weight.)
    b. Vt (Tidal Volume) should be 4-6mL/kg Ideal Body Weight (IBW).
        i. Ideal Body Weight calculation is based on height measured in inches)
            1. FEMALE: 45.5 + 2.3 x (Height – 60) = mL of Vt
            2. MALE: 50 + 2.3 x (Height – 60) = mL of Vt
        ii. Reduce Vt until pPLAT (plateau pressure) < 30cmH_2O
        iii. Tidal volumes as low as 4mL/kg can be used if necessary
            1. CAUTION
                a. Consider increasing rate to maintain Ve (minute ventilation).
                b. Closely monitor I:E (Inspiratory Expiratory Ratio) and avoid inverse ratio ventilation.

Airway
Ventilator Operation (continued)

3. Oxygenation
    a. Generally, 100% FiO_2 (Fraction of inspired Oxygen) should be utilized until SpO_2 is identified or obtained and is greater than 90%. Once at 90%, begin titrating FiO_2 to keep SpO_2 93% to 99%. For inter-facility patients, FiO_2 should be the same as, or as close to, the transferring facility's ventilator.
        i. While strategies exist that address hypoxia with sequential increases in PEEP and FiO_2, hyperoxia and free oxygen radicals have not been shown to be of concern in the <u>acute resuscitative</u> phase of an injury or illness.
    b. PEEP should be <u>at least</u> 5 cmH_20 on all patients. Some patients may require more. For pre-hospital patients, contact with the Base Station Physician is recommended. For inter-facility patients, PEEP should be the same as the facility's ventilator.
    c. PEEP should be increased to 20 cmH_20 to promote alveolar recruitment, prior to reflexively moving to pressure control ventilation.
    d. PEEP may also be increased to reduce FiO_2 requirements in long term setting
4. Ventilation
    a. Ventilatory RATE
        i. Used to control minute ventilation to accommodate patient needs as they relate to pCO_2 and respiratory acidosis
        ii. $\frac{Current\ Respiratory\ rate\ x\ pCO_2}{Desired\ pCO_2} = New\ Respiratory\ Rate$

pCO2 is typically 2-5 mm Hg higher than EtCO2

Flow and I:E ratio

    b. Inspiratory time (i-Time)
    c. Reducing the i-Time increases flow (VCALC)
    d. Reducing the i-Time will increase the Peak Inspiratory Pressure
    e. Be cognizant of I:E ratio and inadvertent inverse ratio ventilation (i.e. 2:1).

For post-intubation HYPOXIA, consider **DOPES**

Displacement of endotracheal tube (ETT)
Obstructions of the ETT
Patient – **P**neumothorax, **P**ulmonary edema, **P**ulmonary embolism, collapse or bronchospasm
Equipment – ventilator malfunction
Stacked breaths – lack of expiratory time

For ETT suctioning: French size suction catheter = ETT size x 1.5

Simple way to determine proper ETT cuff pressure in order to prevent tracheal &/or anterior esophageal necrosis from overinflated cuffs:

1. Attach 10mL syringe to cuff pilot tube port.
2. Depress syringe plunger to inflate cuff w/ 10mL air.
3. WAIT for syringe plunger to retract back into syringe body. This indicates the equalization of pressures between the air within the cuff, atmospheric pressure & the pressure of the tracheal soft tissues on the cuff.
4. 10mL - Amount of equalized back into the syringe = Amount of air remaining in the cuff. Document.

Airway
Ventilator Operation (continued)

FEMALE: Tidal Volume (mL) per Ideal Body Weight						
Height (inches)	IBW (kg)	4mL/kg	5mL/kg	6mL/kg	7mL/kg	8mL/kg
4’ 0” (48”)	17.9	72	90	107	125	143
4’ 1” (49”)	20.2	81	101	121	141	162
4’ 2” (50”)	22.5	90	113	135	158	180
4’ 3” (51”)	24.8	99	124	149	174	198
4’ 4” (52”)	27.1	1078	136	163	190	217
4’ 5” (53”)	29.4	118	147	176	203	235
4’ 6” (54”)	31.7	127	159	190	222	254
4’ 7” (55”)	34	136	170	204	238	272
4’ 8” (56”)	36.3	145	182	218	254	290
4’ 9” (57”)	38.6	154	193	232	270	309
4’ 10” (58”)	40.9	164	205	245	286	327
4’ 11” (59”)	43.2	173	216	259	302	346
5’ 0” (60”)	45.5	182	228	273	319	364
5’ 1” (61”)	47.8	191	239	287	335	382
5’ 2” (62”)	50.1	200	251	301	351	401
5’ 3” (63”)	52.4	210	262	314	367	419
5’ 4” (64”)	54.7	219	274	328	383	438
5’ 5” (65)	57	228	285	342	399	456
5’ 6” (66”)	59.3	237	297	356	415	474
5’ 7” (67”)	61.6	246	308	370	431	493
5’ 8” (68”)	63.9	256	320	383	447	511
5’ 9” (69”)	66.2	265	331	397	463	530
5’ 10” (70”)	68.5	274	343	411	480	548
5’ 11” (71”)	70.8	283	354	425	496	566
6’ 0” (72”)	73.1	292	366	439	512	585
6’ 1” (73”)	75.4	302	377	452	528	603
6’ 2” (74”)	77.7	311	289	466	511	622
6’ 3” (75”)	80	320	400	480	560	640
6’ 4” (76”)	82.3	329	412	494	576	658
6’ 5” (77”)	84.6	338	423	508	592	677
6’ 6” (78”)	86.9	348	435	521	608	695
6’ 7” (79”)	89.2	357	4469	535	624	714
6’ 8” (80”)	91.5	366	458	549	641	732
6’ 9” (81”)	93.8	375	469	563	657	750
6’ 10” (82”)	96.1	384	481	577	673	769
6’ 11” (83”)	98.4	394	492	590	689	787
7’ 0” (84”)	100.7	403	504	604	705	806

Airway
Ventilator Operation (continued)

MALE: Tidal Volume (mL) per Ideal Body Weight						
Height (inches)	IBW (kg)	4mL/kg	5mL/kg	6mL/kg	7mL/kg	8mL/kg
4’ 0” (48”)	22.4	90	112	134	157	179
4’ 1” (49”)	24.7	99	124	148	173	198
4’ 2” (50”)	27	108	135	162	189	216
4’ 3” (51”)	29.3	117	147	176	205	234
4’ 4” (52”)	31.6	126	158	190	221	253
4’ 5” (53”)	33.9	136	170	203	237	271
4’ 6” (54”)	36.2	145	181	217	253	290
4’ 7” (55”)	38.5	154	193	231	270	308
4’ 8” (56”)	40.8	163	204	245	286	326
4’ 9” (57”)	43.1	172	216	259	302	345
4’ 10” (58”)	45.4	182	227	272	318	363
4’ 11” (59”)	47.7	191	239	286	334	382
5’ 0” (60”)	50	200	250	300	350	400
5’ 1” (61”)	52.3	209	262	314	366	418
5’ 2” (62”)	54.6	218	273	328	382	437
5’ 3” (63”)	56.9	228	285	341	398	455
5’ 4” (64”)	59.2	237	296	355	414	474
5’ 5” (65)	61.5	246	308	369	431	492
5’ 6” (66”)	53.8	255	319	383	447	510
5’ 7” (67”)	66.1	264	331	397	463	529
5’ 8” (68”)	68.4	274	342	410	479	547
5’ 9” (69”)	70.7	283	354	424	495	566
5’ 10” (70”)	73	292	365	438	511	584
5’ 11” (71”)	75.3	301	377	452	527	602
6’ 0” (72”)	77.6	310	388	466	543	621
6’ 1” (73”)	79.9	320	400	479	559	639
6’ 2” (74”)	82.2	329	411	493	575	658
6’ 3” (75”)	84.5	338	423	507	592	676
6’ 4” (76”)	86.8	347	431	521	608	694
6’ 5” (77”)	89.1	356	446	535	624	713
6’ 6” (78”)	91.4	366	457	548	640	731
6’ 7” (79”)	93.7	375	469	562	656	750
6’ 8” (80”)	96	384	480	576	672	768
6’ 9” (81”)	98.3	393	492	590	688	786
6’ 10” (82”)	100.6	402	503	604	704	805
6’ 11” (83”)	102.9	412	515	617	720	823
7’ 0” (84”)	105.2	421	523	631	736	842

Blood Product Administration

POLICY: This is a physician order procedure. **For inter-facility transfer only**. Only paramedics who have successfully completed MPD approved training will be monitoring the administration of blood products.

Clinical Indications:

- To replace blood loss while maintaining adequate circulating volume and oxygen during transport.
- To replace clotting factors or other life saving blood products.

Complications:

- Transfusion reactions may manifest as anaphylaxis with shortness of breath, hypotension with BP<90, tachycardia, angioedema, altered mental status, rash or fever. Severe reactions are usually manifested during the initial 50cc or less of infusion.
- Too rapid an infusion producing a volume overloaded state.

Equipment Use: Infusion pumps may be helpful but not required unless delivery is through a central venous catheter or pediatrics. **Blood admin. sets will be provided by the hospital.**

Procedure:

1. Initial blood administrations will be instituted at the transferring hospital. All additional units must have the transferring hospital nursing staff cross check for correct blood before accepting. (The paramedic is allowed to begin administering a new bag that has been cross checked and verified by the transferring nursing staff.) Document RN in PCR
2. Verify the physician order for blood product, blood type, rate of infusion and use of micro-aggregate or leukocyte removal filter.
3. ***Check for history of previous reaction to a blood product and for pre-transfusion symptoms that could be mistaken for a transfusion reaction. (i.e fever, hypotension, tachycardia, shortness of breath, altered mental status or rash) See #4 below.***
4. Assess baseline temperature, pulse, RR and BP prior to starting transfusion and at least every 15 minutes while blood is infusing and again when transfusion is completed (except albumin and plasma protein fraction). Vital signs must be documented.
5. Assess TPR and BP every 15 minutes x 4 during intravenous gamma globulin administration.
6. Replace blood tubing after every 2 units or after 4 hours of use. Discard tubing immediately following completion of transfusion.
7. Monitor peripheral site and infusion system at least every 15 minutes during blood product administration.
8. For any suspected reaction:
   a. Stop transfusion, do not clear tubing
   b. Recheck labels
   c. Notify base station physician
   d. See **Allergic Reaction protocol, Pg. 33**
   d. Remove bag and tubing; start isotonic saline
   e. Monitor and treat symptoms of anaphylaxis
   f. Collect a urine specimen for receiving hospital. Keep containers available.
   g. Save blood bag - deliver to receiving hospital along with urine specimen for further testing

Cardiac
Automatic Implantable Cardiac Defibrillator (AICD) Deactivation

Clinical Implications:

- For verified frequent and recurrent inappropriate AICD discharges
- End of Life Care
- During resuscitation
- With External Transcutaneous Pacing
- During Central Line Placement

Procedure:

1. Monitor to verify triggering rhythm and inappropriate defibrillator discharge
2. Record EKG rhythm before and after magnet application
3. Identify location of AICD
4. Place magnet directly over AICD and secure in place
5. Treat underlying rhythm

Considerations:

- Identification of AICD type, date of implantation should be found on wallet card with patient

Note:

MAGNET INHIBITION:

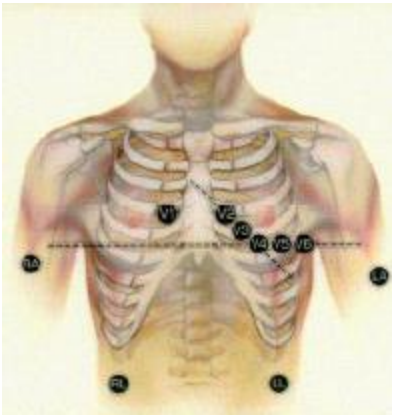
In most devices, placing a magnet over a permanent pacemaker temporarily “reprograms” the pacer into asynchronous mode. It does not turn off the pacemaker. Each pacemaker type has a unique asynchronous rate for beginning-of-life (BOL), elective replacement indicator (EFI), and end-of-life (EOL). Therefore, if the device company parameters are known, application of a magnet can determine if the pacer’s battery needs to be replaced. Further interrogation or manipulating of the device should be performed by an individual skilled in the technique. If patient’s condition deteriorates with magnet in place then remove magnet and reassess patient.
Although many different branded pacemaker/ICD magnets are available, in general any pacemaker/ICD magnet can be used to inhibit the device. When a magnet is applied to an ICD, it can temporarily turn off defibrillation therapy without affecting its pacemaker ability. Some devices can be programmed not to respond to a magnet.

Cardiac
15 Lead ECG

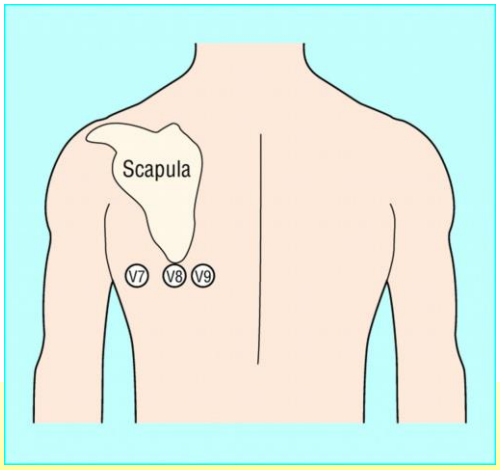
Clinical Indications:

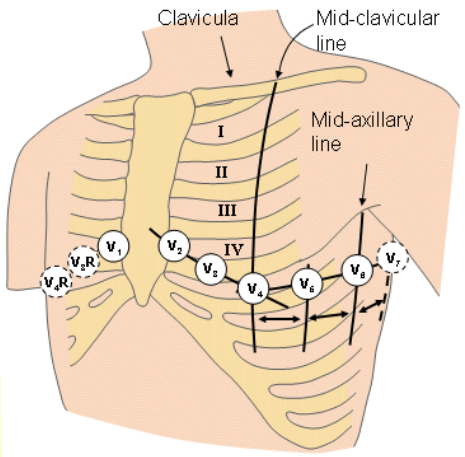
- Chest pain/upper abdominal pain age > 35
- Suspect cardiac etiology

Procedure:



1. Assess patient and monitor cardiac status.
2. Administer oxygen as patient condition warrants.
3. If patient presents with pain or complaint, suspect of a cardiac related emergency, then perform a ECG. (EMT can perform ECG - read only)
4. Prepare ECG monitor and connect patient cable with electrodes.
5. Enter the required patient information (patient name, etc.) into the ECG device.
6. Expose chest and prep as necessary. Modesty of the patient should be respected.
7. Apply chest leads and extremity leads using the following landmarks:
   - RA -Right arm
   - LA -Left arm
   - RL -Right leg
   - LL -Left leg
   - V1 -4th intercostal space at right sternal border
   - V2 -4th intercostal space at left sternal border
   - V3 -Directly between V2 and V4
   - V4 -5th intercostal space at midclavicular line
   - V5 -Level with V4 at left anterior axillary line
   - V6 -Level with V5 at left midaxillary line
   - V7 -same level as V6 at left posterior axillary line, use V4
   - V8 -level with V7 at inferior tip of scapula, use V5 lead
   - V9 -level with V7 and V8 at medial edge of scapula, use V6 lead
   - VR3 -right 5th intercostal space between right sternal border and midclavicular line
   - VR4 -right 5th intercostal space at midclavicular line





Cardiac
15 Lead ECG (continued)

8. Instruct patient to remain still.
9. Press the appropriate button to acquire the ECG.
10. If the monitor detects signal noise (such as patient motion or a disconnected electrode), the ECG acquisition will be interrupted until the noise is removed.
11. Once acquired, transmit the ECG data by fax (where available) to the appropriate hospital.
12. Contact the receiving hospital to notify them that a ECG has been sent.
    - If V1 and V2 ST depression, transition to 15 lead ECG
    - If tall R wave in V1 or V2, or inferior ST elevation, perform right sided ECG
    - If lateral ST elevations, perform V7 and V8
13. Monitor the patient while continuing with the treatment protocol.
14. Download data as per guidelines and attach a copy of the ECG to the Patient Care Report.
15. **Document the procedure, time, and results on/with the patient care report (PCR)**

I Lateral	aVR	V1 Septal	V4 Anterior
II Inferior	aVL Lateral	V2 Septal	V5 Lateral
III Inferior	aVF Inferior	V3 Anterior	V6 Lateral
RV3 Right Ventricle	RV4 Right Ventricle	V7 Apical/Posterior	V8 Apical/Posterior
V9 Posterior			

Synchronized Cardioversion

Clinical Indications:

- **Unstable** patient with a tachydysrhythmia (rapid atrial fibrillation known to be less than 48 hours onset, supraventricular tachycardia, ventricular tachycardia)
- Patient is not pulseless (the pulseless patient requires unsynchronized cardioversion, i.e., defibrillation)

Procedure:

1. Ensure the patient is attached properly to a monitor/defibrillator capable of synchronized cardioversion.
2. Have all equipment prepared for unsynchronized cardioversion/defibrillation if the patient fails synchronized cardioversion and the condition worsens.
3. See **Sedation Protocol Pg. 38.**
4. Set energy selection to appropriate level per AHA guidelines.
    a. Suggested energies for adult 50-100 J in SBT, 100-200 J in atrial fibrillation, Wide complex tachycardia begin at 100 J.
    b. Pediatrics start with 0.5-1J/kg, if unsuccessful increase to 2J/kg
5. Set monitor/defibrillator to synchronized cardioversion mode. Verify synchronized markers.
6. Make certain all personnel are clear of patient.
7. Press and hold the button to cardiovert. Stay clear of the patient until you are certain the energy has been delivered. NOTE: It may take the monitor/defibrillator several cardiac cycles to “synchronize”, so there may be a delay between activating the cardioversion and the actual delivery of energy.
8. Note patient response and perform immediate unsynchronized cardioversion/defibrillation if the patient’s rhythm has deteriorated into pulseless ventricular tachycardia/ventricular fibrillation. Follow the procedure for **Defibrillation-Manual on page 113.**
9. If the patient’s condition is unchanged, repeat steps 2 to 8 above, using appropriate energy level per AHA guidelines. Re-select SYNCHRONIZED mode for subsequent attempts
10. If the patient has not improved after two attempts of synchronized cardioversion, contact medical control.
11. Note procedure, response, and time in the patient care report (PCR).
12. Attach rhythm strips to PCR and document energy used in procedure.

Cardiac
Defibrillation - Automated

Clinical Indications:

- Non-traumatic cardiac arrest in patients older than 1 year of age

Procedure:

1. Confirm the cardiac arrest. Instruct partners or First Responders to initiate CPR while the defibrillator is set up. If defibrillation is underway by First Responders, continue resuscitation as outlined.
2. Turn the defibrillator on and begin documentation.
3. Attach the cables to the appropriate pads and then apply the pads to the patient's chest in the proper position.
4. **Stop CPR and clear the patient** prior to rhythm analysis.
5. Analyze the patient's rhythm by pushing the "analyze" button. After analysis and shock is advised, perform 30 compressions (1 cycle) of CPR before SHOCK while AED is charging.
6. **Assertively state "CLEAR" and visualize that no one, including yourself, is in contact with the patient prior to defibrillation.**
7. Defibrillate if appropriate by depressing the "shock" button.
8. The sequence of defibrillation charges is preprogrammed for monophasic defibrillators. Biphasic defibrillators will determine the correct joules accordingly.
9. Immediately resume CPR for two minutes and then repeat steps 4 - 7 as indicated.
10. Minimize time off chest while analyzing rhythm or shocking patient.
11. If "no shock advised" appears, perform CPR for two minutes and then reanalyze.
12. If ROSC (return of spontaneous circulation), turn off AED unit.
13. Transport and continue treatment as indicated.

Cardiac
Defibrillation - Manual

Clinical Indications:

- Non-traumatic cardiac arrest with ventricular fibrillation or pulseless ventricular tachycardia

Minimize time OFF the chest while performing CPR and completing this procedure.

Procedure:

1. Clinically confirm the diagnosis of cardiac arrest and identify the need for defibrillation.
2. After application of an appropriate conductive agent if needed, apply defibrillation paddles or hands free pads to the patient's chest in the proper position.
3. Set the appropriate energy level according to AHA guidelines and device type (mono vs biphasic).
4. Charge the defibrillator to the selected energy level.
    a. for pediatrics start with 0.5-1J/kg, if unsuccessful increase to 2J/kg
5. Assure proper placement of the paddles or pads.
6. Make sure fast patch pads have good skin contact.
7. **Assertively state, "CLEAR" and visualize that no one, including yourself, is in contact with the patient.**
8. Deliver the shock by depressing the **shock button.**
9. Immediately resume High Performance CPR for 2 minutes.
10. Repeat the procedure as indicated by patient response and ECG rhythm.
11. Document the dysrhythmia and the response to defibrillation with ECG strips on/with the PCR.

Cardiac
Transcutaneous Pacing

Clinical Indications:

- Patients with symptomatic bradycardia.
- If used in asystole, it must be used early.

Procedure:

1. Oxygen, ECG monitor, IV (if possible) should be in place prior to pacing. 12 or 15 lead ECG if clinically appropriate.
2. Confirm the presence of the dysrhythmia (include a copy of the ECG strip) and evaluate the patient's hemodynamic status.
3. Adjust the QRS amplitude so the machine can sense the intrinsic QRS activity.
4. Apply pacing pads to the patient's chest in either of the following positions - anterior-posterior (preferred) or anterior-lateral.
    a. Pediatric patients requiring external transcutaneous pacing require the appropriate placement of pads for pediatric patients per the manufacturer's guidelines.
5. Attach the pacing pads to the therapy cable from the machine.
6. See **Sedation Protocol, Pg. 38**
7. Turn the pacer on.
8. Observe the ECG screen for a "sense" marker on each QRS complex. If a "sense" marker is not present, readjust ECG size or select another lead.
9. Set the desired pacing rate (60-80) .
10. Start at the lowest setting and increase the current slowly while observing the ECG screen for evidence of electrical pacing capture. Confirm mechanical capture.
11. Assess the patient's response to the pacing therapy.
12. Document the dysrhythmia and the response to external pacing with ECG strips.

