Submission on: ALRC Discussion Paper, Proposal 10.
Permanent cessation of critical brain functions, Normothermic Regional Perfusion, and Permanence

Purpose

- Support Proposal 10 and provide drafting refinements for proposed Section X.
- Explain why "critical" should qualify "functions of the brain" and how to defend the proposed use of this term and proposed definition in Proposal 10.
- Address the main ethical/legal objections raised about normothermic regional perfusion (NRP) under a unified brain-based criterion and a permanence standard.

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At a glance

Key points

- "Critical" avoids two confusions: (i) neural activity vs neural function; and (ii) brain-related functions not tied to consciousness (e.g., neuroendocrine regulation).
- The proposed definition of "critical" in proposal 10 Section X prevents the drift between (a) causal necessity and (b) constitutive necessity; Proposal 10's intended meaning is (b).
- NRP concerns can be answered if (i) death is understood on a unified brain-based standard and (ii) permanence is recognised as a threshold irreversibility rule for DNAR/withdrawal contexts.
- We must distinguish between threshold reversibility/irreversibility and success/failure term reversibility/irreversibility.

1. Support for Proposal 10

We welcome the opportunity to respond to the ALRC Discussion Paper on revising statutory provisions for determining death. We support Proposal 10 and suggest drafting refinements (Section 7).

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2. What "critical" adds to "functions of the brain"

- It prevents confusing neural activity with neural function (activity in a cluster of cells is not automatically a function).
- It excludes brain-related functions not tied to consciousness (e.g., neuroendocrine regulation).

3. Current definition of "critical" in proposed Section X avoids the following ambiguity

"Critical" can mean either:

Meaning	Explanation
Causally necessary for your continued life	Certain *functions* must be sustained for you to remain alive (e.g., circulation, oxygenation, water balance). These are causally necessary functions for continued life. If a function stops and there is *no timely substitute* available, you will die. In that situation, the *usual biological source* (e.g., your heart) is *also* causally necessary *in the circumstances*. But if a substitute *is* available (ECMO; heart transplant), the source is no longer causally necessary. When the causally necessary function stops, the downstream result is permanent loss of critical functions.
Constitutively necessary for your continued life (Proposal 10's intended meaning).	If the brain systems that generate wakefulness and awareness are destroyed, they cannot be "replaced" in a way that keeps *you* alive. Replacing a heart (or supplying a hormone) can keep *you* alive; replacing the basis of wakefulness and awareness cannot; it replaces you.

Proposed way of understanding the distinction, explained below:

In practice: a function is "critical" when it cannot be replaced without replacing *you*.

4. Why causal necessity is not enough

Two levels of irreplaceability:

- The *function* must continue for survival, but it can be delivered by different *sources* (an organ, a machine, a drug, a transplant). Strictly speaking we don't "replace" functions—we either *keep them going* by some means or we *fail to keep them going*. We can keep them going with different sources.
- The *function* must continue for survival, and it *cannot* be delivered by different sources. If we keep function going by a different source, we do not keep *your* function going.

Example: Replaceable sources

- ADH regulates water balance; without regulation, you will die (causal necessity).
- But the source can be substituted (e.g., vasopressin by injection).
- The source may be causally necessary in the circumstances, e.g., if we cannot use ECMO in place of your heart.
- But in principle we can sustain these functions by substituting their source: transplantation (kidney, heart, lungs, liver) or devices (e.g., ECMO).
- After such substitutions, we ordinarily say we have kept the person alive, not replaced them.

Example: Non-replaceable source (consciousness)

- If conscious awareness is gone, there is no analogue of swapping in an alternative source that preserves the same subject.
- A permanently conscious machine would be the *machine* being conscious (a different subject), not *you* being conscious.
- Thought experiment: transplanting a different head onto your torso: do you get a new head or does the donor get your body?

5. Why breathing and brainstem function matter

Some elements of breathing are controlled by the brainstem, including the drive to breathe.

