Prevalence of skin injuries in COVID-19 patients in a specialist UK respiratory Intensive Care Unit

KEY WORDS
- COVID-19
- ECMO
- Essential care rolling team
- Incident reporting systems
- Skin injury prevalence

Background: The impact of COVID-19 on skin integrity in an intensive care setting is a challenge due to the pathological acuity and extended length of stay experienced by this patient group. **Objectives:** The objectives of this study were: to establish the prevalence of skin injury (pressure ulcers [PU], moisture-associated skin damage [MASD], or medical device-related pressure ulcers [MDRPU]) in a cohort of COVID-19 patients admitted to a specialist respiratory intensive care unit during the first COVID-19 surge in early 2020; to establish the prevalence of skin injury in respiratory failure patients supported with extracorporeal membrane oxygenation (ECMO) and respiratory failure patients not supported with ECMO; and to establish if there were significant variances between actual skin injuries experienced by patients and the number recorded through formal incident reporting systems. **Methods:** We conducted a retrospective skin injury audit of the electronic patient record of every patient who tested positive for COVID-19 and was admitted to the intensive care unit between 16 March 2020 and 26 June 2020. **Results:** Of 100 patients identified, 64% experienced at least one or more PU, MASD or MDRPU. Of 64 patients not supported with ECMO, at least one or more skin injuries were experienced by 52% of patients. Of 36 patients supported with ECMO, 89% experienced one or more skin injury. 43% of patients who required an incident report for skin damage had one submitted. **Conclusion:** In COVID-19 ICU patients, skin injury was a frequent complication encountered during their admission. PU prevalence data derived from formal incident reporting systems alone may not represent the extent of skin injury experienced by patients and misrepresents the challenge and resources required to support skin injury preventative strategies in COVID-19 ICU patients. Further study exploring the impact of streamlined skin protection protocols to prevent injury is required.

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Skin injury caused by pressure ulcers (PU), moisture-associated skin damage (MASD) and medical device-related pressure ulcers (MDRPU) is a common morbidity encountered by patients who experience an extended period of care in intensive care unit (ICU) settings. PU, MDRPU and MASD are among the most common skin injuries patients experience during their admission to ICU (Tubaishat et al, 2018; Barakat-Johnson et al, 2019; Lin et al, 2020; Moore et al, 2020; Team et al, 2021).

With the exception of category 1 PUs, reporting the incidence of all three groups of skin injuries and their subtypes is mandatory (NHS England and NHS Improvement, 2018).

The relentless advance of the SARS-CoV-2 (COVID-19) pandemic, the unprecedented pressure it has placed on UK ICU capacity and the advent of what are effectively pop-up temporary surge ICUs, serve only to further challenge maintaining skin integrity, and the standards of skin care in terms of preventative and management strategies.

The use of mechanical ventilation to support life in patients experiencing some of the most

severe forms of respiratory failure in ICU is well established (Windisch et al, 2020). Advanced health economies, such the UK, have access to the necessary financial and human resources to deliver nationwide intensive care support, and newer advanced respiratory support technologies, including extracorporeal membrane oxygenation (ECMO). ECMO, described as a means to support escalation in acute respiratory failure beyond the capability of traditional mechanical ventilation (Fowles et al, 2014) is becoming increasingly established in treatment plans of COVID-19 ICU patients (Ramanathan et al, 2020).

Alongside the normal threat to skin integrity posed by long periods of immobility in the ICU, regular exposure to excess moisture and indwelling devices, such as endotracheal tubes and nasogastric tubes, further increases the risk of skin injury (Barakat-Johnson et al, 2019; Johansen et al, 2020). Patients' skin integrity may be further compromised by sedative-induced sensory dampening and complications of medication to support central tissue perfusion such as peripheral vasoconstrictors (Coyer et al, 2015).

The true extent of injury sustained is often difficult to ascertain through a single formal reporting system, such as the Datix incident reporting system (IRS) used in our hospital. However, discrepancies between the number of such injuries reported through IRS and what is reported through point-prevalence audit can differ, with hospital-wide under-reporting found through a formal IRS versus point-prevalence audit (Smith et al, 2016). The study reported variances between actual skin injury experienced and IRS data of 67% for category 2 PUs, 45% for category 3 PUs and 60% for category 4 PUs. MASD was underreported by 91% and MDRPU underreported by 78%.

During the COVID-19 ICU surge, staff-to-patient ratios were often suboptimal and many staff working in this environment were redeployed from other clinical settings, with varying levels of skin assessment skills. This has the potential to result in a further mismatch between the number of skin injuries reported and the reality.