Central Venous Device

Clinical Indications:

- Need for vascular access using a patient's current externally accessible central venous device.
- For multi-lumen lines, PICC lines, Hickman's and Groshong catheters.
- Subcutaneous ports

Procedures:

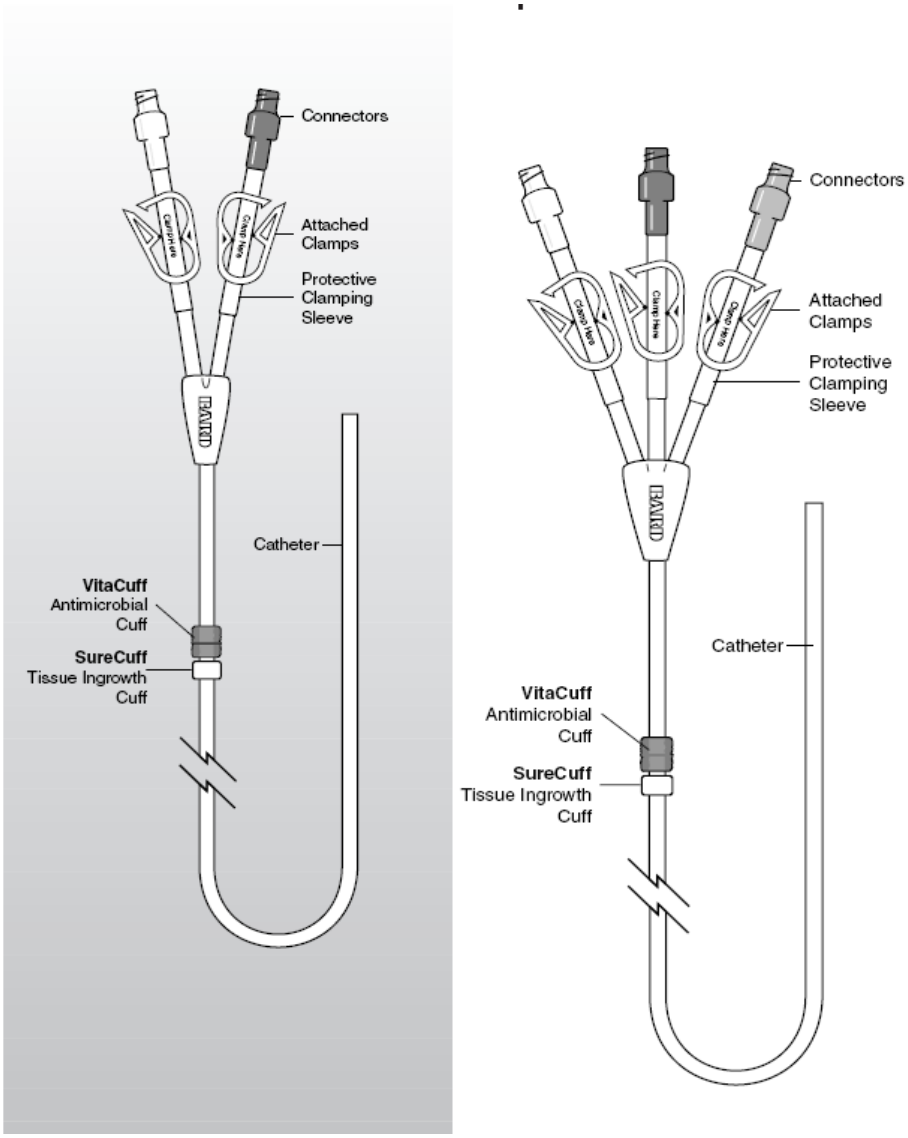
1. Apply gloves.
2. Gather all equipment required: antiseptic; 10 mL syringe of Normal Saline; IV solution and tubing; extra syringes
3. If thumb or slide clamps are present, assure they are in the locked position before beginning. Clamps need to be closed before removing any syringe of adapter from the hub. Always clean the hub with antiseptic while changing of syringes or adapters.
4. Clean hub with alcohol swab and attach a syringe of saline.
5. Flush with 5 ml of Normal Saline, aspirate for blood return and flush with the remaining 5 ml of Normal Saline.
6. Regardless of the type of PICC line access, if resistance is met, assume the lumen is obstructed and repeat procedure on the second lumen if available. Also repeat the procedure on the second lumen if aspirating for blood is unsuccessful.
7. If drawing labs and a clamp is present, close it, remove the syringe, clean the hub, attach a new syringe, open the clamp and aspirate 5ml of blood to discard. Attach a new syringe if needed, open the clamp and draw blood for labs.
8. Establish IV fluids at minimum TKO rate or desired infusion rate and secure the line.
9. Discontinue if complication occurs.

Accessing a Subcutaneous Implanted Port

1. Don mask and sterile gloves.
2. Palpate port to locate septum.
3. Stabilize device with thumb and index finger.
4. Cleanse area around port with 3 separate antiseptic swabs/pads.
5. While stabilizing port, insert Huber needle at 90 degree angle through skin into the septum. Apply pressure until needle comes into contact with metal backing of device.
6. Aspirate for blood to confirm placement. If no blood return, attempt to irrigate with saline and aspirate blood again.
7. Add new syringe of saline and flush with saline.
8. Assess for swelling around device. If swelling occurs, STOP INJECTION.
9. Tape down Huber needle "wings".
10. Apply transparent dressing.

Central Venous Device (continued)

Hickman Catheter



Chest Decompression

Clinical Indications:

- Tension pneumothorax

Procedure:

1. Confirm presence of a tension pneumothorax or identify strong clinical evidence in a rapidly deteriorating patient in the setting of major trauma. Consider in the setting of refractory PEA.
2. Locate the insertion site at the second intercostal space at the midclavicular line on the affected side of the chest. May consider fifth intercostal space in the midaxillary line.
3. Prep the insertion site.
4. Insert the appropriate length, 10/ 12/ 14/ 16 gauge angiocath (1¼ inch, 18 gauge angiocath in patients less than 8 years) with a 10cc syringe attached, by directing the needle just over the top of the third rib (2nd intercostal space) or (fifth intercostal space in the midaxillary line) to avoid intercostal nerves and vessels which are located on the inferior rib borders.
5. Advance the catheter 1-2 inches (3/4 - 1 inch in patients less than 8 years) through the chest wall. Pull back on the plunger of the syringe as the needle is advanced. Tension should be felt until the needle enters the pleural space. A “pop” or “give” may also be felt. Do not advance the needle any further.
6. Withdraw the needle and advance the catheter until flush with the skin. Listen for a gush or “hiss” of air which confirms placement and diagnosis. Caution: this is frequently missed due to ambient noise.
7. Dispose of the needle properly and **never reinsert into the catheter**.
8. Secure the catheter and rapidly transport the patient providing appropriate airway assistance.

Childbirth / Fundal Massage

Clinical Indications for Childbirth:

- Imminent delivery with crowning

Procedure for Childbirth:

1. Delivery should be controlled so as to allow a slow controlled delivery of the infant. This will prevent injury to the mother and infant.
2. Support the infant's head as needed.
3. Check for the umbilical cord surrounding the neck. If it is present, slip it over the head. If unable to free the cord from the neck, double clamp the cord and cut between the clamps.
4. Suction the airway with a bulb syringe. Mouth then nose.
5. Grasping the head with hands over the ears, gently aim the baby down to allow delivery of the anterior shoulder.
6. Gently aim the baby up to allow delivery of the posterior shoulder.
7. Slowly deliver the remainder of the infant.
8. Clamp the cord 2 inches from the abdomen with 2 clamps and cut the cord between the clamps.
9. Record **APGAR** scores at 1 and 5 minutes. **Pg. 78**
10. Child should be placed skin to skin with mother as soon as possible.
11. Follow the **Newborn Resuscitation/Post Delivery Care Protocol** for further treatment. **Pg. 65**
12. The placenta will deliver spontaneously, usually within 5 minutes of the infant. Do not force the placenta to deliver.
13. Continue rapid transport to the hospital.

Clinical Indications for Fundal Massage:

- Post partum hemorrhage AFTER placental delivery

Procedure for Fundal Massage:

1. Assure complete delivery of placenta.
2. Place absorbent material underneath pelvis of patient to facilitate the estimation of blood loss.
3. Place the ulnar aspect of your non dominant hand perpendicular to the abdomen, parallel and just superior to the symphysis pubis.
4. Exert moderate pressure up and in toward the spine.
5. With your dominant hand find the uterine fundus and begin a "kneading" motion using moderate pressure.
6. This procedure will be uncomfortable to the patient but should not be painful.
7. Uterine massage should result in uterine contracture and the feeling of a firm "grapefruit" sized mass.
8. Continue procedure until bleeding subsides.
9. If hemorrhage continues, perform bimanual compression.
    i. Insert a gloved hand into the vagina with fist against or behind the cervix
    ii. The second hand on the abdomen over the uterine fundus
    iii. Compress the two hands together and hold until bleeding stops
10. Document patient condition, procedure and response on PCR.

High Performance CPR

MANEUVER	Adult HCP: Adolescent and older	Child HCP:1 year to adolescent	Infant Under 1 year old
RECOGNITION	Unresponsive (for all ages)		
	No breathing or no normal breathing (ie, only gasping)	No breathing or only gasping	
	No pulse palpated within 10 seconds for all ages (HCP only)		
ACTIVATE: Emergency Response Number (lone rescuer)	Activate when victim found unresponsive HCP: if asphyxial arrest likely, call after 5 cycles (2 minutes) of CPR Activate after performing 5 cycles of CPR for sudden witnessed collapse, activate after verifying that victim is unresponsive		
CPR Sequence	C-A-B		
Compression Rate	At least 100-120/min		
Compression Depth (Use FEEDBACK DEVICES)	At least 2 inches (5cm	At least 1/3 AP diameter About 2 inches (5cm)	At least 1/3 AP diameter About 1 ½ inches (5cm)
Chest Wall Recoil (Use FEEDBACK DEVICES)	Allow complete recoil between compressions HCPs rotate compressors every 2 minutes		
Compression Interruptions	Minimize interruptions in chest compressions Attempt to limit interruptions to <10 seconds		
Initiate Mechanical CPR Device	Apply Mechanical CPR device, See Pg. 120		
Airway	Head tilt-chin lift (Health Care Provider suspected trauma: jaw thrust), Passive Oxygenation See Pg. 88		
Compression-to-ventilation ratio (until advanced airway placed)	30:2 1 or 2 rescuers		30:2 Single rescuer 15:2 2 HCP rescuers
Ventilations: when rescuer untrained or trained and not proficient	Compressions only		
Ventilations with advanced airway (HCP)	1 breath every 6-8 seconds (8-10 breaths/min) Asynchronous with chest compressions About 1 second per breath, Visible chest rise		
Foreign-body airway obstruction	**Responsive**: Abdominal thrusts **Unresponsive**: CPR with airway check		**Responsive**: Back slaps and chest thrusts **Unresponsive**: CPR with airway check
Defibrillation	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.		

Mechanical CPR Device

Clinical Indications:

- Cardiopulmonary arrest with limited personnel or need for prolonged High Performance CPR or need for uninterrupted performance CPR.
- Adult or child, the patient must fit in device and come within 15 mm of the device.

Material:

1. Automated CPR device
2. AED or monitor/defibrillator (ALS)

Procedure:

1. Confirm cardiopulmonary arrest.
2. Contact dispatch to declare “CARDIAC ARREST”.
3. Begin High Performance CPR
4. Apply automated CPR device and activate the device per manufacturer’s specifications.
5. Select “Continuous” setting for device
6. Apply AED/defibrillator pads.
7. Elevate head of gurney to 30 degrees after 2 min of CPR
8. Assess the adequacy of CPR by palpating peripheral pulses.

Continuously assess the location and application of the device on the patient. Readjust as necessary

Discontinuation of CPR, Do not attempt Resuscitation Determination of Field Death

DO NOT ATTEMPT RESUSCITATION: Obvious death

- Decomposition of body tissue
- Total decapitation
- Total incineration
- Total separation or destruction of the heart or brain
- Fetus with a foot length of 33mm or less, less than 24 weeks gestation
- Traumatic Arrest (Non-breathing and pulseless)
- Rigor Mortis
- Lividity
- End-stage/terminal condition, at verbal request of family

POLST form or DNR papers are dated and signed by the patient with appropriate witnessed signatures and there is no question they belong to the patient. The patient may be of any age.

DISCONTINUATION WITHOUT MEDICAL CONTROL: (must meet 3 requirements)

- Non-breathing
- Pulselessness
- Asystole in two leads **OR** No Shock Advised on AED (EMT's can transmit Rhythm strip to hospital for convenience)

Note: Exception – suspected hypothermia requires full resuscitation efforts

DISCONTINUATION OF EFFORTS: (any of these apply)

1. Advanced airway and drug therapy appropriate to the presenting rhythm, according to AHA guidelines, have been initiated and the patient remains apneic, pulseless, and in asystole or PEA. EtCO2 less than 20 and not rising, at least 15 minutes of resuscitation efforts, document in PCR
2. Compelling reasons to withhold CPR/Resuscitation efforts. Such as but not limited to
   - End stage of terminal condition
   - Living will
   - Verbal request by family

Note: Prehospital care providers desiring support in the field may contact the Medical Control at any time for Determination of Death

3. DNR or POLST form has been presented after CPR was initiated.

Once death has been determined and resuscitation efforts discontinued, all EMS therapeutic modalities initiated during the resuscitation must be left in place until it has been determined that the patient will not be a Coroners' case. This includes such equipment as endotracheal tubes, IV catheters, monitor electrodes and personal items including clothes, jewelry etc. If the coroner releases the body while the prehospital care provider is still on scene, remove all medical equipment used during the resuscitation.

Time of death recorded on PCR.

Field Ultrasound

Clinical Indications:

- When a patient presents with either obvious or possible high-impact, high mechanism torso or abdominal trauma
- To confirm the presence or absence of wall motion in the cardiac arrest patient

Contraindications:

- Procedure would delay care and disposition of the patient.
- Provider is not fully trained and endorsed.
- Patients exhibiting severe abdominal pain with radiation to the back, flank, and/or groin area

Procedure:

Many high-impact, high-mechanism trauma patients do not exhibit signs and/or symptoms of internal bleeding in the first hour of the event. Utilizing prehospital ultrasound technology allows an additional non-invasive exam to increase survival and decrease morbidity and mortality from internal hemorrhage. When ultrasound is available, a FAST exam will be completed in the following order with at least a six-second recording of each exam. In addition, patients who have the possibility of abdominal aortic aneurysm can benefit from the prehospital ultrasound exam. Anytime the Cessation of Resuscitation Efforts protocol is being utilized for PEA, and prehospital ultrasound is available, it will be used to further confirm the absence of cardiac activity.

a. For patients presenting with torso or abdominal pain or who present with high impact, high-mechanism trauma, a prehospital FAST exam should be considered.
    i. (1) Morison's perihepatic view (RUQ)
    ii. (2) Pelvic view
    iii. (3) Perisplenic view (LUQ)
    iv. (4) Cardiac view
b. For patients with suspected pneumothorax or pulmonary edema.
c. For patients who have a high clinical suspicion for abdominal aortic aneurysm, an abdominal ultrasound should be considered.
d. Before termination of resuscitation, a cardiac ultrasound should be considered, when available.

The trained provider will complete the appropriate prehospital ultrasound exam recording for at least six seconds

AT NO TIME SHOULD A PREHOSPITAL U/S EXAM DELAY PATIENT TREATMENT OR TRANSPORT

Exam will be interpreted and transmitted to the consulting hospital for preparation of incoming patient when multi-system trauma is present, when possible

Continue patient care as appropriate for either medical and or traumatic emergency
Assure exam is transmitted to the receiving facility through closed, secure network with patient care report.

Provider must complete MPD specialized training

Firefighter rehabilitation procedure

Purpose:

To provide guidance on the implementation and use of a rehabilitation process as a requirement of the incident management system (IMS) at the scene of a fire, other emergency, or training exercise. It will ensure that personnel who might be suffering the effects of metabolic heat buildup, dehydration, physical exertion, and/or extreme weather receive evaluation and rehabilitation during emergency operations. SCOPE. All personnel attending or operating at the scene of a fire/emergency or training exercise.

Rules:

1. Rehabilitation shall commence when fire/emergency operations and/or training exercises pose a health and safety risk.
2. Rehabilitation shall be established for large-scale incidents, long-duration and/or physically demanding incidents, and extreme temperatures.
3. The incident commander shall establish rehabilitation according to the circumstances of the incident. The rehabilitation process shall include the following:
    a. Rest
    b. Hydration to replace lost body fluids
    c. Cooling (passive and/or active)
    d. Warming
    e. Medical monitoring
    f. Emergency medical care if required
    g. Relief from extreme climatic conditions (heat, cold, wind, rain)
    h. Calorie and electrolyte replacement
    i. Accountability
    j. Release

Responsibilities:

The incident commander shall be responsible for the following:

1. Include rehabilitation in incident/event size-up
2. Establish a rehabilitation group to reduce adverse physical effects on fire fighter while operating during fire/emergencies, training exercises, and extreme weather conditions
3. Designate and assign a supervisor to manage rehabilitation
4. Ensure sufficient resources are assigned to rehabilitation
5. Ensure EMS personnel are available for emergency medical care of fire fighters as required

The rehabilitation manager shall be responsible for the following:

1. Don the rehabilitation manager vest
2. Whenever possible, select a location for rehabilitation with the following site characteristics:
    a. Large enough to accommodate the number of personnel expected (including EMS personnel for medical monitoring)
    b. Have a separate area for members to remove personal protective equipment
    c. Be accessible for an ambulance and EMS personnel should emergency medical care be required

Firefighter rehabilitation procedure (continued)

   d. Be removed from hazardous atmospheres including apparatus exhaust fumes, smoke, and other toxins
   e. Provide shade in summer and protection from inclement weather at other times
   f. Have access to a water supply (bottled or running) to provide for hydration and active cooling
   g. Be away from spectators and media
3. Ensure personnel in rehabilitation "dress down" by removing their bunker coats, helmets, hoods, and opening their bunker pants to promote cooling
4. Provide the required resources for rehabilitation including the following:
   a. Potable drinking water for hydration
   b. Sports drinks (to replace electrolytes and calories) for long duration incidents (working more than one hour)
   c. Active cooling where required
   d. Medical monitoring equipment (chairs to rest on, blood pressure cuffs, stethoscopes, check sheets, etc.)
   e. Food where required and a means to wash or clean hands and face prior to eating
   f. Blankets and warm, dry clothing for winter months
   g. Washroom facilities where required
5. Time personnel in rehabilitation to ensure they receive at least 10 minutes to 20 minutes of rest
6. Ensure personnel rehydrate themselves
7. Ensure personnel are provided with a means to be actively cooled where required
8. Maintain accountability and remain within rehabilitation at all times
9. Document members entering or leaving rehabilitation
10. Inform the incident commander, accountability officer (resource status unit), and EMS personnel if a member requires transportation to and treatment at a medical facility
11. Serve as a liaison with EMS personnel

Company officers shall be responsible for the following:

1. Be familiar with the signs and symptoms of heat stress and cold stress
2. Monitor their company members for signs of heat stress and cold stress
3. Notify the IC when stressed members require relief, rotation, or reassignment according to conditions
4. Provide access to rehabilitation for company members as needed
5. Ensure that their company is properly checked in with the rehabilitation manager and accountability officer (resource unit), and that the company remains intact

Crew members shall be responsible for the following:

1. Be familiar with the signs and symptoms of heat and cold stress
2. Maintain awareness of themselves and company members for signs and symptoms of heat stress and cold stress
3. Promptly inform the company officer when members require rehabilitation and/or relief from assigned duties
4. Maintain unit integrity

Firefighter rehabilitation procedure (continued)

EMS personnel shall be responsible for the following:

1. Report to the incident commander and obtain the rehabilitation requirements
2. Coordinate with rehabilitation manager
3. Identify the EMS personnel requirements
4. Check vital signs, monitor for heat stress and signs of medical issues
5. Document medical monitoring
6. Provide emergency medical care and transportation to medical facilities as required
7. Inform the incident commander and the rehabilitation manager when personnel require transportation to and treatment at a medical facility
8. Document emergency medical care provided

Procedures:

1. All personnel shall maintain hydration on an ongoing basis (preincident, incident, postincident).
2. Members shall be sent to rehabilitation as required.
3. All members shall be sent to rehabilitation following the use of two 30-minute or 45-minute SCBA cylinders or one 60-minute SCBA cylinder. Shorter times might be considered during extreme environmental conditions.
4. Passive cooling shall be employed to reduce fire fighter heat stress. This could include moving to a shaded or air-conditioned area, removal of PPE, ingestion of cool fluids, and rest.
5. Active cooling shall be employed to reduce fire fighter heat stress when passive cooling is ineffective or when a member is experiencing heat-related illness. This could include forearm immersion, misting fans, and cold towels.
6. In hot, humid conditions, a minimum of 10 minutes (20 minutes is preferable) of active cooling shall be applied following the use of the second and each subsequent SCBA cylinder.
7. Personnel in rehabilitation shall rest for at least 10 minutes to 20 minutes prior to being reassigned or released.
8. EMS personnel shall provide medical monitoring and emergency medical care as per medical protocol.
9. If a member is demonstrating abnormal vital signs, he or she shall be monitored frequently during rehabilitation.
10. Personnel who are weak or fatigued with pale clammy skin, low blood pressure, nausea, headache, or dizziness shall be assessed by EMS personnel.
11. Personnel experiencing chest pain, shortness of breath, dizziness, or nausea shall be transported to a medical facility for treatment.
12. Personnel transported to a medical facility for treatment shall be accompanied and attended to by a department representative.
13. Members should drink water during rehabilitation. After the first hour, a sports drink containing electrolytes should be provided. Soda and caffeinated and carbonated beverages should be avoided.
14. Nutritional snacks or meals shall be provided as required during longer duration incidents.
15. No tobacco use shall be permitted in or near the rehabilitation area.

Firefighter rehabilitation procedure (continued)

REHAB GROUP — CHECK IN/.OUT SHEET			
Incident Name:		Incident Location:	Date:
Name/Assignment	Times	Disposition	
First	Time In	Released from Rehab	
Last		Referred to Medical	
	Time Out		
Assignment		Demobilized	
		Vital signs taken on Entry Q	Vital signs taken on Exit Q
Name/Assignment	Times	Disposition	
First	Time In	Released from Rehab	
Last		Referred to Medical	
	Time Out		
Assignment		Demobilized	
		Vital signs taken on Entry Q	Vital signs taken on Exit
Name/Assignment	Times	Disposition	
	Time In	Released from Rehab	
Last		Referred to Medical	
	Time Out		
Assignment		Demobilized	
		Vital signs taken on Entry Q	Vital signs taken on Exit Q
Name/Assignment	Times	Disposition	
First	Time In	Released from Rehab	
Last		Referred to Medical	
	Time Out		
Assignment		Demobilized	
		Vital signs taken on Entry	Vital signs taken on Exit
Name/Assignment	Times	Disposition	
First	Time In	Q Released from Rehab	
Last		Q Referred to Medical	
	Time Out		
Assignment		Demobilized	
		Vital signs taken on Entry Q	Vital signs taken on Exit Q

Glucometry

Clinical Indications:

- Patients with suspected hypoglycemia (diabetic emergencies, change in mental status, bizarre behavior, etc.)
- Patients with Altered Mental Status
- Any patient where appropriate
- Reference range normal is 60 to 120 mg/dL correlated to patient's condition.

Procedure:

1. Gather and prepare equipment.
2. Blood samples for performing glucose analysis should be obtained according to device manufacturers recommendations.
3. Place correct amount of blood on reagent strip or site on glucometer per the manufacturer's instructions.
4. Time the analysis as instructed by the manufacturer.
5. Document the glucometer reading and treat the patient as indicated by the presenting symptoms, analysis, and protocol.
6. Repeat glucose analysis as indicated for reassessment after treatment and document patient response on the PCR.
7. Follow manufacture recommendations for device calibration.

Glasgow Coma Score

Glasgow Coma Score		
Infants		**Children/Adults**
Eye Opening		
Spontaneous	4	Spontaneous
To speech/sound	3	To speech
To pain	2	To pain
No response	1	No response
Verbal Response		
Coos or babbles	5	Oriented
Irritable crying	4	Confused
Cries to pain	3	Inappropriate words
Moans to pain	2	Incomprehensible
None	1	None
Motor Response		
Spontaneous	6	Obeys commands
Withdraws touch	5	Localizes pain
Withdraws pain	4	Withdraws pain
Abnormal flexion	3	Abnormal flexion
Abnormal extension	2	Abnormal extension
No response	1	No response

Impedance Threshold Device

Clinical Indications:

- Cardiopulmonary arrest 12 years and older

Contraindications:

- Patients under 12 years old
- Traumatic cardiopulmonary arrest

Procedure:

1. Confirm absence of pulse and begin CPR immediately.
2. After an advance airway has been established, attach EtCO2 detector and then impedance threshold device as per manufacturer's specifications.
3. Continue CPR with minimal interruptions and ventilate asynchronously.
4. If return of spontaneous circulation occurs, remove impedance threshold device and assist ventilations as indicated.

Injections-Subcutaneous, Intramuscular

Clinical Indications:

- When medication administration is necessary and the medication must be given via the SQ or IM route or as an alternative route in selected medications.

Procedure:

1. Receive and confirm medication order or perform according to standing orders.
2. Prepare equipment and medication, expelling air from the syringe.
3. Needle size Subcutaneous Injection
    a. 25g 5/8 inch needle for average adult
    b. 25-27g ½ inch needle for infant, child, elderly, or thin patient
    c. The most common site for subcutaneous injection is the arm. Injection volume should not exceed 1 cc.
4. Needle size Intramuscular injection:
    a. 20-25g 1-2 inch depending on patient size.
    b. The possible injection sites for intramuscular injection include the arm, buttock and thigh.
5. Injection volume should not exceed 1 cc for the arm and not more than 2.5 cc in the thigh or buttock.
6. The thigh should be used for injections in pediatric patients and injection volume should not exceed 1 cc.
7. Explain the procedure to the patient and reconfirm patient allergies.
8. Expose the selected area and cleanse the injection site with topical antiseptic swab.
9. Insert the needle into the skin with a smooth, steady motion
10. **SQ: 45 degree angle IM: 90 degree angle**
11. Aspirate for blood. If blood is aspirated do not inject medication. Discard and begin again.
12. Inject the medication.
13. Withdraw the needle quickly and dispose of properly without recapping.
14. Apply pressure to the site.
15. Monitor the patient for the desired therapeutic effects as well as any possible side effects.
16. Document the medication, dose, route, patient response and time on/with the patient care report (PCR).

