MUSCULOSKELETAL TRAUMA
STATEWIDE ALS PROTOCOL

Initial Patient Contact – See Protocol #201

Splint suspected fractures as appropriate:

- Traction splinting is preferred for isolated femur fractures [1]
- Straighten severely angulated fractures if distal extremity has signs of decreased perfusion.

Assess pain on 1-10 scale
Assess Neurovascular Status distal to injury

Mild to moderate pain AND
Oral medication not contraindicated

- Place in position of comfort
- Provide verbal reassurance

Administer Oral Analgesic Medication:

- **Acetaminophen**, [2] if available, 650 mg orally
  Peds 15 mg/kg (max 650 mg)
  OR
- **Aspirin** 324-975 mg orally (adult > 14 y/o only)
  OR
- **Ibuprofen**, if available, 400 mg orally [3]
  Peds ≥ 2 y/o, 10 mg/kg (max 400 mg), if available

WARNING: Do not administer these medications if patient had medication recently (within 4 hours for acetaminophen/aspirin, within 6 hours for NSAID).

Peds
< 2 y/o

Moderate/severe pain

- Place in position of comfort
- Provide verbal reassurance
- Initiate IV/IO NSS [4]
- If nausea, consider ondansetron, if available (see protocol 7010)
- **Administer Analgesic Medication [5] (see box below)**
- Monitor Pulse Oximetry (if opioid or nitrous oxide given)

CONTACT MEDICAL COMMAND

ANALGESIC MEDICATION OPTIONS (Choose one)

Fentanyl 50-100 mcg IV/IO/IM/IN [6,7,8,9] (1 mcg/kg) slowly, maximum 100 mcg/dose
may repeat ½ dose every 5 minutes until maximum of 300 mcg total (or peds maximum 3 mcg/kg)

OR

Morphine sulfate 2-5 mg IV/IO/IM [6,7,8,9] (0.1 mg/kg) slowly, maximum 10 mg (pediatric max. 5 mg/dose)
may repeat dose every 5 minutes, until maximum of 20 mg total (or peds maximum 0.2 mg/kg)

OR

Nitrous Oxide (50:50) by inhalation [10]

OR

Ketorolac [3, 11], if available, 15 mg IV/IO (30 mg IM)
(Peds 0.5 mg/kg IV/IO/IM, maximum 15 mg IV/IO or 30 mg IM)

OR

Acetaminophen, if available, 1000 mg IV (maximum 650 mg if <65 kg), give slowly over 15 minutes
(Peds 15 mg/kg, maximum 650 mg)
WARNING: Do Not Administer if patient had acetaminophen in last 4 hours.

OR

Ketamine, if available, 0.3 mg/kg in 100 mL NSS, given IV/IO over 10 min (maximum 30 mg).
WARNING: Ketamine must be administered by infusion rather than direct bolus. Ketamine should not be administered to pediatric patients <15 yrs old. Adverse psychomimetic effects are more common in bolus dosing and the elderly. EMS providers require special approval to administer ketamine.

MUSCULOSKELETAL TRAUMA
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with isolated suspected extremity fractures.

B. Patient with acute extremity pain after trauma

C. Patient with acute back pain, excluding chronic back pain

D. Patient with acute thoracic/ rib pain after trauma

Exclusion Criteria:

A. Traumatic/hypovolemic shock (Follow Multisystem Trauma or Traumatic Shock protocol #6002)

System Requirements

A. EMS region must approve the use of ketamine within the region, and the region must perform a QI audit of **every** case of ketamine administration for compliance with this protocol. All results must be forwarded quarterly to the Bureau of EMS for statewide QI.

B. Agency medical director must approve of ketamine use by the EMS agency and must perform a QI audit of **every** case of ketamine administration for compliance with this protocol.

C. Agency medical director must personally assure training and continuing education in patient selection, continuous respiratory monitoring, advanced airway management, ketamine pharmacology, and use of this protocol.

D. Ketamine is an optional medication for EMS providers at or above the level of ~~AEMT~~ paramedic level, and approval to carry this medication is specific to the use for pain, delirium with agitated behavior, and/or airway management based upon regional and agency medical director approval. EMS providers are not permitted to administer ketamine for indications outside of specific indications within these protocols – even by medical command order – unless they have received special approval to participate in pilot use for other indications. An agency may have medical director and regional approval to use ketamine for some, all, or none of the indications above.Agency medical director must assure initial and ongoing competence for each individual EMS provider who will use ketamine. Only individuals credentialed to administer this medication will utilize the medication.

E. The ALS agency must carry a~~n alternative/ rescue~~ supraglottic airway device in various sizes.

F. Ketamine may only be carried by ALS agencies that follow all aspects of this protocol and permission to carry the medication will be removed from the agency by the Bureau of EMS if either the agency/regional QI or other investigation determines that there are significant variances from this protocol.

