Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Quick Reference Page – Peds (<18 y/o)

Normal Vital Signs In Children

Age	Heart Rate (Beats Per Minute)		Respiratory Rate (Breaths Per Minute)	Systolic Blood Pressure	Weight (kg)
	Awake Rate	Sleeping Rate			
Newborn	100-180	80-160	30-60	60-90	2-3
Infant (1-12mos)	100-170	75-160	30-60	87-105	4-10
Toddler (1-2yrs)	80-150	60-90	24-40	85-102	10-14
Preschool (3-5yrs)	70-130	60-90	20-34	89-108	14-18
School Age (6-12yrs)	65-120	60-90	15-30	94-120	20-42
Adolescent (13-17yrs)	55-90	50-90	12-20	107-132	>50

Modified Glasgow Coma Scale for Infants and Children

	Child	Score	Infant
Eye Opening	Spontaneous To Speech To Pain None	4 3 2 1	Spontaneous To Speech To Pain None
Best Verbal Response	Oriented, Appropriate Confused Inappropriate Words Incomprehensible Sounds None	5 4 3 2 1	Coos and Babbles Irritable, Cries Cries in Response to Pain Moans in Response to Pain None
Best Motor Response	Obeys Commands Localizes Painful Stimulus Withdraws in Response to Pain Flexion in Response to Pain Extension in Response to Pain None	6 5 4 3 2 1	Moves Spontaneously and Purposely Withdraws in Reponse to Touch Withdraws in Response to Pain Abnormal Flexion Posture to Pain Abnormal Extension Posture to Pain None

Wisconsin EMSC Recommended Weight Conversion (2.2lbs = 1kg -OR- 1lb = 0.45kg)

Lbs.	Kgs.	Lbs.	Kgs.	Lbs.	Kgs.
5 lbs	**2 kgs**	**20 lbs**	**9 kgs**	**35 lbs**	**16 kgs**
6	3	21	10	36	16
7	3	22	10	37	17
8	4	23	10	38	17
9	4	24	11	39	18
10 lbs	**5 kgs**	**25 lbs**	**11 kgs**	**40 lbs**	**18 kgs**
11	5	26	12	41	19
12	5	27	12	42	19
13	6	28	13	43	20
14	6	29	13	44	20
15 lbs	**7 kgs**	**30 lbs**	**14 kgs**	**45 lbs**	**20 kgs**
16	7	31	14	46	21
17	8	32	15	47	21
18	8	33	15	48	22
19	9	34	15	49	22
www.chawisconsin.org				**50 lbs**	**23 kgs**

Equipment	GRAY 3-5kg	PINK Small Infant 6-7kg	RED Infant 6-9kg	PURPLE Toddler 10-11kg	YELLOW Small Child 12-14kg	WHITE Child 15-18kg	BLUE Child 19-23kg	ORANGE Large Child 24-29kg	GREEN Adult 30-36kg
Resuscitation Bag		Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Adult
Oxygen Mask (NRB)		Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric	Pediatric/ Adult
Oral Airway (mm)		50	50	60	60	60	70	80	80
Laryngoscope Blade (Size)		1 Straight	1 Straight	1 Straight	2 Straight	2 Straight	2 Straight OR Curved	2 Straight OR Curved	3 Straight OR Curved
Endotracheal Tube (mm)		3.5 Uncuffed 3.0 Cuffed	3.5 Uncuffed 3.0 Cuffed	4.0 Uncuffed 3.5 Cuffed	4.5 Uncuffed 4.0 Cuffed	5.0 Uncuffed 4.5 Cuffed	5.5 Uncuffed 5.0 Cuffed	6.0 Cuffed	6.5 Cuffed
King Airway	Size 0 (Clear)	Size 1 (White)	Size 1 (White)	Size 1 (White)	Size 2 (Green)	Size 2 (Green)	Size 2.5 (Orange)	Size 3 (Yellow)	Size 3 (Yellow)
LMA	NA	#1	#1	#1.5	#2	#2.5	#3	#3.5	#4
Suction Catheter (French)		8	8	10	10	10	10	10	10-12
BP Cuff	Neonatal #5/ Infant	Infant/Child	Infant/Child	Child	Child	Child	Child	Child	Small Adult
IV Catheter (ga)		22-24	22-24	20-24	18-22	18-22	18-20	18-20	16-20
IO (ga)		18/15	18/15	15	15	15	15	15	15
NG Tube (French)		5-8	5-8	8-10	10	10	12-14	14-18	16-18

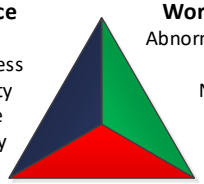
Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Destination Determination – Peds (<18 y/o)

Step One — Measure Vital Signs and Level of Consciousness

Appearance
Tone
Interactiveness
Consolability
Look/Gaze
Speech/Cry

Work of Breathing
Abnormal Breath Sounds
Retractions
Nasal Flaring



Circulation to the Skin
Pallor
Mottling
Cyanosis

Glasgow Coma Scale	≤13
Systolic blood pressure (mmHg)	<70 + (age in years x 2)mmHG
Respiratory rate	<10bpm or >upper normal (p.121)

OR need for ventilation support

ANY 'Yes'

ALL 'No'

Step Two — Assess Anatomy of Injury

- Penetrating Injury to head, neck, torso, extremities proximal to knee
- Chest wall instability or deformity
- ≥2 proximal long bone fractures
- Crushed, degloved, or mangled extremity
- Amputation proximal to wrist or ankle
- Pelvic fracture
- Open or depressed skull fracture
- Paralysis

ANY 'Yes'

Transport to Level 1 *Pediatric* Trauma Center;
Notify via Radio as early as possible

ALL 'No'

Step Three — Assess Mechanism of injury and evidence of High Energy Impact

- Falls > 10 ft or twice the height of the child
- High Risk Auto Crash
- Auto vs. Pedestrian/Bicyclist thrown, run over or significant (>20 mph) impact
- Motorcycle crash >20 mph

ANY 'Yes' → Transport to closest appropriate PICU-Capable, Leveled Trauma Center

ALL 'No'

Step Four — Assess Special Patient or System Considerations

- Age ≤1 year
- Anticoagulation **AND/OR** history of bleeding disorder(s)
- Burns
  - without other trauma, transport to B*urn Facility*
  - with traumatic mechanism, transport to *trauma center*
- End Stage Renal Disease requiring Hemodialysis
- Pregnancy ≥20 weeks
- **EMS provider judgment**

ANY 'Yes' → **Contact Medical Control**; Consider Pediatric Trauma Center or Specialty Resource Center

ALL 'No'

Transport according to Appropriate Trauma Protocol

Any Airway Compromise not able to be managed by EMS should be taken to the CLOSEST FACILITY for stabilization immediately

