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# Draft National Air Ambulance Strategy

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1 December 2004

Please find attached the **Draft National Air Ambulance Strategy**. This document outlines a proposed model for the provision of air ambulance services in New Zealand over the next 5-10 years.

**In seeking to ensure New Zealanders receive world class emergency medical care, the strategy acknowledges evolving technology and professionalisation of emergency transport services, and looks to ensure that these enable improvements in patient outcomes.**

Air ambulance services are used for a range of activities in New Zealand. To be effective, the air ambulance network needs to be integrated with, and complement, both road based ambulance services and the emergency care functions, inter-hospital transfers and other services of District Health Boards.

The draft strategy is very much a strawman. We welcome your consideration and discussion. We have highlighted a number of areas that need significant further refinement. These areas are complex and need feedback from providers, clinicians, users and funders.

We invite you to consider the strategy and respond in the format provided. Following feedback on the draft strategy, the strategy will be finalised in 2005.

Electronic copies of this document and a Feedback Booklet can be found on the ACC website <http://www.acc.co.nz/> or email [REDACTED]@acc.co.nz.

On behalf of the Steering Committee for the National Air Ambulance Strategy, I invite you to consider the issues raised by the discussion document and provide us with feedback **before 25 February 2005** as to your views regarding air ambulance services in New Zealand.



Dr David Rankin  
General Manager  
ACC Healthwise

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# Draft National Air Ambulance Strategy

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## **Air Ambulance Services in New Zealand: A Discussion Document**

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**DRAFT FOR CONSULTATION**

29 November 2004

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# Draft National Air Ambulance Strategy

## Foreword

This draft Strategy provides direction for the future development of air ambulance sector so that it can play a central role within the evolving health system. There is increasing evidence available about the specific contribution air ambulance services can make to improving health outcomes.

This Strategy has not been developed in isolation; it follows on from the New Zealand Health Strategy, New Zealand Primary Health Care Strategy, Roadside to Bedside and the Cull Report – all of which have guided the development of the Draft National Air Ambulance Strategy.

Trends in pre-hospital care are changing, technology is evolving and the air ambulance service has come of age – providing (often fully dedicated) professional high quality, timely clinical care supported by up to date equipment. It is in recognition of this increasing sophistication in the sector that the aim of the strategy is 'for the air ambulance network to provide cost effective pre-hospital care and inter-hospital transfer services complementary to the road ambulance system ensuring people get the right care, at the right time, in the right place from the right person'.

This release of this document for consultation is one of the key steps in the process of developing a National Strategy. The draft document contains more questions than answers and consequently will generate significant and robust debate within the sector. Following consultation, it is anticipated that the sector will continue to work with stakeholders to refine the Strategy ensuring it continues to provide the quality of air ambulance services that the public has come to expect.

The configuration described within this Strategy is one of a range of options that could achieve the above aim. Alternatively, existing air ambulance services are well proven, having served New Zealanders admirably for 20 years, competently providing local solutions to meet local needs. The challenge therefore is to identify an outcome that achieves a balance between the aim of this Strategy and the status quo whilst not losing sight of the quality of service currently being provided.

The detail of the Strategy implementation will evolve over the next few years and may not be fully realised for five to ten years. Further changes may need to be made as more detail comes to light. However, ACC contracts are already in place until October 2006 ensuring current services will be maintained for some time. During this transition there will be opportunities for future work to review and validate some of the core assumptions made in the draft Strategy (e.g. max volumes per HEMS helicopter per year and per day, cost benefit of national coordination, ability to fly from each HEMS base to all points of their flying radius 24/7).

The Strategy considers a new vision for air ambulance services; it does not contain details of implementation, which will involve evolutionary change to protect the gains already made. Involvement and collaboration with the air ambulance sector will be a key feature of the implementation process in the coming years. This is crucial to ensure that all issues and options are considered in developing the new arrangements.

Although this Strategy principally describes a single model, and the air ambulance sector has expressed reservations in regard to the practicality of providing it, it is anticipated that through this consultation process a range of alternate models or variations to the one described will be developed. Readers of this draft Strategy should not draw conclusions if their existing service is not specifically referred to within the draft. The proposed deployment configuration and diagrams are a discussion option only and it is anticipated that feedback from the sector and stakeholders will develop these further and ensure any real or perceived geographic gaps are served appropriately.

It is essential to the process that all parties carefully consider the content of this consultation document and provide detailed comment that ensures their particular expertise or interest in pre-hospital care is tabled for consideration. It is important that the final strategy reflects the best available air ambulance strategy for New Zealand.

# Draft National Air Ambulance Strategy

## Draft for Consultation

This is a draft strategy for the Air Ambulance services in New Zealand. It is the culmination of more than 12 months of discussion with stakeholders about the role and nature of air ambulances in New Zealand.

Following feedback this draft strategy, a final strategy will be prepared in the New Year.

### FEEDBACK ON THIS DRAFT STRATEGY

Title: <b>Draft National Air Ambulance Strategy</b>		
Provide feedback to: [Redacted] Project Manager National Air Ambulance Strategy C/- ACC Healthwise PO Box 242 Wellington  Or by email to [Redacted]@acc.co.nz	From: (Your Name, Address, Telephone)	
	Closing date for comment  <b>25 February 2005</b>	Date of your comments

Comment is preferred in electronic format using Microsoft Word, following the layout below. *Note that this is available as a separate Feedback Booklet for comments to be submitted electronically.*

### GENERAL COMMENT

Type your general comments in the box. The comment box will automatically expand to accommodate comments of any length.

**SPECIFIC COMMENT**

Insert the section heading and page. Insert the page; paragraph and line number as appropriate. Use a new row for each comment.

The rows will automatically expand to accommodate comments of any length. Remove unused rows, or insert additional rows as required. To insert extra rows at the end of the table, go to the last cell and press the TAB key.

<b>Section and Page</b>		<b>Comment</b> <i>Please detail supporting facts and/or rationale exactly</i>

# Draft National Air Ambulance Strategy

## Draft for Consultation

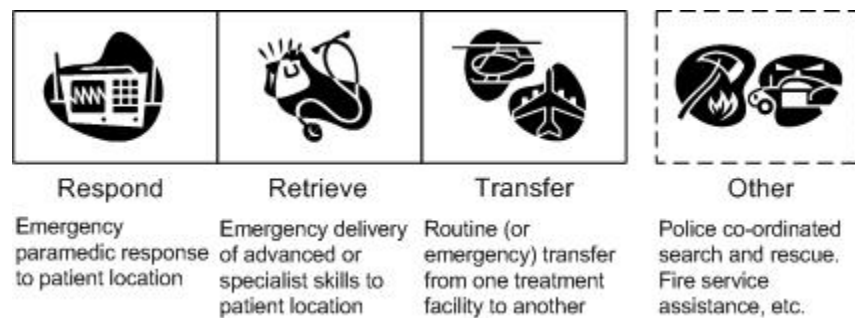
### Executive Summary

The Accident Compensation Corporation (ACC), Ministry of Health and Ambulance New Zealand through the vehicle of their Memorandum of Understanding together with the Air Rescue/Air Ambulance Division of the Aviation Industry Association have sponsored the development of this National Air Ambulance Strategy (NAAS) to ensure an effective and efficient network of air ambulances (both rotary and fixed wing) serving patient needs in New Zealand.

