QEII Trauma Team Activations during COVID-19 Pandemic: Disposition of Adult Trauma Patients

The health and safety of every member of our Trauma Team (TT), ED staff, trauma patients, and families are extremely important. As such, the NSHA Trauma Program has developed a set of protocols for TT members for appropriate screening of patients, use of personal protective equipment (PPE), best practices, and minimization of exposure to team members during the COVID pandemic. As the situation evolves, further changes to this protocol will be made and stakeholders notified of changes.

All members of the TT need to first ensure their own safety, while providing the best care possible to the patient. PPE and appropriate precautions are paramount.

TRAUMA PROGRAM AS A PROVINCIAL AND INTRA-PROVINCIAL RESOURCE

- Trauma Team Activations (TTAs) will continue as per standard.
  - HRM trauma patients will be directed to the QEII via EHS and the QEII Charge MD.
  - Outside-HRM trauma patients TTAs will occur via EHS and EHS-Life flight.
  - Consultation for out-of-province trauma patients (PEI, NB, NL) will continue as per usual.
- However, all TTAs should be evaluated by the Trauma Team Leader (TTL) to ensure that only patients who require the services of the TT are transferred to the QEII.
- If the transfer can safely be delayed, consideration should be given to holding the patient in their home hospital until a controlled transfer directly to an in-patient bed can be arranged.
  - Patients that are unlikely to require resuscitation should be referred directly to the most appropriate service without TTA.
  - The completion of imaging in sending facilities in stable patients should be considered.
  - TTAs based on “mechanism” have the highest rate of false negative TTA (i.e. high rate of minor injuries and/or discharge directly home after TTA).
    - TTLs should place the majority of the decision to activate a trauma resuscitation on other TTA criteria.
- Patients who are referred directly to a surgical service, consider a “3-way” call including the sending MD, the TTL, and the receiving surgery attending.
  - EHS dispatch is capable of facilitating
- The ability to accommodate trauma patients at the QEII ED will be evaluated on an ongoing basis to ensure alignment with the capacity within the QEII and across NSHA.
- Required changes in protocol and related service delivery will be communicated to the TTLs by the Trauma Program Senior Medical Director.

SCREENING AND PRECAUTIONS for RECEPTION OF Trauma Patients

- Pre-hospital COVID-19 screening is being performed by EHS, and EM, and should be followed as per established protocol (See Clinical Pathway Memorandum: Reception of Suspected COVID Patients in the Emergency Department draft 6)
- EHS will provide a pre-arrival patch to QEII for suspected or positive COVID patients.
The staff Charge ED physician will assess all arriving trauma patients in the EHS vehicle for:

1. COVID screen status (i.e. COVID screen positive or negative); and
2. Adequacy of PPE if COVID screen positive

Patients will remain in the EHS vehicle until COVID status is determined.

- If COVID screen negative, patient may be offloaded.
- If COVID screen positive, patient must have appropriate PPE before offloading:
  - If on room air or supplemental oxygen via nasal prongs or mask, a surgical mask must be applied covering the patient’s face AND nasal prongs/mask
  - If intubated, on CPAP, or supraglottic device, a HME filter (given to the ambulance crew by the Charge MD) must be installed

- If unable to get information to complete a COVID screen (i.e. patient not responsive), the patient will be treated as COVID screen positive.

The COVID status of the patient is communicated to the QEII charge nurse and the TT.

- Room destination
  - Trauma patients will continue to be evaluated in Bed 12, if possible
    - ED charge nurse will determine most appropriate location
  - COVID positive patients must be offloaded to a negative-pressure room (preferentially Room 12).
  - COVID negative patients may be evaluated in a non-negative pressure room.

The patient is transported from the ambulance bay to the designated resuscitation room by EHS paramedics following the established process for droplet precautions or airborne precautions.

Paramedics remain in the room providing care and ongoing resuscitation (as necessary) until the TT has donned appropriate PPE and is ready to enter the room safely as a team.

