

## Burns First Aid: The Forgotten Public Health Challenge

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Burn injuries pose a significant public health challenge on a global scale, impacting both developed and developing countries. Burn injuries can occur not only in proximity to specialized centres but anywhere, and individuals may seek medical attention at any moment. Consequently, it is crucial for every doctor, particularly those in rural health facilities, to possess a solid foundational understanding of burn first aid.

Burns can occur when the skin comes into contact with hot liquids, flames, chemicals, radiation, or electricity. The skin, being a vital and the largest organ of the human body, serves crucial functions such as preventing excessive fluid loss and protecting against infections from the surroundings. When the skin is burned, the barrier to fluid loss is compromised, making the patient susceptible to dehydration. If dehydration is not addressed in the early stages, it can result in serious complications, including kidney failure, loss of essential electrolytes, and dangerously low body temperature.<sup>1</sup> A significant challenge in burns first aid is that patients referred from peripheral health facilities often receive all components of first aid

specialized centres, they are already in the midst of developing complications, thereby prolonging their future management.<sup>2</sup>

Severe burns (>10 % in children and > 15% in adults) not only result in significant injury at the localized burn site but also trigger a systemic response throughout the entire body. Inflammatory and vasoactive mediators, such as histamines, prostaglandins, and cytokines, are released, initiating a systemic capillary leak, intravascular fluid loss, and substantial fluid shifts.<sup>3</sup> These responses primarily occur within the initial 24 hours, reaching their peak around six to eight hours' post-injury. This reaction, coupled with reduced cardiac output and increased vascular resistance, can give rise to marked hypovolemia and hypo perfusion, commonly referred to as burn shock. Effectively managing this condition involves implementing aggressive fluid resuscitation and closely monitoring the administration of intravenous fluids to ensure adequacy without inducing excess.<sup>4</sup>

Optimal fluid management for major burns significantly enhances the chances of survival in burn patients. Despite extensive experience, there remains controversy surrounding the most effective fluid management type within the initial 24 hours' post-injury for major burns.<sup>5</sup> Presently, fluid resuscitation formulas established over three decades ago are acknowledged as guidelines. However, ongoing studies are addressing growing

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DOI: <https://doi.org/10.35787/jimdc.v12i4.1077>

except for sufficient resuscitation. When inadequately resuscitated patients reach

concerns that burn patients may be receiving excessive or insufficient fluid resuscitation, often with unclear and inappropriate endpoint targets.<sup>6</sup>

A common misconception, people are living with is, covering a burn wound can worsen it. However, the reality is that burn wound without skin is more susceptible to surrounding infections and loss of fluids.<sup>7</sup> Hence, covering a burn wound with a suitable dressing can decrease the risk of infection and promote healing as well.

Concerning burn first aid, observations at the National Burn Care Centre at the Pakistan Institute of Medical Sciences (PIMS), Islamabad, reveal that a majority of the population relies on applying toothpaste, herbal medicines, salt, and various home remedies as initial interventions. Unfortunately, these practices sometimes exacerbate the condition of the wound, adding to the patient's distress.

According to 2020 Guidelines of American Burn Association (ABA),<sup>8</sup> first aid of minor burns involves cooling the burn with running cool (not cold) water for at least five minutes and sterile water is not mandatory. One should remove jewelry watches, rings and clothing around the burned area. Pain reliever, i.e. ibuprofen or acetaminophen can be taken for pain control. Health care providers should be consulted if pain is not relieved over the period of time. The wound should be covered with a sterile bandage or clean cloth. It should be noted that wrapping the wound tightly should be avoided to prevent too much pressure. A plenty of fluids or solutions containing electrolytes should be given to the patient if the patient appears dehydrated.

Applying ice (over cooling the burn) may further damage the skin. Applying butter, ointments or other home remedies may trap the heat in the tissues and makes the burn worse. Appearance of blisters is a normal phenomenon after getting burns and is not associated with applying water as first aid which is among the most common misconceptions. People should be made aware of knowledge and practices of first aid of burn at

every national basic level. Awareness programs at social media, schools and higher level institutes should be arranged.

Proper management of major burns in the burn care centre can be ensured by an efficient referral system.<sup>9</sup> Burn victims with a significant percentage of burns who present at remote basic health facilities often experience treatment delays due to deficiencies in the referral process, such as longer distances, diversion to inappropriate facilities, and service hours that are not aligned. Establishing an effective referral system necessitates coordination between the referring and referral centres. Key components for proper referral implementation include a well-organized transportation mechanism, effective communication, and adequately trained staff.

It is important to note that addressing burn cases in Pakistan becomes challenging due to the absence of (1) a national strategy or policy; (2) national-level burn statistics, as it is not a reportable condition, and there is no centralized database; and (3) the absence of consistent and standardized burn care at both primary and secondary healthcare levels.

According to a recent analysis, an overall mortality rate of burn in Pakistan is around 6.5%.<sup>10</sup> Studies from different cities of Pakistan show even higher rates. Considering these facts, it is noteworthy that currently, there are not more than 10 fully active specialized burn care centres in Pakistan. Burn units at every district-level hospital and specialized burn centres at the provincial level as per international standards are not present. This raises significant concerns about the future of effective burn management in the country. To effectively and efficiently handle burn care in the country, it is essential to establish a comprehensive national vertical health programme, such as the National Burns Control Programme, under the National Health Ministry.<sup>11</sup> This strategic development would play a crucial role in enhancing the nation's capacity to address burn cases effectively and provide timely and appropriate care.

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