

Maine EMS 2025 Protocol Implementation Frequently Asked Questions



The following represent some of the most common questions encountered during the 2025 Maine EMS Protocol dissemination and implementation process. If a question arises that is not included on this list, please reach out to any of the MDPB members, who will either answer that question directly or will escalate the question to the Medical Direction and Practices Board as a whole for an answer.

This is intended to be a living document and will be updated during the dissemination and implementation process. Please refer to the Maine EMS website, under the “Protocols” tab for the most up to date version of this document.

Question #1: Does the inclusion of oral dexamethasone for adults in the Blue 7 “Respiratory Distress with Bronchospasm” protocol mean the MDPB does NOT want EMS Clinicians to use IV dexamethasone?

Answer: Oral and intravenous dexamethasone are similarly effective for the treatment of acute bronchospasm, with no significant differences in clinical outcomes, relapse rates, or length of hospitalization in both adults and children.^[1-5] Studies comparing oral and intravenous corticosteroids in acute asthma exacerbations consistently show equivalent efficacy in improving peak expiratory flow rates, symptom control, and preventing relapse. The oral route avoids the discomfort and resource use associated with IV access. However, the MDPB considers both the oral and IV routes of administration to be equally acceptable.

References:

1. Intravenous Versus Oral Corticosteroids for Treatment of Acute Asthma Exacerbations. Fulco PP, Lone AA, Pugh CB. *The Annals of Pharmacotherapy*. 2002;36(4):565-70. doi:10.1345/aph.1A107.
2. Oral Versus Intravenous Corticosteroids in Adults Hospitalised With Acute Asthma. Cunningham D, Smith N, Steed K, et al. *Pulmonary Pharmacology & Therapeutics*. 2005;18(3):207-12. doi:10.1016/j.pupt.2004.12.003.
3. Dexamethasone for Acute Asthma Exacerbations in Children: A Meta-Analysis. Keeney GE, Gray MP, Morrison AK, et al. *Pediatrics*. 2014;133(3):493-9. doi:10.1542/peds.2013-2273.
4. 2025 Global Strategy for Asthma Management and Prevention. Helen Reddel, Eric Bateman, Gerard FitzGerald, et al *Global Initiative for Asthma Practice Guideline*
5. 2024 Global Strategy for Asthma Management and Prevention. Helen K. Reddel, Leonard B. Bacharier, Eric D. Bateman, et al *Global Initiative for Asthma Practice Guideline*

The Bottom Line: *Steroids are beneficial to patients suffering from bronchospastic disease. IV access is not necessary to provide steroids. This protocol change allows for the provision of steroids independent of the need for IV access.*

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Question #2: If there is more than one hospital choice for a suspected STEMI patient, one of which has the ability to perform cardiac catheterization (PCI-capable) and the other which uses a lytic strategy, which is the most appropriate hospital to choose?

Answer: For patients with suspected ST-elevation myocardial infarction (STEMI), direct transport to a PCI-capable hospital is preferred, with a goal of first medical contact (FMC) to device time of ≤ 90 minutes. This does not mean that patients should be routinely [word choice here could be changed] transported to a PCI hospital if they are located within 90 minutes of that facility. Instead, the total time between FMC and PCI needs to be considered, including the in-hospital time prior to catheterization. Therefore, working with your local PCI center is likely the best strategy to determine if direct transport to that facility is the most appropriate destination. If PCI cannot be achieved within 90 minutes from EMS first medical contact, fibrinolytic therapy should be administered at non-PCI receiving facility, followed by transfer to a PCI center for angiography and possible PCI within 3–24 hours.^[1-4]

Whenever possible, prehospital identification of STEMI and direct transfer to a PCI-capable facility is associated with shorter reperfusion times and lower mortality compared to initial transport to a non-PCI-capable hospital.^{[1][5]}

References

1. 2025 ACC/AHA/ACEP/NAEMSP/SCAI Guideline for the Management of Patients With Acute Coronary Syndromes: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Rao SV, O'Donoghue ML, Ruel M, et al. *Journal of the American College of Cardiology*. 2025;;S0735-1097(24)10424-X. doi:10.1016/j.jacc.2024.11.009. Practice Guideline
2. Acute Myocardial Infarction. Anderson JL, Morrow DA. *The New England Journal of Medicine*. 2017;376(21):2053-2064. doi:10.1056/NEJMra1606915.
3. 2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines. Lawton JS, Tamis-Holland JE, Bangalore S, et al. *Journal of the American College of Cardiology*. 2022;79(2):e21-e129. doi:10.1016/j.jacc.2021.09.006.
4. ST-segment Elevation Myocardial Infarction. Vogel B, Claessen BE, Arnold SV, et al. *Nature Reviews. Disease Primers*. 2019;5(1):39. doi:10.1038/s41572-019-0090-3.
5. Systems of Care for ST-Segment-Elevation Myocardial Infarction: A Policy Statement From the American Heart Association. Jacobs AK, Ali MJ, Best PJ, et al. *Circulation*. 2021;144(20):e310-e327. doi:10.1161/CIR.0000000000001025.