TRAUMA TEAM TIER CRITERIA for COVID POSITIVE PATIENTS

- Based on the available information, the TTL will perform a risk assessment based on the probability of the patient requiring intubation and/or urgent resuscitation:
  - Tier 1/RED trauma - high likelihood of requiring intubation (i.e. receiving NIPPV, >5L/min via NP or >15L/min by NRB) and/or urgent resuscitation (e.g. prehospital cardiac arrest or prehospital BP <90).
  - Tier 2/YELLOW trauma - low likelihood of requiring intubation and/or urgent resuscitation.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

- PPE definitions
  - Contact:
    - Surgical gown
    - Gloves
    - Optional: OR head and neck protector (if likely body fluid splash or spray)
- **Droplet:**
  - Face and eye protection (surgical mask with visor OR surgical mask with safety goggles or face shield).
  - Standard prescription eyeglasses are NOT acceptable.

- **Airborne:**
  - N95 respirator: The TT will follow established NSHA guidelines for managing confirmed/presumed/suspected COVID positive patients.

- Airborne precautions are required for any **aerosol generating medical procedure** (AGMP)
  - AGMPs include:
    - Use of nebulized medications (i.e. atomized lidocaine for awake intubations)
    - Non-invasive positive pressure ventilation (NIPPV)
    - Intubation
    - Bronchoscopy
    - Disconnections from a closed circuit (i.e. ventilator disconnections) or switching to/from bag-valve mask ventilation
    - Thoracotomy
    - Needle decompression and/or chest tube insertion

- **PPE selection for a TTA**
  - For **COVID screen positive** trauma patients: Selection of PPE type (droplet/contact or airborne) is based upon TTLs Tier categorization of the patient. The **minimum** level of PPE acceptable is droplet/contact precautions:
    - **TIER 1/RED Trauma** requires **airborne** precautions
    - **TIER 2/YELLOW Trauma** requires **droplet/contact** precautions
    - **DETERIORATION OF TIER 2/YELLOW** patients during ED assessment - all team members in the trauma room must be in airborne precautions prior to AGMPs (see above)
  - For **COVID screen negative** patients: PPE (impermeable gown, gloves, surgical mask) as per routine practice.

- **PPE donning and doffing procedures:**
  - **Expectations:**
    - All TT members are expected to be proficient in donning and doffing PPE
    - Training and practice prior to a TTA is essential and is the responsibility of each team member
    - If further training is required, please contact the HI ED PPE lead or HI IPAC
  - **Donning and doffing technique:**
    - Please review donning and doffing protocols to minimize risk of contamination (Appendix A, B; [https://vimeo.com/397525490](https://vimeo.com/397525490))
    - Reminders on the proper donning and doffing procedures for both droplet/contact and airborne procedures are posted at the entrance and exit of Rooms 10, 12, 14
Donning/doffing and entry/exit procedures:

- **Donning**
  - Donning of appropriate PPE should occur before entering the resuscitation room
  - Entry into the resuscitation room is ONLY through the sliding doors leading from the nursing station

- **Doffing**
  - Doffing of all PPE, EXCEPT THE N95 mask (if applicable), should occur at the sliding door leading to the ambulance hallway
  - Only one team member should doff at a time, with the remaining members and/or an ED nurse supervising correct technique
  - N95 should be doffed only OUTSIDE the resuscitation room, in the ambulance hallway, with the mask discarded into the trash receptacle
  - Exit from the resuscitation room is ONLY through the sliding doors leading to the external ambulance hallway

