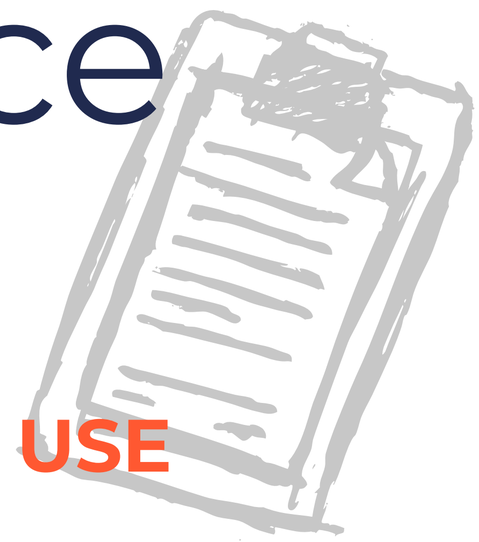
Prehospital Evidence Based Medicine



TRANSLATING KNOWLEDGE FOR PARAMEDIC USE

Trust NOT in Twitter (or Facebook)... Consider Evidence for COVID-19

Updated IPAC Recommendations for Use of Personal Protective Equipment for Care of Individuals with Suspect or Confirmed COVID-19 A Technical Brief by **PUBLIC HEALTH ONTARIO** (March 25, 2020)

WHAT YOU NEED TO KNOW ABOUT PPE USE FOR COVID-19

- In January 2020, epidemiologic data about COVID-19 evolving and **little was known about the virus.** The MOH applied the precautionary principle and initially recommended the use of N95 respirators for patient care as well as patient placement in an airborne infection isolation room.
- **Given current understanding from evidence** on COVID-19, Droplet and Contact precautions are recommended for the routine care of patients with suspected or confirmed COVID-19.
- The Paramedic Point of Care Risk Assessment or "Screen" is the most important step in determining need for PPE.
- **Coughing is NOT considered an AGMP** as per London Regional Hospital Infection Control (March, 2020)
- **Airborne precautions** should be used when aerosol generating medical procedures (AGMPs) are planned or anticipated to be performed on patients with suspected or confirmed COVID-19.
- Transmission is through **close direct contact** with someone who is positive for COVID19.

There is presently **NO EVIDENCE** that COVID-19 is transmitted through the airborne route.

DROPLET & CONTACT PRECAUTION PPE

GOWN GLOVES MASK FACE WEAR

When used correctly this equipment prevents droplets from a cough, sneeze or talking (suspended **temporarily** in the air or landing on a surface) from entering the body of a Paramedic through their mouth, nose and eyes. **ALL 3 AREAS MUST BE PROTECTED.**

WHEN DONNED AND REMOVED PROPERLY USING GOOD HAND HYGIENE...
this PPE prevents secondary contact with droplets that may have otherwise landed on the Paramedics face or clothing.

Contaminated clothing/skin can be touched with hands, then hands touch eyes, nose, or mouth.

Air, Surface Environmental, and Personal Protective Equipment Contamination by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) From a Symptomatic Patient

Journal of the American Medical Association (Ong et al., Feb. 2020)

STUDY PURPOSE

To identify modes of transmission of COVID-19 and environmental contamination within isolation rooms of 3 patients positive for COVID-19. Air sampling conducted and PPE of physicians workers exiting the rooms analyzed using swabs in isolation and anteroom.

RESULTS

Patient C had room samples taken before routine cleaning in 13 of 15 room sites tested over 5 days in 2 week period. Physician PPE ONLY swabbed positive on a shoe and ALL AIR SAMPLES were NEGATIVE despite gross environmental contamination.

DISCUSSION

There was extensive environmental surface contamination by 1 patient with mild upper respiratory tract involvement including droplets from fecal shedding. Study supports the need for strict adherence to environmental and hand hygiene.

WHAT ABOUT AEROSOL GENERATING MEDICAL PROCEDURES?

1. COVID-19 **may** be transmitted airborne through AGMPs.
2. OBHG and the MOH have taken measures to reduce the number of AGMPs by paramedics.
3. N95 Respirator Mask or C6000 Series Reusable Respirator are required PPE for AGMPs.

AEROSOL vs AIRBORNE vs DROPLET.... CLARITY PLEASE?!

Nosocomial Transmission of Emerging Viruses via Aerosol-Generating Medical Procedures (AGMPs)

Viruses (Judson and Munster, Oct 2019)

***AEROSOLS* can be divided into TWO main categories:**

- **Small Droplets** - can dry in air and travel long distances **becoming *airborne (from AGMPs)***
- **Large droplets** - do not evaporate before settling on and ***contaminating surfaces (contact)***

≤ 20 µm
Can be inhaled but also contact

≥ 20 µm
Through close contact

AGMPs can produce *droplets that are small enough* to stay suspended in the air and *remain airborne.* This is why we need a *RESPIRATOR (N95 or C6000 series)* mask for theses procedures and why the OBHG has minimized the application of Paramedic AGMPs.

A natural cough propels droplets up to 6ft (1.8m) from the patient. These droplets are heavy enough that they are pulled down by gravity and land on surfaces.

This is why paramedics should remain 6ft (2m) away from patients when completing the Paramedic COVID-19 Screen or until they are wearing complete droplet/contact PPE (gloves, gown, mask, face protection - goggles/face shield).

Putting a surgical mask on your patient can reduce the spread of droplet particles from natural coughing.

WHAT ARE POTENTIAL LAND PARAMEDIC AGMPs?

