

To glove or not to glove?

Rethinking Personal Protective Equipment

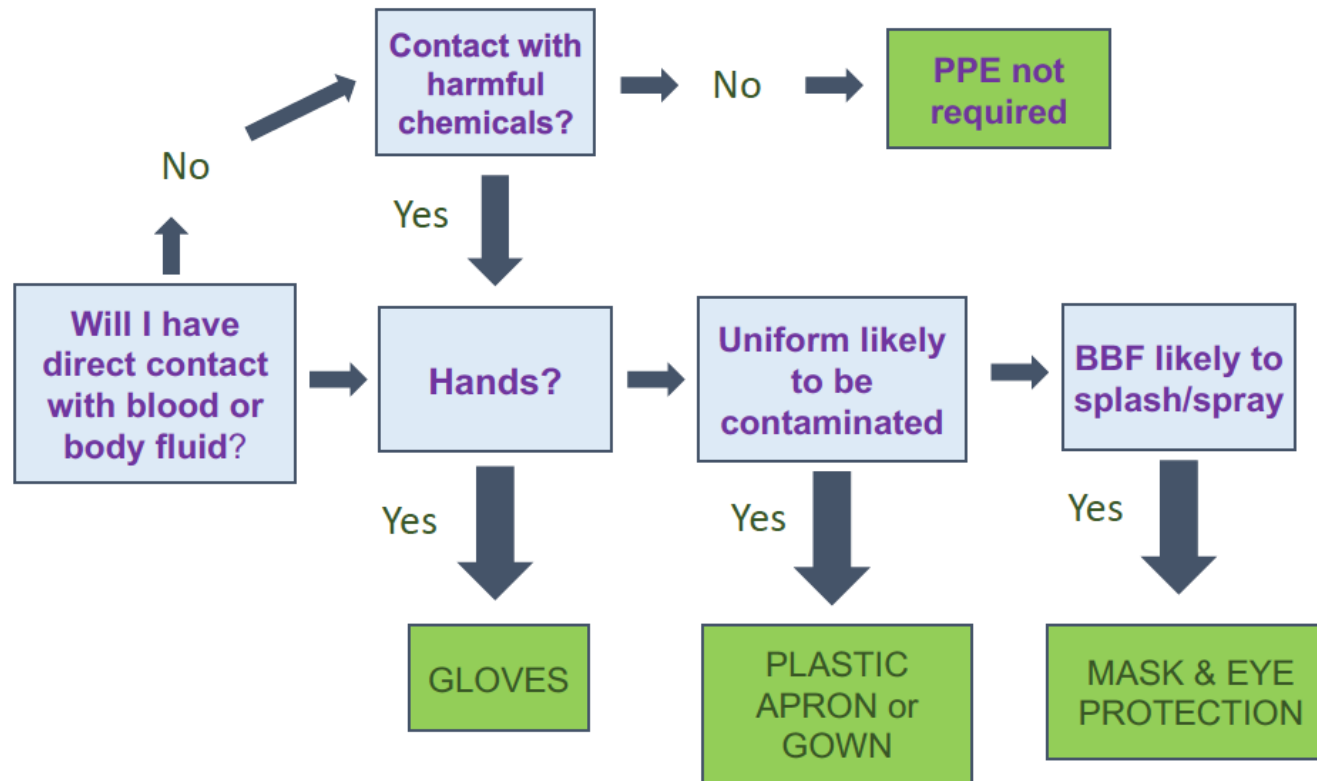
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Standard infection control precautions

Risk assessment for selection of PPE



The screenshot shows the NHS England website with the following content:

- Header: NHS England, Search bar, and navigation links (About us, Our work, Commissioning, Get involved, Coronavirus).
- Page Title: National infection prevention and control manual (NIPCM) for England > Chapter 1: Standard infection control precautions (SICPs)
- Table of Contents:
 - 1.1 Patient placement/assessment for infection risk
 - 1.2 Hand hygiene
 - 1.3 Respiratory and cough hygiene
 - 1.4 Personal protective equipment (PPE)
 - 1.5 Safe management of care equipment
 - 1.6 Safe management of the care environment
 - 1.7 Safe management of linen
 - 1.8 Safe management of blood and body fluid spillages
 - 1.9 Safe disposal of waste (including sharps)
 - 1.10 Occupational safety: prevention of exposure (including sharps injuries)
- Text at the bottom: Standard infection control precautions (SICPs) are to be used by all staff, in all care settings, at all times, for all patients whether infection is known to be present or not, to ensure the safety of those being cared for, staff and visitors in the care environment.

