



IPC Moments that Matter: Fundamentals for Impact

Professor Brett Mitchell & Amy Cartwright
16th October 2023

clinell[®] celebrates the fundamentals of
Infection Prevention

gama
healthcare

Moments that matter

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Podcast: <https://infectioncontrolmatters.com>

Acknowledgement of Country

I wish to acknowledge the Traditional Custodians of country throughout Australia and their connections to land, sea and community.

Pay my respect to their Elders past and present and extend that respect to all Aboriginal and Torres Strait Islander peoples today.



Declarations

- Received no funding for this talk
- Recipient of grant funding from government and professional bodies through a competitive process
- Start with story that some people may find upsetting



Moments that matter



#onesmallactofkindess

Kathy Koschel



Overview: Moments that matter

- Standard precautions
- Air, skin and hands

Standard Precautions

Always follow these standard precautions



Perform hand hygiene before and after every patient contact



Clean and reprocess shared patient equipment



Use personal protective equipment when risk of body fluid exposure



Follow respiratory hygiene and cough etiquette



Use and dispose of sharps safely



Use aseptic technique

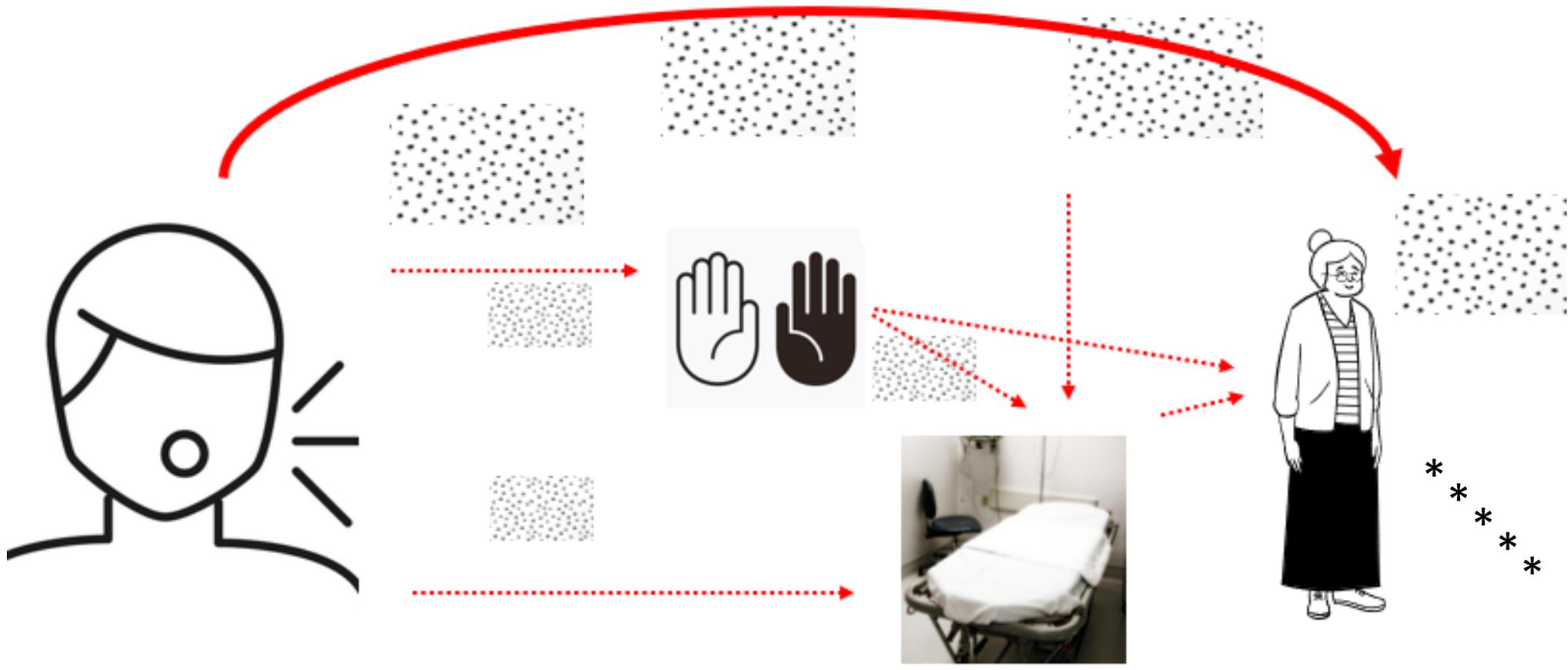


Perform routine environmental cleaning



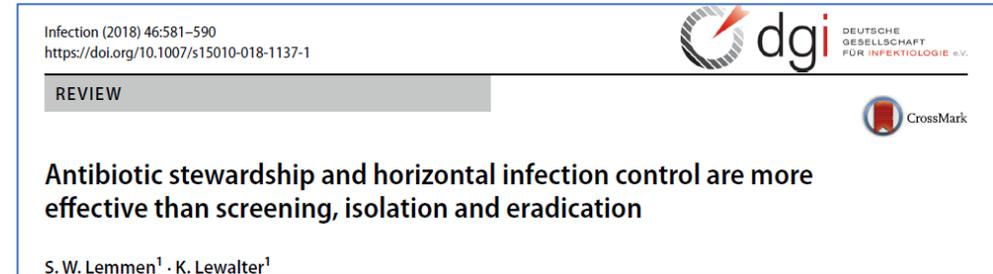
Handle and dispose of waste and used linen safely

Why skin, surface and air?