Intranasal Medication Delivery

Clinical Indications:

- When medication administration is necessary and an alternative route is not available or impractical.

Materials:

1. Appropriate sized syringe and needle/needleless device to draw up medication.
2. Atomizer
3. Medication of appropriate concentration for nasal medication delivery

Maximum volume WITHOUT an atomizer is 1 mL

Procedure:

1. Aspirate the proper volume of medication required to treat the patient. An extra 0.1 mL of medication should be drawn up to account for the dead space within the atomizer at the end of the procedure.
2. Remove the syringe from the needle/needleless device
3. Attach the atomizer tip via Luer lock mechanism (twist into place).
4. Using your free hand to hold the crown of the head, place the tip of the atomizer snugly into the nostril aiming slightly upward and outward (toward the ear on the same side).
5. Briskly compress the syringe plunger to deliver half the medication into the nostril.
6. Move the device to the opposite nostril and administer the remaining medication as in step 5.

Notes:

Medications which are appropriate for intranasal use include:

- Diazepam (5mg/mL) 2-5mg
- Fentanyl (50mcg/mL) 25-50mcg
- Glucagon (solubilize two 1mg vials in 1mL sterile water) 2 mg
- Ketamine (100mg/mL) 50-100mg
- Lorazepam (2mg/mL) 0.5-4mg
- Midazolam (5mg/mL) 1-10mg
- Naloxone (1mg/mL) 0.4-2mg

Nasogastric Tube Insertion

Clinical Indications:

- Gastric decompression in intubated patients.
- Administration of activated charcoal in patients with altered mental status with a advanced airway.

Procedure:

1. Assemble all supplies. Assure functioning suction unit.
2. Estimate insertion length by superimposing the tube over the body from the nose, to the ear, to the stomach.
3. Mark the proper insertion distance with tape.
4. Flex the neck **if not contraindicated** to facilitate esophageal passage.
5. Liberally lubricate the distal end of the tube and pass through the patient's nostril along the floor of the nasal passage. Do not orient the tip upward into the turbinates. This increases the difficulty of the insertion and may cause bleeding.
6. In the setting of an unconscious, intubated patient or a patient with facial trauma, oral insertion of the tube may be considered or preferred.
7. Continue to advance the tube gently until the appropriate distance is reached.
8. Confirm placement by injecting 20cc of air and auscultate for the swish or bubbling of the air over the stomach. Additionally, aspirate gastric contents to confirm proper placement.
9. Secure the tube.
10. Decompress the stomach of air and food either by connecting the tube to suction or manually aspirating with the large catheter tip syringe.
11. Mechanical suction should not reach high setting.
12. Document the procedure, time, patient response, and result (success) on/with the patient care report (PCR).

Orthostatic Blood Pressure Measurement

Clinical Indications:

- Patient situations with suspected blood / fluid loss / dehydration who have the mobility to complete the procedure.
- Patients larger than the Length Based tape

Procedure:

1. Assess the need for orthostatic vital sign measurement.
2. Obtain patient's pulse and blood pressure while supine.
3. Have patient stand for two minutes.
4. Obtain patient's pulse and blood pressure while standing.
5. If pulse has increased by 30 BPM **or** systolic blood pressure decreased by 30 mmHg, the orthostatics are considered positive. If dizzy or symptomatic during procedure, consider the test positive.
6. If patient is unable to stand, orthostatics may be taken while the patient is sitting with feet dangling.
7. If positive orthostatic changes occur while sitting, **DO NOT** continue to the standing position.
8. Patients on prolonged beta-blocker therapy will not demonstrate orthostatic vital sign changes. Provider must complete assessment and utilize clinical judgment.
9. Document the time and vital signs for supine and standing positions on/with the patient care report (PCR).
10. Determine appropriate treatment based on protocol.

Pain Assessment and Documentation
ADULT

Clinical Indications:

- Any patient with pain

Definitions:

- Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage.
- Pain is subjective (whatever the patient says it is).

Procedure:

1. Initial and ongoing assessment of pain intensity and character is accomplished through the patient's self report.
2. Pain should be assessed and documented during initial assessment, before starting pain control treatment, and with each set of vitals.
3. Pain should be assessed using the appropriate approved scale.
4. Two pain scales are available: the 0 - 10 and the Wong - Baker "faces" scale.
5. 0 – 10 Scale: the most familiar scale used by EMS for rating pain with patients. It is primarily for adults and is based on the patient being able to express their perception of the pain as related to numbers. Avoid coaching the patient; simply ask them to rate their pain on a scale from 0 to 10, where 0 is no pain at all and 10 is the worst pain ever.

Visual Analog Scale

0 1 2 3 4 5 6 7 8 9 10

No Pain Worst pain

6. Wong – Baker "faces" scale: may be used with geriatrics or any patient with a language barrier. The faces correspond to numeric values from 0-10. This scale can be documented with the numeric value or the textual pain description.

0 No Hurt | 2 Hurts Little Bit | 4 Hurts Little More | 6 Hurts Even More | 8 Hurts Whole Lot | 10 Hurts Worse

From Wong D.L., Hockenberry-Eaton M., Wilson D., Winkelstein M.L., Schwartz P.: Wong's Essentials of Pediatric Nursing, ed. 6, St. Louis, 2001, p. 1301. Copyrighted by Mosby, Inc. Reprinted by permission.

Pelvic Fracture Stabilization

Clinical Indications:

- Physical exam indicates and mechanism of injury suggests a pelvic fracture

Procedure:

1. Physical exam shows instability of pelvis with compression.
2. Assess the abdomen and neurovascular status of the lower extremities.
3. Assess for blood at the perineum
4. Fold a sheet lengthwise into a swathe approximately 12 to 18 inches wide.
5. Pass this swathe under the patient's buttocks and clamp or tie circumferentially around the pelvis covering buttocks posteriorly. The swathe should be just below the iliac crests. Secure ends of sheet with clamps or zip ties.
6. Bind the feet together

OR

1. Physical exam shows instability of pelvis with compression.
2. Assess the abdomen and neurovascular status of the lower extremities.
3. Assess for blood at the perineum.
4. Utilize a commercial pelvic stabilization device following the manufacturer's specifications.
5. Bind the feet together

Pulse Oximetry

Clinical Indications:

- Patients with suspected hypoxemia.

Procedure:

1. Turn the machine on and allow for self-tests.
2. Apply probe to patient as recommended by the device manufacturer.
3. Allow machine to register saturation level.
4. Record time and initial saturation percent on room air if possible on/with the patient care report (PCR).
5. Verify pulse rate on machine with palpated pulse of the patient.
6. Monitor critical patients continuously until arrival at the hospital. If recording a one-time reading, monitor patients for a few minutes as oxygen saturation can vary.
7. Document percent of oxygen saturation every time vital signs are recorded and in response to therapy to correct hypoxemia.
8. In general, normal saturation is SpO_2 94-98%. Below 94%, suspect a respiratory compromise.
9. For patients with low oximetry at baseline, treat the patient and not oximetry.
10. The pulse oximeter reading should never be used to withhold oxygen from a patient in respiratory distress or when it is the standard of care to apply oxygen.
11. Factors which may reduce the reliability of the pulse oximetry reading include:
    - (a) Poor peripheral circulation (blood volume, hypotension, hypothermia)
    - (b) Excessive pulse oximeter sensor motion
    - (c) Fingernail polish (may be removed with acetone pad)
    - (d) Carbon monoxide bound to hemoglobin
    - (e) Irregular heart rhythms (atrial fibrillation, SVT, etc.)
    - (f) Jaundice
    - (g) Excessive light entering the side of the probe causing "washout" of the signal

Restraints

Clinical Indications:

- Patients with actual or potential threat to self or others.
- Involuntary hold

Procedure:

1. Planning:
    A. Request assistance from Law Enforcement.
    B. EMS personnel are not to knowingly place themselves at risk during the process of restraining a patient.
    C. Obtain necessary resources to manage scene and patient.
    D. Assess patient for any condition that may contribute to violent behavior. Treatment for identified conditions is to be initiated according to protocol immediately after controlling the situation and patient behavior.
    E. Consult Medical Control if questions or concerns.
    F. Verbal de-escalation techniques are to be implemented and documented. If verbal de-escalation fails, providers may need to implement physical and or chemical restraint measures.
2. Application of restraints:
    A. Obtaining and preparing appropriate restraints
        - Padded leather restraints
        - Soft restraints (i.e. posey, Velcro or seatbelt type)
        - Any method utilized must allow for quick release
    B. Assessing the safety of the situation
        - Complete a visual check for potential weapons
        - If there is suspicion of weapon involvement request involvement of Law Enforcement prior to engaging in patient interaction.
        - Providers should remove any potential weapons from their person. (i.e., pens, flashlights, trauma shears etc.)
    C. Assigning a contact for the out of control person
        - Minimize the number of people speaking to the out of control person.
        - Continue use of verbal de-escalation
    D. Designating who will direct and cue team members in the application of restraints
        - Assign each limb and the head to specific team members
        - Give the signal to go hands-on (this may be a non-verbal signal)
        - Supervise the application of restraints
        - Give the verbal signal for hands-off (RELEASE)
        - No team member is to release their designated limb until directed
    E. Conduct a preliminary debriefing
        - Assess team members and patient for any injuries
        - Re-assess restraints for appropriate application

Glucometry

Restraints (continued)

3. Reassessment / Chemical Adjuncts:
   A. EMS personnel must assess the patient to determine the need for administration of an anxiolytic, or sedative to prevent continued forceful struggling against the restraint. Continued forceful struggling against the restraint can lead to hyperkalemia, rhabdomyolysis, or cardiac arrest. See **Psychological/Emotional/Excited Delirium Protocol Pg. 39**
   B. Chemical adjuncts to physical restraints are to be administered in accordance with patient care protocols and / or on line medical direction.
   C. Post restraint assessment must include hemodynamic, respiratory, and neurologic systems. Restrained extremities should be evaluated for pulse quality, capillary refill, color, nerve and motor function distal to restraints, a minimum of every fifteen minutes.
4. Documentation:
   A. In addition to standard information, the Medical Incident Report must document the following:
      i. Complete assessment of patient
      ii. Objective description of patient behavior (competence) (Use BAR score)
      iii. Use and effectiveness of verbal de-escalation techniques
      iv. Reason for physical restraint
      v. Explanation offered to the patient
      vi. Type of restraint used and time applied
      vii. Post restraint serial extremity evaluation
      viii. Post evaluation of the patient's respiratory status
      ix. Condition of the patient enroute and on transfer to Emergency Department Staff.
5. Approved restraint devices / patient positioning:
   A. The following forms of restraint are NOT to be utilized by EMS personnel:
      i. "Sandwiching" patients between backboards, scoop-stretchers, or mattresses, as a restraint
      ii. Restraining a patient's hands and feet behind the patient (i.e. hog-tying)
      iii. Methods or other material applied in a manner that could cause respiratory, vascular, or neurological compromise, including the use of "choke holds".
      iv. Locking handcuffs
      v. Hard plastic ties or any restraint device requiring a key to remove
   B. Patients should not be transported in the prone position. EMS personnel must ensure that the patient's position does not compromise the patient's respiratory, circulatory, or neurological systems, and does not preclude any necessary medical intervention to protect the patient's airway should vomiting occur.
   C. Occasionally it is necessary for Law Enforcement to apply restraint devices that are not approved for EMS use (e.g. handcuffs) in order to protect the safety of the patient and the public. As soon as the situation is controlled EMS personnel are to exchange these devices for those that are approved for EMS use. In the event that restraint exchange cannot safely occur, Law Enforcement must accompany patient during transport.

Simple Thoracostomy

Clinical Indications:

- Patients in traumatic cardiac arrest or peri-arrest state with ongoing positive pressure ventilation and clinical indications of pneumothorax.
- Patients presenting with a tension pneumothorax with hypoxia, hypotension, and unilaterally absent breath sounds.
- In the setting of blunt traumatic cardiac arrest, bilateral thoracostomies should be considered

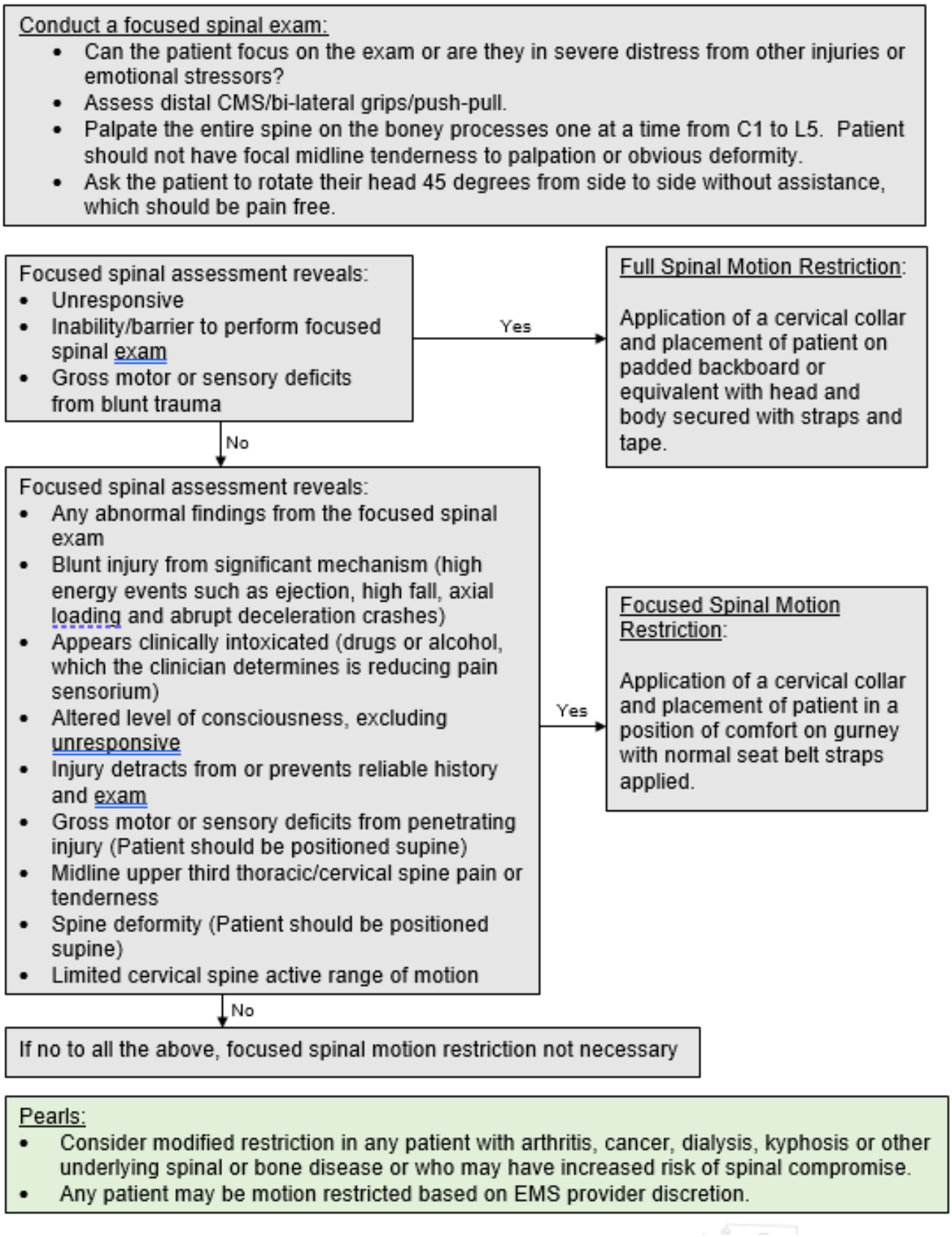
Equipment:

- Sterile gloves
- Eye protection/face shield
- Chlorhexidine prep
- Scalpel
- Hemostats or other blunt instrument
- Skin marking pen

Procedure:

1. Utilize universal precautions, especially face and eye protection.
2. With arm abducted, find and mark the area over the fifth rib at the midaxillary line (within the triangle of safety).
3. Clean the area as best as possible with an antiseptic swabstick.
4. Make a 1-2” (3-5 cm) transverse incision through the skin over the 5th rib at the marked location just anterior to the mid axillary line.
5. With a large forceps, rapidly dissect over the rib and through the intercostal muscles.
6. Push through the pleura and open the forceps.
7. With the forceps open, retract from the chest.
8. Insert finger along the track into the pleural cavity and perform sweep.
9. Assess for release of air or blood.
10. Each wound should be circled with a permanent marker and labeled EMS-R or EMS-L to identify incisions made by EMS in the event of autopsy or criminal investigation.

Spinal Motion Restriction



Splinting

Clinical Indications:

- Immobilization of an extremity, either due to suspected fracture, sprain, or injury.
- Immobilization of an extremity to secure medically necessary devices such as intravenous catheters.

Procedure:

1. For any reduction, see **Pain and Sedation Management Pg. 38**
2. Remove all clothing, jewelry or restricting items from the extremity.
3. Select a site to secure the splint both proximal and distal to the area of suspected injury, or the area where the medical device will be placed.
4. Do not secure the splint directly over the injury or device.
5. Place the splint and secure with Velcro, straps, or bandage material (e.g., kling, kerlex, cloth bandage, etc.) depending on the splint manufacturer and design.
6. Document pulses, sensation, and motor function after placement of the splint. If there has been a deterioration in any of these 3 parameters, remove the splint and reassess.
7. If a femur fracture is suspected and there is no evidence of pelvic and/or knee fracture or instability, place a traction splint as per manufacturer's specifications. The following procedure may be followed for placement of a femoral traction splint:
    a. Place the ankle device over the ankle.
    b. Place the proximal end of the traction splint on the posterior side of the affected extremity, being careful to avoid placing too much pressure on genitalia or open wounds. Make certain the splint extends proximal to the suspected fracture. If the splint will not extend in such a manner, reassess possible involvement of the pelvis.
    c. Extend the distal end of the splint at least 6 inches beyond the foot.
    d. Attach the ankle device to the traction crank.
    e. Twist until moderate resistance is met.
    f. Reassess alignment, pulses, sensation, and motor function. If there has been deterioration in any of these 3 parameters, release traction and reassess.
8. Document the time, type of splint, and the pre and post assessment of pulse, sensation, and motor function in the patient care report (PCR).

Stroke BEFAST Assessment

Clinical Indications:

- Suspected Stroke Patient

Procedure:

1. If possible, prehospital care providers should establish the time of onset of stroke signs and symptoms.
2. Last known well

Stroke test

1. **Balance** – Sudden change in patient's balance or equilibrium.
2. **Eyes** – Sudden loss of vision in one or both eyes.
3. **Facial droop** – Have patient show their teeth or smile.
    a. Normal – Both sides of face move equally
    b. Abnormal – One side of the face does not move as well as the other.
4. **Arm drift** – Have the patient close their eyes and hold both arms straight out with palms upward.
    a. Normal – Both arms move the same direction or do not move at all (pronator grip may be helpful).
    b. Abnormal – One arm does not move or one arm drifts down compared to the other.
5. **Speech** – Have the patient say "you can't teach an old dog new tricks".

    a. Normal – The patient uses the correct words with no slurring

    b. Abnormal – The patient slurs their words, uses inappropriate words or is unable to speak.
6. Any positive findings in steps 1-5 may indicate stroke and you should consider activating your Code Stroke per County Operating Procedure.
7. Report specific findings for example: left side facial drooping, slurred speech.
8. Perform LAMS score. A score of 4 or 5 suggests a large vessel occlusion (LVO) Activate your Code stroke per County Operating Procedure

Los Angeles Motor Scale (LAMS)[22]		
Face	0	Both sides move normally
	1	One side is weak or flaccid
Arm	0	Both sides move normally
	1	One side is weak
	2	One side is flaccid/doesn't move
Grip	0	Both sides move normally
	1	One side is weak
	2	One side is flaccid/doesn't move
Total	0–5	

Taser Dart Removal

Clinical Indication:

- The darts should only be removed in the field if they do not involve the eye, genitalia, or potential for vascular involvement. Patients with retained darts in these areas should be transported to a hospital for removal by a physician.

Procedure:

1. Prior to removal, patient must be adequately restrained.
2. Body substance isolation procedures must be taken.
3. Ensure that wires are disconnected from the gun or the wires have been cut.
4. On the body part which the barbed dart (straight #8 fish hook) is imbedded, apply pressure to either side of the dart and pull it straight out.
5. Apply alcohol or iodine to the puncture area and dress wound.
6. Treat the dart as a “contaminated sharp”. The dart should be placed in a biohazard sharps container and turned over to law enforcement.
7. Patient must be thoroughly assessed to determine if other medical problems or injuries are present.
8. If the individual does not have any other presenting injuries/illness, they may be left in the custody/care of law enforcement.
9. If transported to the hospital, follow the Patient Care Procedure regarding restraints for aggressive or violent patients.
10. Detailed documentation is very important as it is likely to become evidence.

Temperature Measurement

Clinical Indications:

- Monitoring body temperature in a patient with suspected infection, hypothermia, hyperthermia, or to assist in evaluating resuscitation efforts.
- Continuous monitoring for hypothermia and hypothermic arrest.

Procedure:

1. If clinically appropriate, allow the patient to reach equilibrium with the surrounding environment. For example, the temperature of a child or infant that has been heavily bundled is often inaccurate, so “unbundle” the child for 3 to 5 minutes before obtaining temperature.
2. For adult patients that are conscious, cooperative, and in no respiratory distress, an oral temperature is preferred (steps 3 to 5 below). For infants or adults that do not meet the criteria above, a rectal temperature is preferred (steps 6 to 8 below).
3. To obtain an oral temperature, ensure the patient has no significant oral trauma and place the thermometer under the patient’s tongue with appropriate sterile covering.
4. Have the patient seal their mouth closed around thermometer.
5. If using an electric thermometer, leave the device in place until there is indication an accurate temperature has been recorded (per the “beep” or other indicator specific to the device). If using a traditional thermometer, leave it in place until there is no change in the reading for at least 30 seconds (usually 2 to 3 minutes). Proceed to step 9.
6. Prior to obtaining a rectal temperature, assess whether the patient has suffered any rectal trauma by history and/or brief examination as appropriate for patient’s complaint.
7. To obtain a rectal temperature, cover the thermometer with an appropriate cover, apply lubricant, and insert into rectum no more than 1 to 2 cm beyond the external anal sphincter.
8. Follow guidelines in step 5 above to obtain temperature.
9. Record time, temperature, method, and scale (C° or F°) in Patient Care Report (PCR).

Thrombolytic Screen

Clinical Indications:

- Rapid evaluation of a patient with suspected acute stroke, acute myocardial infarction, or acute pulmonary embolus who may benefit from thrombolysis. (e.g. BEFAST and LAMS)
- OR USE YOUR COUNTY OPERATING PROCEDURE IF AVAILABLE

Procedure:

1. Follow the appropriate protocol for patient's complaint to assess need for thrombolysis (e.g., FAST assessment for suspected stroke, 12-lead EKG for suspected myocardial infarction, etc.). If the screen is positive, proceed to step 2 below.
2. By history from the patient and/or family members, obtain and record the following information:
    a. history of active internal bleeding?
    b. history of CNS neoplasm, arteriovenous (AV) malformation, or CNS aneurysm?
    c. history of CNS surgery in past 2 months?
    d. history of severe, uncontrolled hypertension (>200/130)?
    e. history of bleeding disorder?
    f. history of aortic dissection?
    g. history of allergy to thrombolytic?
    h. Currently anticoagulated?
3. Record all findings in the Patient Care Report (PCR).