PPE should be worn for DIRECT contact with blood and body fluid to reduce the risk of contamination from substances that are likely to have a high pathogen load

Indications for wearing gloves

Gloves required

Touching body fluids

Contact with mucous membranes

Insertion/removal invasive device

Contact with non-intact skin

Vaginal examination

Tracheal suctioning

Handling hazardous chemicals

Taking blood

Gloves not required

Taking patient observations

Handling used linen (unless soiled)

Injections

Administration/preparation IV drugs

Manipulating IV lines

Bathing/dressing patient

Feeding patient

Mobilisation patients & physiotherapy

Hands are a major vehicle for transmission of infection in healthcare settings



- Microorganisms are picked up on hands when they touch surfaces, things or people
- Microorganisms are then transferred to the next surface, thing or person touched
- Hand hygiene interrupts transmission by removing or killing these microorganisms on the hands
- If gloves are worn, they also pick up and transfer microorganisms between surfaces and people in the same way as hands



Gloves become contaminated with pathogens

Misuse of gloves: the foundation for poor compliance with hand hygiene and potential for microbial transmission?

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Observed 120 HCW

64% gloves not changed, after contact

18.3% of contacts had potential for microbial transmission

- Before aseptic procedures

22 gloves sampled (100% grew bacteria)

- 86% grew pathogens - 59% same microorganism as patient



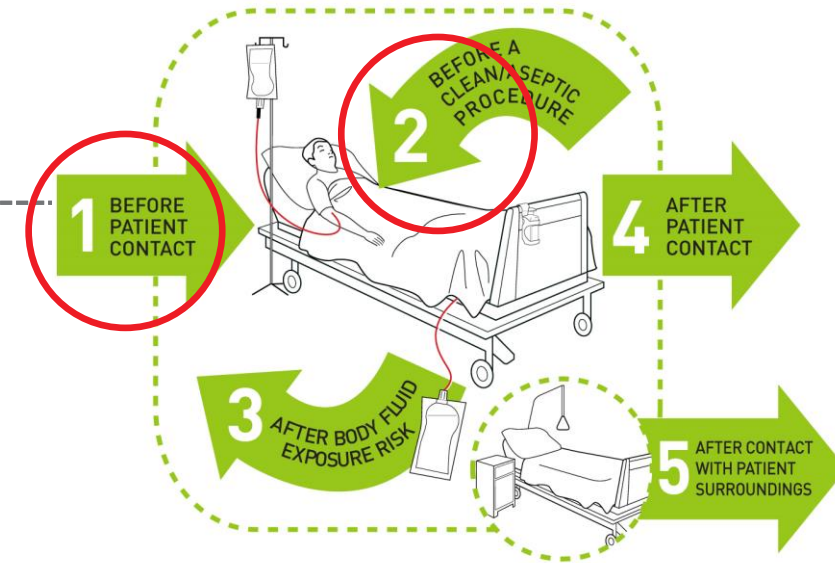
The 5 Moments of Hand hygiene

Define critical moments when HH is needed to:

- prevent transfer of microorganism to or from a patient
- onto a susceptible site

They are complex to apply in practice

- **Moment 1 - immediately before contact with the patient**
- **Moment 2 - immediately before contact with susceptible site**
- Moment 3 – after gloves are removed
- Moments 4 and 5 – often redundant as combined with other moments e.g.1



