BCEHS | BC Emergency Health Services

# Personal Protective Equipment Toolkit



including Point of Care Risk Assessment

Infection Prevention and Control
5/22/2018

# FEEDBACK

Your feedback and questions are appreciated

Email Infection Prevention and Control - IPAC@bcehs.ca

Please be as specific as possible with your comments and questions; include the section or page number where possible/appropriate. It is also helpful to receive your suggestions for improvements.

Education sessions can also be arranged as availability allows

# Summary of Major Revisions

New materials [from most recent date] will be shaded within the text and listed below

| Page | Details | Date |
|---|---|---|
| | | |

You can BROWSE by the following

**Precautions Selection Table**

- Point of Care Risk Assessment
- Personal Protective Equipment
- Additional Precautions
- Donning PPE
- Doffing PPE

## Introduction

**Routine Practices** describes the regular steps that are taken at all times when providing patient care. Routine Practices is the term commonly used in Canada.

The use of Routine Practices does not depend on having a diagnosis of infection. It relies on the recognition of signs and symptoms and the knowledge of how infectious diseases are spread. Early recognition and appropriate actions will reduce the potential for acquiring and transmitting infectious diseases.

Routine Practices are based on the premise that all patients' secretions, excretions, body fluids, skin surface and the environment in which they receive care could potentially be contaminated with harmful microorganisms.

Routine Practices include the following:

- Point of care risk assessment
- Hand hygiene
- Personal protective equipment (PPE)
- Sharps safety
- Patient accommodation and transport considerations
- Cleaning and disinfection [hyperlink to toolkit]

Point of care risk assessment and PPE are included in this toolkit.



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## Point of Care Risk Assessment

The risk of exposure to an infectious disease is often not perceived as an environmental hazard in the same way that downed hydro wires, confined spaces, or leaking fuel, but must be considered prior to providing care to the patient. Assessment begins with the information received from dispatch, with attention to any information suggestive of an infection. Further information is gathered by assessing for risks prior to getting into close proximity of the patient (within 2 metres). This should include whether:

- there is any potential for blood or body fluid exposure,
- the patient has any obvious symptoms of infection (i.e., fever, chills, coughing, pain, redness, diarrhea), and
- the patient is cooperative, not shouting or spitting, and will respond to questions and follow directions given

## Risk Assessment

| Symptom | Question | Risk |
|---|---|---|
| Cough | Is it new or has worsened in the last few days? | Determining if chronic or acute condition. "New" or "worsening" may indicate an acute condition (rather than chronic) and a higher risk for the existence of infection |
| Shortness of breath | Is it new or has worsened in the last few days? | Determining if chronic or acute condition. "New" or "worsening" may indicate an acute condition (rather than chronic) and a higher risk for the existence of infection |
| Diarrhea and/or vomiting | Are these symptoms present?<br><br>Is there a known cause (e.g., vomiting due to pregnancy)? | Determining if there is a known cause, or if this is new condition which may indicate a higher risk for the existence of infection.<br><br>The risk of cross infection from exposure to body fluids must be considered high even when there is a known cause, and therefore additional infection control precautions must be put in place |
| Flushed and rapid respirations | Does the person have a fever (>38$^0$C)? Have they felt hot, had shakes or chills in the last 24 hours? | Determining if these sign and symptoms are present, especially if other symptoms suggestive of infection are present (such as rash or rapid respiration rate); and if yes, would indicate a higher risk for existence of infection |



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| | | |
|---|---|---|
| Wounds | Is there any purulent drainage?<br><br>Is the wound(s) covered and contained? | Determining if there is an infection and if there is potential exposure to the drainage. If drainage cannot be contained, there is a greater risk for environmental contamination and subsequent exposure to staff and patients |
| Rash | Does the patient have a rash that is new to them? | Determining if chronic or acute condition. "New" would indicate an acute and a higher risk for existence of infection |

# Precautions Selection Table – symptom based

The need to wear personal protective equipment (PPE) for Routine Practices is dependent on the risk of contact or contamination with blood or body fluids

| Disease, Condition, Organism | Presentation / Transmission Route | Routine | Additional Precautions if Needed | | | PPE for Staff | | | | PPE for Patient | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Abscess – Minor** | Drainage is limited or contained within dressing.<br>**Contact** with exudate | ✓ | | | | | | | | | |
| **Abscess – Major** | Drainage is not contained by a dressing. | | ✓ | | | ✓ | ✓ | | | | Gown should be worn if uniform is likely to become soiled with the wound drainage |
| **Cellulitis** | Reddening of the skin. | ✓ | | | | | | | | | |
| **Conjunctivitis** | Soreness, swelling and redness, often with discharge.<br>**Contact** with the discharge | | ✓ | | | | ✓ | | | | |
| **Diarrhea** | Liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | | ✓ | | | | Gown should be worn if the patient needs to us a bedpan or their personal hygiene needs to be addressed |
| **Draining wound** | Wound discharge | | ✓ | | | | ✓ | | | | |
| **Rash with fever** | Vesicular rash fluid or respiratory secretions, dependent on organism | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | Gown should be worn if uniform is likely to become contaminated with secretions or vesicular rash fluid |