This document is the draft National Air Ambulance Strategy and has been made available for public consultation. The process of development has employed consultation at each step of the way – over the project scope, the assessment of current services, consultation feedback and key elements of the strategy.

To be effective, the air network needs to be integrated with, and complement, both road based ambulance services and the emergency care functions, inter-hospital transfers and other services of District Health Boards. Air ambulance services are used for a range of activities in New Zealand, as illustrated in the Figure 1.

Figure 1 – Range of Activities for Air Ambulance Services



Consistent with established local and international practice, an effective emergency care system that integrates pre-hospital management, hospital treatment and rehabilitation services will optimise patient outcomes. The National Air Ambulance Strategy endeavours to ensure the pre-hospital component of an effective emergency care system will provide a quality rapid retrieval/primary emergency response ambulance service for New Zealand as well as an effective network to meet the needs for urgent and non-urgent inter-hospital transfers.

The strategy proposes a comprehensive network of air ambulances servicing both emergency response and inter-hospital transfer air ambulance needs:



- An enhanced standard of Helicopter Emergency Medical Services (particularly in respect to clinical crewing by advanced paramedics and closer integration with major DHB emergency departments and ICU retrieval teams)
- The preservation of local community rescue helicopters in areas more peripheral to the likely HEMS coverage (i.e. greater than 45 minutes flying time)
- National coordination of inter-hospital transfers by air supported by a network of intensive care air ambulances and associated DHB clinical retrieval teams.

The strategy advances a more consistent and equitable standard with greater coordination of services for all of New Zealand, whilst retaining good local services. It has focused on the nature and quality of emergency pre-hospital clinical service delivery, differentiating it from community need for rescue capability (an established part of local search and rescue service capability). Some areas where rescue resources are not configured as effectively or efficiently for health purposes, while not precluded, have not been explicitly endorsed by the strategy.

The strategy balances clinical advice from leading specialists, clinical colleges and international literature with the strong desire by communities for the preservation of local services.

Recommendations of the strategy, including integration with the new Ambulance Communications Centres, improving national coordination through a flight desk, greater organisation of DHB retrieval services and more streamlined Crown funding processes, will ensure air ambulance services are well integrated with the other pre-hospital emergency medical services and the hospital-based components of the emergency management system to obtain optimal patient outcomes.

# Draft National Air Ambulance Strategy

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## Glossary of Key Terms

ACC	Accident Compensation Corporation
AIA	Aviation Industry Association
CAA	Civil Aviation Authority
Casevac	Missions for the retrieval of acute accident victims in the pre-hospital emergency situation
CFIT	Controlled Flight Into Terrain
DHB	District Health Board
ECCT	Emergency Care Coordinating Team
EMS	Emergency Medical Service
HEMS	Helicopter Emergency Medical Services
IFR	Instrument Flight Rules – operation of an aircraft by instruments when visibility is below minimum visual levels
IHT	Inter-hospital Transfers – the transfer of seriously ill patients between hospitals
Medivac	Acute medical evacuations in the pre-hospital emergency situation
MSA	Minimum Safe Altitude
NAAS	National Air Ambulance Strategy
PHO	Primary Health Organisation – as defined by the New Zealand Primary Care Strategy (Ministry of Health)
SAR	Search and Rescue – Missions initiated by the Police or by CAA via the National Rescue Coordinators Centre, for search and rescue of people either on land or at sea
VFR	Visual Flight Rules – operation of an aircraft in normal visual conditions

# Draft National Air Ambulance Strategy

## Development of the Draft Strategy

### Introduction

The Accident Compensation Corporation (ACC), Ministry of Health and Ambulance New Zealand through the vehicle of their Memorandum of Understanding together with the Air Rescue/Air Ambulance Division of the Aviation Industry Association have sponsored the development of this National Air Ambulance Strategy (NAAS) to ensure an effective and efficient network of air ambulances (both rotary and fixed wing) serving patient needs in New Zealand.

To be effective, the air network needs to be integrated with, and complement, both road based ambulance services and the emergency care functions, inter-hospital transfers and other services of District Health Boards.

This document is the draft National Air Ambulance Strategy and has been made available for public consultation.

It needs to be read in conjunction with the Current State Assessment Discussion Document released in August 2004 that presented a summary of air ambulance services in New Zealand, and the subsequent summary of the consultation feedback. Both of these documents are available by request from ACC.

The earlier published Current State Assessment focuses on air ambulance services, and reviews current environmental issues, including:

- The Health Sector
- The Ambulance Service
- Air Ambulance Services
- Air Ambulance Volumes and Costs
- International Research.

It also takes particular note of the following recent developments and initiatives, including:

- Roadside to Bedside
- Ambulance Communications Project
- National Framework for Delivery, Retrieval and Transfer Protocols
- Standards (AIA, Ambulance Service Sector)
- Sustainable Funding Review for Ambulance Services.

It invited discussion on a wide range of issues, for example:

- The rapid growth of air ambulance services over the past decade
- The sizeable role air ambulances have supporting District Health Boards transferring patients from one hospital to another
- The high number of air ambulances operating in New Zealand (relative to other jurisdictions when we compare geographical area and/or population)

- The low average utilization of air ambulances operating in New Zealand and the consequent high average hourly costs
- The variety of funding sources, particularly of individual communities, sponsorship and the Crown through the Ministry of Health, District Health Boards, and ACC.

As the feedback document graphically illustrated, there exists a wide range of opinion as to how air ambulance services should be configured in New Zealand.

This strategy has endeavoured to build on these first two documents, based on many input sources:

- 100+ members of Emergency Care Coordinating Teams
  - DHBs, primary care, emergency services, health care workers
  - 5 centres: Auckland, Hamilton, Wellington, Christchurch and Dunedin
- Through meetings and workshops, members of key stakeholder organisations:
  - Ambulance New Zealand
  - Aviation Industry Association
  - Air Rescue NZ (previously NZSARTS)
- 65 Written responses to the Current State Assessment Discussion Document
- Prior documentation and knowledge
  - International literature
  - NZ Health Strategy, Roadside to Bedside, Hospital Plan

The strategy recognises the:

- Substantial and historical contribution of communities to existing service network
- Unique geographical challenges of NZ
- Dedication of existing operators who have developed network into what it is today
- Increasingly positive relationship between air operators and Ambulance NZ
- Increasing focus by DHBs on ensuring effective supply of clinical staff for the retrieval and repatriation of patients by air ambulance.

