Whitsundays and on the Great Barrier Reef, where these deaths occurred.[5] One of us (P J F) is possibly the only person to have captured specimens likely responsible for causing Irukandji syndrome from the Whitsundays, and the species remain unidentified, as they are a new species and not described to date. Also, when the moribund patient was admitted, no obvious sting site was visible, and a negative skin scraping would not rule out a jellyfish sting.

Phentolamine has previously proved effective for relieving distressing autonomic symptoms,[6] and not just for cardiovascular complications, although it appeared ineffective at the lower doses used in our patient. However, nothing appears to prevent toxic cardiac dilatation occasionally occurring later in the syndrome.[7] Further research is currently under way.

Antivenom development may prevent some (possibly all) major symptoms of Irukandji syndrome. However, production is impossible until sufficient specimens of all species (some six to 10) causing the syndrome are caught and their venom assessed. Such advances are many years away and may never be achieved with current poor levels of funding.

Cardiac markers for jellyfish envenomation have previously been identified.[5,8] Since 1999 troponin level has replaced creatine kinase isoenzyme (CK-MB) level, and both are invariably raised in patients stung by the Whitsunday jellyfish. Thus, the words "cardiac markers" should have been used in the article and for not doing so I apologise.

Despite *C. barnesi* stings being common at north Cairns beaches, it has taken six years of dragging the beaches, with nets to catch jellyfish of this species. The thought of trying to catch a 12 mm jellyfish that makes erratic and irregular appearances in several hundred square kilometres of ocean around the Whitsunday Islands is totally daunting, but the possibility is being assessed. Such a venture will depend on funding becoming available.

Other stings were reported in the area at the time of our patient's death and are well known at the resorts where people who have been stung in surrounding areas are taken for treatment. However, stings remain erratic; they have no predictable patterns of appearance, and unfortunately prophecy is currently impossible.

1. Fenner PJ, Hadok JC. Fatal envenomation by jellyfish causing Irukandji syndrome. *Med J Aust* 2002; 177: 362-363.
2. Barnes JH. Cause and effect in Irukandji stingings. *Med J Aust* 1964; 1: 897-904.
3. Barnes JH. Observations on jellyfish stingings in North Queensland. *Med J Aust* 1960; 2: 993-999.
4. Currie BJ, Wood YK. Identification of *Chironex fleckeri* envenomation by nematocyst recovery from skin. *Med J Aust* 1995; 162: 478-480.
5. Fenner PJ, Carney I. The Irukandji syndrome: a devastating syndrome caused by a north Australian jellyfish. *Aust Fam Physician* 1999; 28: 1131-1137.
6. Fenner PJ, Williamson J, Callanan VI, Audley I. Further understanding of, and a new treatment for, "Irukandji" (*Carukia barnesi*) stings. *Med J Aust* 1986; 145: 569-574.
7. Fenner PJ, Williamson JA, Burnett JW, et al. The "Irukandji syndrome" and acute pulmonary oedema. *Med J Aust* 1988; 149: 150-156.
8. Little M, Mulcahy RF. A year's experience of Irukandji envenomation in far north Queensland. *Med J Aust* 1998; 169: 638-641. ❑

Chemical–biological–radiological (CBR) response: a template for hospital emergency departments

David A Bradt
Emergency Physician, Department of Emergency Medicine, Royal Melbourne Hospital, PO Box 2009, Grattan Street and Royal Parade, Parkville, VIC 3050
dbradt@jhsph.edu

To the Editor: The article by Tan and Fitzgerald[1] raises numerous concerns. The authors report that their recommended personal protective equipment (PPE) conforms to standards "in a hospital environment where the chemical vapour concentration will not be high". At the same time, the authors acknowledge data indicating most patients from a disaster will present to the local hospital by private transport (ie, without triage, decontamination, or prehospital care). These two considerations are incompatible and further ignore the possibility of the hospital as a direct terrorist target. The authors' assertion that their three decontamination lines "allow mass casualties, as well as trolleys and equipment, to be decontaminated quickly, efficiently, and in an orderly fashion" is simply not evidence based.