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| | | | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Respiratory illness** Cold, influenza, viral respiratory disease etc | Respiratory secretions | | | ✓ | | | ✓ | ✓ | ✓ | ✓ | Gown should be worn if respiratory secretions likely to contaminate uniform<br>Symptoms: new or worsening cough, fever, joint aches, running nose.<br>Due to the risk of TB, all pre-hospital staff are required to wear a fit tested N95 respirator |
| **Vomit** | Vomit | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✘ | |



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# Precautions Selection Table – specific disease

**A B C** D **E** F **G H I** J K **L M N** O P Q **R S T** U **V W** X Y Z

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| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Adenovirus**<br>Conjunctivitis<br>Gastroenteritis<br>Urinary tract infection | Presentation is dependent on the source of the infection.<br>**Contact** with the source body fluid | | ✓ | | | ✓ | ✓ | | | | |
| **Adenovirus**<br>Respiratory tract infection | New or worsening cough, fever, runny nose, sore throat<br>Direct **contact** or by **droplets** landing in the mouth or nose of those within 6 feet of the infected person | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |



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| **Bed Bugs**<br>*Cimex lectularius* | Bed bugs are flattened oval shaped insects approximately 4 – 5 mm long and primarily feed on blood while their host is sleeping | | ✓ | | | ✓ | ✓ | | | | Limit non-essential contact with the patient and their environment.<br>Where possible, remove the patients clothing and wrap in sheet on stretcher.<br>See fact sheet[1] |
| **Campylobacter** | Diarrhea illness; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |
| **Chicken Pox**<br>Varicella Zoster Virus | Vesicles – blister like rash.<br>**Contact** with the vesicle fluid, and **airborne** spread from the respiratory tract | | | | ✓ | ✓ | ✓ | ✓ | ✓ | | Vaccination available.<br>Incubation period – 10-21 days after exposure<br>Infectious period – 2 days before rash starts until all the vesicles have crusted |
| **CJD & vCJD**<br>Creutzfeldt Jacob Disease | Contaminated tissue of the infected person or animal | ✓ | | | | | | | | | Additional precautions are only necessary in certain surgical circumstances |

[1] Fact sheet available on the IPAC page of the BCAS intranet site - https://intranet.bcas.ca/areas/qsrma/ipac/

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| ***Clostridium Difficile*** | Diarrhea illness; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Diarrhea often following antibiotic use. If a person has been diagnosed in the past but does not have symptoms, additional precautions are not needed. Particular risk when hands are not cleaned prior to eating |
| **Conjunctivitis** | Soreness, swelling and redness, often with discharge.<br>**Contact** with the discharge | | ✓ | | | | ✓ | | | | |
| **CPO –** Carbapenemase-Producing Organism | Presentation depends on the type of infection.<br>Direct or indirect **contact** with the patient, particularly their secretions and excretions | | ✓ | | | ✓ | ✓ | | | | May also be known as CPE (carbapenemase-producing enterobacteriaceae) or CRE (carbapenem resistant eterobacteriaceae) |
| **Croup** | Respiratory secretions | | | ✓ | | | ✓ | ✓ | ✓ | | Mask may be put on patient if tolerated |
| **Cryptosporidium** | Diarrhea illness; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |



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| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Conjunctivitis** | Soreness, swelling and redness, often with discharge.<br>**Contact** with the discharge | | ✓ | | | | ✓ | | | | |
| **CPO –** Carbapenemase-Producing Organism | Presentation depends on the type of infection.<br>Direct or indirect **contact** with the patient, particularly their secretions and excretions | | ✓ | | | ✓ | ✓ | | | | May also be known as CPE (carbapenemase-producing enterobacteriaceae) or CRE (carbapenem resistant eterobacteriaceae) |
| **Cryptosporidium** | Diarrhea illness; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |
| **Cytomegalovirus (CMV)** | Mild illness, sore throat, fatigue and swollen glands | ✓ | | | | | | | | | Often people do not get diagnosed as the symptoms are suggestive of other illnesses like the common cold. The risk of transmission is very small. |
| **E. coli 0157:H** *Escherichia coli* 0157:H | Diarrhea illness; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |



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| **Epstein Barr Virus** Infectious mononucleosis | Fever and sore throat. Transmission is usually by very close mouth to mouth contact | ✓ | | | | | | | | | |
| **ESBL** Extended Spectrum Beta-Lactamase producing organisms | Presentation is dependent on the site of infection, but commonly causes urinary tract infection. **Contact** particularly with secretions and excretions | | ✓ | | | ✓ | ✓ | | | | |
| **Giardia** | Diarrhea illness; liquid faeces which takes on the shape of the container. **Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |
| **Group A Streptococcus –** skin infection | Wound, skin infection, impetigo, cellulitis. **Contact** | | ✓ | | | ✓ | ✓ | | | | Can be the cause of **necrotizing fasciitis** |
| **Group A Streptococcus –** respiratory infection | New or worsening cough, fever, sore throat Contact with the large respiratory **droplets** | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | **Scarlet fever** |



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| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Haemophilus Influenza** | New or worsening cough, fever, sore throat.<br>Contact with the large respiratory **droplets** | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | Can also present as meningitis, cellulitis or septic arthritis<br>Haemophilus influenza **type B** meningitis is the only type contact traced by WPH |
| **Hand Foot and Mouth** | Fever, mouth sores, skin rash<br>Contact with respiratory secretions and faeces | | ✓ | | | | ✓ | | | | May also be known as Parvovirus B 19, Erythema Infectiosum, Fifth Disease or slapped cheek syndrome |
| **Hepatitis A** | Can cause diarrhea illness; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |
| **Hepatitis B** | Often asymptomatic blood borne virus.<br>Contact with blood and body fluids | ✓ | | | | | | | | | Body fluids include saliva, semen, cerebral spinal fluid, vaginal, synovial, pleural, peritoneal and amniotic fluids |
| **Hepatitis C** | Often asymptomatic blood borne virus.<br>Contact with blood and body fluids | ✓ | | | | | | | | | Body fluids include saliva, semen, cerebral spinal fluid, vaginal, synovial, pleural, peritoneal and amniotic fluids |



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| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Herpes Simplex** | Skin or mucosal lesions<br>**Contact with the lesion** | | ✓ | | | ✓ | ✓ | | | | Precautions needed for the duration of the lesions |
| **HIV**<br>Human Immunodeficiency Virus | May be asymptomatic, but can present with clinical symptoms dependent on illness | ✓ | | | | | | | | | Body fluids include saliva, semen, cerebral spinal fluid, vaginal, synovial, pleural, peritoneal and amniotic fluids |
| **Impetigo** | Skin lesions<br>**Contact** with the lesion fluid | | ✓ | | | | ✓ | | | | |
| **Influenza**<br>Seasonal | New or worsening cough, fever, sore throat, myalgia.<br>Contact with the large respiratory **droplets** | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | Avoid nebulized therapy where possible |



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|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Influenza**<br>New/Pandemic strain | New or worsening cough, fever, sore throat, myalgia.<br>Contact with the large respiratory **droplets**<br><br>**Do not use nebulized therapy**<br><br>**Inform hospital of symptomatic patient as early as possible** | | | ✓ | | ✓ | ✓ | ✓ | | ✓ | Avoid aerosol generating medical procedures including nebulized medication. Inform hospital of symptomatic patient as early as possible |
| **Lice**<br>Head or body | Infestation<br>**Contact** with the louse | | ✓ | | | ✓ | ✓ | | | | |
| **Measles** | Maculopapular rash, fever, runny nose, rhinitis<br>**Airborne** spread from the respiratory tract | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | Vaccination available.<br>Incubation period – 7-21 days after exposure<br>Infectious period – 4 days before rash and 4 days after |

