Allergy/Anaphylaxis #1

E

EMT

1. Manage airway as appropriate, see **Blue 3**
2. If shock present, refer to Medical Shock protocol, **Gold 14**
3. If anaphylaxis identified, assist administration of patient's own EPINEPHrine auto-injector, administer an adult or pediatric (as applicable) auto-injector, OR provide EPINEPHrine through the Maine EMS Check and Inject program in the anterolateral thigh:
   a. Adult: EPINEPHrine 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh, or
   b. Pediatric dose of EPINEPHrine which is as follows: less than 25 kg, 0.15 mg **IM** [0.15mL of 1mg/mL], greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] in anterolateral thigh

   c. May repeat **IM** EPINEPHrine doses every 5-15 min and notify OLMC of incoming critical patient.

4. Request ALS, if available
5. Consider local measures to prevent absorption of allergen

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6. If anaphylaxis identified:
   a. Adult: EPINEPHrine 0.3 mg IM [0.3 mL of 1mg/mL] in anterolateral thigh, or
   b. Pediatric dose of EPINEPHrine which is as follows: less than 25 kg, 0.15 mg **IM** [0.15mL of 1mg/mL], greater than 25 kg, 0.3 mg **IM** [0.3 mL of 1mg/mL] **IM** in anterolateral thigh

   c. May repeat **IM** EPINEPHrine doses every 5-15 minutes. If patient requires repeated EPINEPHrine, request ALS.
7. IV en route
8. Cardiac monitor
9. If shock present, perform fluid bolus
10. If wheezing persists 5-15 minutes after first dose of EPINEPHrine consider Albuterol.
11. For patients with minor symptoms only or resolution of symptoms with a single dose of EPINEPHrine, the AEMT, in consultation with OLMC, may consider canceling ALS.

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PARAMEDIC

12. Consider glucagon 1 mg **IV** q 5 minutes for patients taking beta-blockers and not responsive to EPINEPHrine
13. Diphenhydramine (Benadryl)
    a. Adult: 25-50 mg **IV/IO/IM**
    b. Pediatric: 1-2 mg/kg **IV/IO/IM** (max single dose of 50 mg)

14. Consider one of the following; may repeat x 1
    a. Albuterol 2.5 mg by nebulization;
       -OR-
    b. 1 mL of 1mg/mL EPINEPHrine nebulized with 2 mL of NS
       -OR-
    c. 0.5 mL of 2.25% racemic EPINEPHrine solution nebulized with 2.5 mL NS

Continued

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15. Contact OLMC for repeat **IM** EPINEPHrine every 5 minutes and/or EPINEPHrine **IV infusion** for shock or cardiovascular compromise, which may typically be dosed the following way:
    - **Preparation** - Add 1mL (1mg) EPINEPHrine 1mg/mL to 250 mL bag NS. This results in a 1 mg/250 mL = 4 mcg/mL mix.
    - **Dose** - Start at 0.05 mcg/kg/min. Titrate by 0.05 mcg/kg/min every 5 min. Titrate to desired desired effect which may include resolution of respiratory symptoms, SPB of > 90 mmHg and/or MAP > 65 mmHg.
    - **Usual dose** is 0.05-0.5 mcg/kg/min. Absolute maximum dose is 0.5 mcg/kg/min
    - **This must be performed with OLMC and administered via a Maine EMS approved medication pump**.

PEARLS for Allergy/Anaphylaxis

Children with a known, recent exposure to common triggers of allergic reactions (peanuts, medications, bee stings) should be considered at risk for having an allergic reaction or anaphylaxis.

Children with asthma should be considered high risk for a severe reaction.

Anaphylaxis in children should be treated for those exhibiting hypotension after exposure to a known allergen, respiratory compromise with acute onset of skin or mucosal involvement, or two or more of the following after exposure to a likely allergen: gastrointestinal symptoms, skin/mucosal involvement, respiratory compromise, or hypotension.

Severity should be differentiated between anaphylaxis and non-anaphylaxis (ie: Allergic reaction only). Only patients with anaphylaxis (as defined in **Gold 3**) should receive EPINEPHrine. Evidence suggests that the incidence of anaphylaxis is under recognized. Please consider the definitions of anaphylaxis (on the following page) and treat all cases of anaphylaxis with EPINEPHrine.

Evidence does not support the routine use of cardiac monitoring for patients who receive one dose of EPINEPHrine.

