

# STATE-WIDE PREVALENCE OF PRESSURE INJURY IN INTENSIVE CARE

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# Background

- Pressure injury (PI) is an enduring complication of hospitalisation
- ICU patients are more susceptible due to multiple risk factors
- Several studies have indicated that ICU patients are more likely to develop PIs compared to general patients.

# Background

- 3-year state-wide prevalence (Coyer et al., 2017)
- ICU PI prevalence **11.5%** vs non-ICU 3.0%
  - Mucosal PI accounted for 22.4% of all ICU PIs
- Not adjusted for variables such as hospital, time, risk level
- Stage 1 PI not included

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Research paper

**Pressure injury prevalence in intensive care versus non-intensive care patients: A state-wide comparison**

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# Study design

- 5-year secondary data analysis of annual state-wide point prevalence studies
- 18 ICUs
- Stage I PI included
- Logistic regression modelling used to derive prevalence and effect estimates



# Results

- ICU sample ( $n = 611$ )
  - Mean age 58 (SD 17) years (vs 65 general patients  $p < .001$ )
  - 93% at risk of PI (vs 33% general patients  $p < .001$ )
  - ICU median risk level = high risk

# Overall results summary

- All-stage ICU prevalence estimate of hospital-acquired (HA) PI = **9.6%** (vs 2.1% in non-ICU)
- ICU  $\geq$  Stage II prevalence estimate of HAPI = **8.6%** (vs 1.2% in non-ICU)
- ICU patients developed a greater proportion of severe HAPIs than non-ICU patients
- Most ICU HAPIs on the sacrum/coccyx and heels.

# Characteristics of ICU HAIs

- 86 HAIs (range 1-5) reported in 58 ICU patients
- Largest proportion was **Stage II (29.1%)**
- Proportion of **severe PI = 14.4%** (stages 3,4 and SDTI)
- **75.9%** of patients with HAI were at **very high risk**
- Most HAIs on sacrum/coccyx (20.9%), heel (16.3%), or mouth/lips (15.1%)



# ICU vs non-ICU HAPIs by category

| Pressure injury category     | ICU n (%) | Non-ICU n (%) | Total n (%) |
|------------------------------|-----------|---------------|-------------|
| Stage I                      | 18 (20.9) | 186 (46.0)    | 204 (41.6)  |
| Stage II                     | 25 (29.1) | 126 (31.2)    | 151 (30.8)  |
| Stage III                    | 7 (8.1)   | 17 (4.2)      | 24 (4.9)    |
| Stage IV                     | 0 (0)     | 4 (1.0)       | 4 (.8)      |
| Suspected deep tissue injury | 17 (19.8) | 37 (9.2)      | 54 (11.0)   |
| Unstageable                  | 9 (10.5)  | 26 (6.4)      | 35 (7.1)    |
| Mucosal                      | 10 (11.6) | 8 (2.0)       | 18 (3.7)    |
| Total                        | 86 (100)  | 404 (100)     | 490 (100)   |

<sup>a</sup>Hospital-acquired pressure injuries were present in 370 patients (58 in intensive care and 312 in non-intensive care wards).

Most **Stage I** on heels (28%)

Most **Stage II** on sacrum/coccyx (20.0%)

Most **Stage III** on sacrum/coccyx (57.1%)

Most **SDTI** on heels (35.3%) and sacrum/coccyx (28.6%)

Most **Unstageable** on heels (33.3%) and sacrum/coccyx (22.2%)

**Mucosal** on either lips/mouth (70%) or nose (30%)





# ICU vs non-ICU HAIs by site: Top 5


| Body site     | Intensive care n (%) | Non-intensive care n (%) | Total n (%) |
|---------------|----------------------|--------------------------|-------------|
| Sacrum/coccyx | 18 (20.9)            | 135 (33.4)               | 153 (31.2)  |
| Heel          | 14 (16.3)            | 98 (24.3)                | 112 (22.9)  |
| Lip/mouth     | 13 (15.1)            | 0 (0)                    | 13 (2.7)    |
| Ear           | 8 (9.3)              | 32 (7.9)                 | 40 (8.2)    |
| Nose          | 8 (9.3)              | 10 (2.5)                 | 18 (3.7)    |