Venous Access
Blood Draw

Clinical Indications:

- Collection of a patient's blood for laboratory analysis.

Procedure:

1. Utilize universal precautions as per **Infection control standards Page 11.**
2. Select vein and prep with topical antiseptic as usual.
3. Select appropriate blood-drawing devices: Vacutainer blood tubes and blood tube holders with male or female adaptors shall be available and used to obtain and transfer all blood samples
4. Draw appropriate tubes of blood for lab testing per destination hospital protocol.
5. Assure that the blood samples are labeled with the correct information (a minimum of the patients name, along with the date and time the sample was collected).
6. Deliver the blood tubes to the appropriate individual at the hospital.
7. Nitrous oxide (where available) can be use to facilitate venous access in the pediatric patient.
8. May inject a small intradermal wheal of 2% Lidocaine prior to blood draw.

Venous Access
External Jugular

Clinical Indications:

- External jugular vein cannulation is indicated in a critically ill patient > 8 years of age who requires intravenous access for fluid or medication administration and in whom an extremity vein is not obtainable.
- External jugular cannulation can be attempted initially in life threatening events where no obvious peripheral site is noted.

Procedure:

1. Utilize universal precautions as per **Infection Control Standards Page 11.**
2. Place the patient in a supine head down position. This helps distend the vein and prevents air embolism.
3. Turn the patient's head toward the opposite side if no risk of cervical injury exists.
4. Prep the site as per peripheral IV site.
5. May inject a small intradermal wheal of 2% Lidocaine prior to IV insertion.
6. "Tourniqueting" the vein lightly with one finger above the clavicle, puncture the vein midway between the angle of the jaw and the clavicle and cannulate the vein in the usual method.
7. Attach the IV and secure the catheter avoiding circumferential dressing or taping.
8. Document the procedure, time, and result (success) on/with the patient care report (PCR).

Venous Access
Extremity

Clinical Indications:

- Any patient where intravenous access is indicated (significant trauma or mechanism, emergent or potentially emergent medical condition).

Procedure:

1. Utilize universal precautions as per **Infection Control Standards Page 11.**
2. Inspect the IV solution for expiration date, cloudiness, discoloration, leaks, or the presence of particles.
3. Connect IV tubing to the solution in a sterile manner. Fill the drip chamber half full and then flush the tubing bleeding all air bubbles from the line.
4. Place a tourniquet around the patient's extremity to restrict venous flow only.
5. Select a vein and an appropriate gauge catheter for the vein and the patient's condition.
6. Prep the skin with an antiseptic solution.
7. Insert the needle with the bevel up into the skin in a steady, deliberate motion until the blood flash is visualized in the catheter.
8. Advance the catheter into the vein. **Never** reinsert the needle through the catheter. Dispose of the needle into the proper container without recapping.
9. Draw blood samples when appropriate.
10. Remove the tourniquet and connect the IV tubing or saline lock.
11. Open the IV to assure free flow of the fluid and then adjust the flow rate as per protocol or as clinically indicated.
12. Cover the site with a sterile dressing and secure the IV and tubing.
13. Document the procedure, time and result (success) on/with the patient care report (PCR).

Venous Access
Intraosseous Adult

Clinical Indications:

- Inability to obtain vascular access in a patient that requires emergent access.

Procedure:

1. Utilize universal precautions as per **Infection Control Standards Page 11.**
2. Assemble standard intravenous access equipment as well as IO needle. **If a commercial kit is being used (O™, Bone Injection Gun™), or hand held Intraosseous needle, follow the procedure recommended by the manufacturer.**
3. Follow manufacturers' specifications for placement. Suggested sites: proximal humerous, proximal tibia distal tibia and distal femur.
4. Holding the I/O needle perpendicular to the site, insert it with a twisting motion until you feel decreased resistance or feel a "pop". Stop advancing the needle.
5. Remove the trochar.
6. Flush 1-5mL of 2% **Lidocaine** in conscious patients PRN.
7. Begin infusion of IV fluids. The fluids should flow easily. Once ease of flow has been established, the line may be used just as any other IV line.
8. Stabilize the IO needle.
9. Record the procedure, any complications, and clinical response in the patient care report (PCR).

Wound Care and Hemorrhage Control

Clinical Indications:

- Bleeding control of open wounds, including tourniquet use.
- Protection and care for open wounds.

Procedure:

1. Utilize universal precautions as per **Infection Control Standards Page 11.**
2. Control Bleeding
    A. Apply direct pressure to wound with clean gauze pad. If extremity wound, elevate above the level of the heart.
    B. If gauze soaks through, apply additional gauze on top of original- do not remove initial dressing.
    C. Use pressure points if unable to control bleeding using direct pressure, elevation, and additional gauze.
    D. If prolonged extrication or transport and unable to control bleeding to extremity wound, consider use of commercially-prepared gauze impregnated with a hemostatic non-thermogenic agent (ie Quick Clot gauze). Follow manufacturers' recommendations for packing, dressing and bandaging site.
    E. Tourniquets. For partial or complete extremity amputation or uncontrolled bleeding, consider use of commercial tourniquet device. Use blood pressure cuff only if commercial device not available and continuous pressure monitoring can be assured.
        i. Follow device manufacturers' recommendations for application and monitoring.
        ii. Apply tourniquet pressure only to point bleeding is controlled to preserve as much distal tissue as possible.
        iii. Record application time
        iv. Providers may immediately apply commercial tourniquets in the setting of severe, life-threatening bleeding to an extremity.
    F. Once bleeding is controlled, bandage dressing in place – do not rely on bandage to control bleeding.
3. Once bleeding is controlled, irrigate contaminated wounds with saline as appropriate (this may have to be avoided if bleeding was difficult to control). Consider analgesia per protocol prior to irrigation.
4. Cover wounds with sterile gauze/dressings. Check distal pulses, sensation, and motor function to ensure the bandage is not too tight.
5. Monitor wounds and/or dressings throughout transport for bleeding.
6. Document the wound and assessment and care in the patient care report (PCR).

Acetaminophen (Tylenol)	P
Indications:	Fever, Pain
ADULT Dose:	ADULT: 20mg/kg PO **TOXIC DOSE IS 150 mg/kg**
Contraindications:	Documented hypersensitivity
Pediatric Considerations:	15mg/kg PO Liquid solutions vary in concentration verify correct dose Do not exceed 5 doses in 24 hours
Precautions:	Use cautiously in patients with long term alcohol use Many OTC products contain APAP- Consider Toxicity
Adverse Effects:	Hypoglycemia Allergic reaction
Onset/Duration:	20-30 minute onset 4-6 hour duration
Classification:	Antipyretic, Analgesic
Action:	Antipyretic, Analgesic
Notes:	Caution with long term alcohol ingestion

Acetysalicylic acid/Aspirin (Bayer/Ecotrin)	R E A P
Indications:	Chest Pain with Suspected MI
ADULT Dose:	81mg X 4 tabs Chewable up to 325 mg PO
Contraindications:	Known Hypersensitivity
Pediatric Considerations:	Contraindicated
Precautions:	Toxic dose is 200-300 mg/kg
Adverse Effects:	Angioedema Occult Blood loss Nausea- GI upset Hepatotoxicity
Onset/Duration:	30-60 minute onset 4-6 hour duration
Classification:	Antiplatelet, Analgesic, Antipyretic, Anti-inflammatory
Action:	Inhibition of platelet aggregation and platelet synthesis Reduction of risk of death in patients with a history of myocardial infarction or unstable angina
Notes:	Salicylate Toxicity: tinnitus, nausea, vomiting,

Activated charcoal (Actidose-Aqua/Insta-Char)	E A P
Indications:	Suspected overdose or accidental ingestion of drugs or chemicals within 30 minutes.
ADULT Dose:	ADULT 50 grams PO/NG
Contraindications:	ALOC (may give via NGT with secured airway) Diminished or absent gag reflex Caustic, corrosive, or petroleum distillate ingestion
Pediatric Considerations:	PED 1 gm/kg PO/NG Do not use preparations containing sorbitol
Precautions:	Unpleasant taste be prepared for spitting or vomiting Use of straw may facilitate administration in adult patient
Adverse Effects:	Vomiting Aspiration
Onset/Duration:	Immediate onset 24 hour duration
Classification:	Chemical adsorbent
Action:	Inhibits gastrointestinal absorption of drugs or chemicals.
Notes:	Most effective if administered within 30 minutes of ingestion

Adenosine (Adenocard)	P
Indications:	Supra-ventricular tachyarrhythmias (stable)
ADULT Dose:	6 mg Rapid IVP followed with 10 -20 cc NS flush Repeat dose of 12 mg as indicated
Contraindications:	2nd or 3rd degree heart block — Sick sinus syndrome Hypersensitivity to adenosine — Relative contraindication in WPW
Pediatric Considerations:	0.1 mg/kg initial Repeat 0.2 mg/kg
Precautions:	Some Asthma patients may experience bronchoconstriction
Adverse Effects:	Headache — Dizziness Dyspnea — Nausea/vomiting Chest pressure — Transient asystole
Onset/Duration:	Immediate Onset 10 second duration
Classification:	Antidysrhythmic agent Endogenous purine nucleoside
Action:	Slows conduction through the A-V node, can interrupt the re-entry pathways through the A-V node
Notes:	Individuals with long term adjustment to nicotine or high doses of caffeine may require larger dose of Adenosine. Warn patient of unpleasant effects of medication PRIOR to administration
Drug : Drug interactions	Theophylline, nicotine, caffeine- may require higher doses

Albuterol (Proventil / Ventolin)	E A P
Indications:	Treatment of Bronchospasm in patients with reversible obstructive airway disease
ADULT Dose:	**E**: 1-2 puffs of patients OWN Metered Dose Inhaler (MDI), 2.5 mg SVN (with specialized training) **AP:**2.5 mg in 3cc NS via nebulizer May initiate continuous nebulizer for persistent distress. Do not exceed 15mg/ hr
Contraindications:	Known hypersensitivity Tachycardia (relative)
Pediatric Considerations:	2.5-10 mg as per Broselow tape
Precautions:	Cardiovascular disease Diabetes mellitus Hyperthyroidism
Adverse Effects:	Tachycardia Palpitations Dysrhythmias Nausea Hypertension Dizziness Restlessness
Onset/Duration:	5 minute onset 3-4 hour duration
Classification:	Bronchodilator
Action:	Relaxes bronchial smooth muscle by stimulating beta2 receptors resulting in bronchodilation
Drug : Drug interactions	Beta Blockers:Pt may not respond as effectively to medication Sympathomiemetics: additive effects

Amiodarone (Cordarone)	P
Indications:	VF/pulseless VT; pulsed wide-complex, Narrow complex tachycardia tachycardia; monomorphic sustained VT; SVT.
ADULT Dose:	VF/pulseless VT: 300mg IV/IO (dilute in NS/D5W 20cc). May repeat 150mg IVP x 1 in 5-10min. Max 450mg. VT, wide-complex tachycardia, narrow complex tachycardia: 150mg IV infusion over 10min (mix in NS/D5W 100cc).
Contraindications:	Known hypersensitivity; cardiogenic shock; bradycardia with ventricular escape beats; marked sinus bradycardia; 2nd or 3rd-degree AV blocks. Antiarrhythmics are not indicated for prophylactic treatment of ectopy or as a prophylactic post-arrest. Do not use with medications that prolong QT interval (procainamide).
Pediatric Considerations:	VF/pulseless VT: 5mg/kg IV/IO (dilute in NS/D5W 15cc). May repeat q 5-10min to max 15mg/kg. VT,wide-complex tachycardia, Narrow complex tachycardia: 5mg/kg IV/IO infusion over 20-60min (mix in NS/D5W 100cc),
Precautions:	Dosing varies for specific arrhythmias, pay attention to dosing/concentration for specific patient age and clinical presentation. Lidocaine should be used for pulsed patients. If allergic to lidocaine or if lidocaine is not carried or if amiodarone has already been given, then administer amiodarone. May potentiate effects of oral anticoagulants, digoxin, antiarrhythmics and cyclosporine. Amidarone will effect Lidocane if the two agents are used together.
Adverse Effects:	Flushing; N/V; HA; tinnitus; blurred vision; dizziness; restlessless; confusion; tremors; numbness; hypotension; edema; CHF; dysrhythmias; SA node dysfunction; bradycardia (may be resistant to atropine and require pacing); Q-T prolongation; heart block; sinus arrest; abdominal pain; muscle twitching; seizures, respiratory depression. Phlebitis may occur at IV site with higher concentrations. May cause grayish-blue skin discoloration. Discontinue if significant adverse effects occur.
Onset/Duration:	Onset via IV 15min/half-life 40 days.
Classification:	Antiarrhythmic Class III; has effects in all four classes. Class I – sodium channel blockade; Class II – noncompetitive alpha and beta-adrenergic inhibition; Class III – prolonged repolarization and refractoriness by increased action potential duration; and Class IV – slight calcium channel blockade.

Amiodarone (Cordarone) *continued*	P
Action:	Suppresses ventricular ectopy, increases ventricular fibrillation threshold; increases cardiac refractory period without influencing resting membrane potential; relaxes vascular smooth muscle, reduces peripheral vascular resistance, and slightly increases cardiac index.
Notes:	Amiodarone will form precipitate in IV lines if combined with aminophylline, heparin sodium or sodium bicarbonate. If sodium bicarbonate needs to be administered, after amiodarone flush IV line with NS 10-20cc. Also precipitates with cefamandole nafate, cefazolin sodium and mezlocillin sodium, Amiodarone leeches plasticizers from IV tubing and IV bags; bags should be mixed and run when needed. Do not premix or save unused mixed bags.

Atropine (Atreza)	P
Indications:	Symptomatic bradycardia Pulseless electrical activity HR < 60 (PEA) Organophosphate poisoning (OPP) Oral secretions for palliative care
ADULT Dose:	Bradycardia: 0.5- 1 mg IV / IO q 3-5 min to maximum of 3 mg PEA HR < 60: 1 mg IV / IO q 3-5 minutes to maximum of 3mg Organophosphate Poisoning: 2 mg IV / IO q 3-5 minutes until Oral secreations improve Oral secretions: add 2-4 drops in oral cavity
Contraindications:	Non symptomatic bradycardia (Relative: Asthma, Myasthenia Gravis, narrow angle glaucoma)
Pediatric Considerations:	Organoshosphate poisoning 0.08 mg/Kg IV/IO Contraindicated in neonates Sequenced intubation adjunct 0.02 mg/kg
Precautions:	Use with caution in patients with suspected acute myocardial infarction (AMI) Will not be effective for Type II AV Block and new Third Degree Block with wide QRS complexes (In these patients may cause paradoxical slowing. Be prepared to pace).
Adverse Effects:	Tachycardia Increased myocardial 02 demand Palpitations Nausea/vomiting Dilated pupils Increased intraocular pressure
Onset/Duration:	2-5 minute onset 20 minute duration
Classification:	Parasympathetic blocker (Anticholinergic) Antidysrhythmic agent
Action:	Blocks acetylcholine receptors, Decreases vagal tone resulting in increased heart rate and AV conduction, Dilates bronchioles and decreases respiratory tract secretions, Decreases gastrointestinal secretions and motility

Bumetanide (Bumex)	P
Indications:	Pulmonary edema
ADULT Dose:	0.5 to 2mg IV/IO to maximum of 10 mg as a daily dose
Contraindications:	Anuria, hepatic encephalopathy, hepatic coma
Pediatric Considerations:	NONE
Precautions:	Patients using potassium depleting steroids, h/o lupus, h/o hepatic cirrhosis, increased risk of hypokalemia in patient taking digoxin, dehydration, pneumonia. Potential crossreactivity with SULFA allergy.
Adverse Effects:	Hypotension, electrolyte imbalance, transient hearing loss.
Onset/Duration:	5-10 minutes for preload reduction, 30 min for diuresis onset 2-4 hours duration
Classification:	Non-potassium sparing loop diuretic
Action:	Inhibits sodium and chloride re-absorption in the proximal loop of Henle promoting excretion of sodium, water, chloride, and potassium. Also reduces cardiac preload by increasing venous capacitance.
Notes:	Bumetanide 0.5 mg IV = Furosemide 20mg IV Bumetanide 1 mg IV = Furosemide 40mg IV Bumetanide 2 mg IV = Furosemide 80mg IV

Calcium Chloride (CaCl2)	P
Indications:	Hyperkalemia specific arachnid envenomation Over dose of calcium channel blockers Hypermagnesemia Crush Syndrome
ADULT Dose:	10 to 20 mg/kg slow IV /IO
Contraindications:	VF (unless due to hyperkalemia) Hypercalcemia
Pediatric Considerations:	DOSE : 10 mg/kg IV/IO
Precautions:	Causes tissue necrosis if injected into interstitial space Precipitates with sodium bicarbonate May increased digoxin toxicity Clear IV with 20cc NS before and after administration
Adverse Effects:	Bradycardia, hypotension, syncope
Onset/Duration:	5 to 15 minute onset duration is dose dependent, effects may persist for up to 4 hrs
Classification:	Electrolyte
Action:	Couples electrical and mechanical events of the myocardium Increases myocardial contractility Increases ventricular irritability
Notes:	200mg IV prophylactic to diltiazem admin in elderly dehydrated or drug-induced hypotension

Clopidogrel Bisulfate (Plavix)	P
Indications:	STEMI confirmed with Medical Control authorization required
ADULT Dose:	300mg PO with TNKase 600mg PO with primary PCI
Contraindications:	Active pathological bleeding, bleeding conditions/disorders (hemophilia), peptic ulcer Intracranial hemorrhage Recent surgery, recent serious injury (physical trauma)
Precautions:	Avoid concomitant use CYP2C19 inhibitors (e.g., omeprazole) medications
Adverse Effects:	Bruising, bleeding
Onset/Duration:	2 hrs onset 7-10 day duration
Classification:	Anti-platelet, thienopyridine class inhibitor
Action:	Inhibits platelets' ability to clump together as part of blood clot. Inhibitor of adenosine diphosphate (ADP) induced platelet aggregation acting by direct inhibition of ADP binding to its receptor and of subsequent ADP-mediated activation of glycoprotein GPIIb/IIIa complex.

Dexamethasone (Decadron)	P
Indications:	Counteract allergic anaphylactic shock. RAD, bronchospasm, croup
ADULT Dose:	4 to 8 mg intravenously
Contraindications:	Hypersensitivity to the product
Pediatric Considerations:	0.6 mg/kg IV/IO/IM max dose 16 mg
Precautions:	Use cautiously with renal or hepatic disease; hypothyroidism, ulcerative colitis with impending perforation; diverticulitis; active or latent peptic ulcer; inflammatory bowel disease; CHF, hypertension, thromboembolic disorders; osteoporosis; seizure disorders; diabetes mellitus; lactation.
Adverse Effects:	Stomach upset, headache, dizziness
Onset/Duration:	4-8 hours onset 24 -72 hours duration
Classification:	Glucocorticoid.
Action:	Enters target cells and binds to specific receptors, initiating many complex reactions that are responsible for its anti-inflammatory and immunosuppressive effects.

Dextrose / D50W / D25W (DGlucose)	A P
Indications:	Hypoglycemia Hyperkalemia with concurrent insulin administration Altered level of consciousness due to suspected or confirmed hypoglycemia
ADULT Dose:	12.5 to 25 g IV / IO repeat dose to maximum of 50 g
Contraindications:	Hyperglycemia
Pediatric Considerations:	DOSE: 0.5gm/kg D25% DILUTE D50% 1:1 to D25% with NS
Precautions:	Causes tissue necrosis if injected into interstitial space May increase cerebral ischemia in CVA Caution with intracranial hemorrhage
Adverse Effects:	Thrombophlebitis Osmotic Diuresis Pulmonary Edema May worsen Wernicke's encephalopathy
Onset/Duration:	30 to 60 seconds onset duration depends on severity of hypoglycemia
Classification:	Hyperglycemic agent Hypotonic solution
Action:	Provide immediate source of glucose for rapid utilization for cellular metabolism
Notes:	Follow with complex carbohydrate if leaving patient at home

Diazepam (Valium)	P
Indications:	Major motor seizures, status epilepticus, premedication for painful procedures, combative patients, anxiety
ADULT Dose:	Sedation and pain management 2-5 mg IV/IO for procedural Seizures 5mg IV over 2 minutes, 10 mg PR, or 2-5 mg IM Eclamptic seizures 2-5 mg IV q5min for effect or 10 mg PR
Contraindications:	Hypotension
Pediatric Considerations:	Sedation and pain management 0.1mg/kg IV/IO Seizures 0.1mg/kg IV over 2 minutes, or 0.5 mg/kg PR MAX DOSES: 5 mg in children and 10 mg in adolescents
Precautions:	Inject slowly, do not use small veins. Use caution in elderly patients.
Adverse Effects:	Hypotension Respiratory depression
Onset/Duration:	IV 1-5 minute onset, 15-60 minute duration IM 15-30 minute onset, 15-60 minute duration
Classification:	Benzodiazepine
Action:	Suppresses spread of seizure activity through the motor cortex, skeletal muscle relaxant, reduces anxiety and causes sedation
Notes:	Intramuscular administration leads to widely variable absorption and should be avoided if possible. **Diastat – EMT, AEMT's may administer patients own prescription ONLY with specialized training** E A

Diltiazem (Cardizem)	P
Indications:	A fib A flutter PSVT
ADULT Dose:	10-25 mg IV/IO may repeat dos, max dose 0.25 to 0.35 mg/Kg
Contraindications:	Concurrent use of IV beta-blockers Wide complex tachycardia of unknown etiology Sick Sinus Syndrome WPW High Degree AV Blocks
Precautions:	May precipitate with use of furosemide Use cautiously in elderly patients Congestive Heart Failure Not recommended in pediatric patients Calcium chloride 200 mg IV prophylactic in elderly dehydrated or drug-induced hypotension
Adverse Effects:	Arrhythmias Bradycardia Hypotension Heart Failure AV block Pulomnary edema
Onset/Duration:	2 to 10 minute onset, 1-3 hour duration
Classification:	Calcium channel blocker
Action:	Inhibit calcium ion passage across cell membrane Slows SA and AV node conduction velocity Decreases myocardial contractility Decreases peripheral vascular resistance
Drug: Drug Interactions	Potentiates with Beta-Blocker, Lithium, Tegretol,cyclosporins

Diphenhydramine (Benadryl)	E A P
Indications:	Anaphylaxis Allergic reactions Dystonia Sedation Nausea Headache
ADULT Dose:	12.5 to 50 mg IV/IO/IM 12.5 to 50 mg PO (with specialized training) **E**
Contraindications:	Known hypersensitivity Newborns Acute asthma COPD exacerbation Relative: narrow angle glaucoma
Pediatric Considerations:	DOSE: 1 mg/kg IV/IO/IM 1 mg/kg PO (with specialized training) **E**
Precautions:	Reduce dose for elderly
Adverse Effects:	Seizures Sedation Thickening of Bronchial Secretions
Onset/Duration:	IV administration has immediate onset 6 to 8 hour duration
Classification:	Antihistamine
Action:	Prevents but does not reverse histamine mediated responses suppresses cough reflex
Drug: Drug Interactions	Potentiates CNS depressants

Epinephrine (Adrenaline) E A P

Indications:	Cardiopulmonary arrest: ventricular fibrillation pulseless ventricular tachycardia pulseless electrical activity Anaphylaxis Status Asthmaticus Profound Refractory Hypotension asystole
ADULT Dose:	**A** **P** <u>Cardiopulmonary arrest:</u> If EtCO2 > hold Epinephrine If arrest from BRONCHOSPASM, ANAPHYLAXIS OR HYPOTENSION then 1 mg 1:10,000 IV/IO q 3-5 min. EtCO2 10-19, 100 to 300 mcg 1:10,000 IV/IO q3-5 min EtCO2 9 or less, 300 to 700 mcg 1:10,000 IV/IO q 3-5 min <u>Anaphylaxis:</u> **E** 0.1-0.3 mg of 1:1,000 IM q 10-20 mins. X 2, **R** **(Auto-Injector)** <u>Status Asthmaticus:</u> 0.3 mg of 1:1000 SQ q 20 minutes X 2 <u>Profound Refractory Hypotension:</u> 2-10 mcg/min IV infusion mix one milligram of 1:1,000 epinephrine in 250 cc normal saline for a concentration of 4mcg/cc
Pediatric Considerations:	Dose 0.01 mg/kg 1:1,000 IM/IV/IO max 0.3mg Nebulized for respiratory emergencies see pediatric protocols
Precautions:	Use caution when given IV in anaphylactic shock as myocardial ischemia and or cardiac arrest may occur.
Adverse Effects:	Hypertension Tachycardia Increased myocardial oxygen demand
Onset/Duration:	Onset: Immediate if given IVP / 5-10 minutes SQ/IM Duration: 3-5 minutes IVP / 20 minutes SQ/IM
Classification:	Sympathomimetic agent (catecholamine)
Action:	Beta effect is more profound than Alpha effect
Notes:	Epinephrine is the pressor of choice in the case of pediatric shock states. Dopamine may be ineffective.

