Donation After Cardiac Death: A Standard of Care?

David Zygun MD MSc FRCPC
Conflicts of interest may have a negligible or considerable effect on judgment. They may influence care at any stage in the process of organ and tissue donation and, therefore, should be identified. Failure to identify and disclose such conflicts may undermine the integrity of a program and jeopardize public and professional trust.

Shemie et al. CMAJ  October 10, 2006 175(8)
Disclosures

• My primary clinical and research interest is severe neurological injury requiring intensive care management with focus on traumatic brain injury
• I have received grants from CIHR, AHFMR/Al:HS, CICF, ICS, AAGBI, CAH, Calgary Health Trust and University of Calgary, and U of C DCCM to perform studies which will lead to improved outcome from neurological injury
• Involvement in Donation and Transplantation:
  – I have cared for patients in the ICU who have met neurological criteria for the determination of death (NCD)
  – Following NCD, I have offered families the opportunity to donate
  – I have participated in physiological support of organs in the ICU in patients with NCD
  – I was a participant in the CCDT conference on DCD
  – I trained in a neurological ICU where DCD was offered
  – My donor card is not signed although it is my intent to donate my organs after NDD
• I am representing my own opinions NOT those of the Canadian Neurocritical Care Society, Canadian Congress of Neurological Sciences, Canadian Critical Care Society, University of Alberta, University of Calgary, Alberta Health Services, nor the U of A Departments of Critical Care, U of C Medicine, Clinical Neurosciences, or Community Health Sciences (of which I am a member)
Dying Patient

Transplant Recipient

Neurological Criteria for Death

Cardiac Death

Decision to Withdraw Life Sustain Therapies
Medical Standard of Care
Prepared For: Legal Education Society of Alberta
Health Law

The following passage from *Perzy v. Kieser*, [2005] A.J. No. 1757 (Q.B.) at para. 77 sets out the generally accepted statement of law regarding the standard of care to be exercised by a physician:

A doctor undertakes that she possesses and utilizes the skill, knowledge and judgment of the average reasonable doctor. In judging the average reasonable doctor regard must be had to the special class and community to which the doctor belongs. If she holds herself out as a specialist, a higher degree of skill is required of her, equal to that of a reasonably competent member in her group of specialists: Wilson v. Swanson, [1956] S.C.R. 804; Challand v. Bell (1959), 18 D.L.R. (2d) 150 at 154 (Alta. S.C.).

The classic statement with respect to standard of care was stated in *Grzy v. Sylvester*, [1956] O.R. 132 (C.A.) at 143; aff’d [1956] S.C.R. 991:

Every medical practitioner must bring to his task a reasonable degree of skill and knowledge and must exercise a reasonable degree of care. He is bound to exercise that degree of care and skill which could reasonably be expected of a normal, prudent practitioner of the same experience and standing, and if he holds himself out as a specialist, a higher degree of skill is required of him than one who does not profess to be so qualified by special training and ability.
“These quotations highlight the well-entrenched and overriding principle that the doctor must conduct himself or herself according to the standard of the reasonable physician with reference to the particular circumstances at the material time.

The test is an **objective** one and does not take into account the individual’s own physical characteristics, intelligence, or personality”
Disagreement on at least one of the daily judgments by nurses and doctors was found in 21% of all patients and in 63% of the dying patients.

The disagreements more frequently concerned quality of life than survival.

In surviving and dying patients, nurses gave more pessimistic judgment and considered withdrawal more often than did doctors ($p < .001$).

Crit Care Med 2003;31:456 – 461
Variation in WLST

- Survey of 1600 Canadian ICU health care providers
- 12 standardized and “usual” ICU scenarios to ascertain treatment recommendations from 5 potential options, ranging from continuing full management, to limiting some treatment interventions (for example, not instituting dialysis), to withdrawal of all active treatment
- In only 1 of the 12 scenarios was the same option chosen by more than 50% of respondents
- In 8 of 12 scenarios, opposite extremes of care were chosen by more than 10%
- Factors associated with treatment decisions included years since graduation, city and province of work, number of beds within the ICU where they worked, and self-perceived likelihood of limiting treatment relative to colleagues.

Physician prediction of ICU survival <10%: HR 16.77 (8.54–32.92)

In the group of patients in whom ICU physicians predicted survival <10%, the actual survival was 29%
Survivors’ Own Assessment and Comparison With Nurses’ and Doctors’ Predictions 6 months after ICU admission:

94% of the former patients considered their QOL as good (64%) or as fair (30%)

Full physical dependence was indicated in only 2.4% and partial physical dependence in 19%.

Compared with the survivors’ statements, nurses’ ($p < .001$) as well as doctors’ ($p < .05$) predictions had been too pessimistic: of the 1,273 daily evaluations, nurses had considered medical treatment to be questionably or definitely futile with regard to QOL on 175 days (45 patients) compared with 105 days (26 patients) by doctors.

Only 15% of survivors for whom nurses and 9% for whom doctors had considered treatment eventually futile with regard to future QOL reported bad QOL 6 months later.