Objectives

The primary objective was to establish the prevalence of skin injury in a cohort of COVID-19 patients admitted to a specialist respiratory ICU during the first surge from March 2020 to June 2020, and to compare PU, MDRPU and MASD data sets in order to evidence the true extent of skin injury in COVID-19 ICU patients.

The second objective was to establish the prevalence of PU, MDRPU and MASD experienced by patients supported with ECMO, and patients in respiratory failure not supported with ECMO, over the same time period.

The final objective was to establish if there are significant variances between actual skin injuries experienced by patients and the number of reported skin injuries through formal IRS, and to establish if IRS data alone can represent the extent of skin injury when an ICU is in surge status.

This article will further describe how our hospital responded to the threat that the COVID-19 pandemic presented to patient skin integrity.

Clinical background

The setting for the study is a regional referral centre providing specialist cardiac and respiratory ICU services. The ICU is a 46-bed unit that admits patients post-cardiothoracic surgery, including post-transplantation and pulmonary endarterectomy, and those with cardiac failure. It is one of five severe respiratory failure ECMO centres in England. The ratio of trained nursing staff to patients before the pandemic was 1:1 for level 3 patients as recommended in national ICU standards (Intensive Care Society, 2019). Before the COVID-19 ICU surge, 33 of the 46 available beds in ICU were open. During the surge period, the ICU capacity was increased to 63 beds, with 13 more beds opened in the ICU and 17 beds opened in 'surge areas' outside of the normal ICU footprint.

Trained ICU nurse ratio was reduced to 1:3 on some dates in late March and early April, due to the impact of surge bed openings, staff sickness and staff self-isolation. To bridge the deficit in bedside staff, mass redeployment of clinical staff was enacted from general ward areas, outpatient clinics, day wards, theatres, catheter labs and various speciality nursing departments. Some medical staff were redeployed in the role of bedside nurse. Many of the redeployed staff had little or no experience in nursing critically ill patients or managing skin integrity in the critically unwell.

In the initial weeks, the ICU's primary focus was to maintain essential safety of patients through maintaining adequate oxygenation and preserving the functions of advanced lifesaving support. The pre-pandemic culture of delivering a high standard of essential care including patient repositioning, skin care and essential hygiene was challenged. Compounding this, the majority of patients admitted were referrals from District General Hospitals, where they had already spent a period of time as an inpatients. Many had sustained periods of immobility, a reduction in adequate pressure relief to key anatomical areas, and had developed MASD and MDRPU before admission into our ICU.

Before the introduction of a formalised and rostered essential care team (ECT) described by Hales et al (2020) at the end of March 2020, there was a brief period from initial to full surge, where clinical teams needed to prioritise critical ICU care over frequent repositioning of patients. As a consequence, skin injury became a dominant pathology and the most reported type of COVID-19-related clinical incident through the IRS.

Early in the surge period, it was noted in the clinical setting that there was little correlation between the number of skin injury incident reports that should have been generated through the IRS, versus the number that was recorded in the patients' electronic patient record (EPR).

To inform resource planning for future surges and support effective preventative skin care, a retrospective study detailing the degree of documented skin injury was carried out to evidence the challenge incompletely recorded through formal IRS.

METHODS

The study design was reviewed by the hospital ethics committee and concluded that formal ethical approval was not required as no patient-identifiable data were collated to inform the study. From an ethical perspective, the study was labelled as a service evaluation.

The study design is a retrospective skin injury audit of the Surface, Skin inspection, Keep moving, Incontience/moisture and Nutrition (SSKIN) bundle EPR of every patient who tested positive for the COVID-19 virus and was admitted to the ICU between 16 March 2020 and 26 June 2020. The SSKIN care bundle used in the study clinical setting is an electronic adaptation of Whitlock et al (2013) SSKIN care bundle. A bundle is a powerful tool, as it defines and ties best practices together, making the actual process of preventing PUs visible to all. This approach minimises variation in care practices (Healthcare Improvement Scotland, 2020).

A report was compiled by our EPR system manager to identify the COVID-19 patients in question and

