

Considerations for infection prevention and control and personal protective equipment during the COVID-19 crisis

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Structure of the presentation

PART 1: Dawn Carnes

Current guidance and recommendations and practice specific considerations in respect of infection prevention and control (IPC) and personal protective equipment (PPE)

PART 2: Ian Harrison

Practicalities of IPC and PPE

STILL LOTS TO LEARN, THIS PRESENTATION IS BASED ON CURRENT INFORMATION:

- THINGS MAY CHANGE
- DECISIONS WILL BE BASED ON YOUR PERSONAL SITUATIONS AND CLINICAL JUDGEMENT

Aim

To enable you to make considered, sensible decisions about infection prevention and control and personal protective equipment in respect of COVID-19 situation.

Current advice:

- Osteopathic care is not indicated for:
 - People confirmed COVID-19 positive
 - People with COVID-19 symptoms (fever, persistent cough etc)
 - People who have recently (within 14 days) been directly exposed to the virus

These people should be self isolating or if seriously ill in hospital - Risk of infection to self, family, friends, patients and colleagues.

NCOR Evidence summary <https://www.ncor.org.uk/wp-content/uploads/2020/03/CoronaVirusEvidenceUpdate23.3.20204-1.pdf>.

Physiotherapy Management for COVID-19 in the Acute Hospital Setting: Recommendations to guide clinical practice. Version 1.023 March 2020 Open access <https://www.journals.elsevier.com/journal-of-physiotherapy>

The need to consider IPC and PPE:

- Asymptomatic people can shed the virus before symptom onset - incubation period 5 days (mean), viral shedding ~2.5 days prior (from Greenhalgh et al BMJ 2020)
- In one study 56% of infected people were asymptomatic or presymptomatic (nearly all developed symptoms within 14 days - 88%) (Arun et al. NEJM 2020)
- Prevalence of COVID-19 (SARS-CoV-2) is still unknown and changing
- 1-2% pop. carry a corona virus causing ~15% of hospital pneumonia infection (Chen et al. J. Med. Virol. 2020)

Government Guidance: context

- Most guidance and advice directed at health care professionals working in a hospital setting with patients with COVID-19 or suspected COVID-19
- Some advice available for primary care, community health and social care settings for essential care delivered during lockdown
- Advice in non-hospital settings for care delivered within 2 metres and with contact is not so clear

Standard infection control procedures are required to reduce levels of:

- Contact transmission (SARS-CoV-2 route is via contact with mucosa)
- Droplet transmission (higher risk within 2 metres of someone, generally heavy and drop to nearest surface relatively quickly)
- Airborne transmission (for example with aerosol generating procedures, smaller particles airborne, can remain viable in the air for up to 3 hours)

(Van Dormalen et al NEJM 2020)

Standard infection control precautions:

- **Standard Actions (PHE guidance April 2020) relate to:**
- **Hand hygiene:** washing with soap and or alcohol based hand rub, up to elbows before (forearms then hands) and after each patient and before and after entering and leaving the treatment room. Remove all jewellery watches and keep finger nails short
- **Gloves:** for contact with patients in epidemic situations (WHO)
- **Respiratory cough hygiene:** catch it, bin it, kill it – tissues or using elbow, frequent hand washing and hand sanitising

Standard infection control precautions:

- Keep hands away from face
- Masks for clinicians and those with respiratory symptoms
- 2 metre social distancing
- Cleaning disinfecting equipment and surfaces
- Waste disposal closed bins, plastic bags
- Cleaning linen (inc. uniforms) reverse and store in a closed bag for washing - min. 60 degrees with detergent
- Ventilation Air exchange and droplet dissipation (WHO)

COVID-19 PPE Government Guidance (Public Health England, Public Health Wales, Health Protection Scotland, NHS, Public Health Agency)

Environment: Primary care setting	Mask	Water resistant apron	Water resistant gown	Gloves	Eye protection
Clinician: Direct care (<2m)	Yes	Yes		Yes	Risk assess
Clinician: Direct care with AGP	Yes		Yes	Yes	Yes
Clinic personnel: reception / communal area not always able to maintain <2m distancing	Yes				
Patient: Direct care (<2m)	Risk assess				
Patient: Direct care with AGP (non invasive)	Yes				

COVID-19 IPC Guidance

(Extrapolated from Public Health England, Public Health Wales, Health Protection Scotland, NHS, Public Health Agency and WHO)

Contact	Hand hygiene	Cleaning surfaces between patients	Aeration between patients	Gloves, gowns and aprons: single use	Mask changes	Linen (inc uniform) if no plastic protection used change between patients
Clinician: Direct care (<2m)	Yes	Yes	Yes	Yes	When moist, damaged or removed	Yes
Clinician: Direct care (<2m) with AGP	Yes	Yes	Yes	Yes	Single use per patient	Yes
Non contact personnel: reception, communal area not always able to maintain <2m distancing	Yes	Yes	Risk assess	No	When moist, damaged or removed	No

Masks: Recommended

Rationale: to reduce droplet and airborne infection

Different types of masks are designed to:

- **Prevent** dispersal of droplets
- **Protect** the wearer by filtering particles

Masks: types (from Viswaneth & Monga J. Clin Ortho & Trauma March 2020)

- Cloth and paper masks

Reduce dispersion from infected person (inc. paper tissues)

- Surgical and procedural masks

Reduce dispersal with some personal protection via particle filtration ~35%

Fluid resistant surgical face masks (FRSMs / FFP1) flat, pleated sometimes cupped. Loose fit, single use

