Individual license holders are responsible to hold and maintain the appropriate competencies (satisfactory knowledge and appropriate psychomotor skills) for the safe performance of these patient care maps. Clinical care is to be provided in accordance with the protocols and procedures as established by the Provincial Medical Director and all patient care duties and functions must be performed in accordance with the EMS Protocols and Procedures as published by the Minister.

| A - Adult | 17 years & older |
| B - Adolescent | 10 up to 17 years |
| C - Child | 1 up to 10 years |
| D - Infant | 0 to 12 months |
| E - Neonatal | Newly born |

### A - GENERAL ASSESSMENT

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<tr>
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<td>Transport</td>
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<td>On-line Medical Support</td>
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<td>A07.2</td>
<td>Patient Positioning in Pregnancy</td>
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<td>A08.1</td>
<td>Patient Destination When Closest ED Is Within WRHA</td>
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### B - AIRWAY & BREATHING MANAGEMENT

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### C - RESUSCITATION & EMERGENCY MEDICAL CONDITIONS

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<td>Advanced Resuscitation – Adolescent</td>
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<td>C04</td>
<td>Advanced Resuscitation for Traumatic Cardiopulmonary Arrest</td>
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<td>C09A</td>
<td>ICD &amp; Pacemaker Malfunction – Adult</td>
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### D - CHILD BIRTH & NEWBORN CARE

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<td>Prolapsed Umbilical Cord</td>
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<td>Breech Presentation</td>
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<tr>
<td>Code</td>
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<td>D03.3</td>
<td>Multiple Gestations</td>
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<td>D03.4</td>
<td>Shoulder Dystocia</td>
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**E – MEDICAL & NON-TRAUMATIC CONDITIONS**

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<td>Agitation &amp; Behavioral Emergencies</td>
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<td>Agitation &amp; Behavioral Emergencies</td>
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<td>E03A</td>
<td>Anaphylaxis – Adult</td>
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<td>Anaphylaxis – Adolescent</td>
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**F – TRAUMA & ENVIRONMENTAL CONDITIONS**

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<td>Traumatic Hemorrhage &amp; Shock – Adult</td>
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**G - TRANSPORT & INTERFACILITY TRANSFER**

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<td>Transfer to the Comprehensive Stroke Center HS</td>
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**H - REFERENCES & CLINICAL SUPPORT**

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<td>Pediatric Airway Sizes Correlated to Broselow Tape</td>
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<td>Care Map Entry by Chief Complaint</td>
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<td>H04</td>
<td>Oxygen Consumption Guideline</td>
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</table>
Scene Assessment

Primary Assessment (Figure two)

Immediate life threatening illness

Yes

No

Secondary Assessment

Immediate life threatening illness

Yes

Initiate life saving interventions on scene

No

Potential for deterioration or time sensitive illness

Yes

Initiate stabilizing interventions on scene or en route

No

Limb threatening illness

Yes

Initiate treatment on scene or en route

No

Transport

Return to Primary Assessment as required

Transport

Continue stabilizing interventions on route

Transport

Continue treatment on route

Transport

Continue stabilizing interventions en route

Transport

Continue treatment en route
FIGURE TWO: PRIMARY ASSESSMENT

1. Advanced airway procedure
   - No
   - Yes
     - Airway maintainable (+/- basic device)
       - Yes
       - No
         - Oximetry
         - Supplemental oxygen
         - Ventilatory support
       - No
         - Secured device
         - Confirm placement
         - Adequate ventilation & oxygenation
           - Yes
           - No
             - Advanced airway procedure
             - Consider capnometry *
             - Exclude tension pneumo
           - No
             - Establish vascular access
             - Consider fluid admin
             - Exclude tension pneumo
             - Assess LOC
             - Assess pupils
               - Yes
               - No
                 - Aspiration risk
                 - Consider airway protection
               - Exclude hypoglycemia
               - Complete vital signs
               - Appropriate exposure
               - Prevent hypothermia
             - ECG monitor
             - Consider IV access
               - Yes
               - No
                 - Initiate life saving interventions
               - Secondary Assessment
                 - Yes
                 - No
                   - TRANSPORT
INDICATIONS:

- This is the common entry point for all medical (non-trauma) patients into the Patient Care Maps.

NOTES:

- EMS providers require the appropriate delegations to perform any reserved acts (ie. perform procedures or administer medications) in all Patient Care Maps.
- Standard scene assessment includes personal, patient and public safety; the need for activating other agencies or services; and the need for additional resources, including advanced life support (ALS) intercept.
- EMS personnel must utilize personal protective equipment (PPE) and follow appropriate bodily substance isolation (BSI) procedures at all times.
- In the event of cardiopulmonary arrest, providers with emergency (basic) and primary care delegations will initiate resuscitation as per C01 BASIC RESUSCITATION. Providers with the intermediate care delegations and above will conduct resuscitation as per the age-appropriate C02 ADVANCED RESUSCITATION care map.
- The primary assessment must be conducted efficiently and systematically. Steps may be performed sequentially or concurrently, depending upon the patient’s clinical condition and available on-scene personnel.
- The secondary assessment includes an appropriate history, collateral information, details of the incident, and a relevant physical examination. The examination may be generalized or focused depending upon the chief complaint(s) and the patient’s clinical condition.
- If any immediate life threatening condition(s) is/are identified or suspected, life saving interventions must be immediately initiated and emergent transport undertaken. These should be resolved or stabilized when encountered before resuming assessments. With adequate on-scene personnel, assessment and management of life threats may occur simultaneously.
- If no life threatening condition(s) is/are identified or suspected the secondary assessment may be conducted on scene or en route as per A04 TRANSPORT.
- On-scene time should be kept as short as possible. Every effort should be made to minimize the potential for deterioration while en route. Further important but non life saving interventions may be performed en route as resources and the patient’s condition allow.
- Non-life or limb threatening condition(s) may be managed on scene as the patient’s condition allows. All efforts should be made to minimize the need for initiating unnecessary interventions while en route.
- The treatments of specific medical conditions are addressed in the various patient care maps.
- The complexity of monitoring and frequency of reassessment(s) will depend on the patient’s condition and stability, transport time, and the competencies and delegations of the treating personnel.
- Transport to destination as indicated by Provincial or Regional directive. In the absence of specific directive transport to closest facility.
- Consider appropriate positioning for pregnant patients beyond 20 weeks gestation to prevent supine hypotensive phenomenon.
**INDICATIONS:**

- This is the common entry point for all trauma (non-medical) patients into the Patient Care Maps.

**NOTES:**

- EMS providers require the appropriate delegations to perform any reserved acts (i.e., perform procedures or administer medications) in all Patient Care Maps.
- Standard SCENE ASSESSMENT includes personal, patient, and public safety; the need for activating other agencies or services; and the need for additional resources, including advanced life support (ALS) intercept.
- EMS personnel must utilize personal protective equipment (PPE) and follow appropriate bodily substance isolation (BSI) procedures at all times.
- Control of obvious exsanguinating hemorrhage takes priority. With adequate on-scene resources control of exsanguination may occur concurrently with pulse check.
- In the event of cardiopulmonary arrest, providers with emergency (basic) and primary care delegations will initiate resuscitation as per C01 BASIC RESUSCITATION. Providers with the intermediate care delegations and above will conduct resuscitation as per the age-appropriate C04 Traumatic CPA care map.
- The primary assessment must be conducted efficiently and systematically. Steps of the primary assessment may be performed sequentially or concurrently, depending upon the patient's clinical condition and available on-scene personnel.
- The rapid trauma survey includes a complete screen for any life threatening injury(s). This screening may be more focused if the mechanism of injury (MOI) is localized, as long as immediate life threats have been safely excluded by the primary assessment.
- The secondary assessment includes an appropriate history, collateral information, details of the incident, and a relevant physical examination. The examination may be generalized or focused depending upon MOI, chief complaint(s) and the patient's clinical condition.
- If any immediate life threatening condition(s) is/are identified or suspected, life saving interventions must be immediately initiated and emergent transport undertaken. These should be resolved or stabilized when encountered before resuming assessments. With adequate on-scene personnel, assessment and management of life threats may occur simultaneously.
- If no life threatening condition(s) is/are identified or suspected the secondary assessment may be conducted on scene or en route as per A04 TRANSPORT.
- On-scene time should be kept as short as possible. Every effort should be made to minimize the potential for deterioration while en route. Further important but non life saving interventions may be performed en route as resources and the patient’s condition allow.
- Non-life or limb threatening condition(s) may be managed on scene as the patient’s condition allows. All efforts should be made to minimize the need for initiating unnecessary interventions while en route.
- The treatments of specific injuries are addressed in the various patient care maps.
- The complexity of monitoring and frequency of reassessment(s) will depend on the patient’s condition and stability, transport time, and the competencies and delegations of the treating personnel.
- Transport to destination as indicated by Provincial or Regional directive. In the absence of specific directive transport to closest facility.
- Consider appropriate positioning for pregnant patients beyond 20 weeks gestation to prevent supine hypotensive phenomenon.
- Trauma patients should be given nothing by mouth.
Estimate the number and type(s) of casualties

Notify dispatch and / or on-call supervisor

10 years & older
START Triage
(Appendix A)

0 up to 10 years
JumpSTART Triage
(Appendix B)

Categorize and tag all patients (Appendix C)

RED
Immediate Trauma Primary Assessment
Life Saving Interventions
Immediate transport

YELLOW
Urgent Trauma Primary Assessment
Known or suspected life threatening injury

GREEN
Trauma Primary Assessment as resources allow
Transport

BLACK
Move to "scene morgue"

Transport as resources allow
## INDICATIONS:

- Any traumatic incident (excluding mass lightning strike) where the number and severity of casualties significantly exceeds the available personnel and resources currently on scene

## NOTES:

- The total number of casualties should be rapidly estimated and reassessed regularly to ensure no patients are missed.

- Contact dispatch or the on-call supervisor as soon as possible to obtain additional resources.

- If patient age is unknown but suspected to be less than 10 years of age, triage using the JumpSTART algorithm (appendix B).

- The senior responding EMS personnel should assume site command until a designated site command is established. Medical response must remain coordinated with other agencies and activities.

- **All EMS personnel are required to be familiar with the disaster plans for their service, community, and/or region.**
Appendix A:
Simple Triage and Rapid Treatment (START)
Appendix B:
JumpSTART Pediatric MCI Triage

Able to walk? 
Yes: GREEN 
No: Breathing? 
Yes: Respiratory rate = 15 to 45 
No: Pulse? 
Yes: Unresponsive or inappropriate posturing to pain 
No: Secondary Triage

Breathing? 
Yes: Open upper airway 
No: No Pulse? 
Yes: Perform 5 Rescue Breaths 
No: Secondary Triage

Pulse? 
Yes: Breathing? 
Yes: GREEN 
No: RED 
No: BLACK

Respiratory rate = 15 to 45 
Yes: Pulse? 
No: No Unresponsive or inappropriate posturing to pain 
Yes: BLACK 
No: GREEN 
No: YELLOW
# Appendix 3:
## Priority categories

<table>
<thead>
<tr>
<th>Tag Color</th>
<th>Priority</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Highest</td>
<td>Immediate treatment &amp; transport needed to survive.</td>
</tr>
<tr>
<td>Yellow</td>
<td>Intermediate</td>
<td>Urgent treatment needed but will likely survive. Transport urgency will depend upon assessment.</td>
</tr>
<tr>
<td>Green</td>
<td>Low</td>
<td>Treatment can be safely deferred / delayed. Transport urgency will depend upon assessment and available resources.</td>
</tr>
<tr>
<td>Black</td>
<td>Lowest</td>
<td>Vital signs absent or not expected to survive. Transport priority is lowest and depends upon available resources.</td>
</tr>
</tbody>
</table>
Immediate life threatening condition

Yes

No

Potential for deterioration or limb threatening condition or time sensitive condition

Yes

Initiate life saving interventions on scene

No

Initiate stabilizing interventions on scene or en route

Further assessment and management on scene

Further assessment on scene or en route

TRANSPORT

TRANSPORT

Further assessment and management en route

TRANSPORT

Continue life saving interventions en route
Urgency of Transport:

The urgency of transport depends on multiple factors:

- Known or suspected life threatening condition(s)
- Potential for rapid patient deterioration
- Time sensitive condition(s) or treatment(s)
- On scene availability of required interventions
- Non-clinical factors such as road and weather conditions
- Competencies and delegations of the treating EMS provider

The decision regarding urgency of transport should be based on the clinical judgment of on-scene EMS personnel. At any time, EMS personnel may initiate on-line clinical support for assistance with transport decision-making.

Non-clinical issues affecting patient, provider and public safety such as road and weather conditions will be at the discretion of the EMS vehicle operator. Patient transport must be expedient but safe (Z09.1 Emergency Vehicle Operations). At all times patient, paramedic and public safety is paramount.

Transport Management & Transport of Patients with Known or Suspected Immediate Life-Threatening Condition(s):

1. Life saving interventions (LSI) for the management of the airway and breathing must be initiated before loading.

2. LSI that cannot be safely, effectively and consistently initiated en route must be initiated before loading.

3. All other LSI must be initiated as soon as possible. The decision as to when to initiate other LSI (ie. prior to loading versus during transport) will based on the clinical judgment of EMS personnel.

4. On scene time should generally be kept to a minimum.

5. The patient and EMS personnel must be properly secured prior to departure. Vehicular speeds must comply with all Provincial laws and regulations.

6. Further assessment and treatment of non-life threatening conditions may be undertaken en route as the situation allows (ie. if the initial threat to life is resolved or stabilized).

7. These patients must be closely monitored during transport even if the immediate threat(s) has/have been resolved. The complexity and frequency of monitoring (eg. vitals signs) will depend on the patient’s clinical condition, transport duration, and competencies of the treating paramedic.

8. Pre-arrival notification to the receiving facility should be done at an appropriate interval.
TRANSPORT MANAGEMENT & TRANSPORT OF PATIENTS WITH POTENTIAL FOR DETERIORATION OR TIME SENSITIVE CONDITION(S):

1. Only relevant clinical assessment(s) should be completed prior to scene departure.

2. Any necessary intervention(s) should be carried out prior to transport.

3. The patient and EMS personnel must be properly secured prior to departure. Vehicular speeds must comply with all Provincial laws and regulations.

4. Further assessment and treatment of other conditions may be undertaken on scene or en route as indicated.

5. These patients must be monitored during transport. The complexity and frequency of monitoring (eg. vitals signs) will depend on the patient’s clinical condition, transport duration, and competencies of the treating paramedic.

6. Pre-arrival notification to the receiving facility should be done at an appropriate interval.

7. If at any time the patient’s condition deteriorates, appropriate interventions should be initiated and the urgency of transport upgraded.

TRANSPORT MANAGEMENT & TRANSPORT OF PATIENTS WITHOUT LIFE-THREATENING CONDITIONS, POTENTIAL FOR DETERIORATION OR TIME SENSITIVE CONDITION(S):

1. All appropriate clinical assessment(s) must be completed prior to scene departure.

2. Any necessary intervention(s) should be carried out prior to transport.

3. The patient and EMS personnel must be properly secured prior to departure. Vehicular speeds must comply with all Provincial laws and regulations.

4. Further assessment and treatment of other conditions may be undertaken en route as indicated.

5. The complexity and frequency of monitoring (eg. vitals signs) will depend on the patient’s clinical condition, transport duration, and competencies of the treating paramedic.

6. Pre-arrival notification to the receiving facility should be done at an appropriate interval.

7. If at any time the patient’s condition deteriorates, appropriate interventions should be initiated and the urgency of transport upgraded.
Issue beyond established care map(s) and/or routine clinical practice(s)

Contact MTCC & request consultation with OLMS

Yes

MTCC connects paramedic with OLMS

OLMS advises care beyond established care map(s) or routine clinical practice(s)

Yes

Provide care as advised by OLMS

No

Follow established care map(s) and/or routine clinical practice(s)

No - OLMS not available

Consider contact with OCS
**INDICATIONS:**
- Clinical issues not otherwise defined by established care map(s) and/or routine clinical practice(s)

**CONTRAINDICATIONS:**
- Operational issues
- Destination & bypass issues

**NOTES:**
- EMS personnel may consider OLMS for assistance at any time.
- **EMS providers must always operate within their established competencies and delegated scope of practice.**
- Operational issues are defined by Regional or Provincial policy. Contact the OCS for support for operational issues.
- Destination options are defined by Regional or Provincial policy. Contact the OCS for support for operational issues.
- Bypass decisions are defined by Regional or Provincial policy (e.g. E15 STROKE BYPASS).
- Contact MTCC paramedic line and request to speak to the OLMS physician.
- EMS providers should be prepared for OLMS with a brief pertinent summary and current VS.
- Documentation must include time of request for OLMS, time of response by OLMS and pertinent information about clinical discussion.
- If OLMS is unavailable, EMS providers must follow established care map(s) and routine clinical practice(s). EMS providers may consider consultation with OCS if time allows.
- All calls where online medical support is accessed will be audited by the regional quality officer.

**ABBREVIATIONS:**
- MTCC = Manitoba Transportation Coordination Centre
- OCS = on-call supervisor
- OLMS = on-line medical support
- VS = vital signs

**NOTE:** This symbol on a care map is a reminder that EMS providers may contact OLMS for clinical support at any time.
Position of comfort

- Yes
  - Significant decrease in systolic BP when supine (+/- bradycardia)
    - Yes
      - Known or suspected unstable spinal injury
        - Yes
          - Long spine board being used for short term transport
            - Yes
              - Elevate right side of long spine board 4 to 6 inches
            - No
          - Known or suspected unstable pelvic fracture
            - Yes
              - Elevate right hip 4 to 6 inches
            - No
        - No
      - Supine position
        - Yes
          - Hypotension resolved
            - Yes
          - Manually displace uterus to patient’s left side
            - No
        - No
      - Condition prevents lateral positioning
        - Yes
          - Left lateral recumbent position
            - No
        - No
      - Secure in position
        - Yes
          - Right lateral recumbent position
            - No
        - No
    - No
  - No

- No

Condition prevents lateral positioning

- Yes
  - Left lateral recumbent position
    - No
  - Secure in position
    - Yes
      - Hypotension resolved
        - Yes
      - Right lateral recumbent position
        - No
  - No

Known or suspected unstable spinal injury

- Yes
  - Long spine board being used for short term transport
    - Yes
      - Elevate right side of long spine board 4 to 6 inches
    - No
  - Known or suspected unstable pelvic fracture
    - Yes
      - Elevate right hip 4 to 6 inches
    - No
- No

Manual displace uterus to patient’s left side

- Yes
  - Hypotension resolved
    - Yes
  - Secure in position
    - Yes
  - Right lateral recumbent position
    - No
- No
INDICATIONS:
- Pregnant patient beyond twenty weeks gestational age

CONTRAINDICATIONS:
- None

NOTES:
- REMINDER: Always consider other causes of hypotension in pregnant patients.

- Supine hypotension is uncommon under twenty weeks gestational age because the uterus is not yet large enough to compress the inferior vena cava.

- Compression of the vena cava may cause an increase in vagal tone resulting in bradycardia accompanying the hypotension.

- Certain medical conditions (eg. respiratory failure) or injuries (eg. rib fractures) may prevent left lateral recumbent (decubitus) positioning.
Patient Destination
When Closest ED is Within WRHA

Unable to open/maintain airway and/or achieve adequate oxygenation/ventilation and/or control exsanguinating hemorrhage

Yes

No

Patient management beyond delegated scope of practice

Yes

No

Transport to CH-ED

0 up to 17 years of age

Yes

No

Transport to SBGH-ED

- STEMI
- CPA with ROSC
- Hypothermic CPA
- LVAD / ICD
- Cardiac transplant

Refer to table A for specific directions

No

- Traumatic CPA
- Major trauma
- Major burns
- Transplant (non-cardiac)
- Bleeding disorders
- PPH
- Ventilator dependent

Refer to table B for specific directions

Transport as per Table C

Yes

No

- Acute stroke
- Pregnancy > 20 wks
- Dialysis dependent
- AAA

Refer to table C for specific directions

Authorized destination directive

Yes

No

Transport to directed site

Transport to closest ED
INDICATIONS:
• All patients picked up within IERHA or SHSS where the closest ED is within a WRHA facility.

REMINDER: Victoria General Hospital (VGH) will convert to an urgent care center on October 3, 2017 and will no longer accept rural ambulances. The remaining Winnipeg Regional Health Authority (WRHA) sites providing ED services will be:

  • Concordia General Hospital (CGH)
  • Grace General Hospital (GGH)
  • Health Sciences Centre – Adult (HSCA)
  • Health Sciences Centre – Children’s Hospital (CH)
  • Seven Oaks General Hospital (SOGH)
  • St. Boniface General Hospital (SBGH)

NOTES:
• “Closest ED” refers to the ED that has the shortest transport time from the scene of the patient encounter regardless of RHA boundaries.
• Transport must be expedient but safe (Z09.1 EMERGENCY VEHICLE OPERATIONS). Non-clinical issues affecting patient, provider and public safety such as road and weather conditions will be at the discretion of the EMS vehicle operator, and must be considered in estimating transport time.
• If two facilities have similar transport times, providers should then transport to the ED that has the shortest transport distance from the scene of the patient encounter irrespective of RHA boundaries.
• Providers may contact MTCC at any time to help identify the closest ED.
• Providers may contact OLMS at any time for assistance with clinical decision-making.
• The local or provincial EMS medical director must approve in advance any destination directive.

TABLE A
• Known or suspected STEMI (excluding STEMI confirmed by Code-STEMI physician on-call)
• Non-traumatic CPA with ROSC
• CPA without ROSC where hypothermia is known or suspected to be the cause of arrest
• LVAD
• ICD
• Cardiac transplant

TABLE B
• CPA due to penetrating trauma
• CPA due to blunt trauma (only when arrest has been witnessed by EMS personnel)
• Trauma meeting criteria outlined in appendix A
• Burns meeting criteria outlined in appendix B
• Organ transplant other than cardiac
• Bleeding disorders not due to anticoagulant use (e.g. Hemophilia, von Willebrand’s disease)
• Flolan or Remodulin continuous infusion for PPH
• Long term mechanical ventilation (excluding CPAP for OSA)

TABLE C

<table>
<thead>
<tr>
<th>CONDITION</th>
<th>Primary destination</th>
<th>Secondary destination based on RHA of origin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute stroke with positive CPSS</td>
<td>N/A</td>
<td>IERHA SHSS</td>
</tr>
<tr>
<td>Pregnancy with EGA greater than 20 weeks</td>
<td>Scheduled delivery site (if unknown transport to secondary destination)</td>
<td>HSCA-ED SBGH-ED</td>
</tr>
<tr>
<td>Dialysis dependent</td>
<td>Primary dialysis site (if unknown transport to secondary destination)</td>
<td></td>
</tr>
<tr>
<td>Known AAA with abdominal pain and stable VS</td>
<td>Scheduled vascular surgery site (if unknown transport to secondary destination)</td>
<td></td>
</tr>
<tr>
<td>Suspected ruptured AAA</td>
<td>Closest vascular surgery site (HSCA or SBGH)</td>
<td>N/A</td>
</tr>
</tbody>
</table>
APPENDIX A:
Transport directly to Provincial Trauma Centre (HSCA-ED) for any of the following:

Unstable VS:
- Evidence of head trauma and GCS less than 14
- RR greater than 30 or less than 10 rpm
- SBP less than 90 mmHg
- HR greater than 120 bpm

Anatomical Injury:
- Penetrating injury to head, neck, chest, axilla, shoulder, abdomen, groin
- Two or more proximal long bone fractures (humerus or femur)
- Open fracture or dislocation
- Fracture or dislocation with absent pulse in injured limb
- Open pelvic fracture/injury
- Life threatening chest injuries
  - Tension pneumothorax
  - Flail chest
  - Open (sucking) chest wound
- Amputation of extremity proximal to ankle or wrist
- Paraplegia or quadriplegia
- Any pregnant patient

Mechanism of Injury:
- Fall from a height greater than 10 feet (1 story)
- Ejection (partial or complete) from a motorized vehicle
- Death in the same passenger compartment
- Pedestrian struck by motor vehicle at greater than 30 kph, or run over, or thrown any significant distance
- MVC with intrusion greater than 12 inches into occupant location

APPENDIX B:
Transport directly to Provincial Burn Centre (HSCA-ED) for any of the following burns:

- Greater than 20% BSA (any thickness)
- Greater than 5% of BSA (full thickness)
- Location:
  - Face
  - Neck
  - Hands
  - Feet
  - Perineum
- Potential airway involvement
- High voltage electrical burns
ABBREVIATIONS:

AAA = abdominal aortic aneurysm
bpm = beats per minute
BSA = body surface area
CPA = cardiopulmonary arrest
CPAP = continuous positive airway pressure
CPSS = Cincinnati Prehospital Stroke Scale
ED = emergency department
EGA = estimated gestational age
GCS = Glasgow coma score
HR = heart rate
ICD = implantable cardiac defibrillator
IERHA = Interlake-Eastern Regional Health Authority
kph = kilometres per hour
LVAD = left ventricular assist device
mmHg = millimeters of mercury
MTCC = Manitoba Transportation Coordination Centre
MVC = motor vehicle collision
OLMS = on-line medical support
OSA = obstructive sleep apnea
PC = palliative care
PPH = primary pulmonary hypertension
RHA = regional health authority
ROSC = return of spontaneous circulation
rpm = respiration per minute
RR = respiratory rate
SBP = systolic blood pressure
SHSS = Southern Health / Santé Sud
STEMI = ST segment elevation myocardial infarction
VS = vitals signs
From PRIMARY ASSESSMENT

Airway opened

No  Refer to AIRWAY OBSTRUCTION

Yes

Airway maintainable with basic device / procedure

No  Consider BIAD

Consider ETI

Yes  Ensure oxygenation & ventilation

Aspiration risk

No

GCS less than 9

No  Consider capnometry

Yes  Consider ETI

Consider drug assisted ETI

Return to PRIMARY ASSESSMENT

BIAD  Blind insertion airway device

ETI  Endotracheal intubation
INDICATIONS:
- Patients with an airway that is not patent, and/or cannot be maintained, and/or is not protected from aspiration; or who are not spontaneously or adequately breathing

CONTRAINDICATIONS:
- None

NOTES:
- If necessary suction should be used to clear the airway of secretions.
- Infants and small children may develop partial or complete airway obstruction from thick nasal secretions. Suctioning may resolve airway or breathing difficulties in these patients.
- If airway is not spontaneously patent or if unable to open airway with basic device or procedure, refer to B02 Airway Obstruction.
- Consider the use of continuous waveform capnometry (CWC) with any airway device. Providers who initiate endotracheal intubation (ETI) must use CWC for monitoring of tube position during transport.
- With suspected hypoxemia do not withhold oxygen pending confirmation by oximetry. With adequate on scene resources consider titration of oxygen to saturation between 90% and 94%.
Airway Obstruction

From AIRWAY & BREATHING MANAGEMENT

Foreign body

Yes

Partial Obstruction
Support patient efforts
Monitor for progression

Obstruction resolved

Yes

Assist ventilation
Ensure oxygenation

Return to AIRWAY & BREATHING MANAGEMENT

No

Complete Obstruction
Abdominal thrusts
(Back slaps & chest thrusts < 1 yr)

Conscious

Yes

Manual removal of oral FB
Chest compressions
Forceps removal of supraglottic FB
Forceps removal of tracheal FB

Obstruction resolved

No

Able to manually ventilate

Establish BIAD
Establish ETI
Emergency airway procedure

Obstruction resolved

No

Assist ventilation
Administer 100% oxygen

TRANSPORT

Able to manually ventilate

Yes

Emergency airway procedure

BIAD Blind insertion airway device
ETI Endotracheal intubation

Basic
Primary
Intermediate
Advanced
Critical
**INDICATIONS:**
- Patients with partial or complete airway obstruction

**CONTRAINDICATIONS:**
- None

**NOTES:**
- In the event of trauma with possible spinal injury, limit spinal motion while performing airway maneuvers.
- With partial obstruction, provide supplemental O2 as long as it doesn’t impede patient efforts.
- With partial foreign body (FB) obstruction monitor carefully for signs of progression (hypoxia, cyanosis, fatigue) or development of complete obstruction.
- With complete FB obstruction in the conscious patient over age 1 year, perform abdominal thrusts until the obstruction is resolved or patient loses consciousness.
- With complete FB obstruction in the conscious patient under age 1 year, perform 5 back slaps followed by 5 chest thrusts. Repeat the sequence until the obstruction is resolved or patient loses consciousness.
Initiate CPR
Attach AED & analyze

Yes

Shock advised

No

CPR x 2 min

Clear & shock CPR x 2 min

Re-analyze
Shock advised

No

Yes

Clear & shock CPR x 2 min

Re-analyze
Shock advised

No

Yes

Clear & shock CPR x 2 min

ROSC

Yes

Post Arrest Care

No

Perform continuous CPR

Consider OLMS

Yes

Transport duration greater than 20 min

No

TRANSPORT
**INDICATIONS:**
- CPA from all causes
- EMS personnel with Basic and Primary Care delegations

**CONTRAINDICATIONS:**
- Obvious signs of death
- Confirmation of a valid health care directive prohibiting resuscitation from CPA

**NOTES:**
- In the event of out of hospital CPA with a shockable rhythm (ie. shock advised by AED), make every effort to resuscitate on scene. At no time should EMS personnel put themselves and the general public at undue risk from emergent transports that will not benefit the patient.
- If the airway cannot be opened with a basic procedure, providers with appropriate delegation must attempt to establish a patent airway with a BIAD.
- If the airway cannot be opened with a BIAD, continue CPR and initiate emergent transport. Note that one attempt at defibrillating a shockable rhythm may be undertaken, where appropriate, before transporting a patient with an obstructed airway.
- For patients less than 8 years of age or less than 25 kg weight, use the adult AED pad-cable system if a pediatric dose attenuator is not available.
- After each shock delivery, immediately resume CPR for two minutes beginning with chest compressions. Do not stop CPR unless the patient shows purposeful movement.
- If there is no ROSC after three shocks and three cycles of CPR on scene, EMS personnel must resume CPR and initiate emergent transport regardless of shock advisory by AED.
- Do not stop CPR or repeat AED analysis while en route. If the patient shows purposeful movement, perform a brief pulse check (less than 10 seconds). If there is no palpable pulse, CPR should be resumed and not interrupted.
- While en route, continue CPR as long as able to safely and effectively do so.
- If transport duration is greater than 20 minutes, EMS personnel may initiate OLMS for consideration of discontinuation of resuscitation.

**ABBREVIATIONS:**
- AED
- BIAD = blind insertion airway device
- CPA = cardiopulmonary arrest
- CPR = cardiopulmonary resuscitation
- kg =
- min = minute
- OLMS = on-line medical support
- ROSC
From PRIMARY ASSESSMENT

Known or suspected hypothermia

Yes

Algorithm C: Hypothermic CPA

No

Shockable rhythm (VT or pVT)

Yes

Algorithm A: Shockable Rhythm

No

Algorithm B: Non-shockable Rhythm

Yes

VF or pVT

No

PEA or Asystole
**INDICATIONS:**
- Cardiopulmonary arrest (CPA) not due to trauma
- EMS personnel with Intermediate Care delegations and above

**CONTRAINDICATIONS:**
- Obvious signs of death
- Confirmation of valid health care directive prohibiting resuscitation from CPA

**NOTES:**
- In the event of out of hospital CPA with shockable rhythm (VF or pVT) make every effort to resuscitate on scene. At no time should EMS personnel put themselves or the general public at risk from emergent transport that will not benefit the patient.
- At any time, if a ventricular fibrillation (VF) or pulseless ventricular tachycardia (pVT) degenerates into a non-shockable rhythm refer to algorithm B. If pulseless electrical activity (PEA) deteriorates to a shockable rhythm refer to algorithm A.
- Do not interrupt cardiopulmonary resuscitation (CPR) to perform any procedure(s).
- If the airway cannot be opened and maintained with a basic procedure, providers must attempt to establish a patent airway with a blind insertion airway device (BIAD). If the airway cannot be opened with a BIAD, providers with appropriate delegation must attempt to establish a patent airway with an endotracheal tube (ETT).
- If the airway cannot be opened with a BIAD or ETT, continue CPR and initiate emergent transport. Note that one attempt at defibrillating a shockable rhythm may be undertaken where appropriate before transporting a patient with an obstructed airway.
- After each reassessment or shock delivery immediately resume CPR for two minutes beginning with chest compressions. **Do not stop CPR unless the patient shows purposeful movements.**
- Dialysis-dependent patients with CPA due to VF, VT or PEA should be treated as hyperkalemic CPA. Administer CALCIUM and SODIUM BICARBONATE as per M10 Hyperkalemia Therapy. Consider insulin and glucose upon return of spontaneous circulation (ROSC).
- Consider magnesium sulfate administration as per M24.1 for polymorphic VT known or suspected to be torsades des pointes.
- For pulseless electrical activity providers may consider administering IV solution (0.9% Saline or Ringer’s Lactate) by bolus infusion (20 ml/kg up to 1000 ml per bolus) for non-traumatic cardiopulmonary arrest known or suspected to be due to hypovolemia or toxin/poison.
- For pulseless electrical activity providers should initiate needle thoracostomy as soon as tension pneumothorax is suspected.
- If there is no return of spontaneous circulation (ROSC) after maximal on-scene interventions initiate emergent transport regardless of rhythm.
- While en route perform CPR as long as you are able to do so safely and effectively. Do not stop CPR or reassess / reanalyze. Do not interrupt transport or defibrillate regardless of rhythm.
- If the patient shows purposeful movement, perform a brief pulse check (less than ten seconds). If there is no palpable pulse, CPR should be resumed and not interrupted.
- If there is continuous pulselessness for 20 minute, appropriate on-scene interventions have been performed, and asystole is confirmed and judged to be refractory to further interventions, discontinue resuscitation.
- **At any time, EMS personnel may initiate On-line Medical Support for assistance with transport decision-making.**
This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support).

