



Improving the comparability and quality of burn research

Sarah E Bache , David Barnes

Determining pertinent outcomes in burn care to be reported in all future trials

For numbered affiliations see end of article.

Correspondence to: Sarah E Bache, c/o Burns Centre, St Andrew's Centre for Plastic Surgery and Burns, Broomfield Hospital, Chelmsford CM1 7ET, Essex, UK; sarahbache@doctors.org.uk

Cite this as: *BMJ MED* 2022;1:e000273. doi:10.1136/bmjmed-2022-000273

Received: 14 June 2022
Accepted: 16 June 2022

Burn injuries contribute considerably to the global healthcare burden, with an estimated 11 million people annually affected worldwide.¹ The impact of burn trauma can be destructive, lifelong, and indiscriminate. People of all ages, ethnic origins, and backgrounds are at risk. But it is the most vulnerable in society who are disproportionately affected: children, elderly people, individuals with poor mental or physical health, and those of low socioeconomic status. However, the past 50 years have seen substantial reductions in burn mortality, largely due to early excision and grafting, improved burn resuscitation, intensive care treatment, and better management of sepsis and wound care. Survival is now expected for the vast majority of people, even after severe burn injuries.² The focus of the next 50 years will be on improving outcomes for survivors. Scarring, functionality, cosmesis, psychological, and long term physical impact are just a few examples of areas of research and focus for the worldwide burn community.

The evaluation and comparison of burn treatments presents a difficult challenge because they are a heterogeneous group of injuries. Burn size, depth, anatomical location, cause, and patient factors are inconsistent. Additionally, the outcomes measured are also heterogeneous, reliant on the preferences of researchers and not necessarily those most important to patients. Decreasing incidence of major burn in high income countries limits recruitment to trials, so evidence increasingly relies either on multicentre collaboration or systematic reviews. In the past, authors of systematic reviews have been prohibited from drawing firm conclusions by a lack of comparable outcomes in burn studies. The linked article by Young et al³ (doi:10.1136/bmjmed-2022-000183) is the first step towards reporting consistency through the development of a core outcome set for burn care research (COSB-i). The ultimate aim is for future burn research papers to include (but not be limited to) this common set of pertinent outcomes.

But what outcomes are considered most important—not only to those delivering burn care, but also to the patients and carers receiving it? Previous papers identified a framework of outcomes following the agreement of multidisciplinary burn teams.⁴ However, Young and colleagues have built on this work by producing a core outcome set through established methods outlined by the COMET (core outcome measures in effectiveness trials) initiative.^{5 6} Core outcome

sets are scientifically identified by stakeholders (including clinical staff, commissioners and, most importantly, patients) as those most crucial in determining the effects of an intervention. They have the potential to prevent wasted time and resources by directing researchers towards only the most relevant outcomes when embarking on a trial. In addition, core outcome sets can reduce selective reporting of favourable findings, and ensure that study outcomes are meaningful and relevant to stakeholders. If widely used, they will facilitate comparison between trials, evidence synthesis, and better quality systematic reviews and will therefore have a considerable impact on the quality of future burn research.

The authors' methodology is clearly described, following their published protocol and using the core outcome set standards for development (COS-STAD).^{7 8} Three key stages are described. Firstly, a comprehensive long list of 1021 unique outcomes was identified through a systematic literature review of randomised controlled trials on burn injury, patient reported outcomes, and semi-structured interviews of 15 patients and 10 clinicians.^{9–11} Secondly, a Delphi survey comprising two rounds of questionnaires completed by 668 worldwide health professionals and 126 UK patients or carers enabled the creation of a shortlist of 31 outcomes. Thirdly, a stakeholder meeting of 28 UK and 19 international clinical staff was held to decide by vote the final seven core outcomes.

The final seven outcomes were: death; specified complications (eg, sepsis or wound infection); ability to do daily tasks; time to wound healing; long term neuropathic pain and itch; psychological wellbeing; and return to school or work. Several of these outcomes emphasise long term function, rather than the short term physiological markers that are often used by clinicians. This list reflects the co-production and participation of a wide group of stakeholders, and is a strength of the work. The inclusion of these outcomes in any study of burn research will be a marker of the standard of research and the importance of findings to the burn community.