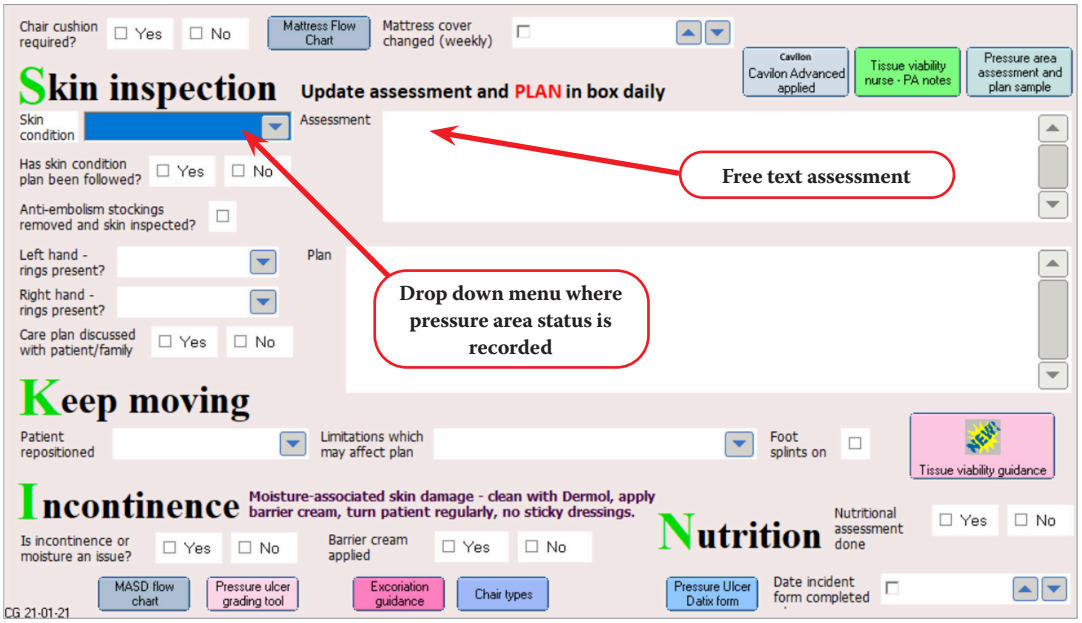
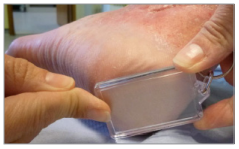


Figure 1. Royal Papworth Hospital ICU SSKIN care bundle (2021)

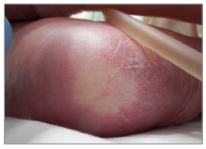
Figure 2. Categories of pressure ulcers (NHS England and NHS Improvement, 2018)

Blanching erythema

Healthy skin may develop transient redness when subjected to pressure – for example, if the legs are crossed. To test if damage has occurred, light finger pressure should be applied to see if the skin blanches (goes white). In dark skin tones, redness may present as a darker area that is grey or purplish. This is not a pressure ulcer.



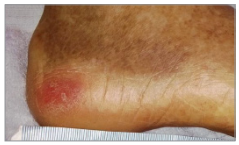
Example of skin blanch



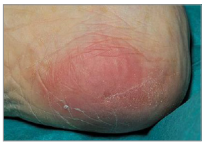
Blanch in dark skin

Category 1: Non-blanchable erythema

Intact skin with non-blanchable redness of a localised area, usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its colour may differ from the surrounding area. The area may be painful, firm, soft, warmer or cooler compared to adjacent tissue. Category 1 may be difficult to detect in individuals with dark skin tones. May indicate 'at-risk' individuals (a heralding sign of risk).



This redness is persistent and does not blanch



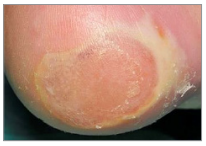
This redness will not blanch when pressure is applied

Category 2: Partial-thickness skin loss

Partial-thickness loss of dermis presenting as a shallow open ulcer with a red-pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister. Presents as a shiny or dry shallow ulcer without slough or bruising.* This category should not be used to describe skin tears, tape burns, perineal dermatitis, maceration or excoriation.

**Bruising indicates suspected deep tissue injury.*

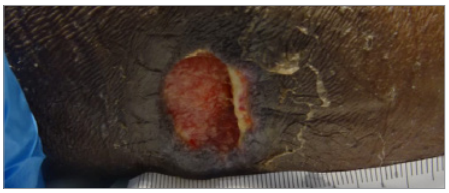
An intact serum-filled blister



A shallow open ulcer with a red-pink wound bed without slough

Category 3: Full-thickness skin loss

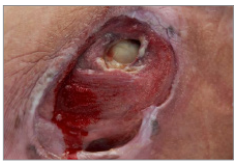
Subcutaneous fat may be visible, but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunnelling. The depth of a Category 3 pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue, and Category 3 ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep Category 3 pressure ulcers. Bone/tendon is not visible or directly palpable.



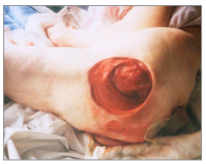
Full-thickness tissue loss. Subcutaneous fat is visible but no bone, tendon or muscle

Category 4: Full thickness tissue loss

Full-thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often includes undermining and tunnelling. The depth of a Category 4 pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue, and these ulcers can be shallow. Category 4 ulcers can extend into muscle and/or supporting structures (e.g. fascia, tendon or joint capsule), making osteomyelitis possible. Exposed bone/tendon is visible or directly palpable.