Horizontal approaches to IPC

- Antibiotic stewardship
- Antiseptic washing
- Hand hygiene
- Environment



Surface

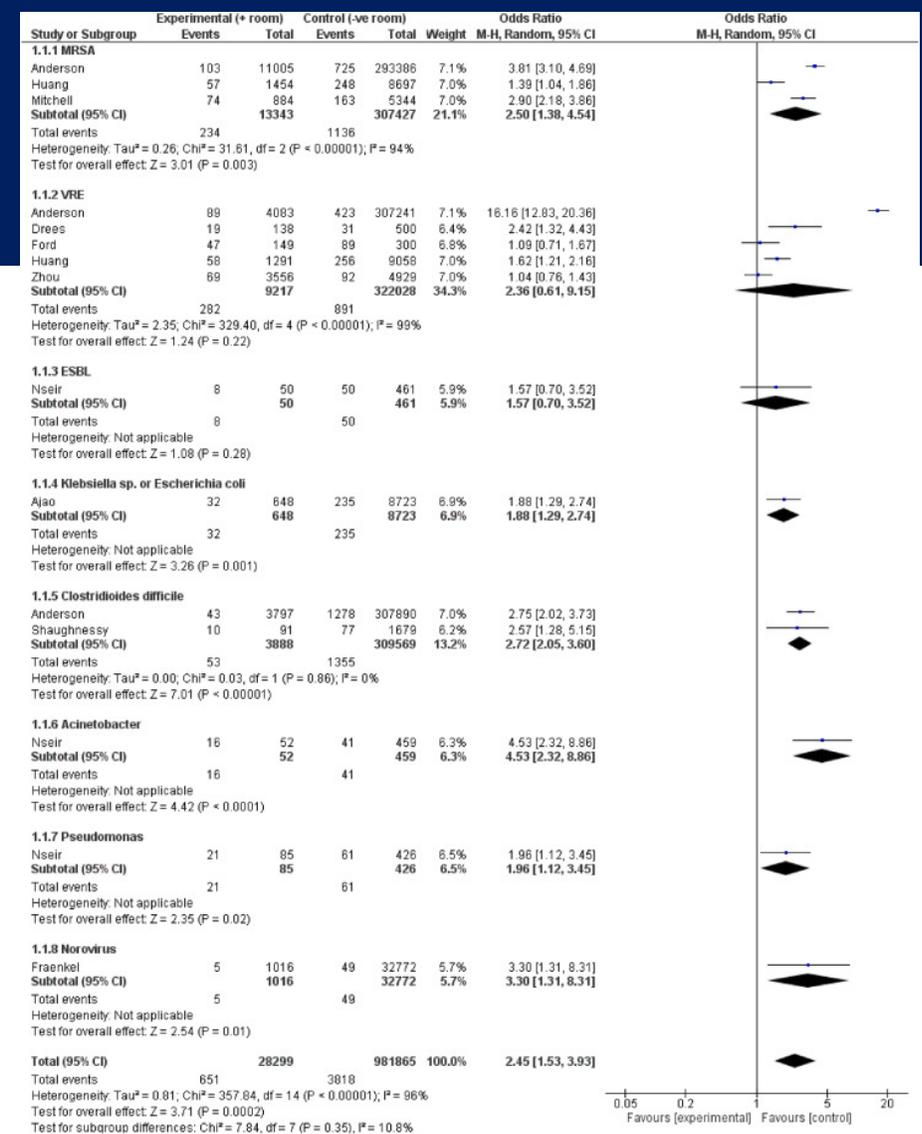
- Pathogens can survive in the environment
- Increased risk of acquiring the same pathogen from a prior room occupant
- Improving routine and discharge cleaning has been shown to reduce the risk of HAIs in RCTs.

Type of bacterium	Duration of persistence (range)	Reference(s)
<i>Acinetobacter</i> spp.	3 days to 5 months	[18, 25, 28, 29, 87, 88]
<i>Bordetella pertussis</i>	3 – 5 days	[89, 90]
<i>Campylobacter jejuni</i>	up to 6 days	[91]
<i>Clostridium difficile</i> (spores)	5 months	[92–94]
<i>Chlamydia pneumoniae</i> , <i>C. trachomatis</i>	≤ 30 hours	[14, 95]
<i>Chlamydia psittaci</i>	15 days	[90]
<i>Corynebacterium diphtheriae</i>	7 days – 6 months	[90, 96]
<i>Corynebacterium pseudotuberculosis</i>	1–8 days	[21]
<i>Escherichia coli</i>	1.5 hours – 16 months	[12, 16, 17, 22, 28, 52, 90, 97–99]
<i>Enterococcus</i> spp. including VRE and VSE	5 days – 4 months	[9, 26, 28, 100, 101]
<i>Haemophilus influenzae</i>	12 days	[90]
<i>Helicobacter pylori</i>	≤ 90 minutes	[23]
<i>Klebsiella</i> spp.	2 hours to > 30 months	[12, 16, 28, 52, 90]
<i>Listeria</i> spp.	1 day – months	[15, 90, 102]
<i>Mycobacterium bovis</i>	> 2 months	[13, 90]
<i>Mycobacterium tuberculosis</i>	1 day – 4 months	[30, 90]
<i>Neisseria gonorrhoeae</i>	1 – 3 days	[24, 27, 90]
<i>Proteus vulgaris</i>	1 – 2 days	[90]
<i>Pseudomonas aeruginosa</i>	6 hours – 16 months; on dry floor: 5 weeks	[12, 16, 28, 52, 99, 103, 104]
<i>Salmonella typhi</i>	6 hours – 4 weeks	[90]
<i>Salmonella typhimurium</i>	10 days – 4.2 years	[15, 90, 105]
<i>Salmonella</i> spp.	1 day	[52]
<i>Serratia marcescens</i>	3 days – 2 months; on dry floor: 5 weeks	[12, 90]
<i>Shigella</i> spp.	2 days – 5 months	[90, 106, 107]
<i>Staphylococcus aureus</i> , including MRSA	7 days – 7 months	[9, 10, 16, 52, 99, 108]
<i>Streptococcus pneumoniae</i>	1 – 20 days	[90]
<i>Streptococcus pyogenes</i>	3 days – 6.5 months	[90]
<i>Vibrio cholerae</i>	1 – 7 days	[90, 109]

- Kramer, K et al (2006). BMC Infectious Diseases, 130
- Mitchell, BG et al (2023). Infection Disease and Health
- Anderson, D et al (2017), 389(10071):805-814
- Mitchell BG et al (2019). Lancet Infectious Disease, 19 (4) 410-18

Surface

- Pathogens can survive in the environment
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Riskiest room

Research paper

Nurses' and midwives' cleaning knowledge, attitudes and practices: An Australian study

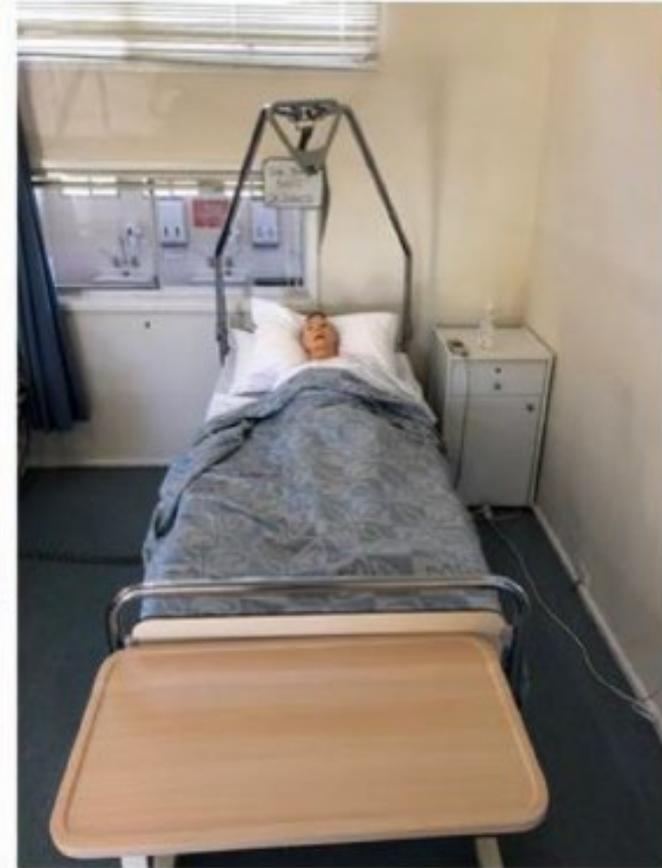
Brett G. Mitchell ^{a,b,*}, Philip L. Russo ^{c,d}, Martin Kiernan ^{a,e}, Cassie Curryer ^a