https://www.dhs.wisconsin.gov/publications/p0/p00730.pdf

Legend	
	EMT
A	A-EMT
P	Paramedic
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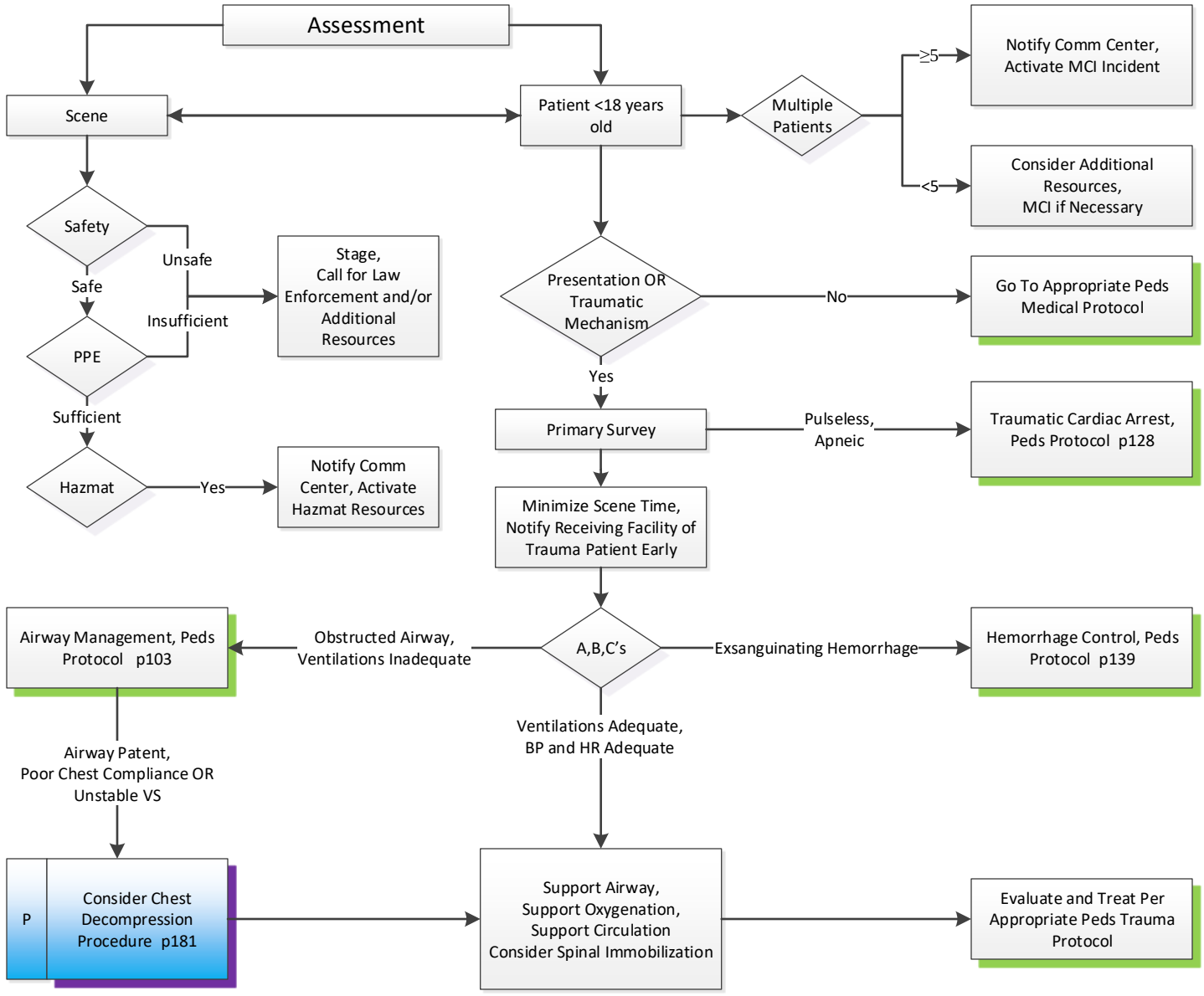
General Approach – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- Time of Injury, Mechanism of Injury
- DCAP-BTLS
- SAMPLE History
- OPQRST History
- Pain / Swelling
- Mental Status
- Hypotension / Shock

Differential

- Stroke
- STEMI
- Overdose
- Child Abuse / Non-Accidental Trauma
- Domestic Violence
- Non-Accidental Trauma



Pearls

REQUIRED EXAM: Vital Signs, GCS, Loss of Consciousness, Location of Pain (then targeted per Appropriate Trauma Protocol)

- Assess for major trauma criteria immediately upon patient contact
  - -RR <10 or >upper normal **(p.121)**; SBP <70 + (age in years x 2)mmHG; Pulse <50 or >upper normal **(p.121)**; GCS <13; SpO2<93%
  - -Transport to Trauma Center, minimize scene time to goal of <10 minutes
- Disability – assess for neuro deficits including paralysis, weakness, abnormal sensation
- Suspect Tension Pneumothorax when:
  - -Mechanism consistent with Chest Trauma; Resp Distress; Decreased Breath Sounds; JVD; Low BP; Tachycardia; Tracheal Deviation
  - -Signs and Symptoms of Tension Pneumothorax may be present *with or without* positive pressure ventilations
  - -Needle Decompression should be performed with an 18-20ga needle at the 2nd intercostal space, *midclavicular line*
  - -If repeat decompression necessary, continue to move laterally along the superior aspect of the 3rd rib

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

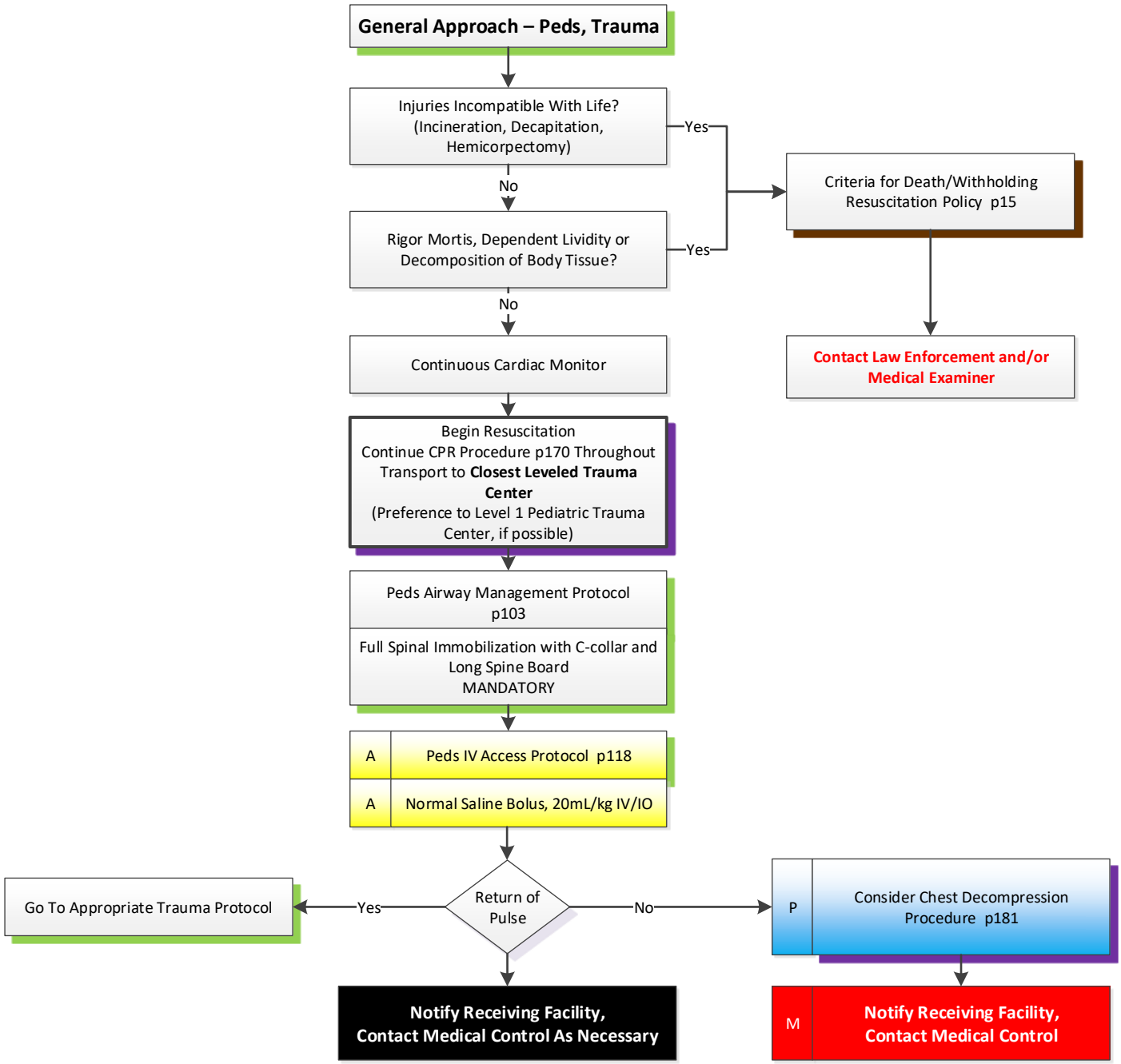
Traumatic Cardiac Arrest – Peds, Trauma

Pertinent Positives and Negatives

- Age, if known
- Mechanism of Injury
- Events leading up to arrest

Differential

- Hypovolemic Shock
  - -External Hemorrhage
  - -Internal Hemorrhage
  - -Unstable Pelvic Fracture
- Tension Pneumothorax
- Medical Condition Causing Trauma (i.e. Cardiac Arrest)