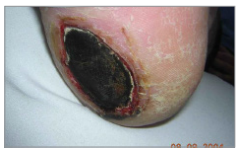
In this wound, the bone is clearly visible



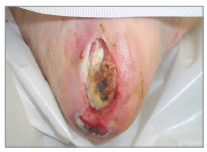
This wound shows exposed muscle

Unstageable: depth unknown

Full-thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, grey, green or brown) and/or eschar (tan, brown or black) in the wound bed. Until enough slough and/or eschar is removed to expose the base of the wound, the true depth, and therefore category, cannot be determined. Stable (dry, adherent, intact without erythema or fluctuance) eschar on the heels serves as 'the body's natural (biological) cover' and should not be removed.



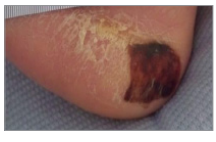
This heel ulcer is covered by hard dry eschar



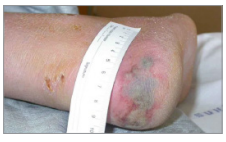
The necrotic cap on this heel has softened and started to separate

Suspected deep tissue injury: depth unknown

Purple or maroon localised area of discoloured intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler compared to adjacent tissue. Deep tissue injury may be difficult to detect in individuals with dark skin tones. Evolution may include a thin blister over a dark wound bed. The wound may further evolve and become covered by thin eschar. Evolution may be rapid, exposing additional layers of tissue even with optimal treatment.



This heel ulcer appears as a dry blood blister



This heel ulcer appears as a linear area of deep purple-black discolouration

Figure 3. Total incidence of skin injury

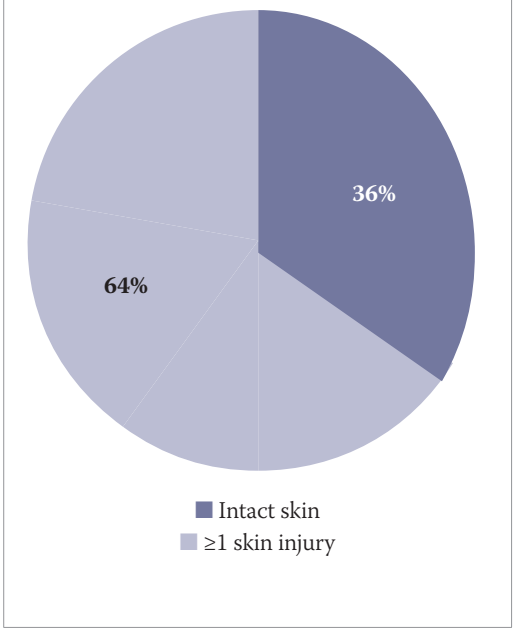


Table 1. Pressure ulcers by category summary	
Category 1	12%
Category 2	30%
Category 3	4%
Category 4	0%
DTI	20%
Unstageable	18%
Unknown	16%

contained data regarding the type of skin injury experienced by each patient, extrapolated from a drop-down menu *(Figure 1)*.

The SSKIN care bundle also features a section for entering a free text skin assessment to describe and categorise the type of skin injury observed. This feature of the SSKIN care bundle proved very beneficial in gathering documented skin care episode data beyond that entered through the drop-down menu choices. The design proved to be a most useful feature in the surge period, as redeployed staff not familiar with how to report skin injury could simply type in a description of the skin injuries they observed.

Each individual EPR report was then analysed by the hospital's wound care nurse consultant to recover data from the drop-down menus and free text descriptions. The data was judged against documented skin assessments carried out by members of the hospital's wound care team as expert wound assessors, during and after their redeployment to ICU. A minority of skin injuries were not assessed by members of the wound care team and the impact of this on robustness of findings will be discussed later.

The study also compares the documented injuries in the individual SSKIN care bundle against whether a formal incident report was generated through IRS. The standards for reporting were measured against NHSI and NHSE reporting standards for pressure ulcers (NHS England and NHS Improvement, 2018; Fletcher and Hall, 2018).