A



B

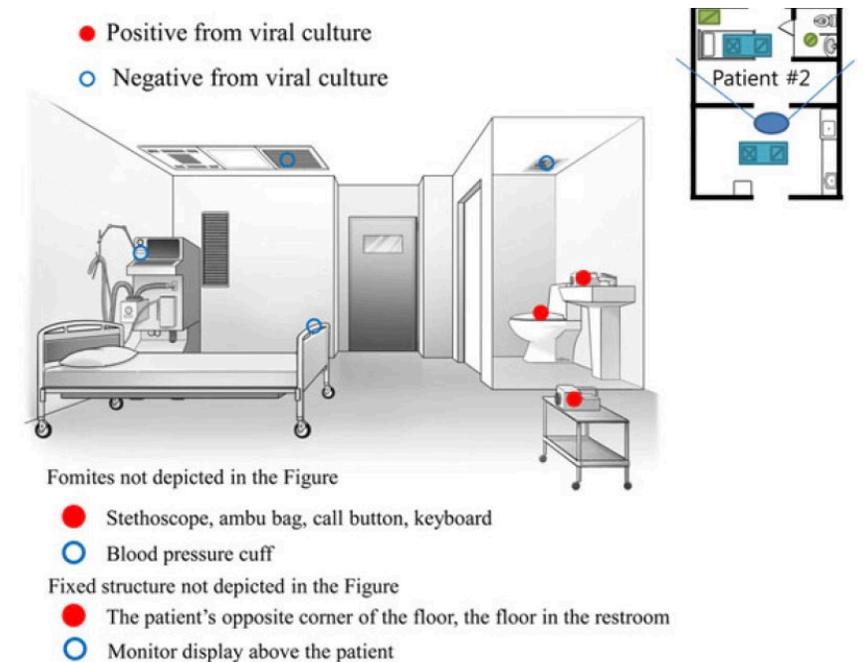


C

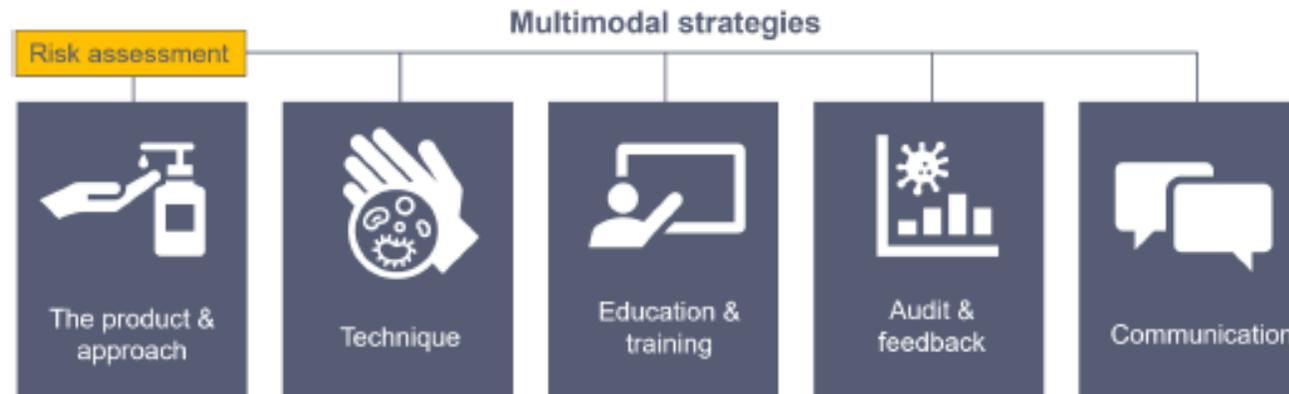
96%: Room A | 3%: Don't know

Surface

- Several modes of transmission dynamics, most commonly direct contact or aerosolization were identified
 - Even fast walking
 - Rashid, T., et al (2017) *Epidemiol Infect* **145**(2): 347-357.
- Bhalla, A. (2004). "Acquisition of nosocomial pathogens on hands after contact with environmental surfaces near hospitalized patients." *Infect Control Hosp Epidemiol* **25**(2): 164-167.
- Extensive viable MERS-CoV contamination of the air and surrounding materials in MERS outbreak units



Cleaning: considerations



Product and approach

- Health and safety
- Preparation
- Contact time
- Reprocessing

- Storage
- Compatibility
- Efficacy
- Transferability of pathogens
- Practical considerations