- Filtration masks

Designed for personal protection

N95 or FFP2 95% filtration 300nm particles and over: corona virus is ~100nm

Respirator masks – high particle filtration. Tight fit, seal required

Masks: Effectiveness

- Masks (FRSM and higher) are better than no mask (Long et al J.EBM 2020)
- FRSM for symptomatic people (coughing and sneezing) (Cowling et al Epid Infect. 2010).
- FRSM and N95/FFP2 no additional benefit of one over the other in a clinical setting (Long et al J.EBM 2020)
- FRSM and N95/FFP2 recommended for use by health care professionals (WHO, E CDC, US CDC and PHE)
- Cloth masks are not recommended for use by health care professionals as there is an increased risk of infection (MacIntyre et al BMJ Open 2015) (Penetration of cloth masks by particles was almost 97% and medical masks ~44%).

Masks: Effectiveness is dependent upon

- Keeping the mask on
- Changing the mask once moist
- Changing damaged masks - tears or holes
- Fit (for adequate tightness to ensure maximum filtration)
- Cross contamination from poor hand hygiene and/or poor donning and doffing procedures

Manual therapy techniques and AGP

AGP: Any procedure that may stimulate or assist a cough or 'huff'

(Physiotherapy Management for COVID-19 in the Acute Hospital Setting: Recommendations to guide clinical practice. 2020)

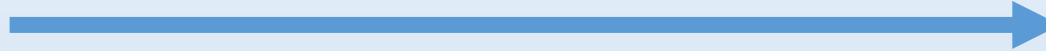
During the 2009 H1N1 flu pandemic: chest physiotherapy increased droplet production; these particles precipitated within 1m of the patient. (Simonds A et al. Health Technology Assessment 2010)

No specific guidance on AGPs for manual therapists in a non hospital setting:
Consider techniques requiring deep inspiration and expiration and, or chest compression techniques

- Droplet precaution PPE
- Consider giving patient a mask (FRSM) if coughing or huffing expected

Aeration:

Low droplet concentration with **Breathing talking**



High droplet concentration up to 2 meters with **Coughing and sneezing**

- SARS-CoV-2 can remain in the air for 3 hours (Van Dormalen et al NEJM 2020)
- Reduces viral load /concentration
- Aerated rooms are safer than closed spaces
- Regular ventilation of closed spaces is advisable
- 20 minutes ventilation for air exchange (WHO)
- Avoid systems that re-circulate the air such as fans in closed rooms

Hand hygiene: rationale

- The virus is surrounded by a lipid layer and is effectively inactivated /destroyed by:
 - Detergents - lipid solvents (soaps), ether ethanol/alcohol (70% +)
 - Disinfectants – such as bleach
 - Ultraviolet rays - direct exposure only
 - Heat - temperatures >70 degrees within 5 minutes

Hand hygiene: rationale

The virus is active for:

- up to 72 hours on plastic and stainless steel
- less than 4 hours on copper
- less than 24 hours on cardboard
- 5-7 days at 22 degrees - Dependant on surface (porous or not) and conditions (moisture and heat)

(www.who.int/covid-19 FAQs) and (<https://www.gov.uk/government/publications/wuhan-novel-coronavirus-infection-prevention-and-control/transmission-characteristics-and-principles-of-infection-prevention-and-control>)

Gloves: Recommended in Guidance

1. To reduce the risk of contamination of health-care workers hands **with blood and other body fluids.**
2. To reduce the risk of germ dissemination to the environment and of transmission from the health-care worker to the patient and vice versa, as well as from one patient to another.

WHO (https://www.who.int/gpsc/5may/Glove_Use_Information_Leaflet.pdf)

UK Gov Guidance:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878750/T2_poster_Recommended_PPE_for_primary_outpatient_community_and_social_care_by_setting.pdf

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/879111/T4_poster_Recommended_PPE_additional_considerations_of_COVID-19.pdf

Gloves: Effectiveness

- Barrier to pathogens (especially in bodily fluids)

Effectiveness dependent on:

- Whether combined with good hand hygiene
- Remembering to change gloves between patients and if required during the consultation
- Not touching the face with gloved hand
- How used: doffing and donning

(US: <https://www.ncbi.nlm.nih.gov/books/NBK554776/>)

Aprons / Gowns – Recommended in Guidance

- Plastic waterproof barrier against droplets on clothing: single use only
- Reduce cross contamination between patients
- Actual evidence of effectiveness for reducing infection is limited
- Effectiveness is also dependent on how used

(US: <https://www.ncbi.nlm.nih.gov/books/NBK554776/>)

Cleaning and disinfecting – Essential

- Between patients to destroy any virus
- Products that destroy the virus: detergents (soaps), bleach, alcohol ethanol destroy the virus within 1 minute of contact with the product (depending on concentration)

US CDC: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cleaning-disinfection.html>

US: <https://www.ncbi.nlm.nih.gov/books/NBK554776/>

Reflections before practice: risk assessment

- Own acceptable risk level (personal health and health of others, vulnerability of self and others, consequences of being ill)
 - Decisions about: Type of masks, when to use eye protection, use of potential AGPs, supine vs prone techniques, patient mask wearing
- Financial considerations
 - Additional costs required to practice (purchasing IPC and PPE, splash screens etc)
 - Potential reduced capacity / volume patients
 - Online payment systems
- Access to hand washing facilities, PPE and appropriate cleaning / sanitising products
- Clinical environment considerations for patient flow and social distancing
- Clinical environment – cleaning regimens