We invite you to consider this strategy for the provision of air ambulance services in New Zealand over the next 5-10 years.

# Draft National Air Ambulance Strategy

## An integrated national network of air ambulances

### Background

#### An Evolving Health Sector

Within the last five years the provision and focus of medical care has changed considerably with a move towards:

- Increasing specialisation and sub-specialisation in many areas of medical practice – changing the nature of services and locality
- Centralisation of acute care, with resuscitation/stabilisation and transportation of patients from smaller centres and definitive care being undertaken at larger hospitals
- Integration of primary and secondary care within the rural health sector with general practitioners becoming more involved in health centres and accident services
- Proportionally fewer hospitals and hospital beds generally as result of increasing population base
- Increased travel distances between secondary and tertiary care providers
- Increasing public expectations of healthcare delivery
- Increased emphasis on preventative and educational health
- Greater use of primary care and PHOs
- Increased emphasis on quality, safety, and outcomes
- Greater awareness and willingness to contribute personally to improve access.

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#### Continuum of Care

The aim of Roadside to Bedside<sup>1</sup> is to ensure an acute management system consisting of a number of complementary components that together should provide a patient-focused, seamless service and the best possible outcome for people who need to access emergency services. For this to occur:

It is essential that people get the right care, at the right time, in the right place from the right person.

It describes a system of five regional networks, incorporating all hospitals and providers involved in trauma and emergency work within a defined geographic region. At the 'hub' of each network will be one of New Zealand's five tertiary centres (Auckland, Waikato, Wellington, Christchurch and Dunedin). The 'spokes' will extend out through secondary hospitals and sub-acute units to health centres and all rural health professionals. Providers will work together to ensure that patients get to the nearest place capable of providing definitive care as quickly and safely as is reasonably practicable. Networks will also need to work together at a national level.

The proposed HEMS network will provide a surer way to implement the regional care networks as envisaged by Roadside to Bedside particularly as:

- Co-located with DHB-based retrieval teams and emergency doctor (referred to by Waikato DHB as an “A-Zero response”) arrangements, greater expertise can be delivered to the side of the patient more quickly than can now
  - Advanced paramedics rostered to HEMS will be more practiced at providing care routinely in an air ambulance and will have greater knowledge of the actual and potential safety and clinical threats to patients than can paramedics who are called on to occasionally staff local helicopters
  - Operating regionally, with close liaison with the regional tertiary centre, HEMS will be better placed to safely deliver patients to hospitals that can provide definitive care improving outcomes and reducing patient inconvenience
  - Approximately 90% of New Zealanders will be able to be access advanced clinical skills within the 60 minute golden hour.
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## Population Health

With the establishment of District Health Boards (DHBs), the emphasis shifted from funding for individual services to funding for a district’s needs. More attention was focused on providing resources for an equitable level of services across the country. The way funding is calculated changed to reflect this new emphasis, ensuring that funds were divided evenly across the country (e.g. Population-Based Funding Formula).

As a result of how services are funded, DHBs have a need to understand the burden of disease on local populations and to develop a greater range of preventative services. In the past, regional services had a ‘sickness’ focus, but are now moving towards both a ‘wellness’ and ‘sickness’ focus.

DHBs have agreed that the DHB of domicile of the patient will pay retrieval and repatriation by air ambulance. Key considerations include:

- The substantial cost and clinical commitment (e.g. training, supervision, etc.) of staffing retrieval teams has led to concern at the potential for too many to be established causing duplication, low utilisation and wastage.
  - The need to be informed by a more robust data set than is currently available. DHBs are collecting data now during the 2004/05 year which will usefully inform the development of a business case for a national network of clinical retrieval teams and air ambulances required to support IHT service needs.
  - The need for agreed clinical standards, dispatch protocols and operational processes to ensure seamless and safe collaboration by DHBs, particularly retrieval teams
  - The compliance costs to the health and aviation sector if the current funding model of 23 Crown funders continues, with operators requiring contracts with multiple funding agencies.
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## Local Decision-Making

Up to 11 board members sit on each DHB board. Seven members are elected every three years at the time of local body elections. In addition to the elected members, up to 4 members can be appointed by the Minister of Health, in consultation with his or her colleagues. The selection process for board member appointments identifies people with capabilities and skills that contribute to the effective functioning of the board.



The strategy proposes an affordable, quality national air ambulance network of HEMS and Fixed Wing Intensive Care air ambulances that will service the needs of patients throughout New Zealand. However, the strategy recognises the right of local communities to establish and fund the health services they perceive they require – either through community donations, local sponsorship or DHB funding.

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### Need for National Frameworks for Co-ordination

The 21 DHBs throughout New Zealand are responsible to the Minister of Health for the health of the population. However, in a devolved environment challenges arise on how to best optimise the use of scarce skills and resources to achieve national health objectives. The need to federate governance arrangements and planning for services such as air ambulance will help understand interfaces between district requirements and the national view (e.g. back-filling of air ambulance flights, inter-district support/backup).

The Ambulance Communications Project<sup>2</sup> and the National Framework for Ambulance Delivery, Retrieval and Transfer<sup>3</sup> have highlighted the need for greater national co-ordination for air ambulance services.

It is important that these services integrate with the broader emergency management framework and systems for coordinating services to optimise patient need, resource utilisation and simplify data collection. DHBs are encouraged to ensure that this occurs, specifically:

- Rescue helicopters, for air ambulance services, and HEMS may only be dispatched through ambulance communications centres for all missions including IHTs
  - National Flight Desk is able to provide a complete information service as to IHT current and planned IHT operations, that quality data is collected in one place and that services are coordinated in such a way that urgent calls for assistance can be responded to with the nearest and most appropriate resource.
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### Small Rural Hospitals and Transport

Changes in health care delivery have increasingly challenged the availability of some medical specialities at smaller hospitals. Difficulties to retain staff with specialist skills by small rural hospitals have increased the need to transport patients quickly and safely to major hospitals for treatment and rehabilitation.

The lack of specialist skills available in rural areas have also increased the demand for quicker transport of specialist hospital and paramedical staff to emergencies and the retrieval of patients to specialist medical facilities.

This strategy proposes greater use of regional tertiary based retrieval services – either HEMS or Intensive Care Fixed Wing services – in order to deliver more advanced skills to patients earlier than is otherwise available. In most instances this is through retrieval and back-up to local services at the scene or point of stabilisation (e.g. GP/rural health centre).

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## Why we need a strategy for Air Ambulance services

Consistent with established local and international practice, an effective emergency care system that integrates pre-hospital management, hospital treatment and rehabilitation services will optimise patient outcomes.