Air



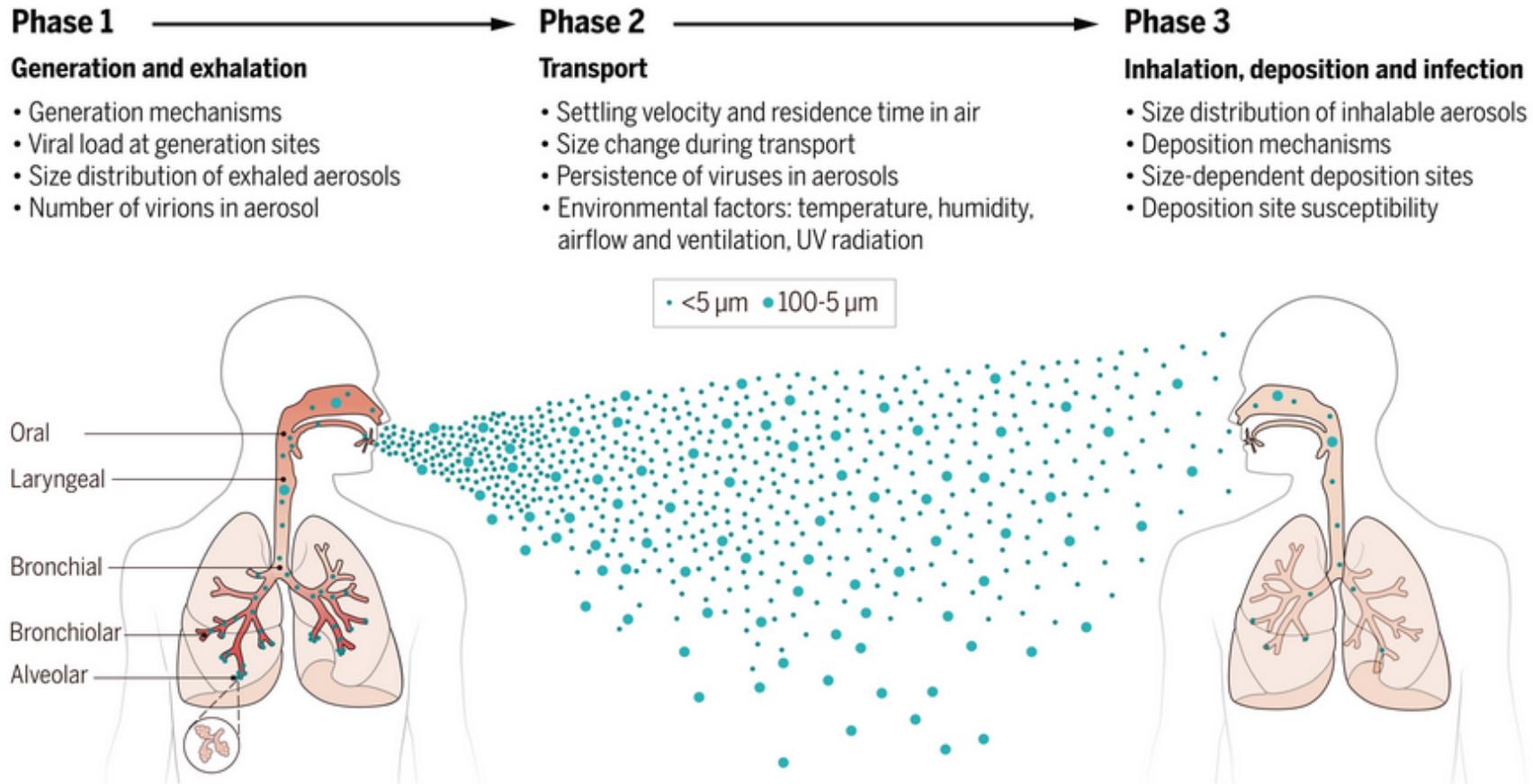
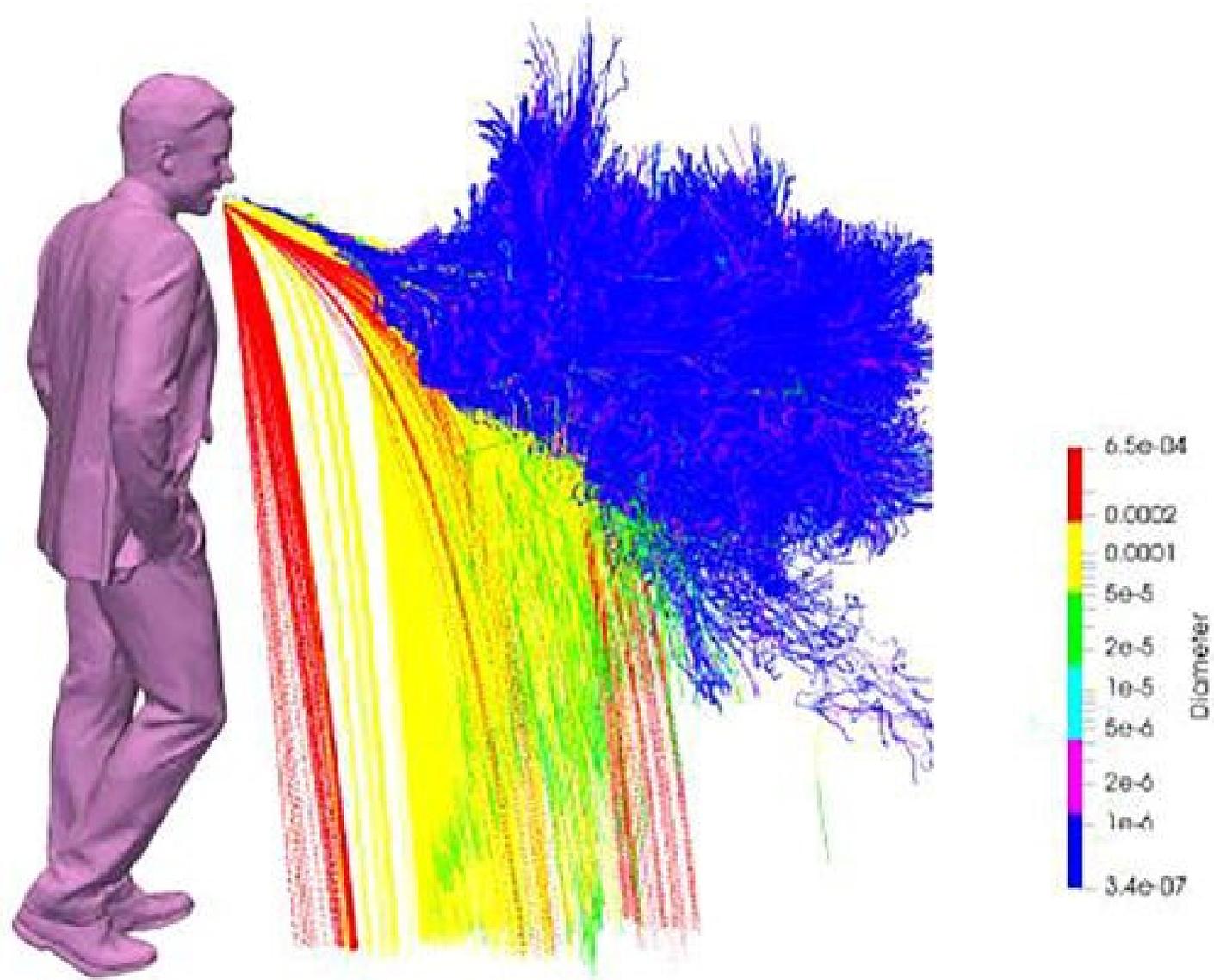


Fig. 1. Airborne transmission of respiratory viruses.

Phases involved in the airborne transmission of virus-laden aerosols include (i) generation and exhalation; (ii) transport; and (iii) inhalation, deposition, and infection. Each phase is influenced by a combination of aerodynamic, anatomical, and environmental factors. (The sizes of virus-containing aerosols are not to scale.)



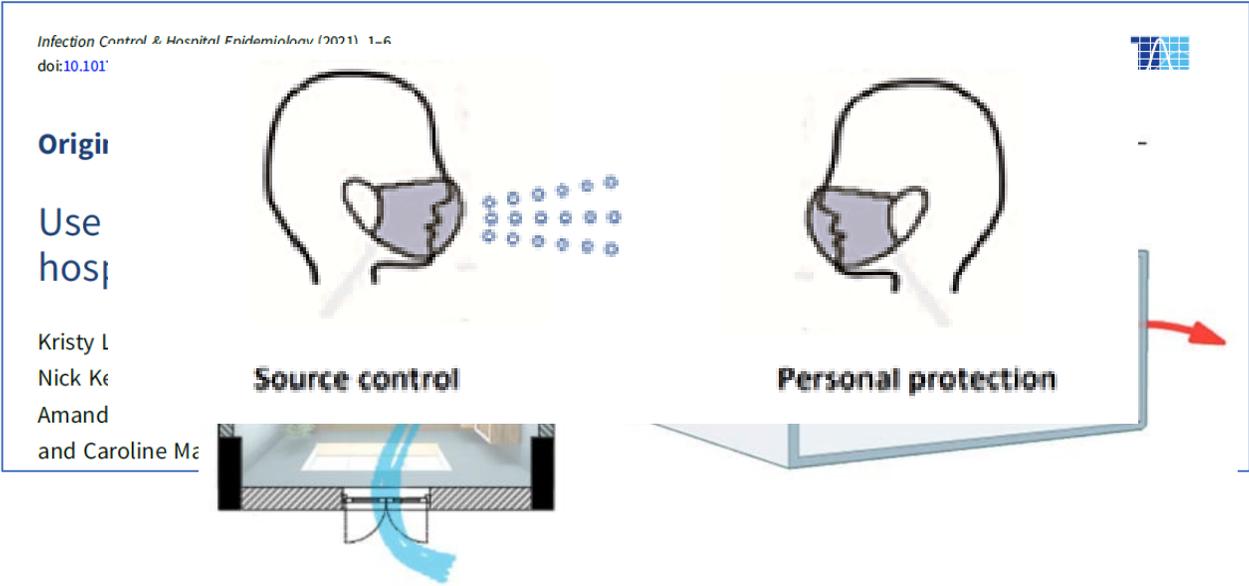
Trivedi, S et al (2021). *Physics of Fluids*, 33(11), 115130.

