

GLOVES OFF!

Clean hands.

Safe for all.

Sarah Browning

Infectious Diseases Physician

John Hunter Hospital

Patricia Knight

Clinical Nurse Consultant, Infection Prevention Service

John Hunter Hospital

Hosted by Jane Banett
jane@webbertraining.com

www.webbertraining.com



Disclaimer: no conflicts of interest to declare

February 18, 2026

Hunter New England Local Health District



131,785 square kilometres
Approx 1 million residents
38 hospitals
1 Principal referral (John Hunter)
4 Public Acute Group A



Gloves and Sustainability



Annually NSW Health produces 52,400 tonnes of waste

Hunter New England Local Health District (HNELHD) sends 75 tonnes of gloves to landfill per year

A typical JHH ward (32 beds) uses 30,000 non-sterile gloves/month, 360,000/year

The carbon footprint of annual glove use at the JHH is equivalent to driving around Australia sixty-eight times



Gloves off! Clean hands, Safe patients



Gloves off program
concept commenced
in 2022

Net Zero Lead
Allied Health
Tina Wilkie

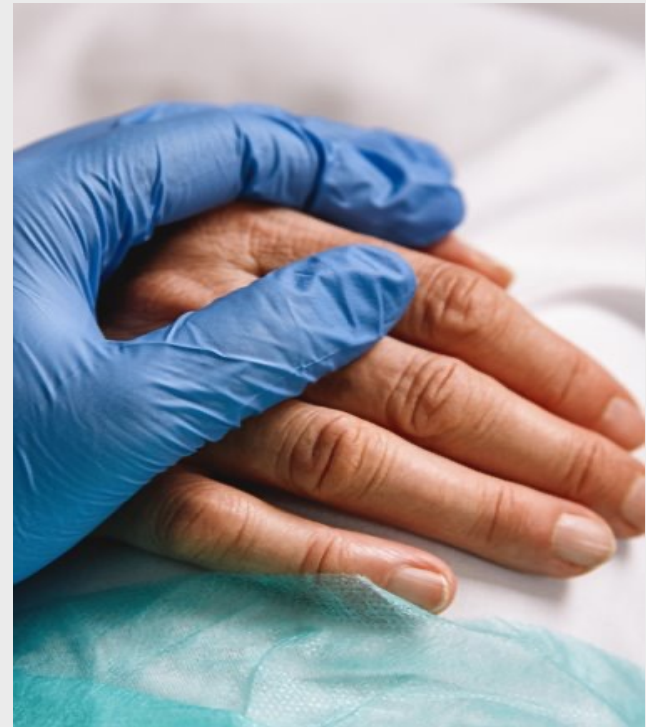
Team created
planning commenced

Engagement with
stakeholders

Funding from Ministry
of health climate risk
and net zero unit

Evidence against glove use

- Gloves do not provide complete protection against hand contamination
- Glove use is widely accepted to be associated with poor hand hygiene (HH) compliance
- HH compliance can be as low as 41% when gloves are utilised
- 49% of healthcare workers do not perform hand hygiene when removing gloves
- 37% of glove usage leads to cross contamination with healthcare workers touching multiple surfaces whilst wearing the same gloves.



Reference: Fuller et al, (2011). "the dirty hand in the latex glove": a study of hand hygiene compliance when gloves are worn

Project Aims

01



Improve hand hygiene compliance

02



Improve healthcare worker risk assessment confidence and understanding

03



Reduce unnecessary use of non-sterile gloves

04



Design and deliver a quality improvement package which can be used by other wards and across HNE

Outcome data



Glove purchase numbers

- Hospital procurement records

Unnecessary glove use and hand hygiene compliance

- Observational audits
- Customised audit tool
- Simultaneous collection of hand hygiene and glove use appropriateness data

Staff knowledge and attitudes

- Electronic survey

Occupied Bed days

- Hospital records

Glove purchase impacts

- Carbon footprint from lifecycle analysis literature
 - Weight of gloves
 - Cost from local procurement records
-

GLOVES OFF! Quality improvement program



PILOT WARDS H3 AND J3 ACUTE SURGICAL WARDS JHH

BASELINE MEASURES: PRE EDUCATION AUDITS, DATA COLLECTION AND STAFF SURVEY

EDUCATION

WARDCHAMPIONS

NEWSLETTER

POST EDUCATION AUDIT , DATA COLLECTION AND SECOND STAFF SURVEY

EVALUATION

DEVELOP ROADMAP FOR BROADER JHH ROLL OUT AND DISTRICT PARTICIPATION

Timeline for outcome measures and Intervention



	Baseline					Post-intervention							
Glove purchase data			Baseline			Immediate Follow-up							Long-term follow-up
Glove use and hand hygiene audits				Before			After						
Staff Survey													
Intervention					Intensive launch	Maintenance							
	July - Dec	Jan - April	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar
	2022	2023								2024			

Analysis

- Statistical modelling used to assess the effect of the intervention on glove usage rates
- Mean glove usage rates before and after intervention
- Adjusted for occupied bed days
- Audit data
- Unnecessary glove use
- Gloves missed (when should have been used)
- Correct hand hygiene

Gloves Off! Campaign

Hunter New England Local Health District



Stop!
Do you need gloves?