<table>
<thead>
<tr>
<th>DEFIBRILLATION:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biphasic – default or maximum</td>
</tr>
<tr>
<td>Monophasic – 360 J</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EPINEPHRINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 1 mg; IV or IO; repeat every 3 to 5 minutes as required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AMIODARONE</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 300 mg; IV or IO; repeat 150 mg once</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MAGNESIUM SULFATE (for suspected torsades de pointes only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 2 gm; IV or IO; repeat once</td>
</tr>
</tbody>
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<th>CALCIUM CHLORIDE 10% (for suspected hyperkalemia only)</th>
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<th>SODIUM BICARBONATE 8.4% (for suspected hyperkalemia only)</th>
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<td>- 2 x 50 ml (100 mmol); IV or IO; once only</td>
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</table>
Reassess after 2 min:
VF or pVT
Yes

Establish IV or IO access
Consider hyperkalemia
Administer EPINEPHRINE

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT
No

Yes

Algorithm B:
Non-shockable Rhythm

Repeat
EPINEPHRINE

Clear & shock
CPR x 2 min

Repeat
AMIODARONE

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT
No

Yes

Repeat
EPINEPHRINE

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT
No

Yes

ROSC
POST ARREST CARE

Consider On-line Medical Support

Transport

PEA or Asystole

Yes

No

Pulse present

Perform continuous CPR
ALGORITHM B:  
NON-SHOCKABLE RHYTHM  
(PEA or ASYSTOLE)
ALGORITHM C: HYPOTHERMIC CPA

- Hypothermic arrest known or suspected
  - Yes
    - VF or pVT
      - Yes
        - Clear & shock once
          - Resume CPR
          - Establish IV or IO access
          - Administer EPINEPHRINE once
        - No
          - Reassess after 2 min:
            - Pulse present
              - Yes
                - POST ARREST CARE
              - No
                - Consider advanced airway
                  - Limit further heat loss
          - No
            - Perform continuous CPR
  - No
    - Shockable rhythm
      - Yes
        - Reassess after 2 min:
          - Pulse present
            - Yes
              - POST ARREST CARE
            - No
              - Consider advanced airway
                - Limit further heat loss
        - No
          - TRANSPORT
From PRIMARY ASSESSMENT

Known or suspected hypothermia

Yes

Algorithm C: Hypothermic CPA

No

Shockable rhythm (VT or pVT)

Yes

Algorithm A: Shockable Rhythm

No

Algorithm B: Non-shockable Rhythm

VF or pVT

Yes

No

PEA or Asystole

Yes
### INDICATIONS:
- Cardiopulmonary arrest (CPA) not due to trauma
- EMS personnel with Intermediate Care delegations and above

### CONTRAINDICATIONS:
- Obvious signs of death
- Confirmation of valid health care directive prohibiting resuscitation from CPA

### NOTES:
- In the event of out of hospital CPA with shockable rhythm (VF or pVT) make every effort to resuscitate on scene. At no time should EMS personnel put themselves or the general public at risk from emergent transport that will not benefit the patient.
- At any time, if a ventricular fibrillation (VF) or pulseless ventricular tachycardia (pVT) degenerates into a non-shockable rhythm refer to **algorithm B**. If pulseless electrical activity (PEA) deteriorates to a shockable rhythm refer to **algorithm A**.
- Do not interrupt cardiopulmonary resuscitation (CPR) to perform any procedure(s).
- If the airway cannot be opened and maintained with a basic procedure, providers must attempt to establish a patent airway with a blind insertion airway device (BIAD). If the airway cannot be opened with a BIAD, providers with appropriate delegation must attempt to establish a patent airway with an endotracheal tube (ETT).
- If the airway cannot be opened with a BIAD or ETT, continue CPR and initiate emergent transport. Note that one attempt at defibrillating a shockable rhythm may be undertaken where appropriate before transporting a patient with an obstructed airway.
- After each reassessment or shock delivery immediately resume CPR for two minutes beginning with chest compressions. **Do not stop CPR unless the patient shows purposeful movements.**
- Dialysis-dependent patients with CPA due to VF, VT or PEA should be treated as hyperkalemic CPA. Administer CALCULUM and SODIUM BICARBONATE as per **M10 Hyperkalemia Therapy**. Consider insulin and glucose upon return of spontaneous circulation (ROSC).
- Consider magnesium sulfate administration as per **M24.1** for polymorphic VT known or suspected to be *torsades des pointes*.
- For pulseless electrical activity providers may consider administering IV solution (0.9% Saline or Ringer’s Lactate) by bolus infusion (20 ml/kg up to 1000 ml per bolus) for non-traumatic cardiopulmonary arrest known or suspected to be due to hypovolemia or toxin/poison.
- For pulseless electrical activity providers with appropriate delegation should initiate needle thoracostomy as soon as tension pneumothorax is suspected.
- If there is no return of spontaneous circulation (ROSC) after maximal on-scene interventions initiate emergent transport regardless of rhythm.
- While en route perform CPR as long as you are able to do so safely and effectively. Do not stop CPR or reassess / reanalyze. Do not interrupt transport or defibrillate regardless of rhythm.
- If the patient shows purposeful movement, perform a brief pulse check (less than ten seconds). If there is no palpable pulse, CPR should be resumed and not interrupted.
- **At any time, EMS personnel may initiate on-line clinical support for assistance with transport decision-making.**
This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support).

**DEFIBRILLATION:**
Biphasic – default or maximum
Monophasic – 360 J

**EPINEPHRINE**
- 0.01 mg/kg (maximum = 1 mg); IV or IO; repeat every 3 to 5 minutes as required

**AMIODARONE**
- 5 mg/kg (maximum = 300 mg); IV or IO; repeat 5 mg/kg (maximum = 150 mg) up to twice as required

**MAGNESIUM SULFATE (for suspected torsades de pointes only)**
- 50 mg/kg (maximum = 2 gm); IV or IO; repeat once

**CALCIUM CHLORIDE 10% (for suspected hyperkalemia only)**
- 0.2 ml/kg or 20 mg/kg; IV or IO; administer once only
- Max dose = 10 ml (1 gm) at 50 kg

**CALCIUM GLUCONATE 10% (for suspected hyperkalemia only)**
- 0.6 ml/kg or 60 mg/kg; IV or IO; administer once only
- Max dose = 10 ml (1 gm) at 17 kg

**SODIUM BICARBONATE 8.4% (for suspected hyperkalemia only)**
- 1 ml/kg or 1 mmol/kg; IV or IO; administer once only
- Max dose = 100 ml (100 mmol)
ALGORITHM A:
SHOCKABLE RHYTHM
(VF or pulseless VT)

Establish IV or IO access
Consider hyperkalemia
Administer EPINEPHRINE

Reassess after 2 min:
VF or pVT

Clear & shock
CPR x 2 min

Yes

No

Repeat EPINEPHRINE

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT

Yes

No

Repeat AMIODARONE

Clear & shock
CPR x 2 min

Repeat EPINEPHRINE

Clear & shock
CPR x 2 min

Repeat AMIODARONE

Clear & shock
CPR x 2 min

Repeat EPINEPHRINE

Clear & shock
CPR x 2 min

Clear & shock
CPR x 2 min

Clear & shock
CPR x 2 min

PEA or Asystole

Yes

No

ROSC

POST ARREST CARE

Perform continuous CPR

TRANSPORT

Yes

No

Yes

No

Algorithm B: Non-shockable Rhythm
ALGORITHM B: NON-SHOCKABLE RHYTHM
(PEA or ASYSTOLE)

Exclude tension pneumo

CPR x 2 min

Reassess after 2 min: PEA or Asystole

Perform continuous CPR

TRANSPORT

POST ARREST CARE

VF or pVT

ROSC

Consider hyperkalemia
Administer EPINEPHRINE
Consider hypovolemia

Establish IV or IO access

Consider On-line Medical Support

Algorithm A: Shockable Rhythm

Yes

No

Yes

No
ALGORITHM C:
HYPOTHERMIC CPA

Hypothermic arrest known or suspected

Yes

VF or pVT

No

Shockable rhythm

Pulse present

Yes

Perform continuous CPR

No

Clear & shock once
Resume CPR
Establish IV or IO access
Administer EPINEPHRINE once

Reassess after 2 min:
Pulse present

Yes

POST ARREST CARE

No

Consider advanced airway
Limit further heat loss

TRANSPORT

Perform continuous CPR
From PRIMARY ASSESSMENT

- Known or suspected hypothermia
  - Yes → Algorithm C: Hypothermic CPA
  - No → Shockable rhythm (VT or pVT)

**Algorithm A:** Shockable Rhythm

- Yes → VF or pVT
- No → Algorithm B: Non-shockable Rhythm

**Algorithm B:** Non-shockable Rhythm

- Yes → PEA or Asystole
- No → Algorithm A: Shockable Rhythm
**INDICATIONS:**
- Cardiopulmonary arrest (CPA) not due to trauma
- EMS personnel with Intermediate Care delegations and above

**CONTRAINDICATIONS:**
- Obvious signs of death
- Confirmation of valid health care directive prohibiting resuscitation from CPA

**NOTES:**
- In the event of out of hospital CPA with shockable rhythm (VF or pVT) make every effort to resuscitate on scene. At no time should EMS personnel put themselves or the general public at risk from emergent transport that will not benefit the patient.
- In children CPA is often the end-result of the progression of untreated respiratory failure and/or shock. Sudden collapse of a previously well child suggests shockable rhythm precipitating CPA.
- At any time, if a ventricular fibrillation (VF) or pulseless ventricular tachycardia (pVT) degenerates into a non-shockable rhythm refer to algorithm B. If pulseless electrical activity (PEA) deteriorates to a shockable rhythm refer to algorithm A.
- Do not interrupt cardiopulmonary resuscitation (CPR) to perform any procedure(s).
- If the airway cannot be opened and maintained with a basic procedure, providers must attempt to establish a patent airway with a blind insertion airway device (BIAD). If the airway cannot be opened with a BIAD, providers with appropriate delegation must attempt to establish a patent airway with an endotracheal tube (ETT).
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- After each reassessment or shock delivery immediately resume CPR for two minutes beginning with chest compressions. **Do not stop CPR unless the patient shows purposeful movements.**
- Dialysis-dependent patients with CPA due to VF, VT or PEA should be treated as hyperkalemic CPA. Administer CALCIUM and SODIUM BICARBONATE as per M10 Hyperkalemia Therapy. Consider insulin and glucose upon return of spontaneous circulation (ROSC).
- Consider magnesium sulfate administration as per M14 Resuscitation Drugs for polymorphic VT known or suspected to be torsades des pointes.
- For pulseless electrical activity providers may consider administering IV solution (0.9% Saline or Ringer’s Lactate) by bolus infusion (20 ml/kg up to 1000 ml per bolus) for non-traumatic cardiopulmonary arrest known or suspected to be due to hypovolemia or toxin/poison.
- For pulseless electrical activity providers with appropriate delegation should initiate needle thoracostomy as soon as tension pneumothorax is suspected.
- If there is no return of spontaneous circulation (ROSC) after maximal on-scene interventions initiate emergent transport regardless of rhythm.
- While en route perform CPR as long as you are able to do so safely and effectively. Do not stop CPR or reassess / reanalyze. Do not interrupt transport or defibrillate regardless of rhythm.
- If the patient shows purposeful movement, perform a brief pulse check (less than ten seconds). If there is no palpable pulse, CPR should be resumed and not interrupted.
- **At any time, EMS personnel may initiate on-line clinical support for assistance with transport decision-making.**
This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support).

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosage</th>
<th>Route</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DEFIBRILLATION:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- First shock</td>
<td>2 J/kg</td>
<td>IV or IO</td>
<td></td>
</tr>
<tr>
<td>- Second and all subsequent shocks</td>
<td>4 J/kg (up to adult maximum)</td>
<td>IV or IO</td>
<td></td>
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<td><strong>EPINEPHRINE:</strong></td>
<td></td>
<td></td>
<td></td>
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<td>- 0.01 mg/kg (maximum = 1 mg)</td>
<td>IV or IO; repeat every 3 to 5 minutes as required</td>
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<td></td>
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<tr>
<td><strong>MAGNESIUM SULFATE:</strong></td>
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<tr>
<td>- For suspected torsades de pointes only</td>
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<td>- 0.2 ml/kg or 20 mg/kg</td>
<td>IV or IO; administer once only</td>
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<td>- Max dose = 10 ml (1 gm) at 50 kg</td>
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<td>IV or IO; administer once only</td>
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<tr>
<td>- Max dose = 50 ml (50 mmol)</td>
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<tr>
<td><strong>SODIUM BICARBONATE 4.2% (for suspected hyperkalemia only):</strong></td>
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<td>- 2 ml/kg or 1 mmol/kg</td>
<td>IV or IO; administer once only</td>
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<tr>
<td>- Max dose = 100 ml (50 mmol)</td>
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ALGORITHM A: SHOCKABLE RHYTHM
(VF or pulseless VT)

Establish IV or IO access
Consider hyperkalemia
Administer EPINEPHRINE

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
VF or pVT

Yes
Clear & shock
CPR x 2 min

No

Reassess after 2 min:
Pulse present

Yes
Perform continuous CPR

TRANSPORT

No

PEA or Asystole

Yes
POST ARREST CARE

No

ROSC

Algorithm B: Non-shockable Rhythm

Establish IV or IO access
Consider hyperkalemia
Administer EPINEPHRINE

Repeat EPINEPHRINE
Repeat AMIODARONE
Repeat EPINEPHRINE
Repeat AMIODARONE
Repeat EPINEPHRINE

Administer AMIODARONE
Consider MAGNESIUM

Repeat EPINEPHRINE
Repeat AMIODARONE
Repeat EPINEPHRINE
Repeat AMIODARONE
Repeat EPINEPHRINE

C02C Advanced Resuscitation
ALGORITHM B:
NON-SHOCKABLE RHYTHM
(PEA or ASYSTOLE)

- Exclude tension pneumo
  - Establish IV or IO access
    - Consider hyperkalemia
    - Administer EPINEPHRINE
    - Consider hypovolemia

- CPR x 2 min

- Reassess after 2 min:
  - PEA or Asystole

- Perform continuous CPR

- Transport

- Algorithm A: Shockable Rhythm
  - VF or pVT
    - Yes
    - ROSC
    - No

- Consider On-line Medical Support
ALGORITHM C: HYPOTHERMIC CPA

Hypothemic arrest known or suspected

VF or pVT

Yes

Shockable rhythm

No

Perform continuous CPR

Clear & shock once
Resume CPR
Establish IV or IO access
Administer EPINEPHRINE once

Reassess after 2 min:
Pulse present

No

POST ARREST CARE

Consider advanced airway
Limit further heat loss

TRANSPORT

Yes

Perform continuous CPR
INDICATIONS:
• Cardiopulmonary arrest (CPA) not due to trauma
• EMS personnel with Intermediate Care delegations and above

CONTRAINDICATIONS:
• Obvious signs of death)
• Confirmation of valid health care directive prohibiting resuscitation from CPA

NOTES:
• In the event of out of hospital CPA with shockable rhythm (VF or pVT) make every effort to resuscitate on scene. At no time should EMS personnel put themselves or the general public at risk from emergent transport that will not benefit the patient.
• In infants CPA is often the end-result of the progression of untreated respiratory failure and/or shock. Sudden collapse of a previously well infant suggests shockable rhythm precipitating CPA.
• At any time, if a ventricular fibrillation (VF) or pulseless ventricular tachycardia (pVT) degenerates into a non-shockable rhythm refer to algorithm B. If pulseless electrical activity (PEA) deteriorates to a shockable rhythm refer to algorithm A.
• Do not interrupt cardiopulmonary resuscitation (CPR) to perform any procedure(s).
• If the airway cannot be opened and maintained with a basic procedure, providers must attempt to establish a patent airway with a blind insertion airway device (BIAD). If the airway cannot be opened with a BIAD, providers with appropriate delegation must attempt to establish a patent airway with an endotracheal tube (ETT).
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• For pulseless electrical activity providers with appropriate delegation should initiate needle thoracostomy as soon as tension pneumothorax is suspected.
• If there is no return of spontaneous circulation (ROSC) after maximal on-scene interventions initiate emergent transport regardless of rhythm.
• While en route perform CPR as long as you are able to do so safely and effectively. Do not stop CPR or reassess/reanalyze. Do not interrupt transport or defibrillate regardless of rhythm.
• If the patient shows purposeful movement, perform a brief pulse check (less than ten seconds). If there is no palpable pulse, CPR should be resumed and not interrupted.
• At any time, EMS personnel may initiate on-line clinical support for assistance with transport decision-making.
This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support).

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Establish IO access
Administer EPINEPHRINE

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT

Yes

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT

Yes

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT

Yes

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT

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CPR x 2 min

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CPR x 2 min

Reassess after 2 min:
VF or pVT

Yes

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT

Yes

Clear & shock
CPR x 2 min

Reassess after 2 min:
VF or pVT

Yes

Clear & shock
CPR x 2 min

Reassess after 2 min:
Pulse present

Yes

Perform
continuous CPR

TRANSPORT

Reassess after 2 min:
PEA or Asystole

No

PEA or Asystole

Yes

ROSC

POST ARREST CARE

Algorithm A: SHOCKABLE RHYTHM
(VF or pulseless VT)

Algorithm B: Non-shockable Rhythm

Administer AMIODARONE

Repeat EPINEPHRINE

Repeat AMIODARONE

Repeat EPINEPHRINE

Repeat AMIODARONE

Repeat EPINEPHRINE
ALGORITHM B:
NON-SHOCKABLE RHYTHM
(PEA or ASYSTOLE)

Examine tension pneumo

Establish IO access
Administer EPINEPHRINE
Consider hypovolemia

CPR x 2 min

Reassess after 2 min:
PEA or Asystole

Yes

Perform continuous CPR

TRANSPORT

Algorithm A:
Shockable Rhythm

VF or pVT

Yes

ROSC

No

POST ARREST CARE

Consider On-line Medical Support
ALGORITHM C:
HYPOTHERMIC CPA

Hypothermic arrest known or suspected

Yes
VF or pVT

No
Shockable rhythm

Clear & shock once
Resume CPR
Establish IO access
Administer EPINEPHRINE once

Reassess after 2 min:
Pulse present

Yes
POST ARREST CARE

Consider advanced airway
Limit further heat loss

No
VF or pVT

Transport

Perform continuous CPR
From RESUSCITATION

ROSC

Maintain O2 saturation 92-94%
Secure and monitor airway
Do not hyperventilate

Consider ETT
Consider BIAD

Secure vascular device(s)
Secure thoracostomy needle / tube
Exclude hypoglycemia

Establish vascular access if not yet done

Consider ECG acquisition

Hypotension

Administer fluid bolus(es)

Yes

No

TRANSPORT

Administer fluid bolus(es)
### INDICATIONS:
- Patient with a return of spontaneous circulation (ROSC) after cardiopulmonary arrest (CPA)

### CONTRAINDICATIONS:
- None

### NOTES:
- If endotracheal tube is established, continuous end-tidal CO2 monitoring by capnography must be established.

- For this care map hypotension in adults and adolescents is defined as a systolic blood pressure (SBP) below 100 mmHg. Hypotension in children and infants will be defined as an SBP less than the age appropriate minimum (< 70 + 2 x age).

- If hypotensive administer IV solution (0.9% saline solution or Ringer’s lactate) by bolus infusion of 20 ml/kg (to a maximum of 1000 ml per bolus) and repeat as required. Discontinue administration if signs of fluid overload develop.

- Providers should obtain an electrocardiogram (ECG) unless it will delay transport. Evidence of ST elevation myocardial infarction (STEMI) may require bypass to a specialized facility capable of performing percutaneous coronary intervention (PCI) but only with an established bypass policy and destination agreement in place.

- **ROSC from traumatic CPA** may require bypass to a designated trauma center but only with an established bypass policy and destination agreement in place.

---

This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Basic Life Support).
From TRAUMA ASSESSMENT

Control exsanguination

Yes

Exsanguinating hemorrhage

No

Airway open & maintainable

No

Continuous CPR

Yes

Initiate CPR Attach defibrillator

TRANSPORT

Shockable rhythm (VT or pVT)

No

Algorithm A: Shockable Rhythm

Yes

VF or p VT

No

Algorithm B: Non-shockable Rhythm

Yes

PEA or Asystole
INDICATIONS:
- Cardiopulmonary arrest (CPA) known or suspected to be due to traumatic injury
- EMS personnel with Intermediate Care delegations and above

CONTRAINDICATIONS:
- Obvious signs of death
- Confirmation of valid health care directive prohibiting resuscitation from CPA

NOTES:
- In the event of out of hospital traumatic CPA with shockable rhythm (VF or pVT) make every effort to resuscitate on scene. At no time should EMS personnel put themselves or the general public at risk from emergent transport that will not benefit the patient.

- At any time, if a ventricular fibrillation (VF) or pulseless ventricular tachycardia (pVT) degenerates into a non-shockable rhythm refer to **algorithm B**. If pulseless electrical activity (PEA) deteriorates to a shockable rhythm refer to **algorithm A**.

- Do not interrupt cardiopulmonary resuscitation (CPR) to perform any procedure(s).

- If the airway cannot be opened and maintained with a basic procedure providers must attempt to establish a patent airway with a blind insertion airway device (BIAD). If the airway cannot be opened with a BIAD, providers must attempt to establish a patent airway with an endotracheal tube (ETT). If the airway cannot be opened with a BIAD or ETT device, continue CPR and initiate emergent transport.

- After each reassessment or shock delivery immediately resume CPR for two minutes beginning with chest compressions. **Do not stop CPR unless the patient shows purposeful movements.**

- For pulseless electrical activity providers should initiate needle thoracostomy as soon as tension pneumothorax is suspected.

- If there is no return of spontaneous circulation (ROSC) after maximal on-scene interventions initiate emergent transport regardless of rhythm.

- While en route perform CPR as long as you are able to do so safely and effectively. Do not stop CPR or reassess / reanalyze. Do not interrupt transport or defibrillate regardless of rhythm.

- If the patient shows purposeful movement, perform a brief pulse check (less than ten seconds). If there is no palpable pulse, CPR should be resumed and not interrupted.

- If there is continuous pulselessness for 20 minute, appropriate on-scene interventions have been performed, and asystole is confirmed and judged to be refractory to further interventions, discontinue resuscitation.

- **At any time, EMS personnel may initiate on-line clinical support for assistance with transport decision-making.**

---

*This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support).*

<p>| Adult &amp; Adolescent | Child &amp; Infant |</p>
<table>
<thead>
<tr>
<th><strong>DEFIBRILLATION:</strong></th>
<th><strong>DEFIBRILLATION:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Biphasic – maximum (or default)</td>
<td>- First shock = 2 J/kg</td>
</tr>
<tr>
<td>Monophasic – 360 J</td>
<td>- All subsequent shocks = 4 J/kg (up to adult maximum)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>EPINEPHRINE</strong></th>
<th><strong>EPINEPHRINE:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- 1 mg; IV or IO; repeat every 3 to 5 minutes as required</td>
<td>- 0.01 mg/kg (maximum = 1 mg); IO or IV; repeat every 3 to 5 minutes as required</td>
</tr>
</tbody>
</table>
ALGORITHM A: SHOCKABLE RHYTHM - TRAUMA
(VF or pulseless VT)

- Consider IO or IV access
- Consider EPINEPHRINE

Exclude tension pneumo

Clear & shock CPR x 2 min

Reassess after 2 min: VF or pVT

Yes

Clear & shock CPR x 2 min

Reassess after 2 min: VF or pVT

Yes

Clear & shock CPR x 2 min

Reassess after 2 min: Pulse present

Yes

Perform continuous CPR

Transport

No

Reassess after 2 min: VF or pVT

No

PEA or Asystole

Yes

ROSC

No

POST ARREST CARE

Algorithm B: Non-shockable Rhythm

Consider On-line Medical Support

C04 Traumatic CPA
ALGORITHM B:
NON-SHOCKABLE RHYTHM - TRAUMA
(PEA or ASYSTOLE)

Exclude tension pneumo

Establish IO or IV access
Consider EPINEPHRINE

CPR x 2 min

Reassess after 2 min:
PEA or Asystole

Algorithm A:
Shockable Rhythm

Yes

No

VF or pVT

Asystole

PEA

Yes

No

Continuous CPR

TRANSPORT

POST ARREST CARE

Discontinue resuscitation

Consider On-line Medical Support

Lightning strike or electrocution

No

Yes
Unstable Bradycardia - Adult

From MEDICAL ASSESSMENT

Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Complete MEDICAL ASSESSMENT

Yes

HR greater than 50

No

Administer atropine

Yes

HR greater than 50

No

Consider dopamine or epinephrine

Yes

HR greater than 50

No

Initiate TCP

Capture

Yes

No

Discontinue TCP

Consider sedation / analgesia

ACUTE CORONARY SYNDROME

Yes

ACS known or suspected

No

TRANSPORT

ACS – Acute coronary syndrome
TCP – transcutaneous pacing
INDICATIONS: **ALL THREE MUST BE PRESENT.**

1. Sustained bradycardia with a heart rate of less than 50 beats per minute (bpm)

2. SBP less than 100 mmHg and at least one sign of poor perfusion:
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Chest pain suspicious for or consistent with myocardial ischemia
   - Acute heart failure

3. Bradycardia is known or suspected to be the cause of hypotension or poor perfusion

CONTRAINDICATIONS:

- Do not initiate transcutaneous pacing (TCP) with a functioning LVAD (C08 Left Ventricular Assist Device)

NOTES:

- **REMINDER:** Hypoxemia is a common and reversible cause of unstable bradycardia in all age groups.

- If patient condition allows, providers with appropriate delegation should obtain an ECG prior to drug administration or pacing.

- Consider the administration of midazolam or opioid analgesia with transcutaneous pacing (TCP). Watch for hypotension and signs of respiratory depression if sedation is administered.

*This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support).*

**ATROPINE:**
- 0.5 mg IV / IO
- May repeat to a total dose of 3 mg

**DOPAMINE:**
- 2 to 20 mcg /kg/min by continuous IV/IO infusion
- Titrate to HR between 50 and 60 bpm

**EPINEPHRINE:**
- 2 to 10 mcg / min by continuous IV/IO infusion
- Titrate to HR between 50 and 60 bpm
From MEDICAL ASSESSMENT

Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Yes

HR greater than 50

No

Complete MEDICAL ASSESSMENT

Administer atropine

HR greater than 50

No

Consider dopamine or epinephrine

Yes

HR greater than 50

No

TCP – transcutaneous pacing

Initiate TCP

Capture

Yes

Consider sedation / analgesia

No

Discontinue TCP

TRANSPORT
**INDICATIONS:** ALL THREE MUST BE PRESENT

1. Sustained bradycardia with a heart rate of less than 50 beats per minute (bpm)

2. SBP less than 100 mmHg and at least one sign of poor perfusion:
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Acute heart failure

3. Bradycardia is known or suspected to be the cause of hypotension or poor perfusion

**CONTRAINDICATIONS:**

- Do not initiate transcutaneous pacing (TCP) with a functioning LVAD (C08 Left Ventricular Assist Device)

**NOTES:**

- **REMINDER:** Hypoxemia is a common and reversible cause of unstable bradycardia in all age groups.

- If patient condition allows, providers with appropriate delegation should obtain an ECG prior to drug administration or pacing.

- Consider the administration of midazolam or opioid analgesia with transcutaneous pacing (TCP). Watch for hypotension and signs of respiratory depression if sedation is administered.

---

**This care map has been developed in accordance with**

**the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines**

**(Pediatric Advanced Life Support & Advanced Cardiac Life Support).**

**ATROPINE:**

- 0.5 mg IV / IO
- May repeat to a total dose of 3 mg

**DOPAMINE:**

- 2 to 20 mcg/kg/min by continuous IV/IO infusion
- Titrate to HR between 50 and 60 bpm

**EPINEPHRINE:**

- 2 to 10 mcg / min by continuous IV/IO infusion
- Titrate to HR between 50 and 60 bpm
From MEDICAL ASSESSMENT

Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Yes

Consider TCP

HR greater than 60

No

Complete MEDICAL ASSESSMENT

Consider chest compressions

Administer epinephrine

HR greater than 60

Yes

No

Consider atropine

HR greater than 60

Yes

Discontinue chest compressions

No

Consider TCP

Capture

Yes

Consider sedation / analgesia

No

Discontinue TCP

TRANSPORT

TCP – transcutaneous pacing
**INDICATIONS:**  **ALL THREE MUST BE PRESENT.**

1. Sustained bradycardia with a heart rate of less than 60 beats per minute (bpm)

2. SBP less than age-adjusted minimum and at least one sign of poor perfusion:
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Acute heart failure

3. Bradycardia is known or suspected to be the cause of hypotension or poor perfusion

**CONTRAINDICATIONS:**
- None

**NOTES:**

- **REMINDER:** In children sinus bradycardia is almost always the end result of untreated respiratory failure or shock. Strict attention to the airway, breathing and circulation usually makes TCP or drug administration unnecessary.

- **For this care map, hypotension is defined as a systolic blood pressure (SBP) of less than 70 + (age x 2).**

- If patient condition allows, providers with appropriate delegation should obtain an ECG prior to drug administration or pacing.

- For children less than six years of age, consider chest compressions if HR remains less than 60 bpm after correction of hypoxemia.

- Consider the administration of midazolam or opioid analgesia with transcutaneous pacing (TCP). Watch for hypotension and signs of respiratory depression if sedation is administered.

---

*This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Pediatric Advanced Life Support).*

**EPINEPHRINE:**
- 0.01 mg / kg by IV or IO
- Repeat every three to five minutes as necessary
- Target heart rate (HR) between 60 and 70 bpm

**ATROPINE:**
- 0.02 mg / kg by IV or IO (minimum dose = 0.1 mg; maximum dose = 0.5 mg)
- Repeat once as required to achieve a HR between 60 and 70 bpm
From MEDICAL ASSESSMENT

Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Yes

HR greater than 60

No

Complete MEDICAL ASSESSMENT

Initiate chest compressions

Administer epinephrine

Yes

HR greater than 60

No

Consider atropine

HR greater than 60

No

Consider TCP

Yes

Capture

No

Consider sedation / analgesia

Discontinue chest compressions

Discontinue TCP

Resume CPR

TRANSPORT

TCP – transcutaneous pacing

HR greater than 60

No

Consider TCP

Yes

Capture

No

Discontinue TCP

Resume CPR

TRANSPORT

2017-03-09

Unstable Bradycardia - Infant

C05D Unstable Bradycardia
### INDICATIONS: **ALL THREE MUST BE PRESENT.**

1. Sustained bradycardia with a heart rate of less than 60 beats per minute (bpm)

2. SBP less than 70 mmHg and at least one sign of poor perfusion
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Acute heart failure

3. Bradycardia is known or suspected to be the cause of hypotension or poor perfusion

### CONTRAINDICATIONS:
- None

### NOTES:
- **REMEMBER:** In infants sinus bradycardia is almost always the end result of untreated respiratory failure or shock. Strict attention to the airway, breathing and circulation usually makes TCP or drug administration unnecessary.
- If patient condition allows, providers with appropriate delegation should obtain an ECG prior to drug administration or pacing.
- Initiate chest compressions if HR remains less than 60 bpm after correction of hypoxemia.
- Consider the administration of midazolam or opioid analgesia with transcutaneous pacing (TCP). Watch for hypotension and signs of respiratory depression if sedation is administered.