1 mg epinephrine 1:1,000 in 250 cc = 4 mcg/ cc use 60gtt tubing

Mcg/ min	2	4	6	8	10
administer	30 gtt/min	60 gtt/min	90 gtt/min	120 gtt/min	150 gtt/min

Etomidate (Amidate) P

Indications:	Induce sedation to facilitate intubation. Procedural Sedation
ADULT Dose:	0.1-0.3 mg/kg IV over 15-30 seconds
Contraindications:	Hypersensitivity Pregnancy
Pediatric Considerations:	0.1 - 0.3 mg/kg IV over 15-30 seconds
Precautions:	Do not re-dose with etomidate. Long term use can cause decreased corticosteroid production.
Adverse Effects:	Myoclonic skeletal muscle movement, apnea, hyperventilation, laryngospasm, dysrhythmias, nausea, vomiting, eye movement, hiccups, snoring, seizures
Onset/Duration:	15-20 seconds onset 5-10 minutes duration * Half life 75 mins.
Classification:	Hypnotic, non sedative, non narcotic, non analgesic
Action:	Ultra short acting, nonbarbituate hypnotic. Produces rapid induction of anesthesia with minimal cardiorespiratory effects. Rapidly distributed following IV injection/ rapidly metabolized and excreted. (note extremely short duration)
Notes:	MUST Use sedative (ativan/ versed) for intubation maintenance.

Wt in lbs	**100**	**110**	**120**	**130**	**140**	**150**	**160**	**170**	**180**	**190**	**200**
WT in kg	45	50	54	59	64	68	73	77	82	86	91
Dose in mg	13 mg	15 mg	16 mg	18 mg	19 mg	20 mg	22 mg	23 mg	25 mg	26 mg	27 mg

Wt in lbs	**210**	**220**	**230**	**240**	**250**	**260**	**270**	**280**	**290**	**300**
WT in kg	95	100	104	109	113	118	122	127	132	136
Dose in mg	28 mg	30 mg	31 mg	33 mg	34 mg	35 mg	37 mg	38 mg	40 mg	41 mg

Famotidine	P
Indications:	Allergic reaction, anaphylaxis
ADULT Dose:	20 mg IV/IO
Contraindications:	Known allergy to Famotidine or anti-histamines
Pediatric Considerations:	0.25 mg/kg IV/IO
Precautions:	May interact with antivirals, oral antifungals
Adverse Effects:	Headache, dizziness
Onset/Duration:	Onset 20 min, Duration (half-life) 4 hours
Classification:	Histamine-2 blocker, antihistamine
Action:	Blocks Histamine-2 receptors and prevents histamine mediated responses.

Fentanyl (Sublimaze)	P
Indications:	Analgesia, Pulmonary Edema, Acute MI, Palliative Care
ADULT Dose:	1 mcg/Kg IV/IO/IM, max initial dose 100mcg, max accumulative dose 2 mcg/kg 25 mcg in 2 mL NS by SVN
Contraindications:	Known hypersensitivity
Pediatric Considerations:	DOSE: 1 mcg/kg IV/IN/IM, max initial dose 100 mcg, max accumulative dose 2 mcg/kg
Precautions:	Head injuries, COPD, ALOC, Hypotension
Adverse Effects:	CNS depression, resp. depression, hallucinations, hypotension, hypertension, arrythmias, n/v, constipation, Chest wall rigidity
Onset/Duration:	Onset- 1-2min IV, 7-15min IM Duration- ½ - 1hr IV, 1-2hr IM
Classification:	Opiod agonist/ narcotic analgesic
Action:	Binds to opiate receptors as an agonist to alter pt's perception of painful stimuli.
Notes:	CNS and resp. depressant effects are similar to Morphine. Drug has little hypnotic activity and rarely causes histamine release.

Furosemide (Lasix)	P
Indications:	Pulmonary edema
ADULT Dose:	40mg-80mg (or double pt's daily dose up to 100mg) slowly * can be dosed at 0.5-1.0 mg/kg
Contraindications:	Dehydration/ hypovolemia, hypokalemia, hepatic coma
Pediatric Considerations:	2 mg/kg
Precautions:	Pt's using potassium depleting steroids, hx of lupus, hx of hepatic cirrhosis, increased risk of hypokalemia in pt's taking digoxin, dehydration or pneunomia
Adverse Effects:	Hypotension, electrolyte imbalance, transient hearing loss
Onset/Duration:	Onset 5 min for preload reduction, 30 min for diuresis. Duration ~2 hours.
Classification:	Non-potassium sparing loop diuretic
Action:	Inhibits sodium and chloride re-absorption in the proximal loop of henle promoting excretion of sodium, water, chloride, and potassium. Also reduces cardiac preload by increasing venous capacitance.

Glucagon	P
Indications:	Hypoglycemia, Beta-blocker OD, Calcium channel blocker OD
ADULT Dose:	Hypoglycemia- 1.0mg IM / IN Ca++ and beta-blocker OD- 3-5mg IV/ IM / IN
Contraindications:	None in emergency setting
Pediatric Considerations:	Dose: 0.1mg/kg up to 1mg IM
Precautions:	**Do not dilute with saline solutions, will form a precipitate**.
Adverse Effects:	Nausea & Vomiting, hyperglycemia, hypersensitivity reactions
Onset/Duration:	Onset is 5-20 minutes, peak effect at 30 minutes. Duration is 1-1.5 hours
Classification:	Polypeptide hormone
Action:	Accelerates liver glycogenolysis and inhibits glycogen synthetase resulting in blood glucose elevation. Stimulates hepatic gluconeogenesis and causes an inotropic myocardial effect. Relaxes GI smooth muscle
Notes:	Reconstitute powdered solution with supplied dilutent only If given IV, flush line with D-5% instead of NS solution.

Glucose Oral (Glucose Paste)	R E A P
Indications:	Hypoglycemia in conscious patient that is able to swallow.
ADULT Dose:	One tube PO- between cheek and gum
Contraindications:	Unconsciousness, inability to swallow, hyperglycemia
Pediatric Considerations:	One tube PO
Precautions:	Not tasty, watch for spitting
Adverse Effects:	Choking if not properly administered
Classification:	Carbohydrate
Action:	Rapidly metabolized source of calories in pt's with inadequate oral intake.
Notes:	Perform glucose check before and after administration of Glucose. Follow with complex carbohydrate if leaving patient at home.

Heparin Sodium	P
Indications:	Confirmed STEMI in accordance with STEMI triage procedures.
ADULT Dose:	60U/kg IV bolus to max 4,000U (if >100kg max 5,000U); 12U/kg/hr IV drip to max 1,000U/hr
Contraindications:	Allergy to heparin, thrombocytopenia, hemophilia
Precautions:	Increased risk of bleeding w/ bleeding/clotting disorders (hemophilia), GI ulceration, bacterial endocarditis Recent surgery Derived from porcine intestinal mucosa, avoid if allergic to pork
Adverse Effects:	Bleeding, Heparin induced thrombocytopenia, Hyperkalemia (5-10%)
Onset/Duration:	onset immediate duration 1.5 hours
Classification:	Injectable anticoagulant
Action:	Binds to and activates antithrombin III which binds to and inactivates thrombin. This inhibits further clot formation.
Notes:	Invert infusion solution periodically to prevent pooling Do not mix in same line with droperidol

Hydromorphone (Dilaudid)	P
Indications:	Moderate to severe pain.
ADULT Dose:	0.5mg IV q 3-5 min total of 4mg (caution in elderly) 1-2mg IM
Contraindications:	Hypotension SBP <110 CNS depression Respiratory depression RR<12 Head Injury Current nausea or vomiting (prior to anti-emetics)
Pediatric Considerations:	0.015 mg/kg IV/IM
Precautions:	Caution should be used in patients who have taken other central nervous depressants, narcotic analegesics, sedative/hypnotics, or tricyclic antidepressants.
Adverse Effects:	Respiratory depression Increased sedation Headache Abdominal pain Decreased LOC Impaired mental status Nausea/vomiting
Onset/Duration:	Onset: IV – Immediate IM – 7-15 minutes Duration: 4-5 hours
Classification:	Narcotic analgesic, Opiate
Action:	Decrease sensitivity to pain, Stimulates variety of opioid receptors
Notes:	This is a strong narcotic. Start with low doses given slowly and add additional low doses as needed. One mg of hydromorphone is equal to 7mg of morphine

Insulin	P
Indications:	Insulin is a naturally-occurring hormone in the body that causes the uptake of glucose by the cells, decreases blood glucose, and promotes glucose storage. Used in the treatment of Type 1 diabetes, Type 2 diabetes that cannot be controlled by diet or oral agents, and severe diabetic ketoacidosis (DKA). Also used for hyperkalemia (high potassium), especially in patients needing renal dialysis.
Contraindications:	Glucose level below 70
Adverse Effects:	Metabolic: Hypoglycemia, Hypokalemia
Notes:	**For Critical Care Inter-facility Transport Only** Regular Insulin must be infused via an infusion pump. Be sure to get separate vial in order to bolus from the hospital prior to leaving hospital.

Ipratropium (Atrovent / Ipramide)	E A P
Indications:	Bronchospasm due to reactive airway diseases Organophosphate poisoning
ADULT Dose:	0.5 mg via nebulizer q 6-8 hours
Contraindications:	Known Hypersensitivity
Pediatric Considerations:	0.25 mg SVN under 6 years old and 0.5 mg SVN over 6 years old
Precautions:	Should be used with caution in patients with narrow-angle glaucoma.
Adverse Effects:	Anxiety Palpitations Nausea/ vomiting
Onset/Duration:	15-30 minute onset 5-7 hour duration
Classification:	Anticholenergic bronchodilator
Action:	Blocks acetylcholine receptors Dries respiratory tract secretions Reduces bronchospasm

Ketamine	P
Indications:	Induction agent for rapid sequence intubation (RSI) Treatment for Excited Delirium A condition that manifests as a combination of delirium, psychomotor agitation, anxiety, hallucinations, speech disturbances, disorientation, violent and bizarre behavior, insensitivity to pain, elevated body temperature and superhuman strength. As the EDC patient may have hyperthermia, which can be made worse with Ketamine, you must immediately address the hyperthermia as soon as you have control of the patient with the Ketamine. Inter-facility transport for pain control with initial doses and guidelines for repeat doses set by the hospital staff to include guidelines for epidural doses. Pain control via epidural or IV should be a just in time training via the anesthetist. Doses should be started and adjusted per the transferring physician recommendations. Reactive Airway Sedation Infusion 1000 mg in 250 mL NS (4mg/mL)
ADULT Dose:	RSI: 1-2 mg/kg IV push; 4-5 mg IM Excited Delirium: 5-10mg/Kg IM Sedation: Infusion 0.5 to 2 mg/kg/hr
Contraindications:	RSI: Severe Hypertension, Severe Hyperthermia…be prepared to cool immediately

Ketamine *continued*	**P**
Pediatric Considerations:	RSI: 0.5 to 1 mg/kg IV over one minute; 4-5 mg IM Sedation: Infusion 0.5 to 2 mg/kg/hr Pain: 0.1 mg/kg IV/IO max cumulative dose 1.5 mg/kg
Precautions:	RSI: Increased blood pressure due to catecholamine release. Reemergence phenomenon. As with any intubated patient, continued sedation must be provided before the induction agent has worn off. Increased intracranial pressure (ICP) has been a theoretical concern, however studies have not shown a significant increase in ICP with the use of ketamine and therefore it is felt to be an appropriate induction agent for patients with possible increased ICP, unless they have markedly elevated blood pressure.
Adverse Effects:	Excited Delirium: Laryngospasm, hyper salivation, nausea/vomiting, arrhythmias, emergence delirium, hallucinations, elevated BP, hypotension, documentation or observation of worsening hyperthermia
Onset/Duration:	Excited Delirium: Adults: IV 30 sec; duration 5-10 min for 2 mg/kg; IM 3-4min, duration 12-25 min; Pediatrics: IV 30-120 sec; duration 20-60 min; IM 5-10 min, duration 30-90 min
Classification:	General dissociative anesthetic
Action:	Dissociative anesthetic agent, structurally similar to phencyclidine (PCP), which interrupts the connection between the thalamo-neocortical tracts and the limbic system. In addition, it stimulates many different receptors, including the opioid and catecholamine receptors. It is unique among sedative agents in that it also provides analgesia in addition to the amnestic and sedative effects. The sympathomimetic effects cause an increase in heart rate, blood pressure, and cardiac output. It is also a bronchodilator, and thus may be beneficial in patients with bronchospasm requiring intubation.
Notes:	When elevated ICP is suspected, consider using a lower dose along with midazolam. Avoid in patients with severely elevated blood pressure; May increase respiratory secretions. Consider adjuvant use of anti-sialagogue such as atropine minimum dose 0.1mg

Ketorolac (Toradol)	P
Indications:	Renal colic/calculi (abdominal/flank pain) Muscular skeletal pain
ADULT Dose:	Renal colic/calculi 30 mg IM, 15 mg IV ½ dose for >65 years old
Contraindications:	Documented hypersensitivity to ASA or other NSAID's, bleeding disorders, renal impairment, active peptic ulcer, nursing mothers, labor & delivery. Suspected or possible dissecting AAA. On any anti-coagulant.
Pediatric considerations:	Pain 1 mg/kg IM or 0.5 mg/kg IV to maximum dose of 30 mg IM or 15 mg IV
Precautions:	Patients that are > 65 y/o or < 50 kg should receive ½ dose. Use extreme caution in elderly and hepatic dysfunction pts.
Adverse Effects:	Possible anticoagulation effects, anaphylaxis, drowsiness, sweating/diaphoresis, nausea, pain at injection site.
Onset/Duration:	IM: 45-60 minutes onset 4-6 hours duration
Classification:	NSAID, analgesic, antipyretic
Action:	Inhibits synthesis of prostaglandins

Labetalol (Trandate, Normodyne)	P
Indications:	Hypertension (SBP > 180 or DBP > 105 atraumatic neurologic deficits. **If treating hypertension must call for Medical Control MD approval prior to admin unless in another specific protocol.**
ADULT Dose:	10 mg slow IV, may repeat 10-20 mg q 10mins IV slow bolus over 2 mins until desired supine blood pressure obtained; or 200mg placed in 500ml D5W to deliver at 2mg/min IV drip rate. Max total 300mg.
Contraindications:	COPD, asthma, CHF, 2nd & 3rd heart block, bradycardia, cardiogenic shock
Precautions:	Pt placed in supine position. BP, HR & EKG monitored. Atropine and TCP available.
Adverse Effects:	Bronchospasm, CHF, heart block, bradycardia, postural hypotension, nausea
Onset/Duration:	5 mins onset duration dose dependent
Classification:	Sympathetic Alpha-1, non-selective Beta Blocker
Action:	Blocks adrenergic receptors which decreases peripheral vascular resistance without significantly altering heart rate or cardiac output: non-selective beta blocker with intrinsic anti-sympathomimetic activity, plus alpha blockade.
Drug:Drug Interactions:	Beta-receptor agonists, verapamil, cimetidine, precipitate forms with furosemide.
Notes:	Reduce BP ≤20% first hr then toward 160/100mmHg within next 2–6hrs. Pt with chronic HTN may not tolerate "normal" BP. Excessive rapid BP reduction may precipitate coronary, cerebral, or renal ischemia. Maintain supine position x 3hrs min. Pregnancy Cat C use only if potential benefits justify potential risk to fetus/nursing infant.

Lidocaine (Xylocaine) P

Indications:	First line antiarrythmic in pregnancy VT/VF VT with pulse Symptomatic PVCs
ADULT Dose:	**VF/VT**- 1 mg/kg IV / IO q 5-10 min. Max 3 mg/kg. **VT w/ pulse**- 1 mg/kg IV/ IO, then 0.5-0.75mg/kg q 5-10 min. up to 3 mg/kg **Run of 6 or more Symptomatic PVC's**- 0.5-1 mg/kg IV/IO then 0.5-0.75mg/kg q 5-10min up to 3 mg/kg.
Contraindications:	High degree heart blocks Stokes-Adams syndrome hypotension WPW SVT Bradycardias
Pediatric Considerations:	**VF/VT**- 1mg/kg IV / IO q 10 min. Max 3 mg/kg **VT w/ pulse**- 1mg/kg IV/ IO, q 10 min. up to 3 mg/kg Drip 2-4mg/min following conversion
Precautions:	Caution in use with pts >70 y/o or with liver or renal disease, CHF, resp depression, shock. Reduce maintenance infusion by 50%
Adverse Effects:	Seizures, slurred speech, altered mental status
Onset/Duration:	Onset- 45-90 seconds Duration- 10-20 minutes
Classification:	Amide derivative, antiarrythmic
Action:	As an antiarrhythmic, it suppresses automaticity and shortens the effective refractory period and action potential duration of His-Purkinje fibers and suppresses spontaneous ventricular depolarization during diastole by altering sodium permeability through cellular fast channel membranes. The drug acts preferentially on diseased or ischemic myocardial tissue, exerting its effect on the conduction system by inhibiting re-entry mechanisms and halts ventricular arrhythmias.

Drip – mix 1G/250ml D5W using 60gtt set

4mg/ml:	1mg	2mg	3mg	4mg
gtts/min:	15gtt	30gtt	45gtt	60gtt

Lorazepam (Ativan)	P
Indications:	Seizures Sedation Anxiety Intubation maintenance
ADULT Dose:	0.5 - 2 mg IV/IO/IN/IM. May repeat PRN
Contraindications:	Narrow angle glaucoma, pregnancy (except for eclamptic seizures)
Pediatric Considerations:	0.1 mg/kg IV/IO/N/IM
Precautions:	Caution in use with pt's with renal or hepatic impairment. Increased CNS depression in pts intoxicated or on other depressant type drugs.
Adverse Effects:	Orthostatic hypotension, drowsiness, respiratory depression, Tachycardia, confusion
Onset/Duration:	Onset 1-5 minutes IV, 15-30 minutes IM Duration 12-24 hours
Classification:	Benzodiazepine hypnotic
Action:	CNS depressant via facilitation of inhibitory neurotransmitter gamma-amiobutyric acid (GABA) at benzodiazepine receptor sites in the ascending reticular activating system. Effects include muscle relaxation, anticonvulsant activity and emotional behavior anxiolytic effects.
Notes:	**E** **A**, may assist caregiver with rectal administration of patient's own prescription **Lorazepam – EMT, AEMT's may administer patients own prescription ONLY with specialized training**

Magnesium Sulfate (MgSO4)	**P**
Indications:	Eclamptic seizures Torsades de Pointes refractory VF/VT refractory bronchospasm
ADULT Dose:	TdP/VF/VT: 2g IVP Eclamptic SZ: 4g IVP Breathing diff/RAD: 2g/100cc NS/D5W
Contraindications:	Renal disease, heart block, hypermagnesemia
Pediatric Considerations:	25-50 mg/kg IV/IO for V-fib/VT or difficulty breathing. SVN 300 mg under 20 Kg and 600 mg over 20 Kg.
Precautions:	Caution should be used in patients receiving digitalis as it may cause severe hypotension or cardiac arrest. Calcium chloride should be readily available as an antidote if respiratory depression results from treatment.
Adverse Effects:	hypotension, respiratory depression, bradycardia, dysrhyth-mias, cardiac arrest, CNS depression, flushing, sweating
Onset/Duration:	1-5 min onset approximately 30 min duration
Classification:	Electrolyte, anticonvulsant, antidysrhythmic
Action:	Decreases acetylcholine at neuromuscular junction (motor end plate), which is responsible for anticonvulsant properties; reduces SA node impulse formation and prolongs conduction time in the myocardium; Attracts and retains water in the intestinal lumen which distends the bowel to promote mass movement and relieve constipation
Drug : Drug interaction	Potentiates neuromuscular blockade produced by nondepolarizing paralytics (rocuronium/Zemuron, vecuronium/ Norcuron)

Methylprednisolone (Solu-Medrol/Amethapred)	P
Indications:	Allergic reaction Anaphylaxis Upper airway burns Reactive airway disease COPD exacerbations History of adrenal insufficiency associated with either serious trauma/illness or shock unresponsive to conventional therapy
ADULT Dose:	125 mg IV / IO / IM
Contraindications:	Preterm infants, Newborn, systemic fungal infections
Pediatric Considerations:	2 mg/kg IV / IO / IM
Precautions:	Use with caution in patients with G.I. bleeding, diabetes mellitus & severe infection
Adverse Effects:	Alkalosis, CHF, headache, hypertension, hypokalemia, seizures, nausea and vomiting
Onset/Duration:	Onset: 20 minutes-2 hours Duration: 18-36 hours
Classification:	Corticosteroid, glucocorticoid steroid, anti-inflammatory
Action:	Decreases inflammation by depressing migration of polymophonuclear leukocytes and activity of endogenous mediators of inflammation. Potentiates vascular smooth muscle relaxation by beta adrenergic agonists.
Notes:	Hypoglycemic responses to insulin and oral hypoglycemic agents may be blunted. Potassium depleting agents may potentiate hypokalemia induced by corticosteroids.

Metoprolol (Lopressor)		P
Indications:	Hyperdynamic ACS/STEMI	tachycardia
ADULT Dose:	2.5 - 5mg slow IV q 5min; to a maximum dose of 15 mg	
Contraindications:	Documented hypersensitivity Uncompensated congestive heart Failure cardiogenic shock AV conduction abnormalities	Asthma Bradycardia Pediatric
Precautions:	During IV administration, carefully monitor blood pressure, heart rate, and ECG. Goal of treatment is to reduce heart rate to 60-90 beats/min.	
Adverse Effects:	Hypotension, CHF, Dizziness, chest pain, headache, Bronchospasm, Bradycardia	
Onset/Duration:	Onset immediate, peaks in 20 minutes IV / Duration 5-8 hours	
Classification:	Beta-blocker	
Action:	Selective beta-1-adrenergic receptor blocker that decreases the automaticity of contractions (and thus heart rate). Negative inotropic and chronotropic effects are manifested by slowed AV conduction, antidysrhythmic effects, and decreased myocardial oxygen demand.	
Notes:	Use of Calcium channel blockers may potentiate side effects/adverse effects; toxicity of metoprolol may increase with coadministration of phenothiazines and calcium channel blockers; metoprolol may increase toxicity of digoxin, flecainide, clonidine, epinephrine, nifedipine, prazosin, verapamil, and lidocaine	

Midazolam (Versed)	P
Indications:	Sedation Seizure chemical restraint Nerve agent or organophosphate poisoning
ADULT Dose:	RSI: 2.5-10mg IV/IO over 2 minutes Chemical restraint: 2.5-5mg IM/IV/IN over 2 min, repeat PRN Seizure: 2.5-5mg IV/IO/IN/IM
Contraindications:	Hypersensitivity, OD of alcohol or other CNS depressants, depressed vital signs / hypoperfusion, acute narrow angle glaucoma, Pregnancy (except for eclamptic seizures)
Pediatric Considerations:	6 months to 5 years of age: Initial dose 0.05 to 0.1 mg/kg IV/IO/IN/IM. A total dose up to 0.6 mg/kg 6 to 12 years of age: Initial dose 0.025 to 0.05 mg/kg IV/IO/IN/IM; total dose up to 0.4 mg/kg may be needed to reach the desired endpoint but usually does not exceed 10 mg total.
Precautions:	Use caution in patients with renal impairment, history of COPD; may wish to double the IV dose when administering IM
Adverse Effects:	Respiratory depression or arrest, Hypotension, bradycardia, HA, N/V, pain at injection site, hiccups
Onset/Duration:	Onset IV/ IO: 1-3 min IM: approx 10-20 min duration of action is dose dependent
Classification:	Benzodiazepine, CNS depressant, anticonvulsant, amnestic, muscle relaxant
Action:	Potentiation of gamma aminobutyric acid (GABA) by binding to specific benzodiazepine receptors in the CNS; may act on limbic system and on the reticular formation
Notes:	Sedative effect potentiated by barbiturates, alcohol, and narcotics

Morphine	P
Indications:	Pain management, Pulmonary edema, Procedural sedation, Analgesia, ACS
ADULT Dose:	0.1 mg/Kg IV/IM/IO max initial dose 10 mg IV, and 15 mg IM
Contraindications:	Head injury, exacerbated COPD, depressed respiratory drive, hypotension, ALOC
Pediatric Considerations:	0.1 mg/kg IV/IM/IO, max initial dose 3 mg, max cumulative dose 0.3 mg/kg
Precautions:	Patients with acute bronchial asthma, chronic pulmonary diseases, severe respiratory depression, and pulmonary edema induced by chemical irritants.
Adverse Effects:	Respiratory depression, hypotension, ALOC, nausea & vomiting
Onset/Duration:	IV immediate onset, peak effect 20 min. IM/SQ 15-30 min. , peak effect 30-60 min. Duration 2-7 hours
Classification:	Narcotic analgesic
Action:	Narcotic agonist with activity at u-recptors (supraspinal analgesia, euphoria, respiratory and physical depression), K-receptors (sedation and myosis), and delta-receptors (dysphonia, hallucinations, respiratory and vasomotor stimulation)
Notes:	Naloxone and respiratory equipment should be immediately accessible.

