

2005 Australasian Trauma Symposium

How many “Rescue” Helicopters does New Zealand need?

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"But why is this so?"

- Julius Sumner Miller

- Ad hoc establishment of services
 - from large pool of general aviation helicopters
 - with assumption that any helicopter makes a good air ambulance.
- Not coordinated with overall trauma or critical care planning
- Varying clinical standards
- Community xenophobia



"Show me the money"
- Cuba Gooding, Jr (*"Jerry Maguire"*)

Financial Issues



- Utilisation based reimbursement
- Low or no standing/establishment funding
- Commercial helicopter providers

RESULT:

"TAXICAB OPERATING PHILOSOPHY"

But above all:

1. Shortage of quality local evidence:

- Outcome based studies
- Class 1, 2 or 3 studies
- Even class 4 recommendations

2. Abundance of “Class 7” evidence

(Class 7 Evidence: *“Media reports of the unsolicited opinions of morons with a conflict of interest”*)

-Tony Smith, 2004

Research – the ideal



- Relevant
 - Appropriate hypothesis
- Outcome based
 - Survival/functionality vs surrogate endpoints
- Controlled
 - Ideally randomised
- Ethical
 - "No patients were harmed during this study"*

World first for pre-hospital trauma care trial

THE northern beaches was the launch pad for a world-first clinical trial run by NRMA CareFlight yesterday.

The head injury retrieval trial, launched with a demonstration at Denzil Joyce Oval at North Curl Curl, will determine whether providing pre-hospital trauma care at the scene of an accident improves recovery outcomes for people with head injury.

The trial will run throughout Sydney and surrounding regions this month by sending a specialist doctor and paramedic by helicopter to the crash scene.

NRMA CareFlight medical director Alan Garner said this was the first time an evidence-based clinical trial of this nature has been conducted.

He said CareFlight would identify trial participants through daytime emergency calls to the NSW Ambulance Service.

The progress of patients treated in the trial will be monitored and compared with that of other patients six months after their incident.

"We will compare results to determine whether providing head injury trauma treatment at the scene of an accident improves the rate of severe disability and decreases the death rate," Dr Garner said.



WORLD FIRST: The NRMA CareFlight crew launching the clinical trial with a demonstration yesterday.

Picture: ROS CANNON



Head Injury Retrieval Trial (The “HIRT” study)

Approved by “C.O.C.O.A.”
Committee Organising Contrived
& Outrageous Acronyms
(not really)

It's not (just) about the helicopter



HIRT Study: Outline (1)

- Comparison of critical vs standard care.
“Does prehospital advanced care from a medical team improve outcome in head injury?”
- Randomised controlled study
All ‘adult’ patients within Sydney basin with trauma & reduced consciousness at ‘000’ call
- Study group: Team -> patient in ≤ 15 mins
 - Senior ICU/Anaes/Emerg doctor + paramedic
 - Care as per physician judgement (EMST guided)
- Control group: “Standard care”
GD/paramedic ambulance +/- medical team



Inner-city mission . . . the CareFlight helicopter lands in the CBD yesterday.

Picture: TOBY ZERNA

Flying angel of mercy in city rescue

By GEMMA JONES

CITY workers ducked out of the way as a medical flying squad racing to treat an injured pedestrian landed a helicopter in the CBD for the first time yesterday.

The NRMA CareFlight helicopter was dwarfed by Sydney skyscrapers as it landed in a small park outside the Botanic Gardens in Macquarie St. just after 11.30am.

Pedestrians and motorists watched as a doctor and para-

medic emerged and ran two blocks to treat a 25-year-old woman who had been hit by a car in Young St.

The first ambulance officers at the scene feared she had suffered massive head injuries.

The flying squad, including NRMA CareFlight doctor Blair Munford, gave the woman life-saving treatment 15 minutes sooner than if she had been taken to the nearest hospital.

In 18 years service with the rescue helicopter organisation Dr Munford

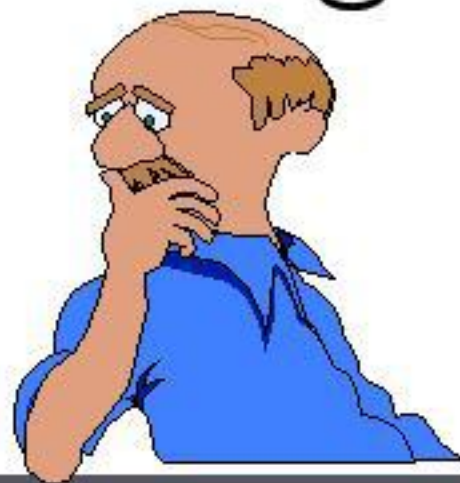
had never landed in the CBD: "It was an interesting experience."