# Conclusions

- Significant differences between HAPI prevalence of ICU versus non-ICU patients
  - Downward trend (11.5% → 8.6% [9.6% inc. Stage I])
  - Mucosal PI proportion of 11.6% = clinically significant
- International benchmarks
  - Global ICU-acquired PI 16.2% (Labeau et al., 2021)
    - Australian sub-set: ICU-acquired PI = 9.7% (Coyer et al., 2022)
    - UK sub-set: ICU-acquired PI = 8.8% (Rubulotta et al., 2022)
    - Chinese sub-set: ICU-acquired PI = 4.3% (Lin et al., 2022)
  - USA ICU HAPI prevalence 14.3% (Cox et al., 2022)

# State-wide prevalence of pressure injury in intensive care versus acute general patients: A five-year analysis

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# ICU incidence and characteristics of hospital-acquired mucous membrane pressure injury

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# Background

## ➤ Mucous membrane pressure injury (MMPI) first defined in 2008

- International guideline (EPUAP et al., 2019) recommends they should be reported in incidence and prevalence studies
  - (N.B. DecubICUs study [Labeau et al., 2021] did not collect MMPI)

## ➤ Caused by pressure from medical devices at the site of injury

- ICU patients are particularly vulnerable
- Few previous studies have reported incidence or prevalence (Fulbrook et al., 2022)
- ICU MMPI prevalence **low** = 1.6% but accounted for **11.6% of ICU HAIs** (Fulbrook et al., 2023)



# Background

- Systematic review 2008-2020
- 21 studies met inclusion criteria
- None directly reported MMPI incidence or prevalence
- MMPI incidence/prevalence able to be calculated from only 4 studies – all in ICU
  - Incidence 0.8% and 30.4%
  - Prevalence 1.7% and 3.7%

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**ORIGINAL ARTICLE**

*Int Wound J.* 2022;19:278–293

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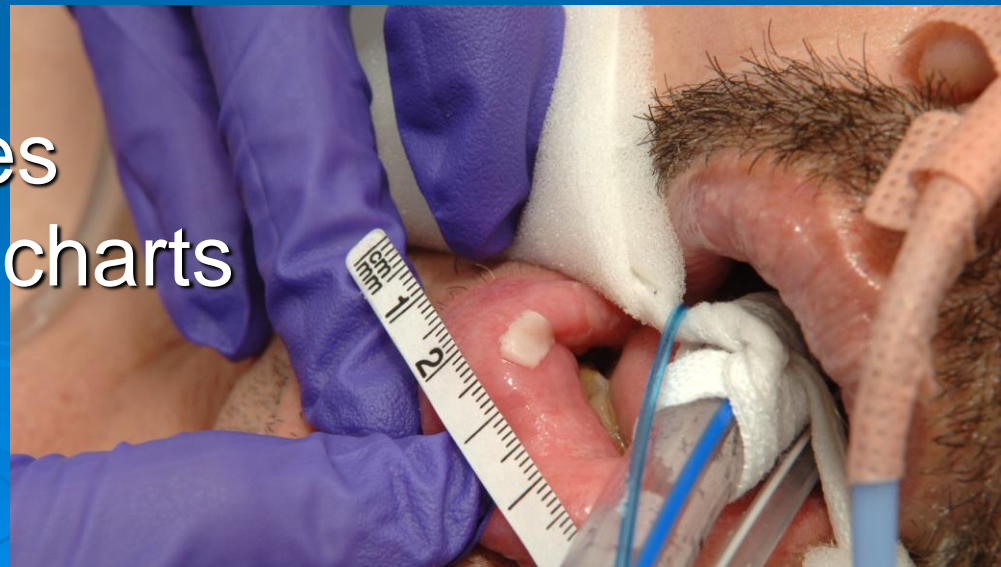
**Systematic review: Incidence and prevalence of mucous membrane pressure injury in adults admitted to acute hospital settings**

Paul Fulbrook<sup>1,2,3</sup> | Josephine Lovegrove<sup>1,4</sup> | Sandra Miles<sup>1,2</sup> | Ban Isaqi<sup>5</sup>



# Study design

- 5-year secondary data analysis of hospital clinical incident reports of MMPI (2015-2019)
  - 630-bed tertiary general hospital
  - 26-bed general and cardiac ICU
- All MMPI validated by specialist nurses
- Device insertion times derived from patient charts



# Results

- 414 MMPI reported in 296 of 265,396 hospital episodes
- Most MMPI were hospital-acquired (91.5%,  $n = 379$ )
- Of these, 74% were in ICU (mean age 60, SD 16)
- ICU incidence = 2.4% vs .03% non-ICU
- In ICU, most MMPI initially reported correctly (89.5%)



