

Burn Survival in Mass-Casualty Situation Planning, Preparation, Response: What is the Key?

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When facing a situation involving mass casualties, we must consider the choices we have as individuals and as communities. The range of opportunity and privilege across the world is vast. Set against the background of natural and manmade disasters, how do we provide the right care at the right time for those in need? How can we share our collaborative knowledge?

The recognition of the dignity of those in need is the first step.

Relationship building in the time of non-disaster leads to mutual understanding, facilitating care. Medicine brings science and experience into the art of clinical problem-solving. Disaster situations require rapid solutions based on prior planning, communicated with the understanding that optimal outcomes depend upon relationships based on respect, sharing knowledge of the local environmental resources, coupled with clinical care.

Emergency risk management is a systematic process that produces a range of measures contributing to the well-being of communities and the environment. Planning requires identification of the risk with analysis and evaluation in context, such that the risk can be monitored and treated should the need arise. Mass casualties with burns occur when fire and/or explosions interface with large numbers of people. The risk analysis is based on current knowledge and past experience of such incidents. The review of the literature from the Coconut Grove fire to the London Bombings provides vital information, to understand the opportunities to improve outcomes.

Improving outcomes requires a "Whole of Health" response. Emergency management linked with medical disaster response is a multidisciplinary response involving multiple agencies. Therefore, it hardly is surprising that the overwhelming lesson from the literature is the need for clear, concise, and consistent *communication*.

In Western Australia, during the year 2000, we analyzed the risk in the context of our increasing awareness of vulnerability to multiple burn casualties. Bushfires continue to increase (280% in 14 years), and the petrochemical industry continues to expand, particularly in remote areas. At the time terrorism was in the small print, but was brought to the fore in 2002, due to the Bali bombing.

The question asked was "how can we influence the outcome for those suffering burn injuries"? The answer revolved around three key elements: education, training, and *communication*. Every intervention impacts the lifetime scar imparted by the burn; therefore, everyone who assists in the management of that injury becomes part of the burn team. At the site of injury, care can commence using education and training strategies including the local communities in prevention, first aid, and emergency survival training.

Specific to the Western Australian situation was the problem posed by distance. The region has a population of 2 million, 75% of which lies in the metropolitan area, with the remaining 0.5 million in an area covering 250,500 square kilometers. Self-reliance is essential in rural and remote Australia. However, this can be enhanced significantly by environmentally and culturally appropriate education and training. Understanding the local needs and resources is essential in tailoring advice such that it is practical. In some areas in the north, the tap water is hot, not good for cooling a wound. In some instances there is no clean water. Once there is a level of understanding of the situation, then targeted education is key to optimizing the outcome from injury.

Education was undertaken using a generic template adapted to provide tailored solutions in collaboration between the burn care team and recipient groups. The focus of education always is on patient outcome, bringing together the experience of the caregiver, the equipment available, and the needs of the patient. The Burn Management Program commenced in 1995 as a multidisciplinary team, single-day interactive workshop. It has been conducted 81 times with 2,487 participants over the last 12 years. In addition, it formed the basis for educational visits to Nepal and Indonesia.

On review of the educational program, the key question asked was "who needs burn treatment education?" An analysis of first aid knowledge was enlightening. We know that effective cooling of the burn wound can limit the damage and life-long scarring. As burn care professionals, we can educate the whole community with respect to basic care and our medical colleges with respect to triage, stabilization, and transfer of burn patients. The answer to the question is that everybody can benefit by appropriate education in burn prevention and first aid.

Returning to the disaster situation, how can we impact the outcomes as the situation becomes overwhelming? It is my belief that the relationships built in times of relative calm form the foundations of surge responses based on mutual respect. There are established organizations with credibility suitable enough to endorse such relationships. The link between the World Health Organization (WHO) and the International Society for Burn Injuries (ISBI) is demonstrated by the joint statement on burn injury on the WHO Website:

The role of public health is listed in the statement about burn care:

- To describe the magnitude of the problem by collecting data on mortality and morbidity from burn injuries;
- To study the risk factors and protective factors;
- To show the economic impact of burns on the community in order to provide a basis for the cost-benefit analysis of safety improvements;
- To ensure appropriate pre-hospital and hospital care and rehabilitation of patients with burns;
- To promote safety education;
- To monitor and evaluate interventions; and
- To promote prevention measures and policies.

This list provides a comprehensive plan for developing a global model of care for burn injury, from pre-injury prevention, on to complete rehabilitation.

Education is needed on a global scale, beginning with awareness, demonstrating patterns of injury, and taking the collective responsibility as a community for prevention with legislation where needed. The education of the community must be extended to first aid and emergency survival strategies.

The first responder is the individual on the scene, and we can all take responsibility for our education and wellness and be able to influence outcomes from injury by administering appropriate first aid. By doing so, we will not only reduce scarring to a given individual, but we will positively impact the health budget. Take the example of a small child sustaining a scald injury—with removal of clothing and cooling the wound, there is the potential to reduce the injury by 80%. In treatment terms, this is a wound that could heal with conservative dressing management, with minimal residual scarring. The alternative is a wound

requiring surgical intervention to achieve wound healing, followed by scar management, and possible reconstructive surgery. The cost differential is 1 to 12 by conservative estimate, potentially saving significant amounts of money.

What does this have to do with disaster planning preparedness and response? Everything—it is the key. By raising awareness and educating our global population, we will respond to a disaster with an enhanced level of preparedness. Planning must hinge on the understanding that disaster response is not purely a medical response, but rather one of the community. Whole health is an integrated multidisciplinary response that is one piece in the much more complex jigsaw puzzle of emergency management. Therefore, by sharing knowledge across the world and across disciplines, we will enhance the ability to respond in a time of duress as individuals and as societies.

It is a clear role for the members of the ISBI to collaborate across the world and disciplinary boundaries to promote burn prevention, first aid, and emergency survival strategies. To do should be a routine practice, endorsed and supported by the WHO, so that we will have the potential to deliver quality health care even in mass-casualty situations. We should continue to learn from today's experiences to enhance tomorrow's performance and continue to strive for excellence.

In this keynote address, I finished by sharing words from history from which I feel we can learn:

Human history becomes more and more a race between education and catastrophe.

H.G. Wells (1866–1946)

This is the true joy in life, the being used for a purpose recognized by yourself as a mighty one.

The being a force of nature instead of a feverish little clod of ailments and grievances, complaining that the world will not devote itself to making you happy.

I am of the opinion that my life belongs to the whole community, and as long as I live it is my privilege to do for it whatever I can.

I want to be thoroughly used up when I die, for the harder I work the more I live.

I rejoice in life for its own sake.

Life is no "brief candle" to me. It is a sort of splendid torch which I have got hold of for the moment and want to make burn as brightly as possible before handing on to future generations.

George Bernard Shaw

I would like to acknowledge all those I have worked with over the years and currently in the Burns Service of Western Australia, McComb Research Foundation, Health Department of Western Australia, Australian Commonwealth Health Protection Committee, and my colleagues in ANZBA and around the world in the ISBI. I have had the privilege of working with many dedicated individuals who have and continue to influence the lives of those in need. As we live in a rapidly changing world in many ways from communication to terror, from the rights of the individual to those of the society, I look forward to sharing a journey in the future recognizing the power of the individual to influence the outcome from burn injury.