Possible Medical Command Orders:

A. Additional fentanyl or morphine or other analgesic

B. Intramuscular fentanyl or morphine

Notes:

1. Traction splinting should not be used for hip (proximal femoral neck) fractures.
2. Acetaminophen is contraindicated in patients with liver disease/failure.
3. NSAID (nonsteroidal anti-inflammatory drugs), including ibuprofen and ketorolac, are contraindicated if:
    a. Oral NSAID (e.g. ibuprofen, naproxen, etc.) taken by patient in last 6 hours
    b. Bleeding or suspected bleeding (e.g. head/chest/abdominal trauma, gastrointestinal, vascular).

c. Known kidney disease/failure or kidney transplant

4. IV/IO access is not required for administration of nitrous oxide or IM ketorolac.
5. Reassess and document 1-10 pain score 15-30 minutes after analgesic dose or at time of transfer of care.
6. Opioid pain medication may not be administered for other medical/trauma conditions (e.g. multiple rib fractures) before attempted contact with Medical Command.
7. Reduce dose for patients over 65 y/o.
8. Opioid medication should not be given if:
    a. Oxygen saturation ≤ 95%
    b. SBP < 100 for adults
    c. SBP ~~< 70 + 2(age in years) for children < 14 y/o~~ for children 1-10 years old and BP <70+ (age x 2) or if greater than 10 years old and BP <90.
    d. Patient has altered level of consciousness
9. If respiratory depression or hypoxia occur after opioid:
    a. Administer oxygen and ventilate if necessary
    b. If significant respiratory depression, administer naloxone 0.4 mg IV, titrate additional doses until adequate ventilation or total of 2 mg.
10. Nitrous oxide should be self-administered. Patient should be coached to hold mask on his/her face, and the patient will drop mask if he/she becomes sedated. Over sedation may occur if EMS provider holds mask to patient's face. Nitrous oxide may be administered without IV access. Avoid nitrous oxide in:
    a. SBP ~~<90 [Pediatrics < 70 + (2 x age)]~~ for children 1-10 years old and BP <70+ (age x 2) or if greater than 10 years old and BP <90.
    b. obvious intoxication
    c. head injury with altered mental status
    d. chronic lung disease
    e. suspected pneumothorax
    f. suspected bowel obstruction
    g. decompression sickness (e.g. from diving/submersion)
11. Dosing over 15mg IV or 30mg IM for Ketorolac does not improve pain relief but risks additional side effects to renal and GI systems.

Performance Parameters:

A. Pain medication given or documentation of pain medication being offered for suspected isolated extremity fractures.

B. Traction splinting used for isolated femur fractures without hypotension in all cases.

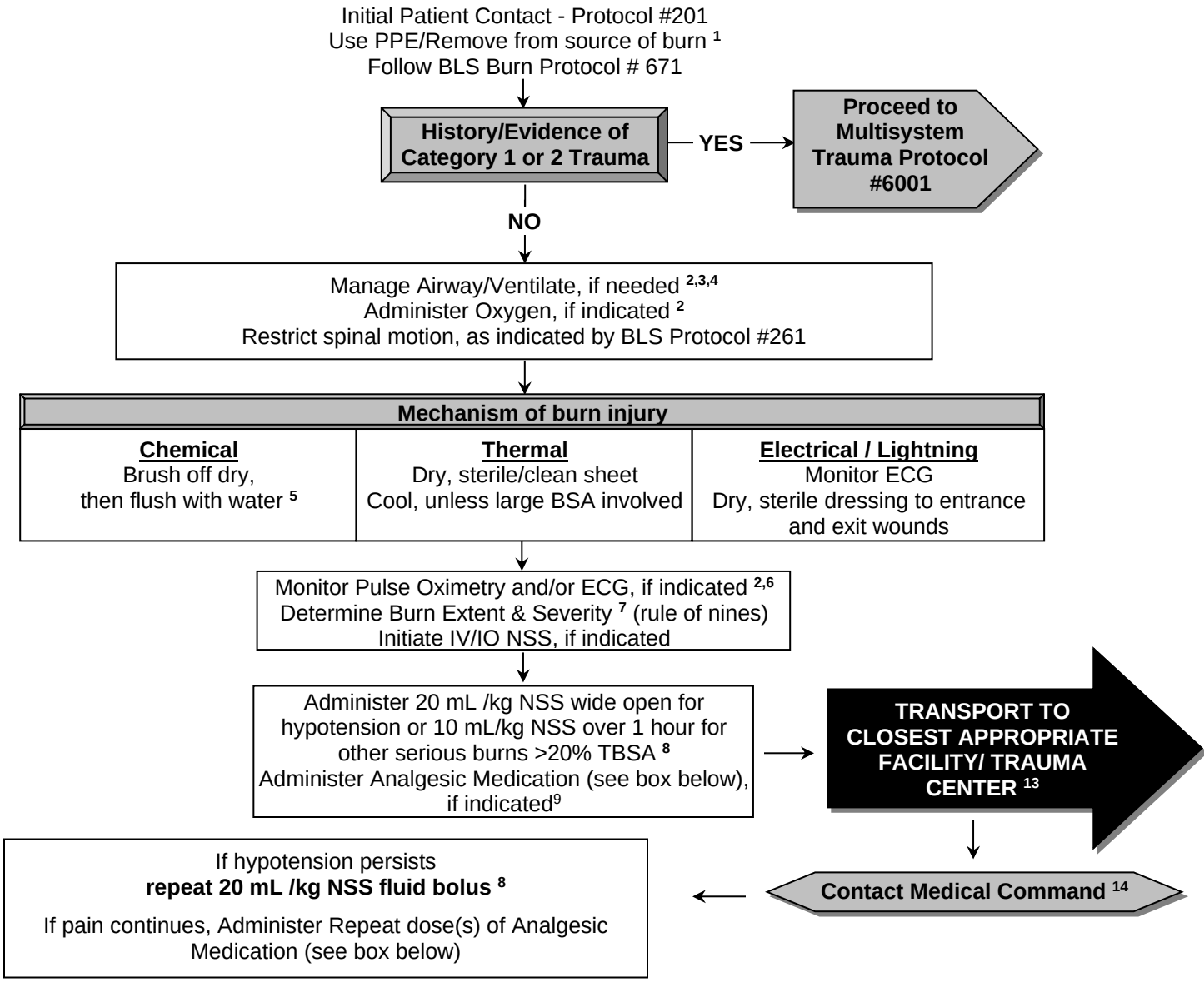
C. Vital signs and oxygen saturation documented before and after any administration of opioid.