Gloves on

- Contact with body fluids, non-intact skin, or mucous membranes
- Transmission-based precautions
- Handling cytotoxic medications
- Contaminated waste, linen or environmental surfaces
- Invasive procedures

Gloves off

- Intact skin to intact skin
- Routine observations
- Activities of daily living
- Injections (subcutaneous, intramuscular or intradermal)
- Accessing cannula / IV line using aseptic non-touch technique

Remember the 5 Moments for HAND HYGIENE



More information on gloves



Hunter New England Local Health District



GLOVES OFF!
Clean hands. Safe for all.

Non-sterile gloves only need to be worn for:

- Contact with body fluids, non-intact skin, or mucous membranes
- Transmission-based precautions
- Handling cytotoxic medications
- Handling contaminated waste, linen or environmental surfaces
- Invasive procedures



More information on gloves

John Hunter Hospital Infection Prevention Rules ALL STAFF

Pre and post intervention glove usage audit tool


- NHHI Hand hygiene audit tool adapted
- Glove usage recorded as moments
- Hand hygiene auditors – standardised approach
- Clear guidance provided for glove usage
- Approved by NSW Clinical Excellence Commission



Hand hygiene and glove use observation data collection form version 3										
Organisation				FIVE MOMENTS FOR HAND HYGIENE 1. Before touching a patient 2. Before a procedure 3. After a procedure or body fluid exposure risk 4. After touching a patient 5. After touching a patient's surroundings						
Dept / ward										
Date										
Auditor	Session #									
Start time	Finish time									
Duration of session		mins								
GLOVES NEEDED				GLOVES NOT NEEDED						
- contact with non-intact skin, or mucous membrane - contact with blood, body substances, secretions excretions - invasive procedure, eg, venepuncture or a finger or heel prick, IV cannula - contaminated waste / linen / environmental surfaces - Providing care to patients on transmission-based precautions				- Direct physical contact with intact skin - Activities of daily living, eg washing - Routine observations (eg blood pressure measurement) - Performing subcutaneous, intramuscular, intravenous or intradermal injections						
HCW	Moment	Action	Glove used	Glove needed?	HCW	Moment	Action	Glove used	Glove needed?	
	<input type="radio"/> 1	<input type="checkbox"/> 1 Rub	<input type="radio"/> 1.On	<input type="checkbox"/> YES		<input type="radio"/> 1	<input type="checkbox"/> 1 Rub	<input type="radio"/> 1.On	<input type="checkbox"/> YES	
	<input type="radio"/> 2	<input type="checkbox"/> 2 Wash	<input type="checkbox"/> 2. Off	<input type="checkbox"/> NO		<input type="radio"/> 2	<input type="checkbox"/> 2 Wash	<input type="checkbox"/> 2. Off	<input type="checkbox"/> NO	
	<input type="checkbox"/> 3	<input type="checkbox"/> 3Missed	<input type="checkbox"/> 3.Cont			<input type="checkbox"/> 3	<input type="checkbox"/> 3Missed	<input type="checkbox"/> 3.Cont		
	<input type="checkbox"/> 4		<input type="checkbox"/> NoGlove			<input type="checkbox"/> 4		<input type="checkbox"/> NoGlove		
	<input type="checkbox"/> 5					<input type="checkbox"/> 5				
	<input type="radio"/> 1	<input type="checkbox"/> 1 Rub	<input type="radio"/> 1.On	<input type="checkbox"/> YES		<input type="radio"/> 1	<input type="checkbox"/> 1 Rub	<input type="radio"/> 1.On	<input type="checkbox"/> YES	
	<input type="radio"/> 2	<input type="checkbox"/> 2 Wash	<input type="checkbox"/> 2. Off	<input type="checkbox"/> NO		<input type="radio"/> 2	<input type="checkbox"/> 2 Wash	<input type="checkbox"/> 2. Off	<input type="checkbox"/> NO	
	<input type="checkbox"/> 3	<input type="checkbox"/> 3Missed	<input type="checkbox"/> 3.Cont			<input type="checkbox"/> 3	<input type="checkbox"/> 3Missed	<input type="checkbox"/> 3.Cont		
	<input type="checkbox"/> 4		<input type="checkbox"/> NoGlove			<input type="checkbox"/> 4		<input type="checkbox"/> NoGlove		
	<input type="checkbox"/> 5					<input type="checkbox"/> 5				
	<input type="radio"/> 1	<input type="checkbox"/> 1 Rub	<input type="radio"/> 1.On	<input type="checkbox"/> YES		<input type="radio"/> 1	<input type="checkbox"/> 1 Rub	<input type="radio"/> 1.On	<input type="checkbox"/> YES	

Staff surveys - REDCap

- Pre and post pilot survey sent to staff on targeted wards
- Anonymous responses
- Questions: Roles/ward worked, five moments of hand hygiene quiz, attitudes and knowledge assessment
- **Pre-survey**: perceptions of climate change in the workplace
- **Post survey**: education assessment related questions
- Each survey open for two weeks, 2 reminders sent to non-responders