Allergy/Anaphylaxis #3

PEARLS for Allergy/Anaphylaxis:

1. Anaphylaxis is highly likely when any ONE of the following 3 criteria is fulfilled:

Acute onset of an illness (minutes to several hours) with involvement of the skin, mucosal tissue, or both (eg, generalized hives, pruritus or flushing, swollen lips-tongue-uvula) AND at least ONE of the following:

a. Respiratory compromise (eg, dyspnea, wheezing- bronchospasm, stridor, reduced Peak Expiratory Flow (PEF), hypoxia)
b. Reduced BP or associated symptoms of end-organ dysfunction (eg, hypotonia [collapse], syncope, incontinence)

OR

TWO or more of the following that occur rapidly after exposure to a likely allergen for that patient (minutes to several hours):

a. Involvement of the skin-mucosal tissue (eg, generalized hives, itch- flush, swollen lips, tongue-uvula)
b. Respiratory compromise (eg, dyspnea, wheeze-bronchospasm, stridor, reduced peak expiratory flow, hypoxia)
c. Reduced BP or associated symptoms (eg, hypotonia [collapse], syncope, incontinence)
d. Persistent gastrointestinal symptoms (eg, crampy abdominal pain, vomiting) (several hours)

OR

Reduced BP after exposure to known allergen for that patient (minutes to several hours)

a. **Infants and children**: low systolic BP (age specific) or greater than 30% decrease in systolic BP
b. **Adults:** systolic BP of less than 90 mmHg or greater than 30% decrease from that person's baseline

2. In every case when anaphylaxis is identified, EPINEPHrine should be provided. The best route of administration is via the **IM** route in the anterolateral thigh

3. Patients may require repeated doses EPINEPHrine. These repeated doses are also provided via the **IM** route

4. **DO NOT administer IM EPINEPHRrine concentration (1mg/1mL) via the IV route.**

Allergy/Anaphylaxis #4

IV EPINEPHrine infusion drip, administered via a Maine EMS approved medication pump, should be started for patients unresponsive to **IM** EPINEPHrine administration in either of the following settings:

- Cardiovascular collapse (hypotension with altered mental status, pallor, diaphoresis, or delayed capillary refill)

OR

- Hypotension that is unresponsive to a total of 60 mL/kg (3 x 20 mL/kg boluses) isotonic fluid boluses and repeat doses of **IM** EPINEPHrine

Evidence does not support the prophylactic use of EPINEPHrine in the asymptomatic patient after exposure to a known allergen.

Children experiencing cutaneous signs of an allergic reaction with no systemic symptoms should be evaluated by a medical clinician.

Children experiencing anaphylaxis in the prehospital setting who receive EPINEPHrine require EMS transport.

Altered Level of Consciousness

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Assess for trauma, drugs, diabetes, breath odor, needle tracks, medical alert tags, suspected seizure. Refer to appropriate protocol for specific suspected conditions.

Consider SCENE SAFETY as there may be an environmental or toxicologic cause, especially if more than one patient has decreased level of consciousness.

EMT

1. Immobilize spine if indicated
2. Manage airway as appropriate, see **Blue 3**
3. Request ALS, if available
4. If shock present, refer to Medical Shock protocol, **Gold 14**
5. Perform finger stick to measure blood glucose, if so trained. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**
6. If respirations less than 12 per minute AND narcotic overdose suspected, refer to Poisoning/Overdose protocol, **Yellow 1**

*****Never administer naloxone to a neonate*****

A P

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7. IV en route
8. Cardiac monitor

Differential Diagnosis of Coma	
A	Alcohol (and other drugs), Acidosis (hyperglycemic coma/DKA)
E	Electrolyte abnormality, Endocrine problem, Epilepsy
I	Insulin (diabetes/hypoglycemic shock)
O	Oxygen (hypoxia), Overdose (or poisoning)
U	Uremia (renal failure/insufficiency)
T	Trauma, Temperature (hypothermia, heat stroke)
I	Infection (meningitis, encephalitis, sepsis)
P	Psychogenic
S	Stroke, Space occupying lesions, Seizure, Shock

Diabetic/Hypoglycemic Emergencies #1

E

EMT

1. Manage airway as appropriate, see **Blue 3**
2. Request ALS, if available
3. **If trained,** perform finger stick to measure blood glucose
   a. If blood glucose is less than 60 mg/dL, and patient is conscious and able to swallow, give glucose orally
4. **If not trained** to perform and patient is a known diabetic, has a known low blood sugar, or has an altered mental status, and if the patient is conscious and able to swallow, give glucose orally

Glucose paste is to be administered as soon as possible if the patient is conscious and able to swallow and presenting with the signs/symptoms of a diabetic emergency

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5. IV en route
6. If blood glucose is less than 60 mg/dL
   a. If patient is conscious and able to swallow, give glucose **orally**, otherwise
   b. Administer dextrose 25 gm **IV** (50 mL of 50% solution or 250 mL of $D_{10}W$ solution)
   c. If under 40 kg give $D_{10}W$ as per the following:

Weight (Kg/Lbs)	Volume to be infused
10/22	50 mL
20/44	100 mL
30/66	150 mL
40/88	200 mL

   d. If IV unavailable, DO NOT PLACE IO
      i. Administer glucagon at the following doses:
         1) Adult and Pediatric patients 20 kg or greater: Glucagon 1 mg **IM**.
         2) Pediatric patients less than 20 kg: Glucagon 0.5 mg **IM**

7. If blood glucose greater than 300 mg/dL, give NS fluid bolus
8. Repeat glucose measurement in 5 minutes
9. Cardiac monitor

P

PARAMEDIC

10. Contact OLMC for OPTION of repeating dextrose, repeating glucagon, or placing an **IO**. If **IO** placed, administer dextrose 25 gm (250 mL of **$D_{10}W$**) via **IO**

Diabetic/Hypoglycemic Emergencies #2

Pearls for Diabetes/Hypoglycemic Emergencies

- The definition of hypoglycemia has been changed from 80 mg/dL to 60 mg/dL based upon current literature which suggests most patients will experience adrenergic symptoms under 60 mg/dL and CNS symptoms under 50 mg/dL. If a patient's finger stick glucose measurement is above 60 mg/dL and hypoglycemia remains a concern, contact OLMC for treatment options.
- Goal of fluid bolus in hyperglycemia is to treat hypotension/signs of hypoperfusion as well as decrease blood glucose to less than 300 mg/dL.
- Hypoglycemic patients on sulfonylurea class medications (glipizide (Glucotrol), glyburide (Diabeta), etc.) may have refractory hypoglycemia and all require transport, glucose monitoring and hospital evaluation.

Seizure #1

PEARLS for Seizures: Most seizures are self-limited. Unless a specific underlying condition exists (i.e. diabetes with hypoglycemia), treatment of a seizure or multiple seizures with a total duration of less than 5 minutes should focus on patient protection and oxygenation.

E

EMT

1. Manage airway as appropriate, see **Blue 3**
2. Spinal immobilization as indicated. Refer to Spine Assessment protocol, **Green 6**
3. Left lateral recumbent position and protect patient from injury
4. Request ALS, if available
5. Perform finger stick to measure blood glucose, if so trained. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**

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6. Cardiac monitor
7. IV en route
8. If shock present, refer to Medical Shock protocol, **Gold 14**

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PARAMEDIC

9. If the patient has a single seizure lasting greater than 5 minutes OR recurrent seizure activity without recovery/return to baseline between seizures, administer IM midazolam if no IV is established. If an IV is established, administer midazolam via the **IV** route
   a. Intramuscular dosing –
      i. **Adult** - midazolam 10 mg **IM**
      ii. **Pediatric** - midazolam 0.2 mg/kg IM to MAX dose of 10 mg

   b. Intravenous/Intraosseous dosing
      i. **Adult** - midazolam 5 mg **IV/IO**
      ii. **Pediatric** - midazolam 0.1 mg/kg IV to a MAX dose of 5 mg

   c. If Seizures continue, repeat midazolam at above doses **IV/IO/IM** q 5 min until resolution of seizure, for a total of: **Adult:** 20 mg **IM** total, 15 mg **IV** total; **Pediatric** 0.6 mg/kg **IM** with MAX cumulative dose of 20 mg, 0.3 mg/kg **IV** with MAX cumulative dose of 15 mg
      i. Contact the hospital if additional midazolam is necessary

PEARLS for Persistent Seizures: Patients requiring more than one dose of midazolam are potentially very ill and possibly in status epilepticus. Early hospital notification allows the hospital to prepare additional medications to care for the patient.

   ii. Monitor oxygenation and ventilation with O_2 saturation and end-tidal capnography, especially if providing repeated doses of midazolam
   iii. Manage the patient's airway as necessary, see **Blue 3**

Seizure #2

10. For patients visibly pregnant or less than 2 weeks postpartum
    a. Magnesium sulfate 4 gm **IV/IO** over 10 minutes
        i. If IV/IO not available, magnesium sulfate 8 gm **IM** (4 gm in <u>each</u> buttock)

11. Contact OLMC for the following OPTIONS:
    a. If unable to stop seizure activity, or if therapy beyond these protocols are necessary

PEARLS for Seizures:

- First dose of midazolam should be given IM unless an IV has already been established; do not delay treatment to start an IV.
- References for dosing of medications in seizures are in part from the article: *Silbergleit, et al. “Intramuscular versus Intravenous Therapy for Status Epilepticus” , New England Journal of Medicine, Feb 16, 2012, Vol. 366, No. 7.
- Contact OLMC for any patient requiring 3 or more doses of midazolam independent of the route provided.
- For patients with Vagus Nerve Stimulator who are having repeated/continuous seizure activity, consider activation of the Vagus Nerve Stimulator, if not already attempted, by holding the patients hand-held magnet over the Vagus Nerve Stimulator.