D. Severity of pain documented for all painful conditions and documented before and after analgesic medications/ interventions.

E. Agency medical director and QI committee review of each case of sub-dissociative dose of ketamine for pain. Review for pre- and post-administration pain severity, appropriate indication, appropriate dosage, monitoring of VS and continuous pulse oximetry. Agencies must submit

quarterly report of ketamine uses to EMS regional QI committee. Regional QI committee must report quarterly regional summary of use and protocol compliance to BEMS quarterly

BURNS
STATEWIDE ALS PROTOCOL



ANALGESIC MEDICATION OPTIONS
(Choose one)

Fentanyl 50-100 mcg IV/IO/IM/IN [10,11] (1 mcg/kg); maximum 100 mcg/dose
may repeat ½ dose every 5 minutes until maximum of 3 mcg/kg

OR

Morphine sulfate 2-10 mg IV/IO/IM [10,11] (0.1 mg/kg); maximum 10 mg/dose (peds max 5 mg/dose)
may repeat dose every 5 minutes until maximum of 0.2 mg/kg

OR

Nitrous Oxide (50:50) by inhalation [12]

OR

Ketamine, if available, 0.3 mg/kg in 100 mL NSS, given IV/IO over 10 min (maximum 30 mg).
WARNING: Ketamine must be administered by infusion rather than direct bolus. Ketamine should not be administered to pediatric patients <15 yrs old. Adverse psychomimetic effects are more common in bolus dosing and the elderly. EMS providers require special approval to administer ketamine.

BURNS

STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with burns from:

1. Thermal injury
2. Chemical dermal injury.

B. Patient with lightning or electrical injury.

Possible MC Orders:

A. Additional morphine or fentanyl

B. Transport to a burn center or trauma center

C. NIPPV ~~CPAP/BiPAP~~ for respiratory difficulty

Notes:

1. Consider scene safety. Be aware of possible chemical contamination and/or electrical sources. Stop the burning process. Remove clothing and constricting jewelry.
2. Determine presence of respiratory burns as indicated by carbonaceous sputum, cough, hoarseness, or stridor (late). All patients with exposure to smoke or fire in a confined space should receive high-flow oxygen and Pulse Oximetry monitoring.
3. Consider early intubation in patients with respiratory distress, hoarseness, carbonaceous sputum or stridor. If unsure, contact medical command early for assistance with this decision.
4. Confirm and document tube placement with absence of gastric sounds and presence of bilateral breath sounds **AND** ~~confirmatory device (like wave-form $ETCO_2$ detector)~~ with electronic waveform capnography. Follow Confirmation of Airway Placement Protocol #2032.
5. For chemical burn exposure, brush dry powders then begin flushing immediately with water or appropriate agent for chemical. **Exceptions:** for phosphorous and sodium, **DO NOT** flush with water, cover with cooking oil if available; for Phenol remove with alcohol and follow with large volume of water. If eye is burned, flush with large volume of NSS for 15-20 minutes. May administer tetracaine eye drops before flushing. Continue eye flushing during transport.
6. Monitor ECG for all patients with:
   a. Electrical/Lightning injury
   b. Respiratory symptoms
   c. Multisystem trauma
   d. Hypovolemic/Traumatic Shock
7. Indicators of severe burn injury include:
   a. Respiratory tract injury, inhalation injury.
   b. 2nd and 3rd degree burns that involve face, hands, feet, genitalia or perineal area or those that involve skin overlying major joints.
   c. 3rd degree burns of greater than 5% BSA.
   d. 2nd degree burns of greater than 15% BSA.
   e. Significant electrical burns, including lightning injury.
   f. Significant chemical burns.
   g. Burn injury in patients with pre-existing illnesses that could complicate management, prolong recovery, or affect mortality.