Improving air to reduce the risk of infection

- Aerosol transmission risk
- Pathogens attached to aerosols – transmission route
- Ventilation – changing air – bringing in new area
- Air cleaning – remove particles from (human) from the air

Improving air to reduce the risk of infection

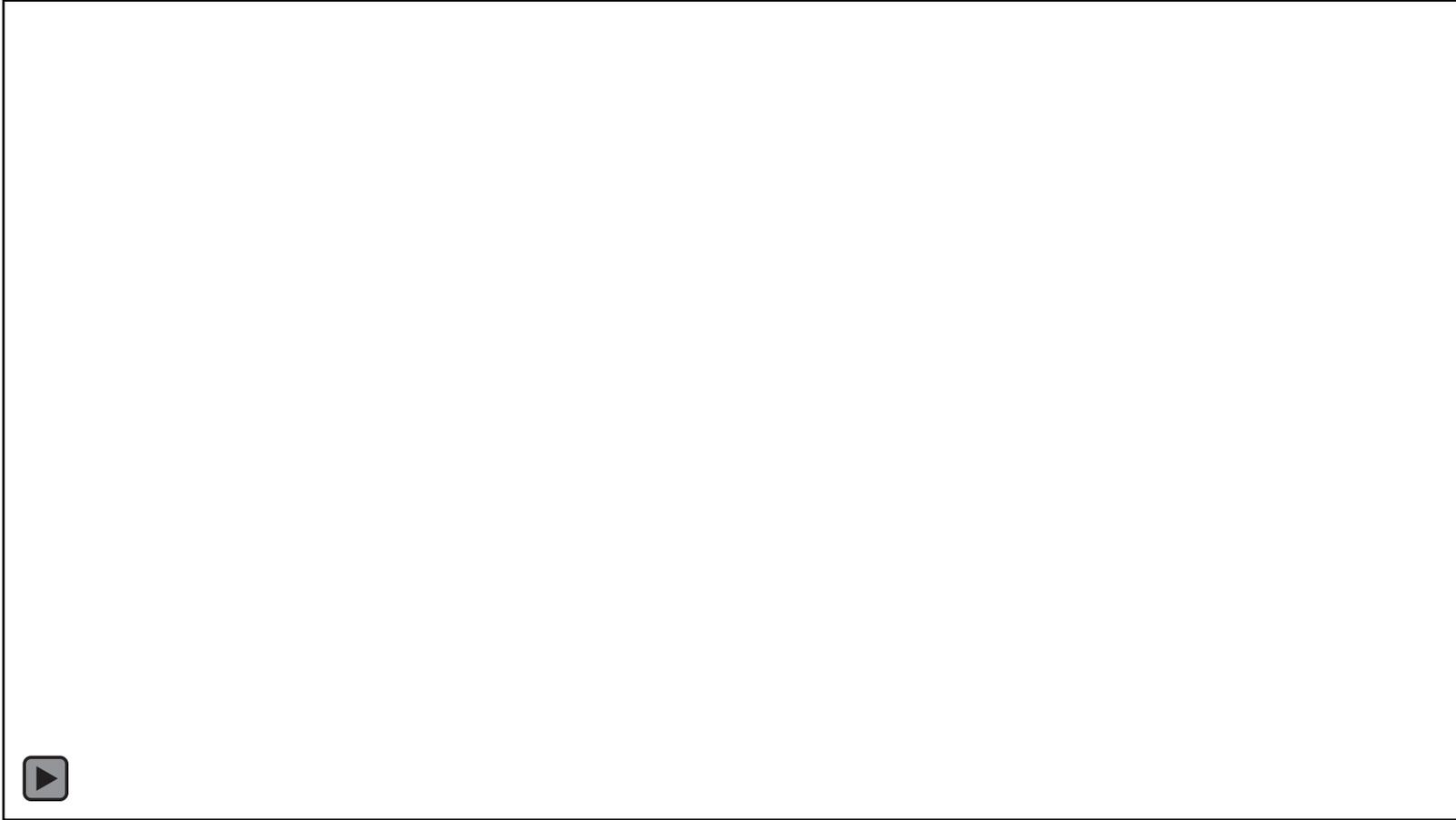
- Improving clean air exchange
 - Natural
 - Mechanical
- Air scrubber / purifiers
- Source control



Hands, surfaces, physical isolation etc

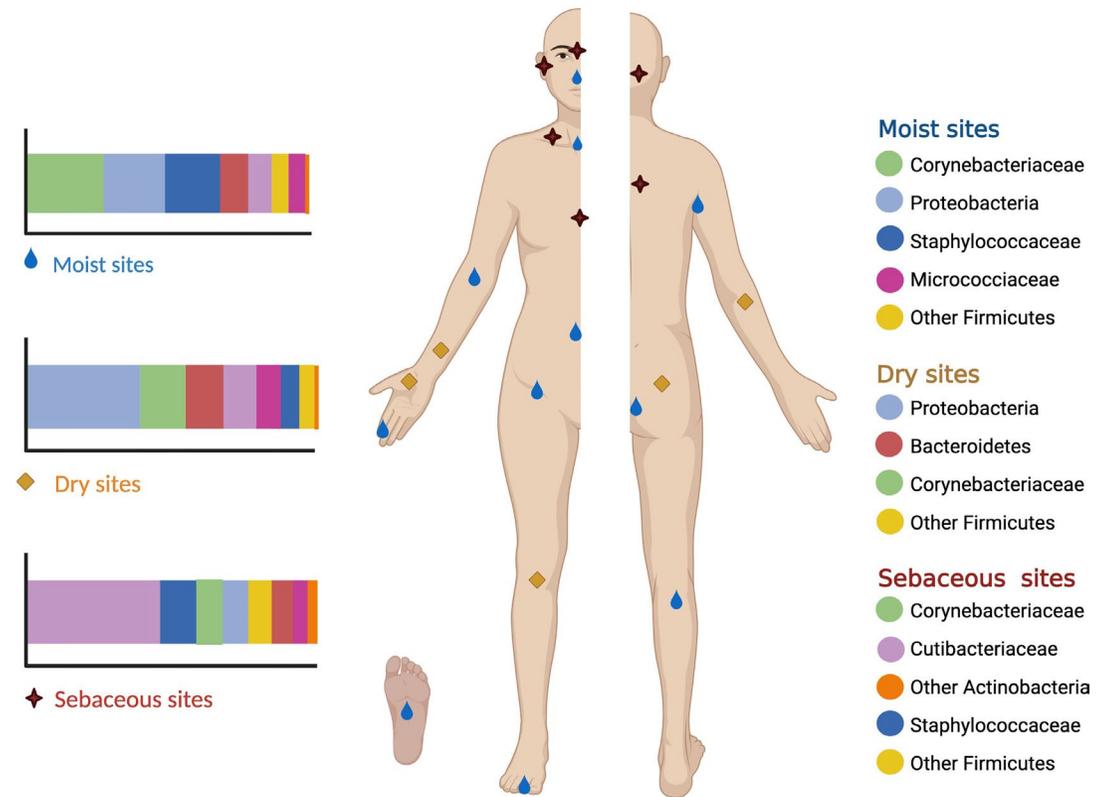
Two video thumbnails are shown. The left one is titled 'Something in the air? With Dr Kirsty...' and the right one is titled 'Cleaning up the air using air cleaners...'. Both have a red play button icon. Between them is a cartoon character in a white lab coat and cap, with a speech bubble that says 'Supply fresh, clean air'. A blue arrow points up from the character, and a green arrow points down from the ceiling.

