



Ketamine Evaluation Program

ADULT DRUG VOLUME QUICK CHART- DOSES BY mL VOLUME (Ketamine)

1. Verify dose for adults as per each individual protocol, and verify that the CONCENTRATION listed here is the drug concentration you currently have in service that you are about to administer.
 2. Estimate weight (weight in kg = weight in pounds/2.2), verify correct dose in kilograms for approximate weight.
 3. If all verifications are correct, and your partner agrees, administer the appropriate drug volume as per the chart below.
- ** This reference may include minimal "rounding" of doses and/or volumes for weight ranges and drug safety ****
4. 5 mL vial 100mg/mL concentration for IM injection only

Volume in ml to Administer by Approximate Weight at Given Concentration

COG Dosing	40kg (88lbs)	50kg (110lbs)	60kg (132lbs)	70kg (154lbs)	80kg (176lbs)	90kg (198lbs)	100kg (220lbs)	110kg (242lbs)	120kg (264lbs)	130kg (286lbs)	140kg (308lbs)
1 mg/kg IM Burns/Pain	0.4mL	0.5mL	0.6mL	0.7mL	0.8mL	0.9mL	1.0mL	1.1mL	1.2mL	1.3mL	1.4mL
2 mg/kg IM Cardioversion	0.8mL	1.0mL	1.2mL	1.4mL	1.6mL	1.8mL	2.0mL	2.2mL	2.4mL	2.6mL	2.8mL
4 mg/kg IM Excited Delirium	1.6mL	2.0mL	2.4mL	2.8mL	3.2mL	3.6mL	4.0mL	4.4mL	4.8mL	5mL Max Dose	5mL Max Dose

(Ketamine)

Atrial Fibrillation with Rapid Ventricular Response

History:

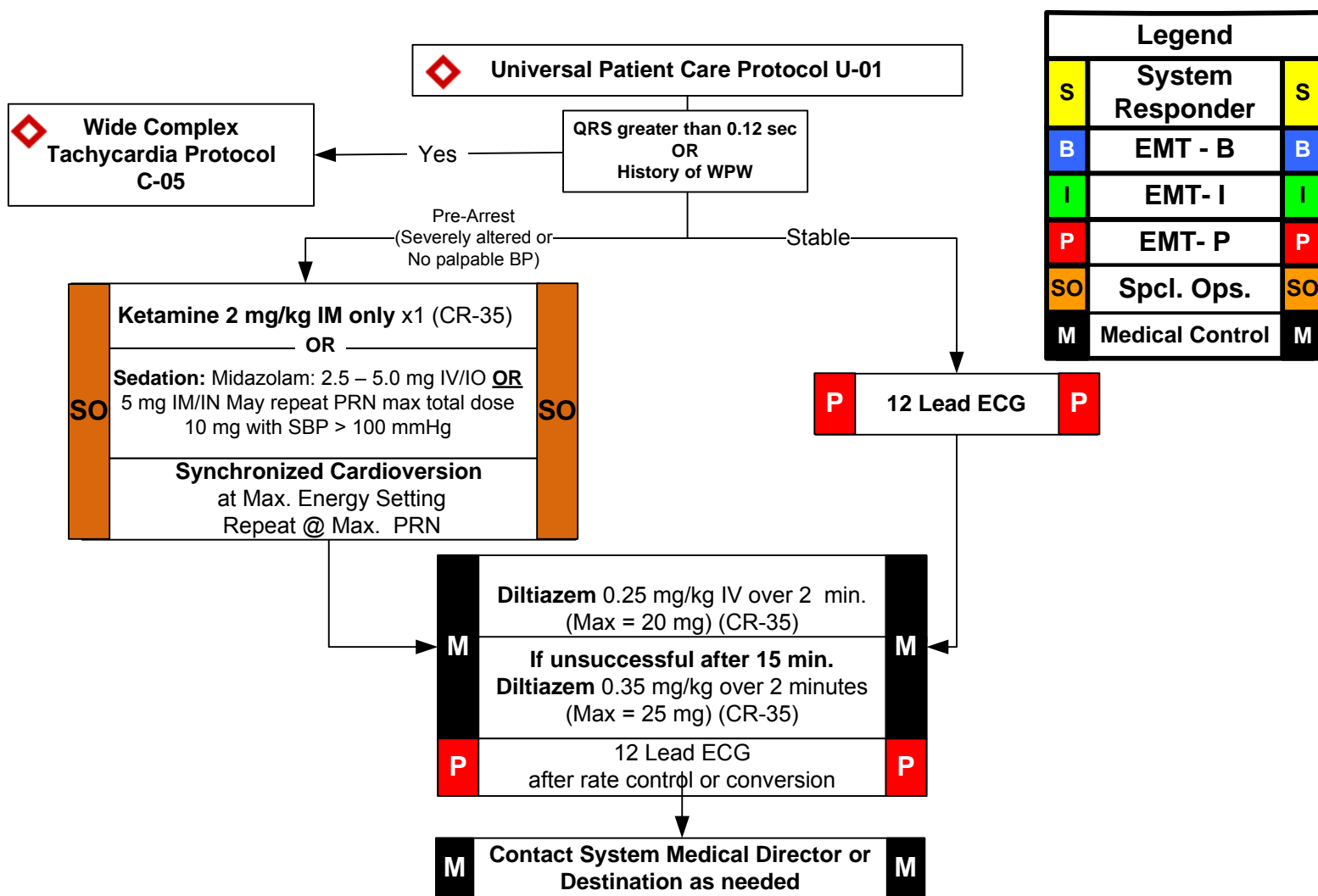
- Medications
(Aminophylline, Stimulants, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical HX (A-fib, COPD, CAD)