   Medical Command physician may direct transport to Burn Center in these cases.
8. **DO NOT** provide fluid bolus if respiratory symptoms are present.

9. Opioid pain medication should not be given if:
    a. Oxygen saturation ≤ 95%
    b. SBP < 100 for adults
    c. SBP ~~< 70 + 2(age in years) for children < 14 y/o~~ for children 1-10 years old and BP <70 + (age x2) or if greater than 10 years old and BP < 90
    d. Patient has altered level of consciousness
10. Reduce dose for patients over 65 y/o.
11. If respiratory depression or hypoxia occur after opioid:
    a. Administer oxygen and ventilate if necessary
    b. If significant respiratory depression, administer naloxone 0.4 mg IV, titrate additional doses until adequate ventilation or total of 2 mg.
12. Nitrous oxide should be self-administered. Patient should be coached to hold mask on his/her face, and the patient will drop mask if he/she becomes sedated. Over sedation may occur if EMS provider holds mask to patient's face.
13. Transport to the closest appropriate medical facility, using the following order of preference:
    a. If unable to maintain airway or unable to ventilate or patient has symptoms of shortness of breath/cough or inhalation injury is suspected, transport to closest hospital.
    b. **Transport to Trauma Center, if patient has associated trauma**. Follow Trauma Destination Protocol #180.
    c. Medical Command Physician may assist in decision for direct transport to a burn center. Consider transport to a burn center if:
        1) The burn meets one of the following clinical criteria:
            a) Partial thickness burns of >10% body surface area
            b) Burns involving the face, hands, feet, genitalia, perineum, or major joints
            c) Third degree burns in any age group
            d) Electrical burns, including lightning injury
            e) Chemical burns
            f) Inhalation injury
        2) **AND**, the patient does not meet trauma triage criteria,
        3) And, the difference between estimated transport time to the closest receiving facility and the burn center is 45 minutes or less.
    d. If none of the above apply, transport to the closest hospital.
14. Medical Command Physician may direct transport to Burn Center.

Performance Parameters:

A. Review all burn calls for compliance with Trauma Destinations Protocol # 180

B. Review all burn calls for frequency of administration of or documentation of offering pain medication.

NONTRAUMATIC PAIN MANAGEMENT
STATEWIDE ALS PROTOCOL

Initial Patient Contact – See Protocol #201

Assess pain on 1-10 scale
Headache with history of migraine (current headache similar to previous migraines)
OR
Abdominal/ Flank/ Pelvic/Back Pain (Not due to Trauma or Injury)

Oral medication not contraindicated

- Place in position of comfort
- Provide verbal reassurance

If mild to moderate pain:

- **Acetaminophen**[1] , if available, 650 mg orally
  Peds 15 mg/kg (max 650 mg)
  OR
- **Aspirin** 324-975 mg orally (adult > 14 y/o only)
  OR
- **Ibuprofen**, if available, 400 mg orally [2]
  Peds ≥ 2 y/o, 10 mg/kg (max 400 mg), if available

WARNING: Do not administer these medications if patient had medication recently (within 4 hours for acetaminophen/aspirin, within 6 hours for NSAID).

If severe pain (greater than a 7/10):

- **Fentanyl** 1mcg/kg up to 100mcg
  Or
- **Morphine** 0.1mg/kg max dose 10mg
  *caution/lower dose with elderly and hemodynamic instability.

Peds < 2 y/o

Nausea or contraindication to oral medication

- Place in position of comfort
- Provide verbal reassurance
- Initiate IV/IO NSS [3]
- If nausea, consider ondansetron, if available (see protocol 7010)
- Administer Nonopioid Analgesic Medication (see box below)

CONTACT MEDICAL COMMAND

NONTRAUMATIC PAIN MANAGEMENT
STATEWIDE ALS PROTOCOL

NONOPIOID ANALGESIC MEDICATION OPTIONS (Choose one)
Medical Command MUST order any opioid medication for mild or moderate pain

Nitrous Oxide, if available (50:50) by inhalation [4]

OR

Ketorolac, if available, 15 mg IV/IO [2,5] (30 mg IM)
IV administration preferred if kidney stone suspected
(Peds ≥ 2 y/o, 0.5 mg/kg IV/IO/IM, maximum 15 mg IV/IO or 30 mg IM)

OR

Acetaminophen, if available, 1000 mg IV (maximum 650 mg if < 65 kg), give slowly over 15 minutes.
(Peds ≥ 2 y/o, 15 mg/kg, maximum 650 mg)
WARNING: Do Not Administer if patient had acetaminophen in last 4 hours.

OR

Ketamine, if available, 0.3 mg/kg in 100 mL NSS, given IV/IO over 10 min (maximum 30 mg).
WARNING: Ketamine must be administered by infusion rather than direct bolus. Ketamine should not be administered to pediatric patients <15 yrs old. Adverse psychomimetic effects are more common in bolus dosing and the elderly. EMS providers require special approval to administer ketamine.