Skin



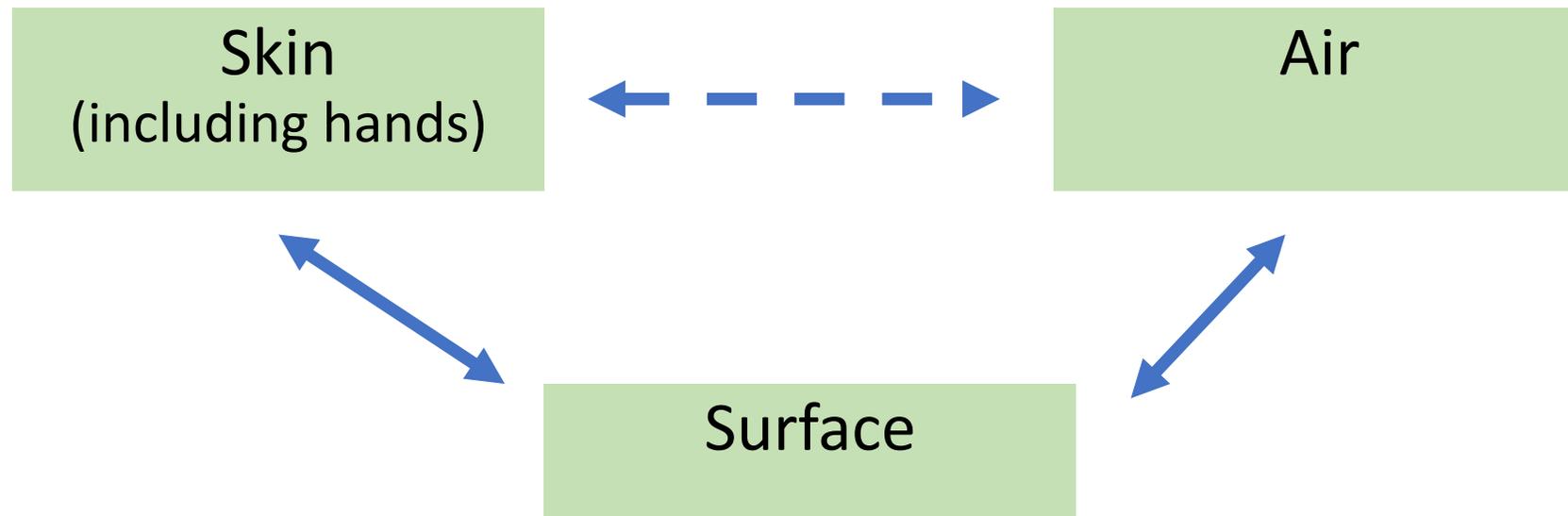
Skin

- Protective interface between internal organs and the environment
- The skin encounters a host of toxins, pathogenic organisms, and physical stresses.
- Skin functions as more than a physical barrier: it is an active immune organ.

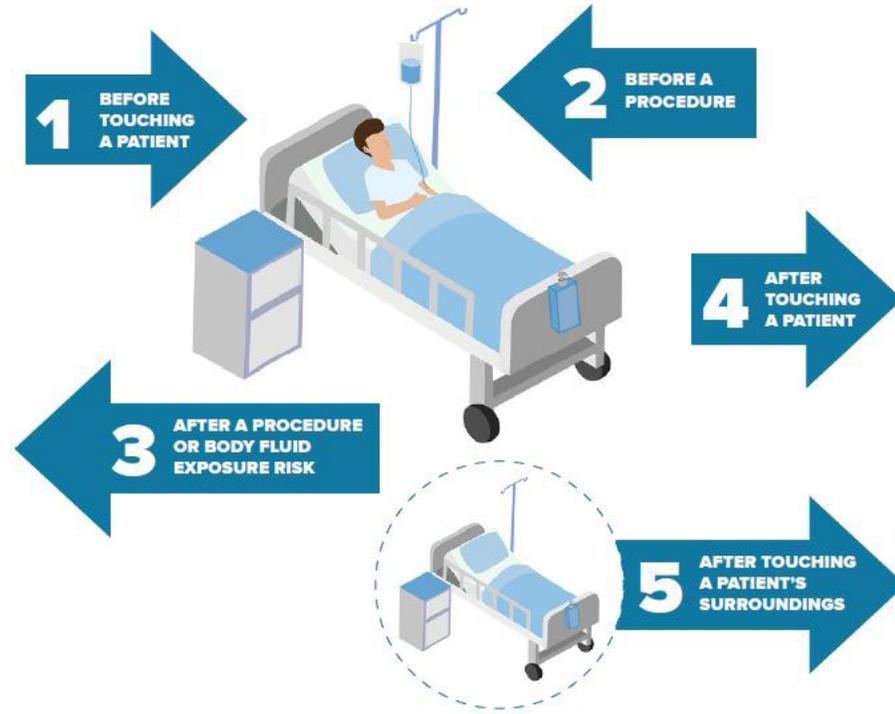


Skin's role in transmission

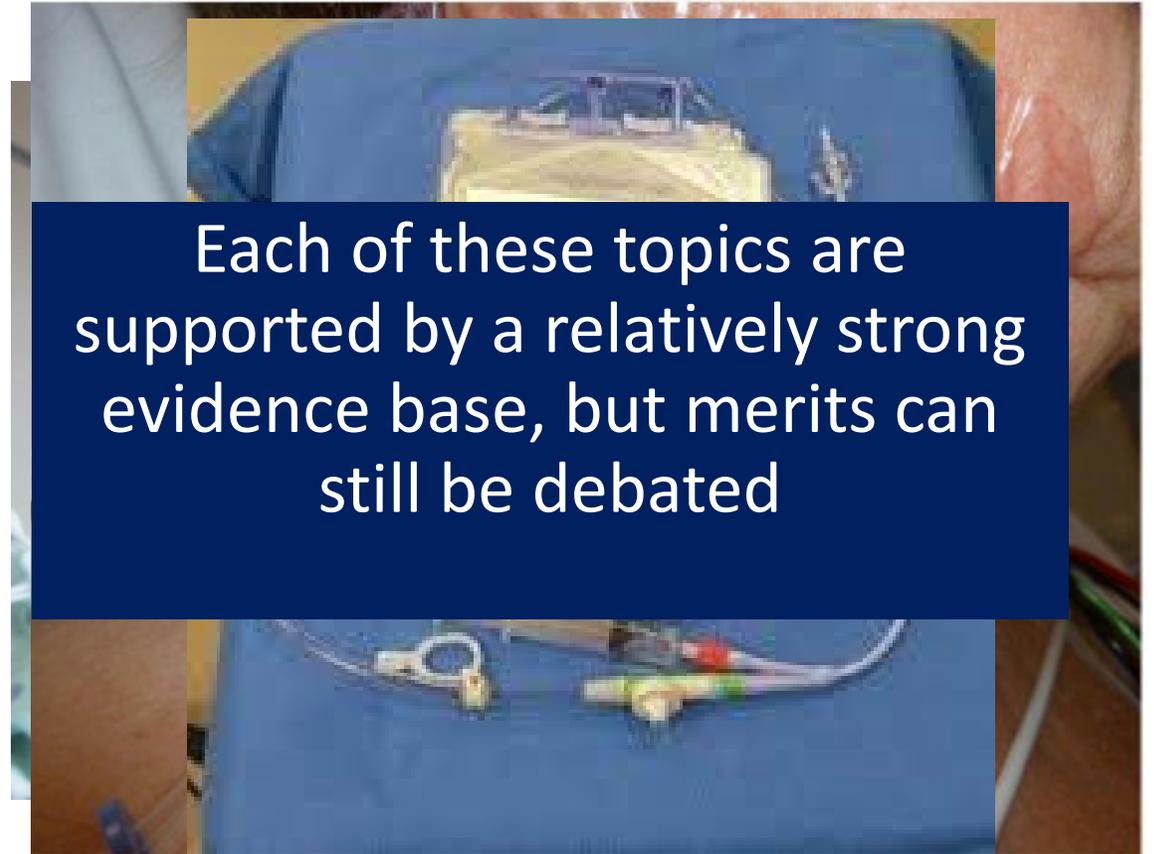
- Skin role in both
 - Exogenous (from others)
 - Endogenous (from yourself)



