

Withholding and withdrawal of life-sustaining therapies in intensive care: an Australian experience

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The decision to withhold or withdraw treatment is widely accepted in intensive care.^{1,2} Reasons include therapeutic failure, treatment futility and patient wishes.^{3,4} Yet, little has been published on the incidence of such end-of-life decisions in Australia.⁵

Previously, we contributed to a prospective observational study of patients who had life-sustaining treatments withdrawn in two tertiary referral hospitals of the Hunter New England Area Health Service, New South Wales.⁶ However, the incidence of decisions to limit or withdraw treatment and the process of this decision-making remained unknown. We hypothesise that most patients who die in an ICU will have the therapeutic effort either limited or withdrawn as part of the end-of-life decision process.

This study aimed to identify the incidence of withholding and withdrawal of treatment at the end of life in ICU patients at hospitals of the Hunter New England Area Health Service.

Methods

The study was a retrospective audit of all ICU deaths at the two study hospitals in the 2008 calendar year. The hospitals provide ICU services to a population of about 860 000 and admit about 2000 intensive care patients each year. The Hunter New England Clinical Ethics Committee approved the study and waived informed consent because of the nature of the audit.

Demographic data were recorded on a standard case report form and de-identified for analysis.

Patients who died were classified into one of three groups:

- no limitations — patients who died while receiving full treatment;
- withholding of treatments — patients for whom a specific treatment limitation (eg, mechanical ventilation, cardiovascular support or renal replacement therapy) or “do not resuscitate” orders were documented in the medical record in the days before death; or
- withdrawal of life-sustaining treatment (WLST) — patients in whom life-sustaining treatments were discontinued, and palliative care was initiated.

Patients diagnosed with brain death were included in the no-limitations group.

To evaluate the association between study group and outcome, all categorical independent variables were analysed with χ^2 tests, and all continuous independent data

ABSTRACT

Objectives: Withholding and withdrawal of treatment in intensive care is currently widely accepted, but little has been published about Australian practice.

Design and setting: Retrospective audit of all deaths in two major tertiary intensive care units in the Hunter New England Area Health Service during 2008. Patients who died were classified as “no limitations” (died while receiving full treatment), “treatments withheld” (specific treatment limitations) or “withdrawal of life-sustaining treatment” (WLST).

Results: Of 1950 patients admitted to an ICU, 283 died (14.5%). Of these 283, 54 (19%) died despite all therapeutic efforts; 97 (34%) had treatments withheld, and 132 (47%) had WLST. There were no statistically significant differences in length of stay between the three groups. Patients who died despite all therapeutic efforts were younger than those who died after treatments were withheld or WLST (mean age [SD], 58.7 [21.1] v 73.1 [12.5] v 69.3 [13.5]; $P=0.001$). APACHE II score was higher in the group who died than in the total ICU group (mean [SD], 25.5 [8.3] v 17.7 [8.7], $P=0.001$).

Conclusions: In this population of critically ill patients, most deaths occurred after discussion of end-of-life decisions and withholding or withdrawal of treatment.

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with Student *t* tests. All tests were two-tailed, and a $P<0.05$ was considered to indicate a statistically significant difference between two samples. All demographic data were described with absolute numbers and percentages. For statistical analysis, we used StatsDirect version 2.7.1 (Altrincham, UK).

Results

During 2008, 1950 patients were admitted to an ICU in the Hunter New England Area Health Service, and 283 died in the ICU (14.5%). Their demographic and clinical characteristics are shown in Table 1. Those who died were significantly older, with longer duration of ICU stay than the total group of ICU patients. They also had significantly higher

Table 1. Baseline characteristics of all ICU patients admitted in 2008 and those who died*

	All ICU patients (n = 1950)	Patients who died (n = 283)	P
Age (years)	61.0 (17.0)	68.6 (15.8)	0.001
APACHE II score	17.7 (8.7)	25.5 (8.3)	0.001
Length of stay (days)	3.7 (5.9)	5.2 (7.7)	0.002
Male to female ratio	1.6 : 1	1.5 : 1	0.29

* Mean (SD) unless otherwise indicated.

APACHE II scores (mean [SD], 25.5 [8.3] v 17.7 [8.7] for the total group; $P=0.001$).

Of the 283 patients who died, 172 (61%) were male (male:female ratio, 1.5). General medical and surgical patients accounted for most deaths (238, 84%), with the remainder from a range of subspecialties (Figure 1).

The ICU patients who died comprised:

- 54 (19%) who died despite all therapeutic efforts;
- 97 (34%) who died after withholding of a treatment; and
- 132 (47%) who died after WLST.

Analysis of overall length of stay found no significant differences between the three groups (P not significant) (Figure 2A).