NONTRAUMATIC PAIN MANAGEMENT
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with headache that is similar to previous migraine headaches

B. Patient with flank pain, including suspected kidney stone pain

C. Patient with acute abdominal pain

D. Patient with acute pelvic pain

Exclusion Criteria:

A. Headache pain that is new for patient, associated with cerebral aneurysm, or is worst headache of patient's life - these may be associated with intracranial hemorrhage

B. Known or suspected bleeding (gastrointestinal bleeding, leaking AAA, vaginal bleeding, etc.)

C. Known or suspected pregnancy

D. Pain from musculoskeletal trauma (Follow Musculoskeletal Trauma Protocol #6003)

E. Known history of glucose-6-phosphate dehydrogenase (G6PD) deficiency

System Requirements

A. ~~EMS region must approve the use of ketamine within the region, and the region must perform a QI audit of **every** case of ketamine administration for compliance with this protocol. All results must be forwarded quarterly to the Bureau of EMS for statewide QI.~~ The Agency's assigned EMS regional council must verify the agency has met, and continues to meet the requirements as specified by the Department, for training, stocking, and QI. The region must perform a QI audit of every case of ketamine administration for compliance with this protocol. All results must be forwarded quarterly to the Bureau of EMS for statewide QI.

B. Agency medical director must approve of ketamine use by the EMS agency and must perform a QI audit of **every** case of ketamine administration for compliance with this protocol.

C. Agency medical director must personally assure training and continuing education in patient selection, continuous respiratory monitoring, advanced airway management, ketamine pharmacology, and use of this protocol.

D. Ketamine is an optional medication for EMS providers above the level of AEMT, and approval to carry this medication is specific to the use of pain, sedation assisted intubation, and/or delirium with agitated behavior, based upon regional and agency medical director approval. **EMS providers are not permitted to administer ketamine for indications outside of specific indications within these protocols – even by medical command order** – unless they have received special approval to participate in pilot use for other indications.

E. Agency medical director must assure initial and ongoing competence for each individual EMS provider who will use ketamine. Only individuals credentialed to administer this medication will utilize the medication.

F. The ALS agency must carry an alternative/ rescue airway device in various sizes.

G. Ketamine may only be carried by ALS agencies that follow all aspects of this protocol and permission to carry the medication will be removed from the agency by the Bureau of EMS if either the agency/regional QI or other investigation determines that there are significant variances from this protocol.

Possible Medical Command Orders:

A. Fentanyl or morphine[6]

Notes:

1. Acetaminophen is contraindicated in patients with liver disease/failure.
2. NSAID (nonsteroidal anti-inflammatory drugs), including ibuprofen and ketorolac, are contraindicated if:
    a. Oral NSAID (e.g. ibuprofen, naproxen, etc.) taken by patient in last 6 hours
    b. Gastrointestinal, vascular or other bleeding suspected.
    c. Known kidney disease/failure or kidney transplant.
3. IV/IO access is not required for administration of nitrous oxide or IM ketorolac.
4. Nitrous oxide should be self-administered. Patient should be coached to hold mask on his/her face, and the patient will drop mask if he/she becomes sedated. Over sedation may occur if EMS provider holds mask to patient's face. Nitrous oxide may be administered without IV access. Avoid nitrous oxide in:
    a. SBP <90 ~~[Pediatrics < 70 + (2 x age)]~~ For children 1-10 years old and BP <70 + (age x2) or if greater than 10 years old and BP < 90
    b. altered mental status (e.g. obvious intoxication, head injury)
    c. chronic lung disease
    d. suspected pneumothorax
    e. suspected bowel obstruction
    f. decompression sickness (e.g. from diving/submersion)
5. In renal colic (kidney stone pain), IV administration of ketorolac is preferred.
6. Medical command must be contacted if EMS provider believes that patient requires opioid analgesia for abdominal pain or other nontraumatic pain.