5 Moments for HAND HYGIENE



Skin antisepsis



Skin: evidence

- **Hand hygiene**

- Pittet, D., et al. (2000). Effectiveness of a hospital-wide programme to improve compliance with hand hygiene. *The Lancet*, 356(9238), 1307-1312.

- **Peripheral vascular device insertion and management**

- Webster, J et al (2019). Clinically-indicated replacement versus routine replacement of peripheral venous catheters. *Cochrane Database of Systematic Reviews*, (1).
- Rickard, C. et al. (2018). Dressings and securements for the prevention of peripheral intravenous catheter failure in adults (SAVE): a pragmatic, randomised controlled, superiority trial. *The Lancet*, 392(10145), 419-430.

- 
- Assess the need
 - Inform and partner with patients
 - Ensure competency
 - Right insertion site
 - Maximise success of first insertion
 - Insert and secure
 - Document decisions and care
 - Routine use: inspect, access
 - Review ongoing need
 - Remove safely and replace if needed

(Australian Commission on Safety and Quality in Healthcare, 2021)

- **Surgical site infection**

- Seidelman, et al (2023). Surgical site infection prevention: a review. *JAMA*, 329(3), 244-252.
- Tanner, J. et al . (2021). Preoperative hair removal to reduce surgical site infection. *Cochrane database of systematic reviews*, (8).
- Chen, S., et al (2020). Preoperative antisepsis with chlorhexidine versus povidone-iodine for the prevention of surgical site infection: a systematic review and meta-analysis. *World Journal of Surgery*, 44, 1412-1424.

- **Chlorhexidine bathing**

- Climo et al (2013). Effect of daily chlorhexidine bathing on hospital-acquired infection. *New England Journal of Medicine*, 368(6), 533-542.
- Musuuza, J. S., et al (2019). The impact of chlorhexidine bathing on hospital-acquired bloodstream infections: a systematic review and meta-analysis. *BMC infectious diseases*, 19(1), 1-10.
- Lewis, S. et al (2019). Chlorhexidine bathing of the critically ill for the prevention of hospital-acquired infection. *Cochrane Database of Systematic Reviews*, (8).

- Decolonisation
- Hair removal
- Antibiotic prophylaxis
- Temperature and glucose management
- Asepsis
- Skin preparation
- Oxygenation

- **Central line associated infections**

- Buetti, N., et al (2022). Strategies to prevent central line-associated bloodstream infections in acute-care hospitals: 2022 Update. *Infection Control & Hospital Epidemiology*, 43(5), 553-569.
- O'Grady, N. P. (2023). Prevention of Central Line–Associated Bloodstream Infections. *New England Journal of Medicine*, 389(12), 1121-1131.
- Ullman et al (2015). Dressings and securement devices for central venous catheters (CVC). *Cochrane Database of Systematic Reviews*, (9).

- **Urinary catheters**

- Meddings, et al (2010). Systematic review and meta-analysis: reminder systems to reduce catheter-associated urinary tract infections and urinary catheter use in hospitalized patients. *Clinical Infectious Diseases*, 51(5), 550-560.
- Fasugba, O., et al (2019). Chlorhexidine for meatal cleaning in reducing catheter-associated urinary tract infections: a multicentre stepped-wedge randomised controlled trial. *The Lancet Infectious Diseases*, 19(6), 611-619.

Some examples

Some examples

- Insert only if required
- Meatal cleaning prior to insertion
- Aseptic technique
- Prompt removal
- Manual decontamination of hubs

• Pneumonia prevention

- Mitchell, et al (2019). Strategies to reduce non-ventilator-associated hospital-acquired pneumonia: a systematic review. *Infection, disease & health*, 24(4), 229-239.
- Wolfensberger, et al (2023). Prevention of non-ventilator-associated hospital-acquired pneumonia in Switzerland: a type 2 hybrid effectiveness–implementation trial. *The Lancet Infectious Diseases*.

- Improving quality and frequency of oral care
- Dysphagia identification and management
- Mobilisation

"We do not remember days,
we remember moments."

- Cesare Pavese, 1908-1950



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Scan the QR code
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Your healthcare facility
- 3 Improve**
Get suggestions to improve the cleanliness

Moments that matter

Professor Brett Mitchell

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Podcast: <https://infectioncontrolmatters.com>



Educational tools to build the fundamentals of IPC in daily practice.

Amy Cartwright, Clinical Educator

clinell[®] celebrates the fundamentals of
Infection Prevention

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Clinical education

- Clinical education team of clinical staff
- Examples of the types of education and training we facilitate
 - Full product roll out training
 - Refresher training on current products
 - Targeted training in areas needing extra support
 - Study day presentations
 - Production of educational materials



Hospital simulation

- As a clinical education and training team we regularly make use of our hospital simulation suite for training events both internally and externally.
- This is an opportunity to keep our skills up to date as well as help educate our internal teams.



Training

What can our training look like:

- Instructions for use
- Principles of cleaning
- 5 Moments for environmental decontamination
- Specific equipment training
- Product storage and dispensers

clinell® Universal Wipes

Kills more than 99.99% of germs

Clinell Universal Wipes can be used for regular cleaning and disinfection of surfaces and non-invasive medical devices.

Clinell Universal Wipes are **NOT** flushable and **NOT** maceratable.

Please dispose of in the waste bin provided.

CW200 - Universal Wipes 200

The following equipment should be regularly decontaminated with Clinell Universal Wipes as per local protocol / policy.
(Examples of use - this is not an exhaustive list)

- Ultrasound transducers	- ECG machines	- Blood pressure cuffs
- Pulse oximeter probes	- Incubators	- Monitors
- Doppler probes	- Blood pressure machines	- Mattresses
- Stethoscope	- Radiology equipment	

Instructions for use

Please ensure that you follow the manufacturer's guidelines.