The pre-hospital component of an effective emergency care system needs to provide a rapid retrieval/primary emergency response ambulance service. That service is provided primarily by road ambulance and emergency air ambulance helicopters. Fixed wing aircraft and emergency helicopters are also used for urgent and non-urgent inter-hospital transfers. Air ambulance services, therefore, need to be well integrated with the other pre-hospital emergency medical services and the hospital-based components of the emergency management system to obtain optimal patient outcomes.

The last review of air ambulance services in New Zealand was in 1996. This was a scoping report for ACC and the combined Regional Health Authorities as to the establishment of a national air ambulance network. Specifically, it sought to give operational effect to the Royal Australasian College of Surgeons (RACS) Trauma Care Guidelines as they affect the provision of emergency air ambulance services.

Since that time, there has been considerable progress in many areas including:

- Standards – new Ambulance Service Sector Standards have been promulgated.
- Service Specifications – common service specifications between the Ministry of Health and ACC have been implemented.
- Implementation of nationally consistent emergency dispatch protocols
- Development of a protocols framework for the delivery, retrieval and transfer of patients in New Zealand providing a foundation upon which local protocols for the transport of patients can be built in conjunction with regional Emergency Care Co-ordinating Teams established to implement the vision of *Roadside to Bedside*.
- Communication Centres – agreement by ACC and the Ministry of Health to a business case for the rationalisation of the current eight centres to three, based in Auckland, Wellington and Christchurch, and the implementation of standard modern technologies to improve quality and service.

These and other developments in the sector have meant that much has been done to progress many of the issues identified in the 1996 report. However, some of the issues identified in 1996 persist and there is concern within the sector that supports the need to look now at how we can improve the current air ambulance services network in New Zealand. Current issues include:

- Independent contracting approaches by Crown agencies – the 21 DHBs, Ministry of Health and ACC – has led to fragmentation, duplication and inefficiency including coverage, funding models and standards
- Concern at poor coordination of flights between regions, or within a region when things are busy
- Lack of information on activity, patients serviced, quality or cost
- Concern expressed from within the ambulance sector regarding:
  - Representation of sector interests by industry bodies
  - Part-time pilots with planes competing with dedicated operators
- Concern over conflict of interests
- Inappropriate use of helicopters for long distance travel
- Variable clinical retrieval team staffing practices by DHB

- Development of regional or district solutions that have promoted greater supply which appears to have had the effect of:
    - lowering quality (e.g. labour cost of pilots, part time operators)
    - constraining the investment capability of operators to upgrade machines and equipment
    - creating duplication in frontline and back up aircraftwithout necessarily improved quality local communities should expect, or the lower costs as would naturally occur in a contestable market.
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What work is in progress to address these issues?

It is worthwhile to recognise that promising efforts to address many of these issues are underway:

- DHBs are working collectively to improve cost and activity data
  - New communications infrastructure and state of the art communication systems, funded by ACC and the Ministry of Health are being implemented by Ambulance New Zealand
  - DHBs are clarifying the provision of clinical retrieval teams
  - DHBs, with ACC, are developing services specifications for IHTs with minimum quality levels, response times, etc.
  - Ministry of Health is unbundling the Central Region IHT road ambulance funding and transferring it to the population based funding approach as it is elsewhere in New Zealand
  - Both AIA and Ambulance New Zealand are working to improve trust of their members in their respective governance arrangements, member representation and organisational relationships with key stakeholders.
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## Overview – A Proposed National Network of Air Ambulances

The purpose of this strategy is to outline how New Zealanders can be assured of an effective and efficient network of air ambulance services to patients in need of pre-hospital care and transportation to and between health facilities.

The strategy has focused on the three issues that are most important to improving the patient-focus, effectiveness and efficiency of air ambulance services in New Zealand. For each of the three issues it makes a number of recommendations and proposes a high level implementation plan. The three key issues are:

1. Ensuring clarity in the role and definition of Air Ambulance Services in New Zealand
2. Ensuring effective operational coordination of air ambulance operations
3. Improving the air ambulance funding model and contracting process.

Each of these issues is addressed in the chapters that follow.

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### Aim

The air ambulance network should provide cost effective pre-hospital care and inter-hospital transfer services complementary to the road ambulance system ensuring that people get the right care, at the right time, in the right place from the right person.

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### Principles

Principles that should drive the funding and provision of air ambulance services are:

- Quality emphasis – compliance with standards for patient care and safe transport
  - Community participation and choice
  - Collegiality and service
  - Maintenance of standards through Membership of Ambulance New Zealand (ensures service quality) and accreditation by AIA (ensures aviation quality)
  - Transparent governance, funding and tendering
  - Coordination and utilisation
  - Efficient and affordable.
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## Key Themes

### More specialist clinical skills to patients, earlier

For the vast majority of patients, earlier access to more specialist skills leads to better outcomes. Air ambulances have a key role in delivering these skills to patients so that care can be delivered pre-hospital.

Current demand levels, the need to maintain competency and good practice skills, the need for dedicated clinical resources from hospitals and the cost of providing more specialist skills means these need to be distributed through New Zealand and available primarily as a first response, or back-up to local emergency resources.

Some services of New Zealand already provide the service level proposed by this strategy for emergency responses by HEMS. The majority of services however, who undertake on average one mission every three days, are challenged to maintain the competency and familiarity of clinical skill that a HEMS would provide. This strategy proposes that as a consistent high quality standard for all of New Zealand.

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### Faster is not always better

The balance of clinical opinion canvassed during the development of the strategy is that it is better to wait slightly longer for better quality clinical care than to save up to half an hour through faster access to care that is not as practiced, as familiar or of the same clinical standard.

The proximity of provincial centres to regional tertiary centres in New Zealand enables us to cost effectively support provinces with higher quality services by air. Few provincial centres are more than 80nm (or 40 minutes flying time) from a regional tertiary hospital e.g. Queenstown – Dunedin, Invercargill – Dunedin, Wanganui – Wellington, Nelson – Wellington, Whakatane – Hamilton. New Plymouth – Hamilton is approximately 90nm. For this to be effective, we will however need to ensure effective support systems are in place, including robust dispatch criteria and best practice mobilisation times.

Where there are longer distances to tertiary centres and good support from local DHBs, additional HEMS are proposed by the strategy to complement the proposed HEMS coverage from tertiary centres (i.e. Whangarei for the Far North and Hastings for East Coast of the North Island).

On average existing HEMS services respond to 1 mission per day. Using them more than we currently do is more efficient, more affordable as a nation, and the new standard proposed by this strategy will provide a better quality of service.