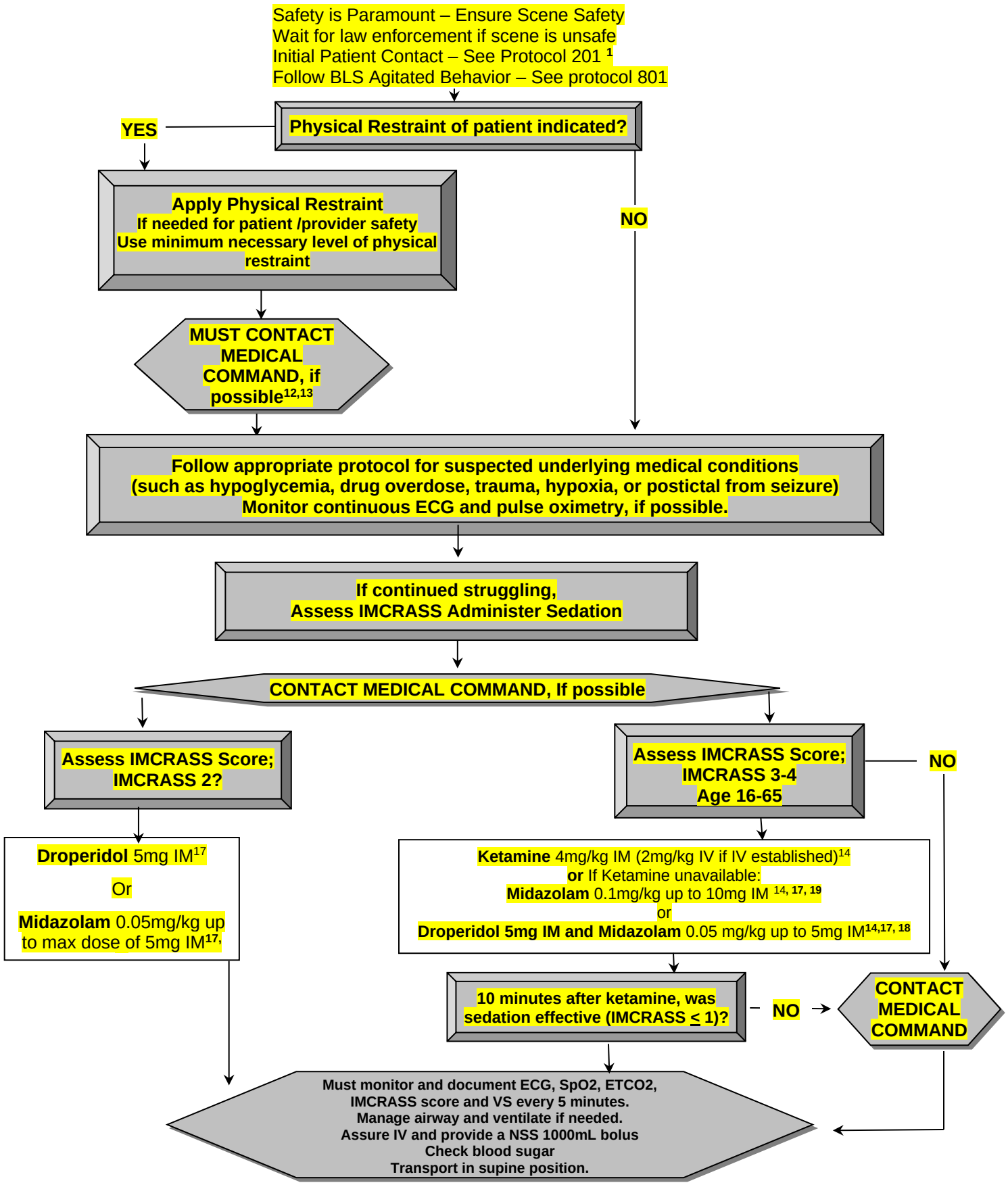
Performance Parameters:

A. Severity of pain documented for all painful conditions and documented before and after analgesic medications/ interventions.

B. Agency medical director and QI committee review of each case of sub-dissociative dose of ketamine for pain. Review for pre- and post-administration pain severity, appropriate indication,

appropriate dosage, monitoring of VS and continuous pulse oximetry. Agencies must submit quarterly report of ketamine uses to EMS regional QI committee. Regional QI committee must report quarterly regional summary of use and protocol compliance to BEMS quarterly.

AGITATED BEHAVIOR
STATEWIDE ALS PROTOCOL



AGITATED BEHAVIOR
STATEWIDE ALS PROTOCOL

Criteria:

A. Patient with a psychiatric or behavioral disorder who is at imminent risk of self-injury or is a threat to others.

B. Delirium with agitated behavior– a condition of agitated fighting against restraints without being aware of actions – can lead to death

C. Patient with a medical condition causing agitation and possibly violent behavior. Examples of these conditions include (but are not limited to):
   1. Alcohol or drug (e.g. PCP, methamphetamine, cocaine) intoxications
   2. Hypoglycemia
   3. Stroke
   4. Drug overdose
   5. Post-ictal after seizure
   6. Head trauma

Exclusion Criteria:

A. Patients under the age of 16 years of age

Procedure for patients that require physical restraint:

All Patients:

1. Use the minimum amount of restraint necessary to safely accomplish patient care and transportation with regard to the patient's dignity.
2. Assure that adequate personnel are present and that police assistance has arrived, if available, before attempts to restrain patient.
3. Restrain all 4 extremities with patient supine on stretcher.[5,6,7,8]
4. Use soft restraints to prevent the patient from injuring him or herself or others.[9]
   a. If the patient is handcuffed by law enforcement officers, consideration should be made to transition to the least restrictive restraints that are safe for the patient and responders.
   b. Physical restraint devices that are easily removed by providers without a key are preferred. However, if a patient is restrained in devices that require a key, the key must accompany the patient during treatment and transportation.
   c. If the handcuffs or law enforcement devices are used to restrain the patient, a law enforcement officer must remain immediately available while the EMS provider assesses and manages the patient and should accompany the patient during transport by ambulance.
   d. If soft restraints are used, it is still preferable that a law enforcement officer accompanies the patient or follows the ambulance in a patrol car to the receiving facility.
5. Do not place restraints in a manner that may interfere with evaluation and treatment of the patient or in any way that may compromise patient's respiratory effort.[10]
6. If the patient is spitting, providers may cover the patient's face with a surgical mask, NRB mask with high flow oxygen, or commercial device to prevent spitting.[11]