John Hunter Hospital GLOVES OFF! Staff Survey	
Thank you for taking the time to complete this anonymous survey on hand hygiene and glove use. This survey will take approximately five minutes to complete. If you have problems completing the survey, please contact Sally Munnoch (sally.munnoch@health.nsw.gov.au)	
By selecting Yes, I certify that I am 18 years or older	
* must provide value	
<input checked="" type="radio"/> Yes	<input type="radio"/> No
reset	
By selecting Yes, I certify that I have given my consent freely to participate in this study	
* must provide value	
<input checked="" type="radio"/> Yes	<input type="radio"/> No
reset	
What is your area of work at HNELHD?	
* must provide value	
<input type="text" value="Nursing"/>	<input type="text" value="Medical"/>
<input type="text" value="Allied Health"/>	<input type="text" value="Wardsperson/OA"/>
<input type="text" value="Healthshare"/>	<input type="text" value="Other"/>
reset	
What gender do you identify as:	
* must provide value	
<input type="text" value="Female"/>	<input type="text" value="Male"/>
<input type="text" value="Transgender"/>	<input type="text" value="Non binary/non-conforming"/>
<input type="text" value="Prefer not to respond"/>	<input type="text" value="Other"/>
reset	
On which ward do you predominantly work on?	
* must provide value	
<input type="text" value="H3"/>	<input type="text" value="J3"/>
reset	
<input type="button" value="Submit"/>	



Education

- Formal: Infection Prevention Service (20-minute sessions)
- Informal: Team leaders and NUMs during safety huddles
- Safety huddles in front of poster on the ward
- Gloves Off! Champions allocated to wards
- Newsletter
- Support from Surgical services educators



Stop!

Do you need gloves?



Gloves on

- Contact with body fluids, non-intact skin, or mucous membranes
- Transmission-based precautions
- Handling cytotoxic medications
- Contaminated waste, linen or environmental surfaces
- Invasive procedures

Gloves off

- Intact skin to intact skin
- Routine observations
- Activities of daily living
- Injections (subcutaneous, intramuscular or intradermal)
- Accessing cannula / IV line using aseptic non-touch technique

GLOVES OFF!
Clean hands. Safe for all.

More information on gloves

- Based on staff's own risk assessment
- Medication preparation
- When should gloves be changed ?

Remember the 5 Moments for HAND HYGIENE

Bribery and blackmail



Stop and think – do you need a glove?

→ Do your risk assessment.

Do you need cake?

→ Almost certainly.

Do you need lemon blondie or spiced apple?

→ Probably both.



Gloves Off! Jingle



(Sing to The Beatles "Love me do"!) **Love me do!**

Glove, glove me do

If it's wee, poo or spew

But for intact skin

Then Pleeeeeasee No gloves hand gel rub it in





**GLOVES
OFF!**
Clean hands.
Safe for all.

Non-sterile gloves only need to be worn for:

- ✓ Contact with body fluids,
non-intact skin, or mucous membranes
- ✓ Transmission-based precautions
- ✓ Handling cytotoxic medications
- ✓ Handling contaminated waste,
linen or environmental surfaces
- ✓ Invasive procedures

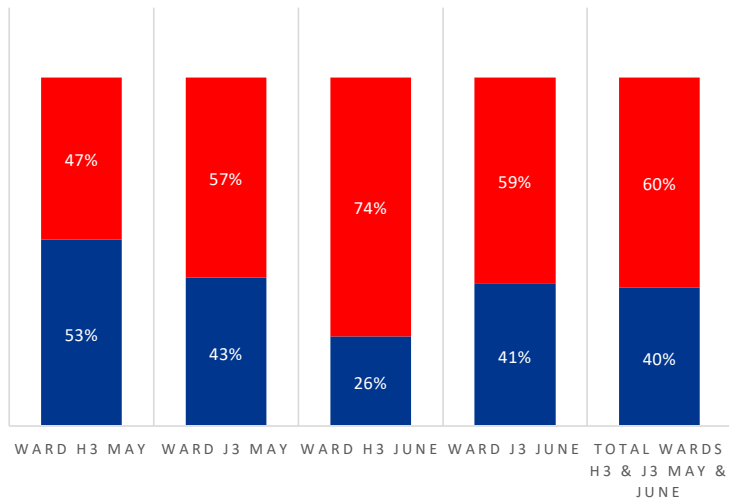


Results

Hand hygiene audit – were gloves needed? Pre and post intervention

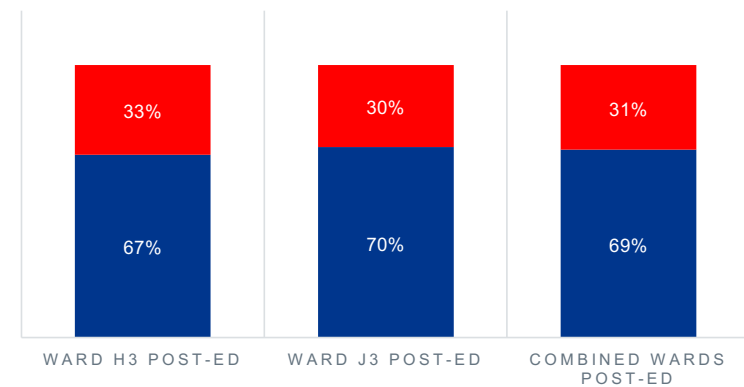
WHEN GLOVES USED WERE THEY NEEDED?
PRE EDUCATION