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Stroke #1

Stroke should be suspected if any of the following have appeared in the last few hours or days: weakness on one side of face, weakness in one arm or leg, abnormal speech (slurred, incoherent, absent).

Refer to the next page for early hospital notification process for patients who are potential stroke patients.

See Altered Level of Consciousness protocol, **Gold 5**, if warranted.

See Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**, if warranted.

Northern New England Stroke Screening Tool

Time Last Known Well: *(if patient awoke with symptoms, last time known to be at baseline)*

Witness Name and Best Contact Number:

Prehospital Stroke Scale Examination Please note: Normal Abnormal

Facial Droop: *Have the patient smile and show teeth.*
Normal: Both sides of the face move equally well.
Abnormal: One side of the face does not move as well as the other.

Normal | Abnormal

Arm Drift: *Have the patient close their eyes and hold arms extended.*
Normal: Both arms move the same, or both arms don't move at all.
Abnormal: One arm doesn't move, or one arm drifts down compared to the other.

Normal | Abnormal

Speech: *Ask the patient to repeat a phrase such as " You can't teach an old dog new tricks".*
Normal: Patient says the words without slurring.
Abnormal: Patient slurs words, says the wrong word, or is unable to speak.

Normal | Abnormal

Blood Glucose:

YES	NO	**Stroke Alert Criteria - Please check Yes or No:**
☐	☐	Time from onset of symptoms is known to be less than 24 hours?
☐	☐	Blood glucose is or has been corrected to greater than 60 mg/dL?
☐	☐	Any abnormal finding on Prehospital Stroke Scale examination?
☐	☐	Deficit unlikely due to head trauma or other identifiable cause?

Stroke Alert Criteria - if YES to all criteria, contact receiving hospital and report a CODE STROKE.

If Patient Screens Positive for Stoke Based on Facial Droop, Arm Drift or Speech Abnormalities, Proceed to Next Page for Large Vessel Occlusion Screening

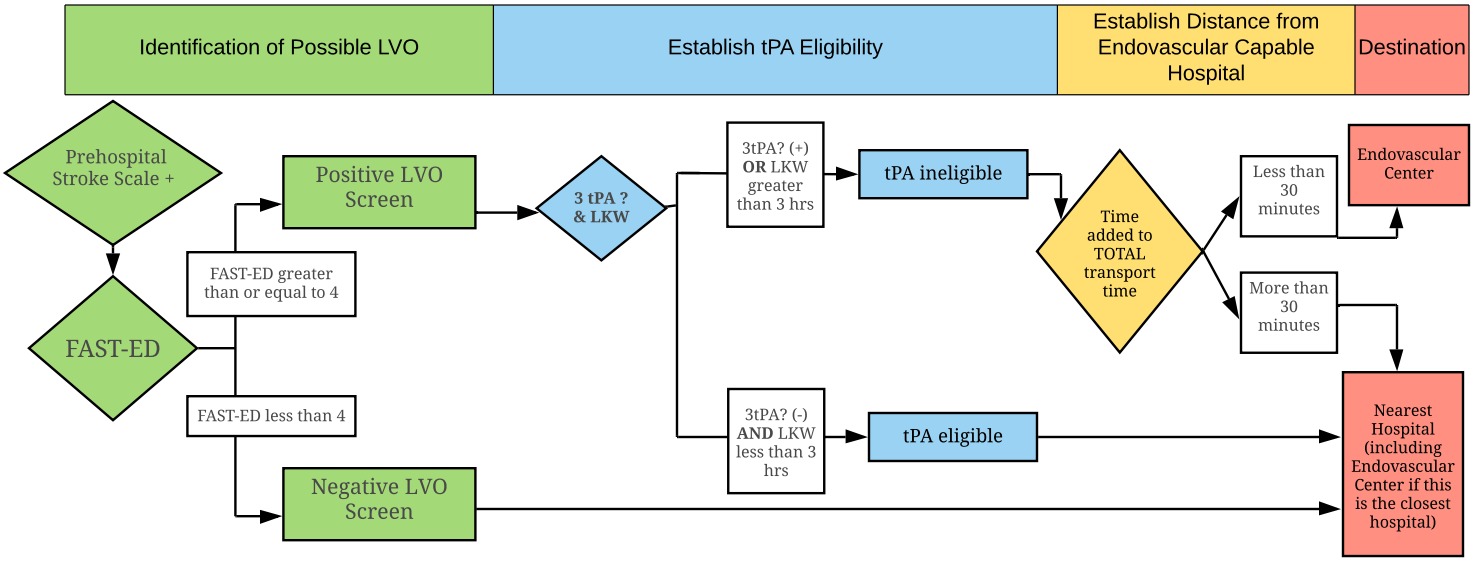
Stroke #2 - Large Vessel Occlusion Screening

All patients who screen positive for stroke by presence of facial droop, speech abnormalities, or drift/weakness of the upper extremity should be screened for Large Vessel Occlusive stroke. These specific types of strokes *may* benefit from therapies in addition to IV tPA. Screening should be performed by all scopes of practice by using the **F**ield **A**ssessment **S**troke **T**riage for **E**mergency **D**estination (FAST-ED) Screening Tool.