Crit Care Med 2003;31:456 – 461
Mortality associated with withdrawal of life-sustaining therapy for patients with severe traumatic brain injury: a Canadian multicentre cohort study

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Abstract

Background: Severe traumatic brain injury often leads to death from withdrawal of life-sustaining therapy, although prognosis is difficult to determine.

Methods: To evaluate variation in mortality following the withdrawal of life-sustaining therapy and hospital mortality in patients with critical illness and severe traumatic brain injury, we conducted a two-year multicentre retrospective cohort study in six Canadian level-one trauma centres. The effect of centre on hospital mortality and withdrawal of life-sustaining therapy was evaluated using multivariable logistic regression adjusted for baseline patient-level covariates (sex, age, pupillary reactivity and score on the Glasgow coma scale).

Results: We randomly selected 720 patients with traumatic brain injury for our study. The overall hospital mortality among these patients was 228/720 (31.7%, 95% confidence interval [CI] 28.4%–35.2%) and ranged from 10.8% to 44.2% across centres ($\chi^2$ test for overall difference, $p < 0.001)$. Most deaths (70.2% [160/228], 95% CI 63.9%–75.7%) were associated with withdrawal of life-sustaining therapy, ranging from 45.0% (18/40) to 86.8% (46/53) ($\chi^2$ test for overall difference, $p < 0.001) across centres. Adjusted odd ratios (ORs) for the effect of centre on hospital mortality ranged from 0.61 to 1.55 ($p < 0.001). The incidence of withdrawal of life-sustaining therapy varied by centre, with ORs ranging from 0.42 to 2.40 ($p = 0.001). About one half of deaths that occurred following the withdrawal of life-sustaining therapies happened within the first three days of care.

Interpretation: We observed significant variation in mortality across centres. This may be explained in part by regional variations in physician, family or community approaches to the withdrawal of life-sustaining therapy. Considering the high proportion of early deaths associated with the withdrawal of life-sustaining therapy and the limited accuracy of current prognostic indicators, caution should be used regarding early withdrawal of life-sustaining therapy following severe traumatic brain injury.
Timing of neuroprognostication in postcardiac arrest therapeutic hypothermia

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Objective: Early assessment of neurologic recovery is often challenging in survivors of cardiac arrest. Further, little is known about when to assess neurologic status in comatose, postarrest patients receiving therapeutic hypothermia. We sought to evaluate timing of prognostication in cardiac arrest survivors who received therapeutic hypothermia.

Design: A retrospective chart review of consecutive postarrest patients receiving therapeutic hypothermia (protocol: 24-hr maintenance at target temperature followed by rewarming over 8 hrs). Data were abstracted from the medical chart, including documentation during the first 96 hrs post arrest of “poor” prognosis, diagnostic tests for neuroprognostication, consultations used for determination of prognosis, and outcome at discharge.

Setting: Two academic urban emergency departments.

Patients: A total of 55 consecutive patients who underwent therapeutic hypothermia were reviewed between September 2005 and April 2009.

Intervention: None.

Results: Of our cohort of comatose postarrest patients, 59% (29 of 49) were male, and the mean age was 56 ± 16 yrs. Chart documentation of “poor” or “grave” prognosis occurred “early”: during induction, maintenance of cooling, rewarming, or within 15 hrs after normothermia in 57% (28 of 49) of cases. Of patients with early documentation of poor prognosis, 25% (seven of 28) had care withdrawn within 72 hrs post arrest, and 21% (six of 28) survived to discharge with favorable neurologic recovery. In the first 96 hrs post arrest: 88% (43 of 49) of patients received a head computed tomography, 90% (44 of 49) received electroencephalography, 2% (one of 49) received somatosensory evoked potential testing, and 71% (35 of 49) received neurology consultation.

Conclusions: Documentation of “poor prognosis” occurred during therapeutic hypothermia in more than half of patients in our cohort. Premature documentation of poor prognosis may contribute to early decisions to withdraw care. Future guidelines should address when to best prognosticate in postarrest patients receiving therapeutic hypothermia. (Crit Care Med 2012; 40:000–000)

Key Words: cardiac arrest; cardiopulmonary resuscitation; do not resuscitate; mild therapeutic hypothermia; prognosis; resuscitation
'Ere. He says he's not dead! Well, he will be soon. He's very ill. I'm getting better! No, you're not. You'll be stone dead in a moment. I can't take him like that. It's against regulations."

Monty Python and the Holy Grail
Ten years post injury I am a university graduate, live life independently, drive independently and have a career. I think that is pretty fantastic for someone who had less than 1% chance of survival.

When I was in the hospital I was asked what my goal was. I said I wanted to be on stage again dancing. It was suggested that I make a more realistic goal. Last year when I began walking again I found my old dance shoes, put them on and struttet across the floor at Synap tic with the high walker. Maybe not an ideal stage prop but certainly on my way to where I intended to be.
The Patient's Voice
“...and we know that we have standards in this country that protect patients at the end of life... Those standards are in place...”