*This care map has been developed in accordance with the Heart & Stroke Foundation of Canada’s 2015 Canadian Resuscitation & First Aid Guidelines (Pediatric Advanced Life Support).*

### EPINEPHRINE:
- 0.01 mg / kg by IV or IO
- Repeat every three to five minutes as necessary
- Target to heart rate (HR) between 60 and 70 bpm

### ATROPINE:
- 0.02 mg / kg by IV or IO (minimum dose = 0.1 mg; maximum dose = 0.5 mg)
- Repeat once as required to achieve a HR between 60 and 70 bpm
From MEDICAL ASSESSMENT

Yes

QRS ≤ 120 msec

No

Regular Rhythm

No

Regular NCT Algorithm (A)

Yes

Irregular NCT Algorithm (B)

WCT Algorithm (C)

Tachycardia terminated and hypotension / poor perfusion resolved

No

Yes

Complete MEDICAL ASSESSMENT

ACUTE CORONARY SYNDROME

No

Known or suspected ACS

TRANSPORT

ACS – acute coronary syndrome
NCT – narrow complex tachycardia
WCT – wide complex tachycardia
**INDICATIONS:**  ALL THREE MUST BE PRESENT

1. Sustained tachycardia with a heart rate of greater than 150 beats per minute.

2. SBP less than 100 mmHg and at least one other signs of poor perfusion:
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Chest pain suspicious for or consistent with myocardial ischemia
   - Acute heart failure

3. Tachycardia is known or suspected to be the cause of hypotension or poor perfusion.

**CONTRAINDICATIONS:**

- Rhythm known or suspected to be sinus tachycardia.
- Do not cardiovert or defibrillate with a functioning LVAD (*C08 Left Ventricular Assist Device*).

**NOTES:**

- If the patient’s condition allows, consider sedation with midazolam before cardioversion or defibrillation. Monitor for hypotension or signs of respiratory depression with sedation.

- For regular NCT providers with appropriate delegation may consider carotid sinus massage (CSM) in the absence of known contraindications.

- For all NCT and regular WCT ensure that the device is switched to the synchronized mode for cardioversion.

- For irregular WCT use unsynchronized (asynchronous) mode for cardioversion (ie. defibrillation).

- If tachycardia recurs after initial termination, consider repeat shock at same energy dose as was previously successful in terminating the tachycardia.

*This care map has been developed in accordance with the Heart & Stroke Foundation of Canada 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support).*

**ADENOSINE:**

- **First dose:** 6 mg IV rapid push, followed by fluid flush
- **Second dose:** 12 mg IV rapid push, followed by fluid flush
- Do not exceed two doses, even if tachycardia recurs
A. Regular Narrow Complex Tachycardia - Adult

- Ensure patent airway
- Ensure oxygenation / ventilation

- Valsalva manoeuvre

- Establish cardiac monitor
  - Consider ECG & vascular access

- Consider CSM
  - Consider adenosine

- Tachycardia terminated

- Synchronized cardioversion
  - Consider sedation

- Tachycardia terminated

- Hypotension / poor perfusion resolved

- Consider one additional shock with increased energy dose

- Complete MEDICAL ASSESSMENT

- CSM - carotid sinus massage

- TRANSPORT

SYNCED SHOCK ENERGY:
- Biphasic = 50 to 100 Joules
- Monophasic = 100 to 200 Joules
B. Irregular Narrow Complex Tachycardia - Adult

- Ensure patent airway
- Ensure oxygenation / ventilation

- Establish cardiac monitor
  - Consider ECG & vascular access

Duration of tachycardia known to be less than 24 hours

- Synchronized cardioversion
  - Consider sedation

Tachycardia terminated

- Complete MEDICAL ASSESSMENT

- Hypotension / poor perfusion resolved

SYNCED SHOCK ENERGY:
- Biphasic = 120 to 200 Joules
- Monophasic = 200 Joules

Consider up to two additional shocks with increasing energy dose

TRANSPORT
Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Irregular

Yes

SYNCED SHOCK ENERGY:
Biphasic = 100 Joules
Monophasic = 200 Joules

Synchronized cardioversion
Consider sedation

Defibrillation
Consider sedation

No

Tachycardia terminated

No

Consider up to two additional shocks with increasing energy dose

UNSYNCED SHOCK ENERGY:
Biphasic = 120 - 200 Joules
Monophasic = 360 Joules

Yes

TRANSPORT
From MEDICAL ASSESSMENT

QRS < 90 msec

Yes

Probable SVT

No

Known aberrancy

Yes

Presumed VT

No

NCT Algorithm (A)

Tachycardia terminated and hypotension / poor perfusion resolved

Yes

Complete MEDICAL ASSESSMENT

No

TRANSPORT

NCT – narrow complex tachycardia
SVT – supraventricular tachycardia
VT – ventricular tachycardia
WCT – wide complex tachycardia
INDICATIONS: **ALL THREE MUST BE PRESENT**

1. Sustained tachycardia with a heart rate of greater than 150 beats per minute.

2. SBP less than 90 mmHg and at least one other sign of poor perfusion:
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Acute heart failure

3. Tachycardia is known or suspected to be the cause of hypotension or poor perfusion.

**CONTRAINDICATIONS:**

- Rhythm known or suspected to be sinus tachycardia.
- Do not cardiovert or defibrillate with a functioning LVAD (**C08 Left Ventricular Assist Device**).

**NOTES:**

- If the patient’s condition allows, consider sedation with midazolam before cardioversion. Monitor for hypotension or signs of respiratory depression with sedation.
- For NCT (probable SVT) providers with appropriate delegation may consider carotid sinus massage (CSM) in the absence of known contraindications.
- Ensure that the device is switched to the **synchronized** mode for cardioversion.
- If tachycardia recurs after initial termination, consider repeat shock at same energy dose as was previously successful in terminating the tachycardia.

*This care map has been developed in accordance with the Heart & Stroke Foundation of Canada 2015 Canadian Resuscitation & First Aid Guidelines (Advanced Cardiac Life Support & Pediatric Advanced Life Support).*

**ADENOSINE:**

- **First dose:** 0.1 mg / kg mg (max = 6 mg) IV rapid push, followed by fluid flush
- **Second dose:** 0.2 mg / kg (max = 12 mg) IV rapid push, followed by fluid flush
- Do not exceed two doses, even if tachycardia recurs
A. Narrow Complex Tachycardia - Adolescent

Ensure patent airway
Ensure oxygenation / ventilation

Valsalva manoeuvre

Establish cardiac monitor
Consider ECG & vascular access

Consider CSM
Consider adenosine

Yes

Tachycardia terminated

No

Synchronized cardioversion
Consider sedation

SYNCED SHOCK ENERGY:
Biphasic = 0.5 to 1 Joule / kg
Monophasic = 2 Joule / kg

Tachycardia terminated

Yes

Hypotension / poor perfusion resolved

No

Consider one additional shock with increased energy dose

Complete MEDICAL ASSESSMENT

Yes

TRANSPORT

No
B. Wide Complex Tachycardia - Adolescent

Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Synchronized cardioversion
Consider sedation

SYNCED SHOCK ENERGY:
Biphasic = 0.5 to 1 Joules / kg
Monophasic = 2 Joules / kg

Consider up to two additional shocks with increasing energy dose

Tachycardia terminated

Yes

No

TRANSPORT
From MEDICAL ASSESSMENT

QRs ≤ 90 msec

Probable SVT

Known aberrancy

Presumed VT

NCT Algorithm (A)

WCT Algorithm (B)

TRANSPORT

NCT – narrow complex tachycardia
SVT – supraventricular tachycardia
VT – ventricular tachycardia
WCT – wide complex tachycardia
INDICATIONS: ALL THREE MUST BE PRESENT

1. Sustained tachycardia with a heart rate of greater than 180 beats per minute.

2. SBP less than age-adjusted minimum and at least one other signs of poor perfusion:
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Acute heart failure

3. Tachycardia is known or suspected to be the cause of hypotension or poor perfusion.

CONTRAINDICATIONS:

- Rhythm known or suspected to be sinus tachycardia.

NOTES:

- For this care map, hypotension is defined as a systolic blood pressure (SBP) of less than 70 + (age x 2).
- If the patient’s condition allows, consider sedation with midazolam before cardioversion. Monitor for hypotension or signs of respiratory depression with sedation.
- For NCT (probable SVT) providers with appropriate delegation may consider carotid sinus massage (CSM) in the absence of known contraindications.
- Ensure that the device is switched to the synchronized mode for cardioversion.
- If tachycardia recurs after initial termination, consider repeat shock at same energy dose as was previously successful in terminating the tachycardia.

This care map has been developed in accordance with the Heart & Stroke Foundation of Canada 2015 Canadian Resuscitation & First Aid Guidelines (Pediatric Advanced Life Support).

ADENOSINE:

- **First dose:** 0.1 mg / kg (max = 6 mg) IV rapid push, followed by fluid flush
- **Second dose:** 0.2 mg / kg (max = 12 mg) IV rapid push, followed by fluid flush
- Do not exceed two doses, even if tachycardia recurs
A. Narrow Complex Tachycardia - Child

Ensure patent airway
Ensure oxygenation / ventilation

Valsalva manoeuvre

Establish cardiac monitor
Consider ECG & vascular access
Consider CSM
Consider adenosine

Tachycardia terminated

SYNCHED SHOCK ENERGY:
Biphasic = 0.5 to 1 Joule / kg
Monophasic = 2 Joule / kg

Complete MEDICAL ASSESSMENT

Tachycardia terminated

Consider one additional shock with increased energy dose

TRANSPORT
B. Wide Complex Tachycardia - Child

Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Synchronized cardioversion
Consider sedation

SYNCED SHOCK ENERGY:
Biphasic = 0.5 to 1 Joules / kg
Monophasic = 2 Joules / kg

Tachycardia terminated

No

Consider up to two additional shocks with increasing energy dose

Yes

TRANSPORT
From MEDICAL ASSESSMENT

Yes

QRS ≤ 90 msec

No

Probable SVT

Known aberrancy

Yes

No

Presumed VT

NCT Algorithm (A)

WCT Algorithm (B)

TRANSPORT

NCT – narrow complex tachycardia
SVT – supraventricular tachycardia
VT – ventricular tachycardia
WCT – wide complex tachycardia
### INDICATIONS: ALL THREE MUST BE PRESENT

1. Sustained tachycardia with a heart rate of greater than 220 beats per minute.

2. SBP less than 70 mmHg and at least one other sign of poor perfusion:
   - Weak pulses, cool & pale / cyanotic skin, slowed capillary refill
   - Acutely altered LOC
   - Acute heart failure

3. Tachycardia is known or suspected to be the cause of hypotension or poor perfusion.

### CONTRAINDICATIONS:

- Rhythm known or suspected to be sinus tachycardia.

### NOTES:

- If the patient’s condition allows, consider sedation with midazolam before cardioversion. Monitor for hypotension or signs of respiratory depression with sedation.

- Ensure that the device is switched to the synchronized mode for cardioversion.

- If tachycardia recurs after initial termination, consider repeat shock at same energy dose as was previously successful in terminating the tachycardia.

*This care map has been developed in accordance with the Heart & Stroke Foundation of Canada 2015 Canadian Resuscitation & First Aid Guidelines* *(Pediatric Advanced Life Support).*

### ADENOSINE:

- **First dose:** 0.1 mg / kg mg (max = 6 mg) IV rapid push, followed by fluid flush
- **Second dose:** 0.2 mg / kg (max = 12 mg) IV rapid push, followed by fluid flush
- Do not exceed two doses, even if tachycardia recurs
A. Narrow Complex Tachycardia - Infant

Ensure patent airway
Ensure oxygenation / ventilation

Valsalva manoeuvre

Establish cardiac monitor
Consider ECG & vascular access

Consider CSM
Consider adenosine

Tachycardia terminated

Complete MEDICAL ASSESSMENT

Synchronized cardioversion
Consider sedation

SYNCED SHOCK ENERGY:
Biphasic = 0.5 to 1 Joule / kg
Monophasic = 2 Joule / kg

Tachycardia terminated

Consider one additional shock with increased energy dose

TRANSPORT
B. Wide Complex Tachycardia - Infant

Ensure patent airway
Ensure oxygenation / ventilation

Establish cardiac monitor
Consider ECG & vascular access

Synchronized cardioversion
Consider sedation

SYNCED SHOCK ENERGY:
Biphasic = 0.5 to 1 Joules / kg
Monophasic = 2 Joules / kg

Transport

Tachycardia terminated

Consider up to two additional shocks with increasing energy dose

No

Yes
From MEDICAL ASSESSMENT

Ensure oxygenation

Exclude tension pneumo
- Establish vascular access
- Establish cardiac monitor
- Consider causes of shock

SBP > 100 mmHg
- Consider 12/15 Lead ECG

SBP = < 100 mmHg or suspicion of shock
- Administer fluid by bolus
- Monitor for volume overload

Yes
- SBP correcting or shock improving

No

Yes
- Volume overload

No

Maintain / reduce IVF @ TKVO

TRANSPORT
**INDICATIONS:**

- Any patient with hypotension, or suspected or confirmed shock, not due to injury or a traumatic incident

**CONTRAINDICATIONS:**

- None

**NOTES:**

- Transport the patient in the supine position. Do not elevate the legs. Patients in cardiogenic shock may not tolerate the supine position (due to pulmonary vascular congestion) and should be transported in the position they find most comfortable regardless of blood pressure.

- Providers with the appropriate delegation should initiate needle decompression as soon as tension pneumothorax is suspected.

- Providers with the appropriate delegation should consider IO device insertion if IV access cannot be established, patient condition is critical, and transport time is anticipated to be longer than the time required establishing IO access.

- Appendix A lists the various causes of shock and the primary prehospital interventions available.

- Providers with the appropriate delegation should obtain an ECG providing it does not delay emergent transport. Evidence of STEMI on ECG will require emergent transport, even if the patient is pain free.

- Certain types of shock may be present with a normal SBP and certain patients may be in compensated shock and still register a normal SBP.

- Total volume and rate of administration will be determined by patient condition and response.

- Continuously monitor for signs of pulmonary volume overload, especially in the elderly and patients with cardiogenic shock. If volume overload develops, reduce the rate of fluid administration to TKVO (regardless of the SBP) and initiate emergent transport.

**IV Fluid:**

- NS or RL by bolus
- 20 ml/kg (to a maximum of 1000 ml per bolus)
- Repeat as required
- Consider smaller boluses (5 – 10 ml/kg) if age > 75 yr or cardiac dysfunction known / suspected
## APPENDIX A:
### Causes of Shock in Adults

<table>
<thead>
<tr>
<th>Cause</th>
<th>BP</th>
<th>Prehospital Intervention</th>
<th>Associated Care Map(s) or Procedure(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenal insufficiency</td>
<td>↓</td>
<td>Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Anaphylaxis</td>
<td>↓ / ↔</td>
<td>Fluid administration</td>
<td>Anaphylaxis Care Map</td>
</tr>
<tr>
<td>Cardiogenic</td>
<td>↓</td>
<td>Cautious fluid administration</td>
<td>Acute Coronary Syndrome Care Map</td>
</tr>
<tr>
<td>Hemorrhagic</td>
<td>↓</td>
<td>Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Hypovolemic</td>
<td>↓</td>
<td>Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Obstructive *</td>
<td>↓</td>
<td>Fluid administration</td>
<td>Needle Decompression Procedure</td>
</tr>
<tr>
<td>Sepsis</td>
<td>↓ / ↔</td>
<td>Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Neurogenic</td>
<td>↓ / ↔</td>
<td>Fluid administration</td>
<td></td>
</tr>
</tbody>
</table>

* Obstructive shock may be due to tension pneumothorax, cardiac tamponade or pulmonary embolism
From MEDICAL ASSESSMENT

Ensure oxygenation

Exclude tension pneumo

Establish vascular access
Establish cardiac monitor
Consider causes of shock

SBP > 100 mmHg

Consider 12/15 Lead ECG

Administer fluid by bolus
Monitor for volume overload

SBP = < 100 mmHg or suspicion of shock

Yes

SBP correcting or shock improving

No

Volume overload

Yes

Maintain / reduce IVF @ TKVO

No

TRANSPORT
**INDICATIONS:**

- Patient with hypotension, or suspected or confirmed shock, not due to injury or a traumatic incident

**CONTRAINDICATIONS:**

- None

**NOTES:**

- Transport the patient in the supine position. Do not elevate the legs. Patients in cardiogenic shock may not tolerate the supine position (due to pulmonary vascular congestion) and should be transported in the position they find most comfortable regardless of blood pressure.
- Providers with appropriate delegation should initiate needle decompression as soon as tension pneumothorax is suspected.
- Providers with appropriate delegation should consider IO device insertion if IV access cannot be established, patient condition is critical, and transport time is anticipated to be longer than the time required establishing IO access.
- Appendix A lists the various causes of shock and the primary prehospital interventions available.
- Certain types of shock may be present with a normal SBP and certain patients may be in compensated shock and still register a normal SBP.
- Total volume and rate of administration will be determined by patient condition and response.
- Continuously monitor for signs of pulmonary volume overload, especially in patients with cardiogenic shock. If volume overload develops, reduce the rate of fluid administration to TKVO (regardless of the SBP) and initiate emergent transport.

**IV Fluid:**

- NS or RL by bolus
- 20 ml/kg (to a maximum of 1000 ml per bolus)
- Repeat as required
- Consider smaller boluses (5 – 10 ml/kg) if cardiac dysfunction known / suspected
### APPENDIX A:
Causes of Shock in Adolescents

<table>
<thead>
<tr>
<th>Cause</th>
<th>BP</th>
<th>Prehospital Intervention</th>
<th>Associated Care Map(s) or Procedure(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adrenal insufficiency</td>
<td>↓</td>
<td>- Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Anaphylaxis</td>
<td>↓ / ↔</td>
<td>- Fluid administration</td>
<td>- Anaphylaxis Care Map</td>
</tr>
<tr>
<td>Cardiogenic</td>
<td>↓</td>
<td>- Cautious fluid administration</td>
<td></td>
</tr>
<tr>
<td>Hemorrhagic</td>
<td>↓</td>
<td>- Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Hypovolemic</td>
<td>↓</td>
<td>- Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Obstructive *</td>
<td>↓</td>
<td>- Fluid administration</td>
<td>- Needle Decompression Procedure</td>
</tr>
<tr>
<td>Sepsis</td>
<td>↓ / ↔</td>
<td>- Fluid administration</td>
<td></td>
</tr>
<tr>
<td>Neurogenic</td>
<td>↓ / ↔</td>
<td>- Fluid administration</td>
<td></td>
</tr>
</tbody>
</table>

* Obstructive shock may be due to tension pneumothorax, cardiac tamponade or pulmonary embolism
From MEDICAL ASSESSMENT

Ensure oxygenation

Exclude tension pneumo

Establish vascular access
Establish cardiac monitor
Consider causes of shock

Normal SBP

Low SBP or suspicion of shock

Administer fluid by bolus
Monitor for volume overload

Yes
SBP correcting or shock improving

No

Volume overload

Yes
Maintain / reduce IVF @ TKVO

No

TRANSPORT
**INDICATIONS:**
- Patient with hypotension, or suspected or confirmed shock, not due to injury or a traumatic incident

**CONTRAINDICATIONS:**
- None

**NOTES:**
For this protocol, hypotension will be defined as a systolic blood pressure less than the age appropriate minimum (<70 + 2 x age).

- Providers with appropriate delegation should initiate needle decompression as soon as tension pneumothorax is suspected.
- Providers with appropriate delegation should consider IO device insertion if IV access cannot be established, patient condition is critical, and transport time is anticipated to be longer than the time required establishing IO access.
- Appendix A lists the various causes of shock and the primary prehospital interventions available.
- Certain types of shock may be present with a normal SBP and certain patients may be in compensated shock and still register a normal SBP.
- Total volume and rate of administration will be determined by patient condition and response.
- Continuously monitor for signs of pulmonary volume overload. If volume overload develops, reduce the rate of fluid administration to TKVO (regardless of the SBP) and initiate emergent transport.

**IV Fluid:**
- NS by bolus
- 20 ml/kg
- Repeat as required
- Consider smaller boluses (5 – 10 ml/kg) if cardiac dysfunction known / suspected
**APPENDIX A:**
**Causes of Shock in Children**

<table>
<thead>
<tr>
<th>Cause</th>
<th>BP</th>
<th>Prehospital Intervention</th>
<th>Associated Care Map(s) or Procedure(s)</th>
</tr>
</thead>
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<tr>
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<td>- Needle Decompression Procedure</td>
</tr>
<tr>
<td>Sepsis</td>
<td>↓ / ↔</td>
<td>- Fluid administration</td>
<td></td>
</tr>
</tbody>
</table>

* In the absence of trauma, tension pneumothorax would be an uncommon cause of shock.
From MEDICAL ASSESSMENT

Ensure oxygenation

Exclude tension pneumo

Establish vascular access
Establish cardiac monitor
Consider causes of shock

SBP > 70 mmHg

SBP < 70 mmHg
susicion of shock

Administer fluid by bolus
Monitor for volume overload

Yes

SBP correcting or shock improving

No

Yes

Volume overload

No

Maintain / reduce IVF @ TKVO

TRANSPORT
**INDICATIONS:**
- Patient with hypotension, or suspected or confirmed shock, not due to injury or a traumatic incident

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Providers with appropriate delegation should initiate needle decompression as soon as tension pneumothorax is suspected.
- Providers with appropriate delegation should consider IO device insertion if IV access cannot be established, patient condition is critical, and transport time is anticipated to be longer than the time required establishing IO access.
- Appendix A lists the various causes of shock and the primary prehospital interventions available.
- Certain types of shock may be present with a normal SBP and certain patients may be in compensated shock and still register a normal SBP.
- Total volume and rate of administration will be determined by patient condition and response.
- Continuously monitor for signs of pulmonary volume overload. If volume overload develops, reduce the rate of fluid administration to TKVO (regardless of the SBP) and initiate emergent transport.

**IV Fluid:**
- NS by bolus
- 20 ml/kg
- Repeat as required
- Consider smaller boluses (5–10 ml/kg) if cardiac dysfunction known / suspected
### APPENDIX A: Causes of Shock in Children

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* In the absence of trauma, tension pneumothorax would be an uncommon cause of shock.
From MEDICAL & TRAUMA ASSESSMENT

Red heart alarm

Refer to appropriate care map & treat

Assist with trouble-shooting

Red heart alarm persists

LVAD functioning

Patient responsive

Initiate CPR

TRANSPORT

Consider discontinuing resuscitation if asystole persists beyond 20 min

Transport to closest appropriate facility

Transport time to SBGH less than 30 min

Bypass to SBGH ER

Contact LVAD Coordinator (204-237-2053)

No

Yes

No

Yes

No

Yes
INDICATIONS:

- Patient with left ventricular assist device (LVAD).

CONTRAINDICATIONS:

- None

NOTES:

LVAD patients and caregivers will be trained in trouble-shooting and management prior to hospital discharge and will have appropriate documentation with them at all times.

- EMS personnel should assist the patient and / or caregiver with LVAD trouble-shooting. Ensure that the pump is connected to the controller, the controller is connected to the power source, and the green indicator light is on. If the green power indicator is not lit, ensure the batteries are charged, or the power base & module are plugged into a working AC outlet. If not already done, contact the St. Boniface General Hospital (SBGH) VAD Coordinator, through the paging operator (204-237-2053).

- Patients with a functioning LVAD may not have palpable pulse, measurable BP or show pulse oximetry readings. Proper LVAD functioning is confirmed by auscultation of the left upper abdomen to confirm the presence of a continuous humming sound. Do not cardiovert tachyarrhythmias, pace bradyarrhythmias, or perform 12/15 lead ECG if LVAD is functioning.

- If the LVAD is not functioning and the patient is unresponsive, assume cardiopulmonary arrest. Initiate CPR with chest compressions and manual ventilations. Do not interrupt CPR to establish advanced airway or vascular access or to administer resuscitative drugs. If uncertain, assume LVAD is not working.

- If transport time to LVAD centre (St. Boniface General Hospital -SBGH) is estimated to be less than 30 minutes, maintain continuous CPR and initiate bypass to SBGH. Transport time must be estimated based on reasonably safe vehicular speed. Issues affecting provider and public safety such as road and weather conditions will be at the sole discretion of the vehicle operator.

- If transport time to SBGH is estimated to be greater than 30 minutes, transport to the closest appropriate facility. Maintain continuous CPR as long as possible.

- If documented asystole persists beyond twenty minutes, providers with appropriate delegation may consider terminating resuscitative efforts.
Pulse present

Yes

No

RESUSCITATION

UNSTABLE BRADYCARDIA

Yes

Deactivate ICD if performing TCP

HR less than 60 bpm & hypotension / hypoperfusion

No

Deactivate ICD

UNSTABLE TACHYCARDIA

Yes

HR greater than 150 bpm & hypotension / hypoperfusion

No

Consider deactivating ICD

Inappropriate ICD shocks

Yes

No

Complete MEDICAL ASSESSMENT
## INDICATIONS:
- Patient with ICD and
  - Inappropriate shocks for non-malignant dysrhythmia, or
  - Failure to shock or convert malignant dysrhythmia
- Patient with implanted pacemaker, and
  - Output failure or failure to capture
  - Failure to sense intrinsic (cardiac) electrical activity

## CONTRAINDICATIONS:
- None

## NOTES:
Application of an external magnet over an ICD will inactivate the cardioverting and defibrillating functions, but
not the pacemaker function. Application of an external magnet over an implanted pacemaker will convert the
device to its asynchronous mode, but will not turn the device off. Some devices may be programmed not to
respond to external magnet application.

- Pulseless arrest is managed with standard ACLS protocols. If external defibrillation is required, apply
  pads or paddles at least 10 cm away from ICD if possible.
- **ICD discharge during chest compressions is not harmful to rescuers.** Providers with appropriate
delegation must deactivate ICD.
- TCP may cause an ICD to discharge. Inactivate the ICD when applying TCP.
- **WCT should be presumed to be malignant dysrhythmia in a patient with an ICD (ie. shock delivery is
  appropriate).** Shocks with a NCT or no discernible dysrhythmia are inappropriate. Providers with
  appropriate delegation may consider inactivating the ICD after consultation with OLMS.
- With unstable tachycardia do not inactivate ICD.

## ABBREVIATIONS:
- ACLS – Advanced Cardiac Life Support
- ICD – implanted cardiovertor-defibrillator
- NCT – narrow complex tachycardia
- OLMS – On-line Medical Support
- TCP - transcutaneous pacing
- WCT – wide complex tachycardia
Yes
- Keep warm
- Clear airway
- Dry
- Stimulate

Yes
Term & breathing/crying & good tone?

No
Apnea, gasping or HR < 100

Yes
PPV

PPV until HR > 100

No
Apnea, gasping or HR < 100

Yes
HR > 60

No
CPR until HR > 60

Yes
HR > 60

No
CPR until HR > 60

Reassess every 30 sec

Reassess PPV

Return to mother

TRANSPORT

Continue CPR with 100% O2

PPV = 40 - 60 ventilations / min (ROOM AIR)
CPR = 120 events / min

1 provider = 15 Compressions to 2 Ventilations
2 provider = 3 Compressions to 1 Ventilation
**INDICATIONS:**
- All newborn patients

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Continue to monitor breathing, activity, and color.
- Chest wall movement should be used to guide adequacy of ventilation volume. The primary measure of adequate ventilation is a prompt improvement in the heart rate. Reassess the breathing effort and heart rate every 30 seconds. **Continue PPV as long as the breathing is inadequate (apnea or gasping) or HR is less than 100 bpm.**
- If the HR is greater than 100 bpm, reassess need for PPV and reduce as indicated (absence of apnea or gasping). If HR is greater than 100 bpm but breathing is labored, or cyanosis persists beyond ten minutes, provide blow-by supplemental oxygen.
- If the HR is greater than 60 bpm but less than 100 bpm, continue PPV and transport. Reassess the heart rate every 30 seconds. **Continue PPV as long as the breathing is inadequate or HR is less than 100 bpm.** Once the HR is greater than 100 bpm, slowly reduce the PPV as indicated, and continue to monitor as above.
- If the HR is less than 60 bpm, initiate two-person CPR. Reassess the heart rate every 30 seconds. **Continue chest compressions until the HR is above 60 bpm and continue PPV until the HR is above 100 bpm.** If HR is less than 60 bpm after ten minutes of two-person CPR, initiate load & go and continue CPR with one or two providers, as available.
- If HR remains less than 60 bpm after 90 seconds of CPR, ventilate with 100% oxygen.
Prehospital Delivery

Delivery appears imminent
- No ➔ Position mother appropriately ➔ TRANSPORT
- Yes ➔ Refer to appropriate OE care map

Complicated delivery
- No ➔ Control descent of head
- Yes ➔ Excluding nuchal cord

Exclude nuchal cord
- Suction mouth, then nose
- Deliver torso

NEWBORN CARE & RESUSCITATION
- Double clamp & cut umbilical cord
- Deliver placenta

Significant maternal hemorrhage
- Yes ➔ MATERNAL HEMORRHAGE
- No ➔ Return infant to mother ➔ TRANSPORT

Position mother appropriately

Delivery becomes inevitable en route

Transport

D02 Prehospital Delivery
Page 1
**INDICATIONS:**
- All patients in labour

**CONTRAINDICATIONS:**
- None

**NOTES:**
All reasonable efforts should be made to ensure in-hospital delivery.

- Initiate contact early for additional resources. Consider OLMS at any time.
- Delivery is *imminent* (likely to occur within several minutes) when contractions are less than 2 minutes apart. Multiple clinical and non-clinical factors must be considered in deciding upon transport versus delivery on scene including transport time to next level of care, road and weather conditions, and time to available backup.
- Delivery is *inevitable* if the perineum is bulging, the head is crowning or the patient complains of an urge to “push”, “bear down”, or “have a bowel movement”. In these circumstances, EMS providers must prepare to deliver the baby. The vehicle operator must stop the ambulance and assist with delivery.
- For complicated delivery refer to the following OBSTETRICAL EMERGENCIES care maps:
  - [D03.1 Prolapsed Umbilical Cord](#)
  - [D03.2 Breech Presentation](#)
  - [D03.3 Multiple Gestations](#)
  - [D03.4 Shoulder Dystocia](#)
- Unwind the cord from around the baby’s neck and gently lift the cord over its head.
- If unable to remove the cord, suction out the mouth then nose (this will stimulate breathing), double-clamp and cut the cord, then deliver the baby as quickly as possible.
- Suction the baby’s mouth and then nose (“M” before “N”) prior to the torso delivering if possible.
- After returning infant to mother, keep warm and encourage breast feeding.

**ABBREVIATIONS:**
- OE – obstetrical emergencies
- OLMS – on line medical support
Hold presenting part off pelvic brim
Apply high flow O2
Position mother appropriately
Urge mother not to push
Cover cord in moistened sterile gauze

TRANSPORT

Delivery becomes inevitable en route

PREHOSPITAL DELIVERY
### INDICATIONS:
- Prolapsed cord recognized during prehospital delivery

### CONTRAINDICATIONS:
- None

### NOTES:
- Initiate contact early for additional resources. Consider OLMS at any time.
- Insert a gloved hand into the vagina to hold the presenting part above the pelvic inlet (brim). Ensure the hand does not compress or stretch the umbilical cord. **THIS POSITION MUST BE HELD UNTIL ARRIVAL AT THE RECEIVING FACILITY, DELIVERY BECOMES INEVITABLE, OR FATIGUE SETS IN.**
- Mother should be appropriately secured to the stretcher for transport, with the hips elevated as much as possible.
- Do not reinsert the umbilical cord into the vagina.
- If immediate delivery becomes inevitable, assist delivery as per **D02 Prehospital Delivery**. The vehicle operator must stop the vehicle and assist the attendant with delivery.
- Be prepared to resuscitate the newborn as per **D01E Newborn Care & Resuscitation**.
Support the breech

Footling breech presentation

Urge mother not to push
Apply high flow O2
Position mother appropriately
Notify the receiving facility
DO NOT STIMULATE INFANT

Support the breech

TRANSPORT

Delivery becomes inevitable en route

Apply suprapubic pressure
Support torso

Head delivers

Yes

“V” maneuver
Grasp ankles & lift body

Head delivers

Yes

NEWBORN CARE & RESUSCITATION

No

Continue "V" maneuver
Resume TRANSPORT

No

TRANSPORT

Yes

TRANSPORT

No

urnernt .
INDICATIONS:
- Breech or footling breech presentation during prehospital delivery

CONTRAINDICATIONS:
- None

NOTES:
- Initiate contact early for additional resources. Consider OLMS at any time.

