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## Ethics in Burns Surgery

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the underlying medical conditions are essential in deciding life-prolonging interventions (7).

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## Ethics in burns surgery: when is enough, enough?

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### Abstract

*Patients with extensive burns injuries are often given a poor prognosis. Those who survive after an initial early resuscitation phase often require extensive operative and critical care input, a prolonged hospital stay, and associated significant complications. The overwhelmingly high volume of patients already using the resource-stricken burns care service places extreme pressure on clinicians in respect of decisions they make about who should and should not be resuscitated. In this paper, we present the case of a young woman who sustained significant burn injuries, and discuss the ethical dilemmas encountered during the subsequent management of her care.*

### Case

A 20-year-old woman was brought into the emergency department having sustained a significant flame burn to her body. She had been assaulted by her partner, who had deliberately poured petrol onto her body and then ignited it. She was an aspiring model who had recently been offered a contract with a prestigious fashion company. A total of 60% full thickness burns were noted on her face, neck, trunk and thighs. Initial resuscitation was commenced in the emergency department using humidified oxygen, fluid therapy, analgesia and a topical dressing. Subsequently, she was transferred to the burns unit for further treatment. Anecdotally, there is a 100% mortality rate for patients admitted to the burns unit who have sustained burns to over 50% of their total body surface. Intensive care specialists were consulted immediately, but, unfortunately, the patient did not fulfil the criteria for intensive care admission, primarily due to her low likelihood of survival.

An assessment of this information, coupled with a severe constraint on resources within the burns unit, led to a decision being made by medical staff to consider active palliation.

Consequently, the patient was provided with supportive care using a slow intravenous fluid and an opiate infusion. Also, she became the subject of a documented DNAR Order (Do Not Attempt Resuscitation). It was anticipated that she was unlikely to survive beyond the first 48 hours of care. Overnight she became progressively hypotensive and restless, and was seen to be in extremis. The junior intern assigned on duty was summoned, but was unaware of the documented DNAR plan. Therefore, he proceeded to instruct that the patient be resuscitated aggressively with high flow oxygen, a large amount of intravenous fluid (required for continued resuscitation of initial burns patients who are critically ill) and nasogastric feeding. Also, a central venous line was placed (after several attempts) for haemodynamic monitoring.

On review of the patient the following morning, it was noted that her condition had much improved. Now she was alert, able to converse and comfortable. Therefore, after extensive discussion with the burns team, the decision relating to palliation was reconsidered. A new decision was then made to perform multiple staged burns wound debridements, and this required a substantial amount of blood products and significant operative time. However, subsequent to this treatment she developed burn wound sepsis, multiple drug resistant nosocomial pneumonia, limb cellulitis, central line related sepsis and renal failure. Eventually, she developed refractory septic shock from pneumonia, and went into cardiac arrest 14 days after her admission to hospital.

## Discussion

This patient's care provides an example of the complex decision-making process which can take place when caring for a severe burns sufferer, and highlights the complex ethical dilemmas associated with severe burns patient care. The initial decision taken to administer 'palliation' was based on anecdotal experience within the burns unit - 100% mortality for burns involving over 50% of total body surface area. Although it is well known that the total body surface area (TBSA) burnt is one of the most important predictors used in making burns care decisions (1), many other factors such as the age of the patient, burn depth, and co-morbidities also contribute to the mortality rate of patients who suffer severe burns. Even in developed countries where resources are abundant, treatment failure is a common occurrence in patients with TBSA burns of over 60% (2). Studies undertaken in developing countries report a high mortality rate among severely burned patients. In India for example, Subrahmanyam et al (3) report that mortality rates are 100% for those with TBSA burns of over 60%. In Nigeria, Olaitan et al (4) report a mortality rate for those with TBSA burns of over 80%.

It is clear that critically ill burns patients require significant intensive care support, and although well-defined admission criteria in respect of general intensive care facilities does exist (5, 6) guidelines specifically tailored for burns patients are scarce. It is impossible to admit every critically ill burns patient into an intensive care unit because rational decisions have to be made to ensure the selection of those who are most likely to survive. However, these decisions often rest on the individual intensive care specialist, and a degree of subjectivity is inevitable. The key predictors of non salvagibility in our setting continued to be TBSA > 50% (with or without inhalation injury), dependant on age and any major pre-existing co-morbidity. Overall however, decision-making can be extremely difficult, particularly when patients are young and have been previously well.

Once a patient has been deemed unsuitable for admission into the intensive care unit, the level of support that they receive in the burns unit is somewhat limited. Even if the patient survives the early phases of care, after full resuscitation, the facilities available to manage subsequent complications that may arise (e.g. mechanical ventilation for pneumonia) do not exist. In these cases, continuing with a futile care exercise would most likely lead to a prolongation of the patient's suffering, and this would clearly not be in his or her best interests.