Signs and Symptoms:

- QRS less than 0.12 sec
- Rate related (Dizziness, CP, SOB Syncope / near syncope)

Differential:

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia or Anemia
- Hypovolemia
- Drug effect / Overdose (see Hx)
- Hyperthyroidism
- Pulmonary embolus



Pearls:

- If patient has history of or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer Diltiazem.
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, but is not harmful.
- Monitor for hypotension after administration of Diltiazem.
- Monitor for respiratory depression and hypotension associated with Midazolam.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Continuous pulse oximetry is required for all Atrial Fibrillation Patients.
- Maximum Physiologic HR calculation 220 minus (-) age in years = Max HR
- Rapid ventricular response is defined as rate > 100 however rate related signs and symptoms are uncommon with HR ≤ 150/min in patients with healthy heart. Consider rate control at lower heart rates if symptomatic, .

Burns (Ketamine)

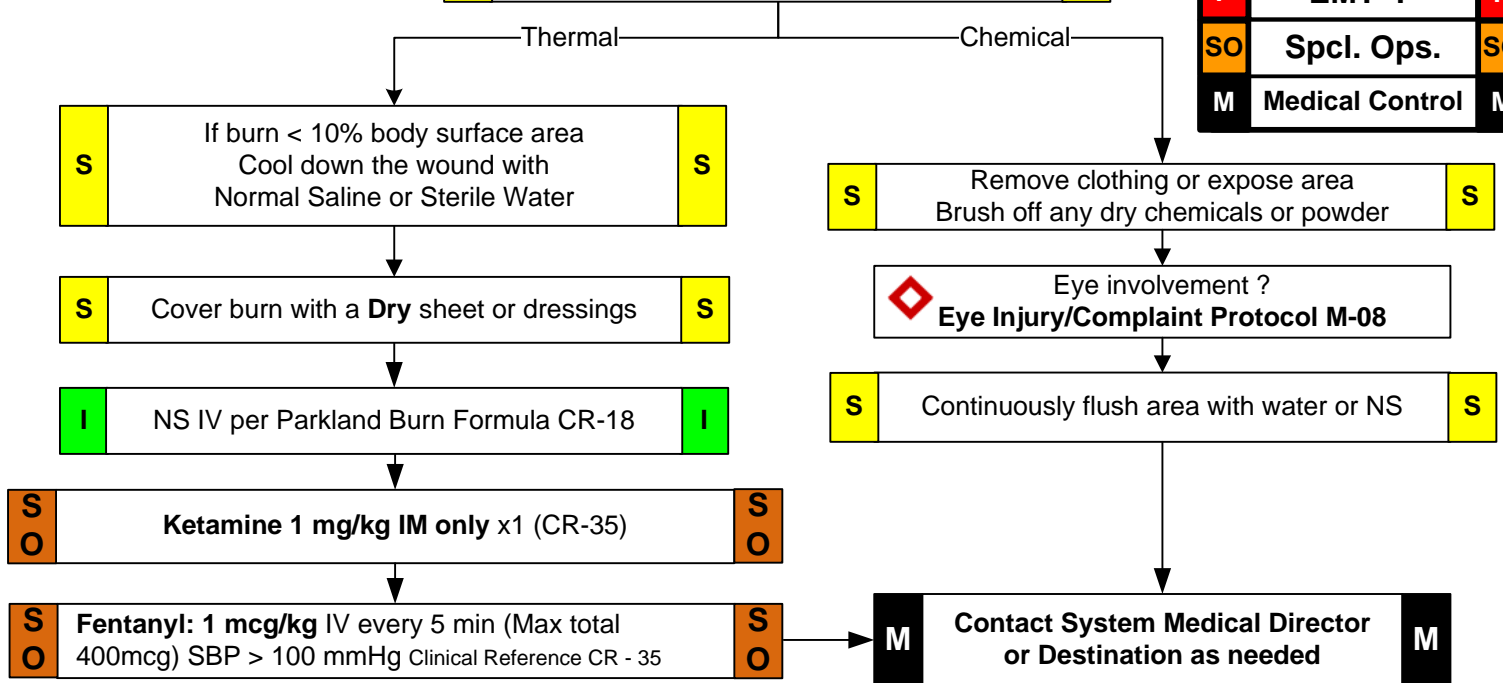
History: <ul style="list-style-type: none"> Type of exposure (heat, gas, chemical) Inhalation injury Time of Injury Past medical history and Medications Other trauma Loss of Consciousness Tetanus/Immunization status 	Signs & Symptoms: <ul style="list-style-type: none"> Burns, pain, swelling Dizziness Loss of consciousness Hypotension/shock Airway compromise/distress singed facial or nasal hair, hoarseness / wheezing 	Differential: <ul style="list-style-type: none"> Superficial (1°) red and painful Partial thickness (2°) blistering Full thickness (3°) painless and charred or leathery skin Chemical Thermal Electrical Radiation
---	--	---