BREECH PRESENTATION:
- If delivery becomes inevitable en route, the driver must stop the ambulance and assist with delivery.
- Allow the delivery to occur spontaneously if possible. Apply continuous suprapubic pressure to aid in descent of fetus and maintain head in flexed position. Allow breech to deliver until umbilicus is past the vaginal opening, then gently support the baby’s torso to hang freely without touching the ground. When head delivers double clamp and cut the umbilical cord and manage the newborn as per D01E Newborn Care & Resuscitation.
- If head does not immediately deliver, place two fingers in the vagina with the palm towards the infant’s face and form a “V” over the baby’s nose: push the vaginal wall away from the face to allow the infant to breath. Maintain this “V” procedure until the baby’s face is out of the vagina.
- If the head will not deliver spontaneously, grasp the baby’s ankles together with one hand and gently lift the baby’s legs upward in a vertical plane, while maintaining the “V” procedure.
- If head still does not deliver, continue the “V” procedure and resume transport.

FOOTLING BREECH PRESENTATION:
- Limb presentations require operative intervention. Do not attempt to deliver, initiate emergency transport.
- Do not touch the presenting part as this may stimulate the infant to try and breathe.
- In the unlikely event of a spontaneous delivery, initiate management as D01E Newborn Care & Resuscitation.
Urge mother not to push
Apply high flow O2
Position mother appropriately
Notify receiving facility

TRANSPORT

Delivery becomes inevitable en route

Delivery of first baby
Resume TRANSPORT

Delivery becomes inevitable en route

Delivery of second baby
Resume TRANSPORT

NEWBORN CARE & RESUSCITATION

INDICATIONS:
• Multiple gestations known or suspected during prehospital delivery
CONTRAINDICATIONS:

- Oxytocin is contraindicated until all babies have delivered

NOTES:

- Initiate contact early for additional resources. Consider OLMS at any time.
- If delivery becomes inevitable en route, the vehicle operator must stop the ambulance, remove securements from the mother and assist the attendant with delivery. Manage delivery of the first baby as per D02 Prehospital Delivery.
- There may be some time after delivery of the first baby to allow for emergency transport (A04 Transport) to resume. Multiple clinical and non-clinical factors must be considered in deciding upon transport versus delivery of the second baby on scene including transport time to next level of care, road and weather conditions, and time to available backup. However, all efforts should be made to ensure in-hospital delivery of the second baby.
- If delivery of the second baby becomes inevitable en route, the vehicle operator must stop the ambulance, remove securements from the mother and assist the attendant with delivery. Manage delivery of the second baby as per D02 Prehospital Delivery.
- After delivery of the second baby, the driver may be required to continue to assist the attendant with three patients. The decision about resuming transport versus staying on scene and awaiting back-up will depend mainly on the transport time to receiving facility versus the time to available backup. All efforts should be made to transport to the receiving facility as efficiently and safely as possible.
Ensure oxygenation
Position mother appropriately

TRANSPORT

Delivery becomes inevitable while en route

Knee to chest position
Suprapubic pressure
Axial traction on fetal head
(APPENDIX A)

Shoulders deliver

No
Resume TRANSPORT

Yes
PREHOSPITAL DELIVERY
INDICATIONS:

- Failure of shoulders to deliver during prehospital delivery

CONTRAINDICATIONS:

- None

NOTES:

- Initiate contact early for additional resources. Consider OLMS at any time.
- REMINDER: Often the shoulders are not truly impeded but will deliver with the next contraction.
- If delivery becomes inevitable while en route, all providers must initiate consult with OLMS physician.
- Two providers will be required for delivery (appendix A):
  - PROVIDER #1:
    - Assist the mother in assuming a knees-to-chest position
    - Apply firm suprapubic pressure
  - PROVIDER #2:
    - Apply axial traction on the fetal head during contractions
- Wood’s maneuver (appendix B) should only be attempted by providers with appropriate delegation after consultation with OLMS.

ABBREVIATIONS:

- OLMS – on line medical support
1. Flexing the maternal hips to achieve thighs on abdomen ("knees-to-chest") may allow the maternal symphysis pubis to lever up and over the anterior fetal shoulder.

2. Suprapubic pressure may push the posterior fetal shoulder into the hollow of the sacrum and allow the anterior fetal shoulder to slip under the maternal symphysis pubis.

3. Axial (not downward) traction on the fetal head may also help to pull the posterior fetal shoulder into the hollow of the sacrum.

These three steps should resolve the majority of cases of shoulder dystocia.

D03.4 Shoulder Dystocia
**APPENDIX B**
**WOOD’S MANEUVER:**

**ACP ONLY:**
With a gloved hand in the vagina, locate the most easily palpated shoulder. Place the index finger in the fetal axilla and the hand against the torso. With a sweeping motion rotate the torso 180 degrees to try and “corkscrew” the shoulder out through the pelvic outlet.
Notify receiving facility
Apply high flow O2

Establish vascular access

NEWBORN CARE & RESUSCIAITION

Yes

Baby or babies delivered

No

Position mother appropriately

Administer single dose oxytocin

Uterine massage
Encourage baby to breast
Direct pressure

Consider IV fluid

Yes

Continued bleeding

No

Consider oxytocin infusion

TRANSPORT
**INDICATIONS:**

- Significant bleeding prior to delivery
- Retained placenta with or without significant bleeding
- Estimated blood loss greater than 500 ml after delivery of the baby
- SBP less than 100 mmHg, or suspicion of shock

**CONTRAINDICATIONS:**

- With known or suspected multiple gestations, oxytocin is contraindicated until all babies have delivered

**NOTES:**

Hemorrhage prior to delivery of the baby may be due to placenta previa (usually at onset of labour), uterine rupture or placental abruption (during labour), or genital tract tear (rare prior to delivery). Hemorrhage after delivery may be due to retention of part or the entire placenta, uterine atony, or genital tract tears.

- If ongoing bleeding providers with appropriate delegation should consider additional oxytocin by infusion as per M16 Oxytocin.

- If immediate delivery appears likely while en route, the vehicle operator must stop the ambulance, remove securements from the mother and assist the attendant with delivery.

- Multiple clinical and non-clinical factors must be considered in deciding upon resuming emergent transport after delivery versus assisting with care of the mother and baby, including transport time to next level of care, road and weather conditions, and time to available backup.

<table>
<thead>
<tr>
<th><strong>Intravenous Fluid:</strong></th>
<th><strong>Oxytocin:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.9% saline (20 ml/kg) by bolus</td>
<td>10 units IM or IV after delivery of baby</td>
</tr>
<tr>
<td>Maximum volume = 1000 ml per bolus</td>
<td>10 units / hr IV by continuous infusion</td>
</tr>
<tr>
<td>Repeat boluses as required</td>
<td></td>
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</table>
Peripheral edema
Headache
Visual symptoms
Upper abdominal pain

Consider vascular access as soon as possible

SBP > 160 mmHg, or DBP > 110 mmHg, or seizure reported

No  Actively seizing  Yes

Ensure airway and oxygenation
Exclude hypoglycemia

Consider magnesium by any route

Midazolam IN

Midazolam by any route
Magnesium by any route

TRANSPORT

SBP > 160 mmHg, or DBP > 110 mmHg, or seizure reported

Consider magnesium by any route
### INDICATIONS:
- Symptoms and / or signs of preeclampsia in a woman at greater than 20 weeks estimated gestational age (EGA)
- Seizure in a woman at great than 20 weeks EGA until 6 wk post-partum

### CONTRAINDICATIONS:
- None

### NOTES:
- Providers with appropriate delegation may consider intranasal midazolam if vascular access is delayed or unavailable.
- If vascular access is delayed or unavailable, providers with appropriate delegation may consider magnesium sulfate by deep intramuscular injection. **DO NOT GIVE MAGNESIUM IV or IO IF INTRAMUSCULAR DOSE HAS ALREADY BEEN GIVEN.**
- Monitor airway and respiratory function closely after magnesium administration.

### MIDAZOLAM IN
- 2 mg
- Repeat once in 5 minutes if required

### MIDAZOLAM IM
- 0.1 mg/kg
- Single maximum dose = 10 mg
- Repeat once in 10 minutes if required

### MIDAZOLAM IV / IO
- 0.1 mg/kg
- Single maximum dose = 10 mg
- Repeat every 5 minutes as required

### MAGNESIUM SULPHATE IV / IO
- 2 grams IV or IO
- Infuse over ten minutes
- Repeat once as required

### MAGNESIUM SULFATE IM
- 4 gm (8 ml)
- 4 ml **once** by deep IM in each buttock

### ABBREVIATIONS:
- DBP – diastolic blood pressure
- EGA – estimated gestational age
- IM - intramuscular
- IN – intranasal
- IO - intraosseous
- IV – intravenous
- PIH – pregnancy induced hypertension
- SBP – systolic blood pressure
Consider ECG for upper abdominal pain

Consider vascular access
Consider antinauseant

Yes

SBP less than 100 mmHg or shock suspected

No

NON-TRAUMATIC HYPOTENSION & SHOCK

Consider opioid analgesia

TRANSPORT
**INDICATIONS:**
- Acute abdominal pain, or an acute or subacute worsening of chronic abdominal pain

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Acute coronary events can present with upper abdominal pain with or without chest pain. Consider ECG acquisition, especially with a history of coronary artery disease (CAD) or CAD risk factors.

- If patient develops hypotension (systolic blood pressure less than 100 mmHg) or shock is suspected, refer to C07A NON-TRAUMATIC HYPOTENSION & SHOCK.

- Opioids in standard analgesic doses will not obscure subsequent clinical assessment.
Consider vascular access
Consider antinauseant

Yes

SBP less than 100 mmHg or shock suspected

No

NON-TRAUMATIC HYPOTENSION & SHOCK

Consider opioid analgesia

TRANSPORT
<table>
<thead>
<tr>
<th>INDICATIONS:</th>
<th>CONTRAINDICATIONS:</th>
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<tr>
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Consider vascular access
Consider antinauseant

Yes

Hypotension or shock suspected

No

NON-TRAUMATIC HYPOTENSION & SHOCK

Consider opioid analgesia

TRANSPORT
### INDICATIONS:
- Acute abdominal pain, or an acute or subacute worsening of chronic abdominal pain

### CONTRAINDICATIONS:
- None

### NOTES:
- If patient develops hypotension or shock is suspected refer to C07C NON-TRAUMATIC HYPOTENSION & SHOCK.
- For this protocol, hypotension will be defined as a systolic blood pressure less than the age appropriate minimum ($< 70 + 2 \times \text{age}$).
- Opioid analgesics in reasonable doses will not obscure subsequent clinical assessment.
HYPOGLYCEMIA & DIABETIC EMERGENCIES

Yes

Hypoglycemia suspected or confirmed

No

Consider Midazolam/Lorazepam

Consider physical restraint

Alcohol withdrawal suspected

No

Consider HALOPERIDOL

Complete MEDICAL ASSESSMENT

Yes

Consider contacting law enforcement for assistance

Consider IV access as soon as possible

ALCOHOL & DRUG WITHDRAWAL

17 years & older
INDICATIONS:

- Acute agitation or combative behavior where the safety of the patient, health care providers, and the public at large may be threatened

CONTRAINDICATIONS:

- none

NOTES: Causes of agitation and combative behavior are listed in appendix A. Suspicion or confirmation of a specific cause may determine degree and complexity of monitoring during transport as well as any anticipated difficulties.

- Monitor for both hypoglycemia and alcohol withdrawal in patients who regularly consume large amounts of alcohol.
- Patients in alcohol withdrawal may require large doses of benzodiazepines. Patients with unknown or other causes of agitation (such as overdose) may be more sensitive to benzodiazepine administration. Monitor for respiratory depression, hypotension and excessive sedation after administration.
- Agitated patients should only be restrained as a last resort after all other options have been exhausted. If restrained (especially if sedated) patient must be maintained in a side lying position and all measures undertaken to prevent vomiting and aspiration.

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>DOSAGE</th>
<th>ROUTE</th>
<th>MONITORING</th>
</tr>
</thead>
<tbody>
<tr>
<td>LORAZEPAM PO</td>
<td>1 to 2 mg</td>
<td></td>
<td>Primary</td>
</tr>
<tr>
<td>LORAZEPAM IM</td>
<td>1 to 2 mg</td>
<td></td>
<td>Intermediate</td>
</tr>
<tr>
<td>LORAZEPAM IV</td>
<td>1 to 2 mg</td>
<td></td>
<td>Intermediate</td>
</tr>
<tr>
<td>MIDAZOLAM IV</td>
<td>0.05 to 0.1 mg/kg (single max dose = 5 mg)</td>
<td></td>
<td>Intermediate</td>
</tr>
<tr>
<td>HALOPERIDOL IV</td>
<td>Age greater than 75 years: 5 to 10 mg IM / IO / IV once; repeat once in 15 minutes if required</td>
<td></td>
<td>Intermediate</td>
</tr>
<tr>
<td></td>
<td>Age less than 75 years: 5 to 10 mg IM / IO / IV once; repeat once in 15 minutes if required</td>
<td></td>
<td>Intermediate</td>
</tr>
</tbody>
</table>

ABBREVIATIONS:

- IM - intramuscular
- IO – intraosseous
- IV – intravenous
- kg – kilogram
- max - maximum
- mg - milligram
- PO - oral
HYPOGLYCEMIA & DIABETIC EMERGENCIES

Yes: Hypoglycemia suspected or confirmed

No: Consider lorazepam PO

Consider Midazolam/Lorazepam

Consider physical restraint

Alcohol withdrawal suspected

Yes: Consider HALOPERIDOL

No: Complete MEDICAL ASSESSMENT

Consider contacting law enforcement for assistance

Consider IV access as soon as possible

ALCOHOL & DRUG WITHDRAWAL
### INDICATIONS:
- Acute agitation or combative behavior where the safety of the patient, health care providers, and the public at large may be threatened

### CONTRAINDICATIONS:
- none

### NOTES:
Causes of agitation and combative behavior are listed in appendix A. Suspicion or confirmation of a specific cause may determine degree and complexity of monitoring during transport as well as any anticipated difficulties.

- Monitor for both hypoglycemia and alcohol withdrawal in patients who regularly consume large amounts of alcohol.
- Patients in alcohol withdrawal may require large doses of benzodiazepines. Patients with unknown or other causes of agitation (such as overdose) may be more sensitive to benzodiazepine administration. Monitor for respiratory depression, hypotension and excessive sedation after administration.
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### LORAZEPAM
<table>
<thead>
<tr>
<th>ROUTE</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PO</td>
<td>1 to 2 mg</td>
</tr>
<tr>
<td>IM</td>
<td>1 to 2 mg</td>
</tr>
</tbody>
</table>

### MIDAZOLAM
<table>
<thead>
<tr>
<th>ROUTE</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>0.05 to 0.1 mg/kg (single max dose = 5 mg)</td>
</tr>
</tbody>
</table>

### HALOPERIDOL
<table>
<thead>
<tr>
<th>ROUTE</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>5 to 10 mg IM / IO / IV once</td>
</tr>
</tbody>
</table>

### ABBREVIATIONS:
- IM - intramuscular
- IO – intraosseous
- IV – intravenous
- kg – kilogram
- max - maximum
- mg - milligram
- PO - oral
Presence of bronchospasm / angioedema / shock

Yes

Consider vascular access
Consider diphenhydramine

No

History of severe / rapidly progressive anaphylaxis

Yes

Consider vascular access
Consider diphenhydramine

No

Signs of deterioration

Yes

Administer epinephrine
Consider salbutamol

No

Establish vascular access
Administer diphenhydramine
Consider fluid bolus

AIRWAY & BREATHING MANAGEMENT

Yes

Airway obstruction present or anticipated

No

Consider ranitidine
Consider glucagon
Consider methylprednisolone

AIRWAY OBSTRUCTION

Consider vascular access
Consider diphenhydramine
Consider fluid bolus

TRANSPORT
INDICATIONS:
- Acute allergic reaction presenting with urticaria, angioedema, bronchospasm or shock
- Exposure to allergen with history of previous anaphylaxis

CONTRAINDICATIONS:
- None

NOTES:
- Any facial swelling (eyes, lips) may indicate impending airway compromise from lingual or pharyngeal edema. Any gastrointestinal symptoms such as abdominal pain, nausea or vomiting may indicate developing angioedema.
- Anaphylactic shock may present with normal BP and warm dry extremities.
- Severe bronchospasm may present without wheezing.
- Airway compromise from angioedema can be rapidly progressive, potentially fatal and very difficult to manage. Injudicious attempts at tracheal intubation, blind insertion of supraglottic devices and use of oropharyngeal airways can potentially worsen the situation. Consider OLMS at any time.
- Providers with appropriate delegation may consider glucagon for refractory anaphylaxis in patients on beta blocker medications.

EPINEPHRINE:
- 0.3 mg IM; repeat once as required
- ACP ONLY: 0.1 mg IO or IV; repeat as required

DIPHENHYDRAMINE:
- 25 to 50 mg IM / IO / IV; repeat every 15 min as required
- 50 mg PO once only

GLUCAGON:
- 1 mg IM / IO / IV; repeat once as required

METHYLPREDNISOLONE:
- 40 mg IO or IV once only
- 125 mg IM once only

RANITIDINE:
- 50 mg IO / IV once only

SALBUTAMOL:
- 2 to 4 inhalations by MDI or 2.5 by NEB; repeat as required (no max)

ABBREVIATIONS:
- BP – blood pressure
- IM – intramuscular
- IO – intraosseous
- IV – intravenous
- Kg – kilogram
- max – maximum
- MDI – metered dose inhaler
- mg – milligram
- min – minute
- NEB - nebulizer
- OLMS – On Line Medical Support
- PO – by mouth
Presence of bronchospasm / angioedema / shock

- Yes: Consider vascular access
- No: Consider diphenhydramine

History of severe / rapidly progressive anaphylaxis

- Yes: Consider vascular access, Consider diphenhydramine
- No: Yes

Airway obstruction present or anticipated

- Yes: Establish vascular access, Administer diphenhydramine, Consider fluid bolus
- No: No

Consider ranitidine, Consider glucagon, Consider methylprednisolone

TRANSPORT

CAUTION: Be prepared to secure the airway at any time
INDICATIONS:
- Acute allergic reaction presenting with urticaria, angioedema, bronchospasm or shock
- Exposure to allergen with history of previous anaphylaxis

CONTRAINDICATIONS:
- None

NOTES:
- Any facial swelling (eyes, lips) may indicate impending airway compromise from lingual or pharyngeal edema. Any gastrointestinal symptoms such as abdominal pain, nausea or vomiting may indicate developing angioedema.
- Anaphylactic shock may present with normal BP and warm dry extremities.
- Severe bronchospasm may present without wheezing.
- Airway compromise from angioedema can be rapidly progressive, potentially fatal and very difficult to manage. Injudicious attempts at tracheal intubation, blind insertion of supraglottic devices and use of oropharyngeal airways can potentially worsen the situation. Consider OLMS at any time.
- Providers with appropriate delegation may consider glucagon for refractory anaphylaxis in patients on beta blocker medications.

<table>
<thead>
<tr>
<th>EPINEPHRINE:</th>
<th>ACP Only: 0.1 mg IV or IO; repeat as required</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 mg IM; repeat once as required</td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>DIPHENHYDRAMINE:</th>
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</thead>
<tbody>
<tr>
<td>25 mg IM / IO / IV; repeat every 15 min as required</td>
<td></td>
</tr>
<tr>
<td>25 to 50 mg PO once only</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>GLUCAGON:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mg IM / IO / IV; repeat once as required</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METHYLPREDNISOLONE:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mg IO or IV once only</td>
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<tr>
<td>125 mg IM once only</td>
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</table>

<table>
<thead>
<tr>
<th>RANITIDINE:</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>50 mg IO / IV once only</td>
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</table>

<table>
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<tr>
<th>SALBUTAMOL:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 4 inhalations by MDI or 2.5 by NEB; repeat as required (no maximum)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ABBREVIATIONS:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BP – blood pressure</td>
<td>MDI – metered dose inhaler</td>
</tr>
<tr>
<td>IM – intramuscular</td>
<td>mg – milligram</td>
</tr>
<tr>
<td>IO – intraosseous</td>
<td>min – minute</td>
</tr>
<tr>
<td>IV – intravenous</td>
<td>NEB - nebulizer</td>
</tr>
<tr>
<td>Kg – kilogram</td>
<td>OLMS – On Line Medical Support</td>
</tr>
<tr>
<td>max – maximum</td>
<td>PO – by mouth</td>
</tr>
</tbody>
</table>
Presence of bronchospasm / angioedema / shock

- Yes
  - History of severe / rapidly progressive anaphylaxis
    - No
      - Consider vascular access
        - Consider diphenhydramine
    - Yes
      - Consider vascular access
        - Consider diphenhydramine

- No
  - Signs of deterioration
    - Yes
      - Administer epinephrine
        - Consider salbutamol
    - No
      - Airway obstruction present or anticipated
        - No
          - Establish vascular access
            - Administer diphenhydramine
            - Consider fluid bolus
        - Yes
          - Airway obstruction present or anticipated
            - Yes
              - Administer epinephrine
                - Consider salbutamol
            - No
              - AIRWAY & BREATHING MANAGEMENT

AIRWAY & BREATHING MANAGEMENT

AIRWAY OBSTRUCTION

CAUTION: Be prepared to secure the airway at any time
**INDICATIONS:**
- Acute allergic reaction presenting with urticaria, angioedema, bronchospasm or shock
- Exposure to allergen with history of previous anaphylaxis

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Any facial swelling (eyes, lips) may indicate impending airway compromise from lingual or pharyngeal edema. Any gastrointestinal symptoms such as abdominal pain, nausea or vomiting may indicate developing angioedema.
- Anaphylactic shock may present with normal BP and warm dry extremities.
- Severe bronchospasm may present without wheezing.
- Airway compromise from angioedema can be rapidly progressive, potentially fatal and very difficult to manage. Injudicious attempts at tracheal intubation, blind insertion of supraglottic devices and use of oropharyngeal airways can potentially worsen the situation. Consider OLMS at any time.
- Providers with appropriate delegation may consider glucagon for refractory anaphylaxis in patients on beta blocker medications.

### EPINEPHRINE:

<table>
<thead>
<tr>
<th>Age Category</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 up to 5 years of age</td>
<td>0.15 mg IM; repeat once as required</td>
</tr>
<tr>
<td>6 years &amp; older</td>
<td>0.3 mg IM; repeat once as required</td>
</tr>
</tbody>
</table>

**ACP only:**
- 0.01 mg/kg IO / IV (single max = 0.1 mg)
- Repeat as required

**DIPHENHYDRAMINE:**
- 1.25 mg/kg IM / IO / IV (single max dose = 25 mg); repeat every 15 min as required
- 12.5 to 25 mg PO once only

**METHYLPREDNISOLONE:**
- 2 mg/kg IO or IV once only (max dose = 40 mg)

**RANITIDINE:**
- 1 mg / kg IO / IV once only

**SALBUTAMOL:**
- 2 to 4 inhalations by inhaler or 2.5 by nebulizer; repeat as required (no max)

**ABBREVIATIONS:**
- BP – blood pressure
- IM – intramuscular
- IO – intraosseous
- IV – intravenous
- kg – kilogram
- max = maximum
- MDI – metered dose inhaler
- mg – milligram
- min – minute
- NEB - nebulizer
- OLMS – On Line Medical Support
- PO – by mouth
E04.1A - ACUTE CORONARY SYNDROME:

**Adults**

Version date: 2018-10-31

Start date: 2018-12-01

Ensure oxygenation
Administer ASA

Acquire 12 lead ECG

Consider 15 lead ECG
Interpret ECG

Is the patient a candidate for "Code-STEMI" bypass?

Yes or uncertain

Refer to E04.2A STEMI BYPASS

No

Administer sublingual nitroglycerin

Establish vascular access
Apply topical nitroglycerin

Yes

Has the pain been relieved with nitroglycerin?

No

Consider IN fentanyl
Consider IV opioid

IF HYPOTENSION DEVELOPS:
Discontinue sublingual nitroglycerin & remove topical nitroglycerin
Discontinue opioids until SBP is corrected

TRANSPORT to closest ED

Administer intravenous fluid until SBP corrects, then administer fentanyl with caution
INDICATIONS:
• Known or suspected acute coronary syndrome (ACS)

CONTRAINDICATIONS:
• None

NOTES:
• After ensuring the airway, breathing and circulation are stable, paramedics with appropriate delegation will acquire a 12 lead electrocardiogram (ECG) as soon as possible in an adult with any of the following:
  o Non-traumatic chest, shoulder or arm pain
  o Non-traumatic upper abdominal pain
  o Dyspnea or respiratory distress
  o Near syncope

• After stabilizing the patient, paramedics will acquire a 12 lead ECG in an unstable adult with any of the following:
  o Non-traumatic chest, shoulder or arm pain
  o Non-traumatic upper abdominal pain
  o Dyspnea, respiratory distress or respiratory failure
  o Syncope or near syncope
  o Hypotension or shock
  o Unstable tachycardia or bradycardia
  o Unstable bradycardia

• For a patient with a known or suspected ST elevation myocardial infarction (STEMI) whose point of origin is within Southern Health - Santé Sud or the Interlake Eastern Regional Health Authority, paramedics with appropriate delegation will refer to E04.2 CODE-STEMI BYPASS for consideration of direct transport for primary coronary intervention (PCI).

• Providers with appropriate delegation will administer acetylsalicylic acid (ASA) as per M37.1 ACETYLSALICYLIC ACID, and sublingual or topical nitroglycerin as per M21 NITROGLYCERIN.

• Paramedics with appropriate delegation will administer intravenous (IV) fentanyl or morphine as per M03.1 OPIOID ANALGESICS. Paramedics with appropriate delegation will administer intranasal(IN) fentanyl as per M03.2 NASAL FENTANYL.

• Nitrates and opioids can cause hypotension in patients with ACS, especially if they are already volume depleted or have right ventricular myocardial dysfunction from ischemia, injury or previous infarction. For the purposes of this protocol, a patient will be considered to have developed hypotension if the systolic blood pressure (SBP) decreases below 90 mmHg, or by more than 30 mmHg from the initial or baseline readings, after the administration of nitroglycerin or opioids.

• If hypotension develops, discontinue nitroglycerin and opioids. Administer 0.9% saline or Ringer’s lactate by rapid IV bolus (10 ml/kg to a maximum volume of 500 ml per bolus). Repeat as required until the SBP is corrected. Then administer fentanyl with caution.
Primary Response

Are there contraindications to bypassing the closest ED?

- Yes
- No
  - Uncertain

Will the time from EMS arrival at patient to arrival at cath lab will be less than 100 minutes?

- Yes
- No
  - Yes
  - No

**Transport to closest ED**

- Code-STEMI physician authorizes bypass to cath lab
  - Yes
  - No
    - TRANSPORT to SBH cath lab

- TRANSPORT to closest ED

- Obtain image of ECG on device
- Contact Code-STEMI physician
- Transmit ECG & provide clinical information

- Administer subcutaneous enoxaparin
- Administer ticagrelor 180 mg by mouth
- Ensure ASA has been administered
- Obtain IV access during transport

- Return to care map E04.1A ACUTE CORONARY SYNDROME for further management

Intermediate Response

**Uncertain**

Start date: 2018-12-01

Version date: 2018-10-30

Critical Response
**INDICATIONS:**

- Known or suspected ST elevation myocardial infarction (STEMI); and
- Patient’s point of origin is within the borders of Southern Health - Santé Sud (SHSS) or the Interlake Eastern Regional Health Authority (IERHA); and
- The transporting EMS personnel have the appropriate delegations to initiate STEMI bypass.

**CONTRAINDICATIONS:**

- Any one of the exclusion criteria to bypassing the closest emergency department (ED):
  - GCS less than 9 and/or eye opening less than 3
  - Suspected respiratory failure, shock or sepsis
  - Advanced health care directive indicating “comfort care” only
- Any one of the absolute exclusion criteria to primary coronary intervention (PCI):
  - Known or suspected current internal bleeding (excluding menstruation)
  - Known or suspected aortic dissection
  - Known or suspected acute stroke
  - Recent significant head trauma
- Estimated time from EMS arrival at the patient (first medical contact) to arrival at the St. Boniface Hospital (SBH) cardiac catheterization laboratory (cath lab) will be greater than 100 minutes.

**NOTES:**

- All EMS providers will contact with the on-call Code-STEMI physician and transmit a copy of the electrocardiogram (ECG) under either of the following circumstances:
  - A paramedic with the appropriate delegation recognizes ST elevation of at least 1 mm in at least two anatomically-contiguous leads on the ECG and it is known or suspected to be acute; or
  - The ECG device displays one of the following automated interpretations:
    - Zoll E-series – “acute MI”
    - Zoll X-series – “STEMI”
    - Lifepak 15 – “Meets ST elevation MI criteria”
- Contact the Medical Transportation Coordination Center (MTCC) for the name of the Code-STEMI physician. Contact that physician directly or through the SBH paging operator (204-237-2053). If unable to contact the Code-STEMI physician after two attempts, contact the paging operator and request to speak to the “on-call interventional cardiologist for a code-25 outside call”. If unable to reach either physician, contact the on-call supervisor or superintendent (OCS).
- Communication with the physician should include current symptoms; time of onset; relevant medical history, medications and allergies; current vital signs and relevant physical findings.
- If providers have any uncertainty around the contraindications PCI, they should initiate contact with the Code-STEMI physician before defaulting to the closest ED.
- If the physician authorizes bypass to the cath lab, initiate emergent transport to SBH. Upon arrival at SBH, transfer the patient directly to the cath lab. Do not transport to the ED unless advised to do so by the Code-STEMI physician, or the patient’s condition has deteriorated.
- EMS personnel will remain with the patient until advised otherwise and manage the patient’s symptoms as per **A04.1 ACUTE CORONARY SYNDROME**.
• All providers with appropriate delegation will administer ticagrelor 180 mg by mouth, as per M37.2A TICAGRELOR. All providers will ensure that the patient has taken acetylsalicylic acid (ASA) or will administered as per M37.1A ACETYSALICYLIC ACID.

• Providers with appropriate delegation will also administer enoxaparin as per M43.1A ENOXAPARIN.

• Cath lab staff will provide EMS personnel with a form to provide information about the patient’s presentation. EMS personnel will assist ensure that all documentation provided by the cath lab staff is appropriately completed prior to departure from the cath lab.
Known or suspected to be post-seizure

CAUTION:
Be prepared to secure the airway at any time

Consider Spinal Motion Restriction

Known or suspected acute stroke

Ensure airway & oxygenation
Exclude hypoglycemia

Obtain vascular access

Known or suspected opioid overdose

Yes

Administer naloxone

No

Known or suspected overdose or intoxication

OVERDOSE & POISONING

Yes

Known or suspected to be post-seizure

SEIZURES

No

Known or suspected acute stroke

ACUTE STROKE

Yes

Consider ECG

TRANSPORT

No

CAUTION:
Be prepared to secure the airway at any time

Consider Spinal Motion Restriction

Known or suspected overdose or intoxication
**INDICATIONS:**
- Patients with a decrease in level of consciousness from any non-traumatic cause

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Decreased level of consciousness from any cause may lead to airway obstruction, hypoventilation, hypoxemia and aspiration. At all times, be prepared to protect and secure the airway.
- Decreased level of consciousness may make it difficult to clinically exclude spinal injury.
- For known or suspected overdose with high potency opioids (fentanyl, sufentanil, carfentanil) providers with appropriate delegation should administer the augmented dose of naloxone.

