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# Letter to the Editor

## "An improvement on burn care" — A full audit cycle on accuracy & appropriateness of burn injury referrals from an Emergency Department through a Burns Network

*Dear Sir,*

We have recently carried out a full audit cycle assessing the accuracy of assessment and appropriateness of referrals from the Emergency Department (ED) affiliated with our Burns Facility, to the regional Burns Unit and Burns Centre. We had received reports of some potentially inappropriate referrals, which led us to carry out this project.

Our method for data collection was to generate a list of patients from the International Burn Injury Database, seen at the Burns Unit and Burns Centre, who lived in postcodes served by our trust. We then cross-referenced this list with hospital or ED notes to find the relevant information regarding the assessment of the injury, both in our Trust, and the receiving Trusts. The information we gathered included: assessment of Percentage Total Body Surface Area (%TBSA) and depth of injury; aetiology; any high-risk features such as special areas (hand, face, etc.), circumferential, chemical, or inhalational injury. We compared both assessments against our regional guidance, as well as making comparisons between the initial assessment in the ED, and by the receiving Plastic Surgery team. At the time of assessment, there was no official guidance on how to determine if an assessment of %TBSA was accurate, as such we decided that, if the final assessment was 10% or less, the initial assessment should be within a standard deviation of 1 (%TBSA), and if the final assessment was over 10%, then the initial assessment should be within a standard deviation of 2 (%TBSA). For example, if the final assessment for a patient was 9% TBSA, the appropriate range for the initial assessment would be 8–10% TBSA; for a final assessment of 13% TBSA, the appropriate range for the initial assessment would be 11–15% TBSA.

The guidance of the Midlands Burn Operational Delivery Network regarding referral of burn injuries from a burn facility is seen in Table 1 [1,2].

Our first study demonstrated that a third of patients did not have an assessment of %TBSA documented in their initial assessment (Fig. 1). Despite this however, 90% of the onward referrals were still appropriately made, based on their initial ED clinical assessment due to other qualifying criteria such as special area involvement (Fig. 2). When considering the final

**Table 1 – MBODN guidance on which injuries a burn facility can manage, and which should be referred.**

| | Children (6 months–16 years) | Adults (>16 years) |
|---|---|---|
| Can manage these injuries | • %TBSA ≤5 (Full thickness %TBSA ≤1) | • %TBSA ≤10 (Full thickness %TBSA ≤5) |
| Should refer these injuries | • Full thickness (%TBSA >1) | • Full thickness %TBSA >5 |
| | • Circumferential | • Circumferential |
| | • Chemical | • Chemical |
| | • Electrical | • Electrical |
| | • Inhalational | • Inhalational |
| | • Special area involvement (face/hands/feet/genitals) | • Special area involvement (face/hands/feet/genitals) |
| | | • Immunocompromised patients |
| | | • Pregnant patients |

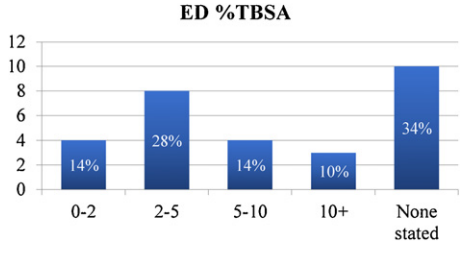


**Fig. 1 – ED %TBSA assessment — 1st audit.**

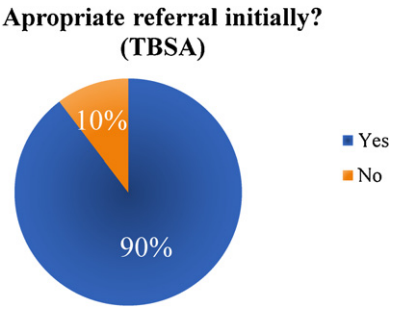


Fig. 2 – Appropriate referral initially? — 1st audit.

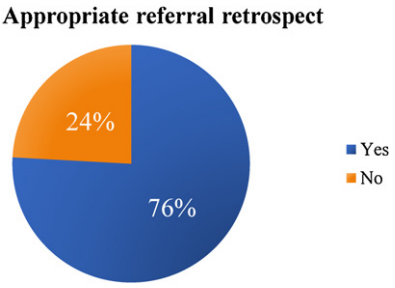


Fig. 3 – Appropriate referral in retrospect? — 1st audit.