■ Gloves used needed % ■ Gloves used not needed %

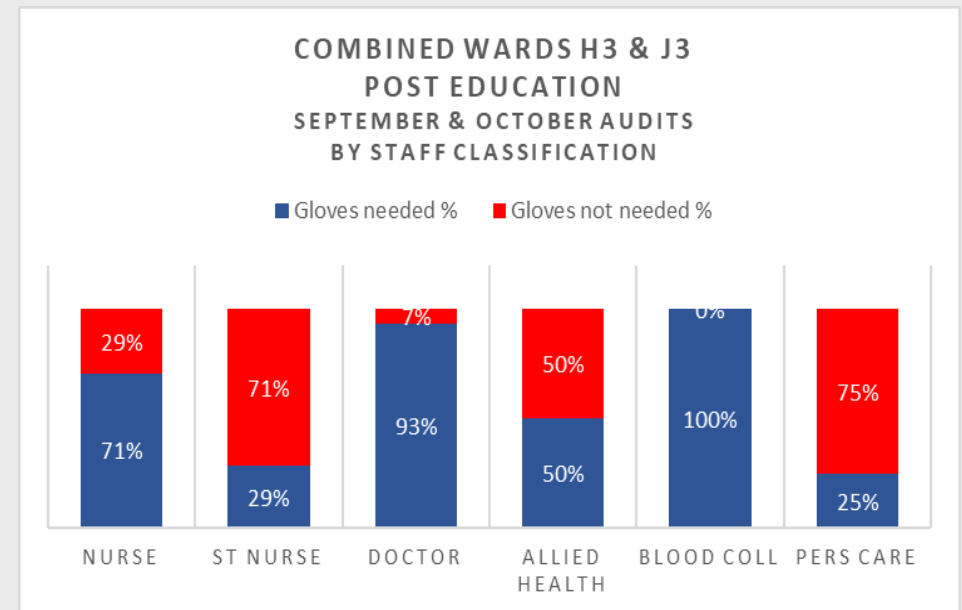
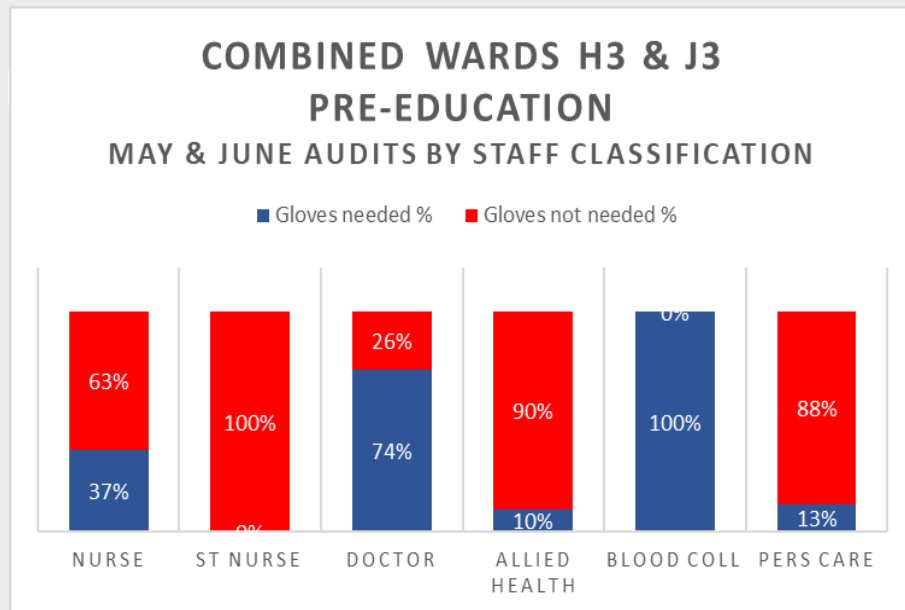