Pearls

REQUIRED EXAM: Pupillary Light Reflex, Palpation of Pulses, Heart and Lung Auscultation

- This protocol is compliant with the Joint Position Statement of the ACS, ACEP, NAEMSP and AAP and can be referenced here: http://www.annemergmed.com/article/S0196-0644(14)00074-2/fulltext#sec6
- Injuries incompatible with life include; decapitation, incineration, massively deforming head or chest injury, dependent lividity, rigor mortis
- As with all trauma patients, DO NOT delay transport
- Consider using medical cardiac arrest protocols if uncertainty exists regarding etiology of arrest
- Use of a long spine board will make chest compressions more effective; however, if spinal immobilization interferes with CPR use reasonable effort to limit patient and spine movement
- Be aware that these may be crime scenes: do your best to avoid disturbing forensic evidence
- If provider safety becomes a concern, transport of deceased patients to the hospital *is acceptable*

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Bites and Envenomations – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Pulses distal to wound
- SAMPLE History
- OPQRST History
- Description or photo of offending creature
- Tetanus status
- Immunization History of Creature (if known)
- Domestic vs. Wild Animal
- Allergic Reaction
- Hypotension, Shock, Fever

Differential

- Penetrating Trauma
- Dry Bite (Snake)
- Abscess/Cellulitis
- Non-Accidental Trauma

General Approach – Peds, Trauma

Offending Organism(s) Neutralized
- No → Call For Resources, Stage Until Scene Safe
  - Contact Dane Co. Animal Control **1-608-255-2345**
- Yes

Active Hemorrhage
- Yes → Hemorrhage Control, Peds Protocol p139
- No

Allergic Reaction
- Yes → Allergic Reaction, Peds Protocol p114
- No

Evaluate Pain
- >5/10 **OR** Severe → Consider Pain Management, Peds Trauma Protocol p120
- None or Mild

Identification of Offending Organism

Spider, Bee, Wasp, Hornet
- Immobilize Injury, Remove jewelry distal to bite
- Muscle Spasms
  - No → Mark Edges of Erythema with Marking Pen
  - A: Peds IV Access Protocol p118
  - P: Midazolam 0.02mg/kg IV/IO (max 10mg) **OR** Midazolam 0.1mg/kg IM/IN (max 5mg)

Snakebite
- Immobilize Injury, Remove jewelry distal to bite
- Mark Edges of Erythema with Marking Pen

Mammalian Bite (including Human)
- Immobilize Injury, Remove jewelry distal to bite
- Wound Care Procedure p197

Mark Edges of Erythema with Marking Pen
- **Notify Receiving Facility, Contact Medical Control As Necessary**

Pearls

REQUIRED EXAM: VS, GCS, Evidence of Intoxication, Affected Extremity Neurovascular Exam

- Cat bites may not initially appear serious, but can progress rapidly to severe infection
- Human bites have higher rates of infection than animal bites and need to be evaluated in the Emergency Department for antibiotics
- Bites on the hands and lacerations over knuckles should be assumed to be “Fight Bites” until proven otherwise, and need evaluation
- It is not necessary to bring the offending insects, animals or reptiles to the ED for identification; this may result in added danger to others
- Brown recluse spider bites are usually painless at the time of bite. Pain and tissue necrosis develops over hours to days
- Immunocompromised patients have higher risk of infection – Think: Diabetes, Chemotherapy, Organ Transplant

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Burns – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS
- SAMPLE History
- OPQRST History
- Mechanism of Burn (heat, gas, chemical)
- Time of Injury
- Singed Facial Hair
- Wheezing, Hoarseness
- Subjective Throat Swelling
- Loss of Consciousness

Differential

- Blast Injury
- Radiation Injury
- Electrical Injury
- Cyanokit Need?
- Cellulitis
- Dermatitis
- Drug Reaction (Stevens-Johnson Syndrome)

Consider Need for Airway Management EARLY

General Approach – Peds, Trauma

Consider CN Exposure for Enclosed Space Fire with Synthetic Materials

Estimate TBSA Burned / Severity

Minor Burn

<5% TBSA, 1st – 2nd Degree Burn
No inhalation Injury,
Normal BP, SpO2

Consider Pain Management – Peds p120

Serious Burn

5-15% TBSA, 2nd – 3rd Degree Burn
Suspected Inhalation Injury,
Hypotension, Altered Mental Status

Consider Pain Management – Peds p120

A Consider Peds IV Access Protocol p118

Critical Burn

>15% TBSA, 2nd – 3rd Degree Burn
Burn with Trauma
Burn with Airway Compromise

Consider Pain Management – Peds p120

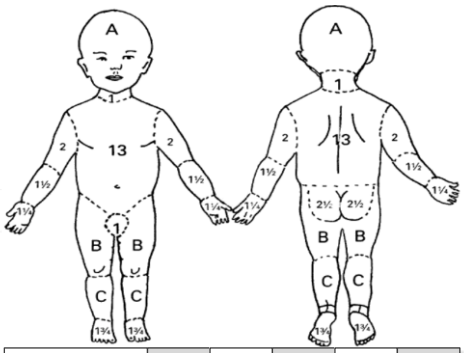
A Peds IV Access Protocol p118

A LR Preferred over NS, If available
If **<5 y/o**, 125mL IV/IO
If **≥5 and <14 y/o**, 250mL IV/IO
If **≥14 y/o**, 500mL IV/IO
Fluids given over 1 hour

Remove Rings, Bracelets and Constricting Items

Remove or Cool Heat Source (if not already done)

Apply Dry Clean Sheet or Non-Adherent Dressing;
Consider Plastic Cling Wrap Application



Area	Age 0	Age 1	Age 5	Age 10	Age 15
A=½ of Head	9 ½	8 ½	6 ½	5 ½	4 ½
B=½ of Thigh	2 ¾	3 ¼	4	4 ¼	4 ½
C=½ of Leg	2 ½	2 ½	2 ¾	3	3 ¼