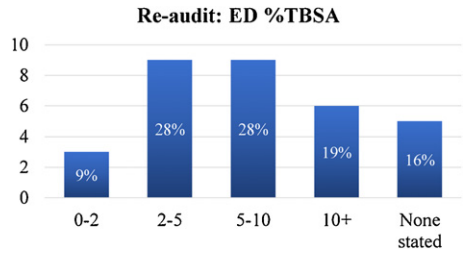


Fig. 5 – ED %TBSA assessment — 2nd audit.

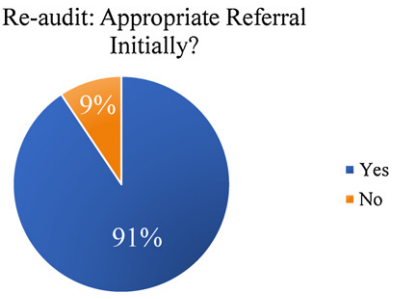


Fig. 6 – Appropriate referral initially? — 2nd audit.

re-assessment by the receiving unit, the proportion of those referrals deemed appropriate dropped to just over 75% (Fig. 3). When comparing the initial and final assessments of %TBSA using the MBODN guidance for referral in Table 1, we found 41% fell within our 'appropriate' range of 1 or 2 standard deviations, as discussed above (Fig. 4). It should be noted this assessment was difficult due to the lack of documentation of % TBSA at initial assessment.

In order to improve the failings unearthed with our preliminary investigation, we introduced burn injury proformas into the ED. Proformas were introduced for adult, minor paediatric and major paediatric injuries. These included diagrams for illustration of injury, Lund and Browder charts, prompts to aid in assessment of depth, and flowcharts to guide initial management and when to refer patients to the appropriate service.

The re-audit did show an improvement in documentation of %TBSA (Fig. 5). The appropriateness of referrals based upon initial assessments was 91% (Fig. 6), and retrospective analysis from the receiving unit showed this proforma to have reduced the number of inappropriate referrals by a third (from 24% to 16%) (Fig. 7). When comparing completeness of initial and final assessments using the aforementioned criteria, introduction of our proforma showed a 50% improvement (up from 41% to 59%) (Fig. 8). It should be noted this assessment was limited due to some patients being referred without documentation of %TBSA (Figs. 1 and 5).

Our findings demonstrate that introduction of our simple proforma has improved the ED referral process for burn injuries. We suggest that such a proforma should be applied in other EDs, in order to improve frontline standards of burn care, nationwide. An example of the adult proforma has been included.

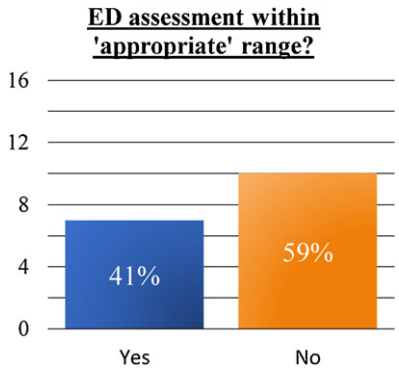


Fig. 4 – Was the ED assessment of %TBSA within an appropriate range of the final assessment? — 1st audit.

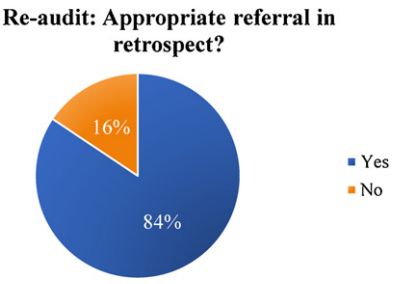


Fig. 7 – Appropriate referral in retrospect? — 2nd audit.

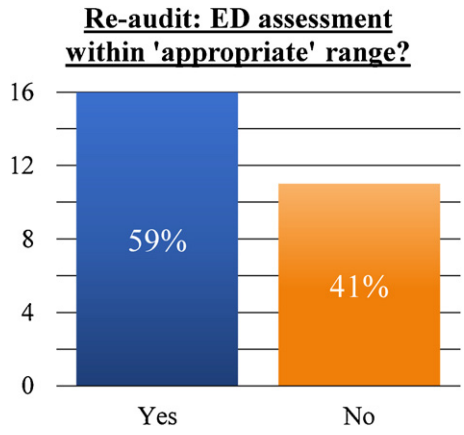


**Fig. 8 – Was the ED assessment of %TBSA within an appropriate range of the final assessment? — 2nd audit. NB: 5 patients excluded from this analysis due to non-documentation of %TBSA.**

## Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

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## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at https://doi.org/10.1016/j.burns.2018.11.016.

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