Universal Patient Care Protocol U-01

Airway Protocol R-01

Remove rings, bracelets, and other constricting items

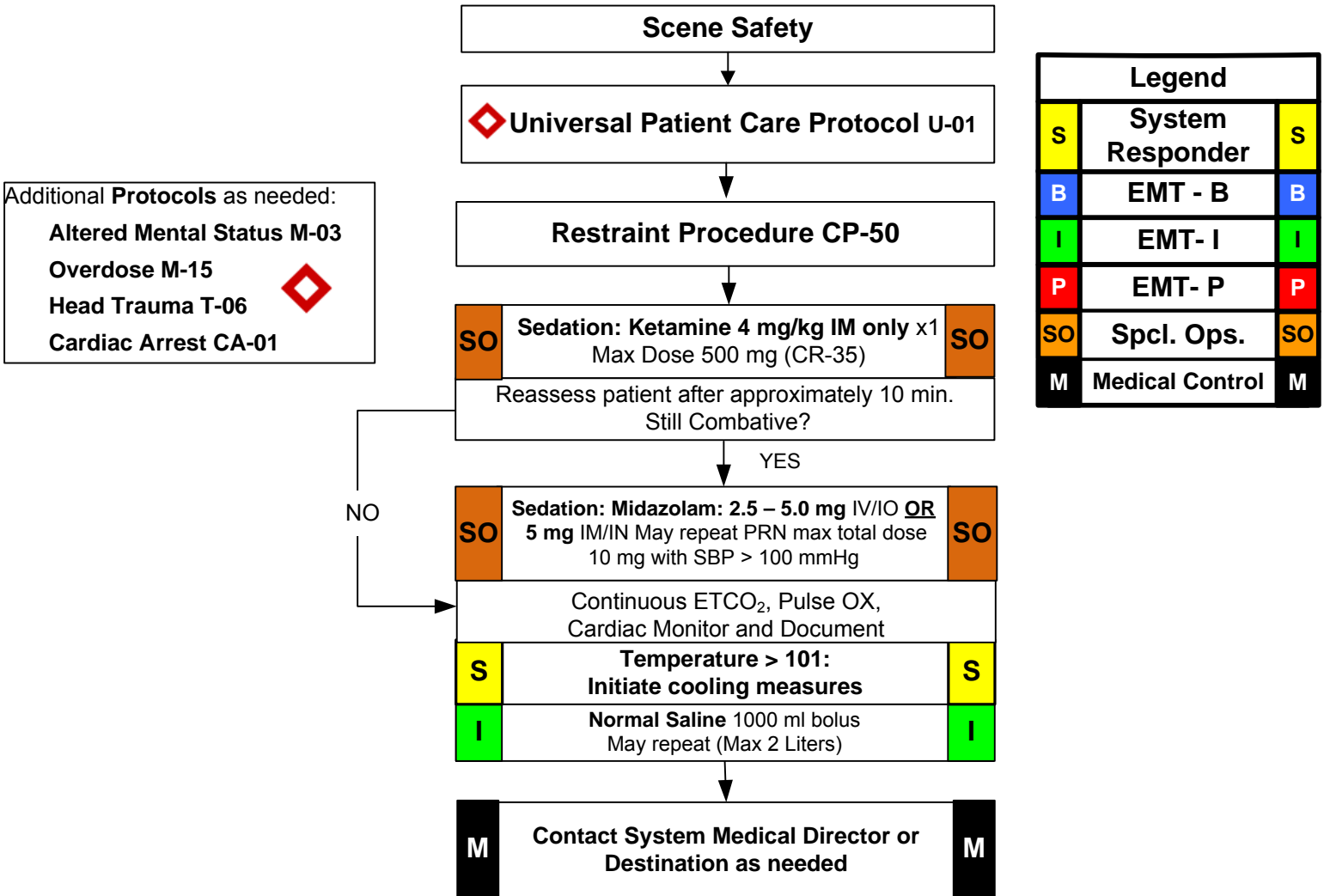
Legend		
S	System Responder	S
B	EMT - B	B
I	EMT - I	I
P	EMT - P	P
SO	Spcl. Ops.	SO
M	Medical Control	M