		0	1	2	Score
F	**Facial palsy** Ask the patient to smile	Normal or mild facial asymmetry	Obvious droop of one side of the mouth	N/A	
A	**Arm weakness** Extend the weak arm with palm facing down to 90° (if sitting) or 45° (if supine) and ask them to hold it there for 10 seconds	No drift down x 10 seconds	Drifts, but not all the way down	Drifts all the way down or no movement at all	
S	**Speech changes** Note spontaneous speech; ask the patient to name 3 common items; ask them to show you 2 fingers without demonstrating this visually to the patient	Normal speech	Impaired but comprehensible speech, and/or unable to name any of the items, and/or unable to follow the command	Incomprehensible speech and/or complete lack of understanding or mute	
T	**Time Last Known Well (LKW)***	N/A	N/A	N/A	Time LKW: _____
E	**Eye deviation** Observe the patients horizontal eye movements	Normal eye movements	Eyes tend to only move to one side	Eyes both forced over to one side	
D	**Denial/Neglect** Touch the patient on both arms at the same time and ask if they feel both sides; Show the patient their hand on the side where there are symptoms of weakness and ask them "Whose hand is this?"	Able to sense touch on both sides at the same time and recognizes the weak hand as their own	Unable to feel one side of the touch but can recognize their weak hand as their own	Unable to feel one side of touch and does not recognize their weak hand as their own	
	TOTAL SCORE				

*Time is documented for decision making purposes and is not scored.
A score of **greater than or equal to 4** has a sensitivity of 0.61 and a specificity of 0.89 for LVO (PPV 0.72)

Destination Support Guidance for Possible LVO Stroke Patients:



3tPA ?'s refers to the tPA checklist screening questions on **Gold 13**. If ALL are answered negative and time criteria are met, the patient is considered tPA eligible. If ANY are answered positive, the patient is tPA ineligible. **LKW** refers to the time the patient was Last Known Well and without the presenting stroke symptoms

Stroke #3

E

EMT

1. Manage airway as appropriate, see **Blue 3**
2. Maintain O_2 saturation between 94 - 99%
3. Elevate head of stretcher to 30 degrees (unless patient requires spinal motion restriction)
4. Request ALS, if available. Do not delay transport for ALS intercept. When operationally and medically feasible, limit scene time to 10 minutes or less.
5. Perform finger stick to measure blood glucose, if so trained. If blood glucose is less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**
6. As early as possible, alert the receiving hospital of a "Code Stroke"
   a. Relay the following information:
      i. Patient age and gender
      ii. Identify the patient as a potential stroke patient
      iii. The patient's neurologic deficits and the findings of the Cincinnati Prehospital Stoke Scale and FAST-ED Scale
      iv. The "Time Last Known Well"
      v. The patient's mental status
      vi. The patient's vital signs and finger stick blood glucose results
      vii. ETA
7. Transport to the most appropriate facility based on regional resources
8. If available and so trained, perform 12-lead ECG en route

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8. Cardiac monitor
9. IV en route
10. Perform 12-lead ECG en route

PEARLS for Stroke:

- Consider transporting a **witness, family member or caregiver** with the patient to verify the time of stroke symptoms onset. If the witness can not come with you, obtain the witness' best phone number and relay to receiving hospital staff.
- **Time Last Known Well** is the last time the patient was noted to be neurologically normal. If the patient was sleeping and wakes up with symptoms, time last known well is the last time the patient was seen to be normal. Check if the patient had gotten up and been at baseline during the night.
- **Suspect stroke** in patients with any of the following new symptoms or complaints: acute visual disturbance, altered mental state, difficulty with balance or coordination, difficulty with speech or understanding, severe headache, weakness or numbness on one side. Stroke should be suspected whenever a person has a sudden change in neurological function. More common symptoms of stroke are weakness or loss of sensation of the face, a limb or a side of the face or body, abnormal speech production (slurred or inappropriate use of words) or comprehension, dizziness/vertigo, uncoordinated movements of a limb, gait disturbance, loss of vision in one eye or one side of vision and/or sudden onset severe headache for no obvious reason.
- Consider **stroke mimics** including: migraine, hypoglycemia, seizures, intoxication, sepsis.
- The management of an LVO stroke is a COMBINATION of rapid provision of tPA AND endovascular therapies when a patient screens positive for an LVO stroke that is amenable for therapy. At present, BOTH therapies should be performed in as rapid as possible manner, highlighting the role of ALL hospitals in the care of stroke patients.