Figure 4. Incidence of skin injury

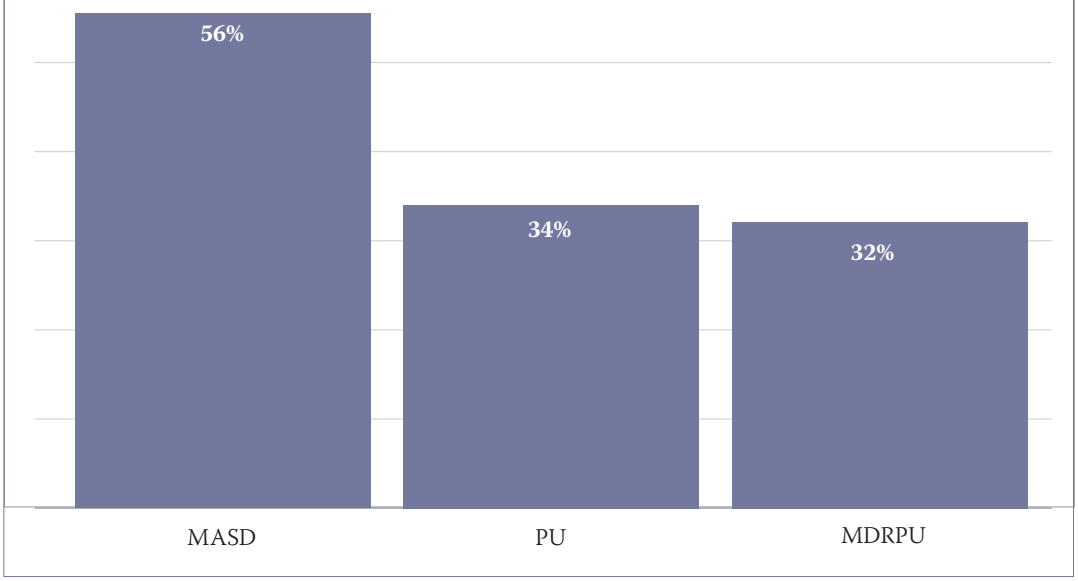


Figure 5. Pressure ulcers by anatomical area

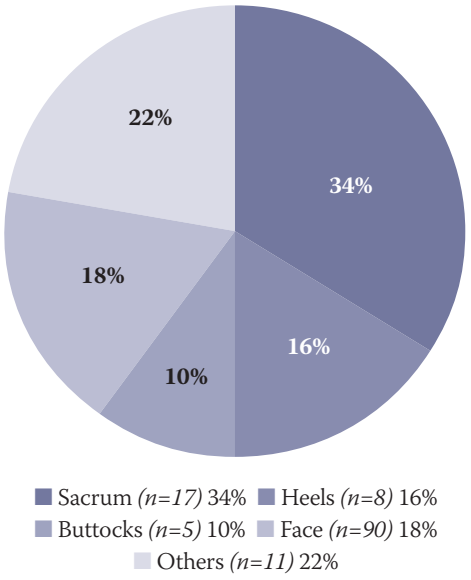


Figure 2 summarises the categories of PU (NHSI Pressure Ulcer Categorisation Group, 2019).

RESULTS

We identified 100 COVID-19 patients who were admitted to the ICU during the study period. 64 patients were respiratory ICU patients not supported on ECMO and 36 were supported on ECMO. A total of 64% of patients admitted to the ICU experienced at least one or more PUs, MASD or MDRPU; 51% of injuries observed developed before admission *(Figure 3)*. The most common injury was MASD, with 56% of admissions experiencing this injury, while 34% experienced a PU. MDRPU developed in 32% of patients *(Figure 4)*.

The most commonly reported PUs were category 2, experienced by 30% of patients. Category 3 PUs were recorded in 4% of patients at admission. No new category 3 ulcers developed and no category 4 ulcers were reported or observed during the study. A deep tissue injury (DTI) was experienced by 20% of patients; 18% of PUs were classed as unstageable and 16% documented as unknown *(Table 1)*.

The most common anatomical areas where pressure ulcers (excluding MASD/MDRPU) developed were sacrum (34%), face (18%), heels (16%) and buttocks (10%). All facial skin pressure ulcers were related to proning, with 88% of the injuries present on admission *(Figure 5)*.

Patients not supported with ECMO

At least one or more skin injury of some description was experienced by 52% of patients in the study. MASD was the most common, impacting on 43% of patients. A MDRPU was experienced by 16% and 34% experienced a PU of some description *(Figure 6)*.

Patients supported with ECMO

A skin injury of some description was experienced by 89% of ECMO patients. MASD was experienced by 78%, and 61% had a MDRPU. A PU was experienced by 33% of ECMO patients *(Figure 7)*.