Consider Airway Management – Peds p103

Consider Airway Management Protocol p103

Burn to Hands, Feet, Face or Perineum

No → Transport to Facility of Choice

Yes → Transport to Designated Burn Center

Pearls

REQUIRED EXAM: VS, GCS, Lung Sounds, HEENT, Posterior Pharynx

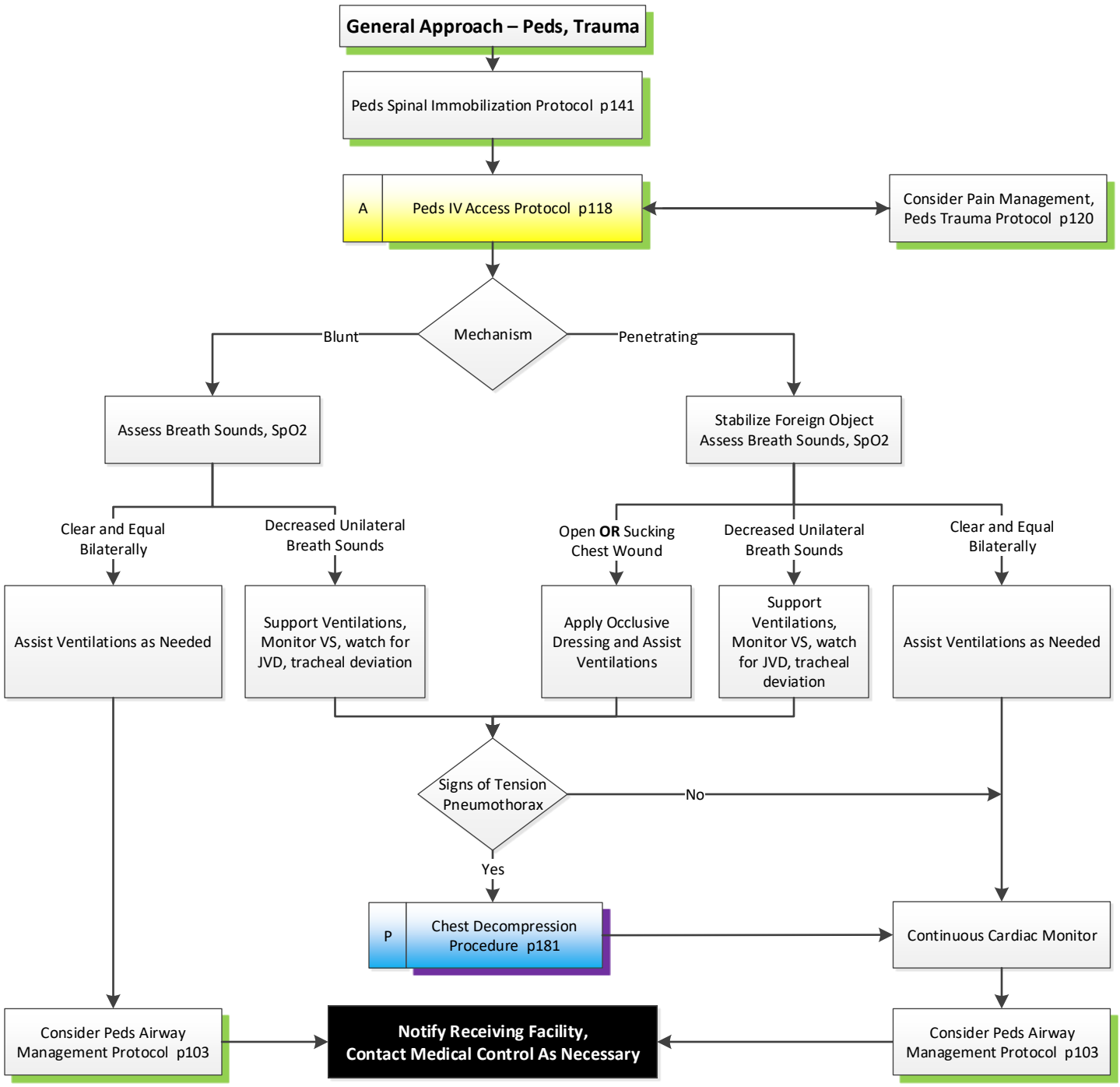
- Safety First! Assure a Chemical source of burn is NOT a hazard to responders. Assure an Electrical source of burn is OFF or no longer contacting pt. Never overlook the possibility that a burn injury may be the result of child abuse / non-accidental trauma.
- High Voltage Electrical Burns (>600 volts) require spinal immobilization, continuous cardiac monitor and IV access regardless of external appearance of injury
- Chemical burns require removal of contaminated clothing, brush away dry powder before irrigation. Flush with copious warm water on scene and continue irrigation en route. Be sure to brush excess away and remove contaminated clothing BEFORE beginning irrigation Burns to face and eyes, remove contact lenses prior to irrigation
- Early intubation is strongly recommended if suspicion of inhalation injury. Suspicion is high in patients involved in an enclosed space fire, who have facial burns or show signs of airway involvement; carbonaceous sputum, facial burns or edema, hoarseness, singed nasal hairs, agitation, hypoxia or cyanosis
- **Indications of possible Cyanide Poisoning -** Exposure to fumes from burning Nitrile (polyurethane, vinyl) Seizures, coma, cardiac arrest, headache, vertigo and/or cherry red skin color from increased venous O2 concentration

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Chest Injury – Peds, Trauma

Pertinent Positives and Negatives
- Type of injury
- Mechanism (blunt vs. penetrating)
- Respiratory Effort, Adequacy
- Abnormal Breath Sounds (unilateral vs. bilateral)
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential
- Simple Pneumothorax
- Tension Pneumothorax
- Pericardial Tamponade
- Aortic Root Disruption
- Bronchial Tree Injury
- Tracheal Disruption
- Great Vessel Laceration
- Cardiac Contusion
- Cardiac Laceration



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Consider tension pneumothorax in any patient with penetrating chest trauma, OR blunt chest trauma with decreased unilateral breath sounds, hypotension, tachycardia, hypoxia, tracheal deviation (late) or JVD (late)**
- Aortic root injuries, bronchial disruption and tracheal disruptions are common with major deceleration injuries (i.e. MVC)
- Cardiac contusions are common with blunt chest trauma, and may present with ectopy, PVCs or even STEMI appearance on cardiac monitor
- Pericardial Tamponade is a surgical emergency and needs rapid transport. Look for muffled heart tones, hypotension, tachycardia

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Prolonged Crush Injury – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- SAMPLE History
- OPQRST History
- Crushed under heavy load ≥30 min
- Building collapse, trench collapse, industrial accident, heavy equipment pinning

Differential

- Compartment Syndrome
- Entrapment without Crush
- Fracture, Sprain, Strain
- Pelvic Fracture
- Hypothermia

General Approach – Peds, Trauma

Management of Crush Injury Patient
Crush Injury should be suspected in prolonged pinnings >1 hour, AND proximal to the knee or elbow.

This protocol is **NOT** intended for hands or feet trapped in machinery or farm equipment

A — Peds IV Access Protocol p118

A — NS Bolus, 20mL/kg IV/IO (max 500mL)

Peds Spinal Immobilization Protocol p141

Continuous Cardiac Monitor

12-Lead ECG Procedure p142 (when possible)

Hemodynamically Unstable

Yes → P — Sodium Bicarbonate 1mEq/kg IV/IO **AND*** Calcium Chloride 20mg/kg IV/IO over 3 min, max 1g → Go To Appropriate Peds Cardiac Arrest Protocol

No

Abnormal ECG

Yes → Peaked T-waves, QRS ≥0.12 sec, QT ≥0.46 sec

Immediately Prior to Extrication

P — Sodium Bicarbonate 1mEq/kg IV/IO **AND*** Calcium Chloride 20mg/kg IV/IO over 3 min, max 1g

Albuterol 2.5mg/3mL Neb

No → Immediately Prior to Extrication

P — Sodium Bicarbonate 1mEq/kg IV/IO

Consider Pain Management, Peds Protocol p120

Monitor and Reassess for Fluid Overload

Notify Receiving Facility, Contact Medical Control As Necessary

Pearls

REQUIRED EXAM: Vital Signs, GCS, Lung Sounds, Neuro Exam, Musculoskeletal Exam

- Structural Collapse, Crush Scenes are often full of hazards, provider safety is the most important consideration
- Patients may become hypothermic, even in warm environments
  -Hypothermia can lead to coagulopathy, which will increase bleeding times and have worse outcomes for the patient
- Crush injuries can result in hyperkalemia from shift of Potassium out of injured cells. Cardiac monitoring is required and 12-lead ECG preferred whenever possible (as dicated by the situation)
- Monitor extremities for signs of compartment syndrome after crush injury; ***P***ain, ***P***allor, ***P***aresthesias, ***P***aralysis, ***P***ulselessness and ***P***oikilothermia (inability to regulate core body temperature)
- * Sodium Bicarb Infusion: 1mEq/kg added to 1L NS, administered 20mL/kg IV just prior to extrication
- **Utilize different IV lines or flush between bicarb and calcium to prevent precipitation in the line

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Near-Drowning / Submersion Injury – Peds, Trauma

Pertinent Positives and Negatives

- Submersion in water regardless of depth
- SAMPLE History
- OPQRST History
- Temperature of water
- Mental Status Changes
- Degree of Water Contamination
- Vomiting
- Coughing, Wheezing, Rales, Rhonchi, Stridor

Differential

- Spinal Trauma
- Pre-Existing Medical Condition
- Hypothermia
- Aspiration
- The Bends
- Pressure Injury
  - Barotrauma
  - Decompression Sickness
- Post-Immersion Syndrome

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Have a HIGH index of suspicion for possible spinal injuries. *Any* diving injury or submersion with unclear details should be fully immobilized
- Hypothermia is often associated with near-drowning and submersion injuries. Consider the Hypothermia Protocol as appropriate
- *All* patients with Near-Drowning / Submersion Injury should be transported for evaluation due to delayed presentation of respiratory failure
- With diving injuries (decompression / barotrauma) consider availability of a hyperbaric chamber; contact Medical Control early.
- Near-drowning patients who are awake and cooperative but with respiratory distress may benefit from CPAP / Positive Pressure Ventilation