NRMA CareFlight began a trial in March of the head injury retrieval helicopter, which carries a specialist doctor and paramedic.

"We can't stop the accident happening but we can stop the consequences of that," Dr Munford said.

The woman treated yesterday regained consciousness and was taken by ambulance to St Vincent's Hospital in a serious but stable condition.

Q.1. How many "Rescue" helicopters does NZ need?



***I can't answer
that question!***

HIRT Study: Outline (2)

- Daylight operation only
- Scene landing only
 - i.e. no hoist rescue capability
- 3 year planned duration: 540 patients
- Supplementary/independent of existing H.E.M.S.
- Total cost: Aust \$ 7 million
- Fully funded by insurance company



Helicopters do not save lives in trauma



Trauma systems that utilise
helicopters appropriately do

**A helicopter equipped and staffed
just like a road ambulance . . .**



. . . is just an expensive noisy ambulance.

“Use of an ambulance-based helicopter retrieval service”

Wills VL, et al (2000) *Aust NZ J Surg* 70: 506-10

- Audit of 179 helicopter scene responses to trauma patients.
- Only 18% had $ISS \geq 15$ (68% ≤ 9)
- 25% of patients < 35km from hospital
- 36% of patients discharged in < 48 hrs
- 81% patients helicopter non beneficial
- 17% beneficial (but 29 % of these died)
- 1.7% assessed as potentially harmed

What about HEMS with ATLS?

- Baxt WG & Moody P, 1983
Impact of a Rotorcraft Aeromedical Care Service on Trauma Mortality *JAMA* **249**: 3047
- Moylan J, et al , 1986.
Factors Improving Survival in Multisystem Trauma Patients. *Ann Surg* **207**: 679
- Oestern HG, 1985.
The German Model for the Rescue of Trauma Patients. *Can J Surg* **28**: 486.
- Baxt WG, et al, 1985
Hospital Based Rotorcraft Aeromedical Services & Trauma Mortality: A Multi Centre Study *Ann Emerg Med* **14**: 859.
- Baxt WG & Moody P, 1987
The Impact of Advanced Prehospital Care on the Mortality of Severly Brain Injured Patients. *J Trauma* **27**: 365
- Bartolacci R, Munford BJ et al, 1998
Air medical scene response to blunt trauma: effect on early survival *Med J Aust* **169**: 612

All studies show improved outcome over predicted survival

Is it the vehicle or the clinical team?

- Baxt WG & Moody P, 1987.
The Impact of A Physician in the Aeromedical Prehospital Team in Patients with Blunt Trauma. *JAMA* 257: 3246
- Schmidt U, et al, 1992.
On Scene Helicopter Transport of Patients with Multiple Injuries - Comparison of a German & an American system. *J Trauma* 33: 548
- Garner A, Rashford S, et al, 1999.
Addition of Physicians to Paramedic Helicopter Services Decreases Blunt Trauma Mortality. *Aust NZ J Surg* 69: 697.

All studies showed improved mortality with physician based team but not with control group

Garner et al - findings:

- Medical team:

$$Z = +2.72; p < 0.01$$

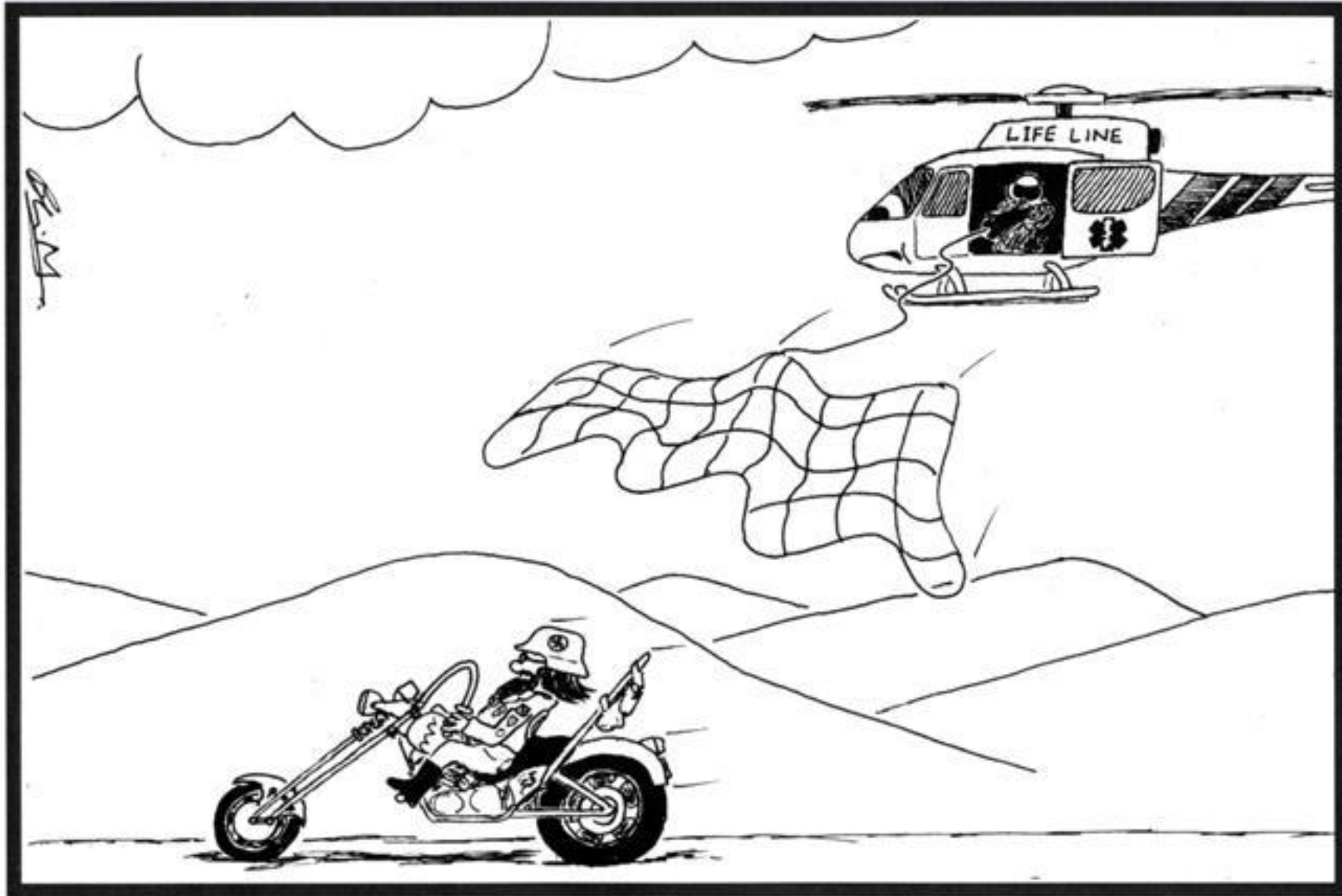
$$W = +9.48 (3.84-15.12)$$

- Paramedical team

$$Z = -1.16; p = 0.25, \text{NS}$$

$$W = -2.37 (-6.81-+2.07)$$

**Comparison between groups: (W statistic) = 13.44
(7.80-19.08) extra survivors per 100 patients, $p < 0.001$**



AIR MEDICAL SERVICES DISCOVER A
POTENTIAL ROLE IN PREVENTATIVE MEDICINE



A HEMS program is only as good as its clinical crew . . .

WHY NOT?



**BECAUSE ... THE QUESTION ITSELF
CANNOT BE ANSWERED IN ISOLATION**



"Aye, there's the rub"

-Hamlet

- Any patient sick enough to need a helicopter (other than purely for difficult access) is sick enough to go to a trauma centre.
- This may mean bypassing the local hospital
- **This is only acceptable if the clinical team has the skill mix to perform equivalent stabilisation on scene/enroute.**

Trauma Centres and HEMS: Symbiosis

- Like pizza & beer
- Like pancakes & maple syrup
- Trauma centre by definition responsible for extended area.
- Therefore needs “outreach” capability
- **But “outliers” who urgently need the trauma centre are least able to tolerate prolonged transport without stabilisation**

Trauma Centres and HEMS:

Highest clinical standard

- *“Because we can”*
 - attributed to early “Pipeline” surfer
- Trauma centre: full clinical resources with a multidisciplinary team
 - Not feasible to provide at every hospital
- **HEMS should also have fullest clinical resources possible & a multidisciplinary team.**
 - **Not feasible to provide on every ambulance**

“Primary” vs “Secondary response

- Irrelevant in trauma!
- Individual response may (?should!) be uncertain at time of dispatch
- Same measures required
- ANZCA/ACEM/JFICM standards for interhospital transport
- Should also apply to scene response to the critically injured.

So how about some answers?