Figure 6. Non-ECMO patients by skin injury type: moisture-associated skin damage (MASD), pressure ulcers (PU) and medical device-related pressure ulcers (MDRPU)

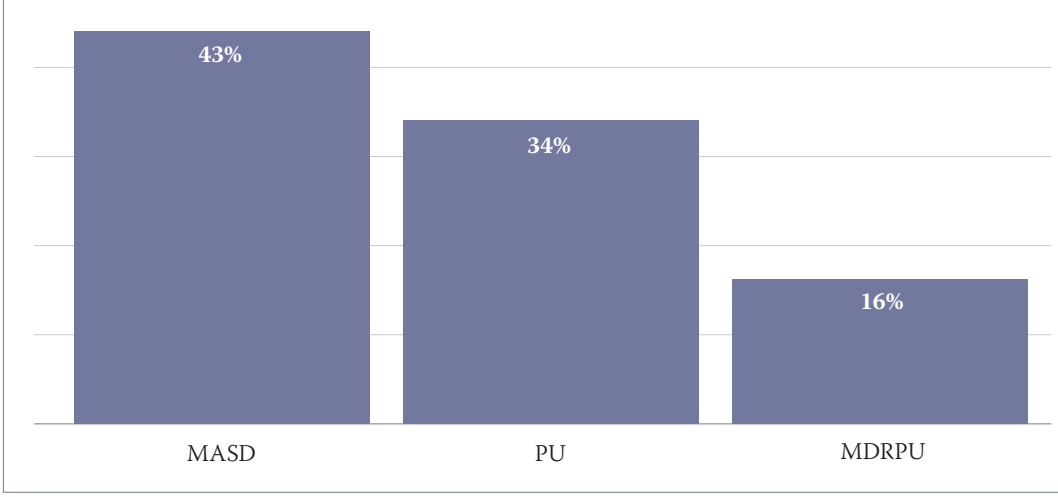
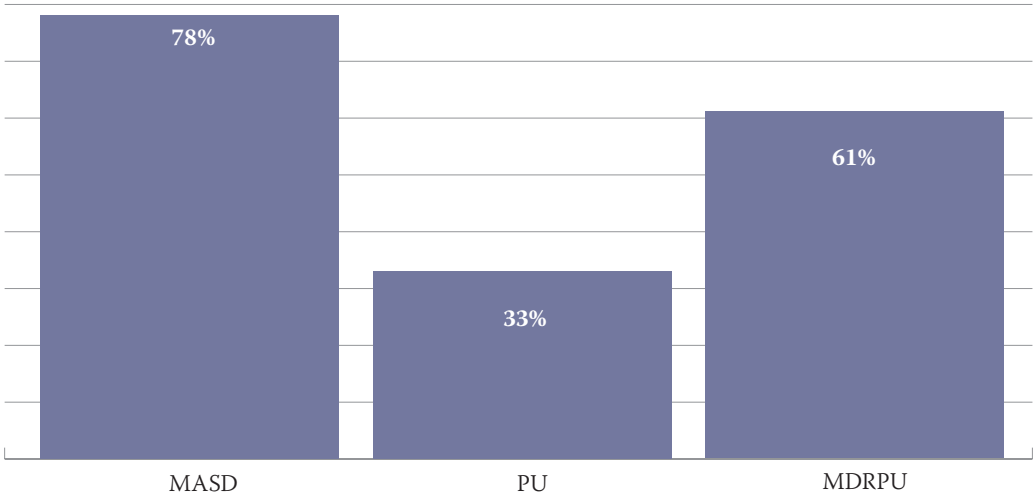


Figure 7. ECMO patients by skin injury type: moisture-associated skin damage (MASD), pressure ulcers (PU) and medical device-related pressure ulcers (MDRPU)



There were no category 3 or 4 PUs experienced by patients in the ECMO group; 52% of this patient group had a skin injury on admission.

Medical device-related pressure ulcers

There were one or more MDRPU in 32% of patients. 19% experienced an endotracheal tube injury, 17% a nasogastric tube injury, and 2% experienced an ECMO pipe injury *(Table 2)*.

Incident reporting through IRS

Based on standards for pressure ulcer reporting (NHS England and NHS Improvement, 2018), 43% of those who required a Datix incident report completed for a PU, including MDRPU and MASD, had one submitted.

Only 4% of patients with MASD had a Datix incident report submitted, despite it been the most widely observed and documented skin injury in the clinical area; 96% had no incident report.

Datix incident reports did not report any skin injury that was not reported in the EPR.

Further notable findings

There were no non-invasive ventilation (NIV) mask injuries reported or witnessed. The rationale

Table 2. Medical device-related pressure ulcers (MDRPU) by type

One or more MDRPU (*n*=32/100)	32%
Non-ECMO MDRPU (*n*=10/64)	16%
ECMO MDRPU (*n*=22/36)	61%
Total Endotracheal Tube (*n*=19/64)	19%
Endotracheal tube non-ECMO (*n*=4/64)	6%
Endotracheal tube ECMO (*n*=15/36)	42%
Total Nasogastric Tube (*n*=17/100)	17%
NG Non-ECMO (*n*=6/64)	9%
NG ECMO (*n*=11/36)	31%
ECMO Pipes MDRPU (*n*=2/100)	2%
ECMO patients only: ECMO Pipes MDRPU (*n*=2.36)	6%

for this is multifactorial: it is a specialist unit very familiar with just two specific brands of masks; the NIV masks used are of a soft seal design that do not have to be applied tightly to achieve safe oxygen saturation levels; and high standards of associated education are routinely delivered *(Figure 8)*.