### NALOXONE (NARCAN):

**Standard Dose:**
- 0.4 mg IM / IN / IO / IV
- Repeat every 3 min as required
- Cumulative max dose = 2 mg

**Augmented Dose:**
- 2 mg IM / IN / IO / IV
- Repeat as necessary
- No cumulative max dose

**ABBREVIATIONS:**
- ECG – electrocardiogram
- IM – intramuscular
- IN – intranasal
- IO – intraosseous
- IV – intravenous
- LOC – level of consciousness
- max - maximum
- mg – milligram
- min - minute
CAUTION: Be prepared to secure the airway at any time

Consider Spinal Motion Restriction

Ensure airway & oxygenation
Exclude hypoglycemia

Obtain vascular access

Known or suspected opioid overdose
Yes
Administer naloxone

No

Known or suspected overdose or intoxication

Yes

Known or suspected to be post-seizure

Yes

SEIZURES

No

Consider ECG

TRANSPORT

OVERDOSE & POISONING

Yes
**INDICATIONS:**
- Patients with a decrease in level of consciousness from any non-traumatic cause

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Decreased level of consciousness from any cause may lead to airway obstruction, hypoventilation, hypoxemia and aspiration. At all times, be prepared to protect and secure the airway.
- Decreased level of consciousness may make it difficult to clinically exclude spinal injury.
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**NALOXONE (NARCAN):**

<table>
<thead>
<tr>
<th>Standard Dose:</th>
<th>Augmented Dose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 mg IM / IN / IO / IV</td>
<td>2 mg IM / IN / IO / IV</td>
</tr>
<tr>
<td>Repeat every 3 min as required</td>
<td>Repeat as necessary</td>
</tr>
<tr>
<td>Cumulative max dose = 2 mg</td>
<td>No cumulative max dose</td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**
- ECG – electrocardiogram
- IM – intramuscular
- IN – intranasal
- IO – intraosseous
- IV – intravenous
- LOC – level of consciousness
- max - maximum
- mg – milligram
- min - minute
CAUTION: Be prepared to secure the airway at any time

Ensure airway & oxygenation
Exclude hypoglycemia

Obtain vascular access

Known or suspected opioid overdose
   Yes → Administer naloxone
   No

Known or suspected poisoning
   Yes
   No → OVERDOSE & POISONING

Known or suspected to be post-seizure
   Yes → SEIZURES
   No

TRANSPORT

OVERDOSE & POISONING
   Yes

Consider Spinal Motion Restriction
### INDICATIONS:
- Patients with a decrease in level of consciousness from any non-traumatic cause

### CONTRAINDICATIONS:
- None

### NOTES:
- Decreased level of consciousness from any cause may lead to airway obstruction, hypoventilation, hypoxemia and aspiration. At all times, be prepared to protect and secure the airway.
- Decreased level of consciousness may make it difficult to clinically exclude spinal injury.
- For known or suspected overdose with high potency opioids (fentanyl, sufentanil, carfentanil) providers with appropriate delegation should administer the augmented dose of naloxone.

### NALOXONE (NARCAN):

<table>
<thead>
<tr>
<th>Standard Dose:</th>
<th>Augmented Dose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 0.1 mg / kg IM / IN / IO / IV</td>
<td>- 0.5 mg/kg IM / IN / IO / IV</td>
</tr>
<tr>
<td>- Single max dose = 0.4 mg</td>
<td>- Single max dose = 2 mg</td>
</tr>
<tr>
<td>- Repeat every 3 min as required</td>
<td>- Repeat as necessary</td>
</tr>
<tr>
<td>- Cumulative max dose = 2 mg</td>
<td>- No cumulative max dose</td>
</tr>
</tbody>
</table>

### ABBREVIATIONS:
- IM – intramuscular
- IN – intranasal
- IO – intraosseous
- IV – intravenous
- kg – kilogram
- LOC – level of consciousness
- max – maximum
- mg – milligram
- min - minute
Dyspnea & Respiratory Distress - Adult

**CAUTION:** Be prepared to secure the airway at any time

- **Upper airway obstruction known or suspected**
  - Yes: **AIRWAY OBSTRUCTION**
  - No: **Ensure oxygenation. Administer salbutamol. Consider bronchodilator.**

- **Improvement in symptoms / signs**
  - Yes: **Complete MEDICAL ASSESSMENT**
  - No:  **Obtain ECG**

- **ACS known or suspected**
  - Yes:  **ACUTE CORONARY SYNDROME**
  - No:  **Obtain vascular access**

- **Lower airway obstruction known or suspected**
  - Yes:  **Heart failure known or suspected**
    - Yes:  **ACUTE HEART FAILURE**
    - No:  **TRANSPORT**
  - No:  **TRANSPORT**
INDICATIONS:
- Acute dyspnea, acute or subacute worsening of chronic dyspnea, or respiratory distress

CONTRAINDICATIONS:
- None

NOTES:
- Severe bronchospasm may present without wheezing.

<table>
<thead>
<tr>
<th>Salbutamol (VENTOLIN):</th>
<th>Salbutamol &amp; Ipratropium (COMBIVENT):</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 to 4 inhalations by MDI or one amp by NEB</td>
<td>One amp by NEB once, then continue with salbutamol only</td>
</tr>
<tr>
<td>Repeat as required (no max)</td>
<td></td>
</tr>
</tbody>
</table>

ABBREVIATIONS:
- ACS – acute coronary syndrome
- amp - ampoule
- COPD – chronic obstructive pulmonary disease
- ECG – electrocardiogram
- max - maximum
- MDI – metered dose inhaler
- NEB - nebulizer
Consider bronchodilator
Obtain vascular access
Ensure oxygenation
Administer salbutamol
Improvement in symptoms/signs

AIRWAY OBSTRUCTION

Upper airway obstruction known or suspected

Yes

No

Ensure oxygenation
Administer salbutamol
Consider bronchodilator

Complete MEDICAL ASSESSMENT

Yes

Improvement in symptoms/signs

No

Obtain vascular access

TRANSPORT

CAUTION:
Be prepared to secure the airway at any time
### INDICATIONS:
- Acute dyspnea, acute or subacute worsening of chronic dyspnea, or respiratory distress

### CONTRAINDICATIONS:
- None

### NOTES:
- Severe bronchospasm may present without wheezing.

#### Salbutamol (VENTOLIN):
- 2 to 4 inhalations by MDI or one amp by NEB
- Repeat as required (no max)

#### Salbutamol & Ipratropium (COMBIVENT):
- One amp by NEB once, then continue with salbutamol

### ABBREVIATIONS:
- amp - ampoule
- max - maximum
- MDI – metered dose inhaler
- NEB - nebulizer
**Dyspnea & Respiratory Distress – Child**

**CAUTION:**
Be prepared to secure the airway at any time

1. **Upper airway obstruction known or suspected**
   - Yes: **AIRWAY OBSTRUCTION**
   - No: **Ensure oxygenation**

2. **Ensure oxygenation**
   - Yes: **Administer salbutamol**
   - No: **Consider bronchodilator**

3. **Consider bronchodilator**
   - Yes: Complete **MEDICAL ASSESSMENT**
   - No: **Obtain vascular access**

4. **Obtain vascular access**
   - Yes: **TRANSPORT**
   - No: **Improvement in symptoms / signs**

5. **Improvement in symptoms / signs**
   - Yes: Complete **MEDICAL ASSESSMENT**
   - No: **TRANSPORT**
**INDICATIONS:**
- Acute dyspnea, acute or subacute worsening of chronic dyspnea, or respiratory distress

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Severe bronchospasm may present without wheezing.

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</tr>
<tr>
<td>• Repeat as required (no max)</td>
<td></td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**
- amp - ampoule
- max - maximum
- MDI – metered dose inhaler
- NEB - nebulizer
Consider bronchodilator

Obtain vascular access

Ensure oxygenation
Administer salbutamol

Consider bronchodilator

Upper airway obstruction known or suspected

Yes

AIRWAY OBSTRUCTION

No

Complete MEDICAL ASSESSMENT

Yes

Improvement in symptoms / signs

No

Obtain vascular access

Lower airway obstruction known or suspected

ACUTE ASTHMA

Yes

No

TRANSPORT

CAUTION:
Be prepared to secure the airway at any time
### INDICATIONS:
- Acute dyspnea, acute or subacute worsening of chronic dyspnea, or respiratory distress

### CONTRAINDICATIONS:
- None

### NOTES:
- Severe bronchospasm may present without wheezing.
- Small infants can develop upper airway (nasal) obstruction and respiratory distress from secretions.

### Salbutamol (VENTOLIN):
- 2 to 4 inhalations by MDI or one amp by NEB
- Repeat as required (no max)

### ABBREVIATIONS:
- amp - ampoule
- max - maximum
- MDI – metered dose inhaler
- NEB - nebulizer
Consider vascular access
Consider fluid administration
Exposure patient
Fan patient
Moisten skin
Resolution of fever

Yes

No

Consider repeat or alternative antipyretic

Complete MEDICAL ASSESSMENT

TRANSPORT
**INDICATIONS:**
- Temperature greater than 38°C or 100°F due to infectious cause

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Use ambient-temperature water.
- Other measures of cooling such as misting & fanning and administration of intravenous fluids should be considered. Avoid inducing shivering.

<table>
<thead>
<tr>
<th>ACETAMINOPHEN</th>
<th>IBUPROFEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 15 mg/kg</td>
<td>10 mg/kg</td>
</tr>
<tr>
<td>Single max dose = 1000 mg</td>
<td>Single max dose = 800 mg</td>
</tr>
<tr>
<td>Repeat once as required, then q4h</td>
<td>Repeat once as required, then q6h</td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**
- IV = intravenous
- kg = kilogram
- max = maximum
- mg = milligram
- q4h = every 4 hours
- q6h = every 6 hours
- °C = degrees Celsius
- °F = degrees Fahrenheit
Consider vascular access
Consider fluid administration

Consider acetaminophen or ibuprofen

Expose patient
Fan patient
Moisten skin

Resolution of fever
Yes

Consider repeat or alternative antipyretic

No

Complete MEDICAL ASSESSMENT

TRANSPORT
**INDICATIONS:**
- Temperature greater than 38°C or 100°F due to infectious cause

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Use ambient-temperature water.
- Other measures of cooling such as misting & fanning and administration of intravenous fluids should be considered. Avoid inducing shivering.

**ACETAMINOPHEN:**
- 10 to 15 mg/kg
- Single max dose = 1000 mg
- Repeat once as required, then q4h

**IBUPROFEN:**
- 10 mg/kg
- Single max dose = 800 mg
- Repeat once as required, then q6h

**ABBREVIATIONS:**
- IV = intravenous
- kg = kilogram
- max = maximum
- mg = milligram
- q4h = every 4 hours
- q6h = every 6 hours
- °C = degrees Celsius
- °F = degrees Fahrenheit
Consider vascular access
Consider fluid administration

Consider acetaminophen
or ibuprofen

CONSIDER PR ROUTE IN YOUNG CHILD

Expose patient
Fan patient
Moisten skin

Resolution of fever
Yes
No

Consider repeat or alternative antipyretic

Complete MEDICAL ASSESSMENT

TRANSFERT
### INDICATIONS:
- Temperature greater than 38°C or 100°F due to infectious cause

### CONTRAINDICATIONS:
- None

### NOTES:
- Use ambient-temperature water.
- Other measures of cooling such as misting & fanning and administration of intravenous fluids should be considered. Avoid inducing shivering.

### ACETAMINOPHEN:
- 10 to 15 mg/kg
- Single max dose = 500 mg
- Repeat once as required, then q4h

### IBUPROFEN:
- 10 mg/kg
- Single max dose = 400 mg
- Repeat once as required, then q6h

### ABBREVIATIONS:
- IV = intravenous
- kg = kilogram
- max = maximum
- mg = milligram
- q4h = every 4 hours
- q6h = every 6 hours
- °C = degrees Celsius
- °F = degrees Fahrenheit
Consider vascular access
Consider fluid administration

Expose patient
Fan patient
Moisten skin

Resolution of fever

Yes

Consider acetaminophen
or ibuprofen

No

Consider repeat or alternative antipyretic

Complete MEDICAL ASSESSMENT

TRANSPORT
**INDICATIONS:**
- Temperature greater than 38°C or 100°F due to infectious cause

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Use ambient-temperature water.
- Other measures of cooling such as misting & fanning and administration of intravenous fluids should be considered. Avoid inducing shivering.

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**ABBREVIATIONS:**
- IV = intravenous
- kg = kilogram
- max = maximum
- mg = milligram
- q4h = every 4 hours
- q6h = every 6 hours
- °C = degrees Celsius
- °F = degrees Fahrenheit
Consider opioid analgesia

SBP less than 100 mmHg or suspected shock

Pain relief

Patient is NPO

Consider oral analgesia

NONTRAUMATIC HYPOTENSION & SHOCK

Consider ketorolac

Consider low dose fentanyl

Consider IN fentanyl

Consider opioid analgesia

Consider ketorolac

Pain relief

Consider ketamine (analgesic dose)

TRANSPORT
**INDICATIONS:**
- Acute pain, or
- Acute exacerbation of chronic pain condition

**CONTRAINDICATIONS:**
- Pain caused by an acute traumatic injury (refer to appropriate trauma care map in Section F)
- Pain condition is managed by other specific care map:
  - E01A – ABDOMINAL PAIN
  - E04A – ACUTE CORONARY SYNDROME
  - E09A – HEADACHE
  - E18A – CHEST PAIN
- Presence or potential for respiratory depression
- Decrease in LOC (GCS < 15)
- Presence or suspicion of head injury or raised intracranial pressure

**NOTES:**
- Providers with appropriate delegation should consider co-administration of an antiemetic with the administration of any opioid (see M04 ANTIEMETICS).
- If hypotension is present or shock is known or suspected, providers with appropriate delegation may consider administration of ketorolac or ketamine. Providers with appropriate delegation may consider low dose fentanyl after correcting hypotension.

**ABBREVIATIONS:**
- IN = intranasal
- mmHg = millimeters of mercury
- NPO = nothing by mouth
- SBP = systolic blood pressure
Consider opioid analgesia

Pain relief

Yes

Consider oral analgesia

No

Patient is NPO

Yes

Consider ketorolac

No

Consider IN fentanyl

SBP less than 100 mmHg or suspected shock

Yes

Consider low dose fentanyl

No

Consider opioid analgesia

Consider ketorolac

TRANSPORT

NONTRAUMATIC HYPOTENSION & SHOCK

Consider ketorolac

Consider low dose fentanyl
## INDICATIONS:
- Acute pain, or
- Acute exacerbation of chronic pain condition

## CONTRAINDICATIONS:
- Pain caused by an acute traumatic injury (refer to appropriate trauma care map in Section F)
- Pain condition is managed by other specific care map:
  - E01A – ABDOMINAL PAIN
  - E09A – HEADACHE
  - E18A – CHEST PAIN
- Presence or potential for respiratory depression
- Decrease in LOC (GCS < 15)
- Presence or suspicion of head injury or raised intracranial pressure

## NOTES:
- Providers with appropriate delegation should consider co-administration of an antiemetic with the administration of any opioid (see M04 ANTIEMETICS).
- If hypotension is present or shock is known or suspected, providers with appropriate delegation may consider administration of ketorolac. Providers with appropriate delegation may consider low dose fentanyl after correcting hypotension.

## ABBREVIATIONS:
- IN = intranasal
- mmHg = millimeters of mercury
- NPO = nothing by mouth
- SBP = systolic blood pressure
Consider opioid analgesia

Yes

No

Patient is NPO

No

Consider oral analgesia

Yes

Pain relief

No

NONTRAUMATIC HYPOTENSION & SHOCK

Consider ketorolac

No

Consider low dose fentanyl

Yes

Hypotension or suspected shock

Consider opioid analgesia

Transport
INDICATIONS:

- Acute pain, or
- Acute exacerbation of chronic pain condition

CONTRAINDICATIONS:

- Pain caused by an acute traumatic injury (refer to appropriate trauma care map in Section F)
- Pain condition is managed by other specific care map:
  - E01A – ABDOMINAL PAIN
  - E09A – HEADACHE
  - E18A – CHEST PAIN
- Presence or potential for respiratory depression
- Decrease in LOC (GCS < 15)
- Presence or suspicion of head injury or raised intracranial pressure

NOTES:

For this protocol, hypotension will be defined as SBP less than the age appropriate minimum (< 70 + 2 x age).

- Providers with appropriate delegation should consider co-administration of an antiemetic with the administration of any opioid (see M04 ANTIEMETICS).
- If hypotension is present or shock is known or suspected, providers with appropriate delegation may consider administration of ketorolac (in the absence of active bleeding). Providers with appropriate delegation may consider low dose fentanyl after correcting hypotension.

ABBREVIATIONS:

- mmHg = millimeters of mercury
- NPO = nothing by mouth
- SBP = systolic blood pressure
Consider opioid analgesia & antiemetic

Consider IV access
Consider dimenhydrinate

Patient is NPO

BP greater than 230/130 mmHg

Pain relief

TRANSPORT

HYPERTENSIVE EMERGENCY

Yes

No

Yes

No

Yes

No
**INDICATIONS:**
- Acute headache, or an acute worsening of chronic headache

**CONTRAINDICATIONS:**
- Decreased LOC (refer to E05A COMA & DECREASED LOC)
- Focal neurological symptoms or signs (refer to E15.1A ACUTE STROKE)

**NOTES:**
- If headache is accompanied by hypertension, the priority is to treat the elevated BP.
- Always consider co-administration of an antiemetic when administering opioids for headache.

**Dimenhydrinate (GRAVOL):**
- 50 mg IM / IV
- Repeat as required
- Max = 100 mg per 4 hr

**Metoclopramide (MAXERAN):**
- 10 mg PO or IV or IM once only

**ABBREVIATIONS:**
- BP = blood pressure
- hr = hour
- IM = intramuscular
- IV = intravenous
- max = maximum
- mg = milligram
- mmHg = millimeters of mercury
- NPO = nothing by mouth
- PO = by mouth
Consider opioid analgesia & antiemetic

Patient is NPO
Yes
Consider oral analgesia

Consider IV access
Consider metoclopramide

Pain relief
Yes
No

Pain relief
Yes
No

Consider opioid analgesia

TRANSPORT
INDICATIONS:
- Acute headache, or an acute worsening of chronic headache

CONTRAINDICATIONS:
- Decreased LOC (refer to E05B COMA & DECREASED LOC)
- Focal neurological symptoms or signs

NOTES:
- Always consider co-administration of an antiemetic when administering opioids for headache.

**Dimenhydrinate (GRAVOL):**
- 25 to 50 mg IM / IV
- Repeat as required
- Max = 100 mg per 4 hr

**Metoclopramide (MAXERAN):**
- 2.5 to 10 mg IM / IV / PO
- Once only

**ABBREVIATIONS:**
- BP = blood pressure
- hr = hour
- IM = intramuscular
- IV = intravenous
- LOC = level of consciousness
- max = maximum
- mg = milligram
- mmHg = millimeters of mercury
- NPO = nothing by mouth
- PO = by mouth
Patient is NPO

Yes

No

Consider oral analgesia

Pain relief

Yes

No

Consider oral metoclopramide

TRANSPORT
**INDICATIONS:**
- Acute headache, or an acute worsening of chronic headache

**CONTRAINDICATIONS:**
- Decreased LOC (refer to E05C COMA & DECREASED LOC)
- Focal neurological symptoms or signs

**Metoclopramide (MAXERAN):**
- 0.1 mg / kg PO once only
- Max single dose = 5 mg

**ABBREVIATIONS:**
- LOC = level of consciousness
- max = maximum
- mg = milligram
- mg / kg = milligram per kilogram
- NPO = nothing by mouth
- PO = by mouth
Decreased LOC

Apply glucose paste to buccal mucosa with patient in recovery position

Administer PO glucose

Improvement in symptoms or serum glucose

Establish IV access

IV access delayed or not available

Administer IV dextrose

Administer IN glucagon

Improvement in symptoms or serum glucose

TRANSPORT
**INDICATIONS:**
- Serum glucose less than 4.0 mmol/l, or
- Suspicion of hypoglycemia

**CONTRAINDICATIONS:**
- None

**NOTES:**
- If a serum glucose level is not known, consider treating any diabetic patient with altered LOC, diaphoresis or unexplained tachycardia.

**DEXTROSE (D50W):**
- 50 ml (25 gm) IV or IO
- Repeat as required

**GLUCAGON:**
- 1 mg IM / IN / IO / IV
- Repeat once in 5 min if required

**GLUCOSE PASTE OR SOLUTION:**
- 25 to 50 gm PO (oral administration or buccal application)
- Repeat as required

**ABBREVIATIONS:**
- D50W = 50% dextrose in water solution
- gm = gram
- IM = intramuscular
- IN = intranasal
- IO = intraosseous
- IV = intravenous
- LOC = level of consciousness
- min = minute
- ml = milliliters
- mmol/l = millimoles per liter
- PO = by mouth
Hypoglycemia - Adolescent

Decreased LOC

- Apply glucose paste to buccal mucosa with patient in recovery position
- Administer PO glucose
  - Improvement in symptoms or serum glucose
    - Yes
      - Establish IV access
    - No
      - IV access delayed or not available

- Establish IV access
  - No
    - Administer IN glucagon
      - Improvement in symptoms or serum glucose
        - Yes
          - TRANSPORT
        - No
          - Administer IV dextrose
      - Administer IM glucagon

- Improvement in symptoms or serum glucose
  - Yes
    - TRANSPORT
  - No
    - No

10 up to 17 years
**INDICATIONS:**
- Serum glucose less than 4.0 mmol/l, or
- Suspicion of hypoglycemia

**CONTRAINDICATIONS:**
- None

**NOTES:**
- If a serum glucose level is not known, consider treating any diabetic patient with altered LOC, diaphoresis or unexplained tachycardia.

**DEXTROSE (D50W):**
- 25 ml (12.5 gm) IV or IO
- Repeat as required

**GLUCAGON:**
- 1 mg IM / IN / IO / IV
- Repeat once in 5 min if required

**GLUCOSE PASTE OR SOLUTION:**
- 25 to 50 gm PO (oral administration or buccal application)
- Repeat as required

**ABBREVIATIONS:**
- D50W = 50% dextrose in water solution
- gm = gram
- IM = intramuscular
- IN = intranasal
- IO = intraosseous
- IV = intravenous
- LOC = level of consciousness
- min = minute
- ml = milliliters
- mmol/l = millimoles per liter
- PO = by mouth
**Hypoglycemia - Child**

1 up to 10 years

- **Decreased LOC**
  - Yes
    - Apply glucose paste to buccal mucosa with patient in recovery position
  - No
    - Administer PO glucose

- **Improvement in symptoms or serum glucose**
  - Yes
    - Establish IV access
  - No

- **IV access delayed or not available**
  - Yes
    - Administer IV dextrose
  - No
    - Administer IM or IN glucagon

- **Improvement in symptoms or serum glucose**
  - Yes
    - TRANSPORT
  - No
### INDICATIONS:
- Serum glucose less than 4.0 mmol/l, or
- Suspicion of hypoglycemia

### CONTRAINDICATIONS:
- None

### NOTES:
- If a serum glucose level is not known, consider treating any diabetic patient with altered LOC, diaphoresis or unexplained tachycardia.

### DEXTROSE (D25W):
- 1 ml/kg (0.25 gm/kg) IV / IO
- Max single dose =10 gm / max single volume = 40 ml
- Repeat as required

### GLUCAGON:
- 0.5 mg IM / IN / IO / IV
- Repeat once in 5 min if required

### GLUCOSE PASTE OR SOLUTION:
- 12.5 to 25 gm PO (oral administration or buccal application)
- Repeat as required

### ABBREVIATIONS:
- D25W = 25% dextrose in water solution
- gm = gram
- IM = intramuscular
- IN = intranasal
- IO = intraosseous
- IV = intravenous
- LOC = level of consciousness
- max = maximum
- min = minute
- ml = milliliters
- mmol/l = millimoles per liter
- PO = by mouth
Consider ECG

- NON-TRAUMATIC HYPOTENSION & SHOCK
  - Yes
  - SBP less than 100 mmHg or shock suspected
    - No
    - Patient is NPO
    - Yes
  
  - No
    - Consider PO antiemetic
      - Symptom relief
        - Yes
        - TRANSPORT
        - No

- Obtain IV access
  - Consider IV dimenhydrinate
    - Symptom relief
      - Yes
      - TRANSPORT
### INDICATIONS:
- Nausea and/or vomiting

### CONTRAINDICATIONS:
- None

### NOTES:
- Acute coronary events can present with nausea and/or vomiting without chest pain.
- Use dimenhydrinate in pregnant women.

<table>
<thead>
<tr>
<th>Dimenhydrinate (GRAVOL):</th>
<th>Metoclopramide (MAXERAN):</th>
<th>Ondansetron (ZOFRAN):</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 mg IM / IO / IV / PO</td>
<td>5 to 10 mg IM / IO / IV</td>
<td>4 to 8 mg IV once only</td>
</tr>
<tr>
<td>Repeat as required</td>
<td>Repeat every 6 hr as required</td>
<td></td>
</tr>
<tr>
<td>Max = 100 mg per 4 hr</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ABBREVIATIONS:
- ECG = electrocardiogram
- hr = hour
- IM = intramuscular
- IO = intraosseous
- IV = intravenous
- max = maximum
- mg = milligram
- mmHg = millimeters of mercury
- NPO = nothing by mouth
- PO = by mouth
- SBP = systolic blood pressure
NON-TRAUMATIC HYPOTENSION & SHOCK

Yes

SBP less than 100 mmHg or shock suspected

No

Patient is NPO

No

Consider PO antiemetic

Yes

Obtain IV access
Consider IV dimenhydrinate

No

Symptom relief

Yes

Symptom relief

No

Consider alternative antiemetic

TRANSPORT
**INDICATIONS:**
- Nausea and/or vomiting

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Use dimenhydrinate in pregnant adolescents.

<table>
<thead>
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<th>Ondansetron (ZOFRAN)</th>
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<tr>
<td>25 to 50 mg IM / IO / IV / PO</td>
<td>2.5 to 10 mg IM / IO / IV</td>
<td>4 mg IV once only</td>
</tr>
<tr>
<td>Repeat as required</td>
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**ABBREVIATIONS:**
- hr = hour
- IM = intramuscular
- IO = intraosseous
- IV = intravenous
- max = maximum
- mg = milligram
- mmHg = millimeters of mercury
- NPO = nothing by mouth
- PO = by mouth
- SBP = systolic blood pressure
NON-TRAUMATIC HYPOTENSION & SHOCK

Yes

Hypotension or shock suspected

No

Patient is NPO

Yes

Obtain IV access
Consider IV dimenhydrinate

No

Consider PO antiemetic

Symptom relief

Yes

Symptom relief

No

Consider alternative antiemetic

TRANSPORT

Yes

No
### INDICATIONS:
- Nausea and/or vomiting

### CONTRAINDICATIONS:
- None

### NOTES:
- For this protocol, hypotension will be defined as SBP less than the age appropriate minimum ($< 70 + 2 \times \text{age}$).

### Dimenhydrinate (GRAVOL):
- 12.5 to 25 mg IM / IO / IV / PO
- Repeat as required
- Max = 50 mg per 4 hr

### Metoclopramide (MAXERAN):
- 0.1 mg/kg IM / IO / IV
- Max single dose = 5 mg
- Repeat every 6 hr as required

### Ondansetron (ZOFRAN):
- 0.1 mg/kg IV once only
- Max single dose = 4 mg

### ABBREVIATIONS:
- hr = hour
- IM = intramuscular
- IO = intraosseous
- IV = intravenous
- max = maximum
- mg = milligram
- mg/kg = milligram per kilogram
- NPO = nothing by mouth
- PO = by mouth
- SBP = systolic blood pressure
NONTRAUMATIC HYPOTENSION & SHOCK

Dermal exposure

Yes

Consider decontamination before assessment & treatment

No

Ensure airway & oxygenation
Exclude hypoglycemia

Consider IV access
Consider cardiac monitor

Administer naloxone

Yes

Known or suspected opioid overdose

No

UNSTABLE RHYTHM

Yes

UNSTABLE TACHYCARDIA

No

UNSTABLE BRADYCARDIA

Hypotension or shock

Yes

Seizures

No

SEIZURES

E12A Overdose & Poisoning Page 1
**INDICATIONS:**
- Exposure to a toxin or medication intentionally, accidentally, or as an assault by another individual
- All routes of exposure (oral / parenteral / inhalational / dermal / ocular)

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Patients with dermal toxin exposure may require decontamination prior to further assessment and treatment by providers.
  - Dry chemicals should be brushed off the skin with a soft brush or sterile gauze.
  - Wet chemicals should be irrigated copiously with NS solution.
  - Ocular exposures with wet or dry chemicals should be irrigated as soon as possible.
- Patients exposed to certain types of radiation pose a risk to providers and may require decontamination prior to treatment or transport. Local technical personnel may be able to provide information for the safe handling of contaminated persons. **Manitoba Conservation – Environmental Operations: Dangerous Goods Emergency Response (1-204-944-4888)** is available 24 hours every day to provide appropriate information, resources and personnel.
- The complexity and frequency of monitoring will depend on the patient’s condition and stability.
- Providers with appropriate delegation may consider administering naloxone for known or suspected opioid overdose causing apnea, hypoventilation or desaturation. Opioid overdose causing only CNS depression should be managed with airway and ventilatory supportive measures.

**NALOXONE (NARCAN):**

<table>
<thead>
<tr>
<th>Standard Dose:</th>
<th>Augmented Dose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 mg IM / IN / IO / IV</td>
<td>2 mg IM / IN / IO / IV</td>
</tr>
<tr>
<td>Repeat every 3 min as required</td>
<td>Repeat as necessary</td>
</tr>
<tr>
<td>Cumulative max dose = 2 mg</td>
<td>No cumulative max dose</td>
</tr>
</tbody>
</table>
NONTRAUMATIC HYPOTENSION & SHOCK

Hypotension or shock

Seizures

Ensure airway & oxygenation
Exclude hypoglycemia

Administer naloxone

Known or suspected opioid overdose

Consider IV access
Consider cardiac monitor

Unstable rhythm

Dermal exposure

Yes

Consider decontamination before assessment & treatment

Yes

No

UNSTABLE TACHYCARDIA

UNSTABLE BRADYCARDIA

No

Agitation / safety concerns

TRANSPORT

DANGEROUS GOODS EMERGENCY RESPONSE
Call 1-204-944-4888

Ensure airway & oxygenation
Exclude hypoglycemia

Yes

No

Consider IV access
Consider cardiac monitor

Seizures

Yes

No

AGITATION & BEHAVIORAL EMERGENCIES

Known or suspected opioid overdose

Administer naloxone

Yes

No

UNSTABLE TACHYCARDIA

UNSTABLE BRADYCARDIA

Yes

No

UNSTABLE TACHYCARDIA

UNSTABLE BRADYCARDIA

Yes

No

Seizures

Yes

No

Seizures

Yes

No

Seizures

Yes

No

Seizures

Yes

No

Seizures

Yes

No

Seizures

Yes

No

Seizures

Yes

No

Seizures
INDICATIONS:
- Exposure to a toxin or medication intentionally, accidentally, or as an assault by another individual
- All routes of exposure (oral / parenteral / inhalational / dermal / ocular)

CONTRAINDICATIONS:
- None

NOTES:
- Patients with dermal toxin exposure may require decontamination prior to further assessment and treatment by providers.
  - Dry chemicals should be brushed off the skin with a soft brush or sterile gauze.
  - Wet chemicals should be irrigated copiously with NS solution.
  - Ocular exposures with wet or dry chemicals should be irrigated as soon as possible.
- Patients exposed to certain types of radiation pose a risk to providers and may require decontamination prior to treatment or transport. Local technical personnel may be able to provide information for the safe handling of contaminated persons. Manitoba Conservation – Environmental Operations: Dangerous Goods Emergency Response (1-204-944-4888) is available 24 hours every day to provide appropriate information, resources and personnel.
- The complexity and frequency of monitoring will depend on the patient’s condition and stability.
- Providers with appropriate delegation may consider administering naloxone for known or suspected opioid overdose causing apnea, hypoventilation or desaturation. Opioid overdose causing only CNS depression should be managed with airway and ventilatory supportive measures.

