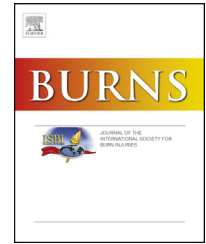


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The influence of outcomes on the provision and practice of burn care[☆]

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ABSTRACT

The provision and practice of burn care changed dramatically during the latter half of the 20th century. Historically, indicators of outcomes that were employed were survival and length of hospital stay, but these have now been expanded with increased data capture. In line with service development, the practice of burn care must continue to evolve in order to meet prescribed standards of care. As burn survivability has significantly increased, overall “crude” mortality is no longer the best indicator of performance. The multiple domains covered by the term “patient outcome” aim to optimize the acute and long-term management of burn patients and have shifted the focus onto lifelong outcomes, rather than short-term gains. This review will investigate the current outcome measures employed in burn care in the UK, how this leads to commissioning and regulation of a burn service, and influences the future direction of travel.

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1. Background

The provision and practice of burn care changed dramatically during the latter half of the 20th century, and is in a state of constant evolution, driven to improve patient outcomes. Prior to the advances made in the UK by Sir Archibald McIndoe during the Second World War, and Henry Harkin’s work on fluid resuscitation in the US, a burn that would be considered as eminently survivable by the standards of today, could so easily have been fatal [1,2]. The approach to the management of a burn injury was typically non-specialist and could consist of minimal fluid resuscitation; disregard for asepsis, open

wound care, with reconstruction an afterthought if the patients were to survive [3].

“The standard of treatment has often been poor, not only due to lack of facilities but because, compared with other surgical emergencies, the treatment of burns is more time consuming, less dramatic, and seemingly less important” [3].

A combination of interventions, or probably in most cases a lack of intervention, in a general hospital setting would lead to high mortality rates: probably the first of the recorded outcome measures after burn injury [4]. Whilst McIndoe was key in

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defining the provision of a specialist burn care service, with centralisation of military patients to his specialised unit at East Grinstead [5], it was countless other clinicians and scientists who have changed the practice. This change in practice would come about through the measuring of outcomes.

Pioneering work on civilian burn care was performed at the Medical Research Council Burn and Industrial Injuries Unit at the Birmingham Accident Hospital in the post-war years: building on the work of McIndoe, the Birmingham Unit advocated the early referral, resuscitation and excision of the burn, as well as reporting of outcomes [6–8]. In addition, this care would be provided in a specialist purpose built facility, designed and staffed to reduce the risk of burn infection and sepsis. This was the era of research-led practice of burn care.

As more patients were surviving the initial injury and burn shock, the search was on for ways to assess the outcome after burn injury, and if possible, predict it. The earliest retrospectively reported measures were of percentage mortality [9]. Then followed survivability calculations by way of the Lethal Area 50 (LA₅₀), developed by Bull and Squire [6]. Using probit analysis, based on Lethal Dose (LD₅₀) animal drug toxicity studies by Trevan [10], Bull proposed the reporting of the size of a burn, as a percentage of total body surface area (TBSA) that is lethal to 50% of patients. Holmes, and later Berkow, had already suggested the importance of burn size in predicting mortality [11,12].

Estimation could now be made of the survivability of the burn, which was further developed by Baux [13], with subsequent modifications [14,15]: now there was an outcome standard to work to, and to better. With the realization that burns would be better treated in a specialist unit, the provision of care could be planned with the key driver of saving lives and improving the burn outcomes. In 1953,

Douglas Jackson, suggested the geographical localization of burn units at centres of population, spaced widely enough apart to receive 98% of major burns occurring in the catchment area of each unit. Even at this point in history, this provision was justified by outcome measures: “units should show a considerable saving of costs due to shorter healing times and less disability” [3].

Specialist burn care service activity is a low volume and high cost practice that utilises multi-professional input and care delivered over a long period of time [16]. Although significant advances have been made in burn care over recent decades, it is recognized that to achieve the best possible clinical outcome for burn injured patients, burn care must be delivered by expert multi-disciplinary teams in specialised burn services. To justify the capital investment into such a service and the revenue stream with which to maintain it, a clear audit trail of outcomes must be provided in line with peer-reviewed standards [17,18] (Table 1). This has become more apparent during the recent financial crisis and the constraints that can be placed on a centrally funded healthcare system.

Over the past 70 years, in both the UK and the US, the modern burns service has evolved, based on setting, meeting and exceeding the expectations for outcome after burn injury. Although this may have been unmeasured and largely unplanned at the outset, with the realization and admission that a single specialist cannot be expected to possess the range of skills, knowledge and energy for the comprehensive care of a burns patient [19], the modern burn service has become a leading example for the development of multidisciplinary critical care pathways and trauma networks.

This review will investigate the current outcome measures employed in burn care in the UK; how this leads to

Table 1 – Peer-reviewed standards for a burns service in the UK. The National Network for Burn Care: National Burn Care Standards [17] outlines the standards for service provision; and the British Burn Association sets outcome standards for care at each stage in the process [18].

	National Network for Burn Care: National Burn Care Standards	British Burn Association: outcome measures for adult and paediatric services
Outcome domains	A: Patient-centred care	Pre-admission: accurate burn assessment; prompt referral and transfer; appropriate management at the referring hospital
	B: Multidisciplinary team	Acute inpatient care non fluid resuscitated burns: adequate analgesia; prompt wound care; effective clinical management; timely wound healing
	C: Inter-reliant services	Acute inpatient care fluid resuscitated burns: adequate analgesia; optimal IV fluid resuscitation; prompt wound care; effective surgical management; prompt treatment of respiratory complications; timely wound healing; adequate enteral nutrition
	D: Facilities, resources and the environment	
	E: Policies and procedures	Rehabilitation: optimal functional outcome; optimal psychosocial well-being; optimal scar outcome
	F: Clinical governance	Global: optimal survival; minimal rate of unplanned readmissions; minimal rate of unplanned ITU readmissions; minimal complication rate; maintain pre-injury body mass
	G: The burn care network	

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