Of greater concern, the authors report "major considerations were policies and plans [referring to the hospital External Disaster Committee] and the emergency department response". Although this bottom-up approach to disaster planning is typical, it pays inadequate attention to interdisciplinary issues of proper hazard identification and management, environmental health, syndromic surveillance, and field outbreak investigation. Readers seeking robust emergency department templates are better referred to other sources for guidance.[2,3]

Of greatest concern, the authors report "our recommendations are similar to systems in the US and Israel, but much less intensive, as the threat of a terrorist attack here is perceived to be much lower". The three references cited for that statement date back to 1994, with none more recent than 1999. Moreover, the logic of the unreferenced threat assertion confuses hazard and risk. Although the absolute probability of a given hazard may be low, the risk attending that hazard encompasses vulnerability of the exposed population. With weapons of mass destruction, the conditional probability of catastrophic public health consequences is high — one event is the only number you will ever need.

The current public health context of chemical–biological–radiological (CBR) incident management in Victoria is one of limited experience, performance improvement indicators, and budgetary support from public health authorities. Public health is at risk when authorities report that "faced with dozens of requests each day to attend sites to assess white powder, the stretch capacity did not exist and nor should it".[4] As a result, the leading trauma centre in Australia extracts $20 000 from its existing operations budget to discharge its CBR responsibilities. This is not good enough. Nevertheless, the authors deserve credit for their initiative. Until cross-trained and disaster-experienced healthcare authorities reprioritise, this article shows the reader an excellent way to play a very weak hand.

1. Tan GA, Fitzgerald MCB. Chemical–biological–radiological (CBR) response: a template for hospital emergency departments. *Med J Aust* 2002; 177: 196-199.
2. Association for Professionals in Infection Control and Epidemiology, Inc, and Center for the Study of Bioterrorism and Emerging Infections. Mass casualty disaster plan checklist: a template for health care facilities. October 2001. Available at http://www.apic.org/bioterror/checklist.doc
3. Agency for Toxic Substances and Disease Registry. Hospital emergency departments: a planning guide for the management of contaminated patients. Vol 2 revised. In: Managing hazardous materials incidents. Atlanta, Ga: ATSDR, 2001. Available at http://www.atsdr.cdc.gov/mhmi.html
4. Van Buynder P. White powder incidents in Victoria: a new role for health services. *Health of Victorians — Chief Health*

Officer's Bulletin 2002; 2: 26-30. Available at http://www.health.vic.gov.au/chiefhealthofficer/chobulletin/downloads/vol2no2may2002/whitepowder.pdf ❑

Antony Nocera
Emergency Physician, Department of Emergency Medicine, Townsville Hospital, PO Box 670, Townsville, QLD 4810 tonynoce@ozemail.com.au

TO THE EDITOR: Tan and Fitzgerald's template for emergency department response to chemical–biological–radiological hazards appears to be based on a dubious assumption of a low level of risk.[1] A recent report details exposure of emergency department staff to potentially fatal secondary contamination during a hazardous materials incident, highlighting the need for staff to have the appropriate training and equipment to deal with these events.[2]

I believe the level of Personal Protective Equipment (PPE) proposed by Tan and Fitzgerald is inadequate. The "facemask with filter" they describe is classified as Level C respiratory protection, and this level only conforms to the Australian Standard (for PPE) when the identity of the chemical and its vapour concentration are known, and when these do not exceed the filtering capacity of the particular filter mask being used.[3,4] In the initial confusion of a hazardous materials incident, the identity of the chemical agent and its vapour will not be known. There may even be misinformation: during the 1995 Tokyo sarin attack, for example, initial advice to hospitals by the Tokyo fire service was that the incident was "a gas explosion in the Tokyo subway".[5]

Emergency department staff must be able to respond before the nature and severity of the chemical hazard can be determined. The only respiratory protection which conforms with the Australian Standard for PPE when the nature and severity of the chemical hazard has not been determined is the supplied gas respirator with full face shield of Level A (an encapsulating suit and self-contained breathing apparatus) or Level B (a non-encapsulating suit with self-contained breathing apparatus or a full face respirator on a gas line).[3,4]

Confronted with a hazardous materials emergency, potentially involving very toxic chemicals, emergency department staff need to have complete confidence in their own protection. This is only possible with the use of supplied gas respirators (Level A or B PPE), which provide complete respiratory protection. An additional problem with Level C air-purifying respirators is that their performance may be adversely affected by water ingress into the filter, which could occur during the decontamination procedures described in the template.