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|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Meningitis** | Meningitis<br>Symptoms can include fever, headache, stiff neck, nausea, vomiting, increased sensitivity to light.<br>Precautions are usually dependent on the cause, but where cause is unknown highest level of precaution are needed – **droplet.** | | | ✓ | | | ✓ | ✓ | ✓ | | Transmission of bacterial meningitis is through direct respiratory secretion contact. Post exposure prophylaxis will be recommended, dependent on the type/level of exposure<br>**WPH Contact Tracing:**<br>• Haemophilus influenza Type B<br>• Meningococcal<br>**No staff contact follow up or prophylactic treatment is required for all other forms of bacterial, fungal or viral meningitis** |
| **MRSA**<br>Methicillin Resistant *Staphylococcus aureus* | Asymptomatic to symptoms associated with current illness.<br>Direct or indirect **contact** | | ✓ | | | ✓ | ✓ | | | | Can cause skin or soft tissue infections, bacteraemia, pneumonia or urinary tract infections, etc |
| **MERS CoV**<br>Coronavirus | New or worsening cough, fever, difficulty breathing<br>**Contact** with the respiratory secretions or airborne **droplets** which are inhaled | | | ✓ | | ✓ | ✓ | | ✓ | ✓ | |



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| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Mumps** | Swelling of the salivary glands, orchitis<br>**Contact** with the respiratory secretions or airborne **droplets** which are inhaled | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | Vaccination available.<br>Incubation period – 12-25 days after exposure<br>Infectious period – 2 days before and 5 days after the onset of parotitis |
| **Norovirus** | Illness can cause nausea, vomiting, diarrhea and abdominal cramps.<br>direct or indirect **Contact** with the faeces or vomit **droplets** | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | |
| **Rotavirus** | Fever and diarrhea, liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |
| **RSV**<br>Respiratory Syncytial Virus | Respiratory tract infection<br>**Contact** with the respiratory secretions or **airborne** droplets which are inhaled | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | |
| **Rubella**<br>German Measles | Maculopapular rash, fever<br>Contact with respiratory **droplets** | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | |



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|---|---|---|---|---|---|---|---|---|---|---|
| | | Routine | Contact | Droplet | Airborne | Gown | Gloves | Visor | N95 Respirator | Surgical procedure mask on Patient | |
| **Salmonella** | Fever and diarrhea; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |
| **Scabies** | Itchy skin lesions caused the invading mite<br>Direct skin to skin contact with the patient for a **prolonged period** of time | | ✓ | | | ✓ | ✓ | | | | If the patient has particularly scaly skin due to the disease, it may indicate "Norwegian Scabies" which is more easily transmitted, but the precautions needed remain the same |
| **Shigella species** | Diarrhea illness; liquid faeces which takes on the shape of the container.<br>**Contact** with the faeces | | ✓ | | | ✓ | ✓ | | | | Particular risk when hands are not cleaned prior to eating |
| **Shingles – localized vesicles**<br>(Varicella Zoster Virus) | Vesicle – painful blister like rash, usually localised.<br>**Contact** with the vesicle fluid. | ✓ | ✓ | | | ✓ | ✓ | | | | Anyone who has had Chicken Pox is at risk of developing Shingles. Chicken Pox can be caught from Shingles if a person does not have immunity to Chicken Pox. Shingles itself is not transmissible. |



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| **Shingles –** Disseminated | Occasionally **airborne** in serious illness or when disseminated (wide spread across the whole body) | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | Disseminated shingles occurs when the patient's immune system becomes compromised from other co-morbidities (e.g. cancer, AIDs) |
| **TB –** non-pulmonary | Presentation is dependent on the source of the disease. | ✓ | | | | | | | | | |
| **TB, pulmonary** (Tuberculosis) | New or worsening cough, fever, night sweats, weight loss, shortness of breath. Transmission occurs when small respiratory droplets are inhaled | | | | ✓ | | | ✓ | ✓ | ✓ | |
| **VRE** Vancomycin Resistant Enterococcus | Presentation is dependent on the source of the disease. | ✓ | | | | | | | | | In situations where a patient presents with symptoms which could suggest infection, the precautions needed are specific to those symptoms |
| **Whooping Cough** (Pertussis) | Irritating, violent coughing. High pitched "whoop" cough. Contact with respiratory **droplets** | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | Generally, children will not tolerate a surgical mask |



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## Personal Protective Equipment

PPE refers to equipment worn or used as a physical barrier between the paramedic and potential risks of contamination (for example microorganisms or body fluids). It comprises the following, all of which are stored in stations and must be carried in the ambulance:

- N95 respirator mask (requires annual fit-testing)
- surgical/procedure masks (for patients or staff during influenza season)
- gloves
- eye protection (protective glasses, goggles, face shields)
- gowns, disposable coveralls or Tyvek™ suits

PPE specific to the task should always be worn when:

- Interacting, treating, and/or transporting patients with a known or suspected infectious disease
- Preparing chemical solutions used for cleaning and disinfection (i.e., detergents, disinfectants)
- Cleaning and disinfecting any equipment used for a patient, and cleaning the vehicle after transport

The choice of PPE is dependent on a patient risk assessment of the situation and the patient, and a determination of what involvement the paramedic will have with the patient based on proximity, interaction and location. The paramedic must use the appropriate PPE to prevent exposure, and in accordance with manufacturer's instructions, recognized standards and training received.