7. After physical restraint, physiologic monitoring and clinical assessment/reassessment of respiratory and hemodynamic status as well as neurovascular status of all restrained extremities must be done as soon as possible and at recurring intervals.
8. Document care, including details of patient behavior, patient assessment, clinical indication for restrain, type of restrain intervention(s) attempted or applied, frequency of reassessment and associated exam findings, and additional care provided during transport.
9. Contact medical command for restraint order if physical restraint is needed. If required for safety of the patient, public or responders, the call to medical command can occur after the patient is physically restrained.

Possible Medical Command Orders:

1. Additional sedating agent
2. Dose modification based on unique patient factors

Notes:

1. De-escalation techniques include:
   a. Direct empathetic and calm voice.
   b. Present clear limits and options.
   c. Respect personal space.
   d. Avoid direct eye contact.
   e. Non-confrontational posture.
2. Do not permit patient to continue to struggle against restraints. This can lead to death due to severe rhabdomyolysis, acidosis, dysrhythmia, or respiratory failure. Medical command should be contacted for possible chemical restraint with sedative medication.
3. If age > 65, contact Medical Command and consider reducing doses of sedatives.
4. Regional or agency policy may permit intranasal midazolam, but this may not be as effective as parenteral medications.
5. Initial “take down” may be done in a prone position to decrease the patient’s visual field and ability to bite, punch, and kick. After the individual is controlled, he/she should be restrained to the stretcher or other transport device in the supine position.
6. DO NOT restrain patient in a prone position, “hogtie”. Do not tie the hands and feet together or link the restraints of hands and feet; each extremity should be individually secured to a firm point of attachment.
7. DO NOT sandwich patient between devices, such as long boards or Reeve’s stretchers, for transport. Avoid restraint to unpadded devices like backboards.
8. A stretcher strap that fits snuggly just above the knees is effective in decreasing the patient’s ability to kick.
9. Padded or leather wrist or ankle straps are appropriate. Handcuffs and plastic ties are not considered soft restraints.
10. Never apply restraints near the patient’s neck or apply restraints or pressure in a fashion that restricts the patient’s respiratory effort.
11. Never cover a patient’s mouth or nose except with a surgical mask, commercial spit containment device, or a NRB mask with high flow oxygen. A NRB mask with high flow oxygen may be used to prevent spitting in a patient that also may have hypoxia or another medical condition causing his/her agitation, but a NRB mask should never be used to prevent spitting without also administering high flow oxygen through the mask.
12. Sedatives must be ordered by a medical command physician, unless there are not adequate resources to contact medical command while ensuring patient safety.

13. Advise the medical command physician if benzodiazepine has been administered before requesting ketamine order. In this case, the medical command physician may want to reduce the ketamine dose.
14. Immediately prior to high dose sedation administration, patient should be restrained following physical restraint procedure above. BVM and advanced airway equipment must be at patient's side prior to administration of high dose sedation.
15. Do not place an IV or IO for the purpose of administering of high dose sedation. If no IV in place, the ideal site for IM ketamine is midline lateral thigh, however administration in deltoid or gluteal sites are permitted if they can be accessed more safely.
16. Once of high dose sedation has been administered, immediately return to de-escalation efforts and apply physiologic monitors when able. Goal is to reduce IMCRASS to <1 within 5 minutes.
17. CAUTION: Patients receiving ketamine and concomitant benzodiazepines are more likely to experience respiratory depression requiring airway management.
18. Midazolam is strongly preferred for IM use due to its rapid absorption and passage across the blood-brain barrier. Other intramuscular benzodiazepines are inferior to midazolam but are sometimes the only medications EMS services have available. For the lower dosing in this protocol, if midazolam is not available, you may substitute lorazepam 0.05mg/kg up to 2mg or diazepam 0.1mg/kg up to 5mg.
19. If ketamine is unavailabe, Midazolam is strongly preferred for IM use due to its rapid absorption and passage across the blood-brain barrier. Other intramuscular benzodiazepines are inferior to midazolam but are sometimes the only medications EMS services have available. For the lower dosing in this protocol, if midazolam is not available, you may substitute lorazepam 0.1mg/kg up to 4mg or diazepam 0.2mg/kg up to 10mg.
20. When safe, initiate transport to the closest appropriate facility. Do not transport in prone position –which can rapidly lead to positional asphyxia. See patient restraint procedure for additional details related to restraint when needed.
21. Ensure adequate resources in patient compartment during transport (law enforcement, additional EMS providers, etc.) in the event the patient becomes agitated again. It is recommended that at least one EMT accompanies the ALS provider in the patient compartment.