WHEN GLOVES WERE USED WERE THEY NEEDED?
POST EDUCATION

■ Gloves used needed % ■ Gloves used not needed %

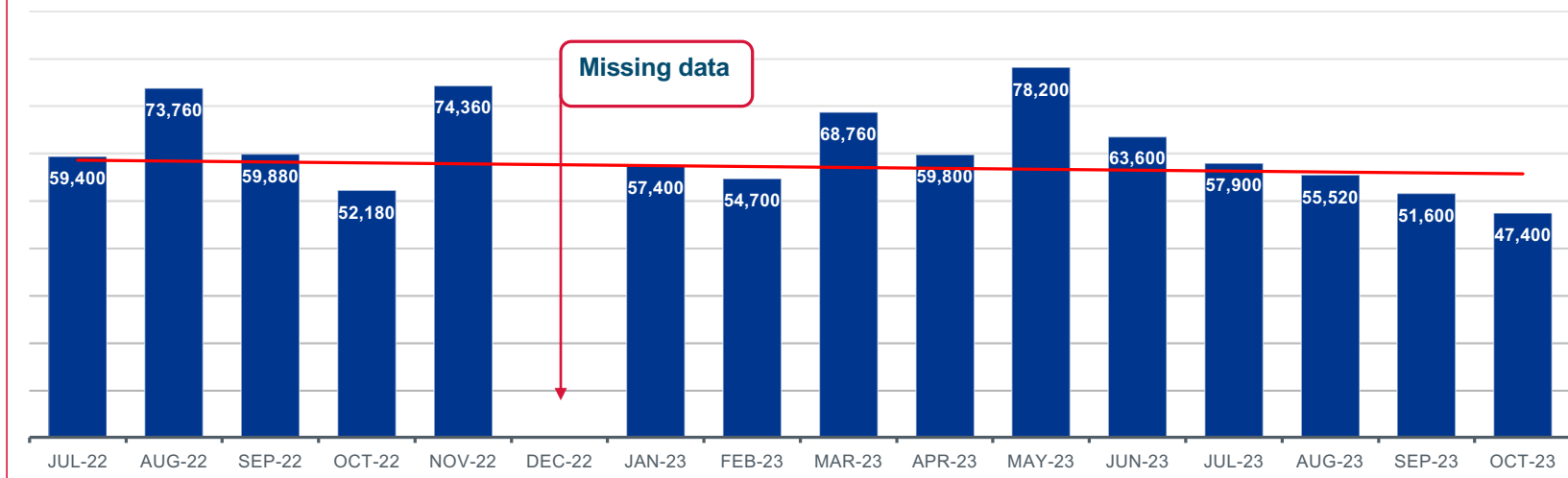


Pre-intervention audit results



Glove usage wards H3 and J3

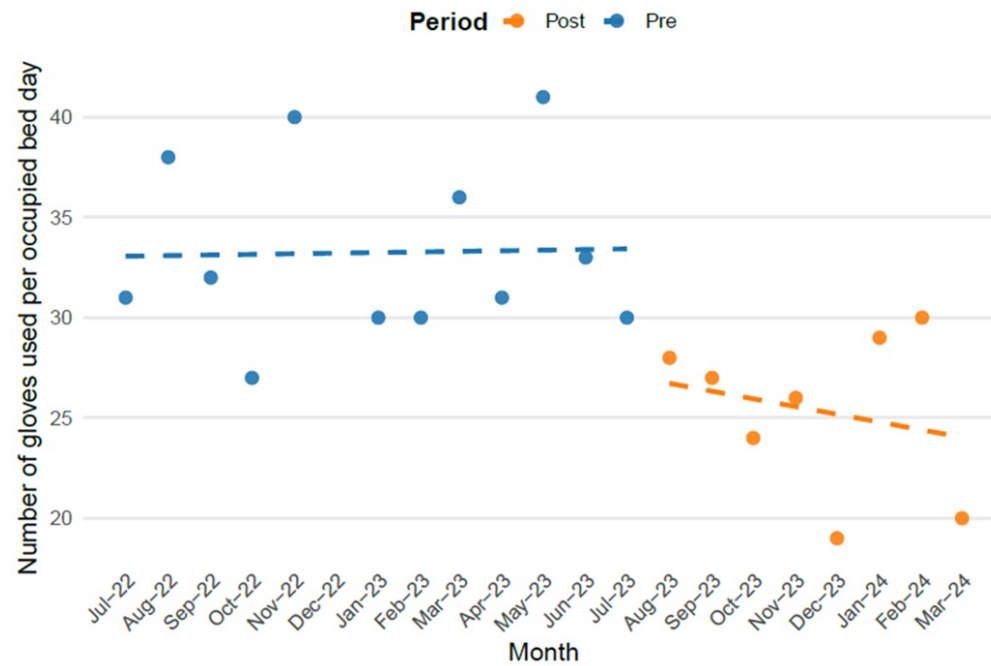
Two Wards - Total Glove Numbers by Month, Since July 2022



Results – Glove Purchase data

Trends in Glove Use Before and After Intervention

With separate trendlines for pre- and post-intervention periods



Results - Glove purchase impact



Decrease of 6.9 gloves per occupied bed day, with 1887 occupied bed days per month results in