GAMA Healthcare Ltd.
The Maylands Building, Maylands Avenue, Hemel Hempstead, Hertfordshire, HP2 7TD, UK.
T: +44 (0)20 7993 0030 E: info@gamahealthcare.com www.gamahealthcare.com

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clinell® 5 moments for environmental decontamination

1. Before procedure WHY: Microorganisms frequently contaminate surfaces and are transferred by touch or sprays. Disinfectant dry surfaces that may have been in contact with the patient or their environment, or could have been sprayed on.	WHEN: Decontaminate surfaces before a procedure.
2. After procedure WHY: Microorganisms frequently contaminate surfaces and are transferred by touch or sprays. Disinfectant dry surfaces that may have been in contact with the patient or their environment, or could have been sprayed on.	WHEN: Decontaminate surfaces after a procedure.
3. Visibly dirty WHY: Any fluid will give microorganisms even if the spot is sterile to start with. Dust will redeposit microorganisms faster than dust or spills for the next active client.	WHEN: Decontaminate a surface when it is visibly dirty.
4. High-touch points WHY: High-touch/high-touch points present a higher risk of cross-transmission because they are touched more frequently, and are the most likely to be contaminated. Regularly decontaminating high-touch points in individual clinical areas will reduce cross-transmission risk.	WHEN: Decontaminate the high-touch points regularly.
5. After patient discharge WHY: Patients are often colonised with microorganisms which if left behind can colonise or infect the next patient, after discharge of a patient all surfaces should be considered contaminated and needing decontamination.	WHEN: Decontaminate the surfaces after patient discharge.

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Training case study

Face-to-face training session on environmental decontamination:

- Sessions can be initiated either by the facility (usually the IPC team) or proactively by the clinical education team.
- Dates for the training, products to be covered, and any literature to be left with areas and key messages will all be discussed and planned beforehand.
- On day 1 of training a meeting with the organiser/IPC is always ideal to reiterate the key messages we will be sharing, be made aware of the areas we are to visit and if there are any PPE considerations in any departments (such as masks)

The 5 principles of cleaning

Clinell® Cleaning protocol Mattress

This guide should be used with consideration as to whether the equipment is being used by a patient or is currently in storage. Always check the manufacturer's instructions before cleaning. Visible spillage or blood on surfaces can be removed with a Clinell Universal Wipe. Each wipe is a 2-in-1 detergent/disinfectant wipe, removing spillage with a detergent component while simultaneously disinfecting the surface with a disinfectant component. Open each wipe and cover the full surface area, wiping in a simple 'S' shape motion to ensure all surfaces are cleaned and disinfected. If the wipe becomes soiled or dries out at any time, replace it with a new wipe. Do not re-use the wipe. Do not use the same wipe on multiple pieces of equipment. Always use a new wipe. Do not flush the wipe down the toilet or put them in a macerator.

- 1 Wash or decontaminate your hands and put on PPE risk assessment to ensure appropriate PPE is worn, as per local protocol.
- 2 Apply the brakes and raise to a suitable height. Remove or dispose of any bedding that may be covering the mattress, as per your local linen protocol.
- 3 Check inside the mattress for any fluid leakage or strike-through. Should the mattress be damaged or contaminated, follow your local protocol to condemn the mattress.
- 4 Always wipe from clean to dirty.
- 5-6 All surfaces should be covered with approximately 3-5 wipes. Should your wipe dry out or become soiled, replace it with a new wipe. Do not re-use the wipe.
- 7 Start at the furthest edge of the mattress and wipe in an 'S' shaped pattern, working towards the nearest edge.
- 8 Clean the sides of the mattress with a new wipe.
- 9 Leave the mattress to air-dry before turning over.
- 10 Repeat the process on the underside.
- 11 Leave the mattress to air-dry, allowing sufficient contact time with the disinfectant.
- 12 Dispose of cleaning wipes as per local protocol.
- 13 Remove PPE, wash or decontaminate hands and if required complete a report of cleaning, as per your local protocols.

Please scan the QR code for more information about our Clinell Universal Wipes.

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The 5 principles of cleaning

Clinell® Cleaning protocol Incubator

Always check the manufacturer's instructions before cleaning. Visible spillage or blood on surfaces can be removed with a Clinell Universal Wipe. Each wipe is a 2-in-1 detergent/disinfectant wipe, removing spillage with a detergent component while simultaneously disinfecting the surface with a disinfectant component. Open each wipe and cover the full surface area, wiping in a simple 'S' shape motion to ensure all surfaces are cleaned and disinfected. If the wipe becomes soiled or dries out at any time, replace it with a new wipe. Do not re-use the wipe. Do not use the same wipe on multiple pieces of equipment. Always use a new wipe. Do not flush the wipe down the toilet and do not put in a macerator.

- 1 Wash or decontaminate your hands and put on PPE risk assessment to ensure appropriate PPE is worn, as per local protocol.
- 2 Always wipe surfaces from clean to dirty.
- 3 Depending on the type of incubator approximately 7-10 wipes will be required to clean it.
- 4 If safe and appropriate to do so, remove any consumables and ensure the power is switched off.
- 5 Following the user manual, fully dismantle the incubator to allow for thorough cleaning of all components, including the air inlet filter.
- 6 Check the mattress for any breaches and where possible strip the mattress apart to inspect for any stains.
- 7 Starting at the top of the incubator, wipe systematically down the lamp and all the way down the fronting. Ensure that all ledges, handles and brackets are included.
- 8 Always wipe in a simple 'S' shape motion to ensure all surfaces are cleaned and disinfected. Always replace your wipe should it dry out or become visibly soiled.
- 9 Using a new wipe, clean the inside of the crib area following an 'S' shaped motion where possible.
- 10 Clean the base of the incubator including the brakes and wheels with a new wipe.
- 11 Leave the incubator to air-dry, allowing sufficient contact time with the disinfectant.
- 12 Remove PPE, wash or decontaminate hands, and if required complete a report of cleaning as per your local protocol.

Please scan the QR code for more information about our Clinell Universal Wipes.

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Case study - tips and ideas

- The main objectives of the sessions will include:
- Educating users on the appropriate use of our products for surface disinfection
- Discussing the appropriate applications and any limitations of the products,
- Demonstrating the proper techniques for use
- Educating users on the 5 principles of cleaning and how to apply them with using our products
- Helping users to understand the importance of surface decontamination
- Providing users with the knowledge and skills to use the products safely and effectively
- Supports ongoing Infection Prevention and Control training



Case study - tips and ideas

- Training usually takes place in the clinical department and can be done multiple times to capture as many staff as possible with little disruption to their jobs.
- All staff are asked to complete a register which are given to the organisations contact (usually IPC) who we have been liaising with at the end of the training along with a summary of the training.
- This kind of training is usually carried out over a few days to enable us to capture as many areas as possible.



Benefits and challenges of face-to-face training

Benefits:

- Ward/department based
- Quick/not too time-consuming
- Key essential points covered
- Good attendance
- Department-specific queries responded to
- Takes some pressure off IPC teams to carry out training

Challenges:

- Can still be difficult for staff to be released
- Only have time to deliver quick messages

Thank you.