System Requirements for the use of ketamine:

A. The agency's medical director, and assigned EMS regional council, must verify the agency has met, and continues to meet, the requirements, as specified by the Department, for training, stocking, and QI. The region must perform a QI audit of every case of ketamine administration for compliance with this protocol. All results must be forwarded quarterly to the Bureau of EMS for statewide QI.

B. Agency medical director must approve of ketamine use by the EMS agency, and must perform a QI audit of every case of ketamine administration for compliance with this protocol.

C. Agency medical director must personally assure training and continuing education in patient selection, IMCRASS scoring, considerations of other causes of agitated behavior, continuous respiratory monitoring, advanced airway management, ketamine pharmacology, and use of this protocol.

D. ALS providers credentialed to administer ketamine must successfully complete the Delirium with Agitated Behavior educational module recognized by the Department.

E. Two EMS providers must be at the patient's side before administration of ketamine. At least one of these providers must be an ALS provider above the level of AEMT who has completed the ketamine

education and is credentialed by the EMS agency medical director to administer ketamine. The other provider must be credentialed at the level of EMT or above.

F. Agency medical director must assure initial and ongoing competence for each individual EMS provider who will use ketamine. Only individuals credentialed to administer this medication will perform the procedure.

G. The ALS agency must carry an alternative/ rescue airway device in various sizes.

H. The ALS agency must have the capability of monitoring and recording the following: continuous electronic waveform capnography in patients that are not intubated, as well as continuous ECG, SpO2, blood pressure and IMCRASS score.

I. Ketamine may only be carried by ALS agencies that follow all aspects of this protocol, and permission to carry the medication will be removed from the agency by the Bureau of EMS if either the agency/regional QI or other investigation determines that there are significant variances from this protocol.

Performance Parameters:

A. Review every case of the use of sedation, physical or chemical restraint.

B. Review all PCRs for documentation of the following:

1. Review for documentation of reason for administration of sedation.
2. Review for documentation of physical restraint procedure, monitoring of respiratory effort
3. Review for complications related to ketamine administration compared to other delirium with agitated behavior conditions.
4. Review for overall successful administration of sedation and presedation IMCRASS scoring.
5. Review for inclusion of recording strip of continuous trend of heart rate and pulse oximetry after each administration of sedation.
6. Review for documentation of heart rate and respirations before administration of sedation.
7. Review for documentation of pulse oximetry, blood pressure, heart rate, ETCO2, and ECG rhythm after sedation administration.
8. Review for documentation of IMCRASS score, before sedation, shortly after sedation, and at time of transfer of care at ED.
9. Review for documentation of assessment of extremity neurovascular status every 15 minutes in the restrained patient.
10. Review for documentation of medical command physician orders for use of physical or chemical restraint.

Improved Montgomery County Richmond Agitation Sedation Scale (IMCRASS)

Score	Term	Description	EMS Activity
+4	Combative	Overtly combative, violent, immediate danger to staff	Unsafe to care for patient without maximal assistance, requires law enforcement assistance
+3	Very agitated	Pulls or removes tubes and catheters, aggressive	Struggles aggressively and forcefully against care. Routine EMS care impossible
+2	Agitated	Frequent, nonpurposeful movements, fights interventions	Resists EMS care, requires gentle physical redirection to allow for routine EMS care
+1	Restless	Anxious but movements are not aggressive or vigorous	Verbally redirectable, follows commands, routine EMS care possible
0	**Alert and Calm**		
-1	Drowsy	Not fully alert but has sustained awakening and eye contact to voice (> 10 seconds)	Awakens to voice
-2	Light sedation	Briefly awakens with eye contact to voice (< 10 seconds)	Awakens to bumps / potholes in roadway during transport or application of oxygen via NC or NRB
-3	Moderate sedation	Movement or eye opening to voice (no eye contact)	Eyes open to physical exam, venous tourniquet application and / or BP cuff inflation
-4	Deep sedation	No response to voice but movement or eye opening to physical stimulation	Responds to insertion of Nasopharyngeal airway or IV start.
-5	Unarousable	No response to voice or physical stimulation	No response to insertion of Oralpharyngeal airway, Nasopharyngeal airway, or IV start

Procedure for IMCRASS Assessment	Score
1. Observe patient - if alert, restless, agitated, or combative	0 to + 4
2. Say patient's name in a gentle tone of voice and ask patient to open eyes	-1
3. If no response to voice, continue with routine EMS care and observe response to routine EMS care and interventions	-2 to - 5

Ketamine may be indicated	Adequate response to Ketamine
Ketamine NOT indicated	**Caution: may be oversedated**

References:

Sessler CN, Gosnell M, Grap MJ, et. Al. The Richmond Agitation-Sedation Scale: validity and reliability in adult intensive care patients. Am J Respir Crit Care Med 2002; 166:1338-1344

Ely EW, Truman B, Shintani A, et al. Monitoring sedation status over time in ICU patients: the reliability and validity of the Richmond Agitation Sedation Scale (RASS). JAMA 2003; 289: 2983-2991

12/6/2016 ver 2.1 approved by: Usatch, Ben; Wang, Alvin; Neubert, Dave; Martin, Ed