Carbon footprint

- Monthly reduction of 443 kg CO₂e

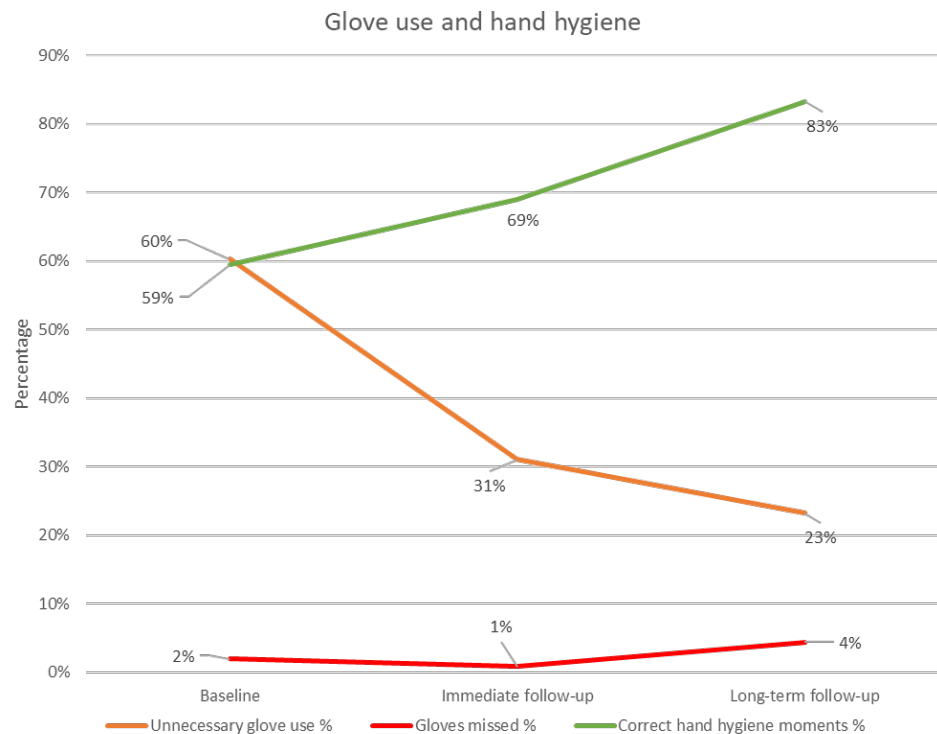
Waste

- Monthly reduction of 44.8kg waste

Cost

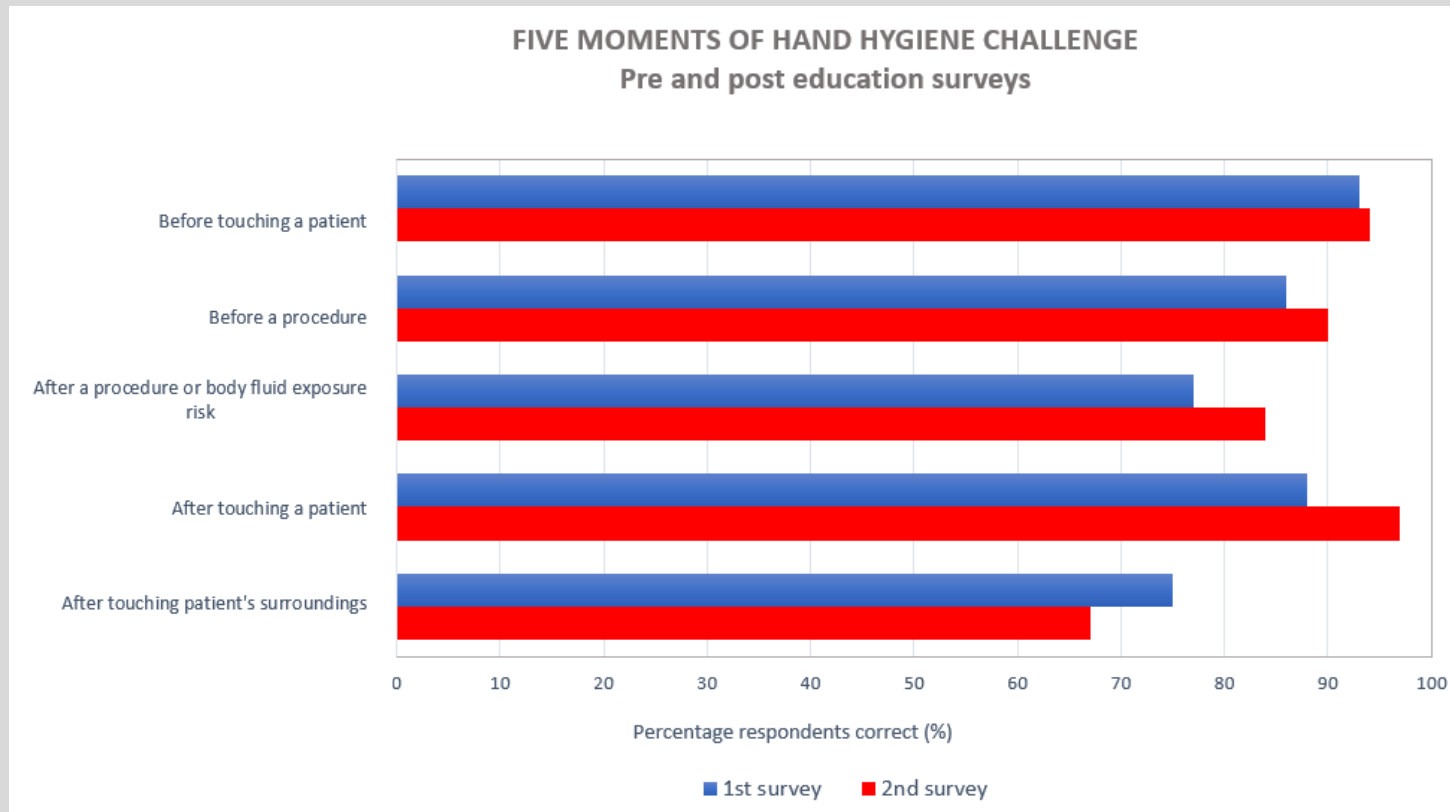
- Monthly saving AUD\$651
-

Results – Unnecessary glove use and hand hygiene compliance



- Hand Hygiene compliance improved
- Unnecessary glove use decreased
- Gloves not used , but required was rare and remained relatively stable

Preliminary staff survey results



Preliminary staff survey results (2)



Scenario	Pre survey	Post survey	P value
Improved identification for when not to wear gloves (standard precautions, minimal risk body fluid exp	22.9%	55.9%	0.000
Improved knowledge: gel application to next task	74.8%	80.9%	0.41
Improved confidence: using ABHR to reduce infection risk to patient	24.6	60.9%	0.000
Improved confidence: using ABHR to reduce infection risk to staff member	24.6%	53.2%	0.0005

As a result of Gloves Off! have you changed the way you wear gloves for clinical practice?	Yes	84%
---	------------	------------

Results – Knowledge and attitudes

- Staff knowledge of the '5 Moments of Hand Hygiene' improved significantly
- 35% v 57% ($p=0.008$)
- Knowledge related to glove use remained high across the study
- Staff attitudes towards alcohol-based hand rub improved.
- Post-intervention, a greater proportion of staff strongly agreed that alcohol-based hand rub is effective in reducing infection risks.
- For patient protection, strong agreement rose from 36 % to 60 % ($p=0.005$).
- For staff protection, strong agreement increased from 25% to 53% ($p<0.001$).