NALOXONE (NARCAN):

<table>
<thead>
<tr>
<th>Standard Dose:</th>
<th>Augmented Dose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4 mg IM / IN / IO / IV</td>
<td>2 mg IM / IN / IO / IV</td>
</tr>
<tr>
<td>Repeat every 3 min as required</td>
<td>Repeat as necessary</td>
</tr>
<tr>
<td>Cumulative max dose = 2 mg</td>
<td>No cumulative max dose</td>
</tr>
</tbody>
</table>
Overdose & Poisoning – Child

1 up to 10 years

**Dermal exposure**
- Yes: Consider decontamination before assessment & treatment
- No: Ensure airway & oxygenation. Exclude hypoglycemia

**Known or suspected opioid overdose**
- Yes: Administer naloxone
- No: Consider IV access. Consider cardiac monitor

**Unstable rhythm**
- Yes: UNSTABLE TACHYCARDIA
- No: UNSTABLE BRADYCARDIA

**Hypotension or shock**
- Yes: NONTRAUMATIC HYPOTENSION & SHOCK
- No: Seizures

**Seizures**
- Yes: SEIZURES
- No: TRANSPORT

**DANGEROUS GOODS EMERGENCY RESPONSE**
Call 1-204-944-4888

---

**Basic**
- Primary
- Intermediate
- Advanced
- Critical
INDICATIONS:

- Exposure to a toxin or medication intentionally, accidentally, or as an assault by another individual
- All routes of exposure (oral / parenteral / inhalational / dermal / ocular)

CONTRAINDICATIONS:

- None

NOTES:

- Patients with dermal toxin exposure may require decontamination prior to further assessment and treatment by providers.
  - Dry chemicals should be brushed off the skin with a soft brush or sterile gauze.
  - Wet chemicals should be irrigated copiously with NS solution.
  - Ocular exposures with wet or dry chemicals should be irrigated as soon as possible.
- Patients exposed to certain types of radiation pose a risk to providers and may require decontamination prior to treatment or transport. Local technical personnel may be able to provide information for the safe handling of contaminated persons. Manitoba Conservation – Environmental Operations: Dangerous Goods Emergency Response (1-204-944-4888) is available 24 hours every day to provide appropriate information, resources and personnel.
- The complexity and frequency of monitoring will depend on the patient’s condition and stability.
- Providers with appropriate delegation may consider administering naloxone for known or suspected opioid overdose causing apnea, hypoventilation or desaturation. Opioid overdose causing only CNS depression should be managed with airway and ventilatory supportive measures.

NALOXONE (NARCAN):

<table>
<thead>
<tr>
<th>Standard Dose:</th>
<th>Augmented Dose:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1 mg / kg IM / IN / IO / IV</td>
<td>0.5 mg/kg IM / IN / IO / IV</td>
</tr>
<tr>
<td>Single max dose = 0.4 mg</td>
<td>Single max dose = 2 mg</td>
</tr>
<tr>
<td>Repeat every 3 min as required</td>
<td>Repeat as necessary</td>
</tr>
<tr>
<td>Cumulative max dose = 2 mg</td>
<td>No cumulative max dose</td>
</tr>
</tbody>
</table>
Establish IV access & cardiac monitor

Administer salbutamol

Vascular access delayed or not available

Administer calcium
Consider insulin & dextrose

Consider ECG

TRANSPORT
### INDICATIONS:
- Dialysis-dependent patient having missed at least one scheduled dialysis treatment

### CONTRAINDICATIONS:
- None

### NOTES:
- Check blood glucose every 30 min if insulin is given.
- Calcium gluconate will cause less pain on injection than calcium chloride.
- Findings on cardiac monitor or ECG suggestive of hyperkalemia include the following:
  - Shortened QT interval
  - Increased QRS duration
  - Sine wave pattern to QRS
  - Increased PR interval
  - Disappearance of P waves

### SALBUTAMOL
- 8 inhalations by MDI or 5 mg by NEB
- Repeat once in 5 min if findings suggestive of hyperkalemia on cardiac monitor or ECG do not resolve
- NOTE: Repeat every 30 min during prolonged transport if this is the only agent given for treatment of hyperkalemia

### CALCIUM GLUCONATE (10%)
- 1000 mg (10 ml) by slow IV push over two minutes
- Repeat once in 5 min if findings suggestive of hyperkalemia on cardiac monitor or ECG do not resolve
- NOTE: Repeat once in 60 min during prolonged transport

### CALCIUM CHLORIDE (10%)
- 500 to 1000 mg (5 to 10 ml) by slow IV push over two minutes
- Repeat once in 5 min if findings suggestive of hyperkalemia on cardiac monitor or ECG do not resolve
- NOTE: Repeat once in 60 min during prolonged transport

### INSULIN (REGULAR) & 50% DEXTROSE
- 10 units Regular insulin, and
- 50 ml of D50W
- Both given by rapid IV push

### ABBREVIATIONS:
- ECG = electrocardiogram
- IV = intravenous
- MDI = metered dose inhaler
- mg = milligrams
- min = minute
- ml = milliliter
- NEB = nebulizer
Establish IV access & cardiac monitor

Administer salbutamol

Vascular access delayed or not available

Yes

Administer calcium

Consider insulin & dextrose

Consider ECG

TRANSPORT

No
INDICATIONS:
- Dialysis-dependent patient having missed at least one scheduled dialysis treatment

CONTRAINDICATIONS:
- None

NOTES:
- Check blood glucose every 30 min if insulin is given.
- Calcium gluconate will cause less pain on injection than calcium chloride.
- Findings on cardiac monitor or ECG suggestive of hyperkalemia include the following:
  - Shortened QT interval
  - Increased QRS duration
  - Sine wave pattern to QRS
  - Increased PR interval
  - Disappearance of P waves

SALBUTAMOL
- 8 inhalations by MDI or 5 mg by NEB
- Repeat once in 5 min if findings on cardiac monitor or ECG do not resolve
- NOTE: Repeat every 30 min during prolonged transport if this is the only agent given for treatment of hyperkalemia

CALCIUM GLUCONATE (10%)
- 1000 mg (10 ml) by IV push over two minutes
- Repeat once in 5 min if findings on cardiac monitor or ECG do not resolve
- NOTE: Repeat once in 60 min during prolonged transport

CALCIUM CHLORIDE (10%)
- 500 to 1000 mg (5 to 10 ml) by IV push over two minutes
- Repeat once in 5 min if ECG findings do not resolve
- NOTE: Repeat once in 60 min during prolonged transport

INSULIN (REGULAR) & 50% DEXTROSE
- 0.1 units/kg Regular insulin (max dose 10 units), and
- 1 ml/kg of D50W (max dose 50 ml
- Both given by rapid IV push

ABBREVIATIONS:
- ECG = electrocardiogram
- IV = intravenous
- kg = kilogram
- max = maximum
- MDI = metered dose inhaler
- min = minute
- ml = milliliter
- NEB = nebulizer
Consider Spinal Motion Restriction

Ensure airway & oxygenation
Exclude hypoglycemia

Actively seizing longer than 2 minutes

CAUTION: Be prepared to secure the airway at any time

Midazolam IN

Midazolam by any route

Seizure persists or recurs after 2 doses of midazolam

Repeat midazolam as required

Seizure persists or recurs after 5 doses of midazolam

Consider propofol

Secure airway as soon as possible

TRANSPORT
INDICATIONS:
- All patients actively seizing or in the immediate post-seizure period

CONTRAINDICATIONS:
- None

NOTES:
- Decreased level of consciousness or post-ictal confusion may make it difficult to clinically exclude spinal injury.
- Respiratory depression and failure are common in the post-seizure period, especially if benzodiazepines and/or other medications have been taken or administered to terminate the seizure(s). **All EMS personnel must remain prepared to secure the airway and support oxygenation and ventilation at anytime.**
- If the seizure persists longer than 2 minutes, administer up to 2 doses of midazolam. Do not administer if the seizure appears to be resolving.
- If the seizure persists or recurs after 2 doses of midazolam, providers with appropriate delegation should continue to administer midazolam IV or IO as required.
- If the seizure persists or recurs after 5 doses of midazolam, providers with appropriate delegation should consider propofol **after** consultation with OLMS. If propofol is administered providers must prepare to secure the airway and support ventilations.

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>DOSE</th>
<th>ADMINISTRATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIDAZOLAM IN</td>
<td>2 mg</td>
<td>Primary</td>
</tr>
<tr>
<td></td>
<td>Repeat once in 5 minutes if required</td>
<td></td>
</tr>
<tr>
<td>MIDAZOLAM IM</td>
<td>0.05 mg/kg</td>
<td>Intermediate</td>
</tr>
<tr>
<td></td>
<td>Single maximum dose = 5 mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat once in 10 minutes if required</td>
<td></td>
</tr>
<tr>
<td>MIDAZOLAM IV / IO</td>
<td>0.05 mg/kg</td>
<td>Intermediate</td>
</tr>
<tr>
<td></td>
<td>Single maximum dose = 5 mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat every 5 minutes as required</td>
<td></td>
</tr>
<tr>
<td>PROPOFOL</td>
<td>1 to 2 mg/kg bolus, then 0.05 to 0.1 mg/kg/min continuous infusion</td>
<td>Advanced</td>
</tr>
</tbody>
</table>

ABBREVIATIONS:
- IM – intramuscular
- IN - intranasal
- IO – intraosseous
- IV – intravenous
- OLMS – on-line medical support
Ensure airway & oxygenation
Exclude hypoglycemia

Consider Spinal Motion Restriction

Consider vascular access as soon as possible

Actively seizing longer than 2 minutes

Midazolam IN

Midazolam by any route

Seizure persists or recurs after 2 doses of midazolam

Repeat midazolam as required

Seizure persists or recurs after 5 doses of midazolam

Consider propofol

Secure airway as soon as possible

TRANSPORT

CAUTION:
Be prepared to secure the airway at any time
**INDICATIONS:**
- All patients actively seizing or in the immediate post-seizure period

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Decreased level of consciousness or post-ictal confusion may make it difficult to clinically exclude spinal injury.
- Respiratory depression and failure are common in the post-seizure period, especially if benzodiazepines and/or other medications have been taken or administered to terminate the seizure(s). **All EMS personnel must remain prepared to secure the airway and support oxygenation and ventilation at anytime.**
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- If the seizure persists or recurs after 5 doses of midazolam, providers with appropriate delegation should consider propofol after consultation with OLMS. **If propofol is administered providers must prepare to secure the airway and support ventilations.**

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>DOSE</th>
</tr>
</thead>
</table>
| **MIDAZOLAM IN** | 1 to 2 mg  
Repeat once in 5 minutes if required |
| **MIDAZOLAM IM** | 0.05 mg/kg  
Single maximum dose = 5 mg  
Repeat once in 10 minutes if required |
| **MIDAZOLAM IV / IO** | 0.05 mg/kg  
Single maximum dose = 5 mg  
Repeat every 5 minutes as required |
| **PROPOFOL** | 1 to 2 mg/kg bolus, then 0.05 to 0.1 mg/kg/min continuous infusion |

**ABBREVIATIONS:**
- IM – intramuscular
- IN - intranasal
- IO – intraosseous
- IV – intravenous
- OLMS – on-line medical support
Ensure airway & oxygenation
Exclude hypoglycemia

Actively seizing longer than 2 minutes

Yes

Midazolam IN

Midazolam by any route

Seizure persists or recurs after 2 doses of midazolam

No

Seizure persists or recurs after 5 doses of midazolam

No

Yes

Repeat midazolam as required

Consider propofol

Secure airway as soon as possible

No

No

Yes

Yes

Refer to FEBRILE SEIZURE

Temperature greater than 38 degrees & age less than 6 years

No

CAUTION:
Be prepared to secure the airway at any time

Consider Spinal Motion Restriction

Consider vascular access as soon as possible
**INDICATIONS:**
- All patients actively seizing or in the immediate post-seizure period

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Febrile seizures are usually brief and self-limited, do not recur, and rarely require administration of any anticonvulsant medications (refer to A14.2C FEBRILE SEIZURES)
- Decreased level of consciousness or post-ictal confusion may make it difficult to clinically exclude spinal injury.
- Respiratory depression and failure are common in the post-seizure period, especially if benzodiazepines and/or other medications have been taken or administered to terminate the seizure(s). **All EMS personnel must remain prepared to secure the airway and support oxygenation and ventilation at anytime.**
- If the seizure persists longer than 2 minutes, administer up to 2 doses of midazolam. **Do not administer if the seizure appears to be resolving.**
- If the seizure persists or recurs after 2 doses of midazolam, providers with appropriate delegation should continue to administer midazolam IV or IO as required.
- If the seizure persists or recurs after 5 doses of midazolam, providers with appropriate delegation should consider propofol after consultation with OLMS. **If propofol is administered providers must prepare to secure the airway and support ventilations.**

| MIDAZOLAM IN | 0.1 mg/kg  
|             | Single maximum dose = 1 to 2 mg  
|             | Repeat once in 5 minutes if required  
| **Primary** |
| MIDAZOLAM IM | 0.05 mg/kg  
|             | Single maximum dose = 2.5 mg  
|             | Repeat once in 10 minutes if required  
| **Intermediate** |
| MIDAZOLAM IV / IO | 0.05 mg/kg  
|             | Single maximum dose = 2.5 mg  
|             | Repeat every 5 minutes as required  
| **Intermediate** |
| PROPOFOL | 1 to 2 mg/kg bolus, then 0.05 to 0.1 mg/kg/min continuous infusion  
| **Advanced** |

**ABBREVIATIONS:**
- IM – intramuscular  
- IN - intranasal  
- IO – intraosseous  
- IV – intravenous  
- OLMS – on-line medical support
Ensure airway & oxygenation
Exclude hypoglycemia

Actively seizing longer than 2 minutes

Consider Spinal Motion Restriction

Consider vascular access as soon as possible

CAUTION: Be prepared to secure the airway at any time

Midazolam IN

Midazolam by any route

Seizure persists or recurs after 2 doses of midazolam

Seizure persists or recurs after 5 doses of midazolam

Consider propofol

Secure airway as soon as possible

TRANSPORT

Refer to FEBRILE SEIZURE

Temperature greater than 38 degrees & age less than 6 years

Yes

No

Yes

No
**INDICATIONS:**

- All patients actively seizing or in the immediate post-seizure period

**CONTRAINDICATIONS:**

- None

**NOTES:**

- Febrile seizures are *usually* self-limited, do not recur, and rarely require administration of any anticonvulsant medications (refer to A14.2D FEBRILE SEIZURES).
- Decreased level of consciousness or post-ictal confusion may make it difficult to clinically exclude spinal injury.
- Respiratory depression and failure are common in the post-seizure period, especially if benzodiazepines and/or other medications have been taken or administered to terminate the seizure(s). **All EMS personnel must remain prepared to secure the airway and support oxygenation and ventilation at anytime.**
- If the seizure persists longer than 2 minutes, administer up to 2 doses of midazolam. Do not administer if the seizure appears to be resolving.
- If the seizure persists or recurs after 2 doses of midazolam, providers with appropriate delegation should continue to administer midazolam IV or IO as required.
- If the seizure persists or recurs after 5 doses of midazolam, providers with appropriate delegation should consider propofol after consultation with OLMS. **If propofol is administered providers must prepare to secure the airway and support ventilations.**

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>Dosage</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIDAZOLAM IN</strong></td>
<td>• 0.1 mg/kg</td>
<td><strong>Primary</strong></td>
</tr>
<tr>
<td></td>
<td>• Single maximum dose = 1 mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Repeat once in 5 minutes if required</td>
<td></td>
</tr>
<tr>
<td><strong>MIDAZOLAM IV / IO</strong></td>
<td>• 0.1 mg/kg</td>
<td><strong>Intermediate</strong></td>
</tr>
<tr>
<td></td>
<td>• Single maximum dose = 1.25 mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Repeat every 5 minutes as required</td>
<td></td>
</tr>
<tr>
<td><strong>PROPOFOL</strong></td>
<td>• 1 to 2 mg/kg bolus, then 0.05 to 0.1 mg/kg/min continuous infusion</td>
<td><strong>Advanced</strong></td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**

- IN - intranasal
- IO – intraosseous
- IV – intravenous
- OLMS – on-line medical support
CAUTION: Be prepared to secure the airway at any time

Ensure airway & oxygenation
Exclude hypoglycemia

Seizure resolves within 2 minutes

Yes
Administer antipyretic

TRANSPORT

No

Return to SEIZURE - CHILD
INDICATIONS:
- Single generalized seizure
- Duration less than 2 minutes
- Documented temperature greater than 38 degrees or history of recent fever

CONTRAINDICATIONS:
- None

NOTES:
- Febrile seizures are usually brief and self-limited, do not recur, and rarely require administration of any anticonvulsant medications.
- Be aware of the potential for airway compromise, hypoventilation or apnea and desaturation after any seizures. At all times be prepared to support ventilation and oxygenation and secure the airway.

| ACETAMINOPHEN       | • 10 to 15 mg/kg PO  
|                     | • Single maximum dose = 400 mg  
|                     | • Repeat once if required |

| IBUPROFEN           | • 10 mg/kg PO  
|                     | • Single maximum dose = 400 mg  
|                     | • Repeat once if required |
Ensure airway & oxygenation
Exclude hypoglycemia

Seizure resolves within 2 minutes

Administer antipyretic

TRANSPORT

CAUTION:
Be prepared to secure the airway at any time

No

Yes

Return to SEIZURE - INFANT
### INDICATIONS:
- Single generalized seizure
- Duration less than 2 minutes
- Documented temperature greater than 38 degrees or history of recent fever

### CONTRAINDICATIONS:
- None

### NOTES:
- Febrile seizures are usually brief and self-limited, do not recur, and rarely require administration of any anticonvulsant medications.
- Be aware of the potential for airway compromise, hypoventilation or apnea and desaturation after any seizures. At all times be prepared to support ventilation and oxygenation and secure the airway.

<table>
<thead>
<tr>
<th>Medication</th>
<th>Dosage</th>
<th>Maximum Dose</th>
<th>Repeat if Required</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACETAMINOPHEN</td>
<td>10 to 15 mg/kg PO</td>
<td>400 mg</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Single maximum dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat once if required</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IBUPROFEN</td>
<td>10 mg/kg PO</td>
<td>400 mg</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Single maximum dose</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Repeat once if required</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### INDICATIONS:
- The new onset of one or more neurological symptom(s) or sign(s) suspicious for, or consistent with, an acute stroke.

### CONTRAINDICATIONS:
- None

### NOTES:
- “Onset” refers to stroke onset and:
  - is defined as the beginning of the neurological symptom(s) or sign(s) suspicious for, or consistent with, acute stroke; and/or
  - is assumed to begin immediately after the last time at which the patient was witnessed to be at their neurological baseline.
- “Closest ED” is defined as closest emergency department (ED), regardless of regional boundaries, that has the shortest estimated transport time from the patient’s current location.
- Transport time must be estimated based on safe vehicular speed. Non-clinical issues that could affect patient, provider and public safety, such as road and weather conditions, are at the discretion of the vehicle operator.
- From the patient, family or bystander(s) attempt to identify the time of stroke onset. EMS personnel will encourage an individual who is able to verify the time of onset and/or provide collateral information and/or provide proxy consent to accompany the patient in the ambulance. If such a person cannot accompany the patient, obtain appropriate information for immediate contact (eg. cellular phone number) and advise them to keep the phone line open and be readily available.
- Minimize scene time. Continue assessment en route. Perform cardiac monitoring during transport. Establish supplemental oxygen for saturation (SpO2) less than 94%. Consider vascular access: if transporting to stroke site, establish vascular access during transport. Perform a 12 lead electrocardiogram on all patients you are not transporting to a stroke site; with chest pain, or with other suspicion of ACS.
- Table D contains the clinical information that will be required when consulting with a stroke neurologist and additional historical information that may be required to determine suitability for therapy.
- Repeat appropriate vital signs and a focused neurological examination as required. The frequency of reassessment will depend on the patient’s condition and stability, as well as the transport duration.
- Do not administer / allow anything by mouth.
- If you will be bypassing a closer ED and transporting directly to a stroke site, refer also to G02.1A STROKE BYPASS & IFT OVER-RIDE.
- Staff at the Medical Transportation Coordination Center (MTCC) can assist with determining the closest ED or stroke site (table A).
- Providers must ensure appropriate pre-arrival consultation with stroke neurologist where required by regional practice or protocol. Providers must ensure appropriate pre-arrival by notification of ED staff at all facilities.
<table>
<thead>
<tr>
<th>Table A: Current Stroke Treatment Sites in Manitoba</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COMPREHENSIVE STROKE CENTER:</strong></td>
</tr>
</tbody>
</table>
| • Health Sciences Center (Winnipeg) | Paging: 204-787-2071  
                      Emergency: 204-787-3167 or 204-787-3168 |
| **PRIMARY STROKE CENTERS:** |
| • Brandon Regional Hospital (Brandon) |
| • St. Boniface Hospital (Winnipeg) | Paging: 204-237-2053  
                      Emergency: 204-233-8563 |
| **TELEHEALTH STROKE SITES:** |
| • Dauphin Regional Health Center (Dauphin) |
| • St. Anthony’s General Hospital (The Pas) |
| • Thompson General Hospital (Thompson) |
Table B: Anticoagulants

<table>
<thead>
<tr>
<th>ORAL</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic Name</strong></td>
<td><strong>Canadian Name</strong></td>
<td><strong>American Name</strong></td>
</tr>
<tr>
<td>Apixiban</td>
<td>ELIQUIS</td>
<td>ELIQUIS</td>
</tr>
<tr>
<td>Betrixiban</td>
<td><em>Not available in Canada</em></td>
<td>BEVYXXA</td>
</tr>
<tr>
<td>Dabigatran</td>
<td>PRADAXA</td>
<td>PRADAXA</td>
</tr>
<tr>
<td>Edoxaban</td>
<td>LIXIANA</td>
<td>LIXIANA</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>XARELTO</td>
<td>XARELTO</td>
</tr>
<tr>
<td>Warfarin</td>
<td>COUMADIN</td>
<td>JANTOVEN</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>INJECTABLE</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic Name</strong></td>
<td><strong>Canadian Name</strong></td>
<td><strong>American Name</strong></td>
</tr>
<tr>
<td>Dalteparin</td>
<td>FRAGMIN</td>
<td>FRAGMIN</td>
</tr>
<tr>
<td>Danaparoid</td>
<td>ORGARAN</td>
<td>ORGARAN</td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>LOVENOX</td>
<td>LOVENOX</td>
</tr>
<tr>
<td>Fondaparinux</td>
<td>ARIXTRA</td>
<td>ARIXTRA</td>
</tr>
<tr>
<td>Nadroparin</td>
<td>FRAXIPARINE</td>
<td>FRAXIPARINE</td>
</tr>
<tr>
<td>Tinzaparin</td>
<td>INNOHEP</td>
<td>INNOHEP</td>
</tr>
<tr>
<td>Unfractionated heparin</td>
<td>HEPARIN</td>
<td>HEPARIN</td>
</tr>
</tbody>
</table>
### Table C: Los Angeles Motor Scale (LAMS) Score

<table>
<thead>
<tr>
<th>Facial droop</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>Normal or no facial asymmetry</td>
<td>0</td>
</tr>
<tr>
<td>Present</td>
<td>Partial or complete drooping of lower face</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arm drift</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>Normal or no drift</td>
<td>0</td>
</tr>
<tr>
<td>Drifts down</td>
<td>Does not fall within 10 seconds</td>
<td>1</td>
</tr>
<tr>
<td>Falls down</td>
<td>Cannot be held up against gravity or falls within 10 seconds</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grip strength</th>
<th>Description</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>Normal</td>
<td>0</td>
</tr>
<tr>
<td>Weak grip</td>
<td>Some movement but weak</td>
<td>1</td>
</tr>
<tr>
<td>No grip</td>
<td>No visible movement (contraction may be seen but movement is absent)</td>
<td>2</td>
</tr>
</tbody>
</table>

**Total**

**Range = 0 to 5**

**Step #1:**
If there is no obvious facial droop, ask the patient to smile.

**Step #2:**
Ask the patient to hold up both arms with the palms facing downward. If lying down, ask them to raise both arms to 45 degrees.

**Step #3:**
Ask them to grasp your index and middle finger to assess their grip strength.
### Table D: Required information.

**Initial information** (to determine destination):
- Patient age & gender
- Time of stroke onset *
  - Is it self-reported or witnessed?
- Symptom(s) or sign(s) suspicious for / consistent with stroke
- Anticoagulation (see table B) *
  - If the patient is on warfarin, is the INR known for certainty and, if so, what is it?
- Estimated transport time to closest stroke center *
- Advanced health care directive (yes, no or unknown)
  - If the patient has a directive, what level of care is directed?

**Identifying information** (required to access prior medical records):
- Patient name
- Personal health information number (PHIN) from MHSAL health card
- Date of birth

**Initial clinical assessment**
- Vital signs, including point-of-care glucose
- LAMS score (see table C) *
- Focused neurological examination for stroke - note right or left:
  - Level of consciousness (alert, responds to voice, responds to pain or unresponsive)
  - Speech (normal, slurred, incoprehensible or mute)
  - Smile (normal, partial droop or complete droop)
  - Arm strength (normal, slow drift or rapid fall)
  - Hand grip strength (normal, weak or absent)
  - Leg strength (normal, slow drift or rapid fall)

**Medical history** (obtain as much detail as possible):
- Within the last three months has the patient had
  - A surgical procedure, and/or
  - A serious injury, and/or
  - A myocardial infarction, and/or
  - Any serious bleeding?
- Has the patient had a seizure within the last 24 hours?
- Does the patient have a bleeding or clotting disorder?
- What other health conditions does the patient have?
- What medications does the patient take?
- Is the patient allergic to any medication or substance?
- When did the patient last eat?

* Indicates information essential to determining destination and logistics of transport and must be obtained as early as possible.
Rapid return to full alertness

Seizure suspected or confirmed

TIA suspected or confirmed

SEIZURES

UNSTABLE BRADYCARDIA
UNSTABLE TACHYCARDIA

Ensure airway & oxygenation
Exclude hypoglycemia

Rapid return to full alertness

No

COMA & DECREASED LOC

Consider cardiac monitor
Consider vascular access

Yes

TIA suspected or confirmed

Yes

ACUTE STROKE

No

Arrhythmia suspected or confirmed

UNSTABLE BRADYCARDIA
UNSTABLE TACHYCARDIA

Yes

TRANSPORT

No
<table>
<thead>
<tr>
<th><strong>INDICATIONS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patients with one or more episodes of syncope, near-syncope or pre-syncope</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>CONTRAINDICATIONS:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>• None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>NOTES:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reminder:</strong> Syncope is defined as an abrupt decrease in or loss of consciousness, brief in duration (measured in seconds), that is followed by a rapid return to normal alertness. The causes of true syncope are few. A persistent decrease in LOC after a main event and/or a slow return to normal alertness suggests other causes (see also E06A COMA &amp; DECREASED LOC).</td>
</tr>
<tr>
<td>• Multiple recurrent episodes suggest malignant cardiac dysrhythmia.</td>
</tr>
</tbody>
</table>
Ensure airway & oxygenation
Exclude hypoglycemia

Rapid return to full alertness

Yes

No

COMA & DECREASED LOC

Consider cardiac monitor
Consider vascular access

If SEIZURES

Seizure suspected or confirmed

Yes

No

UNSTABLE BRADYCARDIA
UNSTABLE TACHYCARDIA

Yes

No

Arrhythmia suspected or confirmed

TRANSPORT
INDICATIONS:
- Patients with one or more episodes of syncope, near-syncope or pre-syncope

CONTRAINDICATIONS:
- None

NOTES:
Reminder: Syncope is defined as an abrupt decrease in or loss of consciousness, brief in duration (measured in seconds), that is followed by a rapid return to normal alertness. The causes of true syncope are few. A persistent decrease in LOC after a main event and / or a slow return to normal alertness suggests other causes (see also to E06B COMA & DECREASED LOC).
- Multiple recurrent episodes suggest malignant cardiac dysrhythmia.
Ensure airway & oxygenation  
Exclude hypoglycemia

- Rapid return to full alertness
  - Yes
  - Consider cardiac monitor  
    Consider vascular access
  - No

- SEIZURES
  - Yes
  - Seizure suspected or confirmed
  - No

- UNSTABLE BRADYCARDIA
  - Yes
  - Arrhythmia suspected or confirmed
  - No

- TRANSPORT

- UNSTABLE TACHYCARDIA

- COMA & DECREASED LOC
  - No
## INDICATIONS:
- Patients with one or more episodes of syncope, near-syncope or pre-syncope

## CONTRAINDICATIONS:
- None

## NOTES:
**Reminder:** Syncope is defined as an abrupt decrease in or loss of consciousness, brief in duration (measured in seconds), that is followed by a rapid return to normal alertness. The causes of true syncope are few. A persistent decrease in LOC after a main event and / or a slow return to normal alertness suggests other causes (see also to E06C COMA & DECREased LOC).
- Multiple recurrent episodes suggest malignant cardiac dysrhythmia.
Establish vascular access; Consider ECG

SBP less than 100 mmHg or shock suspected

Yes

NONTRAUMATIC HYPOTENSION & SHOCK

No

Consider IV insulin

Severe ketosis

Yes

Administer 0.9% saline 20 ml/kg per hr

Severe dehydration

No

Transport

Administer 0.9% saline TKVO

Severe dehydration
**INDICATIONS:**
- Serum glucose greater than 20 mmol/l

**CONTRAINDICATIONS:**
- Do not administer insulin if hypokalemia is known or suspected
- Do not administer lactated Ringer's solution if hyperkalemia is known or suspected

**NOTES:**
- Hyperventilation and strong odor of ketones suggest DKA

**REGULAR INSULIN**
- 0.1 unit / kg IV once
- Max dose = 5 units

**0.9% (Normal) Saline Solution:**
- 20 ml/kg (max = 1000 ml per bolus) per hr
- Consider smaller boluses (10 ml/kg) if age > 75 yr or cardiac dysfunction known / suspected

**ABBREVIATIONS:**
- DKA = diabetic ketoacidosis
- ECG = electrocardiogram
- hr = hour
- IV = intravenous
- max = maximum
- ml /kg = milliliters per kilogram
- mmHg = millimeters of mercury
- mmol/l = millimoles per liter
- SBP = systolic blood pressure
- TKVO = to keep vein open (approximately 50 ml/hr)
Establish vascular access

SBP less than 100 mmHg or shock suspected

Consider IV insulin

Severe ketosis

Administer 0.9% saline 20 ml/kg per hr

Administer 0.9% saline TKVO

TRANSPORT

NONTRAUMATIC HYPOTENSION & SHOCK

Yes

No

Yes

No
**INDICATIONS:**
- Serum glucose greater than 20 mmol/l

**CONTRAINDICATIONS:**
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- Do not administer lactated Ringer’s solution if hyperkalemia is known or suspected

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- 0.1 unit / kg IV once
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- max = maximum
- ml /kg = milliliters per kilogram
- mmHg = millimeters of mercury
- mmol/l = millimoles per liter
- SBP = systolic blood pressure
- TKVO = to keep vein open (approximately 50 ml/hr)
Establish vascular access

Hypotension or shock suspected

No

Administer 0.9% saline 10 - 15 ml/kg per hr

TRANSPORT

Yes

NONTRAUMATIC HYPOTENSION & SHOCK
### INDICATIONS:
- Serum glucose greater than 20 mmol/l

### CONTRAINDICATIONS:
- None

### NOTES:
- For this protocol, hypotension will be defined as SBP less than the age appropriate minimum (< 70 + 2 x age).

### 0.9% (Normal) Saline Solution:
- 10 - 15 ml/kg per hr

### ABBREVIATIONS:
- hr = hour
- IV = intravenous
- max = maximum
- ml/kg = milliliters per kilogram
- mmol/l = millimoles per liter
- SBP = systolic blood pressure
- TKVO = to keep vein open (approximately 25 ml/hr)
Chest Pain – Adult

1. **Possible ACS**
   - Yes: **ACUTE CORONARY SYNDROME**
   - No: **Consider vascular access**

2. **Dyspnea, respiratory distress or SaO2 < 90%**
   - Yes: **AIRWAY & BREATHING MANAGEMENT**
   - No: **Consider vascular access**

3. **SBP less than 100 mmHg or suspected shock**
   - Yes: **NONTRAUMATIC HYPOTENSION & SHOCK**
   - No: **Consider simple analgesia**

4. **Consider opioid analgesia**

5. **TRANSPORT**
INDICATIONS:

- Acute chest pain *not* consistent with or suspicious for acute coronary syndrome

CONTRAINDICATIONS:

- Acute chest pain known or suspected to be associated with ACS

NOTES:

- Do not administer oral analgesia if airway management is anticipated.