- Pearls:
- Evaluate BSA : Use chart or use one side of patients hand = 1% BSA
- Critical Burns:
 - >20% 2° and 3° body surface area (BSA) age > 10;
 - >10% BSA age < 10 or > 50;
 - 3° burns >5% BSA;
 - 2° and 3° burns to face, eyes, hands or feet or genitalia; electrical burns; respiratory burns; deep chemical burns;
 - Burns with extremes of age or chronic disease; and burns with associated major traumatic injury.
- Minor burns (< 5% BSA 2nd and 3rd) not complicated by airway compromise or trauma do not require transport to a trauma center.
- Potential CO exposure should be treated with 100% oxygen.
- Circumferential burns to extremities are dangerous due to potential vascular compromise 2° to soft tissue swelling.
- Burn patients are prone to hypothermia - Never apply ice or cool burns that involve >10% body surface area.
- Do not overlook the possibility of multiple system trauma or child abuse with burn injuries.
- 2nd or 3rd degree burn >10% BSA – Fluid therapy following Parkland Burn Formula.
- Parkland Formula = NS 2 mL/kg x % TBSA 2nd or 3rd burn over the first 8 hours.
- ETCO2 if multiple doses of Narcotic Medication administered

Excited Delirium (Ketamine)

History <ul style="list-style-type: none"> Situational crisis Psychiatric illness/medications Injury to self or threats to others Medic alert tag Substance abuse / overdose Diabetes 	Signs & Symptoms <ul style="list-style-type: none"> Anxiety, agitation, confusion Affect change, hallucinations Delusional thoughts, bizarre behavior Combative violent Expression of suicidal/homicidal thoughts Very "hot" to touch 	Differential: <ul style="list-style-type: none"> see Altered Mental Status differential Hypoxia Alcohol Intoxication Toxin / Substance abuse Medication effect / overdose Withdrawal syndromes Bipolar (manic-depressive) Schizophrenia, anxiety disorders, etc
--	--	--

