

Bystander basic life support: an important link in the chain of survival for children suffering a drowning or near-drowning episode

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Eight children suffered drowning or near-drowning in Sydney pools over an 11-day period in January 2007. Four received basic life support (BLS) within 5 minutes of immersion and survived with good functional neurological outcomes. The other four were not discovered for ≥ 5 minutes and all died. This cluster serves as a reminder that timely effective bystander BLS is crucial to survival and good clinical outcomes in near-drowning episodes. (MJA 2008; 188: 484-485)

Clinical record

During an 11-day period in January 2007, eight children presented to several emergency departments in the Sydney metropolitan region after a drowning or near-drowning event. While these incidents are known to be more common in summer, it is relatively uncommon to have such a cluster of cases occurring within a short period of time.

We retrospectively obtained information on these patients from clinical documentation of the hospitals involved, including ambulance run-sheets, hospital medical records, and coroner's reports. Details of the patients are shown in Box 1.

Seven of the children were from western Sydney, while the other child presented to a hospital in North Sydney. Six were girls and two were boys, with ages ranging from 1.5 to 6 years. In all cases, the children had not been adequately supervised. In seven cases, the approximate period of time for which the child had been

unaccounted could be determined from the records. This time ranged from about 1 minute to 20 minutes. Seven of the events occurred in backyard residential swimming pools and the other in a public pool. Three episodes occurred while children were visiting relatives; these children all drowned.

Four children had a period unaccounted for of < 5 minutes. Timely effective basic life support (BLS) (defined as adequate ventilation and/or chest compression administered within 5 minutes of non-breathing¹) was performed on each of these children by either their parent or a bystander. One patient regained consciousness and BLS was ceased. All four children survived without any neurological deficits.

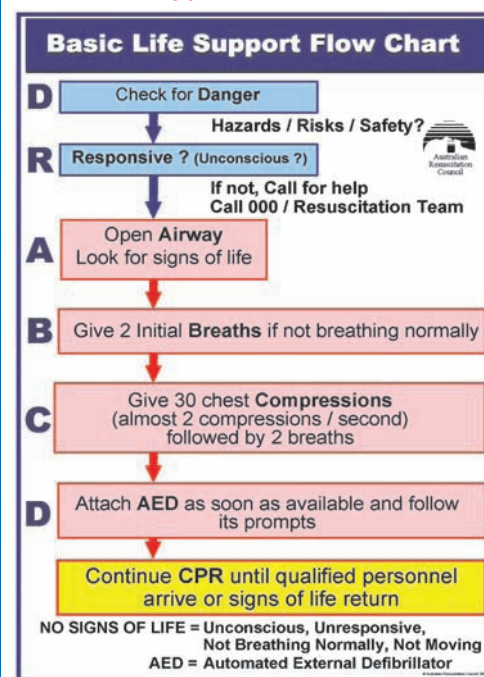
Of the other four children, three had a period unaccounted for of ≥ 5 minutes and one for an unknown time, estimated by the paramedics at the scene to be about 10–20 minutes. BLS was attempted on only one of these four patients. Two of these children

1 Details of eight children involved in drowning or near-drowning events in Sydney, January 2007

Patient no.	Age (months)	Incident location	Time unaccounted for (min)*	Time to BLS after retrieval	Who gave BLS	Outcome [†]
1	49	Relative's home	20	na	na	Died in PICU
2	23	Own home	< 5	Immediate	Medical doctor [‡]	Survived
3	47	Own home	2–3	Immediate	Mother	Survived
4	26	Relative's home	20	Immediate	Father	Died in PICU
5	17	Relative's home	5–10	na	na	Died in ED
6	42	Own home	1–1.5	Immediate	Father	Survived
7	29	Public pool	< 5	Immediate	Bystander	Survived
8	72	Own home	10–20	na	na	Died in ED

BLS = basic life support. ED = emergency department. na = not applicable because BLS not given. PICU = paediatric intensive care unit. * Best estimate of the period of time the child was unaccounted for (ie, possible duration of immersion). † All children who survived had no neurological deficit. ‡ Present at the time of the event.

2 Basic life support flow chart*⁷



CPR = cardiopulmonary resuscitation. * Reproduced with permission of the Australian Resuscitation Council.

died in the emergency department, and the other two had intensive care support withdrawn due to brain death.

Discussion

Over the past 10 years, there has been a significant reduction in the number of drowning and near-drowning events in children.² Several factors have contributed to this decrease, including community education programs alerting parents to the importance of supervising their children; legislation to place fences around backyard swimming pools, and efforts to teach effective BLS in the community.³⁻⁵ However, evidence is lacking of good compliance with these preventive measures, particularly backyard pool fencing,⁶ highlighting the need to continually stress water safety messages to parents.

In addition, a recent paradigm shift in resuscitation guidelines, coupled with differences in interpretation of the new guidelines by various resuscitation authorities, has led to confusion among lay rescuers and clouded the key messages that should be delivered to the public.^{7,8} It is recommended that the guidelines published by the Australian Resuscitation Council should be followed (Box 2).⁷

Of the eight patients reported here, four received timely effective bystander BLS and had a good clinical outcome. For the other four children, BLS was attempted late or not at all. It is possible that the prognosis of these four children would not have been good even with BLS, given their probable long duration of immersion. Even for children with a period unaccounted for of <5 minutes, the likelihood of neurological damage increases if effective BLS is not provided immediately. Hence, timely effective BLS is not just crucial for survival but also important for a better clinical outcome.

There are avenues for lay people to be trained in BLS, but doing so often requires considerable motivation, as there is a monetary and time burden involved, and retraining is required as guidelines change and skill levels deteriorate. Although community attitudes toward BLS are positive, theoretical knowledge of BLS is poor.⁹ At our emergency department, when parents are asked about their willingness and ability to perform BLS should their child need it, few respond positively. We believe that a more uniform community effort is required to ensure this vital link in the chain of survival, when the primary prevention measures of supervision and fencing fail. This effort could include universal provision of BLS training in workplaces and in high schools.

Competing interests

None identified.

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(Received 9 Jan 2008, accepted 11 Mar 2008)

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