Young and colleagues have demonstrated an admirable commitment to co-production in their strategy, through the involvement of clinicians and patients. The process was overseen by a steering group of members of the burn multidisciplinary team and UK patients. Patients were also involved in the study design, both rounds of questionnaires, and the consensus meeting. The authors were unable to recruit international patients, owing to the financial and time implications of translating

and distributing the survey to patients worldwide. This limitation could restrict the relevance of the outcomes globally. The study remains, however, a comprehensive attempt to garner international opinion on burn outcomes, with 77 countries represented by professionals, 18% of whom were from low and low middle income countries.

Research into burn and scar management is on the cusp of further advances in the coming years. The creation of the COSB-i is therefore a timely and important first step in improving the quality and comparability of burn research. The resulting seven outcomes are broad and undefined in nature and scope. While the COSB-i identifies what should be reported in future burn trials, the next step is to determine how these outcomes should be defined and measured.

AUTHOR AFFILIATIONS

Adult and Paediatric Burns Centre, St Andrew's Centre of Plastic Surgery and Burns, Broomfield Hospital, Chelmsford, UK

Contributors Both authors have substantially contributed to the editorial, and agree on the final document.

Competing interests We have read and understood the BMJ policy on declaration of interests and declare the following interests: DB has been an expert witness for the UK Crown Prosecution Service and UK family court; and has received commercial research funding from Smart Matrix and Smith and Nephew for wound care and dressings research, and travel and conference fees from MediWound, a manufacturer and supplier of debridement agents.

Provenance and peer review Commissioned; not externally peer reviewed.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build

upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iD

Sarah E Bache <http://orcid.org/0000-0001-5238-4796>

REFERENCES

- 1 Peck MD. Epidemiology of burns throughout the world. Part I: distribution and risk factors. *Burns* 2011;37:1087–100. doi:10.1016/j.burns.2011.06.005
- 2 Jackson PC, Hardwicke J, Bamford A, *et al*. Revised estimates of mortality from the Birmingham burn centre, 2001–2010: a continuing analysis over 65 years. *Ann Surg* 2014;259:979–84. doi:10.1097/SLA.0b013e31829160ca
- 3 Young A, Davies A, Tsang C. Establishment of a core outcome set for burn care research: development and international consensus. *BMJ MED* 2022;1–11. doi:10.1136/bmjmed-2022-000183
- 4 Falder S, Browne A, Edgar D, *et al*. Core outcomes for adult burn survivors: a clinical overview. *Burns* 2009;35:618–41. doi:10.1016/j.burns.2008.09.002
- 5 Williamson PR, Altman DG, Bagley H, *et al*. The comet Handbook: version 1.0. *Trials* 2017;18:280. doi:10.1186/s13063-017-1978-4
- 6 Williamson PR, Altman DG, Blazeby JM, *et al*. Developing core outcome sets for clinical trials: issues to consider. *Trials* 2012;13:132. doi:10.1186/1745-6215-13-132
- 7 Young A, Brookes S, Rumsey N, *et al*. Agreement on what to measure in randomised controlled trials in burn care: study protocol for the development of a core outcome set. *BMJ Open* 2017;7:e017267. doi:10.1136/bmjopen-2017-017267
- 8 Kirkham JJ, Davis K, Altman DG, *et al*. Core outcome Set-STANDards for development: the COS-STAD recommendations. *PLoS Med* 2016;14:e1002148. doi:10.1371/journal.pmed.1002447
- 9 Young AE, Davies A, Bland S, *et al*. Systematic review of clinical outcome reporting in randomised controlled trials of burn care. *BMJ Open* 2019;9:e025135. doi:10.1136/bmjopen-2018-025135
- 10 Griffiths C, Armstrong-James L, White P, *et al*. A systematic review of patient reported outcome measures (PROMs) used in child and adolescent burn research. *Burns* 2015;41:212–24. doi:10.1016/j.burns.2014.07.018
- 11 Griffiths C, Guest E, White P, *et al*. A systematic review of patient-reported outcome measures used in adult burn research. *J Burn Care Res* 2017;38:e521–45. doi:10.1097/BCR.0000000000000474