A notable trend was also identified in the documentation and observed in practice. Patients who were cared for on Dual Constant Low Pressure & Dynamic Cell Mattresses presented with minimal proning-related PUs in the chest, abdomen, knees or feet. This dynamic mattress system has the capability to totally offload pressure, through manually deflating air cells under key anatomical pressure area points.

Figure 8. Patient wearing a soft seal NIV mask as used at Royal Papworth Hospital (image courtesy of New York Times, 2021)

DISCUSSION

Despite the unprecedented pressure placed on ICU teams, a clear trend emerged, demonstrating high numbers of lower-severity skin injuries, with MASD being most prevalent.

In the very early weeks of surge, before the ECT team was operational, most repositioning episodes occurred for patients who required proning or incontinence-related hygiene. Regular repositioning of patients as per SSKIN care plans was sporadic during this time period. The acuity of the patients cared for was very high and many remained immobile for long periods of their admission. In the initial period, the majority of the critically ill were cared for on dynamic mattress surfaces; all patients were cared for on dynamic mattress surfaces towards the end of surge. Consistent pressure redistribution of the whole body into the mattress surface, with limited periods of sitting out in chairs due to the nature of COVID-19 critical illness, may explain why the prevalence and severity of deep PUs were low. The establishment of the ECT team, who provided regular repositioning of patients, was also a likely contributor to the low rates of injury severity.

The higher rate of skin injury in patients supported on ECMO should not be attributed to the support itself. There were only two incidents of skin injury directly attributable to the use of the ECMO device. Both were MDRPU caused by essential positioning of the ECMO pipes against the skin, to facilitate safe functioning of the device.

Average length of stay for all ICU admission pre-COVID-19 pandemic was 3.9 days (Royal Papworth Hospital, 2020). This compares with an average length of stay for all admission during this COVID-19 surge of 27.3 days. Average length of stay for the ECMO cohort was significantly higher in COVID-19 ECMO patients at 42.5 days, compared to an average length of stay of 16.6 days for non-COVID-19 ECMO patients (Royal Papworth Hospital, 2021). The increased length of stay would have exposed the patients to longer periods of moisture, immobility and medical devices used, which in turn increased the risk of skin injury.

It is thus concluded that length of stay in ICU was a more significant factor in the development of skin injuries than the presence of ECMO support.

The ECT team, who assisted with the majority of repositions and hygiene episodes, were a group of redeployed staff, some with little or no clinical experience, including of skin protection practices. They initially used various means to deliver skin hygiene without a robust protocol to follow. This led to inconsistent application of skin protectant agents and dressings to support healing. However, within a relatively short timeframe of the first COVID-19 patient admission to ICU, the ECT team was assisting with a vast number of patient repositions. The majority of patients were receiving a minimum of 4 repositions in 24 hours and many patients were achieving 5 to 6 repositions in 24 hours by early April. The early introduction of this service to the clinical area may explain why severity of PUs was relatively low. However, the staff's inexperience in protecting skin from moisture damage may also explain why MASD was dominant.

Table 3. The One Protocol
One method of skin hygiene
One long-acting skin protectant
One dressing regime
One moisturiser for dry skin
One dynamic mattress instruction leaflet

Comparing findings with clinical observations

The data was largely consistent with clinical observations of the wound care team while redeployed to ICU and in the period following the end of redeployment. On daily wound care rounds, they observed a large number of patients with MASD, and a small number of DTIs and unstageable ulcers, of which none progressed to deep skin injury during admission. Few category 3 and no category 4 PUs were observed by the wound care team in the clinical setting.

While not every patient in the study had their skin inspected by the wound care team during or after their redeployment to the ICU, 50 out of 64 patients with a skin injury did have assessment input by the team and grading of skin injury was consistent with the documented evidence. This was likely because most skin injuries were of low severity, with relatively few deep PUs reported. Superficial categories of injury are relatively straightforward to assess compared with deeper skin injuries, which are more likely to be incorrectly staged by non-experts grading PUs (Kelly and Isted, 2011; Samuriwo and Dowding, 2014). Therefore, the documentation of grading in patients not reviewed by a member of the wound care team was likely to be accurate in most incidences. However, there is still the possibility that a number of the skin injuries graded by bedside staff may have been incorrectly categorised.