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Environmental, Hyperthermia – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to hot environment
- Hot, dry or sweaty skin
- Seizures
- Nausea
- Hypotension, Shock, Fever

Differential

- Alcohol Withdrawal (DTs)
- Hyperthyroidism (Thyroid Storm)
- Dehydration
- Cocaine or Sympathomimetic OD
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (Serotonin Syndrome, Malignant Hyperthermia)

If Evidence of Sympathomimetic OD

Consider Adult Overdose, Sympathomimetic Protocol p65

General Approach – Peds, Trauma

Remove Patient from Hot Environment (if applicable)

Estimate Severity of Symptoms

Heat Cramps

Painful Spasms of Extremities and/or Abdominal Muscles
Normal Mental Status
Normal Vital Signs

Oral Fluids
Sponge with Cool Water and Fan

Heat Exhaustion

Dizziness, Lightheadedness, Headache, Irritability, Nausea
Normal or Mildly Depressed Mental Status
Mild Tachycardia (age defined)
Normal or Mildly Elevated Temp

Keep Patient Supine
Apply 100% Oxygen
Sponge with Cool Water and Fan

Heat Stroke

Marked Alteration in Level of Consciousness
May Be Sweating **OR** Hot, Dry, Red Skin
Extremely High Temp, >105°F

Semi-Reclining Position with Head Elevated
Apply 100% Oxygen
Rapid Cooling with Cold Packs, Sponge with Cool Water and Fan

A Peds IV Access Protocol p118

A Normal Saline 20mL/kg IV/IO (max 500mL)
P Ondansetron 0.1mg/kg IV/IO (max 4mg)
P If shivering, consider Midazolam 0.04mg/kg IV/IO (max 2mg)

Tolerating Oral Fluids
- Yes → Reassess and Document Mental Status, VS and ability to take PO
  - Abnormal → A Peds IV Access Protocol p118
  - Normal → Requires Transport
- No → A Peds IV Access Protocol p118

A Peds IV Access Protocol p118
A Normal Saline 20mL/kg IV/IO (max 500L)
P Consider Ondansetron 0.1mg/kg IV/IO/ ODT (max 4mg)

Requires Transport
- No → Execute and Document Patient Refusal Protocol, Peds p121
- Yes → **Notify Receiving Facility, Contact Medical Control As Necessary**

Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

- Extremes of Age are more prone to heat emergencies due to inability to easily self-extricate from hot environments
- Patients on Tricyclic Antidepressants, Anticholinergics, Diuretics (i.e. Lasix) are more susceptible to heat emergencies due to medication effects
- Cocaine, amphetamines and salicylates all may elevate body temperature or interfere with the ability to auto-regulate
- Sweating generally disappears as body temperature rises above 104°F
- If Heat Cramps resolved without IV Access or Medications, patients may refuse transport, **IF** tolerating oral fluids **and** VS normal

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

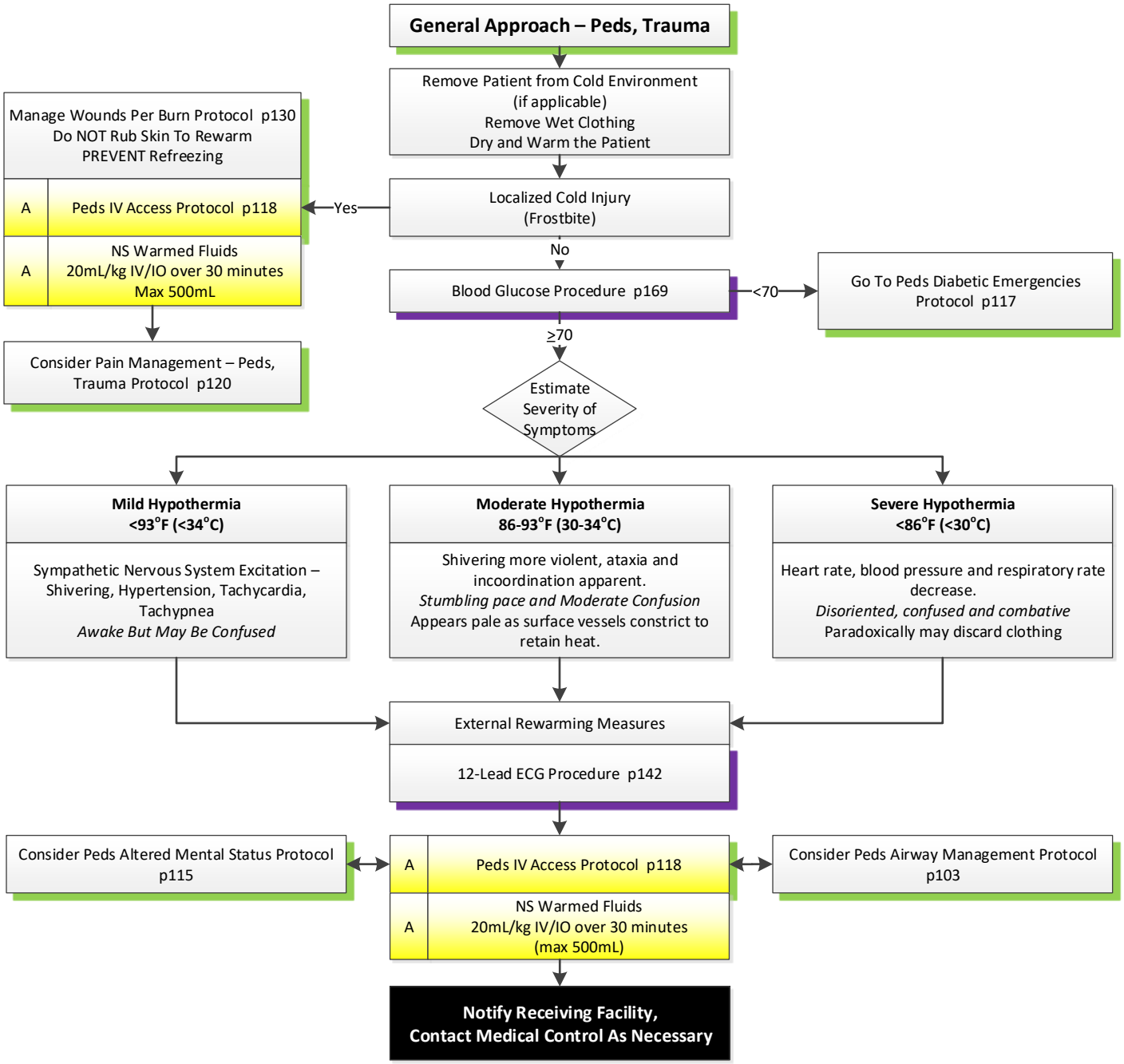
Environmental, Hypothermia – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Mental Status
- SAMPLE History
- OPQRST History
- Time and length of exposure to cold environment
- Cold or clammy skin
- Confusion
- Arrhythmias, J-waves on ECG
- Hypotension, Shock

Differential

- Alcohol Intoxication
- Hypothyroidism (Myxedema Coma)
- Dehydration
- Sepsis
- CNS Lesion or Head Injury
- Abuse or Neglect (Elderly or disabled)
- Medication (beta blocker overdose, opiate overdose)



Pearls

REQUIRED EXAM: VS, GCS, Skin, HEENT, Neuro, Evidence of Intoxication, Mental Status