RX



Stage 1: Performance targets

- Trauma Services should lead, not follow
- Decide on realistic targets for trauma patient management
- Then determine whether and what standard of HEMS can help achieve this (versus alternatives)

Example

- E.g. for neurotrauma:
- Patients with GCS <9 should have airway secured and normocapnic controlled IPPV within 60 minutes of emergency call.
- Group A: performed at scene by ambulance
- Group B: transported to hospital in <55mins
- **Group C: the (unlucky) rest**

Now factor in the impact of HEMS

Results



1-3

Critical care “retrieval”
helicopter services based
in 3 major centres.

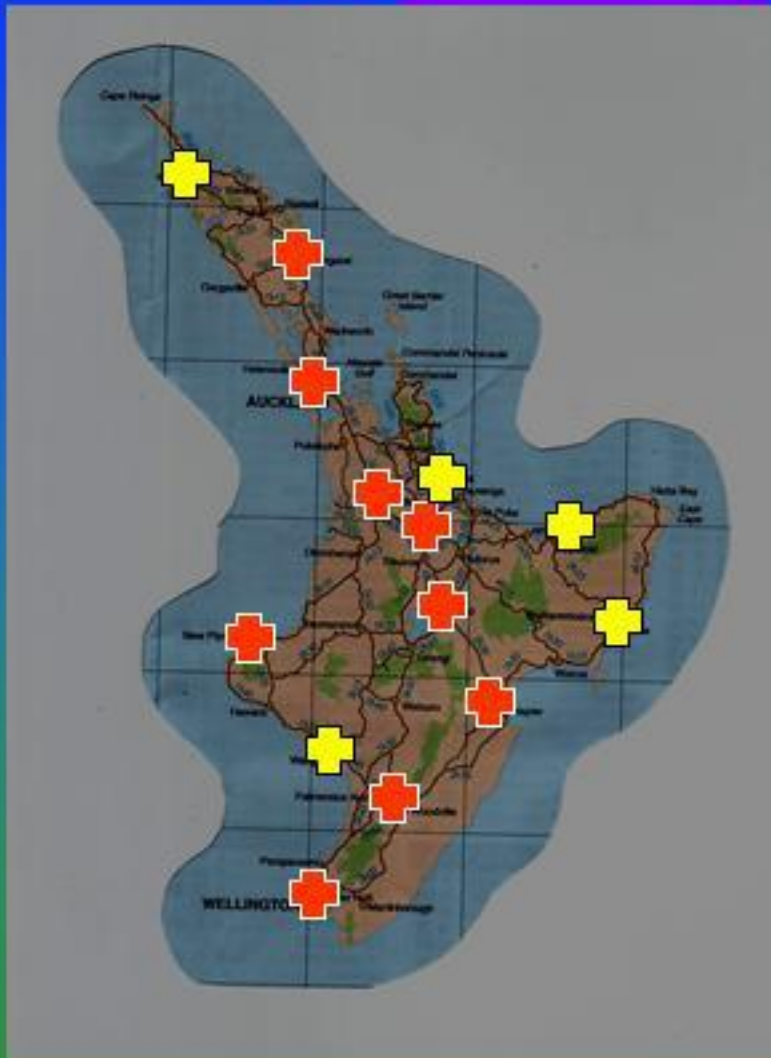
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Ambulance staffed “rescue”
helicopters based in 3
major & 6 regional centres

The “swoop & scoop” approach to entrapped patients can be a problem:



Current NZ situation



- Multiple regional services
- Strongly community supported
- Funding for all trauma casevac & transfers.
- More HEMS per head of population than anywhere else in the world.

Stage 2: System design

- Decide on requirement for HEMS
- Establish services as part of regional trauma plan
- Under regional trauma/critical care system control with centralised tasking
- Funding: standing cost retainer plus operating charge
- Multidisciplinary medical crew (2+)
 - Ambulance/medical/+/-nursing

Stage 3: Tasking

- Central dispatch
- Early callout
 - Mechanism/interrogated response
 - Multicasualty/entrapment
- Respond to scene
 - with potential diversion to local hospital
- Clinical advice
- Backup plan & capability
- Active safety culture



Every (helicopter) home should have one



~~"Can do"~~

vs

"Can't do"