In the case quoted above, the exact definition of what is 'palliation' is rather subjective, as there is no protocol in place to use as guidance in this respect. The question of the appropriateness of providing intravenous fluid was strongly debated amongst the clinicians involved. It was generally agreed that a 'reasonable' amount of fluid should be given to the patient in order to avoid unnecessary suffering from dehydration, but the exact amount classed as being 'reasonable' was open to debate. For example, administering three litres of intravenous fluid over 24 hours would constitute a different

approach to administering one litre of intravenous fluid over the same period of time. Also, it is known that critically ill burns patients require a large amount of intravenous fluid in the early phase of resuscitation, because massive fluid loss is deemed to contribute towards mortality (7). It was estimated that this particular patient required 17 litres of fluid therapy in the first 24 hours of her care.

Additionally, although this patient was not expected to survive beyond the first 48 hours, a series of miscommunication errors meant that she was fully resuscitated early on, and this resulted in her demonstrating early signs of improvement. This apparent improvement initiated a reconsideration of the initial decisions made in respect of palliation, but a severe lack of resources in the unit, and the lack of intensive care facilities contributed towards making the palliation process more complex. The ceiling of care had to be arbitrarily defined up to the need for administering non-invasive ventilation, and this meant that, in the event of cardiopulmonary arrest, the patient would not be resuscitated. Then, a series of time-consuming and labour-intensive surgical procedures followed, in order to manage the extensive burns wounds suffered. The patient underwent a total of six operative procedures, required over 15 units of blood products, and occupied the last available bed in the burns unit for two weeks. Also, her subsequent development of sepsis necessitated a prolonged multiple course of antibiotics. At this point, her prognosis was still somewhat grim, and a debate took place among the medical staff about whether continuation of her care was justified, because the same level of resources could have been re-directed to others who may have been more likely to show favourable outcomes.

Burns care is expensive, and the costs associated with it undoubtedly influence the decision making process in many different settings. A study of the actual cost of burns care at our institution (8) is estimated at a total of 29,549,750 ZAR (approximately US\$37,000,000). The total cost of caring for a single patient with even a 20% body surface area deep dermal thickness burns was 103,000 ZAR (approximately US\$13,000). As the overwhelming burden of burns injuries continues to place pressure on the already resource-stricken setting of the unit, there remains a constant need to justify a fair utilisation of resources which have to be reserved for those with more favourable prognoses.

Finally, guidelines about what decisions are best taken in cases of severe burns are somewhat ill defined. In the case outlined above, the patient was clearly informed that her eventual death was likely and even inevitable. She repeatedly insisted that any decisions made by the medical staff on her behalf in respect of her care should be based around "what is best" for her, as long as she did not "suffer". When asked directly what "not suffering" meant, she described it as being able to "go in peace" and being kept in a comfortable situation. However, her case was further complicated by the fact that her injuries had been inflicted by her intimate partner, and she appeared to have decided that these injuries would mean the end of her career in modelling. These two factors were likely to have contributed to her initial

indifference and somewhat fatalistic attitude.

While it is of paramount importance to respect a patient's right to make informed decisions about their own care, some would argue that it is questionable whether those who are experiencing severe burns can truly make autonomous decisions. It has been documented that hospital burn patients can commonly suffer from psychological disturbance as a direct result of their injuries. This initial phase is often characterised by a sense of uncertainty regarding outcomes, a struggle for survival, and overwhelming anxiety (9, 10). Furthermore, acute stress disorder, delirium, and depression are extremely common (10). More importantly, it has been shown that the total body surface area burnt significantly correlates to the occurrence of psychological complications following hospital admission in burns cases (11). Also, decisions made in respect of DNAR (decisions that are made jointly with the patient) in this setting can potentially be difficult because the patient may well re-consider, and judge their initial decisions to be inappropriate, after their initial recovery. These factors need to be considered when thinking about patient care, especially when critical decisions centre on the ending of life.

Undoubtedly, all the staff involved with our patient's care aimed to do what was best for her, but their definitions and judgements of what was "best" differed. Recurrent themes in the debate about the patient's care mostly concerned arguments about aggressive fluid resuscitation procedures; as mentioned earlier, it is well known that inadequate fluid resuscitation is one of the most important contributing factors to the early mortality of severe burns patients (12). The vast majority of severe burns patients eventually die from overwhelming sepsis (13). In order to continue with the active management of our patient's care, she would have required multiple extensive surgical procedures and, then, even if survival was deemed possible, the acceptability of personal functioning and cosmetic outcomes would have been open to question and debate. In the case of our patient, it is arguable whether the early aggressive treatment administered resulted in the prolongation of her suffering, and was in conflict with the beneficence principle. If, however, the act of fluid resuscitation was considered as a means of preventing further harm (such as organ hypoperfusion, for example), then the overall initial treatment outcome seems to have been somewhat justified, as

the patient did show signs of symptomatic improvement.

## Conclusion

Overall, the example presented was a challenging case for all clinicians involved. The initial seemingly clear-cut clinical decision made was overridden by a series of miscommunications, and this resulted in a complete change of direction in the patient's care and its subsequent management. Although the outcome for this patient was difficult to change, the case was complicated by the ethical issues which arose. This forces us to consider what should or should not be accepted as a good practice. It is hoped that this example case will encourage those involved in burns care to consider similar situations from a slightly different perspective.

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