The drive to breathe (air hunger) is a form of consciousness in the wide sense and cannot be replaced in the relevant way.

Precautionary point: spontaneous breathing capacity indicates a functioning brainstem; therefore we cannot exclude awareness even at a rudimentary level.

6. Normothermic regional perfusion (NRP): issues and responses

Our comments address the ALRC's proposed changes. As Australian law currently stands, NRP is unlawful because it restores blood circulation in the body while the circulatory limb defines death as irreversible cessation of circulation of blood in the person's body. Legislative change is therefore required if NRP is to be used.

Two questions raised by NRP

1) Does restoring circulation to the torso violate the dead donor rule (resuscitation concern)?
2) If not, does preventing circulation from reaching the brain violate the dead donor rule (causation concern)?

6.1 Does restoring circulation to the torso violate the dead donor rule?

This criticism stems from a "two deaths" view (separate circulatory and neurological deaths), encouraged by having two statutory provisions. But the US debate around the UDDA treated the two limbs as alternative tests for a single brain-based criterion: cessation of circulation and respiration leads to cessation of brain function.

Some commentary about NRP falsely suggests the unified brain-based conception was developed to justify NRP. It predates NRP by decades.

Coherence point: critics who accept donation after brain death as compatible with the dead donor rule cannot also claim that restoring bodily circulation (while excluding brain circulation) necessarily invalidates death determination. Brain-dead donors have ongoing bodily circulation without brain circulation.

The reply that "brain death testing" differs from "circulatory testing" does not dissolve the tension: in NRP, circulation is restored only after death has already been determined (post-mortem phase); circulation with the brain isolated is obviously no longer being used as a sign for circulation in the brain at that post-mortem stage.

6.2 Does preventing circulation reaching the brain cause death in NRP?

Two responses are available:

- Standard DCD is commonly defended as compliant with the dead donor rule, yet it also ensures cessation of brain function remains permanent.
- If standard DCD is defensible despite such measures, NRP can be defended on the same basis by defending a permanence standard.

Standard DCD already includes measures that secure permanence

- In some DCD contexts (e.g., lung retrieval), additional safety steps are taken to manage oxygenation and prevent resuscitation.
- At the end of the no-touch period, exsanguination, aorta clamping, and cold flushing are active measures that prevent restoration of circulation to the body and brain.
- These measures secure permanence in standard DCD in the same way vessel clamping does in NRP; critics must therefore either reject all DCD or withdraw this objection to NRP.

6.3 Permanence vs irreversibility: answering the deeper objection

Core objection

If we must take steps to prevent function being restored, how can the patient be dead?

"Preventing restoration" overstates what is at issue

The phrase 'prevent function from being restored' can be misleading because it suggests that, if circulation reaches the brain, critical brain functions will be restored in every single patient. That is not the case. In the majority of donors, blood circulation would not restore critical functions. The measures are only precautionary, to prevent a small probability that some function could be restored. Some donors have endured a long agonal phase after treatment withdrawal but before asystole, during which the quality of oxygenated blood circulation deteriorated substantially and resulting, in some cases, in loss of brain function before asystole.

Irreversibility, reversibility, and permanence are modern, resuscitation-indexed concepts

The concepts of reversibility, irreversibility, and permanence, used to qualify "cessation of critical functions", only evolved with modern resuscitation practice. To possess a concept is to be able to do certain things, so the concept reversing loss of function could only emerge with reliable resuscitation techniques. Yet human beings have been dying for over 300,000 years. Earlier communities may have entertained the idea of someone coming back from the dead, but they lacked the concept of resuscitation and irreversible and reversible cessation of function. It is therefore mistaken to treat irreversible cessation of function as a necessary mark of death, as some critics and even defenders of deceased donation practice have done.

Before modern resuscitation and the ICU, death was determined when someone took their last breath and their heart stopped. Myths, religious narratives, and magical hopes of someone coming back from the dead are not the same, since successful resuscitation means they were never dead.