This protocol was developed in collaboration with the Northern New England Protocol Group.

Acute Stroke #4
Stroke Checklist

Time of symptom onset/Time Last Known Well: _____

Yes No

☐ ☐ **Has the patient had any recent trauma, surgeries or procedures in the last 3 months?**
If Yes, what was the procedure and when did it occur? Including:
1) Severe head trauma within the past 3 months
2) Intracranial or spinal surgery within the past 3 months
3) Major non-cranial surgery or trauma within 14 days with uncontrollable bleeding (e.g. internal organs)

☐ ☐ **Has the patient had any bleeding problems in the past?**
If Yes, what was the bleeding problem and when did it occur? Including:
1) History of spontaneous (non-traumatic) intracranial hemorrhage
2) GI malignancy or GI bleed within in the past 21 days

☐ ☐ **Is the patient taking any anticoagulants, including oral or injectable medications?**
If Yes, clarify what the medication is and when it was last administered. See below lists of common anticoagulants

This list represents a simplified approach to contraindications to tPA and should be inquired of all patients with suspected stroke. These are important to hospital clinicians determining eligibility for tPA AND when determining entry destination for possible LVO Strokes (referred to in the algorithm as 3tPA ?'s)

Please present these findings to the Emergency Medicine Staff at the receiving hospital. The patient's Last Known Well and the answers to these three questions identify the vast majority of ABSOLUTE contraindications for tPA. However, a positive answer to these questions does not absolutely rule out the ability to provide tPA.

PEARLS for Anticoagulants:
Patients may recognize their anticoagulants as "blood thinners". Inquire about traditional anticoagulants including warfarin (Coumadin or Jantoven) and Heparin (IV/IM - including Lovenox) as well as other oral anticoagulants, including dabigatran (Pradaxa), rivaroxaban (Xarelto), apixaban (Eliquis), betrixaban (Bevyxxa) or edoxaban (Savaysa). Please note, medication manufacturers are producing new anticoagulants frequently. Please note all medications the patient identifies as an anticoagulant and pass on to receiving hospital staff.

Medical Shock #1

See Cardiogenic Shock, **Red 22** if appropriate
See Hemorrhagic Shock, **Green 16** if appropriate
See Allergy and Anaphylaxis, **Gold 1** if appropriate
See Airway Algorithm, **Blue 3** if appropriate

IDENTIFICATION OF POSSIBLE SEPSIS

- Suspected infection? **AND:**
- Evidence of sepsis criteria? Includes **two or more** of the following:
  - Temperature less than 96.8 degrees F or greater than 101 degrees F
  - Heart rate greater than 90 bpm
  - Respiratory rate greater than 20 bpm
  - Systolic blood pressure less than 90 mmHg or Mean Arterial Pressure (MAP) less than 65 mmHg
  - New onset altered mental status OR increasing mental status change with previous altered mental status
  - Pedi: Mottling, Cap refill less than 1 sec (flash) OR greater than 3 seconds (delayed)

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EMT

1. Attempt to identify cause
   a. Hemorrhagic Shock, see **Green 16**
   b. Cardiogenic Shock, see **Red 22**
   c. Anaphylactic Shock, see **Gold 1**
2. Manage airway as appropriate, see **Blue 3**
3. Request ALS, if available, and notify receiving hospital that the patient is a "Code Sepsis." When available, ALS is valuable in these patients and allows for initiation of essential therapies, including resuscitation.
4. Perform finger stick to measure blood glucose, if so trained
   a. If blood glucose less than 60 mg/dL, refer to Diabetic/Hypoglycemic Emergencies protocol, **Gold 6**
5. Transport

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6. For Severe Sepsis
   a. Assess for acute pulmonary edema. If present, refer to Cardiogenic Shock protocol, **Red 22**
   b. Administer up to 30 mL/kg fluid bolus.
   c. For patients with evidence of fluid overload or at risk for fluid overload, consider consultation with OLMC for different resuscitation volume goals.

PEARLS for Sepsis: Patients at risk for fluid overload include, but are not limited to, patients over 65 years of age, patients with a history of heart failure, patients on dialysis for renal failure. Such patients may benefit from smaller volumes of resuscitation and earlier initiation of pressors.

   d. Monitor closely during resuscitation. Goals of resuscitation in shock and sepsis are to treat hypotension and/or signs of hypoperfusion