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### Preservation of urgent local rescue capability

New Zealand geography, our active outdoor lifestyle and our growing tourism industry means that there will always be a need for local communities to support search and rescue. Inhospitable terrain, changeable weather patterns and challenging terrain for rescue pilots means that the unpredictable and occasional call for urgent rescue needs local rescue helicopters and their pilots with local knowledge to rapidly respond when called.

As is the case now, local communities and sponsors contribute substantially to preserve the capability of these services. This strategy recognises the strong local support for these services and the important urgent service they provide. These services are particularly important when:

- Patients require urgent extrication from inhospitable terrain and local pilot skills or helicopter equipment are appropriate to the needs of the mission
- Patients require transport for critical life-saving skills of the nearest health facility.

It is important that in an integrated system, advanced clinical skills support local rescue efforts through timely back-up and retrieval.

## Defining Air Ambulances Services

There are two key services provided by air ambulances in New Zealand. The first is the provision of emergency response to the need for pre-hospital care and transportation to a health facility. This requires the delivery of specialist clinical skills to the patient at the scene, and the transportation of the patient to an appropriate health facility. In most instances the local district hospital will be able to provide the patient with definitive care. Occasionally, a local medical or health centre may be all that is required. On other occasions, the patient requires the specialist care from a regional tertiary hospital for their definitive treatment.

The second service is the transfer by air of patients from one health facility to another. This requires specialist clinical skills to accompany the patient during the transfer. This is usually in order for more specialised care to be provided to the patient than is otherwise available locally. Most occasions this means a transfer to one of the five regional tertiary hospitals – Auckland (including Auckland City, Starship and Middlemore), Hamilton, Wellington, Christchurch and Dunedin. Clinical staff may be provided by the hospital sending the patient, or a specialist team from the receiving hospital will retrieve and accompany the patient back to the receiving hospital.

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### Emergency Air Ambulance Services

The strategy proposes a network of emergency helicopters that will continue to provide coverage to all significant populated areas of New Zealand by using existing rescue helicopters (e.g. Palmerston North, New Plymouth, Greymouth) complemented by an enhanced network of high-quality and dedicated Helicopter Emergency Medical Services (HEMS).

The strategy proposes a HEMS network that will provide services to New Zealanders:

- Primarily retrieving patients to the nearest definitive care provider – either the nearest regional tertiary centre, or local health services where suitable
- Covering approximately 90% of the population, within a radius of major centres and major incidence of road trauma
- Staffed by flight-trained advanced paramedics, rostered to the HEMS but rotating through road ambulance duties ensuring well-rounded and practiced skill sets
- Supported by regional hospital services:
  - specialist emergency doctors from who are available to respond when required
  - dedicated retrieval teams of aero-medical trained doctors and flight nurses providing support to fixed and rotary wing retrievals
- Providing support to remote health centres and provincial hospitals triaging and stabilising patients
- Enabling urgent intensive-care inter-hospital transfers, complementing fixed wing and road ambulance transfers
- Delivering advanced clinical skills in support to local rescue efforts where patients have been extricated from inhospitable terrain.

The HEMS network will be supported by existing local rescue helicopters whose role will be predominantly rescue-related, providing urgent local response when patients require

rescue from inhospitable locations while supporting specialist clinical skills are brought to the patient.

This network will, as now, provide a range of services to their local communities of which a part is supporting emergency ambulance services. In some centres, the 'rescue helicopter' may be a roster of local operators as they are now in Queenstown. Rescue helicopters would not ordinarily transport patients for more than 30 minutes (i.e. HEMS should already be en-route with specialist clinical skills to uplift the patient for transport to a definitive care provider).

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## Emergency Response - Dispatch Criteria

The key to safely transporting any patient is getting the appropriate skills that the patient's condition requires to the patient, or the patient to them, within the clinically required time. The National Framework for Ambulance Delivery, Retrieval and Transfer<sup>4</sup> (NFADRT) proposed a decision tree for assigning skills and the mode of transport to patients according to need. A Clinical Reference Group advising the strategy believes that these schema, based on time and skills, are appropriate to base the dispatch of all modes of aeromedical transport upon. To develop a system equitable for all New Zealanders, this strategy needs to focus on patient needs, regardless of location, rather than existing regional protocols.

Getting patients with life threatening trauma to stabilising care, with appropriate escort, within an hour remains an expected principle by the Clinical Reference Group. An Australian study<sup>5</sup> appeared to show significant patient survival benefit to having skilled physician participation in HEMS, and a prospective randomised controlled trial is underway in Sydney to test this hypothesis. A recent report on HEMS in the United Kingdom<sup>6</sup> identified that HEMS might save 2-3 lives/100 cases of serious blunt trauma but the difficulty is appropriately assigning aeromedical transport to patients. The decision assisting program "ProQA" is in use in New Zealand and with consensus adjustment for New Zealand conditions the Clinical Reference Group believes it should be able to implement the principles of the NFADRT for the majority of primary air ambulance tasks. There is also an important issue of equity of 'access' to emergency care services, and HEMS enables a similar level of care to be provided for all patients in the population wherever they live.

The appropriate allocation of skill to aeromedical patients can be assisted further by having clinical expertise available to the Ambulance Dispatcher. Various strategies are used around the world. The London Helicopter Emergency Service has a paramedic reviewing ambulance calls for potentially serious trauma cases and who further questions the caller for more detailed information which has substantially reduced the number of inappropriate HEMS responses<sup>7</sup>. The French have a physician on 24 hour immediate contact to provide clinical expertise to the Ambulance Dispatch centre to help with the decision to allocate clinical expertise or aeromedical resource to a case<sup>8</sup>. The Clinical Reference Group believes that there is a need to provide aeromedical transport expertise to the ambulance dispatch centres, augmented by medical expertise on call. These systems are in use by all the International Medical Assistance organisations and this model should be able to be used within New Zealand.

Data collection and audit in the ambulance service needs to be improved, and begins with robust collection at point of dispatch and job oversight. Mortality, while easily measured, does not provide the only measure of the effectiveness of an ambulance (air or road)



service. The sector should focus on initiatives that will assist in the measurement of morbidity and functional independence. While substantially harder to obtain, these measures provide better information on effectiveness of intervention.

Once implemented, ACP will provide a robust data set and audit methodology that should be used by ECCTs to review the appropriateness of protocols and the effectiveness with which they are being adhered to by Ambulance Communications Centres.

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## Improving and Standardising Clinical Crewing

This strategy proposes an enhanced level of professional staffing for HEMS in line with emerging clinical evidence from overseas. While internationally there are substantial differences in the crewing profile of air ambulance services, the use of volunteers is extremely limited with the emphasis on full-time professional staffing.

Operational crews proposed by this strategy are:

- Standard - 1 pilot, 1 crewman, 1 flight trained advanced paramedic; with a second paramedic on call as required
- A0 ("A Zero") - 1 pilot, 1 aero-medical trained doctor, 1 flight trained advanced paramedic.