- **PPE during transfers to CT/ICU/OR**
  - **Transfers out of the ED:**
    - TTL will doff PPE prior to leaving the resuscitation room, as above
    - All other members of the TT will remain in their PPE whilst transferring the patient out of the ED
  - **Transfers to CT**
    - Team members in PPE will:
      - minimize the chance of contamination of surfaces during the transfer
      - assist in transferring the patient between the stretcher and the CT scanner
      - wait outside the CT scanner, ensuring they do not contaminate furniture, equipment, or walls
      - be prepared to enter the CT scanner should the patient deteriorate
    - Staff TTL will:
      - Doff PPE in the trauma room prior to leaving the ED
      - Enter the CT control room to monitor the patient while in the CT scanner
      - Alert the TT (in PPE) if the patient requires immediate intervention while in the CT scanner
  - **Transfers back to the ED from CT**
    - This should be avoided if it is evident that the patient will need to be admitted to the ICU/OR/ward
    - If return to ED is required, the team should retrace their transfer route as much as possible
    - If under airborne precautions, an AGMP was performed (e.g. intubation), each room has a minimum time interval required to clear airborne infectious particles since the LAST AGMP:
      - PLEASE NOTE, the last AGMP often is not the intubation, but switching the patient to/from the ventilator
● The nursing team will inform the TT of this time interval
● All team members in the resuscitation room must maintain airborne precautions until this time interval has elapsed
  o Transfers to ICU/OR/ward
    ● Team members in PPE will:
      ● minimize the chance of contamination of furniture, equipment, or walls during the transfer
      ● Doff PPE in the unit of the patient’s final destination
    ● Staff TTL will:
      ● Doff PPE in the trauma room prior to leaving the ED (if not already done prior to CT)

TRAUMA TEAM RESPONSE in Trauma Team Activation for COVID screen positive patients

● The TTA level will be determined by the TTL and articulated to the TT and EM staff
  o In the event that the ED team has additional information that necessitates a change in the TTA level, the EM charge physician may inform the TTL and modify as required
● The TT will be divided into a CORE TRAUMA TEAM and READY TRAUMA TEAM (“Ready Team”)
  o CORE TRAUMA TEAM responsibilities:
    ▪ Don appropriate PPE
    ▪ Be in the resuscitation room
    ▪ Perform assessment and management
  o READY TEAM responsibilities:
    ▪ Wait outside the resuscitation room
    ▪ DO NOT don PPE
    ▪ Don appropriate PPE and enter the resuscitation room ONLY when instructed by the staff TTL
  o ALL other individuals (i.e. police, EMS, ED staff) will wait outside the resuscitation room
    ▪ Visitors are subject to the COVID-19 NSHA Visitor Policy
<table>
<thead>
<tr>
<th>Description</th>
<th>TIER 1 (RED)</th>
<th>TIER 2 (Yellow)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient with <strong>high</strong> likelihood of requiring intubation <strong>AND/OR</strong> urgent resuscitation (e.g. prehospital cardiac arrest or prehospital BP &lt;90)</td>
<td></td>
<td>Patient with <strong>low</strong> likelihood of requiring intubation or acute resuscitation</td>
</tr>
<tr>
<td><strong>Core Trauma Team (inside resuscitation room)</strong></td>
<td>✓ TTL</td>
<td>✓ TTL</td>
</tr>
<tr>
<td></td>
<td>✓ rTTL</td>
<td>✓ rTTL</td>
</tr>
<tr>
<td></td>
<td>✓ AIRWAY TEAM</td>
<td>✓ GS resident</td>
</tr>
<tr>
<td></td>
<td>- CoVART if possible</td>
<td>✓ Nurse</td>
</tr>
<tr>
<td></td>
<td>- ED Airway Team for Emergent</td>
<td>✓ X-ray tech</td>
</tr>
<tr>
<td></td>
<td>✓ Assessment Team:</td>
<td>✓ CC paramedic</td>
</tr>
<tr>
<td></td>
<td>- rTTL (EM or GS senior)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Nurse x 2</td>
<td></td>
</tr>
<tr>
<td><strong>PPE (for ALL Primary Trauma Team)</strong></td>
<td>Airborne/Droplet/Contact Precautions</td>
<td>Droplet/Contact Precautions (if patient deteriorates, <strong>airborne</strong> precautions required)</td>
</tr>
<tr>
<td><strong>“Ready Team” (outside resuscitation room/not in PPE)</strong></td>
<td>✓ Other available GS resident(s)</td>
<td>✓ RT</td>
</tr>
<tr>
<td></td>
<td>✓ Anesthesia resident</td>
<td>✓ Anesthesia resident</td>
</tr>
<tr>
<td></td>
<td>✓ Orthopedic surgery resident</td>
<td>✓ Other available GS resident(s)</td>
</tr>
<tr>
<td></td>
<td>✓ GS junior resident</td>
<td>✓ Orthopedic surgery resident</td>
</tr>
<tr>
<td></td>
<td>✓ Charting nurse</td>
<td>✓ Charting nurse</td>
</tr>
<tr>
<td></td>
<td>✓ X-ray tech</td>
<td></td>
</tr>
<tr>
<td><strong>Primary location</strong></td>
<td>Bed 12</td>
<td>Bed 12</td>
</tr>
</tbody>
</table>