Naloxone (Narcan)	R E A P
Indications:	Suspected or Known opiate overdose Altered level of consciousness
ADULT Dose:	0.4 - 4mg IV/IO/IN/IM A P, prn 0.4 - 4mg IN R E, prn
Contraindications:	None in the emergent setting
Pediatric considerations:	Dose : 0.1 mg/kg Max dose 2 mg Use caution in newborns (Physician order needed)
Precautions:	Rapid reversal of narcotic effects may lead to combative behavior and vomiting May not reverse hypotension For patients with chronic pain issues administer 0.4 mg increments until respirations improve
Adverse Effects:	Hypertension, Nausea, Vomiting, Tremors, Dysrhythmias
Onset/Duration:	IV/IO immediate SQ/ IM 5-10 minutes 20-30 minute duration IN onset 2-3 minutes
Classification:	Narcotic Antagonist
Action:	Competitively binds with opiate receptor sites in the CNS
Notes:	Synthetic opioids may need higher and repeated doses for clinical effect. Airway management and ventilatory support cannot be replaced with Naloxone therapy.

Nitroglycerin (NitroStat /NitroQuick) E A P

Indications:	ACS, Acute angina, MI, CHF with pulmonary edema
ADULT Dose:	0.4 mg SL q 3-5 minutes SBP >100 and patient is symptomatic Drip: Start at10mcg/min increase q 4-5 min titrate to effect to max 100 mcg/min Paste; 1-2 inches PRN
Contraindications:	SBP <100, Intracranial bleeding/head trauma Within 24 hours of erectile dysfunction or pulmonary hypertension medication Suldenafil (Viagra/Revation) or Vardenafil (Levitra) Within 48 hours of erectile dysfunction medication Tadalafil (Cialis)
Precautions:	Will cause severe loss of blood pressure if administered to a patient experiencing an inferior MI
Adverse Effects:	Hypotension, HA, syncope, reflex tachycardia, skin flushing
Onset/Duration:	Onset immediate, 0-3 minutes duration up to 30 minutes
Classification:	Nitrate
Action:	Causes relaxation of the vascular smooth muscle via stimulation of intracellular cyclic guanosine monophosphate production. This results in decreased preload, afterload, blood pressure, left ventricular workload and myocardial oxygen demand. Relaxes esophageal smooth muscle.
Notes:	Aspirin may increase nitrate serum concentrations; marked symptomatic hypotension may occur with coadministration of calcium channel blockers or beta-blockers (dose adjustment of either agent may be necessary)

Nitroglycerin Drip Chart
50 mg in 250 mL D5W

mcg/min	gtt/min (mL/hr)		mcg/min	gtt/min (mL/hr)		mcg/min	gtt/min (mL/hr)
5	1.5 gtt/min		64	19.5 gtt/min		125	37.5 gtt/min
10	3.0 gtt/min		70	21.0 gtt/min		130	39.0 gtt/min
15	4.5 gtt/min		75	22.5 gtt/min		135	40.5 gtt/min
20	6.0 gtt/min		80	24.0 gtt/min		140	42.0 gtt/min
25	7.5 gtt/min		85	25.5 gtt/min		145	43.5 gtt/min
30	9.0 gtt/min		90	27.0 gtt/min		150	45.0 gtt/min
35	10.5 gtt/min		95	28.5 gtt/min		155	46.5 gtt/min
40	12.0 gtt/min		100	30.0 gtt/min		160	48.0 gtt/min
45	13.5 gtt/min		105	31.5 gtt/min		170	51.0 gtt/min
50	15.0 gtt/min		110	33.0 gtt/min		180	54.0 gtt/min
55	16.5 gtt/min		115	34.5 gtt/min		190	57.0 gtt/min
60	18.0 gtt/min		120	36.0 gtt/min		200	60.0 gtt/min

Nitrous Oxide (Nitronox)	P
Indications:	Acute pain due to orthopedic trauma (i.e. soft tissue injury or suspected fracture), renal colic, burns, abdominal pain, moderate to severe pain, anxiety, apprehension
ADULT Dose:	Instruct the patient to inhale deeply through the demand valve and mask or mouth piece
Contraindications:	Head injury, Chest injury, EtOH and drug intoxication (relative) COPD, potential bowel obstruction, pregnancy
Pediatric Considerations:	Instruct the patient to inhale deeply through the demand valve and mask or mouth piece
Precautions:	Pregnancy safety: nitrous oxide increases the incidence of spontaneous abortion, ventilate patient area during use, nitrous oxide is a non-flammable and non-explosive gas, nitrous oxide is ineffective in 20% of the population, Oxygen flush after discontinuation of nitrous oxide. Use of nitrous oxide with patients who have been using cannabis can lead to potentiated effect of dysphoria and paranoia
Adverse Effects:	Drowsiness, Dizziness , Nausea/Vomiting
Onset/Duration:	onset: 2 - 5 minutes duration: 2 – 5 minutes
Classification:	Inhaled gaseous analgesic and general anesthetic

Norepinephrine Bitartrate (Levophed) P

Indications:	BP control in certain acute hypotensive states (MI, septicemia, blood transfusion, drug reaction). As an adjunct in treatment of cardiac arrest and profound hypotension not related to volume loss. Hypotensive refractory to other sympathomimetics. Neuogenic shock.
ADULT Dose:	4 mg in 250cc of D5W then titrate 2-20 mcg/min IV/IO. Adjust rate of flow to establish and maintain low normal BP (80-100mmHg systolic) sufficient to maintain vital organ circulation. In previously HTN pt, recommend BP rise no higher than 40mmHg below preexisting systolic BP. Turn drip off if blood pressure maintains at normal levels. Monitor BP q 2min until reach desired BP, then q 5 min with continued infusion. Rate of flow watched constantly; pt never left unattended.
Contraindications:	Sulfite allergy. Hypotensive states due to hypovolemia from blood volume deficits except emergency measure to maintain coronary and cerebral artery perfusion until blood volume replacement therapy completed. Mesenteric or peripheral vascular thrombosis.
Pediatric Considerations:	0.01-0.5mcg/kg/minute IV drip only (rarely used).
Precautions:	Can be deactivated by alkaline solutions. Infusion site in upper extremity large vein, AC if possible. Extravasation can cause tissue necrosis. Caution with occlusive vascular disease, elderly. Infusion site checked frequently for free flow. Blanching along course of infused vein, sometimes without obvious extravasation, attributed to vasa vasorum constriction with increased permeability of vein wall, permitting leakage. Extreme caution with MAOI or antidepressant triptyline or imipramine types per severe, prolonged hypertension. If continuous admin to maintain BP in absence of blood volume replacement, following may occur: severe peripheral, visceral vasoconstriction; decreased renal perfusion, urine output; poor systemic blood flow despite “normal” BP; tissue hypoxia; lactate acidosis. Avoid abrupt withdrawal.
Adverse Effects:	Anxiety, palpitations, hypertension, reflex bradycardia. VT/VF in pts with profound hypoxia or hypercarbia. Conventional dose with hypersensitive pt (hyperthyroid) or overdose may cause severe HTN, violent HA, photophobia, stabbing retrosternal px, pallor, intense sweating, vomiting.
Onset/Duration:	Rapid/1-2min following discontinuation of infusion.
Classification:	Sympathomimetic
Action:	Peripheral vasoconstrictor (alpha-adrenergic). Inotropic stimulator of heart and coronary artery dilator (beta-adrenergic).
Notes:	Elderly pt dose start at lower end, reflecting greater frequency of decreased hepatic, renal, and cardiac function. Admin in saline solution alone not recommended.

Mix 4mg into 250mLD5W — Final Concentration 16mcg/mL
Usual dose range 2-20mcg/min — Maximum dose 20mcg/min

Desired Dose (mcg/min)	4 mcg/min	8 mcg/min	12 mcg/min	16 mcg/min	20 mcg/min	24 mcg/min	28 mcg/min	30 mcg/min
Drip Rate (drops/min)	15 gtts/min	30 gtts/min	45 gtts/min	60 gtts/min	75 gtts/min	90 gtts/min	105 gtts/min	113 gtts/min

Ofirmev (IV Acetaminophen)	P
Indications:	Fever and analgesia
ADULT Dose:	1,000 mg IV over 15 min (greater than/equal to 50 kg)
Contraindications:	Allergy to acetaminophen
Pediatric Considerations:	15 mg/kg IV over 15 min
Precautions:	Severe liver disease, long term alcohol use, many OTC products contain acetaminophen.
Adverse Effects:	Hypoglycemia, allergic reaction, headache, nausea/vomiting
Onset/Duration:	Onset 15 min analgesia, 30 min antipyresis. Duration is 4 to 6 hours
Classification:	Analgesic and antipyretic
Action:	Analgesia, antipyresis

Ondansetron (Zofran)	E	A	P
Indications:	Nausea/ vomiting		
ADULT Dose:	4-8mg IV/IM/PO/SL 4 mg SL (with specialized training) E		
Contraindications:	Hypersensitivity, liver disease (reduce dose)		
Pediatric Considerations:	0.15 mg/kg IV/IM/PO Recommended for use in children greater than 2 years of age		
Precautions:	Maintain lower dose with amiodarone Maintain lower dose with liver disease Antiemetic of last choice in pregnancy		
Adverse Effects:	Rare hypersensitivity, fatigue, pyrexia, dizziness, headache, constipation, unirary retention.		
Onset/Duration:	Rapid onset duration 5 hours		
Classification:	Antiemetic		
Action:	Selective serotonin blocking agent		
Notes:	May precipitate with Sodium bicarbonate.		

Oxymetazoline (Afrin)	E A P
Indications:	Pre-medication for nasal intubation, Epistaxis
ADULT Dose:	2-3 puffs each nostril (on inhalation)
Contraindications:	Known hypersensitivity
Pediatric Considerations:	Children under 12 require diluted concentration
Precautions:	Hyperthyroidism, Cardiac Disease Hypertension, Diabetes mellitus, Simultaneous use of MAOI and ephedrine may result in Hypertensive crisis
Adverse Effects:	Cardiovascular collapse Hypertension palpitations
Onset/Duration:	Immediate onset 30min-4hour duration
Classification:	vasoconstrictor
Action:	Local vasoconstriction of dilated arterioles causing reduction of blood flow and reduction of nasal congestion

Oxytocin (Pitocin)	P
Indications:	Control of postpartum hemorrhage
ADULT Dose:	10 units IM then mix 20 units in 1000cc NS administered IV at 50-1000cc/hr to control postpartum hemorrhage
Contraindications:	Hypersensitivty Toxemia of pregnancy Undelivered placenta Undelivered baby
Precautions:	Status post cervical or uterine surgery, uterine sepsis, primipara after age 35
Adverse Effects:	HTN, subarachnoid hemorrhage, anxiety, dysrhythmias, tetany, uterine rupture, hyponatremia
Onset/Duration:	Onset IV: 1 min IM: 3-7 min Duration IV: 30 min with half-life of 12-17 min IM: 60 min with half-life of 12-17min
Classification:	Hormone
Action:	A synthetic water-soluble protein pharmacologically identical to the naturally-occurring oxytocin secreted by the posterior pituitary. Directly produces phasic uterine contractions characteristic of normal labor and delivery and to treat uterine atony.
Notes:	Additive effects with other vasopressors and ephedra, amphetamine or methamphetamines resulting in severe hypertension; rule out multiple fetuses.

Prednisone	P
Indications:	Reactive airway disease
ADULT Dose:	60 mg PO
Contraindications:	Systemic fungal infections
Pediatric Considerations:	1 – 2 mg/kg PO
Adverse Effects:	Prolonged wound healing, nausea & vomiting
Classification:	Glucocorticoid
Action:	Decreases inflammation by depressing migration of polymorphonuclear leukocytes and activity of endogenous mediators of inflammation.
Notes:	Attempt to administer medication with pudding or other palatable substance

Procainamide (Pronestyl)	P
Indications:	Suppressing PVCs refractory to Lidocaine Suppressing ventricular tachycardia (with a pulse) refractory to Lidocaine Suppressing ventricular fibrillation refractory to Lidocaine PSVT with wide-complex tachycardia of unknown origin (drug of choice when associated with WPW)
ADULT Dose:	Perfusing rhythm: loading dose 20mg/min IV infusion up to 17mg/kg followed by drip of 1-4mg/min (mix 2Grams/250cc NS for 8mg/cc). **Stop** if hypotension occurs or if QRS widens by 50%
Contraindications:	2nd & 3rd AV block Bradycardias Torsades Prolonged QT Lupus
Pediatric Considerations:	2-6mg/kg slow IV at 25 to 50mg/min
Precautions:	May exacerbate arrhythmias or produce paradoxical VT in Afib/Aflutter patients
Adverse Effects:	Anxiety, nausea, seizures, widening QRS, hypotension, CNS toxicity
Onset/Duration:	10-30 min onset 3-6 hours duration
Classification:	Anti-arrhythmic
Action:	Class 1A membrane stabilizer inhibits recovery after repolarization resulting in decreasing myocardial excitability and conduction velocity.
Notes:	Caution with concomitant use of other class 1A antiarrhythmics (Quinidine, TCA's), digoxin

Promethazine (Phenergan)	P
Indications:	Nausea /vomiting Analgesic potentiation
ADULT Dose:	6.25-12.5 mg slow IV/IO/deep IM (if ≥ 60 y/o 12.5 mg IV/IO/IM) start at 6.25 mg and titrate dose to desired effect **Must be diluted aprox 1 : 10**
Contraindications:	Documented hypersensitivity Comatose patients Debilitated patients (signs of dehydration and weakness) Glaucoma Concomitant CNS depressant use/administration Children under age 2
Precautions:	Avoid SQ administration **Give slowly**-rapid administration can cause vein irritation, phlebitis and sclerosis Avoid concomitant use with epinephrine as it may result in hypotension Watch for signs/symptoms of excessive sedation. Dystonic reaction (treat with Diphenhydramine)
Adverse Effects:	Reduces seizure threshold May reduce seizure threshold in heatstroke patients. Drowsiness, sedation, ALOC, allergic reaction, dysrhythmia, nausea and vomiting, hyperexcitability, dystonic (extrapyramidal) reaction and hypertension. **Use in children may cause hallucinations, convulsions and sudden death.**
Onset/Duration:	Onset: IV, 5 minutes; IM, 20 minutes Duration: 4-6 hours
Classification:	Anti-emetic, phenothiazine, antihistamine, H_1 receptor antagonist, antivertigo agent and antitussive
Action:	Blocks cholinergic receptors in the vomiting center, which mediate nausea and vomiting; competes with histamine for the H_1 receptor site.
Notes:	In case of dystonic reaction, treat with diphenhydramine. Promethazine decreases the effects of anticoagulation therapy.

Propofol	P
Indications:	**FOR INTERFACILITY TRANSPORT** The infusion must be initiated by transferring hospital, Verify infusion rate prior to departing hospital. Insure that drip chart comes with medication, verify CXR, verify arterial blood gas and VS are within norms **PATIENTS IN CRISIS (EXCITED DELIRIUM CONDITION)**- After initial control obtained, i.e. by police use of tasers or other means to include droperidol, midazolam or Ketamine, intubate the patient and then start an IV infusion with maintenance doses. See doses below. Do not discontinue until the **EMERGENCY DEPARTMENT PHYSICIAN TAKES OVER**. Decrease the infusion if hypotension, respiratory depression occur.
ADULT Dose:	20-50mg IV q 10 seconds until onset. (1-2.5mcg/kg/min) to desired sedation level. Maintenance BP >90 **Normal maintenance range: 10-20mg incremental IV bolus** Avoid rapid bolus. Do not abruptly stop drug Use dedicated line. Dilute only with normal saline to a concentration not less than 2mg/ml. Rate of administration-slow IVP
Contraindications:	Known hypersensitivity, known allergy to eggs or soy or propofol or peanuts
Pediatric Considerations:	2 mg/kg IV/IO additional doses of 1 mg/kg may be administered at two minute intervals
Adverse Effects:	Hypotension, respiratory depression, respiratory acidosis Most common adverse reaction: hypotension. If SBP< 90, give 500cc NS bolus (provided patient does not have pulmonary compromise) and turn drip rate down by 50%. Call Medical Control. Bradycardia, hypertension, Torsades de Pointes all respond to MgSO4. Other potential side effects include: Injection site pain, involuntary muscle movement, nausea and vomiting, anaphylaxis (rare) to soy and peanuts
Classification:	Sedative/hypnotic/anesthetic adjunct
Action:	CNS Depressant
Notes:	Monitoring: Continuous cardiac and pulse oximetry monitoring and ETC02 with blood pressure every 15 minutes; watch for hypotension, apnea, airway obstruction, oxygen desaturation, document ETCO2 wave form

Rocuronium (Zemuron)	P
Indications:	Need for aggressive airway control and maintenance using RSI
ADULT Dose:	0.6-1.2 mg/kg IV
Contraindications:	Muscular disorders Known hypersensitivity
Pediatric Considerations:	1 mg/kg IV
Precautions:	Not recommended for RSI in Caesarean patients or those over 65 years of age.
Adverse Effects:	Hypotension Altered mental status Increases pulmonary resistance
Onset/Duration:	Onset: 60-70 seconds Duration: 20+ minutes
Classification:	Nondepolarizing neuromuscular blocker
Action:	Neuromuscular blockade (Paralysis)
Notes:	Airway control equipment must be readily available. Intubation conditions expected in 1-2 minutes after injection. Consider lower doses in extremely debilitated patients.

Sodium Bicarbonate	P
Indications:	Cardiac arrest 2^0 to preexisting hyperkalemia or TCA OD with ECG changes of prolonged QT or QRS, or with seizures with VF/VT arrest in setting of meth/cocaine overdose. Consider in prolonged arrest.
ADULT Dose:	**8.4%** - 1 mEq/kg IV, then 25 mEq in 250ml NS and run 250 ml/hr
Pediatric Considerations:	**4.2%** - 1 mEq/kg IV/IO May achieve 4.2% solution with equal volumes of 8.4% solution and sterile water, mix well.
Precautions:	Do not administer in the same IV with calcium chloride Prepare to ventilate patient.
Adverse Effects:	Metabolic alkalosis, electrolyte imbalance, fluid overload
Onset/Duration:	Immediate if IV, onset is less than 15 min Duration 1-2 hours
Classification:	Alkalizing agent
Action:	Agent that dissociates to provide bicarbonate ion to buffer hydrogen ions in order to raise the pH level to reverse acidosis. It has also been found beneficial in the event of drug overdose in order to force urine alkalinization/divresis, membrane stabilization of cardiac cells as well, and electrolyte balance restoration.
Notes:	Most catecholamines and vasopressors (dopamine, epinephrine) can be deactivated by alkaline solutions like sodium bicarbonate. When administered with calcium chloride, a precipitate may form that will clog the IV line.

Succinylcholine (Anectine)	P
Indications:	An adjunct to general anesthesia, to facilitate tracheal intubation, and to provide skeletal muscle relaxation.
ADULT Dose:	1.5 mg/kg IV
Contraindications:	Hyperkalemia
Pediatric Considerations:	1-2 mg/kg IV/IM
Precautions:	Caution should be observed if succinylcholine is administered to patients during the acute phase of injury following major burns, multiple trauma, extensive denervation of skeletal muscle or upper motor neuron injury.
Adverse Effects:	Respiratory depression Anaphylaxis Hypotension Hyperkalemia Dysrhythmias Apnea Hypertension Renal Failure Increased intraocular pressure Malignant hyperthermia
Onset/Duration:	Onset: 1 minute Duration: 4-6 minutes
Classification:	Depolarizing neuromuscular blocking agent
Action:	Short-acting depolarizing-type, skeletal muscle relaxant
Notes:	Should not be mixed with alkaline solutions.

Tenecteplase (TNKase)	P
Indications:	STEMI confirmed with Medical Control authorization required
ADULT Dose:	Single IV bolus over 5sec; if <60kg/132lbs then 30mg; if 60-70kg/132-154lbs then 35mg; if 70-80kg/154-176lbs then 40mg; if 80-90kg/176-198lbs then 45mg; and, if >90kg/198lbs then 50mg
Contraindications:	Active internal bleeding History of CVA, intracranial/intraspinal surgery or trauma past 2 months, intracranial neoplasm/arteriovenous malformation or aneurysm Severe uncontrolled HTN
Precautions:	Blood vessel punctures should be minimized, especially non-compressible sites.
Adverse Effects:	Bleeding
Onset/Duration:	Rapid/90-130min half-life
Classification:	Thrombolytic, tissue plasminogen activator
Action:	Binds to fibrin and converts plasminogen to plasmin; decreases systemic activation of plasminogen and the resulting degradation of circulating fibrinogen.
Notes:	Do not give with glucose-containing solution as may precipitate. Do not use in-line filter.