An A Zero response does require the support of the base hospital and appears to be operating at varying degrees throughout New Zealand now. For example, the current Otago HEMS responds to approximately 40% of missions with medical staff from Dunedin Hospital onboard. This strategy proposes that HEMS services in New Zealand formalises and standardise this arrangement to ensure New Zealanders can access superior pre-hospital care within a reasonable timeframe.

The A0 response is in line with many European crewing models and can be found through Switzerland; France, Germany, Norway and Italy. While New Zealand would struggle to afford this as a standard crewing model, the Waikato Hospital experience is that a doctor on call for A0 responses from the emergency department works very well when required.

Advanced paramedics should be rostered to the HEMS on a 24x7 basis. They should rotate through regular road ambulance duties ensuring their clinical and patient management skills are maintained and well rounded. They should also be specially flight trained to a similar level as is found in medical training for doctors and flight nurse training for nurses. This will provide in particular provincial and rural New Zealand with greater confidence in the safety and quality of care they will receive relative to that usually available to them today.

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## Operational Area - Urban and Rural Areas

The usefulness of helicopters in remote or rural areas where they can reduce response times and time to definitive care is widely recognised. Evidence suggests that they can improve outcomes in time dependent emergencies such as serious trauma and coronary emergencies. Of course, improved response times could also be achieved by a sufficient increase in ground ambulance resources, and it may seem therefore that the HEMS question is just one of cost-effectiveness. However, when the time to definitive hospital care is also considered, there is no realistic possibility of increasing hospital-based

emergency care resources to meet the needs of all emergency patients, and consequently, the effectiveness of HEMS in remote rural areas is clear.

Importantly, the strategy endorses the primary ability of HEMS to deliver expert and experienced emergency care to the scene, rather than just their ability to improve response and transfer times. The ability to transport advanced paramedic skills, familiar and practiced in providing care in air ambulances, is a significant enhancement to the original concept of the 'golden hour' where patients twenty years ago required transport to hospital for what are today basic life-saving skills available in the pre-hospital environment.

Bringing a doctor to the patient is in many situations advantageous. The model of emergency department or intensive care doctors responding to particular and well triaged incidents like that developed by Waikato and Dunedin Hospital are recommended by this strategy. The advantages are that a single doctor can extend the skills of the advanced paramedic's emergency pre-hospital care and that the service is able to more confidently deliver patients to the most appropriate source of *definitive* hospital care, not just the closest.

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#### Operational Area - Geographical and Population Size

The HEMS coverage proposed by this strategy ensures coverage of over 90% of the New Zealand population within a 45-60 minute flight time. With better integration with road and search and rescue operations envisaged through the new ambulance communications centres, this will provide superior quality of pre-hospital emergency care.

Operational imperatives that the strategy proposes are required to ensure improved services include:

- Continued refinement in on-scene triage for HEMS back-up based on the clinical expertise providing on scene triage (e.g. PRIME doctor, advanced paramedic) and taking into account clinical risks according to best practice protocols (i.e. ProQA being implemented through Ambulance Communications Project)
- More frequent use of standby to minimise mobilisation times
- More frequent precautionary back-up dispatch (provided there are contracting arrangements to support this).

HEMS use within a 40-50 kilometre radius of urban areas is not envisaged by this strategy in the normal course of operations. Exceptions may include an incident where there are multiple casualties and/or traffic congestion will jeopardise timely service by road ambulances.

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#### Improving rotary wing air ambulance services

Rotary-wing air ambulances, in contrast to fixed-wing, perform a wide variety of roles. Over the past decade, the proportion of air ambulance related work has diminished as the number of helicopters has increased relative to the available air ambulance work. Roles today incorporate casevac, medivac, inter-hospital transfers and other work such as search and rescue.

The strategy calls for a stronger emphasis on quality – in terms of patient care and of safe transport. Quite apart from being substantially more expensive than alternative

transportation, helicopter travel is inherently risky and should only be used when it is probable that clinical risks to a patient are outweighed by risks (and relative discomfort) associated with rotary wing travel.

There are two categories of rotary wing services proposed that are designed to balance the needs for local DHB flexibility and cost effectiveness with ECCT regional care coordination, utilisation and quality.

There are a number of components to improving rotary wing air ambulance services:

- Configuring a service network that balances higher quality and skilled response with the needs for urgent rescue and extrication from inhospitable locations.
- Funding of HEMS should recognise the emergency preparedness (service capacity) that is required for 24x7 operations.
- Ministry of Health and ACC agreement of common service specifications, quality measures and process measures to ensure transparent commercial practices
- Collection of quality data measures should occur as part of routine processes, not as an additional compliance based data collection
- Ensuring the integrity and quality of the system means that only industry accredited quality providers who are members of Ambulance New Zealand should provide Rotary Wing Air Ambulance Services.

### Categories of Rotary Wing Service

Two categories of rotary wing services are envisaged, balancing local community imperatives for urgent response for the extrication of patients from inaccessible locations and the need to ensure rapid access to superior quality HEMS services (includes aircraft, utilisation, skills, access to medical crewing, etc).

HEMS Air Ambulances could be based in seven centres, based largely on population and a 45-60 minute range from base. They will provide primary response to the need for advanced skills at the scene of an emergency, and will need to work more closely with ambulance communications centres to better anticipate their needs through better use of standby and earlier dispatch, cancelling en route if not required. They will also provide back up to locally based Rescue Helicopters.

Characteristics of Helicopter Emergency Medical Services (HEMS) include:

- Rostered, on-site Advanced Paramedic with air ambulance training, rotated through road duties for maintenance of rounded clinical skill set
- Ready access/on call emergency specialist (emergency medicine, trauma surgeon, intensivist) sourced from tertiary DHBs (similar to Waikato's A0 response) with aero-medical training
- Experienced pilots
- Purpose built aircraft and facilities
- Fully dedicated, 24x7
- 'Float' within broad ECCT regions, delivering patients to appropriate hospital relative to the scene
- 'Home' tertiary DHB for clinical staff training, credentialing and competency
- Capacity funding for emergency response capability matched by reduced fee-for-service.

Consistent with overseas performance, time from call to HEMS Unit to take-off service levels should be revised to 5 minutes during the day and 20 minutes at night.

On occasion, HEMS may as is the case now, provide urgent services to Police and the Rescue Coordination Centre. However, these should in future be requested through the ambulance communications centre so as to take into account regional emergency resource demands.

Due to the special service needs of intensive care HEMS, it is proposed that these be encouraged to be located in:

- Whangarei
- Auckland
- Hamilton or Tauranga
- Hastings
- Wellington
- Christchurch
- Dunedin.