**TRAUMA PATIENT RESUSCITATION by the TRAUMA TEAM**

- Trauma team members must don PPE appropriately prior to entering the trauma room, regardless of the clinical status of the patient.
- Breaches in PPE must be addressed immediately. This may require replacement of a team member to allow for doffing by an affected team member for decontamination.
- Communication with the recording nurse located outside the trauma resuscitation room will occur via electronic communication device.
- **AIRWAY MANAGEMENT**: The approach to airway management is high risk in COVID patients.
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- The TTL (or Charge EM physician if TTL is en route) will determine airway management responsibility
- **COVID negative**: airway management as per usual
  - Anesthesia resident with back up by TTL/Anesthesia staff and EM when required.
- **COVID presumed/positive**:
  - The CoVART team will be responsible airway management in COVID patients, should time permit.
    - TTL to call 473-3333 and ask for CoVART team to attend a trauma patient in the ED
    - The TTL should call as soon as logistically possible.
      - The CoVART team is **not** in hospital at night
      - If possible, the CoVART team should be contacted 30 min before anticipated patient arrival to trauma bay
  - If the CoVART team is not immediately available, the TTL should notify the charge physician (473-4960) that the ED Airway team is required.
    - The ED airway team will manage the airway according to the COVID airway management protocol.
- After intubation, the TT (including the anesthesia resident) will be responsible for patient care and transfer out of the ED
- Ventilation equipment will be determined by the RT:
  - Ventilator setup – In-line suction, waveform CO₂, viral filter
  - Ensure Tube clamps available for disconnections

- Resuscitation will be directed by the TTL.
  - The rTTL will perform the primary and secondary assessment, and perform all procedures (with the exception of airway management)
- Primary and secondary survey will be completed prior to imaging
- Mask placement on patients:
  - In a non-intubated patient, an ear-loop mask should be placed as soon as possible
  - For intubated patients, place one ear-loop mask over the patient’s nose, and one below the tube.
  - Mask conservation strategy is to be used
    - One mask during a patient’s entire resuscitation (unless contaminated)
- No auscultation is to be performed unless the patient is hypoxic (O₂ sat <90% on 5L by NP) and it is absolutely necessary.
  - If auscultation performed, a single use (non-personal) stethoscope will be used.
  - Be extremely careful not to disrupt PPE or touch face when using disposable stethoscopes.
- Portable X-ray of Suspect or Confirmed COVID-19 Patients
  - Digital X-rays will be available
  - All X-rays should be done at the same time
Radiology techs will follow precautions (see Process for Portable X-Ray of Suspect or Confirmed COVID-19 Patients)

Team members will exit the trauma room into the designated area (marked with yellow floor tape) in the exterior ED hall while the X-rays are being performed.

- Security and a member of the radiology team will serve as safety officers to ensure that
  - Only TT members are in the hall area outside the resuscitation room
  - TT members adhere to established COVID protocols while in the designated hall area
- FAST ultrasound should **be limited** to those for whom it will immediately impact management (i.e. hemodynamically abnormal patients without an immediate indication for operation).
  - Specifically, FAST should **not** be used if the patient will undergo a CT scan.
- ED Thoracotomies should **be limited** to those patients with isolated penetrating injury to the chest and have evidence of cardiac motion or hemopericardium on ultrasound.
- One nurse in the room will attempt to be a “clean nurse”, and will pass equipment to the nurse attending to the trauma patient.