PPE, other than an N95 respirator/mask for airborne precautions, must never be worn in the driver's compartment of a vehicle, as this may cause contamination of surfaces and equipment is this area.



### Gloves

Gloves are used to protect the hands from diseases spread through contact transmission. In most contact with patients and their environment medical gloves (nitrile, or neoprene) are used but are only necessary where there is a risk of contact with blood or body fluids. Gloves need to be appropriate to the task. Thicker medical gloves may provide more protection but they also make it harder to handle objects and to perform some assessments.

Hands must be cleaned before gloves are put on and immediately after they are taken off. Medical gloves are single-use and must be discarded after contact or a task is completed. For example, after loading the patient into the patient compartment, the driver should remove and dispose of their gloves (and any other disposable PPE they are wearing) and perform hand hygiene before entering the driver's compartment. The driver will put on gloves if needed (and any other necessary PPE) before assisting to unload the patient at the destination.

### Indications for glove use

Gloves should be used for the following:

- When there is a risk of contact with blood or body fluids;
- When touching the patient's mucous membranes or non-intact skin;

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- When the patient's skin is soiled;
- When performing invasive procedures, such as IV insertion or intubation;
- When treating and transporting a patient with a known or suspected infectious disease;
- When handling dirty laundry, soiled personal items, or garbage
- When disinfecting equipment used for the patient and high touch areas in the vehicle following patient transport in accordance with directions provided by the disinfectant manufacturer

### Considerations when using gloves

- Do not clean your hands with gloves on. Soap and water or ABHR will break down the glove material.
- If a glove becomes torn or ripped, remove immediately, clean your hands, and put on new gloves.
- Be aware of what is touched with gloved hands and be sure to clean and disinfect those surfaces, as well as pens, stethoscopes, pagers, radios, and vehicle door handles.
- Avoid writing notes on gloves as this will damage the material and limits their effectiveness. In addition, used gloves must not be worn outside of the patient care area/zone.
- Avoid touching your face or hair with gloved hands.
- When using gloves, hold hands together. This will decrease potential for self and cross-contamination.
- Discard gloves in a waste receptacle immediately after removal to prevent self-contamination or contamination to others.
- Hands must be considered contaminated after removing gloves. Always perform hand hygiene as soon as gloves are removed.

### Surgical/Procedure Masks

Fluid resistant surgical/procedure masks are considered adequate in most healthcare settings, to prevent transmission of respiratory diseases spread by large droplets. They are not appropriate if the infection is an airborne disease. As it is difficult to ascertain in the pre-hospital setting whether a patient with a respiratory symptoms has an airborne or droplet transmitted disease, paramedics are directed to use a fit tested N95 respirator/mask which provides them protection for both situations.

Surgical masks do not seal to the user's face, and do not provide respiratory protection against small inhalable droplets (<5 microns in size).

Fluid resistant surgical masks are placed on patients who are coughing and sneezing to add an additional barrier in protecting the paramedic from exposure to the patient's respiratory secretions. A mask must never be placed on a patient who is nauseas or vomiting.

### N95 Respirator/Mask

N95 respirators/masks are used to create a sealed barrier that prevents infectious microorganisms from being inhaled into the lungs.

### Indications for N95 respirator/mask use

All staff are required to wear a NIOSH approved, fit tested N95 respirator/mask for:



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- Any suspected or known airborne disease, such as tuberculosis, chickenpox, or measles.
- Any aerosolized occupational exposure, including any aerosol generating medical procedures, such as suctioning, intubation, nebulising therapies, patients on oxygen therapies of 50% or higher.

### Other indications for N95 respirator/mask use

- When caring for a patient with signs and symptoms of a respiratory illness with rash and fever or possible meningitis;
- When blood or body fluid splash is likely or expected, such as when a person has nausea and vomiting;
- When cleaning the equipment and vehicle following the transport of a patient with a known or suspected infectious disease transmitted by either the airborne or droplet route where the vehicle has not been allowed to vent for 20 minutes or longer.