S. Shemie *Dead Enough* The Fifth Estate Mar 21 2014
2.3 Withdrawal of Life Support: the Decision Making Process

(i) Clarification of and consistency in the goals and objectives for the provision of life support will help patients, families, and the ICU team to reach consensus within the context of the decision making process. If the ICU team feels that continued provision of intensive care is equivalent to prolongation of the dying process, the ICU attending physician should seek to establish consensus with medical colleagues that continued life support is inappropriate. These consultations should take place prior to initiating discussions with the patient or family concerning limitation of treatment. Similarly,

(iv) Consultation between the several members of the ICU team is essential in order to achieve and maintain consistency in their communication of information to the patient and/or substitute decision maker. Similarly, there is a need for consistency between the ICU team and involved consulting services.
Next Steps

• Standards for Neuroprognostication in Canada
  – Access to neuroscience specialists and neurocritical care
• Standards for the provision of care for those with life threatening neurological conditions
• Open Discussion and Input with the Public on these standards
• Public dissemination of our neurocritical care outcomes
Survival rates improve for brain-injury patients: study

October 29, 2013

CALGARY — Patients hospitalized for brain injuries are more likely to survive than they did a decade ago, and more likely to return home without requiring any long-term medical support, according to a new research study.

The study, which tracked nearly 4,100 southern Albertans with severe brain injuries in Calgary’s adult Intensive care units (ICUs), shows survival rates for these patients have increased by 10 per cent since the study began 12 years ago. Roughly seven of every 10 patients with critical brain injuries now survive.

“This represents a substantial mortality reduction and is likely due to quality improvement in multiple areas of our health care system,” says critical care physician Dr. Andreas Kramer, Acting Medical Director of the Foothills Medical Centre ICU and a member of the Hotchkiss Brain Institute at the University of Calgary.

“More timely pre-hospital care, better emergency department resuscitation, earlier access to CT (computed tomography) scans, and developments in neurosurgery, ICU care and rehabilitation are all factors that may have helped improve survival rates.”

Over the same period, the proportion of brain-injured patients discharged home without the need of support services, such as home care, also increased from 33 per cent to 40 per cent.

“We aren’t only sending patients home alive, but a larger proportion is also returning to a sense of normalcy in their everyday lives,” Dr. Kramer said.

“Caring for severely brain-injured patients is one of the most challenging tasks in medicine,” said Dr. Kramer. “With better brain-protecting equipment and the best medical care money can buy, we are seeing patients improve and return to their lives.”

Dr. Kramer said the research showed a steady decline in the number of brain injuries over the last 10 years, although the percentage of severe brain injuries remained constant. The researchers attribute the decline in injury severity to better education about safety and the wearing of helmets and safety belts.

Dr. Kramer said the research was conducted by the Brain Injury Research Centre, supported by the Hotchkiss Brain Institute, Hotchkiss Centre for Severe Brain Injury, the Alberta Health and Wellness, and the Alberta Children’s Health Foundation.

End

For more information, please contact:

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Foothills Medical Centre ICU
403-264-2571
andreas.kramer@ahs.ca
Systematic Review

- 12 studies involving 24,520 patients

<table>
<thead>
<tr>
<th>Study</th>
<th>Centers</th>
<th>Population</th>
<th>No. pts</th>
<th>Controls</th>
<th>Neuro-intensivists</th>
<th>Risk adjustment</th>
<th>Functional outcomes</th>
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## Results - Mortality

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<th>Study name</th>
<th>Outcome</th>
<th>Yes / Total</th>
<th>Odds ratio and 95% CI</th>
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<td>Diringer 2001</td>
<td>Death</td>
<td>93 / 266</td>
<td>310 / 771</td>
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<td>Death</td>
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<td>22 / 72</td>
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<td>Death</td>
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<td>29 / 216</td>
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<td>5 / 36</td>
<td>5 / 23</td>
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<td>1461 / 5875</td>
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<td>Death</td>
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<td>661 / 3101</td>
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<td>15 / 78</td>
<td>18 / 50</td>
</tr>
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<td>36 / 164</td>
<td>30 / 123</td>
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<td>Death</td>
<td>41 / 202</td>
<td>19 / 83</td>
</tr>
<tr>
<td>Samuels 2011</td>
<td>Death</td>
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<td>85 / 317</td>
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<td>Wame 1991</td>
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<td>23 / 72</td>
<td>20 / 49</td>
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![Forest plot of observational studies comparing outcomes between specialized neurologic critical care units and alternative models of care association with mortality](image.png)

**Fig. 1** Observational studies comparing outcomes between specialized neurologic critical care units and alternative models of care association with mortality (Note: Lott and colleagues presented separate data for patients with intracranial hemorrhage and ischemic stroke. The size of squares in Forrest plot is proportional to number of patients in study)
# Results – Neurological Outcome

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<thead>
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<td>1133 / 3101</td>
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<td>54 / 78</td>
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</tr>
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<td></td>
<td></td>
<td>5481 / 10990</td>
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</table>

Fig. 2 Observational studies comparing outcomes between specialized neurologic critical care units and alternative models of care: association with favorable outcomes (Note: Lott and colleagues presented separate data for patients with intracranial hemorrhage and ischemic stroke. The size of squares in Forrest plot is proportional to number of patients in study).
“Standard of Care”

How can a practice be a standard of care when we don’t have standards?