Consideration will also be given to the location of additional rescue helicopter coverage for the Central Plateau. This could be located in Palmerston North. We seek further discussion on how to best achieve appropriate coverage in this area and the central North Island.

Suitable aircraft considered to be a good fit to HEMS service needs in New Zealand would have the following characteristics:

- Good access to patients
- Capable of 2 stretchers if needed.
- Agile
- High wind start up/shut down
- Operates well in high wind
- Two pilot capable
- Twin engine
- Isolated patient compartment from pilots
- Common in New Zealand
- Good space for reasonable size crew.

While the strategy does not preclude the use of aircraft that are superior in size or performance for HEMS use, this is a factor for local community and DHB consideration and should not be reflected in HEMS contracts.

Rescue helicopters, like other search and rescue resources, should continue to be based close to the district they serve. They will provide speedier extrication of patients when a HEMS is not immediately available, or there are specialist pilot skills required given the terrain (e.g. mountain rescue from the Southern Alps).

In most cases where they are within 30 minutes of a definitive care facility, they will transport the patient. In other cases, they will transport the patient to a safe location where the patient can be stabilised, and care transferred to a HEMS for transfer to a more distant definitive care facility (as is the case where patients are often taken from a mountain for stabilisation in Queenstown, and immediately transferred to Dunedin). They should not ordinarily be used for lengthy patient transport.

Characteristics of local rescue helicopters include:

- Provide for local community identification and sponsorship
- Integrate with national communications for coordination, backup, safety
- Use of local operators with experienced pilots
- May or may not be dedicated depending on local demand
- Preferably purpose built aircraft and facilities
- Back-up capability for HEMS.

Rescue helicopters will need local arrangements with road ambulance services for on-call flight trained paramedics.

Given their special circumstances, the strategy and industry recognise that rescue helicopters should be considered as essential in the following areas to ensure complete emergency network coverage:

- New Plymouth for urgent mountain and off-shore rescues (approximately 90nm/45mins flying time from Hamilton HEMS)
- Gisborne – for urgent access north to East Cape (approximately 80nm/40mins flying time from Hastings HEMS)
- Greymouth – for urgent support to West Coast, including mountain rescue and transport to Greymouth for stabilisation (back up from Christchurch HEMS or Christchurch or Wellington fixed wing air ambulance)
- Queenstown (approximately 80nm/40mins flying time from Dunedin HEMS)
- Invercargill (approximately 80nm/40mins flying time from Dunedin HEMS)

Rescue helicopters in other areas will be dependant on community ability to support such a service. Community based rescue helicopters will be engaged as part of the emergency response network on a fee for service basis at a predetermined contract rate as they are now.

The two categories of rotary wing services are contrasted in the following table.

	Rescue Helicopter	HEMS
<b>Service Specification</b>	Joint MOH/ACC	Joint MOH/ACC
<b>Standards</b>	Member Ambulance NZ Accredited AIA	Member Ambulance NZ Accredited AIA
<b>Clinical skill set</b>	Rescue Crewman; Minimum Paramedic, as required	Advanced Paramedic, air trained full time; Specialist Doctor, air trained on call
<b>Clinical resources</b>	Local arrangements	Local arrangements – Road Ambulance (advanced paramedics) and DHB (doctors)
<b>Workload</b>	District	Regional
<b>Dedicated</b>	As required	Yes – 24/7
<b>Flight desk</b>	Exclusive dispatch for air ambulance missions (including IHT), and aircraft tracking by Ambulance Communications. Others e.g. SAR may contact operator directly but operator must first notify Ambulance Communications	Exclusive dispatch for all missions (including SAR, IHTs, etc.), and aircraft tracking by Ambulance Communications
<b>Focus</b>	Timely rescue and extrication of patients from inhospitable locations and delivery to advanced skills (HEMS, road ambulance or local hospital)	Delivery of advanced skills to patient/scene, facilitating delivery to definitive care within ECCT region according to protocol
<b>Contracting</b>	Local arrangements	Nationally coordinated
<b>Funding model</b>	Local arrangements	Mix of emergency capability (national) and fee for service
<b>Sponsorship opportunity</b>	Local / Regional	National
<b>Aircraft Specification</b>	Winch/strop Experienced, senior pilots VFR Night vision goggles	Twin engine Winch/strop Prefer experienced pilots IFR capable Night vision goggles
<b>Mobilisation</b>	20 minutes day 30 minutes night	5 minutes day 20 minutes night

## Inter-hospital transfer by Air Ambulance

Inter-hospital transfers (IHTs) will be provided by a network of dedicated intensive care fixed and rotary wing air ambulances:

- Primarily retrieving and repatriating patients from tertiary centres
- Primarily fixed wing, particularly where rotary wing transfers approach or exceed 90 minutes flying time
- Based from DHB hospitals providing dedicated retrieval team capability:
  - dedicated retrieval teams of aero-medical trained doctors and flight nurses providing support to fixed and rotary wing retrievals
  - specialist emergency doctors from who are available to respond when required.

A second tier of fixed wing air ambulances will provide back up to intensive care services, co-ordinated by the national flight desk when required.

The draft strategy proposes a minimum number of intensive care fixed and rotary wing air ambulances until such time as the current process by DHBs to better quantify and define IHT air ambulance service needs is completed. The intensive care services proposed here will provide for most neonate, paediatric and some adult inter-DHB IHT needs. It is acknowledged however that the vast majority of current services are provided by the second tier proposed in this strategy. The strategy proposes that a collective agreement (/business case) is developed by DHBs late in calendar 2005 based on the activity data currently being collected on air ambulance IHTs to determine a final configuration of intensive care and second tier services that will best meet the needs of DHBs for fixed and rotary wing IHT services.

Of note is the significant variability amongst DHBs as to the choice of mode for routine IHTs for trips of 100-200km. Some routinely use road ambulances with 2-3 ambulances travelling inter-city daily, others rotary wing and others fixed wing air ambulances. More than anything else, this appears largely due to historical practice but clearly has significant cost implications for some DHBs. A commitment by DHBs to a robust collection of data – covering road and air IHTs – will be critical to inform any useful review of activity and agreement as to appropriate levels of quality and cost.

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### Categories of Fixed Wing Air Ambulances

Fixed-wing air ambulances, with very few exceptions, provide services that are exclusively inter-hospital transfers (IHTs). These range from quality intensive care air ambulances requiring a pressurised aircraft, sophisticated equipment and a specialist clinical retrieval team, through to cost efficient air transfers for stable ambulatory patients.

There are two categories of fixed wing services proposed that are designed to balance the needs for local DHB flexibility and cost effectiveness with national coordination, utilisation and quality.