### Considerations for N95 respirator/mask use

- Once fit tested, paramedics should be aware of the make and size of the respirator required for their protection.
- N95 respirators/masks must remain dry for maximum effectiveness. If the respirator becomes wet, either from the normal breathing of the paramedic or because of splash, it must be exchanged for a new one in a dry area as soon as possible.
- If an N95 respirator/mask is worn during the treatment of a patient, the used N95 must be removed, hand hygiene performed, and a new unused N95 respirator/mask put on before going into the cab of the ambulance.
- Never put an N95 respirator on the patient.
- N95 respirators must be used and changed according to manufacturer's recommendations.
- N95 respirators are designed for single use only and must be discarded following use.



## Eye Protection

Eye protection, such as protective eye glasses (not prescription or sun glasses) or goggles, is useful during procedures that are likely to generate splashes or sprays of blood and body fluids. A face shield is especially useful because it covers the nose and mouth as well as the eyes. Eye protection or face shields are required until it is reasonably assured that the eyes and/or face will not be splashed with blood or a body substance, or exposed to droplets.

### Indications for eye protection

- When there is potential for blood or body fluid splash while providing care.
- When providing care for a patient with a known or suspected infectious disease transmitted by the droplet route, such as influenza.
- When providing care for a patient who is vomiting.
- When performing procedures such as:
    - Wound irrigation
    - Delivery of new-borns
    - Endotracheal extubation
- A face shield is used in addition to an N95 respirator when performing Aerosol Generating Medical Procedures (AGMP), such as:

- nebulized medication
- endotracheal intubation
- respiratory and airway suctioning
- non-invasive positive pressure ventilation - bag valve mask

### Considerations when using eye protection

- Eye protection should not impair vision, resulting in safety issues for the paramedic or patient.
- Paramedics should not touch their eyes or face while providing care to the patient or while they have gloves on in order to prevent self-contamination.
- Eye protection must be removed properly to prevent self-contamination.
- Reusable eye protection must be thoroughly cleaned and disinfected following every use.
- Disposable single-use goggles and shields must be discarded in an appropriate waste container after use.
- Hand hygiene must be performed following the removal of eye protection.

### Gowns, Coveralls, Boot Covers, Hair Covers

Long sleeved gowns and/or disposable Tyvek™ coveralls are used to protect uncovered forearms and prevent soiling of uniforms at times when there is the potential for splashes, sprays or contact with blood or any body fluids. Impervious, fluid resistant gowns or coveralls are recommended when there are copious amounts of blood and/or body fluids sufficient to soak through regular disposable coverings.

If there's a chance that infectious material may contaminate footwear, waterproof boot covers are also available and should be worn.

### Indications for use

- When blood or body fluid splash/contamination is likely or expected;
- When caring for a patient with draining wounds that cannot be contained, where there are large areas of non-intact skin, or experiencing nausea, vomiting and diarrhea;
- If there is a high risk of paramedic's forearms or uniforms coming in direct contact with surfaces and objects that likely have been contaminated with blood or body fluids or other microbial contamination;

### Considerations when using gowns, coveralls, boot covers, hair covers

- Gowns must cover the user's front and back;
- Gowns, disposable coveralls, and boot covers must be removed immediately following use, and discarded in a waste receptacle;
- Gowns, disposable coveralls, and boot covers must not be worn in the cab of the ambulance;

# Additional Infection Prevention and Control Precautions

## Contact Precautions

Contact transmission occurs through contact with a person or object that is contaminated with an infectious organism, which is then transferred to another person or surface. Contact transmission generally occurs through direct or indirect contact. Contact transmission is the most common means of transmission in healthcare.

**Direct contact transmission** occurs when transfer of microorganisms is a result of direct physical contact

**Indirect contact transmission** involves the passive transfer of microorganisms to a susceptible host via an intermediate object.

**Contact Precautions**

- gloves if close contact with the patient is expected and if blood or body fluids are present
- gowns if close contact with the patient is expected
- excellent hand hygiene is performed after gloves and other PPE is removed
- cleaning and disinfection of equipment and surfaces touched or used

## Droplet Transmission

Droplet transmission refers to the large droplets, greater than 5 microns in size, that are generated from the respiratory tract of an infected person when they cough or sneeze, or during a procedure such as intubation or suctioning. These droplets land on mucous membranes or are transferred by contaminated hands or gloves. They do not remain in the air but fall by gravity, usually within 2 metres

**Droplet Precautions**

- gloves if within 2 meters of the patient
- gown if within 2 meters of the patient who is coughing is unable to wear a surgical/procedure mask
- eye protection and N95 respirator/mask within 2 meters of the patient
- excellent hand hygiene is performed after gloves and other PPE is removed
- cleaning and disinfection of equipment and surfaces touched or within 2 meters of the patient

## Airborne Transmission

Microorganisms which are small enough (less than 5 microns) and light enough to remain suspended in the air for prolonged periods of time. They can be dispersed widely by air currents. Airborne transmission occurs when the organism is inhaled.