ABBREVIATIONS:

- ACS = acute coronary syndrome
- ECG – electrocardiogram
- mmHg – millimeters of mercury
- SaO2 – oxygen saturation
- SBP – systolic blood pressure
AIRWAY & BREATHING MANAGEMENT

Yes

Dyspnea, respiratory distress or SaO2 < 90%

No

Consider vascular access
Consider ECG

SBP less than 100 mmHg or suspected shock

Yes

NONTRAUMATIC HYPOTENSION & SHOCK

No

Consider simple analgesia

Consider opioid analgesia

TRANSPORT
### INDICATIONS:
- Acute chest pain

### CONTRAINDICATIONS:
- None

### NOTES:
- Do not administer oral analgesia if airway management is anticipated.

### ABBREVIATIONS:
- ECG – electrocardiogram
- mmHg – millimeters of mercury
- SaO2 – oxygen saturation
- SBP – systolic blood pressure
AIRWAY & BREATHING MANAGEMENT

Yes

Dyspnea, respiratory distress or SaO2 < 90%

No

Consider vascular access

Hypotension or suspected shock

Yes

NONTRAUMATIC HYPOTENSION & SHOCK

No

Consider simple analgesia

Consider opioid analgesia

TRANSPORT
### INDICATIONS:
- Acute chest pain

### CONTRAINDICATIONS:
- None

### NOTES:
- Do not administer oral analgesia if airway management is anticipated.
- For this protocol, hypotension will be defined as SBP less than the age appropriate minimum ($< 70 + 2 \times \text{age}$).

### ABBREVIATIONS:
- mmHg – millimeters of mercury
- SaO2 – oxygen saturation
- SaO2 – oxygen saturation
- SBP – systolic blood pressure
Acute Heart Failure - Adult

Ensure oxygenation

Consider CPAP
- No: Consider salbutamol
- Yes: Obtain IV access, Obtain ECG

Obtain IV access, Obtain ECG

Consider CPAP

SBP > 100 mmHg
- Yes: Administer furosemide
- No: HYPOTENSION & SHOCK

HYPOTENSION & SHOCK

SBP > 100 mmHg
- Yes: Consider opioid
- No: Administer NTG

Administer NTG

ACUTE CORONARY SYNDROME

ACS
- Yes: ACUTE CORONARY SYNDROME
- No: TRANSPORT

Consider discontinuing CPAP
**INDICATIONS:**
- The following symptoms or signs or findings consistent with heart failure:
  - Dyspnea
  - Respiratory distress
  - Respiratory failure (desaturation on oximetry)
  - Wheezing

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Providers with appropriate delegation should obtain an ECG as early as possible.
- Providers with appropriate delegation may consider application of CPAP at any time. Do not apply CPAP if the patient is hypotensive. If the patient subsequently develops hypotension, consider discontinuing CPAP.
- After hypotension has been corrected, providers with appropriate delegation may consider low dose fentanyl to provide partial relief of dyspnea.

**Fentanyl (low dose)**
- 0.5 mcg/kg IV (single dose maximum = 25 mcg)
- Repeat every 10 to 15 minutes as required
- *For standard doses & other opioids see M3 OPIOID ANALGESIA*

**Furosemide**
- 20 mg IV if the patient is not currently taking furosemide
- 40 mg IV if the patient is currently taking furosemide
- 80 mg IV if the patient is known to have chronic renal failure

**Salbutamol**
- 2.5 mg by nebulizer - if not on CPAP mask
- Repeat as required (no maximum)

**Sublingual nitroglycerin**
- 0.4 mg sublingual - if not on CPAP mask
- Repeat every 5 minutes as required

**Transdermal nitroglycerin**
- SBP greater than 200 mmHg, apply 0.6 mg/hr
- SBP greater than 150 mmHg, apply 0.4 mg/hr
- SBP greater than 100 mmHg, apply 0.2 mg/hr

**ABBREVIATIONS:**
- ACS – acute coronary syndrome
- CPAP – continuous positive airway pressure
- ECG – electrocardiogram
- IV – intravenous
- NTP – nitropatch (transdermal nitrate)
- SBP – systolic BP
HYPOGLYCEMIA & DIABETIC EMERGENCIES

Hypoglycemia suspected or confirmed

Patient is NPO

Establish IV access

Consider IM benzodiazepine

IV access delayed or not available

Administer IV benzodiazepine

Symptom relief?

Yes

No

Administer PO benzodiazepine

Consider contacting law enforcement for assistance

Yes

No

TRANSPORT

Complete MEDICAL ASSESSMENT

Symptom relief?

Yes

No

Administer IV benzodiazepine

Symptom relief?
**INDICATIONS:**
- Known or suspected alcohol withdrawal, delirium tremens, or alcoholic hallucinosis
- Known or suspected benzodiazepine withdrawal

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Monitor for both hypoglycemia and alcohol withdrawal in patients who regularly consume large amounts of alcohol.
- Patients in alcohol withdrawal may require large doses of benzodiazepines. Continuously monitor for respiratory depression, hypotension and excessive sedation after administration.

<table>
<thead>
<tr>
<th>PO BENZODIAZEPINE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DIAZEPAM</td>
<td>20 mg; repeat every 30 min as required</td>
</tr>
<tr>
<td>LORAZEPAM</td>
<td>2 mg; repeat every 30 min as required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IM BENZODIAZEPINE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LORAZEPAM</td>
<td>1 to 2 mg; repeat once in 15 min if required</td>
</tr>
<tr>
<td>MIDAZOLAM</td>
<td>10 mg; repeat once in 15 min if required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IV BENZODIAZEPINE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DIAZEPAM</td>
<td>5 to 10 mg; repeat every 10 min as required</td>
</tr>
<tr>
<td>LORAZEPAM</td>
<td>1 to 2 mg; repeat every 10 min as required</td>
</tr>
<tr>
<td>MIDAZOLAM</td>
<td>0.05 to 0.1 mg/kg (single max dose = 5 mg); repeat every 5 min as required</td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**
- IM = intramuscular
- IV = intravenous
- kg = kilogram
- max = maximum
- mg = milligram
- mg/kg = milligram per kilogram
- min = minute
- PO = oral
HYPOGLYCEMIA & DIABETIC EMERGENCIES

Hypoglycemia suspected or confirmed

Consider IM benzodiazepine

Complete MEDICAL ASSESSMENT

Administer PO benzodiazepine

Patient is NPO

Establish IV access

Yes

No

Symptom relief?

Yes

No

Consider contacting law enforcement for assistance

Administer IV benzodiazepine

IV access delayed or not available

Yes

No

Symptom relief?

Yes

No

TRANSPORT

E20B Medical Office of the Medical Director 2017-06-19 Alcohol & Drug Withdrawal – Adolescent E20B Withdrawal Page 1
**INDICATIONS:**
- Known or suspected alcohol withdrawal, delirium tremens, or alcoholic hallucinosis
- Known or suspected benzodiazepine withdrawal

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Monitor for both hypoglycemia and alcohol withdrawal in patients who regularly consume large amounts of alcohol.
- Patients in alcohol withdrawal may require large doses of benzodiazepines. Continuously monitor for respiratory depression, hypotension and excessive sedation after administration.

<table>
<thead>
<tr>
<th>PO BENZODIAZEPINE (PCP and above)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIAZEPAM</strong></td>
</tr>
<tr>
<td>• 10 to 20 mg; repeat once in 30 min if required</td>
</tr>
<tr>
<td><strong>LORAZEPAM</strong></td>
</tr>
<tr>
<td>• 1 to 2 mg; repeat once in 30 min if required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IM BENZODIAZEPINE (ICP and above)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LORAZEPAM</strong></td>
</tr>
<tr>
<td>• 1 to 2 mg; repeat once in 15 min if required</td>
</tr>
<tr>
<td><strong>MIDAZOLAM</strong></td>
</tr>
<tr>
<td>• Wt &gt; 40 kg - 10 mg; repeat once in 15 min if required</td>
</tr>
<tr>
<td>• Wt &lt; 40 kg - 5 mg; repeat once in 15 min if required</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IV BENZODIAZEPINE (ICP and above)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIAZEPAM</strong></td>
</tr>
<tr>
<td>• 5 mg; repeat every 10 min as required (max 3 doses)</td>
</tr>
<tr>
<td><strong>LORAZEPAM</strong></td>
</tr>
<tr>
<td>• 1 to 2 mg; repeat every 10 min as required (max 3 doses)</td>
</tr>
<tr>
<td><strong>MIDAZOLAM</strong></td>
</tr>
<tr>
<td>• 0.05 to 0.1 mg/kg (single max dose = 5 mg); repeat every 5 min as required</td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**
- ICP = intermediate care provider
- IM = intramuscular
- IV = intravenous
- kg = kilogram
- max = maximum
- mg = milligram
- mg/kg = milligram per kilogram
- min = minute
- PCP = primary care provider
- PO = oral
Recheck BP

BP greater than 230/130 mmHg

Yes

Consider IV access
Apply NTP

Recheck BP in 15 min

BP greater than 230/130 mmHg

Yes

Repeat NTP

Recheck BP in 15 min

BP greater than 230/130 mmHg

Yes

Repeat NTP

BP less than 200/100 mmHg

Yes

Discontinue NTP

No

Continue TRANSPORT
### INDICATIONS:
- Isolated hypertension with BP greater than 230/130 mmHg on at least two measurements

### CONTRAINDICATIONS:
- Elevated BP is known or suspected to be due to acute pain, anxiety, drug ingestion, or drug/alcohol withdrawal, and/or
- Elevated BP is present in association with head trauma or injury, or altered LOC, and/or
- Elevated BP is managed as part of other specific care map:
  - E04.1A ACUTE CORONARY SYNDROME – ADULT
  - E09A HEADACHE - ADULT
  - E15.1A ACUTE STROKE - ADULT
  - E19A ACUTE HEART FAILURE - ADULT

### NOTES:
- REMINDER: Isolated asymptomatic hypertension does not require rapid lowering of BP
- Target range for SBP is 200 to 230 mmHg and target range for DBP is 100 to 130 mmHg
- Repeat blood pressure measurement after the patient has been loaded and secured and transport has been initiated.
- If BP decreases below 200/100 mmHg, remove NTP one dose at a time and reassess

### TOPICAL NITROGLYCERIN (NTP):
- 0.2 mg/hr and repeat up to maximum of 0.6 mg/hr

### ABBREVIATIONS:
- BP = blood pressure
- DBP = diastolic BP
- IV = intravenous
- LOC = level of consciousness
- min = minutes
- mg/hr = milligram per hour
- mmHg = millimeters of mercury
- NTP = transdermal nitroglycerin (nitropatch)
- SBP = systolic BP
Is the patient currently cooperative?  

Yes  

Does the patient have evidence of acute illness (table A) or significant injury?  

No  

Go to E2 AGITATION  

Yes  

Is there a reasonable suspicion of current or developing amphetamine psychosis?  

No  

Contact law enforcement as necessary to assist with transport  

Yes  

Administer olanzapine once by mouth  

Contact law enforcement as necessary to assist with transport  

Transport to the closest ED  

Refer to appropriate patient care map
INDICATIONS:
- Known or suspected ingestion of amphetamine-type stimulants within the last 48 hours

CONTRAINDICATIONS:
- Known or suspected acute illness or significant injury

NOTES:
- Amphetamine-type stimulants can cause a psychosis in up to one-third of users. The predominant symptoms include paranoia, persecutory delusions and hallucinations. It can last for several days post-ingestion and can recur during periods of abstinence. In the case of methamphetamine, it may be accompanied by the rapid development of extreme paranoia, and violent behavior with enhanced physical strength. Early administration of olanzapine may lessen the severity and duration of psychosis.
- Findings of stimulant ingestion include dilated pupils (mydriasis), sympathetic nervous system hyperactivity (fever, tachycardia and hypertension) and psychomotor agitation (including pacing and excessive talking).
- The onset of psychosis is suggested by increased restlessness and agitation, disorientation, hallucinations (auditory, visual and/or tactile) and extreme paranoia.
- After the onset of the psychosis medication administration may be difficult. Without coercion, EMS providers will encourage appropriate patients to voluntarily take olanzapine. Parental or custodial consent will be required for minor patients. Administer olanzapine as per M22 - OLANZAPINE.
- Patients who have taken amphetamine-type stimulants, especially methamphetamine, may deteriorate rapidly with the development of high fever, extremely high blood pressure and seizures. Olanzapine may cause significant hypotension. Obtain full vital signs every 15 minutes during transport.
- If the patient has received prehospital olanzapine, document appropriately and ensure receiving emergency department (ED) have been notified.

Table A: Symptoms or signs suggesting acute illness and contraindicating olanzapine administration.
- Chest pain
- Abdominal pain
- Acute back pain
- Dyspnea
- Headache
- Seizure
- New neurological deficit
- Fever
Supine position
Direct pressure to bleeding site
Consider tourniquet application
High flow oxygen

Consider hemostatic dressing to bleeding site

TRANSPORT

Consider IV access
Consider IO access

Administer crystalloid to achieve SBP = 80 to 90 mmHg

Consider tranexamic acid
**INDICATIONS:**
- All trauma patients with external hemorrhage causing or potentially causing exsanguination

**CONTRAINDICATIONS:**
- None

**NOTES:**
- If exsanguinating external hemorrhage from an injured extremity cannot be controlled by direct pressure, apply a tourniquet. Do not loosen or remove the tourniquet at any time once bleeding is controlled.
- Providers may apply a hemostatic dressing on the wound, then resume direct pressure
- With limited resources, due not interrupt direct pressure to obtain vascular access. With adequate resources, one provider may obtain IO or IV access while another provider maintains direct pressure.
- Providers with appropriate delegation may consider administration of tranexamic acid (TXA). With limited resources, do not interrupt direct pressure to obtain vascular access.

**TRANEXAMIC ACID:**
- 1 gram IO or IV; once only

**0.9% (NORMAL) SALINE or RINGER’S LACTATE:**
- 20 ml/kg bolus (to maximum 1000 ml); repeat as required
- Consider smaller boluses if age > 75 years or cardiac dysfunction is known or suspected
Supine position
Direct pressure to bleeding site
Consider tourniquet application
High flow oxygen

Consider hemostatic dressing to bleeding site

TRANSPORT

Consider IV access
Consider IO access

Administer crystalloid to achieve SBP = 80 to 90 mmHg
### INDICATIONS:
- All trauma patients with external hemorrhage causing or potentially causing exsanguination

### CONTRAINDICATIONS:
- None

### NOTES:
- If exsanguinating external hemorrhage from an injured extremity cannot be controlled by direct pressure, apply a tourniquet. Do not loosen or remove the tourniquet at any time once bleeding is controlled.
- Providers may apply a hemostatic dressing on the wound, then resume direct pressure.
- With limited resources, do not interrupt direct pressure to obtain vascular access. With adequate resources, one provider may obtain IO or IV access while another provider maintains direct pressure.

### 0.9% (NORMAL) SALINE or RINGER’S LACTATE:
- 20 ml/kg per bolus (to maximum 1000 ml); repeat as required
Supine position
Direct pressure to bleeding site
Consider tourniquet application
High flow oxygen

Consider hemostatic dressing to bleeding site

TRANSPORT

Consider IV access
Consider IO access

Administer crystalloid to achieve palpable radial or femoral pulse
**INDICATIONS:**
- All trauma patients with external hemorrhage causing or potentially causing exsanguination

**CONTRAINDICATIONS:**
- None

**NOTES:**
- If exsanguinating external hemorrhage from an injured extremity cannot be controlled by direct pressure, apply a tourniquet. Do not loosen or remove the tourniquet at any time once bleeding is controlled.
- Providers may apply a hemostatic dressing on the wound, then resume direct pressure.
- With limited resources, do not interrupt direct pressure to obtain vascular access. With adequate resources, one provider may obtain IO or IV access while another provider maintains direct pressure.

**0.9% (NORMAL) SALINE or RINGER’S LACTATE:**
- 20 ml/kg per bolus (to maximum 500 ml); repeat as required
Consider pelvic binding

Possible pelvic fracture with internal bleeding

No

Possible femur fracture with internal bleeding

Yes

Consider extremity splinting

No

Supine position
High flow oxygen

TRANSPORT

Establish IV
Establish IO

Known or suspected head injury

Yes

Administer crystalloid to achieve SBP = 100 – 120 mmHg

No

SBP < 100 mmHg or suspicion of shock

No

Maintain crystalloid @ TKVO

Yes

Administer crystalloid to achieve SBP = 80 to 90 mmHg
**INDICATIONS:**

- All trauma patients with external bleeding or known / suspected internal bleeding causing or potentially causing hypotension or shock

**CONTRAINDICATIONS:**

- None

**NOTES:**

- Pelvic binding should be applied across the greater trochanters of the femurs, rather than the superior iliac spines.

- IV access should be established in the largest available vein. Consider establishing two sites of IV access depending on the patient’s condition and stability, transport time, and the skill set of the treating personnel. Consider IO device insertion if IV access is unobtainable but required.

- Significant blood loss (30 to 40%) can be present despite a normal BP (compensated shock). Tachycardia or narrowed pulse pressure may be early clues. Factors such as athleticism and pregnancy alter the clinical response to hemorrhage, while advanced age and numerous medications may mask or impair clinical response and reduce the body’s ability to tolerate acute blood loss.

**TRANEXAMIC ACID:**

- 1 gram IV or IO; once only

**0.9% (NORMAL) SALINE or RINGER’S LACTATE:**

- 20 ml/kg bolus (to maximum 1000 ml); repeat as required
- Consider smaller boluses if age > 75 years or cardiac dysfunction is known or suspected
Consider pelvic binding

Yes

Possible pelvic fracture with internal bleeding

No

Possible femur fracture with internal bleeding

Yes

Consider extremity splinting

No

Supine position
High flow oxygen

TRANSPORT

Establish IV
Establish IO

Known or suspected head injury

Yes

Administer crystalloid to achieve SBP = 100 – 120 mmHg

No

SBP < 100 mmHg or suspicion of shock

Yes

Administer crystalloid to achieve SBP = 80 to 90 mmHg

No

Maintain crystalloid @ TKVO

Administer crystalloid to achieve SBP = 80 to 90 mmHg
**INDICATIONS:**
- All trauma patients with external bleeding or known / suspected internal bleeding causing or potentially causing hypotension or shock

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Pelvic binding should be applied across the greater trochanters of the femurs, rather than the superior iliac spines.
- IV should be established in the largest available vein utilizing a short, widecannula. Consider establishing two sites of IV access depending on the patient’s condition and stability, transport time, and the skill set of the treating personnel. Consider IO device insertion if IV access is unobtainable but required.
- Significant blood loss (30 to 40%) can be present despite a normal BP (compensated shock). Tachycardia or narrowed pulse pressure may be early clues. Factors such as athleticism and pregnancy alter the clinical response to hemorrhage.

**0.9% (NORMAL) SALINE or RINGER’S LACTATE:**
- 20 ml/kg per bolus (to maximum 1000 ml); repeat as required
Possible femur fracture with internal bleeding

Yes: Consider extremity splinting

No: Supine position
    High flow oxygen

EMERGENT TRANSPORT

Establish IV
Establish IO

Known or suspected head injury

Yes: Administer crystalloid to achieve the minimum age-adjusted SBP

No: Low SBP or suspicion of shock

Yes: Maintain crystalloid @ TKVO

No: Administer crystalloid to achieve palpable femoral pulse
**INDICATIONS:**
- All trauma patients with external bleeding or known / suspected internal bleeding causing or potentially causing hypotension or shock

**CONTRAINDICATIONS:**
- None

**NOTES:**
For this protocol, the age-adjusted minimum systolic blood pressure (SBP) is calculated as $70 + (2 \times \text{age})$.

- Vascular access should be established by the quickest means possible. Consider IO device insertion if IV access is (or is anticipated to be) unobtainable.
- If IV access is obtained, use the largest available vein utilizing a short, wide cannula. Consider establishing two sites of IV access depending on the patient’s condition and stability, transport time, and the skill set of the treating personnel.
- Significant blood loss can be present despite a normal BP (compensated shock). Tachycardia or narrowed pulse pressure may be early clues.

**0.9% (NORMAL) SALINE or RINGER’S LACTATE:**
- 20 ml/kg per bolus (to maximum 500 ml); repeat as required
Remove patient from burn source

Chemical or radiation burn
- Yes: Decontaminate
- No: Consider O2, Remove constrictive items, Estimate depth & area, Consider irrigation, Cover

Establish IO access
- Establish IV access
- Consider fluid administration
- Consider analgesia

Monitor for arrhythmia
- Yes
- No: Electrical burn

Suspected or known airway burns
- Resp complaints /distress or SaO2 < 94%
- Circumferential burn(s) of thorax
- Hypotension or shock

Corneal burn
- Yes: Flush eyes
- No

TRANSPORT

F03 Burns
INDICATIONS:
- All patients of all ages with thermal, chemical, electrical and radiation burns.

CONTRAINDICATIONS:
- Life threatening injuries must be resolved or stabilized prior to initiating this care map.

NOTES:
- Other agencies or services may be required to remove the patient from danger before EMS can initiate assessment and treatment.
- Dry chemicals should be brushed off the skin with a soft brush or gauze, and then irrigated copiously with room temperature fluid. Wet chemicals should be irrigated copiously with room temperature fluid. Information regarding the chemical causing the injury should be obtained if possible.
- Patients exposed to certain types of radiation may pose a risk to EMS personnel and may require decontamination before they can be treated or transported. Local technical personnel may be able to provide information for the safe handling of contaminated persons. Manitoba Conservation – Environmental Operations: Dangerous Goods Emergency Response (1-204-944-4888) is available 24 hours every day to provide appropriate information, resources and personnel.
- Any burning or burned clothing must be carefully removed. Remove all jewelry or constrictive clothing before swelling begins.
- Patients from an enclosed fire should receive supplemental oxygen by a NRB at high flow rate, regardless of SaO2.
- Appendix A provides information on assessing size (area) and depth (degree) of burns. Second degree partial thickness and third degree full thickness burns greater than 20% BSA are potentially life threatening injuries.
- Thermal burns can be irrigated with room temperature fluids for pain control. Be aware of the potential of hypothermia with prolonged irrigation and/or large surface areas.
- Do not break blisters. Burns should be covered with clean dry dressings / sheets or commercial burn dressings.
- Excluding patients with known or suspected bleeding, providers should consider intravenous (IV) or intraosseous (IO) fluid administration.
  - If SBP is greater than 100 mmHg, administer IV solution at 500 ml/hr.
  - If SBP is less than 100 mmHg, administer IV solution in bolus volumes of 20 ml/kg (to maximum 1 liter per bolus) and repeat as required. When SBP is greater than 100 mmHg continue at 500 ml/hr.
  - Continuously monitor for signs of pulmonary volume overload, especially in the elderly. If volume overload develops, reduce the rate of fluid administration to TKVO (regardless of the SBP) and initiate emergent transport.
- Patients exposed to strong electrical high current must have continuous electrocardiographic monitoring.
- Consider airway inhalational injury or burn, even in the absence of facial burns, especially if patient was in an enclosed space. REMINDER: Airway compromise can develop rapidly.
- Consider pulmonary inhalational injury, especially if patient was in an enclosed space. Consider pulmonary burns if exposed to hot gases or water vapor.
- Circumferential thoracic burns may lead to restrictive respiratory compromise and are a life threatening emergency.
- Providing there are no other potential life-threatening injuries requiring emergent transport, corneal burns should be irrigated as soon as possible. If there is no evidence of penetrating injury to the globe, thermal burns less than 30 minutes old and all chemical burns can be irrigated copiously with normal saline or sterile water. In the absence of life threatening injuries, this can be done prior to transport. Cool moist compresses can then be applied for pain control.
### Appendix A:
Estimating size (body surface area) and depth of burns

<table>
<thead>
<tr>
<th></th>
<th>ADULT (% BSA)</th>
<th>INFANT / YOUNG CHILD (% BSA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Front torso</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Arm</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Leg</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Genitalia</td>
<td>1</td>
<td>n/a</td>
</tr>
<tr>
<td>Buttock</td>
<td>n/a</td>
<td>2.5</td>
</tr>
<tr>
<td>Palm</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First degree</th>
<th>Second degree</th>
<th>Third degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial thickness</td>
<td>Partial thickness</td>
<td>Full thickness</td>
</tr>
<tr>
<td>Epidermis</td>
<td>Epidermis &amp; dermis</td>
<td>Epidermis, dermis &amp; subcutaneous tissues</td>
</tr>
<tr>
<td>Redness; no blisters</td>
<td>Red, glistening, blisters</td>
<td>Waxy or charred, dry leathery</td>
</tr>
<tr>
<td>Painful +++</td>
<td>Painful +++</td>
<td>Painful +/-</td>
</tr>
<tr>
<td>Not life or limb threatening</td>
<td>Potentially life or limb threatening</td>
<td>Potentially life or limb threatening</td>
</tr>
</tbody>
</table>

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Spinal Motion Restriction (SMR)

1. Penetrating head or neck trauma?  
   - Yes: Initiate or continue SMR without cervical collar
   - No: Continue Trauma Assessment

2. Neck pain, tenderness or deformity?  
   - Yes: Transport
   - No: Proceed to neurological symptoms and/or signs?

3. Neurological symptoms and/or signs?  
   - Yes: EN ROUTE
     - Repeat primary assessment
     - Manage injuries as required
     - Complete secondary assessment
   - No: Unreliable assessment?

4. Unreliable assessment?  
   - Yes: Initiate or continue SMR with cervical collar
   - No: Pain or limitation with AROM?

5. Pain or limitation with AROM?  
   - Yes: Ongoing concern for unstable SCFD
   - No: Omit or discontinue SMR

6. Ongoing concern for unstable SCFD?  
   - Yes: Initiate or continue SMR with cervical collar
   - No: Complete Trauma Assessment
INDICATIONS:

- Any patient that is considered for spinal cord immobilization

NOTES: Long spine boards are not required for adequate SMR. They can be used for short periods of time for extrication and transfers. Adequate SMR can be achieved by the use of an appropriately-sized rigid cervical collar or other suitable device / method and the following steps:

- Instructing the alert cooperative patient to minimize movement.
- Minimizing transfers.
- Log-rolling the patient for any necessary transfers.
- Securing the patient in standard fashion to the stretcher in the full recumbent position.
- Utilizing the scoop stretcher or vacuum splint to transfer the patient.

- Immediate onset of pain is more concerning for than delayed onset of pain. Midline spinous process tenderness is more concerning for SCFD than lateral muscle tenderness.

- Patient subjective complaints of abnormal extremity sensation or strength is concerning for SCI, even with a normal neurological examination.

- Patient history and examination may be unreliable due to intoxication, a language barrier, chronic cognitive impairment, decreased level of consciousness (GCS less than 15), or significant distracting injury (extensive burns, large bone fracture).

- To test active range of motion (AROM), ask the patient to slowly turn his/her head to each side but to stop if there is any tingling or numbness noted in hands and/or feet, or increased pain in the midline neck.

- If the answers to all questions is the flow chart are all negative, the risk of unstable SCDF is extremely small. Providers may safely omit or discontinue SMR.

- If providers remain concerned for SCDF or SDI, consider initiating or continuing SMR. Factors that may increase the risk for spinal column and cord injury include:
  - Age > 65 years
  - Underlying spinal disease (rheumatoid arthritis, ankylosing spondylitis)
  - Any previous spinal surgery
  - High risk mechanism of injury
  - Axial load to top of head (diving injury)
  - Fall from height > 1 m (or 3 feet, or 5 steps)
  - High risk MVC
    - High speed (> 100 kph) at impact
    - Heavier or larger vehicle (truck, bus) striking smaller vehicle (car, motorcycle)
    - Roll-over / ejection
    - Pedestrian or cyclist struck by any motorized vehicle
ABBREVIATIONS:

- AROM – active range of motion
- GCS – Glasgow coma score
- kph – kilometers per hour
- m – meter
- MVC – motor vehicle collision
- SCFD – spinal column fracture or dislocation
- SCI – spinal cord injury
- SMR – spinal motion restriction
Assess visual acuity

- Shield both eyes without pressure
- Blunt or penetrating trauma
  - Yes: Consider IV access
  - No: Consider topical tetracaine

Consider opioid analgesia

- Consider PO analgesia
  - Yes: Thermal or chemical injury
  - No: Loose surface foreign body
    - Yes: Flush eyes
    - No: TRANSPORT

- TRANSPORT
<table>
<thead>
<tr>
<th>INDICATIONS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• All patients with known or suspected eye trauma</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CONTRAINDICATIONS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>NOTES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• REMINDER: Open globe injuries may result from blunt or penetrating eye trauma.</td>
</tr>
<tr>
<td>• Assess and document initial visual acuity.</td>
</tr>
<tr>
<td>• If there is no suspicion of open globe injury, providers with appropriate delegations may consider application of topical anesthetic and / or irrigation.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TETRACAINE 0.5%:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Instill 1 to 3 drops to affected eye</td>
</tr>
<tr>
<td>• Repeat every ten minutes as required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ABBREVIATIONS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• IV = intravenous</td>
</tr>
<tr>
<td>• PO = per mouth</td>
</tr>
</tbody>
</table>
Control significant external bleeding

Yes

Consider analgesic pre-reduction

No

Defect interferes with extrication

Consider PO analgesic

Consider IV access

Consider IN fentanyl

Consider IV/IM analgesic

Yes

Distal circulation compromised

Perform emergency reduction

No

Deformity interferes with transport

No

Open fracture

Yes

Clean & dress exposed bone

No

Splint

TRANSPORT
INDICATIONS:

- All patients of all ages with known or suspected long bone fractures.

CONTRAINDICATIONS:

- None

NOTES:

- Reinforce and / or replace dressings as required. Significant external bleeding may require direct pressure and / or application of a hemostatic dressing to achieve control. Uncontrollable life threatening bleeding may require tourniquet application.

- Check perfusion before and after reduction and splinting.

- For emergency reduction prior to extrication providers with appropriate delegation may consider the administration of IN / IV opioid analgesic. With known or suspected shock providers with appropriate delegation may consider IV ketamine.

- If deformity interferes with patient transport, attempt emergency reduction. If resistance to reduction is encountered or repositioning leads to a loss of distal perfusion, splint in position found.

- With compromise of distal circulation attempt emergency reduction. If resistance to reduction is encountered splint in position found.

- Note any evidence of possible open fracture (eg. protruding bone), document and inform receiving health care providers. Exposed bone should be cleansed of gross debris and dressed appropriately. Exposed bone does not contraindicate necessary reduction of a long bone fracture.

- If traction splints are used, providers must adhere to manufacturer’s recommendations for application, monitoring, and removal.

ABBREVIATIONS:

- IM = intramuscular
- IN = intranasal
- IV = intravenous
- PO = per mouth
Consider analgesic pre-reduction

Yes

Deformity interferes with extrication

No

Deformity interferes with transport

No

Distal circulation compromised

Yes

Consider emergency reduction

No

Splint

TRANSPORT

Consider PO analgesic

Consider IV access

Consider IN fentanyl

Consider IV/IM analgesic

Perform emergency reduction
**INDICATIONS:**
- All patients of all ages with known or suspected joint dislocation.

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Check perfusion **before and after** reduction and splinting.
- For emergency reduction prior to extrication providers with appropriate delegation may consider the administration of IN / IV opioid analgesic. With known or suspected shock providers with appropriate delegation may consider IV ketamine.
- If deformity interferes with patient transport, attempt emergency reduction. If resistance to reduction is encountered splint in position found.
- With compromise of distal circulation providers with appropriate delegation may attempt emergency reduction.

**ABBREVIATIONS:**
- IM = intramuscular
- IN = intranasal
- IV = intravenous
- PO = per mouth
Amputations & Lacerations

Control external bleeding

Yes

Uncontrollable or significant external bleeding

No

Establish vascular access
Consider fluid administration
Consider analgesia

Clean & dress
Splint as required

Complete / partial amputation
Impaired circulation
Impaled object
Evisceration

Yes

TRANSPORT

No

Return to TRAUMA ASSESSMENT
INDICATIONS:
- All patients of all ages with lacerations, deep abrasions, avulsions, partial or complete amputations, impalements or evisceration injuries.

REMINDER:
- Life threatening injuries must be resolved or stabilized prior to initiating this care map.