Patients who died despite all therapeutic efforts were younger than those who died after treatment was withheld or WLST (mean age [SD], 58.7 [21.1] v 73.1 [12.5] v 69.3 [13.5]; $P=0.001$) (Figure 2B). There was no significant difference in the sex distribution (proportion of males) in the treatment withheld and WLST groups compared with the general intensive care population.

Discussion

Our results show that most patients (81%) who died in the Hunter New England Area ICUs had treatments either withheld or withdrawn as part of the end-of-life decision-making process. This is similar to the proportions reported in similar populations in the United Kingdom and France, with incidences of 72.6% and 66%,^{7,8} respectively. Similarly Keenan et al⁹ reported in a Canadian ICU population that 70% of patients had treatments withdrawn or limited before death. Comparable findings were reported in the United States¹ and Europe,² where 90% and 93%, respectively, of the patients had end-of-life recommendations before death.

Little has been published in Australia on this subject. A paediatric unit in Sydney, NSW, reported in 2008 that end-of-life decisions to withhold or withdraw treatments were made in 75% of deaths.¹⁰ Two paediatric deaths were

Figure 1. Percentage of deaths, by patient admission type

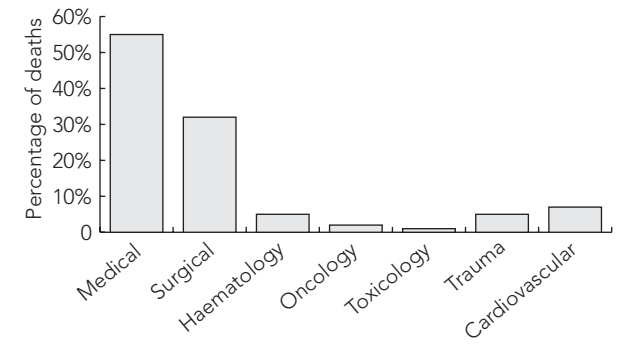
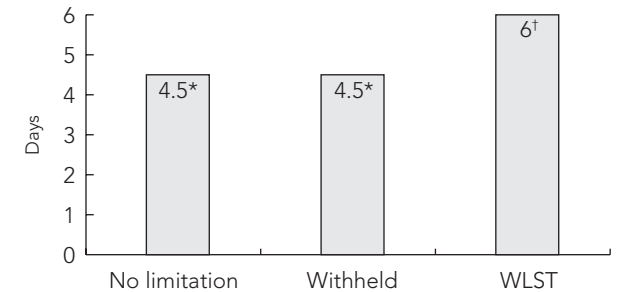


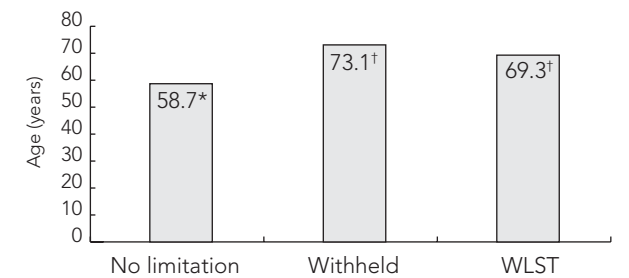
Figure 2. Length of stay in the intensive care unit and age of patients who died in 2008, by treatment group

A. Mean length of ICU stay



Statistical analysis showed no significant difference between groups (* $P=0.99$, † $P=0.16$).

B. Mean patient age



Statistical analysis showed a significant difference between all groups (* $P=0.001$, † $P=0.03$).

WLST = withdrawal of life-sustaining treatment.

included in our audit: one child died despite full resuscitation attempts, and the other after WLST.

In contrast to these reports and our results, a New Zealand survey found that fewer than 10% of patients had therapy withdrawn or withheld, as documented or

discussed at the end of life,⁴ illustrating the variation in practice between countries.

An audit in Western Australia showed that decisions to withhold treatments were not common but accounted for a significant part of hospital mortality. Patients who had treatment limited before death were older, had higher illness severity scores and longer ICU stays.⁵ Similarly, Holzapfel et al⁸ and Keenan et al⁹ reported that patients who had treatment limited or withdrawn were older and had longer ICU stay. As expected, a higher APACHE II score was associated with death and end-of-life decisions.^{8,9}

The most common therapies limited or withdrawn were mechanical ventilation, vasopressors and inotropes, oxygen supplementation, intravenous fluids, nutritional support and renal replacement therapy.^{3,6,9,11} In comparison with our previous study,⁶ common reasons for end-of-life decisions were poor pre-ICU quality of life, therapeutic failure, patient and family wishes, and predicted mortality or poor perceived quality of life.^{3,4}

A limitation of our study was that it did not identify patients who had a decision to withhold or withdraw treatment documented but were discharged alive from the ICU.

We conclude that most of the deaths in our hospital ICUs occur after discussion of end-of-life decisions, and the withholding or withdrawal of life-sustaining treatments.

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