The Bottom Line: *EMS Clinician decisions regarding entry points into the healthcare system for time-sensitive illnesses/injuries are linked to improved survival and decreased morbidity.*

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Question #3: If D5 is preferred for Magnesium infusions, why is there an option to use other fluids?

Answer: 5% dextrose is preferred for mixing magnesium over normal saline or Lactated Ringer's solution primarily due to compatibility and safety concerns. When magnesium is mixed with Lactated Ringer's, there is a risk of precipitation or clot formation, especially in the presence of blood products, as demonstrated in experimental studies.^[1] This is because Lactated Ringer's contains calcium, which can interact with magnesium and other additives, increasing the risk of incompatibility and clotting.

Normal saline does not contain calcium, but it also lacks the carbohydrate calories provided by dextrose, which can be beneficial for patients requiring maintenance fluids and electrolyte replacement.^[2]

For more information, the MDPB has prepared a White Paper titled “The Importance of Proper Preparation of Injectable Medications” which can be found at this website - <https://www.maine.gov/ems/sites/maine.gov.ems/files/inline-files/White-Paper-IV-Medication-Preparation-20250902.pdf>.

References:

1. Blood Products, Crystalloids, and Rapid Infusion: An Experimental Study With Magnesium. Schumann R, Zaimi I, Shebaclo K, Gupta A. Journal of Cardiothoracic and Vascular Anesthesia. 2022;36(4):1040-1046. doi:10.1053/j.jvca.2021.07.006.
2. NORMOSOL-M AND DEXTROSE. Food and Drug Administration Updated date: 2021-07-13

The Bottom Line: *While Magnesium infusions may be mixed in any Maine EMS-approved IV fluid, D5 is preferred to avoid precipitation.*

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Question #4: Is it safe to provide acetaminophen (Tylenol), in oral or IV form, to a woman who is or may be pregnant?

Answer:

Acetaminophen is generally considered safe for use during pregnancy when used at the lowest effective dose for the shortest duration and only when medically indicated. Major regulatory agencies and professional societies, including the American College of Obstetricians and Gynecologists (ACOG), continue to recommend acetaminophen as the preferred analgesic and antipyretic in pregnancy when clinically necessary.^[1]

Recent large, methodologically rigorous studies—including sibling-controlled analyses—do not support a causal association between prenatal acetaminophen exposure and neurodevelopmental disorders such as autism or ADHD.^[1-2] While some observational studies have reported weak associations, these are likely due to confounding factors rather than direct causation.^[1-3] Systematic reviews and meta-analyses also show no increased risk of adverse perinatal outcomes such as preterm birth, low birth weight, or small for gestational age.^[4-5]

References:

1. Paracetamol (Acetaminophen) Use During Pregnancy and Autism Risk: Evidence Does Not Support Causal Association. Louwen F, Deuster E, McAuliffe FM, et al. *International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics*. 2025;. doi:10.1002/ijgo.70577.
2. Acetaminophen Use During Pregnancy and Children's Risk of Autism, ADHD, and Intellectual Disability. Ahlqvist VH, Sjöqvist H, Dalman C, et al. *JAMA*. 2024;331(14):1205-1214. doi:10.1001/jama.2024.3172.
3. Use of Paracetamol During Pregnancy and Child Neurological Development. de Fays L, Van Malderen K, De Smet K, et al. *Developmental Medicine and Child Neurology*. 2015;57(8):718-24. doi:10.1111/dmcn.12745.
4. Association Between Paracetamol Use During Pregnancy and Perinatal Outcomes: Prospective NISAMI Cohort. de Castro CT, Pereira M, Dos Santos DB. *PloS One*. 2022;17(4):e0267270. doi:10.1371/journal.pone.0267270.
5. Effect of Acetaminophen Use During Pregnancy on Adverse Pregnancy Outcomes: A Systematic Review and Meta-Analysis. Castro CT, Gama RS, Pereira M, et al. *Expert Opinion on Drug Safety*. 2022;21(2):241-251. doi:10.1080/14740338.2022.2020246.