Lessons learned

What worked well

Having

- a passionate , enthusiastic team
- a leader with dedicated time to work on the project
- Infection control involvement and backing

Concentrating our resources on just two wards

What could we have done better

- Gained more engagement with medical officers and ancillary staff
- Created a better analysis plan before we commenced
- Ongoing monitoring





Available online at www.sciencedirect.com

ScienceDirect

journal homepage: <http://www.journals.elsevier.com/infection-disease-and-health/>



Research paper

Gloves off!: Environmental and financial impacts of an educational intervention to improve hand hygiene. A quality improvement study

Tina Wilkie-Miskin ^{a,b}, Mya Abigail Acosta ^c, Sarah Browning ^{d,e,f}, Kristen Pickles ^c, Sally Munnoch ^d, Patricia Knight ^d, Amy Bernotas ^g, Stanley Chen ^{a,h}, Rachel Ng ⁱ, Erin Mathieu ^{c,j,*} on behalf of the NSW Health Net Zero Clinical Leads Program

^a Climate Risk and Net Zero Unit, NSW Ministry of Health, Sydney, 2065, NSW, Australia

^b Speech Pathology, John Hunter Hospital, Newcastle, 2305, NSW, Australia

^c Wiser Healthcare Research Collaboration, School of Public Health, Faculty of Medicine and Health, The University of Sydney, Sydney, 2006 NSW, Australia

^d Infection Prevention Service, Hunter New England Local Health District, Newcastle, 2305, NSW, Australia

^e Infection Research Program, Hunter Medical Research Institute, Newcastle, 2305, NSW, Australia

^f University of Newcastle, School of Medicine and Public Health, Callaghan, 2308, NSW, Australia

^g Sustainability Unit, Hunter New England Local Health District, Newcastle, 2305, NSW, Australia

^h Division of Surgery, John Hunter Hospital, Newcastle, 2305, NSW, Australia

ⁱ Division of Anaesthesia and Intensive Care, John Hunter Hospital, Newcastle, 2305, NSW, Australia

^j Healthy Environments and Lives (HEAL) Global Research Centre, Health Research Institute, Faculty of Health, University of Canberra, Bruce, 2617 ACT, Australia

Received 16 December 2024; received in revised form 21 July 2025; accepted 23 July 2025

Available online 13 August 2025



In this issue:

Clean Hospitals Day 2025: The human factors of healthcare environmental hygiene.....	287
Bacterial bloodstream infections in a pediatric population: A 7-year experience at a tertiary care center in Saudi Arabia.....	290
Australian infection prevention and control leads' perceptions of their roles and responsibilities in residential aged care during the COVID-19 pandemic: A qualitative study.....	299



Future directions: Risk assess for PPE success

RISK ASSESS

Do you need gloves and a gown/apron?

ON

- During direct contact with body substance, mucous membrane or non-intact skin
- During invasive procedures, venepuncture, finger/heel prick
- When handling contaminated/soiled waste, linen, equipment or environmental surfaces

OFF

- Contact with intact skin
Routine observations, activities of daily living
- Injections
Subcutaneous, Intramuscular or intradermal
- Accessing cannula/IV line
Using aseptic non-touch technique

It might be gloves/gown. It's ALWAYS hand hygiene.



PPE Decision Making Matrix

	Hand Hygiene	Surgical Mask	P2/N95 Respirator	Eye Protection	Gown	Apron	Gloves
Standard Precautions	✓	RA	RA	RA	RA	RA	RA
Contact Precautions	✓	RA	RA	RA	RA	RA	RA
Droplet Precautions	✓	✓	X	✓	RA	RA	RA
Airborne Precautions	✓	X	✓	✓	RA	RA	RA

✓ = Must be worn
 X = Not required

RA = RISK ASSESS A risk assessment in this context is based on:

LOW RISK <small>Mechanical physical contact / No skin-to-skin or mucous membrane contact eg. Contact with IV, oral hygiene</small>	HIGH RISK <small>Respiratory secretions, blood & body substances / Prolonged physical contact eg. Urinary catheter care, contact</small>
--	--

New transmission based precautions signage

STOP! VISITOR RESTRICTIONS MAY BE IN PLACE.

Contact Precautions

in addition to standard precautions

ON Before entering room/care zone

- 1 Perform hand hygiene
- 2 **RISK ASSESS!** Do you need a gown/apron?

OFF At doorway prior to leaving room/care zone

- 1 Remove and dispose gloves if worn
- 2 Perform hand hygiene
- 3 Remove and dispose gown/apron if worn
- 4 Leave

Always use standard precautions

- Perform hand hygiene before and after touching a patient or their surroundings
- Use personal protective equipment (PPE)*
- Use respiratory hygiene and cough etiquette
- Use aseptic technique
- Use and dispose of sharps safely
- Perform routine environmental cleaning and maintain a clean and safe healthcare environment

*When used as part of standard precautions, PPE protects against probable exposure to blood and body substances. When used as part of transmission based precautions, PPE serves as a barrier to specific means of transmission of infectious agents.

NSW Hunter New England Local Health District

STOP! VISITOR RESTRICTIONS MAY BE IN PLACE.