Medical Shock #2

PARAMEDIC

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7. For medical or presumed septic shock
   a. If no response to initial treatment: initiate NOREPInephrine **IV infusion**. NOREPInephrine infusions must be administered via a Maine EMS approved medication pump.
      i. **Preparation** – mix NOREPInephrine 8 mg in 250 mL NS [32 mcg/mL]
      ii. **Dosing** - Starting dose of NOREPInephrine is 0.03 mcg/kg/min. Titrate by 0.03 mcg/kg/min every 3-5 minutes. Usual dose is 0.03-0.25 mcg/kg/min. Usual MAX dose is 0.6 mcg/kg/min. Absolute MAX dose is 3 mcg/kg/min.
      iii. **Titrate** to maintain SBP greater than 90 mmHg and/or MAP > 65 mmHg

8. Additionally, if the patient is found to have Adrenal Insufficiency (via medic alert bracelet, patient records, or family/staff reports), administer dexamethasone as follows:
   a. **Adults** – dexamethasone 10 mg **IV/IO/IM** x 1 dose
   b. **Pediatrics** - 0.6 mg/kg with MAX single dose of 10 mg **IV/IO/IM** x 1 dose
   c. May provide patient's own dose of hydrocortisone (Solu-cortef) at the patient's physician's prescribed dose if patient's medications are available

PEARLS for Sepsis:

- Sepsis is a systemic inflammatory response due to infection, often resulting in significant morbidity and mortality.
- Septic shock has a 50% mortality rate and must be treated aggressively.
- Treatment consisting of IV fluid administration and early antibiotic administration reduces mortality in septic patients.
- Please alert the receiving hospital with patients identified as septic.
- Current evidence suggests there may be a benefit from use of Lactated Ringers in critically ill patients with shock. Consider using Lactated Ringers preferentially if available.
- When initiating NOREPInephrine, make sure that the IV flushes easily and that there is NO extravasation. Whenever possible, use proximal IV access.
- Patients suffering from sepsis or septic shock are very ill patients and the care of these patients may be nuanced. Please consider the value of On Line Medical Control discussion for any questions or concerns regarding the management of these patients.

This protocol was developed in collaboration with the Northern New England Protocol Group.

Medical Shock #3

Pediatric shock is well established before the appearance of classic signs and symptoms. The earliest signs and symptoms of pediatric shock include delayed capillary refill, alterations in mental status, rising pulse, and increasing respiratory rate. By the time blood pressure drops, circulatory collapse is near. Consider sepsis in certain high-risk clinical settings.

High-risk features for invasive infection include malignancy, bone marrow or solid organ transplant, asplenia, presence of indwelling central line/catheter, or other situation with immune deficiency, compromise or suppression.

Please see below for pediatric specific findings & vital signs.

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IDENTIFICATION OF POSSIBLE SEPSIS

- Suspected Infection - YES
- Temperature greater than 101^{o} F or less than 96.8^{o} F (greater than 38.3^{o} C or less than 36^{o} C)
- Heart rate or respiratory rate greater than normal limit for age (NOTE: heart rate may not be elevated in a septic hypothermic patient) **AND** at least one of the following indications of altered organ function:
  - Altered mental status
  - Capillary refill time less than 1 second (flash) or greater than 3 seconds
  - Mottled cool extremities

Note: Consider early contact with **OLMC** for suspected pediatric sepsis patients

Upper Limit of Pediatric HR & RR		
Age	Heart Rate	Resp Rate
0 day-<1 mo	> 205	> 60
1mo - <3 mo	> 205	> 60
3 mo - <1 y	> 190	> 60
1y - <2 y	> 190	> 40
2y - <4y	> 140	> 40
4y - <6y	> 140	> 34
6y - <10y	> 140	> 30
10y - <13y	> 100	> 30
13 y or older	> 100	> 24

*Americal College of Pediatrids "An Emergency Department Septic Shock Protocol and Care Guideline for Children Initiated at Triage"

Medical Shock #4

PEARLS for Medical Shock

Many pediatric patients with shock have associated hypoglycemia. Mortality is increased if this is not addressed. Also, the presenting symptoms of shock and those of hypoglycemia can be very similar.

In children under the age 6, prompt IO placement after one failed IV attempt should be considered, since timely, successful IV placement in this age group is shown to be difficult.

Patients in shock require frequent reassessment. The following physiologic parameters are appropriate endpoints for therapy: normalization of heart rate, capillary refill, mental status, resolution of existing hypotension and, if available, presence of urine output.

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Abdominal Pain

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Many diseases cause abdominal pain. While it is almost impossible to diagnose the cause of abdominal pain in the EMS environment, it is important to be prepared for the patient to suddenly become very ill. If the patient is in shock, refer to the medical shock protocol.