Recognising where Patient Zone starts and ends

The **patient zone** is “all inanimate surfaces that are touched by or in direct physical contact with the **patient**” * so **NOT the curtains!**



Outside
patient
zone

Journal of Hospital Infection 87 (2014) 141–144

Available online at www.sciencedirect.com

Journal of Hospital Infection

ELSEVIER journal homepage: www.elsevierhealth.com/journals/jhin

Outbreak of invasive group A streptococcus infection: contaminated patient curtains and cross-infection on an ear, nose and throat ward

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2 patients with Gp A Strep bacteraemia
+ 1 colonised patient;
+ 1 HCW

33% (10 of 34) curtains contaminated
with Gp A Strep...?

*WHO Hand Hygiene Guideline 2009



What happened in practice....

- Gloves come into contact with healthcare surfaces and act as a vehicle to transfer pathogens between surfaces, patients and their susceptible sites



Gloves are NOT necessary to prevent transmission



Glove use widespread and often inappropriate

Clinical glove use: healthcare workers' actions and perceptions

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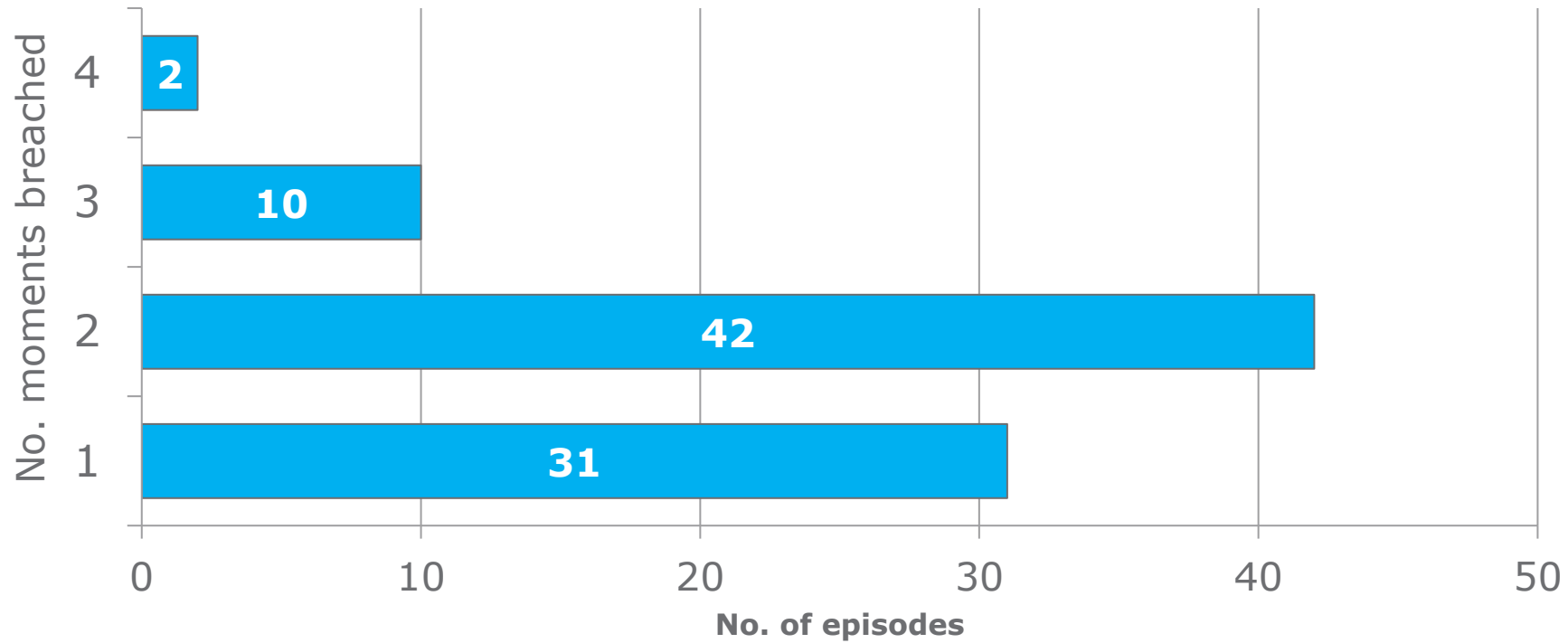
- Observed 163 glove use episodes
- 42% glove use inappropriate (used for low risk procedures)
 - No direct contact with BBF
- 37% associated with risk of cross contamination
 - Put on too early and removed too late
 - Hand hygiene not performed after removal even though hands become contaminated when removed (40%)