### TRAUMA RESUSCITATION EQUIPMENT

- In an attempt to minimize contamination of unused equipment and allow for trauma resuscitation to be better performed in various resuscitation rooms within the QEII, essential equipment will be packaged in bundles that will be placed in the trauma room before a trauma arrives.
- Bundles will contain enough essential equipment for 1 trauma only.
- Bundles will include: (see full list here)
  - Nursing bundle
  - Medication bundle (TXA, Cefazolin, tetanus, phenylephrine, norepinephrine, ketamine, rocuronium, propofol drip, hypertonic saline, +/- blood products)
  - Airway go-pack
  - Chest tube bundle
  - Ultrasound (if HD unstable)
  - Pelvic binder
  - Tourniquet
  - IO kit
- Additional equipment will be passed into the trauma room.
- Bundles will be restocked immediately after each trauma.

### INTRA-HOSPITAL TRANSFERS

- It is recommended that all intubated COVID patients be paralyzed for the duration of transport
- For patients requiring a CT scan, the TTL will designate a member of the TT to call the CT tech (473-2816) and communicate:
COVID trauma patient (positive or presumptive)
Intubation status
After CT, every effort should be made to transfer directly to the most appropriate inpatient location.
The ED department medic will not accompany the patient during transfers to CT/ICU/OR/ward

TRAUMA PATIENT DISPOSITION AFTER RESUSCITATION

ADMISSIONS

- All efforts should be made to transfer the patient directly to OR/ICU/stepdown/ward from the CT scanner
- Patients should be admitted expeditiously (<2 hours after resuscitation) in order to minimize time in the ED.
- ICU Admissions: A member of the TT will be designated to call the attending MD on 5.2 MSN ICU directly:
  - ICU team to occur as soon as possible
  - Transfer from CT if feasible
  - ICU should assess patient in ICU after admission, when possible
- Non-ICU Admissions:
  - WARD:
    - COVID patients will be admitted to the COVID ward under the designated attending MD
    - Consulting surgical services will co-manage as appropriate
    - Non-COVID patients will be admitted to the most responsible surgical service, as per usual
  - STEP-DOWN:
    - COVID patients will be admitted to 3IMCU under the designated attending MD
    - Consulting surgical services will co-manage as appropriate
    - Non-COVID patients will be admitted to the most responsible surgical service stepdown, as per usual

DISCHARGE TO HOME

- In patients who may be able to be discharged home, the TT will return the patient to the designated room in the ED.
- The TTL should advise the Charge ED physician and nursing team of the patient’s management plan and disposition in a timely manner
- Clear instruction should be documented.
- If a patient is unable to be discharged <2 hours after a TTA, the service which the TTL has documented as the MRP will arrange admission.
GUIDE TO PUTTING ON PERSONAL PROTECTIVE EQUIPMENT

Droplet & Contact Precautions

1. Hand Hygiene
   - Perform hand hygiene.
   - Alcohol-based hand rub is preferred. Use soap and water if hand are visibly soiled.

2. Long-sleeved gown
   - Select level of gown based on fluid exposure risk.
   - Make sure the gown covers from neck to knees to wrist.
   - Tie at back of neck and waist.

3a. Procedure/surgical mask
   - Secure ties or ear loops around head or ears so the mask stays in place.
   - Fit moldable band around the bridge of your nose.
   - Fit snugly to face over mouth and nose and below chin.

3b. OR N95 Respirator
   - Required for aerosol-generating medical procedures (AGMP’s) for patients with unknown, novel or emerging pathogens.
   - Refer to manufacturer for specific donning instructions.
   - Perform a ‘seal check’ with each use.
   - N95 respirators must be ‘fit tested’ prior to use.

4. Face/Eye Protection
   - Several types of face/eye protection are available (e.g. mask with built-in visor, goggles, full face shield)
   - Place over the eyes or face.
   - Adjust to fit
   - NOTE: Eyeglasses are not considered protective eyewear.