Droplet Precautions

in addition to standard precautions

ON Before entering room/care zone

- 1 Perform hand hygiene
- 2 Put on surgical mask

OFF At doorway prior to leaving room/care zone

- 1 Perform hand hygiene
- 2 Remove protective eyewear
- 3 Perform hand hygiene

Always use standard precautions

- Perform hand hygiene before and after touching a patient or their surroundings
- Use personal protective equipment (PPE)*
- Use respiratory hygiene and cough etiquette
- Handle and dispose of used linen safely

*When used as part of standard precautions, PPE protects against probable exposure to blood and body substances. When used as part of transmission based precautions, PPE serves as a barrier to specific means of transmission of infectious agents.

NSW Hunter New England Local Health District

STOP! VISITOR RESTRICTIONS MAY BE IN PLACE.

Airborne Precautions

in addition to standard precautions for all staff

ON Before entering room/care zone

- 1 Perform hand hygiene
- 2 Put on a respirator mask (eg. P2/N95) and perform a fit check
- 3 Put on protective eyewear
- 4 Perform hand hygiene

OFF At doorway prior to leaving room/care zone

- 1 Perform hand hygiene
- 2 Leave the room/care zone
- 3 Perform hand hygiene
- 4 Remove protective eyewear
- 5 Perform hand hygiene
- 6 Remove and dispose of mask
- 7 Perform hand hygiene

Always use standard precautions

- Perform hand hygiene before and after touching a patient or their surroundings
- Use personal protective equipment (PPE)*
- Use respiratory hygiene and cough etiquette
- Use aseptic technique
- Use and dispose of sharps safely
- Perform routine environmental cleaning and maintain a clean and safe healthcare environment
- Clean and reprocess reusable patient equipment
- Handle and dispose of waste safely
- Handle and dispose of used linen safely

*When used as part of standard precautions, PPE protects against probable exposure to blood and body substances. When used as part of transmission based precautions, PPE serves as a barrier to specific means of transmission of infectious agents.

NSW Hunter New England Local Health District

Our amazing team

Project Lead

Net Zero lead for allied health

Tina Wilkie, Speech pathologist
Tina.wilkie@health.nsw.gov.au

Sustainability Project Officer

Amy Bernotas
Amy.Bernotas@health.nsw.gov.au

Senior staff specialist JHH General surgery ,

Dr Stanley Chan
Stanley.chan@health.nsw.gov.au

Director of Infection Prevention Service HNELHD

Dr Sarah Browning
Sarah.browning@health.nsw.gov.au

Infection Prevention Service

Patricia Knight, CNC
Patricia.knight@health.nsw.gov.au

Epidemiologist , JHH Infection Prevention Service

Sally Munnoch
Sally.Munnoch@health.nsw.gov.au



References

- Australian Commission on Safety and Quality in Healthcare, (2023). Glove use and Hand hygiene [What is hand hygiene? | Australian Commission on Safety and Quality in Health Care](#)
- CLINICAL EXCELLENCE COMMISSION (2020) Infection prevention and control practice handbook , Sydney, Australia
[Infection Prevention and Control Practice Handbook \(nsw.gov.au\)](#)
- National Health and medical research council. (2022). Australian Guidelines for the Prevention and Control of Infection in Healthcare, Canberra, Australia.
[Australian Guidelines for the Prevention and Control of Infection in Healthcare \(nhmrc.gov.au\)](#)
- National Health and medical research council. (2019). Clinical Educators Guide: Australian Guidelines for the Prevention and Control of Infection in Healthcare, Canberra, Australia.
[Clinical Educators Guide: Australian Guidelines for the Prevention and Control of Infection in Healthcare \(nhmrc.gov.au\)](#)
- Fuller, C., Savage, J., Besser, S., Haywood, A., Cookson, B., Cooper., B. & Stone, S. (2011). "the dirty hand in the latex glove": a study of hand hygiene compliance when gloves are worn. *Infection control and Hospital epidemiology*. 32(12).
- Jain, S., Clezy, K., & McClaws, M. (2019). Modified glove use for contact precautions: Health care workers Perceptions and acceptance. *American Journal of Infection Control* 47. <https://doi.org/10.1016/ajic.2019.01.009>
- Jamal, H., Lyne, A., Ashley, P., & Duane, B. (2021). Non-sterile examination gloves and sterile surgical gloves: which are more sustainable? *Journal of Hospital Infection*. <https://doi.org/10.1016/j.jhin.2021.10.001>

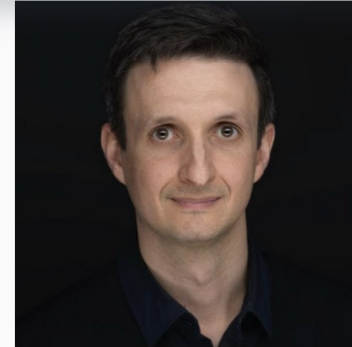
THU
26

February 26 @ 1:30 pm EST

Code Red: Measles On the Ward

Prof. Yves Longtin, McGill University

Free



March 2026

THU
5

March 5 @ 1:30 pm EST

Practical Approaches in a Catastrophe – The Defunding of Aid Projects

Professor Francois Venter, University of the Witwatersrand, South Africa

Free



THU
12

March 12 @ 1:30 pm EDT

The Perfect Predator – A Scientist's Race to Save Her Husband From a Deadly Superbug

Prof. Steffanie Strathdee, Center for Innovative Phage Applications & Therapeutics (IPATH)



Thanks to Teleclass Education
PATRON SPONSORS



diversey.com



virox.com



gamahealthcare.com