London, UK
London, UK



Number of breaches of 5 moments per episode of care

**Number of moments breaches in episodes (n = 92)
with cross-contamination**



Example of how gloves are used

Same gloves: more than one task

- Emptied catheter bag
- Gave patient mouth care
- Checked patients blood sugar



Same gloves: more than one task

- NG feed flush
- Urine catheter
- ET suctioning

IV drugs

- Prepare IV fluids in drug room
- Press button to open door
- Push door open
- Carry drug to bedside

Central IV line flush and disconnection

1. Equipment trolley
2. Central line flush 
3. IV monitor
4. Central line
5. IV infusion lines
6. Central line flush 
7. IV pump
8. IV lines into waste bin
9. Bed controls
10. IV pump

Blood gas analysis

- Nose
- Trolley
- Arm
- Arterial line
- Monitor
- Arterial line
- Syringe
- Arm
- Arterial line
- Bed rail
- Blood gas machine

Emotion a powerful driver

"I am going to touch a patient and need to protect myself"

"I find that when I've got gloves the gloves on I'm less OCD about needing to wash my hands"

if you didn't have gloves [for toileting] because you think well what am I going to get from this, you know I am just going to get all sorts of bad stuff on me.

Fear
Cant rely on 'handover' to tell me if patient has something contagious

Fear
[Gloves] "make me feel safer, more relaxed, more comfortable, more confident"

whether you feel you want to wear gloves because you don't want to touch that skin, that's a completely personal point of view"



Lack of science and logic to glove use

Emotion & socialization are key drivers

- Glove use is routine
- Used to protect the wearer from things perceived to be 'dirty'
- Justified as required by 'policy'

Gloves *perceived* to be 'more sterile'

- Hand hygiene *perceived* to be ineffective
- Gloves used instead of alcohol gel

Hand hygiene *perceived* to damage skin

- Although chemicals in gloves a major cause of dermatitis

Gloves seen as necessary to 'protect hands from antibiotics'

- Although chemicals in gloves a major cause of dermatitis
- No evidence of risk associated with drawing up drugs

Messages about using gloves confused

- Not always based on sound infection control
- Risk assessment is ill-defined
- Standard Precautions & Contact Precautions conflated

To prevent cross contamination on gloves...

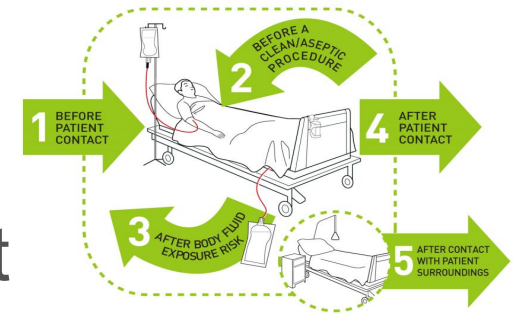
- ✓ **Must** put on gloves **immediately before** contact with blood/body fluid
- ✓ **Must** **change** gloves:
 - between patients
 - between procedures
- ✓ **Must** **decontaminate hands** after removal
 - As contamination can transfer from gloves to hands
 - Gloves may be punctured or tear



Apply human factors ergonomics

Design work area to help staff do the right thing

- Glove location
 - gloves available at the bedside
 - discourage need to ‘touch things’ before the patient
- Alcohol gel location
 - make it easy to use immediately before touching patient
- Revise policies to prevent gloves being used ‘just in case’



Applying human factors and ergonomics to the misuse of nonsterile clinical gloves in acute care

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