Thiamine (Betalin, Biamine, Vitamin B1)	P
Indications:	Coma and seizures of unknown origin especially if alcohol use is suspected. Concurrent use with D50 for patients with history of alcohol abuse. Malnutrition or thiamine deficiency Suspected Wernicke or Korsakoff Syndrome.
ADULT Dose:	100 mg IM/IV (slow)
Contraindications:	Known hypersensitivity
Adverse Effects:	Anaphylaxis (rare), Nausea/Vomiting, Hypotension (from rapid administration or excessive dose), Anxiety/Agitation
Onset/Duration:	ONSET: rapid DURATION: variable
Classification:	B complex vitamin
Action:	Allows and is required for normal metabolism of glucose. Combines with ATP to form thiamine pyrophosphate coenzyme, a necessary component for carbohydrate metabolism. Provides the appropriate thiamine levels to allow glucose to be utilized in sufficient amounts, thus reversing cellular hypoglycemia secondary to thiamine deficiency

Ticagrelor (Brilinta)	P
Indications:	Confirmed STEMI in accordance with county STEMI triage procedure.
ADULT Dose:	180 mg PO
Contraindications:	Active pathological bleeding, bleeding conditions/disorders (hemophilia), peptic ulcer. Intracranial hemorrhage. Recent surgery, recent serious surgery (physical trauma)
Precautions:	Avoid use with CYP3A and P450 inhibitors (Azithromycin, oral antifungals, antivirals). Opioids delay and reduce absorption of Ticagrelor.
Adverse Effects:	Bleeding and dyspnea
Onset/Duration:	2 hours onset, duration (half-life) 8 hours
Classification:	Inhibitor of platelet activation and aggregation
Action:	Blocks the P2Y12P ADP receptor inhibiting platelet activation and aggregation

Tranexamic Acid (TXA, Cyclokapron) **P**	
Indications:	TXA is approved for use in patients with known or suspected hemorrhage/internal bleeding. Blunt or penetrating trauma (multi-system, major pelvic fractures, solid organ injuries…) with evidence of marked blood loss. Evidence of injury consistent with non-compressible hemorrhage (e.g., penetrating thoraco-abdominal trauma or unstable pelvis fractures) along with heart rate >120 bpm and systolic blood pressure (SBP) <90 mmHg are suggested criteria. Consider vital sign adjustments for the geriatric population (> 65 years of age with systolic BP < 110 mm Hg). Sustained tachycardia HR>120/minute with signs of hypo-perfusion (ALOC, cool extremities…) or if the provider determines the patient to be a high risk for significant hemorrhage Traumatic injury occurs within the immediately preceding 3 hours (preferably within the 1st hour) Traumatic amputation or major arterial bleeding requiring tourniquet Patients with suspected significant bleeding, regardless of cause Espistaxis and Post-partum Hemorrhage **Pregnant patients and patients on anti-coagulation medications are eligible*
ADULT Dose:	1 gram in 100ml NS/LR IV over 10 minutes. 1 gm in 100 ml LR/NS = 10 mg/ml, followed by 1gm in 250ml NS/LR IV over 1 hour 100-200 mg topical via cotton or gauze
Pediatric Considerations:	15mg/kg (max 1gm) in 100ml NS/LR IV over 10 minutes, followed by 2mg/kg in 250ml NS/LR IV over 1 hour.
Contraindications:	Greater than three hours since traumatic event Non-hemorrhagic shock Evidence of Disseminated Intravascular Coagulation Isolated head injury Neurogenic Shock (no evidence of hemorrhage) Known history of severe renal failure Known history of thromboembolism (relative) Known hypersensitivity (allergy) to TXA Hemorrhagic shock controlled with other hemostatic agents/measure.
Precautions:	Begin infusion as soon as possible after injury, but no later than 3 hours after injury. Do not give through the same IV as Hextend or blood products. Patients taking oral tretinoin for treatment of leukemia may have enhanced effects Do not give IV push – will cause hypotension. Must be given over 10 minutes Use with caution with patients with a history of DVT, PE, known clotting disorders or severe renal failure

Tranexamic Acid (TXA, Cyclokapron) continued	P
Adverse Effects:	TXA has not been shown to cause significant increase in deep vein thrombosis (DVT), pulmonary embolus, myocardial infarction, or stroke in published trials to date. Dizziness Headache Nausea Vomiting Diarrhea Orthostasis Hypotension (with rapid administration) Seizures (seen mainly in the pediatric cardiac surgery population) Female patients taking or using any form of birth control containing estrogen and progestin are at increased risk for blood clots (enhanced thrombogenic effects) and TXA increases that risk.
Onset/Duration:	Onset of action within 4 hours after IV administration, exact time of onset unclear and variable. Delayed effects up to 48 hours are consistent with anti-inflammatory actions.
Classification:	Anti-Fibrinolytic
Action:	Tranexamic acid (TXA) is a synthetic lysine analog that competitively inhibits the activation of plasminogen to plasmin. TXA may help stabilize clot formation and decrease extravascular bleeding.

Vecuronium (Norcuron)	P
Indications:	Paralysis to facilitate intubation
ADULT Dose:	0.1mg/kg IV/IO defasiculating dose 0.01 mg/kg
Contraindications:	Newborn infants, myasthenia gravis
Pediatric Considerations:	0.1mg/kg IV/IO
Precautions:	Patient must be sedated
Adverse Effects:	Apnea
Onset/Duration:	Onset 1-2 minutes/ Duration 30 minutes
Classification:	Nondepolarizing neuromuscular blocking agent
Action:	Prevents acetylcholine from binding to receptors on the motor end plate, thus blocking depolarization.

Verapamil	P
Indications:	Narrow complex tachycardia
ADULT Dose:	5 mg IV/IO
Contraindications:	Heart failure, AV block, Sick sinus syndrome, WPW, LGL syndrome
Precautions:	Digoxin, avoid polypharmacy with other rate related medications
Adverse Effects:	bradycardia, hypotension
Onset/Duration:	Onset 3-5 min, Duration up to 6 hours
Classification:	Calcium channel blocker, class IV antiarrhythmic
Action:	Inhibits calcium ion from entering the “slow channels” or select voltage sensitive areas, slow automaticity and conduction of AV node.

Drug Reference

Equivalents:

1kg = 2.2lb	1ml = 60 mcgtts (micro tubing)	1 gm = 1000 mg
1kg = 1000 gm	1 ml = 10,15,20 gtts (macro tubing)	1 mg = 1000 mcg
	1 L = 1000 ml	
	1 ml and 1 cc are interchangeable	

Conversions:

MULTIPLY to convert a larger unit into a smaller unit using the above table.
DIVIDE to convert a smaller unit into a larger unit using the above table.

Dosage Calculations:

To calculate the amount of drug to be drawn up or administered, use the following formula:

WHAT (type and amount of drug ordered) multiplied by the QUANTITY (volume of fluid in the container) divided by HAVE (amount of drug in the container) = the amount to be administered.

$$\frac{\text{WHAT} \times \text{QUANTITY}}{\text{HAVE}} = \text{Amount to be administered}$$

IV Rate:

To calculate an IV drip rate based on the volume of fluid to be infused over time. (Make sure the unit measurement of the concentration and the dosage are the same. [e.g. both in milligrams])

$$\text{Drops per minute} = \frac{\text{VOLUME to be infused in cc} \times \text{Drop factor of IV set}}{\text{Time in minutes}}$$

To calculate an IV drip rate for a medication that is administered based on a specified dosage to be infused per minute.

$$\text{Drops per minute} = \frac{\text{Dosage per minute to be administered} \times \text{Drop factor (60)}}{\text{Concentration of medication per ml}}$$

To calculate an IV drip rate for a medication that is administered based on a specified dosage per kilogram of body weight per minute.

$$\text{Drops per minute} = \frac{\text{Desired dosage per minute} \times \text{Weight in Kg} \times \text{Drop factor of IV set}}{\text{Concentration of medication per ml}}$$

Air Ambulance Transports

An air ambulance will be activated based on the Washington State Trauma Triage Procedures by the on scene EMS provider or Incident Commander. Whenever possible, providers will contact Medical Control prior to activating an air ambulance. The decision process as to when to mobilize an air ambulance should take into consideration: site resuscitation, stabilization capabilities and ground transport time. Dispatch may assist in contacting an air ambulance service for activation as soon as the need for air transport is identified.

Every attempt should be made to stabilize the patient prior to transport, including IV, airway, chest decompression or stabilization, control of external hemorrhage, and spine immobilization. Trauma associated cardiac arrest patients should not be transferred by air ambulance. Transfer of care to air ambulance personnel will optimally occur at designated landing sites. Deviation from designated landing sites should be briefly discussed with Medical Control.

Information to have available regarding airlift transport:

- Map coordinates - township, range and section
- Location of nearest landing zone
- Capability to transport to landing zone
- How landing zone is marked
- Any obstructions near landing zone
- Relevant weather information

Provider Present at the Scene

The prehospital care provider functions under the direction of the on-duty Medical Control physician. With Medical Control permission, a physician, physician's assistant or nurse practitioner on scene may participate in the care of a patient at the scene of any emergency in one of the following ways:

1. Take total responsibility for management of the patient(s). If so he/she must accompany the patient(s) to the hospital. The physician, physician's assistant or nurse practitioner on scene must supply proof of credentials prior to initiation of any patient care direction or treatment.
2. Offer assistance in caring for the patient(s), allowing the prehospital care provider to remain under the control of the Medical Control Physician and within the prehospital provider’s scope of practice.

In all cases, the Medical Control Physician must be contacted to specifically delegate authority to any on-scene physician. Access to communication with the Medical Control should be provided to any on-scene physician on request. Notation of Physician’s identification and directive from Medical Control must be documented on the Medical Incident Report.

Emergency at a Physician's office

At a private Physician's, physician's assistant or nurse practitioner's office, the individual physician maintains the responsibility for the treatment and management decisions for the patient. During transport, treatment rendered by the prehospital provider must remain within the provider's scope of practice.

Patient Care Reports (PCR)

A copy of the ECG tracing **MUST** be attached to all copies of the PCR when **ANY** dysrhythmia or ischemic ST segment changes are encountered in the field. Per WAC requirements all PCR must be available at the Emergency Department within 24 hours of patient arrival.

The prehospital contact report is to include:

a. Unit identification
b. Age and sex of patient
c. Severity
d. Chief complaint
e. Relevant medical history
f. Vital signs
g. Treatment given, and response to treatment
h. ETA
i. Request for additional information or treatment

Ten Critical Steps for Handling Possible Bioterrorism Events

<table>
<tr><td rowspan="7">1 – Maintain an index of suspicion.</td><td colspan="2">In an otherwise healthy population, some associations are very suggestive, especially when seen in clusters, high numbers, or unusual presentations.</td></tr>
<tr><td>“Clustered” Symptoms</td><td>Potential Bioagents</td></tr>
<tr><td>Hemoptysis</td><td>Plague</td></tr>
<tr><td>Flaccid Paralysis</td><td>Botulism</td></tr>
<tr><td>Purpura</td><td>Viral Hemorrhagic Fevers (VHF)</td></tr>
<tr><td>Wide mediastinum</td><td>Anthrax</td></tr>
<tr><td>Centripetal rash</td><td>Smallpox</td></tr>
<tr><td>2 – Protect yourself and your patients.</td><td colspan="2">Use appropriate personal protection equipment (PPE). Prophylaxis; vaccines, if available; or antibiotics, if risks are known.</td></tr>
<tr><td>3 – Adequately assess the patient.</td><td colspan="2">Review and assess the patient’s history. Also, ask:
Are others ill?
Were there any unusual events?
Was there an uncontrolled food source or other environmental factor?
Was there vector exposure?
Has the patient been traveling?
What is the patient’s immunization record?
Perform a physical examination with special attention to the respiratory system, nervous system, skin condition and hematologic and vascular status.</td></tr>
<tr><td>4 – Decontaminate as appropriate.</td><td colspan="2">Do not use bleach on exposed people. Soap, water and shampoo are perfectly adequate for all biological and most chemical agents. Chemically contaminated clothes should be removed and discarded safely. Biologically contaminated clothes can be laundered with soap, water and perhaps, bleach.</td></tr>
<tr><td rowspan="11">5 – Establish a diagnosis.</td><td colspan="2">Think clinically and epidemiologically; always send specimens for culture.</td></tr>
<tr><td>Symptom (individuals)</td><td>Possible Diagnosis</td></tr>
<tr><td>Pulmonary</td><td>Tularemia, plague, staph enterotoxin B (SEB)</td></tr>
<tr><td>Neuromuscular</td><td>Botulism, Venezuelan equine encephalitis (VEE)</td></tr>
<tr><td>Bleeding/purpura</td><td>VHF, ricin, plague (late)</td></tr>
<tr><td>Rash (various types)</td><td>VHF, T2 mycotoxin, smallpox, plague</td></tr>
<tr><td>Flu-like symptoms</td><td>Varies</td></tr>
<tr><td>Immediate Symptoms (large numbers)</td><td>Possible Diagnosis</td></tr>
<tr><td>Pulmonary</td><td>SEB, mustard, Lewisite, phosgene, cyanide</td></tr>
<tr><td>Neurologic</td><td>Nerve gases, cyanide</td></tr>
<tr><td>Delayed Symptoms (large numbers)</td><td>Possible Diagnosis</td></tr>
</table>

	Pulmonary	Biologic agents, mustard, phosgene
	Neurologic	Botulism, VEE, other encephalitis
6 – Render prompt treatment.	A irway, B reathing, C irculation.	
7 – Provide good infection control.	• Gown, gloves, mask and hand washing, and eyewear if necessary, are sufficient. • Recommended isolation precautions for biologic agents include: Standard Precautions – for all individuals/patients Contact Precautions – Viral Hemorrhagic Fevers Droplet Precautions – Pheumonic Plague and Tularemia Airborne Precautions - Smallpox	
8 – Alert the proper authorities.	**CALL FIRST:** Your local law enforcement agency; call either 911 or your local phone number for law enforcement. **CALL SECOND:** Your area FBI office Western WA: 206-622-0460 Eastern WA: 509-747-5196 After hours statewide in WA: 206-622-0460 **CALL THIRD:** Your local emergency management agency, or if unavailable, the WA state EM Duty Officer at: 1-800-258-5990	
9 – Assist in the epidemiologic investigations.	Steps in an epidemiologic investigation so as to determine who may be at risk • Count cases; • Relate to the at-risk population; • Make comparisons; • Develop hypotheses; • Test hypotheses; • Make inferences; • Conduct studies; • Interpret and evaluate.	
10 – Know and spread this information.		

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Medical Spanish

Initial questioning

Is there someone with you who speaks English?
¿Hay alguien con usted que hable ingles?
Ah-ee ahl-gee-ehn hohn oss-tehd keh ah-bleh enn-glehs?

I speak a little Spanish. Please answer yes or no to the following questions.
Hablo un poco de español. Por favor conteste si o no a las siguientes preguntas.
Ah-bloh oon pohr-fah-borg kokn-tehs-the see oh noh ah lahs see-gee-ehn-tehs preh-goon tahs.

Speak slowly, please.
Hable despacia, por favor.
Ah-bleh dehs-pah-see-oh, pohr fah-bohr.

What is your name?
¿Cómo se llama?
Koh-moh she yah-mah?

How old are you?
¿Cuántos años tiene?
Kwahn-tohs ah-nyohs tee-eh-neh?

When did the problem start?
¿Cuándo empezó el problema?
Kwahn-doh ehm-peh-soh ehl prog-bleh-mah?

What medicine do you take?
¿Qué medicina torna?
Keh meh-dee-see-nah toh-mah?

Numbers

1. uno
2. dos
3. tres
4. cuatro
5. cinco
6. seis
7. siete
8. ocho
9. neueve
10. diez
11. once
12. doce
13. trece
14. catorce
15. quince
16. dieciséis
17. diecisiete
18. dieciocho
19. diecinueve
20. viente
21. vientiuno
22. vientidós
23. veintritrés
24. veinticuatro
25. veinticinco
26. veintiséis
27. veintisiete
28. veintiocho
29. veintineuve
30. treinta

Days of the week

Lunes: Monday
Martes: Tuesday
Miércoles: Wednesday
Jueves: Thursday
Viernes: Friday
Sábado: Saturday
Domingo: Sunday

Common Medical Questions/Terms

How do you feel?
¿Cómo se siente?
Koh-moh she see-ehn-the?

What is the problem?
¿Cuál es el problema?
Kwahl ehs ehl proh-bleh-mah?

Have you had this problem before?
¿Ha tenido este problema antes?
Ah the-nee-doh ehs-the proh-bleh-mah ahn-tehs?

Do you have nausea or vomiting?
¿Tiene nausea o vómito?
Tee-eh-neh nah-oo-she-ah oh boh-meh-toh?

Don't move
No se meuva
Noh she mweh-bah

We are going to give you an IV
Vamos a ponerie suero intravenoso.
Bah-mohs ah poh-nehr-leg soo-eh-roh enn-trah-beh-noh-soh.

Do you have a fever?
¿Tiene fiebre?
Tee-eh-neh fee-eh-breh?

Calm down
Cálmese
Kahl-meh-sah

Common Medical Questions/Terms (continued)

Where does it hurt?
¿Donde le duele?
Dohn-deh leh dweh-leh?

Show me
Enséñeme
Ehn-she-nyeh-meh.

When?
¿Cuándo?
Kwahn-doh?

How?
¿Cómo?
Koh-moh?

For how long?
¿Por cuánto tiempo?
Pohr kwahn-toh tee-ehm-poh?

Why?
¿Por qué?
Pohr keh?

Relax, please
Por favor, relájese
Pohr fah-bohr, reh-lah-heh-she.

High Blood Pressure?
Alta presion de la sangre?
Ahl-tah preh-see-ohn deh lah sahn-greh?

Diabetes?
Diabetes?
Dee-ah-beh-tehs?

Asthma?
Asma?
Ahs-mah?

Epilepsy?
Epilepsia?
Eh-pee-lep-see-ah?

Heart disease?
Ehfermedad del corazón?
Ehn-fehr-meh-dad dehl koh-rah-sohn?

Stomach ulcers?
Ulceras del estomago?
Ool-she-rahs dehl ehs-toh-mah-goh?

Do you take medicine?
¿Tomas usted medicina?
Toh-mah oos-tehd lah meh-dee-see-nah?

Pain

When did the pain start?
¿Cuándo empezó el dolor?
Kwahn-doh ehm-peh-soh ehl doh-lohr?

Where did the pain start?
¿Donde empezó el dolor?
Dohn-deh ehm-peh-soh ehl doh-lohr?

Does the pain travel to another place?
¿Le viaja el dolor a otro lugar?
Leh vee-ah-hah ehl doh-lohr ah oh-troh loo-gahr?

How long does the pain last?
¿Cuánto tiempo le dura el dolor?
Kwahn-toh tee-ehm-poh leg doo-rah ehl doh-lohr?

Is it severe?
¿Es severo?
Ehs she-beh-roh?

Does it ache?
¿Es adolorido?
Ehs ah-doh-loh-ree-doh?

Is it like pressure?
¿Es opresivo?
Ehs oh-preh-see-boh?

Is the pain the same since it started?
¿Es el dolor igual desde que empezó?
Ehs ehl doh-lor ee-gwahl dehs-deh keh ehm-peh-soh?

Chest Pain

Pain in the chest?
¿Dolor del Pecho?
Doh=lohr dehl peh-choh?

Point to where the pain is, please.
Apunte dónde tiene el dolor, por favor.
Ah-poon-the dohn-deh tee-eh-neh ehl doh-lohr.

Does the pain travel to your left shoulder (arm)?
¿Le viaja el dolor al hombre (brazo) izquierdo?
Leh bee-ah-hah ehl doh-lohr ahl ohm-broh (brah-soh) ees-kee-her-doh?

Is it piercing?
¿Es punzante?
Ehs poon-sahn-the?

OB / GYN

Are you having contractions?
¿Tiene contracciones?
Tee-eh-neh kohn-track-see-ohn-ehs?

(Don't) push.
(No) Empuje, *(Noh)* Ehm-poo-heh

How many minutes do the contractions last?
¿Cuántos minutes le duran las contracciones?
Kwahn-tohs mee-noo-tohs leh doo-rahn lahs kohn-trahk-see-ohn-ehs?

MNEMONIC's

Patient Assessment:	Newborn Assessment:	Medical:
A: Airway	**A:** Appearance	**M:** Morphine
B: Breathing	**P:** Pulse Rate	**O:** Oxygen
C: Circulation	**G:** Grimace (facial actions)	**N:** Nitrates
D: Disability	**A:** Activity	**A:** Aspirin
E: Expose	**R:** Respirations	

History:	
S: Signs and symptoms	**P:** Progression of symptoms
A: Allergies	**A:** Associated chest pain
M: Medications	**S:** Sputum productions, speech, word sentences
P: Pertinent past medical history	**T:** Temperature, tiredness
L: Last oral intake	**M:** Medications the patient is currently taking
E: Events leading to injury or illness	**E:** Exercise/Exertion normally tolerated
	D: Diagnosis (previous)

Trauma Assessment:	Trauma:	
Scene safety	**V:** Vitals	**T:** Tracks, Tags, Tattoos
Spinal Stabilization	**O:** Oxygen	**I:** Instability
LOC	**M:** Monitor	**C:** Crepitus
Airway	**I:** IV/Information	**S:** Scars
Breathing	**T:** Transport decision	
Oxygen	**H:** History	
Circulation	**A:** Allergies	
Arterial Bleeds	**M:** Medications	
Bare the Body		

Trauma or Pain Questions:	Trauma:
O: Onset	**D:** Deformities
P: Provocation, progression	**C:** Contusions
Q: Quality, pain type?	**A:** Abrasions
R: Radiation	**P:** Punctures
S: Severity	
T: Time, duration	**B:** Burns
	T: Tenderness
	L: Lacerations
	S: Swelling

Causes of Pulseless electrical Activity (PEA) – "5" H's and T's:	
H: Hypovolemia	**T:** Toxins
H: Hypoxia	**T:** Tamponade, cardiac
H: Hydrogen ion – acidosis	**T:** Tension Pneumothorax
H: Hypo- / Hypekalemia	**T:** Thrombosis, (Coronary or Pulmonary)
H: Hypoglycemia	
H: Hypothermia	**T:** Thrombosis, (hypovolemia increased ICP)

Altered Mental Status (ALOC):	
A: Alcohol, Drugs	**T:** Trauma
E: Endocrine (glands)	**I:** Infection
I: Insulin, Infection	**P:** Pyschiatric
O: Overdose	**S:** Shock
U: Uremia (2^0 kidney insufficiency)	

Triage:	Charting:
A: Alert	**S:** Subjective
P: Responsive to Verbal	**O:** Objective
V: Responsive to Pain	**A:** Assessment
U: Unresponsive	**P:** Plan

Phone Numbers

HOSPITALS	
Bremerton Naval Hospital	**(360) 475-5678 Medical Reports** (360) 475-4286 ED
Children's Hospital Medical Center	**(206) 987-2222 Medical Reports** (206) 987-2000 Main
Forks Community Hospital	**(360) 374-6271 Main (ER ext. 190)**
Harborview Medical Center	**(206) 731-3074 Medical Reports** (206) 731-3000 Main
Harrison Medical Center – Bremerton	**(360) 377-9111 Medical Reports** (360) 377-3911
Harrison Medical Center – Silverdale	**(360) 744-8800 Main**
Jefferson Healthcare	**(360) 385-7617 Medical Reports** (360) 385-2200 Main
Madigan Army Medical Center	**(253) 968-1396 Medical Reports** (253) 968-1390 Main (ER)
Mary Bridge Children's Hospital	**(253) 403-1476 Medical Reports** (253) 403-1418 Main (ER)
Mason General Hospital	**(360) 426-8171 Medical Reports** (360) 426-1611 Main
Olympic Medical Center	**(360) 417-7381 Medical Reports** (360) 417-7000 Main
St. Anthony's	**(253) 530-2100 Medical Reports** (253) 530-2000 Main
St. Peters Hospital	**(360) 493-7289 (ER)**
St. Josephs	**(253) 426-6769 Medical Reports** (253) 627-4101 Main
Swedish 1st Hill	**(206) 386-2573 Medical Reports** (206) 386-6000
Swedish Cherry Hill	**(206) 320-2111 Medical Reports** (206) 320-2000
Tacoma General Hospital	**(253) 627-8500 Medical Reports** (253) 403-1050 Main (ER)
University of Washington Medical Center	**(206) 598-3300 Main** (206) 598-2000 Report line (206) 598-4000 ER
Virginia Mason Seattle	**(206) 583-6433 ED** (206) 624-1144 Main
COMMUNICATION CENTERS	
Airlift Northwest	**(800) 426-2430**
Life Flight	**(800) 452-7434**
Clallam County (PENCOM)	**(360) 452-4545**
Jefferson County	**(360) 385-3831**
Kitsap County (CENCOM)	**(360) 308-5400**
Mason County	**(360) 426-5533 or** **(360) 426-4441 (Shel-com)**
Olympic Ambulance	**(800) 445-2257**
INFORMATION	
Chem Trek	**(800) 424-9300**
Coast Guard Group Seattle	**(206) 217-6001**
Diver's Alert network (DAN)	**(877) 595-0625**
Department of Ecology	**(425) 649-7000**
National response & Terrorist Hotline	**(800) 424-8802**
Poison Control	**(800) 222-1222**
WA State Ferries Office-Operations	**(206) 515-3456 (watch officer)**
WA State Patrol Dispatch	**(360) 405-6650 (not for public use)**

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Personal Information:

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Home: _____

Cell: _____

Work: _____

Agency: _____

Medical Information:

_____

_____

_____

_____

Plan A – Adult Cardiac Arrest Guiding Principles

1. Care During Cardiac Arrest
   A. Use appropriate PPE for all care providers to protect from exposure.
   B. Confirm cardiac arrest by absence of consciousness and pulse.
   C. Initiate cardiopulmonary resuscitation (CPR) with chest compressions or, if BLS personnel have initiated CPR, direct them to continue pending rhythm assessment. If not already applied by BLS, apply defibrillator pads with minimal interruption to CPR.