AS per the Ontario Base Hospital Group Memo Updated May 6th, 2020

CONSIDERED TO BE AGMPs

- Intubation and Extubation during CPR
- CPAP
- Bag-Valve Mask Ventilation
- Open suctioning - tracheostomy or ETT
- Nebulization of medications

NOT CONSIDERED TO BE AGMPs

- Collection of nasopharyngeal or throat swabs
- Natural coughing to bring up sputum
- Oral suctioning

O2 DELIVERY BEST PRACTICES

- Do not deliver oxygen via Nasal Cannual a flow rate greater then 6L/min
- Do not delivery oxygen using high flow at rate greater then 15 L/min
- Use the FLOMax 2 Mask when ever possible

CRITICAL THINKING OBHG PRACTICE RECOMMENDATIONS

1. Use hydrophobic submicron filter at all times when using the BVM.

2. Place a surgical mask over your patient if using a Nasal Cannula

3. Use High Flow Masks with hydrophobic submicron filter for high-flow O2 administration

4. Insert an SGA (over ETT) as soon as possible in cardiac arrest patients. Pause CPR to do this.

5. Pause ventilations and maintain tight seal (with 2-hands on mask or SGA connected to BVM) when extricating through populated areas or hospital corridors - use judgement with time.

RECALL OBHG MEDICAL DIRECTIVE CHANGES DURING COVID-19 PANDEMIC TO MINIMIZE AGMPs...

DO NOT:

- Administer medications via ETT or Nebulizer
- Use CPAP or open suctioning of ETT/tracheostomy
- Use BVM unless patients SpO2 <85%
- Perform intubation UNLESS an SGA is not effective
- Ventilate when transporting through LTC homes, hospital hallways, or other enclosed public buildings.

CONSIDER:

- IM Epinephrine for **ASTHMA** patients in **Severe Respiratory Distress** with cough and even without need for BVM Ventilation. **May administer 2 doses, q 5 min.**
- Withholding salbutamol MDI with spacer for mild-moderate respiratory distress unless respiratory distress becomes severe **with no cough.**
- Using alternate route for Intranasal and Buccal medication administration

WHY DOES OUR PPE USE MATTER TO THE MINISTRY OF HEALTH?

GLOBAL PPE CONSUMPTION is something we must all consider. As of March 27th, the **Ministry of Health has MANDATED** the regulation and reporting of MLPS PPE consumption. We all have to **WORK TOGETHER** to ensure adequate **SUPPLY OF PPE** for the duration of the COVID-19 Pandemic.

TRY TO THINK OF PPE IN A GLOBAL PANDEMIC LIKE A TOURNIQUET IN AN ACTIVE SHOOTER MCI...

GREEN ZONE (CONVENTIONAL CAPACITY STRATEGIES):
We know there are 100 tourniquets total in London between MLPS and Police.
We know presently that there is 1 classroom with 20 victims, and all have hemorrhaging GSWs.
WE ARE GOOD! We can use the tourniquets as patients need them (or PPE as Health Care Providers need it). We need to have police to prioritize neutralizing the threat (like engineering controls - prevent contact).

YELLOW ZONE (CONTINGENCY CAPACITY STRATEGIES):
We have used up 25 tourniquet and are just informed that there are another 40 patients in a different room with hemorrhaging GSWs. We use up another 40 tourniquets. YIKES! 35 left!
OK, WE ARE STILL GOOD, BUT.... we need to prepare for what to do if there are more patients requiring tourniquets. As we continue on, we consider assessment and removal of tourniquets at secondary triage, clean them and get them back out for use on newly discovered patients. We may need to look at how we can make improvised tourniquets. We need to contact Elgin EMS and Police services and see if they have tourniquets to spare (pull from Global Supply). We need to stop the police from applying tourniquets to people who do not need them - we must ensure they are being used appropriately (implement control measures).

RED ZONE (CRISIS ALTERNATE STRATEGIES):
We have 35 tourniquets left and allied agencies have none to spare! We just discovered the shooter has shot another 100 people on a second floor of the building, all with hemorrhaging GSWs.
WE NEED TO GET CREATIVE! We do not have enough stock. Lets grab training tourniquets and expired tourniquets for use. We need to make sure every patient who gets a tourniquet has a good chance of survival and screen more diligently while triaging (like changing paramedic care and removing AGMPs).

WE NEED TO THINK ABOUT OUR USE OF PPE IN THE GREATER CONTEXT OF THE GLOBAL SUPPLY!

See The Centers for Disease Control and Prevention (CDC) Checklist for Strategies to Optimize the Supply of N95s During COVID-19 Response.
https://www.cdc.gov/coronavirus/2019-ncov/hcp/checklist-n95-strategy.html

TRUST YOUR LEADERSHIP AND THE SCIENCE!

MLPS Leadership and Education team are following evidence based guidelines from the MOH, Public Health Ontario, the WHO and the CDC, all based off what is known about COVID-19 to date.

HOLD ONE ANOTHER ACCOUNTABLE!

We are in this together as a GLOBAL HEALTH CARE COMMUNITY. As a collective, we need to be responsible for appropriate consumption of PPE with considerations for the long run.

Effectiveness of N95 respirators versus surgical masks in protecting health care workers from acute respiratory infection: a systematic review and meta-analysis

Canadian Medical Association Journal (Smith et al., 2015)

STUDY PURPOSE

To conduct a systematic review of both clinical and surrogate exposure data comparing N95 respirators and surgical masks for the prevention of transmissible acute respiratory infections in healthcare workers.

METHODS

Randomized controlled trials (RCTs), cohort studies and case–control studies that included data on health care workers wearing N95 respirators and surgical masks to prevent acute respiratory infections were included in the meta- analysis.

RESULTS

NO significant difference between N95 respirators and surgical masks when used by health care workers to prevent transmission of acute respiratory infections from patients. Discomfort of N95s can lead to inadvertent face contamination. Looked at H1N1 and Influenza.