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EMT

1. Manage airway as appropriate, see **Blue 3**
2. If evidence of shock, refer to the Medical Shock protocol, **Gold 14**
3. If available and so trained, perform 12-lead ECG in patients with prior history of cardiac disease or risk factors for cardiac disease

ADVANCED EMT

4. Establish IV
5. If so trained, perform 12-lead ECG, under the following circumstances:
   1) The patient has a history of cardiac disease or risk factors for cardiac disease, or
   2) Based on the clinician's discretion

PARAMEDIC

6. Perform pain-rating score on 1-10 scale
7. For non-traumatic abdominal pain in a stable patient with a normal level of consciousness:
   a. Consider fentanyl 1 mcg/kg **IV/IN** for a MAX dose of 100 mcg

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   i. If repeated doses necessary, contact OLMC 

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   b. For nausea or vomiting, refer to Nausea and Vomiting protocol, **Gold 19**

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Obstetric Emergencies

Most pregnancies progress with no complications. In cases of pregnancy with either vaginal bleeding or abdominal/pelvic pain, consider the following possibilities:

1. Abruptio placenta: placenta prematurely separates from the uterus causing intrauterine bleeding
2. Placenta previa: placenta covers part or all of the cervical opening
3. Ectopic pregnancy (ruptured)
4. Spontaneous abortion (miscarriage)
5. Pre-Eclampsia/Eclampsia (can occur for up to 6 weeks post partum)
6. Postpartum Hemorrhage

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EMT

1. Manage airway as appropriate, see **Blue 3**
2. Monitor vitals. If evidence of shock refer to the Hemorrhagic Shock protocol, **Green 16.** Contact ALS, if available
   a. Patients in third trimester of pregnancy with evidence of shock should be transported on the side (either left or right), or with uterus manually displaced to the left or right
3. If the patient is pregnant with abdominal/pelvic pain, bleeding or concern for any of the above conditions, and the patient condition permits, transport to the nearest hospital with OB capabilities if total transport time is less than 45 minutes, otherwise go to the closest ED.
4. For trauma related to pregnancy, follow Trauma Triage, **Green 3**
5. Notify Hospital of incoming patient

6. Contact OLMC for decision support if questions regarding patient transport destination.

A P

ADVANCED EMT/PARAMEDIC

7. Establish IV. If evidence of shock, resuscitate with fluid boluses
8. If history of syncope/lightheadedness, perform 12 lead ECG

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PARAMEDIC

9. For patients suffering post partum hemorrhage and demonstrating evidence of shock, refer to the Hemorrhagic shock protocol and consider TXA.
   a. NOTE - TXA is contraindicated in patients greater than 24 wks pregnant (or pregnant with fundus above umbilicus) suffering hemorrhagic shock due to trauma **(see Green 17)**

Pearls for Obstetric Emergencies

Even minor trauma beyond the second trimester can lead to significant consequences for the pregnancy. In some cases, these patients require fetal monitoring and therefore should be transported.

Syncope can be a presenting symptom of hemorrhage from ectopic pregnancy or causes of vaginal bleeding.

Do not place hand/fingers into vagina of bleeding patient except in cases of prolapsed cord or breech birth that is not progressing

Please note, on scene Obstetric clinicians may provide TXA. Please ensure TXA has not been previously provided before proceeding with TXA.

Nausea and Vomiting

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Nausea and vomiting are symptoms of some other illness. Therefore, this is a supplemental protocol to be used in addition to other relevant protocols

EMT

1. Manage airway as appropriate, see **Blue 3**
2. Transport in position of comfort, unless contraindicated
3. If available and so trained, perform 12-lead ECG if the patient has a history of cardiac disease, risk factors for cardiac disease, or based on the EMS clinician's discretion.

ADVANCED EMT/PARAMEDIC

3. Perform 12-lead ECG under the following circumstances:
   a. The patient has a history of cardiac disease or risk factors for cardiac disease,
   b. Or, based on the clinician's discretion
4. Consider Ondansetron: (Remember: do not administer if patient has history of long QT syndrome)
   a. Adults: administer ondansetron 4 mg ODT tablet **PO,** or ondansetron 4 mg **IV**
      i. May repeat once after 15 minutes as needed.
   b. **Pediatric** patients:
      i. If greater than 4 years old, use the adult oral and IV dose as above
      ii. If less than 4 years old, give 0.1 mg/kg **IV/IM** up to adult dose

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5. Consider IV access if active vomiting or for management of underlying cause
6. Consider fluid bolus if actively vomiting

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7. Contact OLMC for dosage question, abnormal vital signs, or coincident drug use (including alcohol) by patient.

PEARLS for Management of Nausea and Vomiting:

A small percentage of patients receiving ondansetron experience adverse cardiac reactions including QT prolongation. For this reason, patients should be questioned about preexisting QT prolongation, which is a contraindication to receiving ondansetron. In these conditions, patients SHOULD NOT receive ondansetron. There are also many medications which may cause a prolonged QT interval and ondansetron should be withheld in these cases. For more information on drugs that can cause QT prolongation, consider reading: https://www.uspharmacist.com/article/drug-induced-qt-prolongation