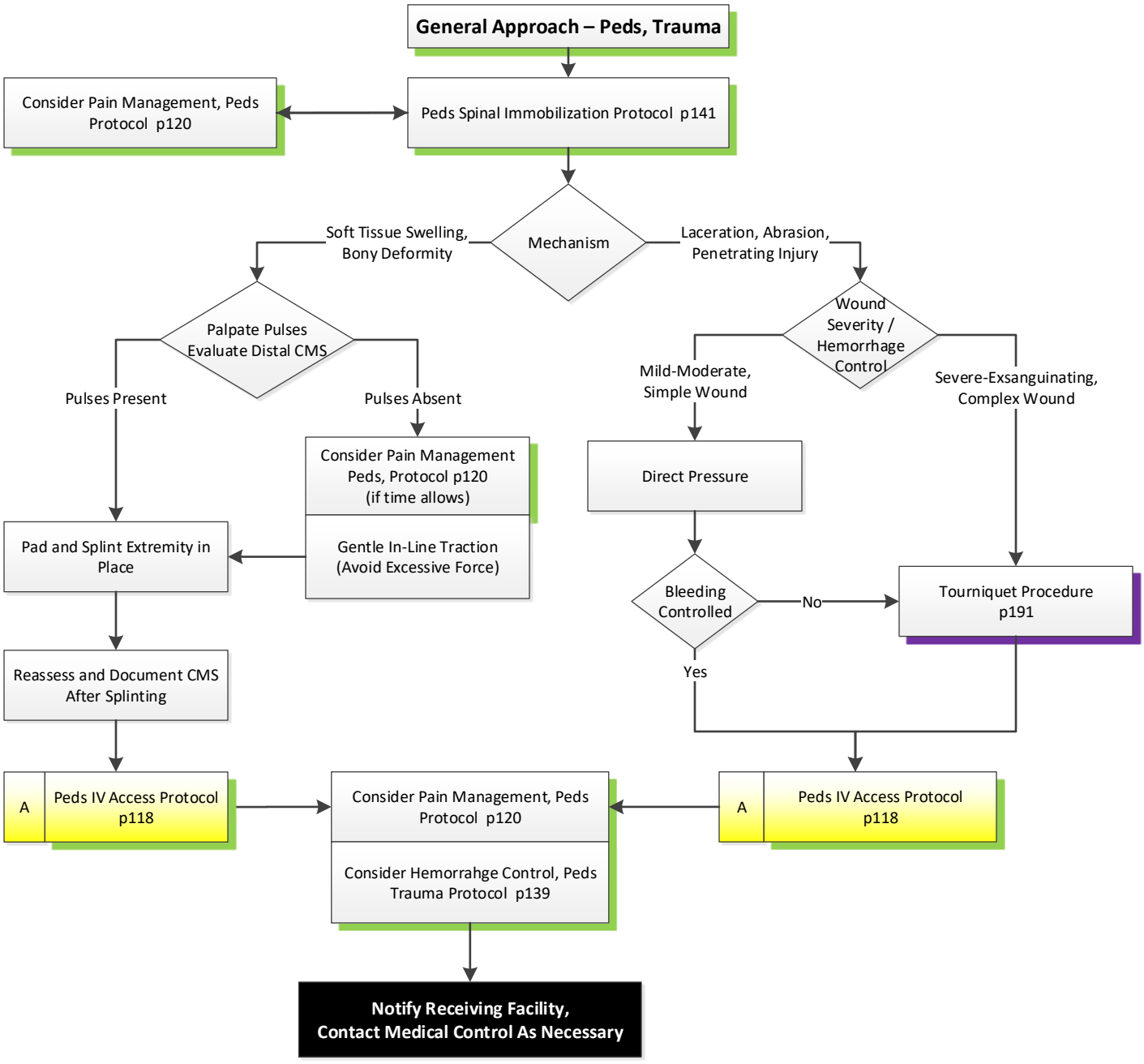
- Hypoglycemia is found in many hypothermic patients, because hypothermia may be a result of hypoglycemia
- Severe hypothermia may cause myocardial irritability and rough handling can theoretically cause V-fib. Please handle carefully.
  -Do not withhold advanced airway or CPR for this concern, but only the most experienced provider available should *gently* attempt advanced airway
- Below 86°F (30°C), antiarrhythmics may not be effective. If given, they should be given at reduced intervals. Do NOT attempt to pace below 86°F. If antiarrhythmics necessary for severely hypothermic patient, Contact Medical Control
- Extremes of age, malnutrition, EtOH and drug abuse and outdoor hobbies / employment all predispose to hypothermia

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Extremity Injury – Peds, Trauma

Pertinent Positives and Negatives
- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential
- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome



Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Immobilization of bony injuries should include the joint above and below. Joint injuries require immobilization of bone above and below
- Palpate and document Circulation, Movement and Sensation both before and after splint application
- Tourniquets should remain in place once hemorrhage control is adequate. The tourniquet is tight enough when the bleeding stops!
- If active hemorrhage and bony/soft tissue deformity, priority should be put on hemorrhage control *first*, then splinting – remember A,B,C's
- If amputated extremities available, seal in a plastic bag and place in cool water and bring to the hospital with the patient

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

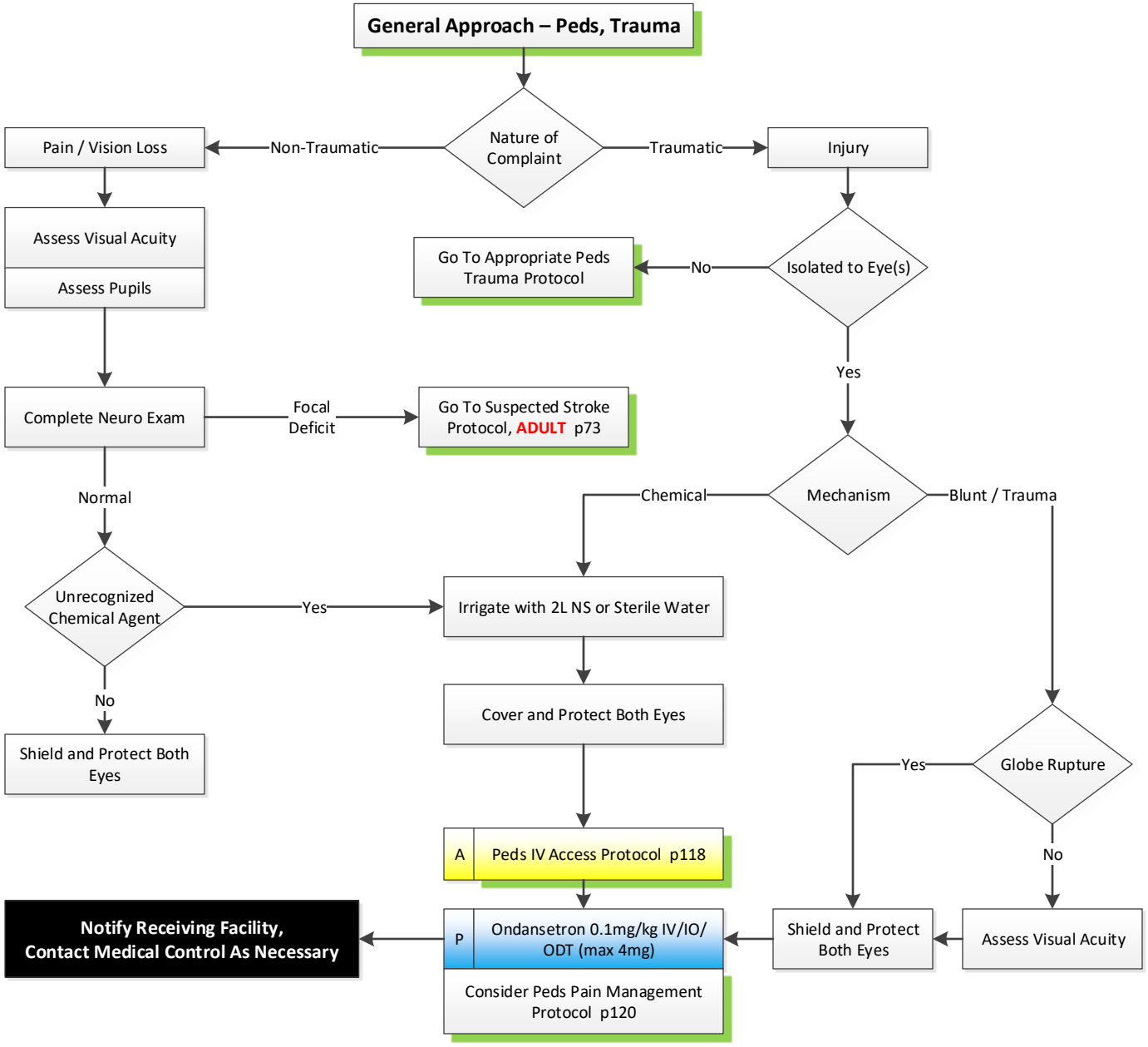
Eye Pain – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, Visual Acuity
- SAMPLE History
- OPQRST History
- Time of Injury
- Involved Chemical MSDS
- Contact / Corrective Lens Use
- "Shooting" or "Streaking" Lights
- Rust Ring
- "Lowering Shade" in Vision