It's tempting to read Shakespeare's line in Hamlet—"the undiscovered country from whose bourn no traveler returns"—as an early recognition that death requires irreversible cessation of function. But that interpretation projects a modern, ICU-indexed technical notion back onto a text written in a world without the practices that give the term its meaning. It treats words as if they retained a meaning when their conditions of use (modern resuscitative technology) are absent.

Shakespeare's line has nothing to do with irreversibility in the ICU; it concerns the idea of life after death and the fear of the great unknown beyond the boundary from which no one returns to tell us what it is like. It would be ludicrous to say: "see, Shakespeare knew that cessation of function had to be irreversible before death could be determined"!

Likewise, even though we long knew of the heart and lungs, understanding their functions came much later (e.g. William Harvey on the heart in 1628). But even then, "irreversible" could not have played the role it does now: irreversibility (and its cognate, reversibility) is born with modern resuscitative practice.

Why this matters now: most death determinations are not resuscitation cases

This point matters today, because in the vast majority of death determination practice, resuscitation is not appropriate. Most of our death determination practice is not concerned with the reversibility of function. Consider my (AM's) frail 89-year-old aunt in a nursing home who had been dying for weeks. She was determined dead shortly after her last breath and cardiac arrest. It would have been inappropriate—indeed monstrous—to perform chest compressions then. Modern practice does not define her "time of death" as "the time at which we could restore no function if we tried," precisely because we already know resuscitation is not to be attempted.

Putting this together with our earlier point—that the very concept of reversing function, and of failing to reverse it, only becomes available once there are reliable resuscitation techniques and practices—we can see what is wrong with the claim that irreversible loss of function is a timeless property of death.

The error is to treat irreversible cessation as an intrinsic feature of an individual's condition, as if it has been sitting there unchanged for 300,000 years. But once we see that "reversibility/irreversibility" entered our conceptual repertoire only with resuscitation, the crucial point comes into view: these are success/failure terms that essentially refer to agents acting on intentions. They are action-involving concepts. A prerequisite for their meaningful use is the presence of people willing to attempt reversal, not merely people able to do so.

A file is only retrievable if there is someone willing to look for it, let alone able to find it. Reversible (and irreversible) are like retrievable (irretrievable) in this sense.

The retrievable example shows that reversible, in its success term sense, requires both ability and willingness. Willingness is the threshold condition that makes ability—or inability—to reverse cessation of function a live possibility at all. And because reversibility (and irreversibility) is action-involving in this way, it is partly relational, not purely intrinsic as critics assume.

The degree of functional loss is a property of the patient; the threshold at which attempts must (or need not) be made is set by us—indexed to technology, capacities, and clinical judgement. Permanence therefore means irreversibility in its threshold sense.

Analogy: Retrievable

- A file is only retrievable in the success-term sense if someone is willing (and able) to look for it.
- Reversible/irreversible are like retrievable: meaningful use presupposes a practice of attempting reversal.

How the "irreversibility rule" arose—and why it does not apply to everyone

Once reliable resuscitation developed, we introduced a new precondition for determining death because we want to know whether the patient could "come back" and, where appropriate, to do all we can to facilitate that. So we stipulated an irreversibility requirement: do not declare death unless we judge the loss of function to be irreversible—i.e., that the patient will not "come back," given what we can and will do.

But it does not apply to all patients. In DNAR/withdrawal contexts (like my aunt), we have no intention of using ECMO-CPR, defibrillation, invasive ventilation, etc. Here, reversibility/irreversibility in the success-term sense is not in play; we instead use threshold irreversibility—that is, permanence.

Permanence embodies a corresponding stipulated rule for DNAR patients: "avoid anything that merely prolongs dying or returns the patient to an earlier dying stage already judged unacceptable to the patient or family". We don't attach the irreversibility requirement (that we fail to resuscitate before determining death) to these patients because doing so would risk prolonging dying for no gain.