Additional Resources:

- American College of Obstetrics and Gynecology Statement on Acetaminophen use in Pregnancy: <https://www.acog.org/news/news-releases/2025/09/acog-affirms-safety-benefits-acetaminophen-pregnancy>

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- American College of Obstetrics and Gynecology “Acetaminophen in Pregnancy: Frequently Asked Questions” - <https://www.acog.org/clinical-information/physician-faqs/acetaminophen-in-pregnancy>
- FDA September 22, 2025 “Notice to Physicians on the Use of Acetaminophen During Pregnancy” - <https://www.fda.gov/media/188843/download>

The Bottom Line: *The administration of acetaminophen in the pre-hospital, emergency setting is considered safe in pregnancy.*

Question #5: Why do patients receiving IV Tylenol by AEMT’s need to be 70 kg or larger?

Answer: The dose of acetaminophen in the Fever Protocol (Gold 20) is 10-15 mg/kg with IV dosing delivered over 15 minutes. Patients weighing less than 70 kg would require a dose less than 1,000 mg and would require infusion on a pump. Setting infusion rates on Maine EMS-approved pumps is not within the scope of practice of AEMTs. Patients weighing 70 kg or more may receive the 1,000 mg maximum which, when delivered without a pump, takes approximately 15 minutes to infuse.

The Bottom Line: *The 70 kg patient requirement for IV acetaminophen at the AEMT level is a direct result of scope of practice (pump utilization).*

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Question #6: What are the indications for needle thoracostomy (AKA needle decompression) in a patient with chest trauma and suspected tension pneumothorax? Why is it essential to ONLY perform needle thoracostomy in patients with suspected tension pneumothorax?

Answer #1: Assume tension pneumothorax in

- a. ALL patients suffering traumatic cardiac arrest, and/or
- b. Chest trauma with increasing respiratory distress/hypoxia, and/or
- c. Chest trauma with unexplained shock or hypotension.

Answer #2: Tension pneumothorax is a life-threatening condition, when pleural pressure in the hemithorax is so high that the mediastinum is shifted, thus kinking the great vessels and limiting return of blood to the heart. Performing a needle thoracostomy relieves this tension in the hemithorax, decreases the pressure in the chest, and reverses shifting of the mediastinum allowing for improved blood return to the heart. Patients with a simple pneumothorax ARE NOT benefited by needle thoracostomy as they do not have the same tension physiology. In addition, injuries to organs are more likely when blindly placing a needle into the hemithorax of a patient without tension pneumothorax.

PLEASE RECALL, two of the most important steps to safe and successful needle thoracostomy are:

- a. Performing the procedure under the proper indications and
- b. Understanding the anatomy of the chest and proper placement of the needle when performing the procedure.

The MDPB suggests regular, recurrent education in both of these skills to ensure safety and efficacy when performing the procedure.

The Bottom Line:

Clinical signs/symptoms of tension pneumothorax include chest trauma with severe, progressive respiratory distress, hypotension, tachypnea, tachycardia, hypoxia, and shock. Additional signs, which are either difficult to appreciate in the dynamic prehospital environment or occur very late in the disease process include: an enlarged, hyper-resonant hemithorax with absent breath sounds, tracheal deviation and mediastinal shift toward the contralateral side, chest retractions, cyanosis, and jugular venous distension. Rapid deterioration and cardiac arrest can occur without immediate management.^[1] Prehospital needle thoracostomy is a potentially lifesaving procedure, but must be performed only under the proper indications and must be placed in the proper position, with diligent attention to proper procedural steps to ensure safety.

References: 1. Light RW. Pleural diseases. Dis Mon. 1992 May;38(5):266-331

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Question #7: Should a suspected fracture that has broken the skin but then retracted back into the wound receive antibiotics?

Answer: Yes. The American College of Surgeons defines an open fracture as a condition in which a fractured bone is exposed to contamination from the external environment through a disruption of the skin and subcutaneous tissues. This exposure may occur either because the fractured bone itself creates the disruption or because an overlying wound penetrates down to the broken bone.^[1]

References:

1. Best Practices In The Management Of Orthopaedic Trauma. Matthew L. Davis MD FACS, Gregory J. Della Rocca MD PhD FACS, Megan Brenner MD MS RPVI FACS, et al American College of Surgeons (2015)

The Bottom Line: *National guidelines recommend antibiotics be provided within 1 hour of hospital arrival to help prevent the short- and long-term complications of infection. Prehospital provision of antibiotics can off load this responsibility from hospitals and provide medications in a shorter timeframe.*

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Question #8: How can members of the EMS community and stakeholder groups participate in the protocol revision process?