Differential

- Globe Rupture
- Acute Closed Angle Glaucoma
- Stroke
- Retinal Artery Occlusion
- Chemical Burn
- Retinal Venous Thrombus



Pearls

REQUIRED EXAM: VS, GCS, Visual Acuity, Neuro Exam, Extraocular Movements

- Stabilize any penetrating objects. DO NOT remove any embedded / impaled objects
- If Long Spine Board not indicated, transport with head of stretcher elevated to 60 degrees to help reduce intraocular pressure
- Remove contact lenses when possible
- Always cover both eyes to prevent further injury
- Orbital fractures increase concern for globe or optic nerve injury; follow visual acuity and extraocular movements for changes
- Normal visual acuity can be present, even with severe injury

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

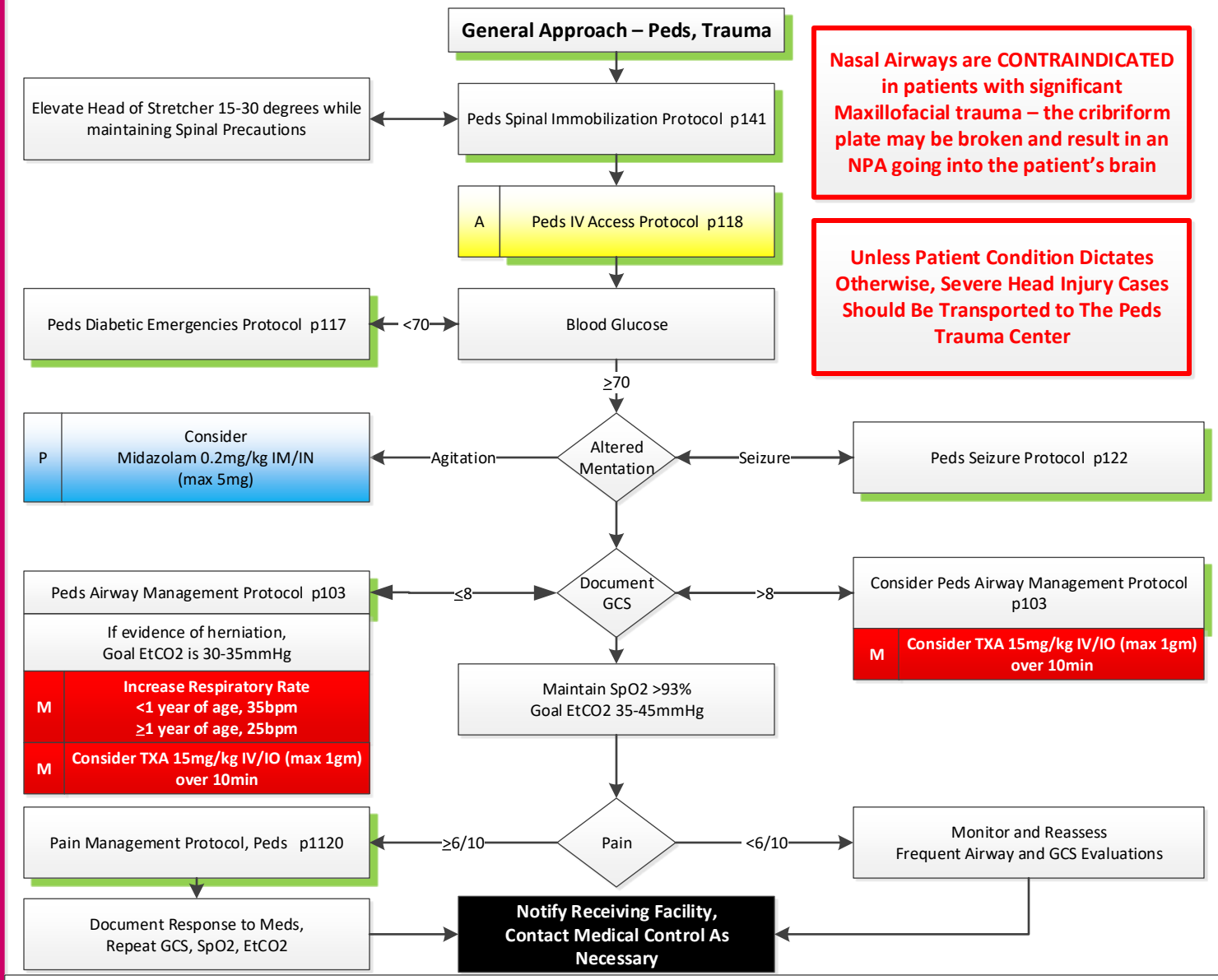
Head Injury – Peds, Trauma

Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Loss Of Consciousness
- Vomiting, Altered Mental Status
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Skull fracture
- Epidural hematoma
- Concussion, Contusion, Laceration, Hematoma
- Non-Accidental Trauma
- Spinal Cord Injury
- Subdural Hematoma
- Subarachnoid Hemorrhage



Nasal Airways are CONTRAINDICATED in patients with significant Maxillofacial trauma – the cribriform plate may be broken and result in an NPA going into the patient's brain

Unless Patient Condition Dictates Otherwise, Severe Head Injury Cases Should Be Transported to The Peds Trauma Center

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- If GCS ≤13 consider Air transport or Rapid Transport to Leveled Trauma Facility
- **Airway interventions can be detrimental to patients with head injury by raising intracranial pressure, worsening hypoxia (causing secondary brain injury) and increasing risk of aspiration. Whenever possible these patients should be managed in the least invasive manner to safely maintain O2 saturation >90% (ie. NRB, BVM with 100% O2, etc.)**
- Acute herniation should be suspected when the following signs are present: acute unilateral dilated and non-reactive pupil, abrupt deterioration in mental status, abrupt onset of motor posturing, abrupt increase in blood pressure, abrupt decrease in heart rate.
- **Only** in suspected acute herniation – increase ventilatory rate with target EtCO2 30-35mmHg
- Increased intracranial pressure (ICP) may cause hypertension and bradycardia (Cushings response)
- Hypotension usually indicates injury or shock unrelated to the head injury and should be treated aggressively
- Most important vital sign to monitor and document is level of consciousness (GCS)
- Concussions are periods of confusion or loss of consciousness (LOC) associated with trauma which may have resolved by the time EMS arrives. Any confusion or mental status abnormality should be transported to an Emergency Department. **Any questions or clarifications, contact Medical Control.**

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Hemorrhage Control – Peds, Trauma

Pertinent Positives and Negatives

- Type of injury
- Mechanism (blunt vs. penetrating)
- Central and Peripheral Pulses
- Neuro Function Distal to Injury
- Time of Injury
- Deformity
- Diminished pulse / capillary refill

Differential

- Vascular Disruption
- Amputation
- Fracture, Dislocation
- Sprain, Strain
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- **Hypotension in trauma needs blood products early**, so minimize scene time. Goal for scene time in major trauma cases should be <10 min
- Multiple casualty incident or obvious life threatening hemorrhage, consider Tourniquet Procedure and/or Hemostatic Dressing FIRST
- Hemostatic Dressings are appropriate for hemorrhage that can't be controlled with a tourniquet, such as junctional wounds in the groin or axilla.
- Remember - hemostatic agents are contraindicated in wounds that violate the thoracic or abdominal cavity; if unsure, use sterile roll gauze.
- Signs/Symptoms of Shock include: altered mental status, pallor, cap refill >3 sec, faint/absent peripheral pulses, hypotension (age defined)