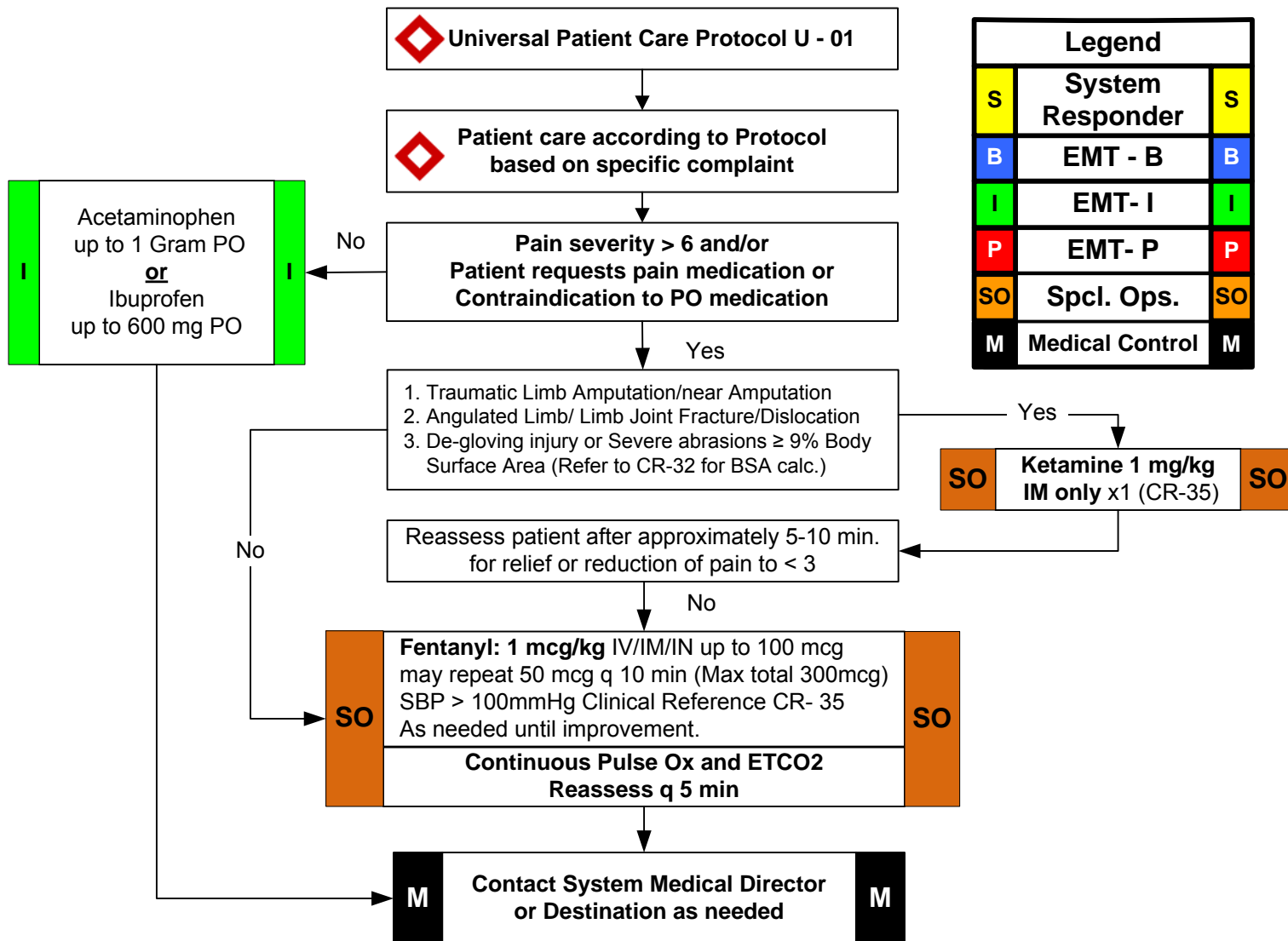


Pearls:

- Consider your safety first. Physical Restraint should be performed/assisted by Law Enforcement when available.
- All patients who receive either physical or chemical restraint must be continuously observed by ALS personnel on scene or immediately upon their arrival.
- Any transported patient who is handcuffed or restrained by Law Enforcement should be accompanied by an officer whenever possible. If not possible law enforcement must be immediately available.
- Be sure to consider all possible medical/trauma causes for behavior (hypoglycemia, overdose, substance abuse, hypoxia, head injury, etc.)
- If patient is suspected of excited delirium suffers cardiac arrest, consider a fluid bolus and sodium bicarbonate early.
- Restrained patients should never be maintained or transported in a prone position..
- Cold saline boluses 30 ml/kg with temperature ≥ 104 (up to 2 liters max in adults)

Pain Management (Ketamine)

History: <ul style="list-style-type: none"> Age Location Duration Severity (1-10) Past Medical History Medications Drug allergies Medications taken prior to arrival 	Signs and Symptoms: <ul style="list-style-type: none"> Severity (pain scale) Quality Radiation Relation to movement, respiration Increased with palpation of area. 	Differential: <ul style="list-style-type: none"> Per the specific protocol Musculoskeletal Visceral (abdominal) Cardiac Pleural / Respiratory Neurogenic Renal (colic)
---	---	--



Pearls:

- Pain severity (0-10) is a vital sign to be recorded pre and post IV or IM medication delivery and at disposition.
- Vital signs should be obtained pre, 5 minutes post, and at disposition with all pain medications.
- Monitor patient closely for over sedation - refer to overdose protocol if needed
- Head injury patients should not receive pain medication
- Do not administer Acetaminophen to patients with history of liver disease.