5. Gloves
   - Put on gloves.
   - Pull the cuffs of gloves over the cuffs of the gown.

For more information complete- Personal Protective Equipment (PPE) LMS video
LMS Code: 0373.01

Developed by Infection Prevention & Control- Jan 31, 2020

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GUIDE TO REMOVING PERSONAL PROTECTIVE EQUIPMENT

Droplet & Contact Precautions

1. Gloves
   - Use glove to glove, skin-to-skin technique.
   - Outside of gloves are contaminated.
   - Discard in garbage

2. Hand Hygiene
   - Perform hand hygiene.
   - Alcohol-based hand rub is preferred. Use soap and water if hand are visibly soiled.

3. Long-sleeved gown
   - Carefully unfasten ties.
   - Grasp the outside of the gown at the back by the shoulders and pull down over the arms.
   - Turn the gown inside out during removal.
   - Carefully fold into bundle. Do not rip off.
   - Place disposable gowns in garbage or place non-disposable gowns in laundry hamper.

4. Hand Hygiene
   - Perform hand hygiene.
   - Alcohol-based hand rub is preferred. Use soap and water if hand are visibly soiled.

5. Face/Eye Protection
   - Handle only by headband or earpieces.
   - Carefully pull away from the face.
   - Place non-disposable goggles in designated area for disinfection & disposable items in waste receptacle.

6. Mask OR N95 Respirator
   - Handle only by the ties.
   - Undo/remove bottom tie first, then top. Allow to fall away from face.
   - N95 respirator is removed outside of the patient room.

7. Perform Hand Hygiene

8. Exit Patient Room, remove N95 (if applicable) & perform Hand Hygiene again as needed

For more information complete - Personal Protective Equipment (PPE) LMS video
LMS Code: 0373.01
Developed by Infection Prevention & Control - Jan 31, 2020

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APPENDIX B

Airway Team PPE
Donning and Doffing Equipment Checklist

Equipment Needed:

☐ 1 Splash resistant blue OR gown

☐ 1 Surgical hood

☐ 1 pair blue nitrile gloves

☐ 1 face-shield

☐ 1 pair fitted OR gloves

☐ 1 N95 respirator
**DONNING:**

**Step 1:** Perform hand hygiene with alcohol-based hand sanitizer. Use water and soap if hands are visibly soiled.

**Step 2:** Put on Nitrile (blue) gloves.

**Step 3:** Put on Splash resistant OR gown. Make sure gown covers from neck down. Use the Velcro at the neck, and use the outer tie to secure at the waist with the knot in front, not behind you.

**Step 4:** Put on N95 mask. Perform a seal check with each use. User should be fit tested prior to use.

**Step 5:** Put on Operator Surgical hood. Place on your head, cross the straps under your neck and tie behind your neck loosely.

**Step 6:** Put on Face-shield. Adjust to fit. Note that eye-glasses are NOT acceptable face/eye protection.

**Step 7:** Put on fitted OR gloves. Ensure that these fit over the wrists of the gown. See image below for finished PPE.
DOFFING:

Step 1: Untie the surgical gown knot that is in front of you.

Step 2: Remove your outer, OR gloves. Use glove-to-glove, skin-to-skin technique, with the nitrile undergloves acting as your “second skin.”

Step 3: Remove the OR gown by undoing the neck-Velcro, and then grasping the outside of the gown by the shoulders and pulling it forward. Carefully turn the gown inside out during removal. Fold in a bundle and dispose.

Step 4: Remove your face shield. Handle only by the headband. You may discard this, or keep it aside for wiping down for re-use.

Step 5: Use Alcohol based hand-sanitizer on your gloved hands.

Step 6: Remove the Surgical Hood by untying in the back, and pulling carefully forward over your head.

Step 7: Remove the blue nitrile gloves

Step 8: Hand hygiene with Ethanol based sanitizer.

Step 9: If not in anteroom, exit patient room.

Step 10: Perform hand hygiene AGAIN if you had to touch any surfaces / door handles on the way out.

Step 11: Remove N95 respirator. Remove the bottom tie first, then top. Allow to fall away from face.

Step 12: Perform hand hygiene.

You are now clean!