Tan and Fitzgerald also propose having a clerk don PPE and enter the contaminated zone. Any stationery taken into a contaminated area would have to be decontaminated before being taken out to a "clean" area, and it is not clear what a clerk would add to the initial response within a contaminated zone.

1. Tan GA, Fitzgerald MCB. Chemical–biological–radiological (CBR) response: a template for hospital emergency departments. *Med J Aust* 2002; 177: 196-199.
2. Geller RJ, Singleton KL, Tarantino ML, et al. Nosocomial poisoning associated with emergency department treatment of organophosphate toxicity — Georgia, 2000. *J Toxicol Clin Toxicol* 2001; 39: 109-111.
3. Standard AS/NZS 1715: 1994. Selection, use and maintenance of respiratory protective devices. Sydney: Standards Australia, 1994.
4. Australian Emergency Manual Series Part 3. Emergency management practice. Volume 2. Specific issues. Manual 3. Health aspects of chemical, biological and radiological hazards. Canberra: Emergency Management Australia, 2000.
5. Nozaki H, Hori S, Shinozawa Y, et al Secondary exposure of medical staff to sarin vapour in the emergency room. *Intens Care Med* 1995; 21: 1032-1035. ❑

Gim A Tan,* Mark C B Fitzgerald†
*Emergency Physician, †Director of Emergency Services, Emergency and Trauma Centre, The Alfred Hospital, PO Box 315, Prahran, VIC 3185
g.tan@alfred.org.au

IN REPLY: We thank Bradt for his interest in our article and acknowledge his expertise in this field, which he has gathered in the United States and other countries. We also thank Nocera for his interest in our article.

Our aim was to stimulate interest among the medical community in chemical–biological–radiological (CBR) response. The interdisciplinary issues mentioned by Bradt were mentioned in our article, but not in detail because of space limitations.

Our personal protective equipment (PPE) conforms to Australian standards[1-3] and the three decontamination lines are in keeping with other institutions. We are not aware of any simple decontamination system which, evidence-based, is superior.

The choice of PPE in the ideal situation would be one that would provide adequate protection in all situations with a minimal amount of training, maintenance and expense. Nocera is correct in stating that the respiratory protection in an unidentified chemical hazard is Level A or B. These PPEs are expensive, bulky (which results in poor manual dexterity), and their use requires specialised training. The amount of chemical present on a victim surviving long enough to self-present to an emergency department is significantly less than that involved at the site of the incident. Therefore, the level of protection required for hospital staff would be less than that required by emergency rescue workers.

Our PPEs were supplied by the Victorian health authorities. It is more important for staff to be familiar with their PPEs and for hospitals to have a CBR response that is regularly practised than having excessive protection that is limited to personnel who have undergone specialised training.

The role of the clerk is to take patient details. These are radioed to staff in the hospital to help identify and correctly label patients, which is very important in mass casualty situations.

Recent experience has demonstrated that terrorist acts are a worldwide phenomenon, and Australians are potential targets. This underlines the need for comprehensive training and maintenance of hospitals' CBR response.

Since publication of the article, Victorian health authorities have reprioritised, and we therefore feel we have achieved the aims of our article.

1. Standards SAA HB9-1994. Occupational personal protection. 2nd ed. Sydney: Standards Australia, 1994.
2. Standard AS 3765.1-1990. Clothing for protection against hazardous chemicals. Part 1: Protection against general or specific chemicals. Sydney: standards Australia, 1990.
3. Standard AS/NZS 1715: 1994. Selection, use and maintenance of respiratory protective devices. Sydney: Standards Australia, 1994. ❑

Trusting numbers: uncertainty and the pathology laboratory

T Paul Hutchinson
Senior Lecturer, Department of Psychology, Macquarie University, North Ryde, NSW 2109
phutchin@psy.mq.edu.au

TO THE EDITOR: White emphasised problems that can arise if medical decisions are overly reliant on the results of laboratory tests.[1] He relates the case of a