Answer: The Medical Direction and Practices Board (MDPB) reviews and updates the Maine EMS Protocols approximately every 2 years. The majority of the deliberations regarding the protocols occurs in the context of the MDPB meetings, which occur on the 3rd Wednesday of every month. Participating in these meetings is one means of involvement in the Maine EMS Protocol review process. Engaging with any of the MDPB members, who's name and email address can be found at this link <https://www.maine.gov/ems/boards-committees/medical-direction-practices-board> is another means of involvement with the protocol review process. Maine EMS and the MDPB have also published a Protocol Development Stakeholder Input Form, found here: <https://www.maine.gov/ems/sites/maine.gov.ems/files/inline-files/20220211-Protocol-Update-Stakeholder-Input-Template.pdf> which is intended to allow any EMS clinician or stakeholder the ability to offer protocol suggestions. Please note, this form is organized using the process the MDPB employs to consider protocol changes, and it asks targeted questions that allow a facilitated review by the MDPB. Please be as detailed as possible and fill as much of the form out as possible to allow for timely and comprehensive review.

Resources:

1. MDPB Member List and Emails: <https://www.maine.gov/ems/boards-committees/medical-direction-practices-board>
2. Protocol Development Stakeholder Input Form: <https://www.maine.gov/ems/sites/maine.gov.ems/files/inline-files/20220211-Protocol-Update-Stakeholder-Input-Template.pdf>

The Bottom Line: *The Maine EMS Protocols are our collective commitment to consistently do our best when called to care for our neighbors or other citizens and visitors to the State of Maine. These protocols are strengthened by the input and engagement of the entire EMS community.*

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Question #9: Explain the wording in Green 10 (Head Trauma #3) "For SBP below goal for age, give 20 mL/kg IV bolus. May repeat x 2 up to a total of 60 mL/kg to achieve goal SBP. If needing the **third bolus**, please consult OLMC."

Answer: When resuscitating pediatric patients, sequential boluses of 20 mL/kg are recommended volume goals, with reassessment after each bolus, in an attempt to achieve the desired response. Please recall: children with congenital heart disease are commonly resuscitated with an alternate volume of 10 mL/kg. Three 20 mL/kg boluses are common before considering additional steps. If shock persists after 2-3 boluses, evidence shows that patients likely have worse outcomes including longer ICU and hospital stays. Boluses greater than 60 mL/kg can increase the risk of fluid overload, coagulopathy, and respiratory compromise. The MDPB's statement in Green 10 (Head Trauma) allows for THREE sequential boluses of 20 mL/kg but asks the EMS clinician to consult OLMC if the third bolus has been started. This is in part intended to prompt a conversation with the receiving hospital and physician regarding next steps should the third bolus not meet resuscitative goals. This same practice should be followed for Green 13 (Hemorrhagic Shock) when resuscitating pediatric patients.

References:

1. [Surviving Sepsis Campaign International Guidelines for the Management of Septic Shock and Sepsis-Associated Organ Dysfunction in Children.](#) Weiss SL, Peters MJ, Alhazzani W, et al. Pediatric Critical Care Medicine : A Journal of the Society of Critical Care Medicine and the World Federation of Pediatric Intensive and Critical Care Societies. 2020;21(2):e52-e106. doi:10.1097/PCC.0000000000002198.
2. [Part 4: Pediatric Basic and Advanced Life Support: 2020 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care.](#) Topjian AA, Raymond TT, Atkins D, et al. Circulation. 2020;142(16_suppl_2):S469-S523. doi:10.1161/CIR.0000000000000901
3. [Pediatric Rapid Fluid Resuscitation.](#) Simpson JN, Teach SJ. Current Opinion in Pediatrics. 2011;23(3):286-92. doi:10.1097/MOP.0b013e3283460599.
4. [Multicenter Study of Crystalloid Boluses and Transfusion in Pediatric Trauma-When to Go to Blood?.](#) Polites SF, Nygaard RM, Reddy PN, et al. The Journal of Trauma and Acute Care Surgery. 2018;85(1):108-112. doi:10.1097/TA.0000000000001897.
5. [Timing and Volume of Crystalloid and Blood Products in Pediatric Trauma: An Eastern Association for the Surgery of Trauma Multicenter Prospective Observational Study.](#) Polites SF, Moody S, Williams RF, et al. The Journal of Trauma and Acute Care Surgery. 2020;89(1):36-42. doi:10.1097/TA.0000000000002702.
6. [Are Crystalloid-Based Fluid Expansion Strategies Still Relevant in the First Hours of Trauma Induced Hemorrhagic Shock?.](#) Tubert P, Kalimouttou A, Bouzat P, David JS, Gauss T. Critical Care (London, England). 2024;28(1):416. doi:10.1186/s13054-024-05185-7.
7. [Initial Care of the Severely Injured Patient.](#) King DR. The New England Journal of Medicine. 2019;380(8):763-770. doi:10.1056/NEJMra1609326.

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The Bottom Line: *Begin pediatric resuscitation with a 20 ml/kg bolus. Repeat up to a total of 60 ml/kg, contacting OLMC to discuss additional therapies should the third bolus not achieve goals of resuscitation.*