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**Airborne Precautions**

- N95 mask
- encourage the patient to wear a surgical/procedure mask
- gloves and gown if there is any potential for contamination from respiratory secretions or vesicle fluid
- proper ventilation in vehicles
- excellent hand hygiene is performed after gloves and other PPE is removed
- allow the patient compartment to vent for 20 minutes after patient transport
- cleaning and disinfection of equipment and surfaces touched



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## Donning Personal Protective Equipment

If the task you are performing requires the use of PPE put it on in the following order (ignore the steps for any PPE that is not applicable):

1. Wash your hands or use an alcohol-based hand rub.
2. Put on boot covers if required.
3. Perform hand hygiene
4. Put on a gown or Tyvek™ suit (see procedure below).
5. Put on a hair cover (if needed).
6. Put on a respirator – N95 Respirator (see procedure below).
7. Put on eye and face protection (such as goggles or a face shield).
8. Perform hand hygiene
9. Put on gloves (see procedure below).

If necessary, utilize your partner to help don PPE.

## Donning Gown (if required)

Take all action belts off first, pager, etc.

Continue to carry your radio sealed in a zip lock bag for safety reasons. Dispose of bag later.

1. Select the appropriate type of gown or suit for the task in the right size for you.
2. Make sure the opening of the gown is in the back, and secure the gown at the neck and waist. (Note: different models may have varying ways to properly tie up the gowns).
3. If the gown is too small to cover your torso fully, use two gowns. Put on the first gown with the opening in front and the second gown over the first one with the opening in the back.
4. Gown cuff should go under the glove. Some gown models have thumb hooks to secure the cuff in place.

## Donning a Tyvek Suit

Take all action belts off first, pager, etc.

Continue to carry your radio sealed in a zip lock bag for safety reasons. Dispose of bag later.

1. Select the appropriate type of gown or suit for the task in the right size for you.
2. Unfasten ties and unzip zipper.
3. Scrunch up the legs of the suit, making a space to put your foot through.
4. Step into the suit one leg at a time.
5. Gently pull the suit over your legs and to your waist.
6. Put on the upper portion of the suit, one arm at a time.
7. Zip the zipper.
8. If the situation requires that the suit be sealed, tape each wrists and ankles tightly.



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## Donning an N95 respirator – individually packaged flat fold design

1. Remove the respirator from its packaging and hold with straps facing upward. Place the bottom strap under the centre flaps next to the "WARNING" statement.

2. Fully open the top and bottom panels bending the nosepiece around your thumb at centre of the foam. Straps should separate when panels are opened. Make certain the bottom panel is unfolded and completely opened.

3. Place the respirator on your face over your nose, mouth and chin so that the foam rests on your nose and the bottom panel is securely under your chin.

4. Pull the top strap over your head and position it high on the back of the head above the ears. Then, pull the bottom strap over your head and position it around your neck and below your ears.

5. Adjust for a comfortable fit by pulling the top panel toward the bridge of your nose and positioning the bottom panel under your chin.

6. Mould the flexible nose piece over the bridge of your nose by placing fingertips from both hands at the top of your nose and mould the nosepiece around your nose to achieve a secure seal.

7. Perform a fit check. Check the seal of your N95 respirator each time. Place one or both hands completely over the middle panel (in flat fold respirators only). Inhale and exhale sharply. If air leaks around your nose, readjust the nosepiece. If air leaks between the face and face seal of the respirator, reposition it by adjusting the panels and straps.



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## Donning an N95 respirator – domed style

1. Cup the respirator in your hand with the nosepiece at fingertips, allowing the head straps to hang freely below the hand

2. Position the respirator under your chin with the nosepiece up

3. While holding the respirator in place, pull the top strap over your head so it rests high on the back of your head

4. While continuing to hold the respirator firmly in place, pull the bottom strap over your head and position it around your neck, below your ears. Untwist the straps if needed. Position the respirator low on your nose.

5. Using both hands, mould the nosepiece to the shape of your nose by pushing inward while moving your fingertips down both sides of the nosepiece. Pinching with one hand may result in improper fit and less effective respirator performance

6. Perform a fit check. Check the seal of your N95 respirator each time. Place both hands completely over the respirator, being careful not to disturb the position. Exhale sharply. If air leaks around your nose, adjust the nosepiece as described in step 5. If air leaks at the edges, adjust the straps back along the sides of your head. Perform a fit test again if any adjustment is made.