It is recognised that this approach to data recovery and validation does not represent the most robust methodology to measuring outcomes. This is a limitation of the study. However, in view of the extraordinary pressures faced by clinical teams, and with the majority of research resources supporting COVID-19 clinical medicine research trials, having wound care experts reviewing a large number of patients on a daily basis as a part of the redeployed ICU team for many weeks lends itself to confidently approximating that the data is valid and reliable.

It would be reasonable to conclude that a number of the PUs on the buttocks were MASD, as the wound care team reviewed several reported PUs in this anatomical area and the majority were re-categorised to MASD.

Nonetheless, the necessary methodological approach is a limitation of the study and may have impacted on data appropriation, but not necessarily on the clinical impact of findings.

The IRS findings were not surprising, considering the complexity of the patients and the low ratios of trained ICU nurse to patients. Bedside staff simply did not have time to report through Datix IRS initially. Additionally, submissions through IRS require training and familiarity to report correctly. Our data reaffirms previous research findings that there can be a significant mismatch between reporting and reality. The additional pressures faced by clinical teams in a pandemic served to exacerbate the mismatch.

The role of simplified protocols in crisis

A simple ECT protocol factsheet was introduced by the hospital wound care team midway through the time period studied, to teach the team the essentials of skin care. A member of the wound care team and ECT team members met daily to discuss key elements of the protocol fact sheet. Individual ECT members were identified to teach the night staff the key elements. Teaching sessions would last no more than 10 minutes and members of the wound care team frequently joined the ECT team to review individual patients. These reviews served as an opportunity to reinforce key messages described in the protocol fact sheet.

The protocol referred to as the 'The One Protocol' *(Table 3)* limited hygiene to using one type of soap substitute unless contraindicated, and introduced application of one choice of skin protectant, Cavilon Advanced (3M Medical), on Mondays and Thursdays. This ensured that there was no confusion about when to apply it and led to a significant increase in appropriate application. Identifying one product that only required twice-weekly application simplified care and reduced the number of applications compared with other barrier products that required more frequent

application. The only dressing options provided to the ECT were non-adhesive foam and Inidine gauze, in order to limit skin damage from adhesive dressings, which most ECT members had little knowledge of how to apply or remove safely. Registered nursing staff or the wound care team could advise on further advanced dressing options as required. The protocol fact sheet included essential information about how the dynamic mattress system operated, in order to maximise impact in reducing pressure exposure to the skin.

With time and resources precluding formal education for the increased ICU bedside workforce, all wound care education was focused towards the ECT members. It proved productive to teach this relatively small team effective practices to protect skin. This approach resulted in all patients benefitting from consistent skin care practices.

In summary, the important learning we took from this stressful period was the overriding need to establish a repetitious and simple protocol that required minimum staff teaching time in order to have maximum clinical impact.

Recommendations

Our study reports the high prevalence of skin injury for COVID-19 patients in ICU. The extent of skin injury reported supports investment in well-resourced but simple strategies when in surge, to ensure critically ill patients receive an adequate standard of skin care.

We ask the question: is there any place for formal IRS use in ICU surge? The study supports an argument that formal incident reporting needs to be supported by retrospective audit and analysis of documented evidence and point-prevalence audit to establish the true extent of skin injuries experienced by patients. Relying on formal IRS alone to report the extent of skin injury is hiding the true extent of the challenge and appears to be unreliable and unsuitable in surge conditions.

This triple approach of compiling representative data from incident reporting, prevalence audits and retrospective audit of individual patient records has been found in this case by our hospital as a robust approach in providing true representation of skin injury in ICU.

In practice, underreporting may give a false impression to operational management and review bodies, such as the Care Quality Commission and Clinical Commissioning Groups, that the challenge faced by clinicians is not as great as the reality found in the clinical setting.

It is recommended that the triple approach to recover skin injury data is examined in further detail to determine if it is a practical and reliable approach to routinely report the true extent of skin injury in ICU.

CONCLUSION

The study identified that the quality of skin injury documentation in the clinical setting during an unprecedented crisis was satisfactorily high and in no significant manner did it under- or over-represent the patient's experience of skin injury.

The current Datix IRS was less reliable in reporting the true extent of skin injuries. We suggest this is due to it being cumbersome and time-consuming to complete if staff are busy or unfamiliar with the process.

It is a great credit to bedside clinicians that essential EPR documentation standards were maintained to such high standards during a pandemic.

We conclude that the severity of skin injury being maintained at low levels throughout surge can be credited to a combination of factors, including an established institutional wound care team, good embedded standards of skin care and documentation by ICU staff, the introduction of ECTs and the provision of focused additional skin care training, which was centred around the deployment of a simplified protocol. WUK

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