Legend	
	EMT
A	A-EMT
P	Paramedic
M	Medical Control

Sexual Assault / Intimate Partner Violence – Peds, Trauma

Pertinent Positives and Negatives

- Age, VS, GCS
- Mechanism of Injury
- Events leading up to 9-1-1 Activation
- Relationship to and Location of Offender
- Strangling or Neck Injury
- SAMPLE History
- OPQRST History
- Evidence of Intoxication
- Evidence of Multi-System Trauma

Differential

- Hypovolemic Shock
  - -External Hemorrhage
  - -Internal Hemorrhage
  - -Unstable Pelvic Fracture
- Abrasion
- Contusion
- Laceration
- Compartment Syndrome

ALL Healthcare Providers are MANDATORY reporters of suspected abuse, including EMS

If something doesn't feel right, report it

General Approach – Peds, Trauma

Peds Spinal Immobilization Protocol p141

A Peds IV Access Protocol p118

Consider Pain Management, Peds Protocol p120

Major Trauma Criteria

Steps 1 and 2 Destination Determination Protocol

Transport To Level 1 Trauma Center

No

Mechanism of Injury

Head Injury → Head Injury, Peds Trauma Protocol p138

Chest Injury → Go To Chest Injury, Peds Trauma Protocol p131

Extremity Injury → Go To Extremity Injury, Peds Trauma Protocol p136

Eye Injury → Go To Eye Injury, Peds Trauma Protocol p137

Sexual Assault

Provide Emotional Support, Do Not Judge The Victim

Contact Law Enforcement for Scene and Provider Safety, if Not Already Present

Preserve Forensic Evidence, Wear Gloves, Use Burn Sheet To Collect Clothing

Work With Law Enforcement to Maintain Chain of Custody

Encourage Patient to Seek Evaluation While Respecting Autonomy

Discourage Patient from Voiding, Vomiting or Bathing to Preserve Evidence

Consider Pain Management, Peds Protocol p120

Transport to ED with SANE Nurse OR Child Abuse Evaluation Capability

Notify Receiving Facility, Contact Medical Control As Necessary

Dane County Rape Crisis Center

Rape Crisis Center: 608-251-5126

Crisis Line: 608-251-7273

Domestic Abuse Intervention Services

DAIS Help Line: 608-251-4445

Pearls

REQUIRED EXAM: Mental Status, HEENT, Heart, Lungs, Abdomen, Extremity, Back, Neuro

- Major Trauma Criteria – Step 1 and Step 2 in Destination Determination Protocol.
- Intimate Partner Violence is very difficult to disclose, and *many victims call 9-1-1 with vague complaints*; Have a HIGH index of suspicion
- Never judge a victim of intimate partner violence or sexual assault on the way they dress, act or present themselves
- Do not be afraid to involve Law Enforcement for assistance as needed, and have a low threshold to transport to a SANE Capable Emergency Department where Social Work, SANE Nurses, and Advocates can provide support and resources for these patients
- Child Abuse Evaluation centers are also specialized units with specialized forensic capabilities, Child-Life Specialists and Social Work.

Legend	
	EMT
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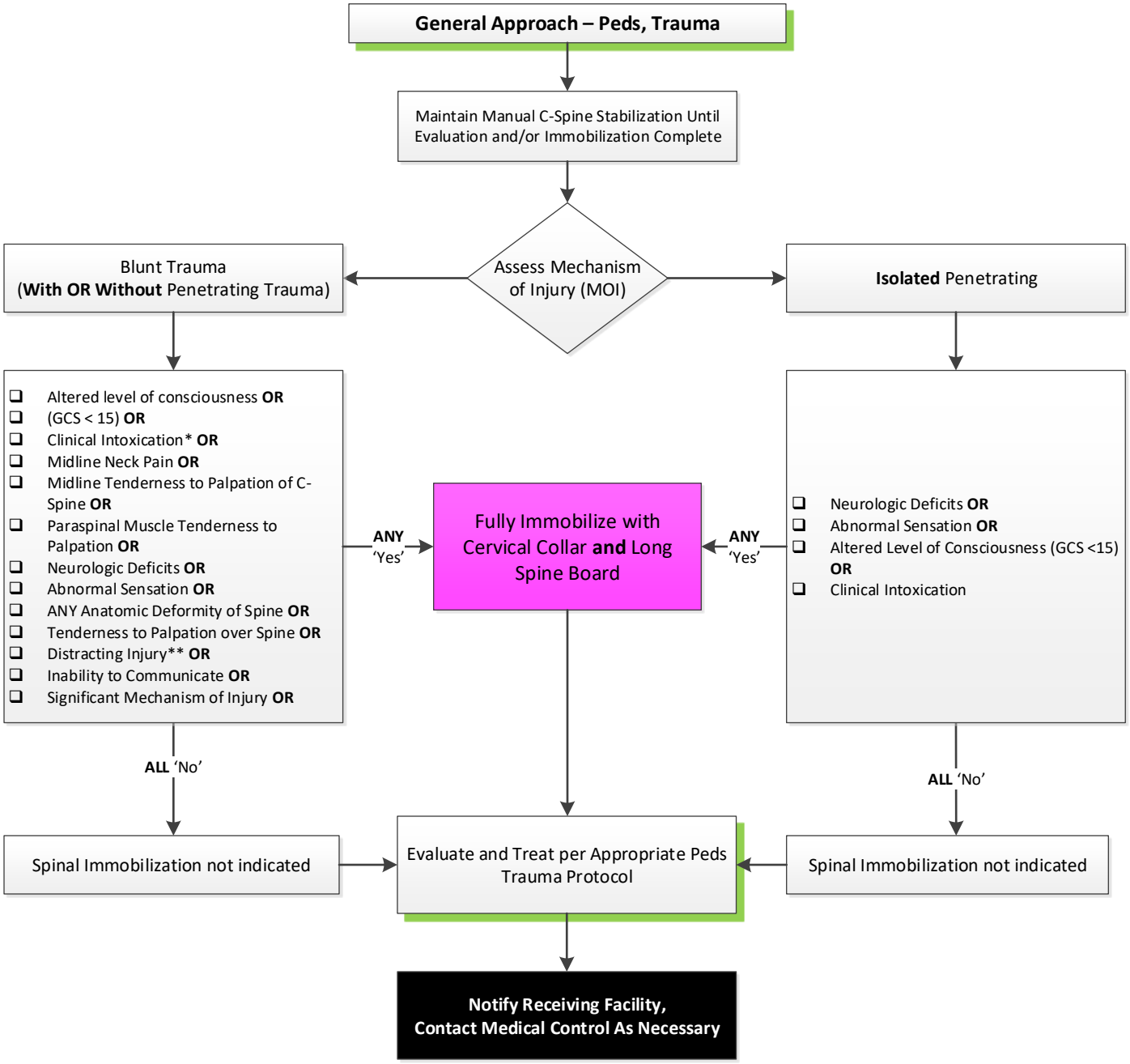
Spinal Immobilization – Peds, Trauma



Pearls

REQUIRED EXAM: Motor Function both upper and lower extremities, Sensation of upper and lower extremities, subjective abnormal sensation, Tenderness to palpation of bony prominences OR paraspinal muscles

- ***Clinical Intoxication** – A transient condition resulting in disturbances in level of consciousness, cognition, perception, affect or behavior, or other psychophysiological functions and responses. Common examples include; ataxia, emotional instability, flight of ideas, tangential thought or motor incoordination.
- **Distracting Injury – Examples include, but are not limited to: long bone fracture, dislocations, large lacerations, deforming injuries, burns OR any condition preventing patient cooperation with history.
- It is always safer and better patient care to assume that a Spinal Cord injury has occurred and provide protection, and should be the standard of care in trauma patient management
- Rigid cervical collars and long spine boards have risks and benefits for patients. Spinal immobilization should always be applied when ***any*** doubt exists about the possibility of spinal trauma.
- EXTREMELY thoughtful consideration and careful physical exam should be part of any decision to apply or not apply the spinal immobilization, and *must be well documented*.