Supraventricular Tachycardia (Ketamine)

History:

- Medications (Aminophylline, Diet pills, Thyroid supplements, Decongestants, Digoxin)
- Diet (caffeine, chocolate)
- Drugs (nicotine, cocaine)
- Past medical history
- History of palpitations / heart racing
- Syncopal / near syncopal

Signs and Symptoms:

- QRS less than 0.12 Sec I
- Rate related (Dizziness, CP, SOB)
- Potential presenting rhythm
 - Sinus tachycardia
 - Atrial fibrillation / flutter
 - Multifocal atrial tachycardia

Differential:

- Heart disease (WPW, Valvular)
- Sick sinus syndrome
- Myocardial infarction
- Electrolyte imbalance
- Exertion, Pain, Emotional stress
- Fever
- Hypoxia
- Hypovolemia or Anemia
- Drug effect / Overdose (see Hx)
- Hyperthyroidism
- Pulmonary embolus

Universal Patient Care Protocol U-01

Legend		
S	System Responder	S
B	EMT - B	B
I	EMT- I	I
P	EMT- P	P
SO	Spcl. Ops.	SO
M	Medical Control	M

Wide Complex Tachycardia with Pulse Protocol C-05

QRS > 0.12 sec
OR
History of WPW

Yes

Pre-Arrest

Severely altered or no palpable radial pulse

Stable

SO	<p>If readily available Consider Adenosine 12 mg rapid IV repeat X1 (Max. 24 mg) 10 mL flush after each dose</p>	SO
	<p>Ketamine 2 mg/kg IM only x1 (CR-35)</p>	
	<p>OR</p>	
	<p>Sedation: Midazolam: 2.5 – 5.0 mg IV/IO OR 5 mg IM/IN May repeat PRN (max total dose 10 mg) with SBP > 100 mmHg</p>	
	<p>Synchronized Cardioversion at Max. Energy Setting Repeat @ Max. PRN</p>	

P	12 Lead ECG	P
P	Valsalva's Maneuver CP-69	P
P	Adenosine 12 mg rapid IV repeat x 1 (Max. 24 mg) use 10 mL flush after each dose	P

P	Diltiazem 0.25 mg/kg IV over 2 minutes (Max dose 20 mg) (CR-35) May repeat x1 at 0.35mg/kg IV q 15 min. (Max dose 25mg) (CR-35)	P
P	12 Lead ECG	P

Any change in rhythm, go to appropriate Protocol

Contact System Medical Director or Destination as needed

Pearls:

- If patient has history of or 12 Lead ECG reveals Wolfe Parkinson White (WPW), DO NOT administer Diltiazem, go to VT with Pulse.
- If patient requires multiple conversion attempts without resolution consider alternative cause of dysrhythmia
- Adenosine may not be effective in identifiable atrial flutter/fibrillation, but is not harmful.
- Monitor for respiratory depression and hypotension associated with Midazolam.
- Document all rhythm changes with monitor strips and obtain monitor strips with each therapeutic intervention.
- Continuous pulse oximetry is required for all SVT Patients.
- Serious S/S are uncommon with HR < 150. Patients with impaired cardiac function may become symptomatic at lower HR.
- Maximum physiologic heart rate (Sinus Tachycardia) is 220 bpm-age in years.

Wide Complex Tachycardia With A Pulse (Ketamine)

History:

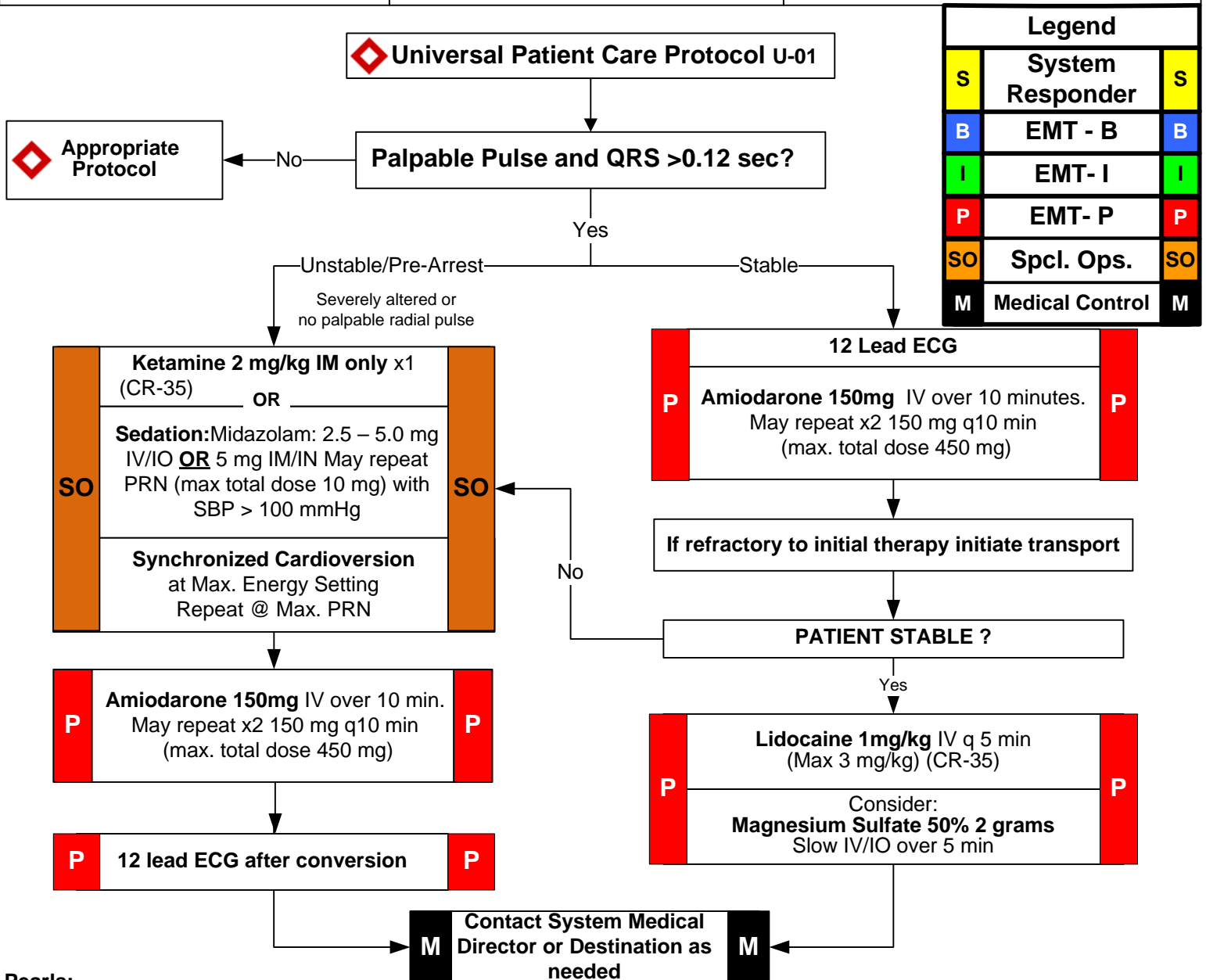
- Past medical history / medications, diet, drugs
- Syncope / Near syncope
- Palpitations
- Pacemaker
- Allergies: Lidocaine / Novocaine
- CAD, CHF, Cardiomyopathy

Signs and Symptoms:

- Ventricular Tachycardia on ECG (Runs or Sustained)
- Conscious, rapid pulse
- Chest Pain, Shortness of Breath
- Dizziness
- Rate usually 150-180 bpm for sustained V-Tach

Differential:

- Artifact / Device Failure
- Cardiac
- Endocrine/Electrolyte
- Hyperkalemia
- Drugs/Toxic exposure
- Pulmonary disease



Pearls:

- For witnessed / monitored ventricular tachycardia, try having patient cough
- Slow wide complex consider Hyperkalemia
- If Lidocaine converts: Drip: 2-4 mg/min
- If torsades de pointes: Magnesium Sulfate 50% 2 grams slow IV /IO push over 5 minutes.
- Maximum dose of antiarrhythmic should be given before changing antiarrhythmic.
- If hyperkalemia or tricyclic OD consider Sodium Bicarbonate 1 mEq/kg early in intervention.
- Amiodarone: allow 10 minutes after dose completed before next dose.