NOTES:
- Replace dressings only if they impede bleeding control. Reinforce as required. Significant external bleeding may require direct pressure and/or application of a hemostatic dressing to achieve control. Uncontrollable life threatening bleeding may require tourniquet application.
- Vascular access can be established en route if appropriate.
- All severed parts should be gently rinsed with sterile saline solution to remove gross debris, wrapped in sterile saline soaked dressings, sealed in a waterproof container and placed on ice. DO NOT SOAK SEVERED PARTS.
- Stabilize impaled object securely prior to transport. DO NOT REMOVE THE OBJECT unless it interferes with CPR or causes complete airway obstruction. Object may be carefully shortened if it impedes transport.
- Cover the evisceration with sterile saline soaked dressings and support with additional dressings to maintain warmth.
- Clean wound(s) of loose foreign material. Splint for pain control or if underlying fracture is suspected. Assess distal circulation & neurological function before and after applying dressing(s) and splint(s) and adjust as necessary.
**Pelvic Trauma**

**Related Flowchart**

1. **Known or suspected hemorrhage or shock**
   - Yes: Consider IV access, Consider IN fentanyl, Consider IV/IM analgesic
   - No: Splint/position for comfort

2. **Consider IV access**
   - Yes: Consider IN fentanyl, Consider IV/IM analgesic
   - No: Splint/position for comfort

3. **Return to TRAUMA ASSESSMENT**

4. **Impalement**
   - Yes: Apply pelvic binder
   - No: Splint/position for comfort

5. **Stabilize in place**

6. **Establish vascular access en route**

7. **Splint/position for comfort**

8. **Consider IV opioid analgesic**

**Notes**

- Known or suspected hemorrhage or shock
- Traumatic hemorrhage & shock
- Impalement
- Known or suspected open-book fracture(s)
- Pelvic Trauma
- All ages

**Date**

2017-08-01
**INDICATIONS:**

- All patients with blunt or penetrating pelvic injury

**CONTRAINDICATIONS:**

- None

**NOTES:**

- Control of obvious exsanguinating trauma takes priority.
- An impaled object should be secured in place unless it interferes with safe extrication and cannot be cut or otherwise dismantled.
- Pelvic binding should be applied across the greater trochanters of the femurs, rather than the superior iliac spines.
- Traction splints are contraindicated with known or suspected pelvic fracture.

**ABBREVIATIONS:**

- IM = intramuscular
- IN = intranasal
- IV = intravenous
Suspected tension pneumothorax

Perform needle decompression

Yes

No

Ensure oxygenation

Cover wound

Yes

Open chest wound

No

Impalement

Yes

Stabilize in place

No

Known or suspected hemorrhage or shock

Yes

Splint/position for comfort

Consider IV access
Consider IN fentanyl
Consider IV/IM analgesic

Return to TRAUMA ASSESSMENT

No

TRAUMATIC HEMORRHAGE & SHOCK

Establish vascular access
en route

TRANSPORT

Splint/position for comfort

Consider IV/IO opioid analgesic
**INDICATIONS:**
- All patients with blunt or penetrating thoracic trauma

**CONTRAINDICATIONS:**
- None

**NOTES:**
- Control of obvious exsanguinating trauma takes priority. However, with obvious exsanguination and known or suspected tension pneumothorax, two providers should simultaneously perform needle decompression and hemorrhage control.
- A sucking chest wound (open pneumothorax) should be treated by application of an occlusive dressing (secured on three sides only) or approved commercial device.
- An impaled object should be secured in place unless it interferes with:
  - airway management and/or chest compressions, or
  - safe extrication and cannot be cut or otherwise dismantled.

**ABBREVIATIONS:**
- IM = intramuscular
- IN = intranasal
- IN = intraosseous
- IV = intravenous
INDICATIONS:
- All patients with blunt and penetrating abdominal trauma

CONTRAINDICATIONS:
- None

NOTES:
- Control of obvious exsanguinating trauma takes priority.
- An impaled object should be secured in place unless it interferes with safe extrication and cannot be cut or otherwise dismantled.

ABBREVIATIONS:
- IM = intramuscular
- IN = intranasal
- IO = intraosseous
- IV = intravenous
INDICATIONS:

- Patient has a known or suspected acute stroke and EMS has been dispatched
  - For a primary response, or
  - For an inter-facility transfer (IFT) at the request of a non-referring health care provider.

CONTRAINDICATIONS:

**For all patients:**

- The following clinical conditions indicate that a patient may be too unstable to bypass a closer health care facility:
  - Instability of the airway, breathing or circulation that cannot be managed by available prehospital personnel, procedures or equipment.
  - Glucose less than 4 mmol/l or greater than 25 mmol/l.
  - Glasgow coma score less than nine, or eye opening score less than three.
  - Known or suspected respiratory failure, shock or sepsis.
- Advanced health care directive indicating comfort care only.
- Non-clinical issues that could potentially affect patient, provider and public safety as determined by the vehicle operator.

**For primary response only:**

- Complete resolution of symptom(s) or sign(s) prior to scene departure

NOTES:

- In certain situations, such as a patient in long-term care or in certain rural or remote areas of the province, there may be a delay before a stroke patient is assessed by a physician or nurse practitioner and referred for emergency stroke care. To limit delays to the initiation of care in such circumstances, a registered nurse may request an emergency interfacility transfer (IFT) to a stroke center, **without first obtaining the acceptance of a receiving physician**.
- The Medical Transportation Coordination Center (MTCC) will arrange the transport **without requiring the name of a receiving physician** and dispatch EMS. For the purpose of this protocol, this dispatch process is called a stroke IFT over-ride and the transport is called a non-referred IFT.
- For primary response, the clinical decision to bypass the closest ED and transport to a stroke treatment site will be at the discretion of the transporting paramedics.
- Staff at the MTCC can assist with determining the closest stroke treatment site (table A).
- For a non-referred IFT, providers will carry out the transport as dispatched. Providers who have clinical concerns about the safety of transport must contact the on-line medical support (OLMS) physician for assistance as soon as possible.
- Non-clinical issues, such as road and weather conditions that could potentially affect patient, provider and public safety are at the discretion of the vehicle operator. Transport time must be estimated based on safe vehicular speed. Providers may contact the EMS on-call supervisor or superintendent (OCS) for assistance.
- Providers will assess all patients as per E15A ACUTE STROKE.
• For patients who may be candidates for fibrinolytic therapy, refer also to G02.3A TRANSPORT TO PRIMARY STROKE TREATMENT SITE.

• For patients who may are not candidates for fibrinolytic therapy but may be eligible for thrombectomy, refer also to G02.2A TRANSPORT TO COMPREHENSIVE STROKE CENTER (HSC).

• Providers will ensure appropriate pre-arrival consultation with the stroke neurologist where required, and notification of emergency department (ED) staff at the receiving facility.

• If the estimated time of arrival changes during transport, ensure notification of the neurologist and ED staff as soon as possible.

• Document all pre-arrival notifications, updates and discussion including the times of all calls on the patient care record.
### Table A: Current stroke treatment sites in Manitoba.

<table>
<thead>
<tr>
<th>COMPREHENSIVE STROKE CENTER:</th>
</tr>
</thead>
</table>
| • Health Sciences Center (Winnipeg)  | Paging: 204-787-2071  
|  | Emergency: 204-787-3167 or 204-787-3168 |

<table>
<thead>
<tr>
<th>PRIMARY STROKE CENTERS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Brandon Regional Hospital (Brandon)</td>
</tr>
</tbody>
</table>
| • St. Boniface Hospital (Winnipeg)  | Paging: 204-237-2053  
|  | Emergency: 204-233-8563 |

<table>
<thead>
<tr>
<th>TELEHEALTH STROKE SITES:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dauphin Regional Health Center (Dauphin)</td>
</tr>
<tr>
<td>• St. Anthony’s General Hospital (The Pas)</td>
</tr>
<tr>
<td>• Thompson General Hospital (Thompson)</td>
</tr>
</tbody>
</table>
Contact the HSC stroke neurologist at 204-787-2071 as soon as possible.
Assist as required to ensure appropriate pre-arrival consultation and notification.

Will the transport duration to HSC exceed 90 minutes?

Yes

Contact the STARS TP for possible HEMS intercept before calling neurologist.

No

Continue transport directly to HSC

Transport as directed

First notification of HSC ED staff as soon as possible

Ensure second notification of stroke neurologist 30 minutes prior to arrival

Second notification of HSC ED staff 10 minutes prior to arrival

If estimated time of arrival changes during transport, ensure notification of neurologist and ED staff.
### INDICATIONS:
- A patient with a known or suspected acute stroke who is not eligible for fibrinolytic therapy, but may be a candidate for thrombectomy, and can arrive at HSC within 6 hours of stroke onset.

### CONTRAINDICATIONS:
- None

### NOTES:
- The Health Sciences Center (HSC) is the comprehensive stroke center for Manitoba. Contact the stroke neurologist through the paging operator at **204-787-2071**. Ask to speak to the “stroke neurologist on-call” and inform the operator that it is for a “stroke-25 outside call”.
- Table A contains the clinic information that will be required when consulting with the stroke neurologist and additional historical information that may be required to determine suitability for therapy.
- Transport time must be estimated based on safe vehicular speed. Non-clinical issues that could affect patient, provider and public safety, such as road and weather conditions, are at the discretion of the vehicle operator.
- To minimize the patient’s transport time, the STARS transport physician (TP) may advise an intercept with helicopter EMS (HEMS) at an appropriate location. Transport or redirect as advised by the TP.
Table A: Required information

**Initial information** (to determine destination):
- Patient age & gender
- Time of stroke onset
  - Is it self-reported or witnessed?
- Symptom(s) or sign(s) suspicious for / consistent with stroke
- Anticoagulation (see table B)
  - If the patient is on warfarin, is the INR known for certainty and, if so, what is it?
- Estimated transport time to HSC
- Advanced health care directive (yes, no or unknown)
  - If the patient has a directive, what level of care is directed?

**Identifying information** (required to access prior medical records):
- Patient name
- Personal health information number (PHIN) from MHSAL health card
- Date of birth

**Initial clinical assessment**
- Vital signs, including point-of-care glucose
- LAMS score (see table C)
- Focused neurological examination for stroke - note right or left:
  - Level of consciousness (alert, responds to voice, responds to pain or unresponsive)
  - Speech (normal, slurred, incomprehensible or mute)
  - Smile (normal, partial droop or complete droop)
  - Arm strength (normal, slow drift or rapid fall)
  - Hand grip strength (normal, weak or absent)
  - Leg strength (normal, slow drift or rapid fall)

**Medical history** (obtain as much detail as possible):
- Has the patient had a seizure within the last 24 hours?
- Does the patient have a bleeding or clotting disorder?
- What other health conditions does the patient have?
- What medications does the patient take?
- Is the patient allergic to any medication or substance?
- When did the patient last eat?
## Table B: Anticoagulants

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Canadian Name</th>
<th>American Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apixiban</td>
<td>ELIQUIS</td>
<td>ELIQUIS</td>
</tr>
<tr>
<td>Betrixiban</td>
<td>Not available in Canada</td>
<td>BEVYXXA</td>
</tr>
<tr>
<td>Dabigatran</td>
<td>PRADAXA</td>
<td>PRADAXA</td>
</tr>
<tr>
<td>Edoxaban</td>
<td>LIXIANA</td>
<td>LIXIANA</td>
</tr>
<tr>
<td>Rivaroxaban</td>
<td>XARELTO</td>
<td>XARELTO</td>
</tr>
<tr>
<td>Warfarin</td>
<td>COUMADIN</td>
<td>JANTOVEN</td>
</tr>
</tbody>
</table>

### INJECTABLE

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Canadian Name</th>
<th>American Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalteparin</td>
<td>FRAGMIN</td>
<td>FRAGMIN</td>
</tr>
<tr>
<td>Danaparoid</td>
<td>ORGARAN</td>
<td>ORGARAN</td>
</tr>
<tr>
<td>Enoxaparin</td>
<td>LOVENOX</td>
<td>LOVENOX</td>
</tr>
<tr>
<td>Fondaparinux</td>
<td>ARIXTRA</td>
<td>ARIXTRA</td>
</tr>
<tr>
<td>Nadroparin</td>
<td>FRAXIPARINE</td>
<td>FRAXIPARINE</td>
</tr>
<tr>
<td>Tinzaparin</td>
<td>INNOHEP</td>
<td>INNOHEP</td>
</tr>
<tr>
<td>Unfractionated heparin</td>
<td>HEPARIN</td>
<td>HEPARIN</td>
</tr>
<tr>
<td>Facial droop</td>
<td>Absent</td>
<td>Normal or no facial asymmetry</td>
</tr>
<tr>
<td>-------------</td>
<td>--------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>Present</td>
<td>Partial or complete drooping of lower face</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Arm drift</th>
<th>Absent</th>
<th>Normal or no drift</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Drifts down</td>
<td>Does not fall within 10 seconds</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Falls down</td>
<td>Cannot be held up against gravity or falls within 10 seconds</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Grip strength</th>
<th>Normal</th>
<th>Normal</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weak grip</td>
<td>Some movement but weak</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>No grip</td>
<td>No visible movement (contraction may be seen but movement is absent)</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total</th>
<th>Range = 0 to 5</th>
</tr>
</thead>
</table>

**Step #1:**
If there is no obvious facial droop, ask the patient to smile.

**Step #2:**
Ask the patient to hold up both arms with the palms facing downward. If lying down, ask them to raise both arms to 45 degrees.

**Step #3:**
Ask them to grasp your index and middle finger to assess their grip strength.
Is the closest stroke site in Winnipeg?

- Yes
  - Initiate transport towards Winnipeg

- No
  - Transport to the closest stroke site listed in table A
    - Ensure pre-arrival consultation with stroke neurologist if required by Regional protocol or practice
    - Ensure appropriate pre-arrival notification of ED staff

Will the transport duration to Winnipeg exceed 90 minutes?

- No
  - Contact the STARS TP for possible HEMS intercept before calling neurologist
  - Transport as directed
  - Assist as required to ensure appropriate pre-arrival consultation and notification

- Yes
  - Is the LAMS score 1 or 2? (appendix C)
    - Yes
      - Transport to SBH
    - No
      - Transport to HSC

Consult stroke neurologist as soon as possible

First notification of ED staff as soon as possible

Ensure notification of stroke neurologist 30 minutes prior to arrival

If estimated time of arrival changes during transport, ensure notification of neurologist and ED staff

Ensure notification of stroke neurologist 30 minutes prior to arrival

Second notification of ED staff 10 minutes prior to arrival
INDICATIONS:
- A patient with a known or suspected acute stroke who is a candidate for fibrinolytic therapy. The patient:
  - can arrive at a stroke site within 3.5 hours of stroke onset, and
  - is not on an anticoagulant (table B).

CONTRAINDICATIONS:
- None

NOTES:
- “Closest stroke site” is defined as the site, regardless of regional boundaries, that is capable of delivering hyperacute stroke treatment and has the shortest estimated transport time from the patient’s current location (table A).
- Staff at the Medical Transportation Coordination Center (MTCC) can assist with determining the closest stroke site.
- Transport time must be estimated based on safe vehicular speed. Non-clinical issues that could affect patient, provider and public safety, such as road and weather conditions, are at the discretion of the vehicle operator.
- If the closest stroke site is within Winnipeg, initiate transport in the direction of Winnipeg and determine the Los Angeles Motor Scale (LAMS) as soon as possible (table C). It will determine the receiving stroke site and stroke neurologist in Winnipeg:
  - Patients with a LAMS score of 3, 4 or 5 will routinely be transported and treated at Health Sciences Center (HSC).
  - Patients with a LAMS score of 1 or 2 will routinely be transported and treated at St. Boniface Hospital (SBH). However, the SBH stroke neurologist may redirect the patient to HSC under certain clinical circumstances.
- If transporting to SBH or HSC, contact the stroke neurologist through the paging operator (see table A for the paging phone numbers). Ask to speak to the “stroke neurologist” and inform the operator that it is for a “stroke-25 outside call”.
- Table D contains the clinical information that will be required when consulting with a stroke neurologist and additional historical information that may be required to determine suitability for therapy.
- To minimize the patient’s transport time, the STARS transport physician (TP) may advise an intercept with helicopter EMS (HEMS) at an appropriate location (patients intercepted and transported by STARS will go initially to HSC, regardless of the LAMS score). Transport or redirect as advised by the TP.
### Table A: Current Stroke Treatment Sites in Manitoba

<table>
<thead>
<tr>
<th><strong>COMPREHENSIVE STROKE CENTER:</strong></th>
<th></th>
</tr>
</thead>
</table>
| • Health Sciences Center (Winnipeg) | Paging: 204-787-2071  
Emergency: 204-787-3167 |

<table>
<thead>
<tr>
<th><strong>PRIMARY STROKE CENTERS:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Brandon Regional Hospital (Brandon)</td>
<td></td>
</tr>
</tbody>
</table>
| • St. Boniface Hospital (Winnipeg) | Paging: 204-237-2053  
Emergency: 204-233-8563 |

<table>
<thead>
<tr>
<th><strong>TELEHEALTH STROKE SITES:</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>• Dauphin Regional Health Center (Dauphin)</td>
<td></td>
</tr>
<tr>
<td>• St. Anthony’s General Hospital (The Pas)</td>
<td></td>
</tr>
<tr>
<td>• Thompson General Hospital (Thompson)</td>
<td></td>
</tr>
</tbody>
</table>
### Table B: Anticoagulants

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Canadian Name</th>
<th>American Name</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ORAL</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apixiban</td>
<td>ELIQUIS</td>
<td>ELIQUIS</td>
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<td>Unfractionated heparin</td>
<td>HEPARIN</td>
<td>HEPARIN</td>
</tr>
<tr>
<td>Table C: Los Angeles Motor Scale (LAMS) Score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------------</td>
<td></td>
<td></td>
</tr>
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<td><strong>Facial droop</strong></td>
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**Step #1:**
If there is no obvious facial droop, ask the patient to smile.

**Step #2:**
Ask the patient to hold up both arms with the palms facing downward. If lying down, ask them to raise both arms to 45 degrees.

**Step #3:**
Ask them to grasp your index and middle finger to assess their grip strength.
### Table D: Required information

#### Initial information (to determine destination):
- Patient age & gender
- Time of stroke onset *
  - Is it self-reported or witnessed?
- Symptom(s) or sign(s) suspicious for / consistent with stroke
- Anticoagulation (see table B) *
  - If the patient is on warfarin, is the INR known for certainty and, if so, what is it?
- Estimated transport time to closest stroke center *
- Advanced health care directive (yes, no or unknown)
  - If the patient has a directive, what level of care is directed?

#### Identifying information (required to access prior medical records):
- Patient name
- Personal health information number (PHIN) from MHSAL health card
- Date of birth

#### Initial clinical assessment
- Vital signs, including point-of-care glucose
- LAMS score (see table C) *
- Focused neurological examination for stroke - note right or left:
  - Level of consciousness (alert, responds to voice, responds to pain or unresponsive)
  - Speech (normal, slurred, incomprehensible or mute)
  - Smile (normal, partial droop or complete droop)
  - Arm strength (normal, slow drift or rapid fall)
  - Hand grip strength (normal, weak or absent)
  - Leg strength (normal, slow drift or rapid fall)

#### Medical history (obtain as much detail as possible):
- Within the last three months has the patient had
  - A surgical procedure, and/or
  - A serious injury, and/or
  - A myocardial infarction, and/or
  - Any serious bleeding?
- Has the patient had a seizure within the last 24 hours?
- Does the patient have a bleeding or clotting disorder?
- What other health conditions does the patient have?
- What medications does the patient take?
- Is the patient allergic to any medication or substance?
- When did the patient last eat?

* Indicates information essential to determining destination and logistics of transport and must be obtained as early as possible.
INDICATIONS:

- Patient with known terminal condition, and
- Reasonable probability of death in transit, and
- Patient and/or proxy are aware and consenting that no resuscitative measures will be undertaken in the event of death in transit, and
- Requirement for palliative measures beyond usual technician scope of practice.

1. Ensure that the patient and/or proxy are aware of the transport and consenting. Any health care directive, if available, should accompany the patient.
2. Ensure patient and/or proxy are aware that, in the event of death or adverse road or weather conditions, rerouting to alternate destination will be at the sole discretion of the aviation crew or ground ambulance operator.
3. Contact on-line medical support (OLMS) if assistance is required to calculate drug dosages or obtain additional controlled medications.
4. Calculate analgesic dosages to treat breakthrough pain.
5. Ensure adequate analgesia is available for the entire duration of the transport (allow for additional requirements due to potential delays or redirections).
6. Ensure secure access for administration of parenteral medications (consider use of indwelling subcutaneous catheter)
7. Ensure administration of maintenance analgesia and any other required or routine medications.
8. Ensure adequate oxygen is available for the entire duration of the transport (allow for additional requirements due to potential delays or redirections).
9. Consider prophylactic antiemetic medications and adjunctive sedation.
10. Patient does not routinely need to remain NPO. Ensure adequate potable water if appropriate.
11. In the event of death in transit, notify the Medical Examiner’s (ME) office as soon as possible. Paramedic or delegate must remain with the body until informed otherwise by the ME. The transporting vehicle or aircraft WILL NOT routinely be impounded in the event of an anticipated death in transit.
12. Inform the referring and receiving health care staff as soon as possible.
13. Inform the on-call supervisor (OCS) as soon as possible. OCS may assist with notification of appropriate individuals.
For primary response, under normal circumstances and excluding the exceptions listed below, EMS providers will transport all patients to the closest ED, regardless of the Provincial border or RHA boundary.

EXCEPTIONS TO STANDARD DESTINATION:

- There is a designated site for a specific clinical condition as listed in table B.
- MTCC has issued a redirection advisory indicating that the closest ED is diverting patients arriving by EMS.
- The patient’s personal health care provider (HCP) recommends that EMS transport their patient to a specific facility and the local medical director (LMD) has approved this in advance.
- The scene or incident command directs transport to an alternative destination in the event of a mass casualty incident (MCI).
- The on-call supervisor or superintendent (OCS) directs transport to an alternative destination due operational circumstances, such as off-load delays.
- The STARS transport physician (TP) directs transport to an alternative destination for the purpose of a helicopter EMS (HEMS) intercept.
- The on-line medical support (OLMS) physician directs transport to an alternative destination for specific clinical reasons.
- Staff at the Medical Transportation Coordination Center (MTCC) advise transport to an alternative destination on the request of the OCS, OLMS physician or TP.

NOTES:

- “Closest” refers to the emergency department (ED) with the shortest estimated transport time from the patient’s current location, regardless of regional boundaries or Provincial border.
- Providers may contact MTCC for assistance to locate the closest ED.
- For clinical conditions requiring specialized care that is only available at selected sites, the patient’s HCP may recommend transport to a specific site. The patient should provide appropriate documentation directing to the specific site. In the event that the patient does not have or cannot produce verifying documentation, EMS providers should contact OCS or OLMS physician. If the patient is unstable transport to the closest ED.
<table>
<thead>
<tr>
<th><strong>Table B: CURRENT PROVINCIAL EMS DESTINATION PROTOCOLS</strong></th>
<th><strong>Notes</strong></th>
</tr>
</thead>
</table>
| C04 RESUSCITATION FOR TRAUMATIC CARDIOPULMONARY ARREST | Will transport to/towards HSC if ROSC achieved  
**Start date 2019-02-01** |
| C08AB LEFT VENTRICULAR ASSIST DEVICE |  |
| E04.2A BYPASS FOR STEMI PRIMARY RESPONSE (Code-STEMI) | SHSS only until 2018-11-30  
IERHA & SHSS after 2018-12-01 |
| G02.1A BYPASS AND NON-REFERRED IFT TO A STROKE CENTER  
G02.2A TRANSPORT TO THE COMPREHENSIVE STROKE CENTER (HSC)  
G02.3A TRANSPORT TO A STROKE TREATMENT SITE |  |
| G01 PATIENT DESTINATION WHEN CLOSEST ED IS WITHIN WINNIPEG |  |
**NOTE:** These are approximate values only and there is considerable variation within and overlap between each age category. Clinical judgment is required to correctly interpret pediatric vital signs.

* Hypotension is defined by SBP < 70 + (age x 2)

<table>
<thead>
<tr>
<th>Age</th>
<th>Respiratory Rate (breaths / min)</th>
<th>Heart Rate (beats / min)</th>
<th>Average Systolic BP (mmHg)</th>
<th>Average Diastolic BP (mmHg)</th>
<th>* Minimum Systolic BP (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 1 month</td>
<td>25 - 60</td>
<td>125 - 185</td>
<td>45 - 80</td>
<td>35 - 55</td>
<td></td>
</tr>
<tr>
<td>1 – 3 months</td>
<td>25 - 55</td>
<td>120 - 180</td>
<td>65 - 85</td>
<td>35 - 60</td>
<td></td>
</tr>
<tr>
<td>3 – 6 months</td>
<td>25 - 55</td>
<td>110 - 180</td>
<td>70 - 90</td>
<td>35 - 65</td>
<td></td>
</tr>
<tr>
<td>6 – 12 months</td>
<td>20 - 50</td>
<td>105 - 175</td>
<td>80 - 100</td>
<td>40 - 65</td>
<td>70</td>
</tr>
<tr>
<td>1 – 2 years</td>
<td>20 -50</td>
<td>95 - 155</td>
<td>80 - 105</td>
<td>40 - 70</td>
<td>72 - 74</td>
</tr>
<tr>
<td>2 – 3 years</td>
<td>20 - 40</td>
<td>90 - 150</td>
<td>80 - 110</td>
<td>40 - 75</td>
<td>74 - 76</td>
</tr>
<tr>
<td>3 – 5 years</td>
<td>20 - 30</td>
<td>75 - 140</td>
<td>80 - 115</td>
<td>40 - 75</td>
<td>76 - 80</td>
</tr>
<tr>
<td>5 – 7 years</td>
<td>20 - 25</td>
<td>65 - 135</td>
<td>85 - 115</td>
<td>40 -80</td>
<td>80 - 84</td>
</tr>
<tr>
<td>8 – 10 years</td>
<td>18 - 20</td>
<td>60 - 130</td>
<td>90 - 120</td>
<td>45 - 80</td>
<td>86 - 90</td>
</tr>
<tr>
<td>11 – 13 years</td>
<td>15 - 18</td>
<td>60 - 130</td>
<td>95 - 120</td>
<td>45 - 80</td>
<td>92 - 96</td>
</tr>
<tr>
<td>14 to 18 years</td>
<td>12 - 15</td>
<td>60 - 120</td>
<td>100 - 120</td>
<td>50 - 80</td>
<td>98 - 116</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>Grey</td>
<td>Pink</td>
<td>Red</td>
<td>Purple</td>
<td>Yellow</td>
</tr>
<tr>
<td>------------</td>
<td>------</td>
<td>------</td>
<td>-----</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>3 - 5</td>
<td></td>
<td>6 - 7</td>
<td>8 - 9</td>
<td>10 - 11</td>
<td>12 - 14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LMA Size &amp; Patient Weight (kg)</th>
<th>1 (&lt; 5)</th>
<th>1.5 (5 – 10)</th>
<th>2 (10 – 20)</th>
<th>2.5 (20 – 30)</th>
<th>3 (30 – 50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>King LT Size &amp; Patient Weight (kg)</td>
<td>N/A</td>
<td>2 (12 – 25)</td>
<td>2.5 (25 – 35)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ABBREVIATIONS:**
- BIAD – blind insertion airway device
- kg - kilograms
- LMA – laryngeal mask airway
- LT – laryngotracheal
**NOTE:** Entry into the Patient Care Maps will most often be from the **Medical Assessment** protocol. If a traumatic incident is suspected or known to cause the complaint, finding, or condition refer to the **Trauma Assessment** care map.

### Patient Care Protocols Related to Chief Complaint, Finding or Condition

<table>
<thead>
<tr>
<th>Finding or Condition</th>
<th>Primary Patient Care Protocol (Most Commonly Used)</th>
<th>Associated &amp; Other Potential Patient Care Protocol(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal distension</td>
<td>Abdominal Pain (E01)</td>
<td></td>
</tr>
<tr>
<td>Abdominal pain or discomfort</td>
<td>Abdominal Pain (E01)</td>
<td>ACS (E04), Chest Pain (E18)</td>
</tr>
<tr>
<td>Abnormal behavior</td>
<td>Behavioral Emergencies (E13)</td>
<td>Agitation (E02)</td>
</tr>
<tr>
<td>Agitation</td>
<td>Agitation (E02)</td>
<td>Behavioral Emergencies (E13)</td>
</tr>
<tr>
<td>Implanted defibrillator firing or malfunction</td>
<td>Unstable Tachycardia (C06)</td>
<td>Syncop &amp; Presyncope (E16)</td>
</tr>
<tr>
<td></td>
<td>ICD and Pacemaker Malfunction (C09A)</td>
<td></td>
</tr>
<tr>
<td>Anaphylaxis</td>
<td>Anaphylaxis (E03)</td>
<td></td>
</tr>
<tr>
<td>Apnea</td>
<td>Airway &amp; Breathing Management (B01)</td>
<td>Resuscitation (C01, C02)</td>
</tr>
<tr>
<td>Back pain</td>
<td>General Pain Management (E08)</td>
<td></td>
</tr>
<tr>
<td>Bleeding</td>
<td>Hypotension &amp; Shock (C07)</td>
<td></td>
</tr>
<tr>
<td>Bradycardia</td>
<td>Unstable Bradycardia (C05)</td>
<td></td>
</tr>
<tr>
<td>Chest pain or discomfort</td>
<td>ACS (E04), Chest Pain (E18)</td>
<td>Abdominal Pain (E01)</td>
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Lightheadedness | Syncope & Presyncope (E16)
Limb numbness | Acute Stroke (E15)
Limb pain | General Pain Management (E08)
Limb weakness or paralysis | Acute Stroke (E15)
Low oxygen saturation | Dyspnea & Respiratory Distress (E06) Airway & Breathing Management (B01)
“Man down” | Resuscitation (C01, C02)
Melena | Hypotension & Shock (C07)
Miscarriage | Obstetrical Emergencies (D03)
Nausea | Nausea & Vomiting (E11)
Near fainting | Syncope & Presyncope (E16)
Newborn problems | Newborn Care (D01)
Overdose | Overdose & Poisoning (E12) Behavioral Emergencies (E13)
Pacemaker malfunction | Syncope & Presyncope (E16)
Palpitations | Syncope & Presyncope (E16) Unstable Tachycardia (C06)
Pelvic pain (female) | Abdominal Pain (E01) Obstetrical Emergencies (D03)
Poisoning | Overdose & Poisoning (E12)
Pulseless | Resuscitation (C01, C02)
Tachypnea or hyperventilation | Airway & Breathing Management (B01) Dyspnea & Respiratory Distress (E06)
Tachycardia | Unstable Tachycardia (C06) Syncope & Presyncope (E16)
Rash | Anaphylaxis (E03) Fever (E07)
Seizure or convulsions | Seizures (E14) Resuscitation (C01, C02)
“Sick Man” | Undifferentiated Symptoms (E17)
Suicide attempt or threat | Behavioral Emergencies (E13) Overdose & Poisoning (E12)
Swelling | Anaphylaxis (E03)
Vertigo | Acute Stroke (E15) Nausea & Vomiting (E11)
Vision loss | Eye Emergencies (F08) Stroke & TIA (E15)
Vomiting | Nausea & Vomiting (E11) Hypotension & Shock (C07)
Weakness | Syncope & Presyncope (E16) Undifferentiated Symptoms (E17)
Wheezing | Dyspnea & Respiratory Distress (E06)

### Patient Care Protocols Related to Trauma & Environmental Incidents

<table>
<thead>
<tr>
<th>Primary Patient Care Protocol (Most Commonly Used)</th>
<th>Associated &amp; Other Potential Patient Care Protocol(s)</th>
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<tr>
<td>Amputation(s)</td>
<td>Amputations &amp; Lacerations (F07) Exsanguinating External Bleed (F01) Traumatic Hemorrhage (F02)</td>
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<td>Assault - child</td>
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<td>Amputations &amp; Lacerations (F07)</td>
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<tr>
<td>Bleeding wound(s)</td>
<td>Exsanguinating External Bleed (F01) Traumatic Hemorrhage (F02) Amputations &amp; Lacerations (F07) Fractures &amp; Dislocations (F06)</td>
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<td>Crush Incident</td>
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<td>Dislocations</td>
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<td>Fire</td>
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<td>Lightning strike</td>
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Calculating the duration of O2 flow:

The duration of O2 flow for a given O2 flow rate can be determined from the following tables by knowing the cylinder pressure. A cylinder pressure of 200 psi or less is the minimum safe residual volume and adequate O2 flow rates cannot be assured at this level.

The duration of O2 flow can also be calculated by dividing the cylinder pressure by the desired O2 flow rate and multiplying by the cylinder conversion factor (k) for that size of cylinder, as follows:

\[ T = k \times \left( \frac{P}{F} \right) \]

- \( T \) = duration of O2 flow (min)
- \( k \) = cylinder conversion factor
- \( P \) = cylinder pressure (psi)
- \( F \) = oxygen flow rate (l / min)

<table>
<thead>
<tr>
<th>Old name</th>
<th>New name</th>
<th>Capacity @ 2200 PSI</th>
<th>Cylinder conversion factor</th>
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### M - cylinder

**Duration of O2 flow (min)**

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Minimum safe residual volume

### E - cylinder

**Duration of O2 flow (min)**

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Minimum safe residual volume

### D - cylinder

**Duration of O2 flow (min)**

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Minimum safe residual volume