Why the "irreversibility rule" is not a physiological moment-finder

Irreversibilists say this confuses treatment-withdrawal decisions with when someone is dead: the state a patient can be brought back to is one thing, whether they are dead is quite another.

The problem with the objection is that it misses what irreversibility is doing here. Irreversibility functions as a rule of practice: it requires that resuscitative efforts be made where it is appropriate to try. It does not purport to identify some determinate physiological moment at which cessation of function becomes irreversible. The reason for this is straightforward. Even when resuscitative efforts are appropriate, the resuscitation team also abide by a stopping rule

beyond which further efforts are considered inappropriate, since the level of function that could be restored would not be acceptable to the patient or surrogates.

A purely biological notion of irreversible would require efforts far beyond the stopping rule, since it strictly requires the irreversible loss of any function. Nobody knows when this timepoint is achieved, partly because there is considerable variability between cohorts and between individuals within a cohort.

The irreversibilist Ari Joffe acknowledges that “precisely when absent circulation is irreversible is not known” . He suggests we can be “highly certain” that after 1 hour of untreated cardiac arrest, effective circulation sufficient for “integrative unity” cannot be restored. But this does not identify when irreversibility first occurs. It replaces a criterion for the moment of irreversibility with an epistemic “by-which” rule (a much later point by which we can be confident it has occurred). As a method for finding the first moment, it is no better than choosing putrefaction or total decomposition. Moreover, it is a rule for resolving uncertainty, and so is normative recommendation not the biological exercise he claims it to be.

On "by-which" rules: Joffe as an illustration

Joffe acknowledges that precisely when absent circulation becomes irreversible is not known. A later "by-which" time-point (e.g., one hour) may secure high confidence that circulation sufficient for certain functions cannot be restored, but it does not identify when irreversibility first occurs. It is an epistemic rule for resolving uncertainty - as a method for locating the first moment, it is no better than waiting for putrefaction or decomposition, and just as normative as permanence is.

Justifying active measures to prevent restoring function

This difficulty supports the modern practice of adopting permanence (threshold irreversibility) as the standard for determining death. Since permanence is itself a rule, it also justifies measures to prevent restoration of circulation (and so possible function) when it is appropriate to prevent this. We finally arrive, then, at the answer to critics of standard DCD and NRP.

Summary: responses to the two fundamental criticisms of NRP

- Restoring circulation to the torso does not violate the dead donor rule on a uniform brain-based standard. Otherwise, brain-dead donors (with ongoing bodily circulation) would not be dead.
- Preventing brain circulation does not cause death on a permanence standard. While critics claim it would cause death on an irreversible standard, they have misunderstood this standard and it cannot be made into a workable criterion identifying the moment biological irreversibility occurs.

7. Drafting suggestions for proposed Section X and Section Y

Targeted refinements to reduce redundancy and avoid unintended legal implications:

- Consider whether proposed section X(1)(b)(ii) is redundant because it may be covered by subsection (b)(iii).
- If subsection (b)(ii) is retained, consider specifying (in a Note/Editor's Note or in the provision) which existing laws govern whether an end-of-life decision is "valid", to avoid creating the impression of a new basis for challenge without existing constraints.
- Section X(1)(b)(iii) may be redundant because it is covered in section Y.
- Consider simplifying by making section Y a subsection of section X (so current section X(2) becomes X(3)).

Suggested provision (illustrative wording)

Section X - When death occurs
For the purposes of any law, a person dies when there has been a permanent cessation of the person's critical brain functions, determined in accordance with section Y.

In this section -
cessation of the critical functions of a person's brain means the complete absence of -
- any form of consciousness (wakefulness and awareness); and
- brainstem functions, including the ability to breathe independently.

permanent means -
- the critical functions of the person's brain cannot resume on their own; and
- the critical functions of the person's brain will not be restored through intervention.

Section Y - Determination of death
A determination that a person has died under section X must be made according to accepted medical practice.

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