# Time-to-MMPI

ICU median time-to-MMPI following device insertion = 3 days (IQR 1–5; range 0–33)



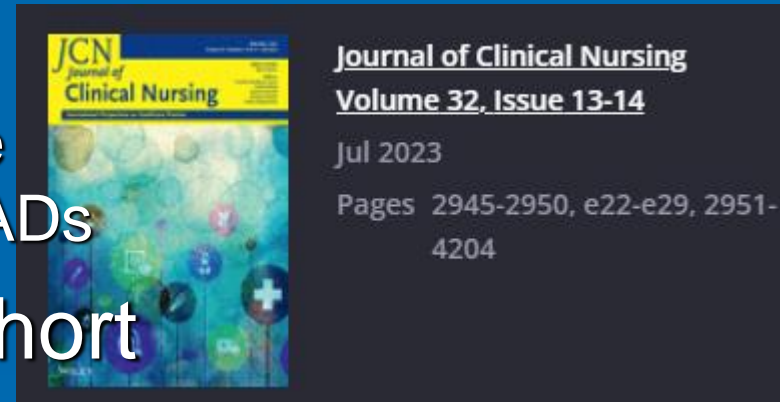
| Device type                           |         | n   | Median (IQR)   | Range |
|---------------------------------------|---------|-----|----------------|-------|
| Oral endotracheal tube-related device | Non-ICU | 5   | 2 (0-5)        | 0-8   |
|                                       | ICU     | 215 | 2 (1-4)        | 0-18  |
|                                       | Overall | 220 | 2 (1-4)        | 0-18  |
| Urinary catheter                      | Non-ICU | 15  | 5 (1-14)       | 0-37  |
|                                       | ICU     | 11  | 14 (7-19)      | 5-33  |
|                                       | Overall | 26  | 9 (4.5-15.3)   | 0-37  |
| Gastric tube (nasal/oral)             | Non-ICU | 12  | 7 (5.3-14.3)   | 2-21  |
|                                       | ICU     | 6   | 4 (1-9.5)      | 1-14  |
|                                       | Overall | 18  | 6.5 (3.8-12.5) | 1-21  |
| Nasal prongs                          | Non-ICU | 5   | 8 (7-15.5)     | 6-17  |
|                                       | ICU     | 0   | -              | -     |
|                                       | Overall | 5   | 8 (7-15.5)     | 6-17  |
| Tracheostomy tube                     | Non-ICU | 0   | -              | -     |
|                                       | ICU     | 6   | 11 (3.5-22.3)  | 2-23  |
|                                       | Overall | 6   | 11 (3.5-22.3)  | 2-23  |

# Device by site: ICU

| Device                    | Hospital-acquired MMPI location <i>n</i> (%) |            |          |            |          |          | Total <i>n</i> (%) |
|---------------------------|--|------------|----------|------------|----------|----------|--------------------|
|                           | Neck   | Mouth      | Tongue   | Lips       | Nose     | Genitals |                    |
| Oral ET-related           | -  | 106 (35.1) | 22 (7.3) | 127 (42.1) | 1 (0.03) | -        | 256 (84.8)         |
| Urinary catheter          | -  | -          | -        | -          | -        | 21 (7.0) | 21 (7.0)           |
| Gastric tube (nasal/oral) | -  | -          | 1 (0.03) | 2 (0.06)   | 13 (4.3) | -        | 16 (5.3)           |
| Tracheostomy tube         | 9 (3.0)                                      | -          | -        | -          | -        | -        | 9 (2.4)            |
| <b>TOTAL <i>n</i> (%)</b> | 9 (3.0)                                      | 106 (35.1) | 23 (7.6) | 129 (4.3)  | 14 (4.6) | 21 (7.0) | 302 (100)          |

# Conclusions

- Massive difference between ICU MMPI incidence versus non-ICU
- Most MMPI ETT-related
  - Further research to differentiate between tube types, tapes, ETADs
- Time-to-MMPI relatively short



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## Incidence and characteristics of hospital-acquired mucous membrane pressure injury: A five-year analysis

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# What next?

Multi-site RCT: Eliminating harm from devices across the life span in critical illness (DEFENCE)  
(Coyer F, Fulbrook P et al.)

## ➤ The DEFENCE bundle:

1. Clinical need, selection and fit of the device
2. Regular skin and mucous membrane assessment under and surrounding the device
3. Repositioning the device
4. Protection of the skin underneath the device
5. Timely removal of the device.



**DEFENCE**  
— PROTECTING SKIN IN THE ICU —