      High-quality CPR is characterized by chest compressions that are at least 2 inches in depth, allow for full recoil (rebound of the chest), achieve a rate of 100-120 per minute, and minimize interruptions in compressions. High quality ventilations require only enough tidal volume to achieve chest rise, with each ventilation lasting only 1-1.5 seconds.
   D. Determine cardiac rhythm using defibrillator pads. Paramedics shall transition to their own defibrillator when possible.
   E. Manual (rather than AED) defibrillation should be deployed by ALS providers whenever possible in an effort to limit CPR interruptions.
   F. The effect of ACLS interventions are maximized with good CPR so that ACLS care needs to be supported by ongoing CPR and defibrillation during resuscitation. Every effort should be made to limit CPR interruptions during IV access, airway management, rhythm assessment, defibrillation, and medication administration. Rhythm analysis should occur at intervals of ≥ 2 minutes with intervening CPR. Pauses in chest compressions should be <10 seconds if feasible.
   G. If endotracheal intubation cannot be achieved, additional options include continued bag-mask ventilation with oral airway, I-Gel LMA, jet insufflation, or surgical cricothyrotomy.
   H. Vascular access should be attempted peripherally. If this approach fails, humeral intraosseous (IO) access is permitted. A flush (open IV) should be used after each drug administration. Drugs should be administered early in the 2 minute period of CPR between rhythm analyses to allow time for circulation.
2. Care after Return of Spontaneous Circulation (ROSC)
   A. Patients who are successfully resuscitated should have a 12-lead ECG performed.
   B. Post-resuscitation hypotension should be managed by reasonable fluid challenge with repeated LR boluses. Initiation of a norepinephrine (levophed) or epinephrine infusion may be necessary and should be titrated to a systolic blood pressure of 80 - 100 mmHg. A systolic blood pressure of <60 mmHg with loss of consciousness should be supported with chest compressions. See infusion table reference in Additional Comments.
3. Medical Control & Documentation
   A. Medical Control Doctor contact is required regarding patient status regardless of outcome. Medical Control should also be contacted for any additional pharmacologic therapy.
   B. All treatment and time of treatment, including permission to cease efforts, shall be recorded on the EMS Medical Incident Report Form.

Plan A-1a — Ventricular Fibrillation or Pulseless Ventricular Tachycardia

If Ventricular Fibrillation (VF) or Pulseless Ventricular Tachycardia (VT) is the first rhythm identified, or if VF or VT recurs, and

Shocks have been delivered by EMTs:

Paramedics may deliver or direct EMTs to provide additional shocks, or may direct ongoing CPR and expeditiously achieve vascular access to administer antiarrhythmic medication prior to additional shocks. If delay to antiarrhythmic will be >4 minutes, then another shock should be delivered.

No shocks have been delivered:

Deliver or direct EMTs to deliver shocks according to resuscitation protocols. The initial shock should be at the device-recommended specific energy for defibrillation. Escalating energies may be used for subsequent shocks. Shocks for VF or pulseless VT should be unsynchronized.

1. If persistent or recurrent VF, establish vascular access and intubate. CPR and defibrillation should remain a priority as part of integrating ACLS interventions and care.
2. For persistent or recurrent VF, drugs should be administered as detailed below:
    A. If the preceding rhythm analysis identified a **pulseless non-shockable rhythm** (asystole or PEA), epinephrine should be administered during ongoing CPR. Continue CPR for approximately 2 minutes before the next rhythm analysis.
    B. If the preceding rhythm analysis resulted in **administration of a shock** (e.g. VT or VF), administer epinephrine or antiarrhythmic drugs during ongoing CPR, as specified below.
3. Neither epinephrine nor antiarrhythmic drugs are known to "chemically convert" VF, and are given to enhance the benefit from defibrillation. The effects of these drugs are maximized with good CPR so that drug therapy needs to be supported by ongoing CPR and defibrillation during resuscitation. In general, drug therapy should be separated by intervals of CPR and rhythm assessment (and if indicated defibrillation)
    A. Epinephrine (0.1 mg/ml) 0.5 to 1 mg IV push. Epinephrine can be repeated every 4 - 8 minutes while the patient remains in VF. These subsequent doses of epinephrine may be alternated between treatments with shock and antiarrhythmic medications (see below).
    B. First line anti-arrhythmic: Lidocaine, 1 - 1.5mg/kg IV push should be given when VF is refractory to shock. A second and third dose of lidocaine at 0.5 - 0.75 mg/kg may be administered subsequently in the course of resuscitation if the patient remains in refractory VF. The maximum cumulative dose of lidocaine is 3 mg/kg.
    C. Second line anti-arrhythmic: Procainamide: 300mg slow push repeated every 8 minutes as indicated to a total dose of 900mg
    D. Magnesium may be considered for refractory VF with suspicion of torsades de pointes. Administer 2 g $MgSO_4$, diluted in D5W, LR, or NS to form 10 mL volume, IV push. Dosage may be repeated in 2 g doses up to a cumulative dose of 6 g.
    E. Sodium bicarbonate is recommended in special clinical conditions such as cardiac arrest associated with presumptive hyperkalemia, acidosis, or poisoning (tricyclic antidepressants, buproprion). The dosage is 1mEq/kg as an IV bolus. Repeat doses at 0.5 mEq/kg may be considered at approximate 10 minute intervals. If none of above, low-dose sodium bicarbonate (25meq IV every 6 minutes until 150meq or ROSC) may also be used if arrest unwitnessed or is unresponsive to conventional therapy; use after epinephrine, intubation.

Plan A-1b — Asystole

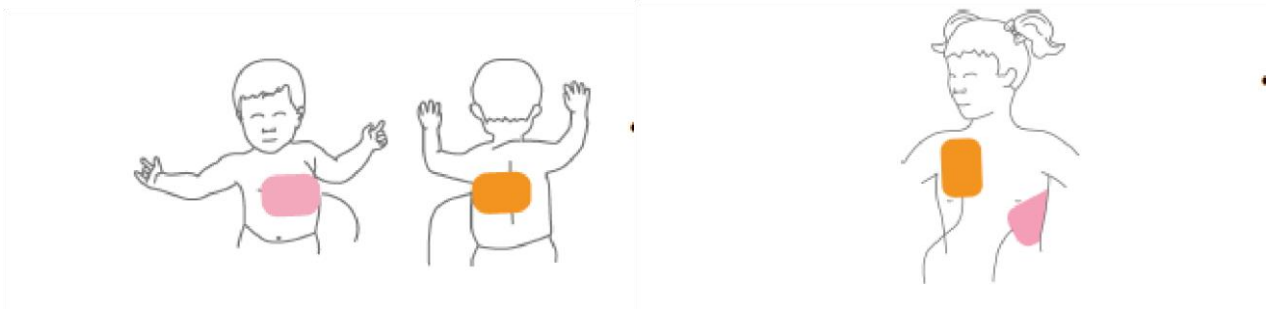
1. Confirm asystole in three leads. Check monitor calibrations, cable and leads. If rhythm is unclear and possibly VF, treat as VF.
2. If confirmed asystole, continue CPR.
3. Establish IV access and intubate.
4. Medications for treatment of asystole include:
   F. Administer epinephrine 0.5mg IV push (1.0mg for patients >100kg) and repeat every 2 – 6 minutes for ongoing arrest. Once patient is intubated and have stable (same for 2 minutes) EtCO2, use lower dose epinephrine for patients with adequate perfusion as identified by EtCO2 > 30mmHg: epinephrine 0.3mg IV push.
   G. Atropine is considered in symptomatic bradycardia but is not routinely recommended in asystolic arrest. However, atropine 1 mg IV push may be considered in circumstances where there is a suspicion of a primary bradyarrhythmia that may respond to the chronotropic effects of atropine.
   H. Sodium bicarbonate is recommended in special clinical conditions such as cardiac arrest associated with presumptive hyperkalemia, acidosis, or poisoning (tricyclic antidepressants, buproprion). The dosage is 1mEq/kg as an IV bolus. Repeat doses at 0.5 mEq/kg may be considered at approximate 10 minute intervals. If none of above, low-dose sodium bicarbonate (25meq IV every 6 minutes until 150meq or ROSC) may also be used if arrest unwitnessed or is unresponsive to conventional therapy; use after epinephrine, intubation.
   I. Calcium chloride can be used for patients with presumed hyperkalemia, dosed 1g slow IV push. May repeat once after 10 minutes.
5. Transcutaneous pacing is not routinely recommended in asystolic cardiac arrest. If transcutaneous pacing is considered, it should be initiated for a brief period to determine whether electrical capture and pulse can be achieved. Pacing should be continued only in those who achieve pulses with pacing. Otherwise CPR should be resumed.

Plan A-1c — Pulseless Electrical Activity (PEA)

1. Confirm the presence of organized ventricular electrical cardiac activity at a rate that could produce a pulse (e.g. 40-150 bpm).
2. Establish IV access and intubate.
3. Medications for treatment of PEA include:
   A. Administer epinephrine 0.5mg IV push (1.0mg for patients >100kg) and repeat every 2 – 6 minutes for ongoing arrest. Once patient is intubated and have stable (same for 2 minutes) EtCO2, use lower dose epinephrine for patients with adequate perfusion as identified by EtCO2 > 30mmHg: epinephrine 0.3mg IV push.
   B. Atropine is considered in symptomatic bradycardia but is not routinely recommended in PEA arrest. However, atropine 1 mg IV push may be considered in circumstances where there is a suspicion of a primary bradyarrhythmia that may respond to the chronotropic effects of atropine.
   C. Sodium bicarbonate is recommended in special clinical conditions such as cardiac arrest associated with presumptive hyperkalemia (as may occur in dialysis patients), acidosis, or poisoning (tricyclic antidepressants, buproprion). Low-dose sodium bicarbonate may also be considered if arrest unwitnessed and is unresponsive to conventional therapy. The dosage for sodium bicarbonate is 1mEq/kg as an IV bolus. Repeat doses at 0.5 mEq/kg may be considered at approximate 10 minute intervals. Low-dose sodium bicarbonate is dosed 25meq IV every 6 minutes until 100meq or ROSC.
   D. Calcium chloride can be used for patients with presumed hyperkalemia, dosed 1g slow IV push. May repeat once after 10 minutes.
4. Transcutaneous pacing is not routinely recommended in PEA cardiac arrest. If transcutaneous pacing is considered, it should be initiated for a brief period to determine whether electrical capture and pulse can be achieved. Pacing should be continued only in those who achieve pulses with pacing. Otherwise CPR should be resumed.
5. Consider differential diagnosis of pulseless electrical activity including hypovolemia, metabolic acidosis, hypoxia, tension pneumothorax, cardiac tamponade, pulmonary embolus, myocardial damage, drug overdose, hyperkalemia and hypothermia, and direct treatment appropriately.
6. Paramedics are authorized to perform additional procedures & treatments if the following are suspected:
   A. Hypovolemia or Massive PE: ≥2 or more large bore IV lines of lactated ringers/saline solution for volume resuscitation (minimal volume if PE).
   B. Tension pneumothorax: flutter valve placement
   C. Cardiac tamponade: pericardiocentesis
   D. Abdominal Distension: Oral-gastric tube placement for decompression
   E. Hyperkalemia: calcium chloride, sodium bicarbonate
   F. Drug overdose: tricyclic antidepressant (TCA, buproprion) (sodium bicarbonate), calcium channel blockers (calcium chloride), beta blocker overdose (glucagon)

Plan A-1d — Pediatric Cardiac Arrest

1. Pediatric CPR. Begin CPR as "CAB" (same as in adults). Note however that the chest compression to ventilation ratio for 2 or more rescuers is 15:2 in children (30:2 for adults or if only a lone rescuer is present in children).
   A. In children 1-8 years old (absence of secondary sexual characteristics; usually <55 lbs), perform chest compressions at 100/min. Compress chest to ≥ 2 inches or 1/3 of chest depth at compression to ventilation ratio of 15:2. Following intubation, perform chest compressions at 100/min at a compression to ventilation ratio of 10:1 without interrupting chest compressions for ventilation.
   B. In infants 1-12 months of age compress chest at 100/min to 1½ inches or 1/3 of chest depth with compression to ventilation ratio of 15:2. Following intubation, perform chest compressions at 100/min at a chest compression to ventilation ratio of 10:1 without interruption in chest compression for ventilation.
   C. In newborns 0-28 days, compress chest to 1/3 chest depth. Perform 90 compressions and 30 ventilations/minute (compression to ventilation ratio of 3:1), taking ½ second for each compression or ventilation. If cardiac arrest is suspected to be of cardiac etiology, may perform 15:2 CPR. Following intubation, the same compression to ventilation ratio of 3:1 should continue, unless a cardiac cause for arrest is suspected, in which case the ratio should be 10:1.
2. Pediatric Defibrillation (up to age 8)
   A. Place adult-sized defibrillator pads in the customary location (anterior-lateral), so long as each is not touching the other and are separated at their closest point by at least 2 ½ inches. If the size of the child's chest is too small to permit such placement, place one defibrillator electrode on the middle of the back, and one on the middle of the chest (anterior-posterior). If the chest wall configuration doesn't permit separating defibrillation pads by at least 2 ½ inches, consider using infant pads.
   B. If VF or pulseless VT, shock initially at 2-4 Joules/kg if the defibrillator allows this energy setting. Subsequent shocks may use 4 Joules/kg and can be titrated to higher energies for recurrent or persistent VF/pulseless VT. Treat suspected acidosis, hypoxemia, hypovolemia, or hypothermia per Plan A.



3. Pediatric ACLS Modifications

A. Refer to pediatric length-based tape to determine patient's color category. Use the Medic One Pediatric Dosing Card to determine treatment dosing.

B. Medication Dosages

i. Epinephrine: IV/IO dose: 0.01mg/kg (0.1 mg/mL; 0.1mL/kg) and repeat every 2-6 minutes during arrest. Administration of endotracheal epinephrine should be at the higher dose range of 0.1 mg/kg (1 mg/ml; 0.1 ml/kg) followed by 2-5 mL saline flush.

ii. Lidocaine: 1 mg/kg IV/IO

iii. Magnesium: 50 mg/kg IV/IO to maximum of 2 g for torsade

C. Management of the airway should be facilitated via endotracheal intubation. If unable to intubate the patient, bag-valve mask ventilation, I-Gel LMA, or jet insufflation may be initiated. Surgical cricothyrotomy is contraindicated in pediatric patients less than 12 years of age. If intubation, bag-valve mask ventilation, I-Gel, and jet insufflation are unsuccessful contact the Medical Control Doctor should surgical cricothyrotomy be essential for patient resuscitation.

D. Intravenous access via peripheral, umbilical or intraosseous means are acceptable.

Additional Comments for Plan A-1

Endotracheal administration of drugs in cardiac arrest

A. Lipid-soluble drugs (Lidocaine, Epinephrine, Atropine, Naloxone – "LEAN") are absorbed via an endotracheal route. Drugs that are not lipid soluble (e.g. calcium and sodium bicarbonate) should NOT be given endotracheally. Drugs should be diluted in 5 ml of sterile water (or normal saline). This is the least effective route of drug administration during cardiac arrest and should be rarely used.

B. Typically the endotracheal dose is at least 2x the IV dose of lidocaine, atropine or naloxone, and up to 10x the dose for epinephrine during cardiac arrest.

C. Absorption of drugs given endotracheally occurs in the lungs (not the trachea). Push the drug solution quickly down the tube, followed by several quick insufflations to create a rapidly absorbed aerosol.

Medication drips using dial-a-flows

Norepinephrine 8mg / 100mL						
Dose	mcg/min	8	16	24	32	64
Dial-a-flow	mL/hour	6	12	18	24	48
Norepinephrine 8mg / 250mL						
Dose	mcg/min	8	16	24	32	64
Dial-a-flow	mL/hour	15	30	45	60	120

Epinephrine 2mg / 100mL						
Dose	mcg/min	2	4	8	10	20
Dial-a-flow	mL/hour	6	12	24	30	60
Epinephrine 2mg / 250mL						
Dose	mcg/min	2	4	8	10	20
Dial-a-flow	mL/hour	15	30	60	75	150

Differential Diagnosis of PEA Based on QRS Width

Narrow PEA?		**Wide PEA?**
Give 1L LR/NS & treat for: · Hypovolemia · Massive PE · Tension pneumothorax · Pericardial tamponade · Abdominal distention		Give 100meq HCO3 & treat for: · Hyperkalemia · Overdose (TCA, CCB, Beta) · Hypoxia · Acidosis · STEMI · Hypothermia

VF/VT	End of Round	PEA/Asystole
Shock 200 J	1	Epi 0.5 mg
Shock 360 J Epi 0.5 mg Lido 100 mg	2	Epi 0.5 mg
Shock 360 J	3	
Shock 360 J Epi 0.5 mg	4	Epi 0.5 mg
Shock 360 J HCO3 25 meq	5	HCO3 25 meq
Shock 360 J Lido 50 mg	6	Epi ≤ 0.5 mg*
Shock 360 J HCO3 25 meq	7	HCO3 25 meq
Shock 360 J Epi ≤ 0.5 mg*	8	Epi ≤ 0.5 mg*
Shock 360 J HCO3 25 meq	9	HCO3 25 meq
Shock 360 J Lido 50 mg	10	Epi ≤ 0.5 mg*
Shock 360 J HCO3 25 meq	11	HCO3 25 meq
Shock 360 J Epi ≤ 0.5 mg*	12	Epi ≤ 0.5 mg*
Shock 360 J HCO3 25 meq	13	HCO3 25 meq
Shock 360 J Procainamide 300 mg	14	Epi ≤ 0.5 mg*
If ROSC, PEA, Asyst ➜ Becomes VF SHOCK (green box) & continue VF Algo Starting with next Antiarrhythmic		
For patients > 100kg, double all Epi doses.		
* Once ETT/iGel in place: if EtCO2 > 30 then Epi 0.3 mg		
HCO3 25 meq starting @ 10min, every other CPR cycle Total 150 meq or ROSC		
"Round" = HP-CPR at least 2 minute duration with pauses < 10 seconds.		

Refractory or Recurrent VF? Consider:
· Procainamide 300mg every 8min (900 mg total)
· Magnesium sulfate 2 g (esp. for Torsades), may repeat x2
· Metoprolol 5-10mg if Cocaine / Meth OD
· "Slow VT": ?Hyperkalemia

Refractory PEA or Asystole? Consider:		
Narrow PEA? Give 1L LR/NS & treat for: · Hypovolemia · Massive PE · Tension pneumothorax · Pericardial tamponade · Abdominal distention · Hypoglycemia		**Wide PEA?** Give 100meq HCO3 & treat for: · Hyperkalemia · Overdose (TCA, CCB, Beta) · Hypoxia · Acidosis · STEMI · Hypothermia

Norepinephrine 8mg / 100mL						
Dose	mcg/min	8	16	24	32	64
Dial-a-flow	mL/hour	6	12	18	24	48
Norepinephrine 8mg / 250mL						
Dose	mcg/min	8	16	24	32	64
Dial-a-flow	mL/hour	15	30	45	60	120

Epinephrine 2mg / 100mL						
Dose	mcg/min	2	4	8	10	20
Dial-a-flow	mL/hour	6	12	24	30	60
Epinephrine 2mg / 250mL						
Dose	mcg/min	2	4	8	10	20
Dial-a-flow	mL/hour	15	30	60	75	150

Tranexamic Acid (TXA)

Classification

Anti-Fibrinolytic: TXA is a synthetic lysine analog that competitively inhibits the activation of plasminogen to plasmin, preventing fibrinolysis.

Indications

Compensated or decompensated hypovolemic shock from noncompressible hemorrhage.

- <3 hours from onset of bleeding
- Trauma Patients
  - Suspicion for major bleeding
  - SBP <90mmHg -OR- HR > 110
- Post-Partum Bleeding
  - Persistent bleeding after fundal massage & oxytocin
- Massive Hemoptysis
  - Dose: 500mg nebulized, may repeat x1
- Uncontrolled Epistaxis
  - Dose: 500mg soaked onto gauze and inserted into nose

Contraindications

> 3 hours since onset bleeding

Isolated head injury (benefit not significant, research ongoing)

Neurogenic Shock without evidence of hemorrhage
Known allergy to TXA (rare)

Adult Dosing

1g mixed in 100mL, IV/IO over 10 minutes -OR- 1g slow (5min) push IV/IO

1g IM if no IV access

Communicate w/ helicopter EMS or local ED that additional 1g needs to be given

If prolonged ground transport: 1gm in 250ml IV/IO over 1 hour

Pediatric Dosing

15mg/kg (max:1gm) in 100mL, IV/IO over 10 minutes -OR- 1g slow (5min) push IV/IO

Communicate w/ helicopter EMS or local ED that additional 2mg/kg needs to be given

If prolonged ground transport: 2mg/kg in 250mL IV over 1 hour

Adverse Effects

Seizures
Nausea / Vomiting
Diarrhea

Prone Positioning for Non-Intubated Patients

Background

In diffuse lung disease such as viral pneumonia, proning may better match blood flow to oxygen flow. This has been associated with marked improvement in oxygen saturation in patients with hypoxemia, especially in COVID-19 Pneumonia. While there is mortality benefit in intubated ICU patients, there is little harm and improved oxygenation.

Indication

- Patients with hypoxemia (SpO_2<90%) despite high-flow oxygen via NRB mask or NC.

Contraindications

- Spinal instability
- Facial or pelvic fractures
- Open chest or unstable chest wall
- Confusion
- 3rd trimester pregnancy
- Relative: inability to independently change position, recent vomiting,

Procedure

- Inform patient of plan
- Assess patient for ability to independently change position in bed
- SpO_2 in place
- ECG leads (if applied) can stay on anterior chest
- Prone, find position of comfort
- Secure for safe transport
- Goal 30 minutes prone, the 15 minutes on L side, then 15 minutes on right side, then prone 30 minutes
- Document oxygen flow, SpO_2, $EtCO_2$ if in use, respiratory rate, and dyspnea prior to proning & every 15 minutes

Procainamide

Classification

Class 1a antiarrythmic (blocks cardiomyocyte sodium channel) that terminates ventricular tachycardia better than lidocaine or amiodarone.

Indications

Refractory VF
VT & Wide complex tachycardia,
Atrial fibrillation
WPW

Contraindications

2nd & 3rd AV block
Bradycardia
Torsades
Prolonged QT
Lupus
TCA overdose

Adult Dosing: Cardiac Arrest

3mg/kg (Maximum Dose 300mg) slow push for refractory VF as second-line antiarrhythmic. May repeat every 8min x3 for total maximum dose 9mg/kg

Adult Dosing: Ventricular Tachycardia, or atrial fibrillation w/ RVR

1. 50mg IV push over 1 minute, repeat every minute
2. 1g mixed in 250mL, 10 gtts/mL ad set, IV/IO over 20 minutes: 2gtts/second = 12.5mL/min = 50mg/min

Stop if hypotension or QRS widen >50%
Maximum dose 17mg/kg. 70kg patient ~1000mg
Typical conversion dose 5-10mg/kg
50mg/min max rate

Pediatric Dosing: Cardiac Arrest

3mg/kg (Maximum Dose 300mg) slow push for refractory VF as second-line antiarrhythmic. May repeat every 8min x3 for total maximum dose 9mg/kg

Pediatric Dosing: Ventricular Tachycardia, or atrial fibrillation w/ RVR

Same as adult dosing above.
Mandatory Base Station contact or MPD direct contact prior to use.

Adverse Effects

Hypotension (with rapid IV push)
Bradycardia
Widening QRS
Seizures