**Only use a respirator for which you have been fit tested, and fit check the device as instructed before using it.**



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## Donning Gloves

Gloves should always be the last piece of PPE that you put on. Follow these steps:

1. Select the appropriate type of gloves for the task in the right size for you.
2. Insert your hands into the gloves, and adjust as necessary.
3. If you are wearing a gown or suit, ensure gloves are pulled up over the gown cuffs.
4. Make sure the gloves overlap the sleeves of the gown. There should be no gaps with visible skin. Taping of sleeves is not necessary.

# Doffing Personal Protective Equipment

It is important to doff PPE in such a manner that prevents self-contamination or cross-contamination of other persons and surfaces. All used PPE must be consider contaminated so must be kept away from your skin and mucous membranes when being removed.

All disposable PPE is placed directly into a waste receptacle as soon as it is removed. Type of waste receptacle will be dependent on type of exposure. For infectious organisms, this is a regular waste receptacle.

1. Remove footwear covers and dispose.
2. Remove gloves and dispose. Perform hand hygiene.
3. Remove the gown or Tyvek suit and dispose. Perform hand hygiene.
4. Remove eye and face protection. If re-usable place in sink or designated area for cleaning/disinfecting later (e.g. Accel wipes). If single-use, dispose into waste receptacle.
5. Remove and discard the respirator.
6. Remove and discard the hair/head cover and discard.
7. Wash your hands or use an alcohol-based hand rub.



## Removing Gloves

**Remember:** Glove to Glove, Skin to Skin

- After completing a task that required gloves
- Before leaving the work area
- As soon as possible if the gloves become damaged or contaminated

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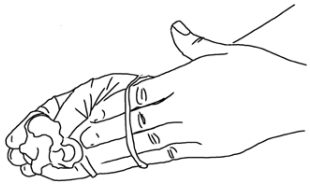
1. With both hands gloved, grasp the outside of one glove near your wrist with the other hand.

2. Peel off this first glove, peeling away from your body and from wrist to fingertips, turning the glove inside out. Hold the glove you just removed in your gloved hand.

3. With your ungloved hand, peel off the second glove by inserting your fingers inside the glove at the top of your wrist.



4. Turn the second glove inside out while tilting it away from your body, leaving the first glove inside the second.

5. Dispose of the entire bundle promptly in a waterproof garbage bag. Do not reuse the gloves.

6. If a gown is not worn, wash your hands thoroughly with soap and water or ABHR as soon as possible after removing the gloves and before touching any objects or surfaces.
   If gown is also worn, proceed to removal of gown.



## Removing Gowns

- Remember: Clean to Clean, Dirty to Dirty; Front = contaminated
- Use the following procedure when removing gowns:
- Untie or tear waist strings gently and then neck strings, being careful that hands do not contact front of gown and that it is done gently to prevent aerosolization of particles from the front of the gown.

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- Pull the gown inside out by grasping the back corners where the neck ties are, and pulling down off shoulders and down arms.
- Place a forefinger under the cuff of the sleeve and pull down over hand.
- With hand inside first sleeve, draw second sleeve down over hand.
- Roll the gown away from body so outer surface of the gown is on the inside of the roll.
- Discard the gown into waste receptacle.
- Perform hand hygiene.

## Removing Tyvek Suit

- Remember: Clean to Clean, Dirty to Dirty; Front = contaminated
- Peel the hood back inside out starting from the crown of head.
- Remove the tape from your wrists (if applicable).
- Unzip the suit.
- Peel back the entire top portion of the suit rolling it inside out all the way down to the knees.
- Remove tape at your ankles (if applicable).
- Step out of suit, and discard.
- Remove the booties peeling back inside out and discard.
- Perform hand hygiene.

## Removing face or eye protection

- Remember: Front = contaminated
- Face Shield: Hold the bottom of the face shield with one hand, then with the other hand pull the strap over your head. Pull the shield away from the face and discard.
- Goggles: Place one hand on front of the goggles, then with the other hand pull the strap over your head. Pull the goggles away from the face and place in sink or designated area for cleaning/disinfection.
- Protective eye glasses: Using both hands, grasp by ear pieces and take off pulling away from face. Put in sink or designated area for cleaning/disinfection, or discard if disposable.

## Removing respirators

- Remember: Front = contaminated
- Grab the bottom strap and pull it over your head. Do not touch front of the respirator.
- Grab the top strap and pull it over your head and remove respirator away from face while exhaling.
- Discard the respirator into waste receptacle, handling it by the straps.
- Perform hand hygiene.



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