*“To a man who has a hammer,
every problem looks like a nail”*

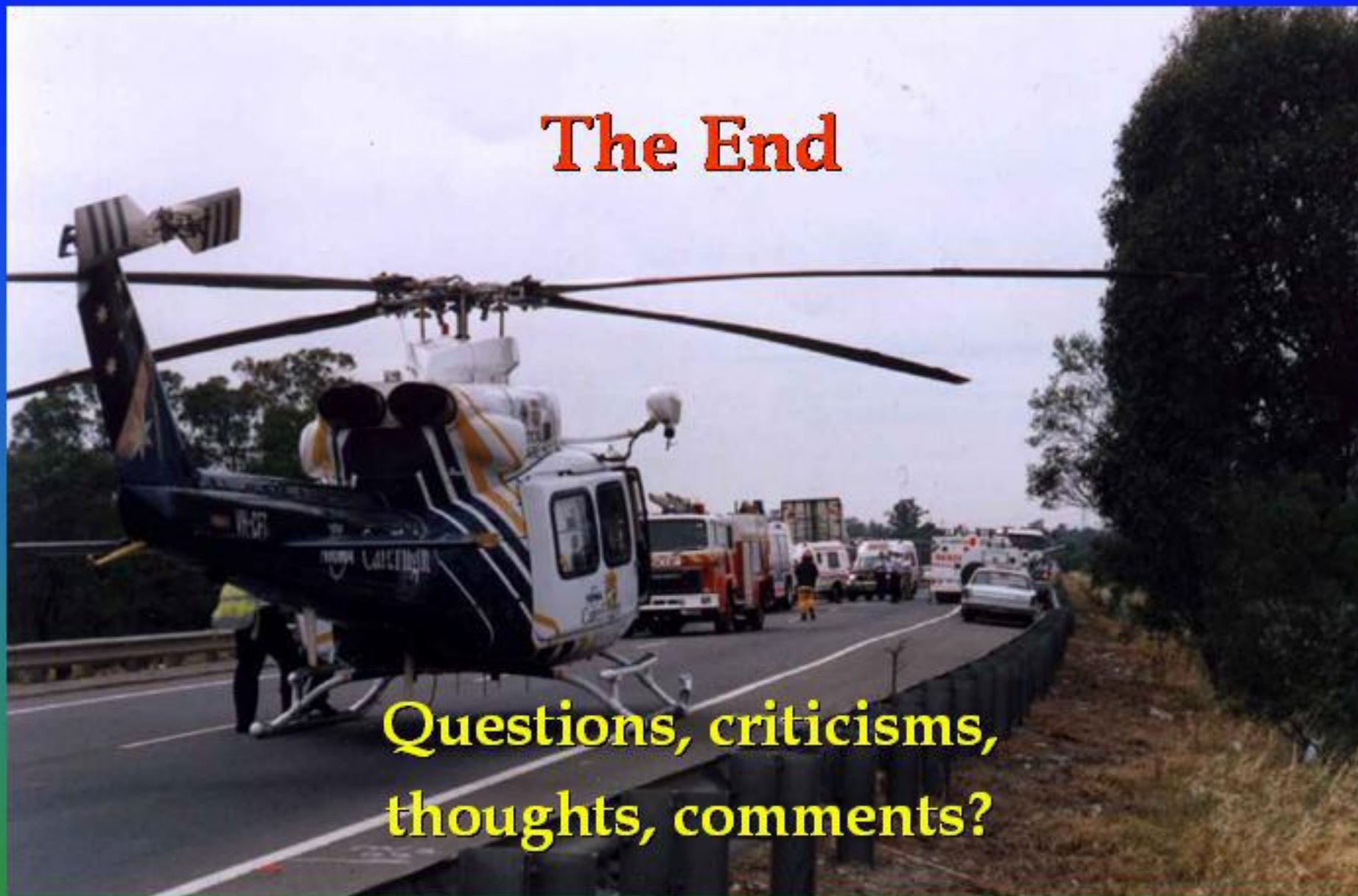
- Anon

SUMMARY

- Trauma systems based on trauma centres need trauma outreach
- Helicopter borne emergency medical services can help provide this
- They are not the whole answer
- Staffing and appropriate utilisation are paramount
- **The key is not more helicopters, but to make better use of less**

The End

Questions, criticisms,
thoughts, comments?





This must be good, right? ■■



Well, maybe not...

A cautionary tale: (Sad, but true)

- Report from NZ provincial daily newspaper
- Farm accident: unconscious patient in ravine
- Regional rescue helicopter responded
- Clinical crew: single ambulance officer
- No on-scene medical stabilisation
- Patient manhandled into aircraft at hover!
- No in-flight medical stabilisation
- Flown to local provincial hospital

Sad, but true : (Continued)

- At provincial hospital intubated & ventilated
- CT scan: sub-dural haematoma
- Loaded back into rescue helicopter
- Flown to regional trauma centre
 - Which has dedicated medical helicopter with rescue hoist & physician/paramedic crew
 - Which was actually closer in a straight line to accident site than the regional rescue helicopter
- SDH drained: made incomplete recovery

Helicopters are intrinsically photogenic . . .



. . . but not intrinsically therapeutic!