There are a number of components to improving fixed wing air ambulance services:

- Configuring a service network that reflects the range of DHB need – from a need for quality intensive care air ambulance capability through to cost efficient air transfers for stable ambulatory patients
- Funding of air ambulance IHTs is by the DHB of domicile. However, improved IHT coordination requires clearer IHT coordinator roles in DHBs particularly improved out of hour arrangements to avoid unnecessary delays and confusion regarding clinical escort requirements and choice of providers
- DHBs and ACC agreement of common service specifications, quality measures and process measures to ensure transparent commercial practices
- Roster costs are substantial for clinical retrieval teams; therefore the fewer, more coordinated services, that meet patient clinical needs, are sensible. These need capability to operate nationally ('float') according to need, but will need the appropriate clinical support environment for supervision, training and peer review that a 'home' DHB should provide
- Collection of quality data measures should occur as part of routine processes, not as an additional compliance based data collection

- Ensuring the integrity and quality of the system means that DHBs should use only industry accredited quality providers who are members of Ambulance New Zealand
- Improved coordination for air ambulance IHTs through a single, specialist flight desk that will:
  - provide a one-call service to locate the nearest and most appropriate air ambulance
  - coordinate logistics (crews, equipment and road ambulance pick up/delivery)
  - support of the dialogue between clinical teams at the sending and receiving hospitals
  - provide robust data on activity, service and quality
  - lead to improved utilisation of air ambulances
  - support better safety and quality.
- Avoiding competing or duplicate communication and coordination for inter-DHB travel services, while providing local flexibility for intra-DHB IHTs.

Two categories of Fixed Wing Air Ambulances are proposed, balancing local DHB imperatives for operational flexibility and cost effectiveness and improved national coordination and support.

Intensive Care Fixed Wing Air Ambulances (“tier one”) should be based in the larger tertiary centres, which have the infrastructure and staffing to support clinical retrieval teams. They should operate seamlessly throughout New Zealand, supporting urgent and scheduled transfer of patients who particularly require intensive care services while in transit. Intensive Care Fixed Wing Air Ambulances will provide a primary ‘backbone’ service for IHTs located in:

- Auckland
- Wellington
- Christchurch.

An Intensive Care Fixed Wing Air Ambulance network includes:

- Clinical retrieval team staffing based from tertiary DHBs
- Experienced pilots
- Purpose built aircraft and facilities
- Fully dedicated, 24x7
- Ability to ‘float’ nationally, requiring agreed clinical crewing standards by DHBs
- ‘Home’ tertiary DHB for clinical staff training, credentialing and competency
- Capacity funding for emergency (IHT) response capability matched by reduced fee-for-service.

Stretcher Care Fixed Wing Air Ambulances (“tier two”) should be based in areas of need as determined by DHBs (such as Hastings by arrangement with Hawkes Bay DHB). They should be integrated with a national flight desk and be available in support of the Intensive Care Fixed Wing Air Ambulances as well as providing services to their local DHB(s).

DHBs have expressed concern that the number of retrieval teams is managed to avoid duplication and excessive cost to the public of New Zealand. This issue should also be addressed by the DHB collective agreement (/business case) as recommended by this strategy.

Characteristics of Stretcher Care Fixed Wing Air Ambulances include:

- Maximise operational flexibility for DHBs



- Provide for local community identification and sponsorship
- Integrate with national communications for coordination, backup, safety
- Use of local operators with experienced pilots
- May or may not be dedicated depending on local demand
- Preferably purpose built aircraft and facilities.

The two categories of fixed wing air ambulances are contrasted in the following table.

	Stretcher	Intensive Care
<b>Service Specification</b>	Joint DHBs/ACC	Joint DHBs/ACC
<b>Standards</b>	Member Ambulance NZ Accredited AIA	Member Ambulance NZ Accredited AIA
<b>Clinical skill set</b>	Usually flight nurse, occasional doctor or paramedic	Usually doctor, flight nurse and advanced paramedic
<b>Clinical resources</b>	Local DHB arrangements	Tertiary based Retrieval Team
<b>Workload</b>	Mainly intra-DHB services and some inter-DHB services	Usually inter-DHB
<b>Dedicated</b>	As required	Yes - on demand
<b>Flight desk</b>	Book/dispatch by hospital calling flight desk Aircraft tracking	Book/dispatch by hospital calling flight desk Aircraft tracking
<b>Focus</b>	Cost-effective and timely support to local DHB. Flight desk manages operations optimising utilisation and inter-district needs, balances urgent work and back loading	Cost-effective and timely national support. Flight desk manages operations optimising utilisation and inter-district needs, balances urgent work and back loading
<b>Contracting</b>	Local arrangements	Nationally coordinated
<b>Funding model</b>	Local arrangements	Mix of emergency capability (national) and fee for service
<b>Sponsorship opportunity</b>	Local / Regional	National
<b>Aircraft Specification</b>	Twin engine Optional - pressurised Experienced, senior pilots IFR, de-icing	Twin engine Pressurised Experienced, senior pilots IFR, de-icing, turbo-prop

#### IHTs by Rotary Wing Air Ambulance

Two centres for reasons of time, geography, workload and support of the local DHB suit rotary wing air ambulances as their primary mode of IHT:

- Whangarei (by arrangement with Northland DHB for Kaitaia-Whangarei and Whangarei-Auckland)
- Hamilton (by arrangement with Midland DHBs).

Helicopters for this role, while largely identical in quality to those proposed for emergency HEMS network, are additional and complement the seven proposed for the emergency HEMS backbone service.

Note that it is not proposed that the Dunedin regional tertiary service, for reasons of workload, requires additional fixed or rotary wing aircraft. With Invercargill and Queenstown barely 80nm or 35 minutes by helicopter from Dunedin, there is sufficient capacity in their existing HEMS service with support as required from the Christchurch based fixed wing intensive care air ambulance.

## Linkages with Key Sector Initiatives

### Roadside to Bedside: A 24 hour clinically integrated acute management system

Roadside to Bedside should continue to be endorsed by ACC, Ministry of Health and DHBs as the preferred model for a clinically integrated acute management system for New Zealand.

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### Ambulance Communications Centre

This project is vital to the effective operation and coordination of air ambulance services. It is required to effectively coordinate HEMS and Rescue Helicopter operations and will provide the infrastructure required for a national flight desk.

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### National Framework for Delivery, Retrieval and Transfer Protocols

The National Framework for Delivery, Retrieval and Transfer Protocols should continue to be adopted by DHBs. While there continue to be some debate as to potential costs associated with their implementation, feedback from consultation suggests they are increasingly being used as a basis for clarifying, standardising and agreeing local practice – which appears to have been the purpose of the framework. ECCTs should continue to provide the forum for localising protocols consistent with the framework.

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### Ambulance Service Sector Standard

Ambulance Service Sector Standard should be endorsed by ACC, Ministry of Health and DHBs as a minimum foundation as they related to air ambulance services and continue to evolve under sector stewardship.

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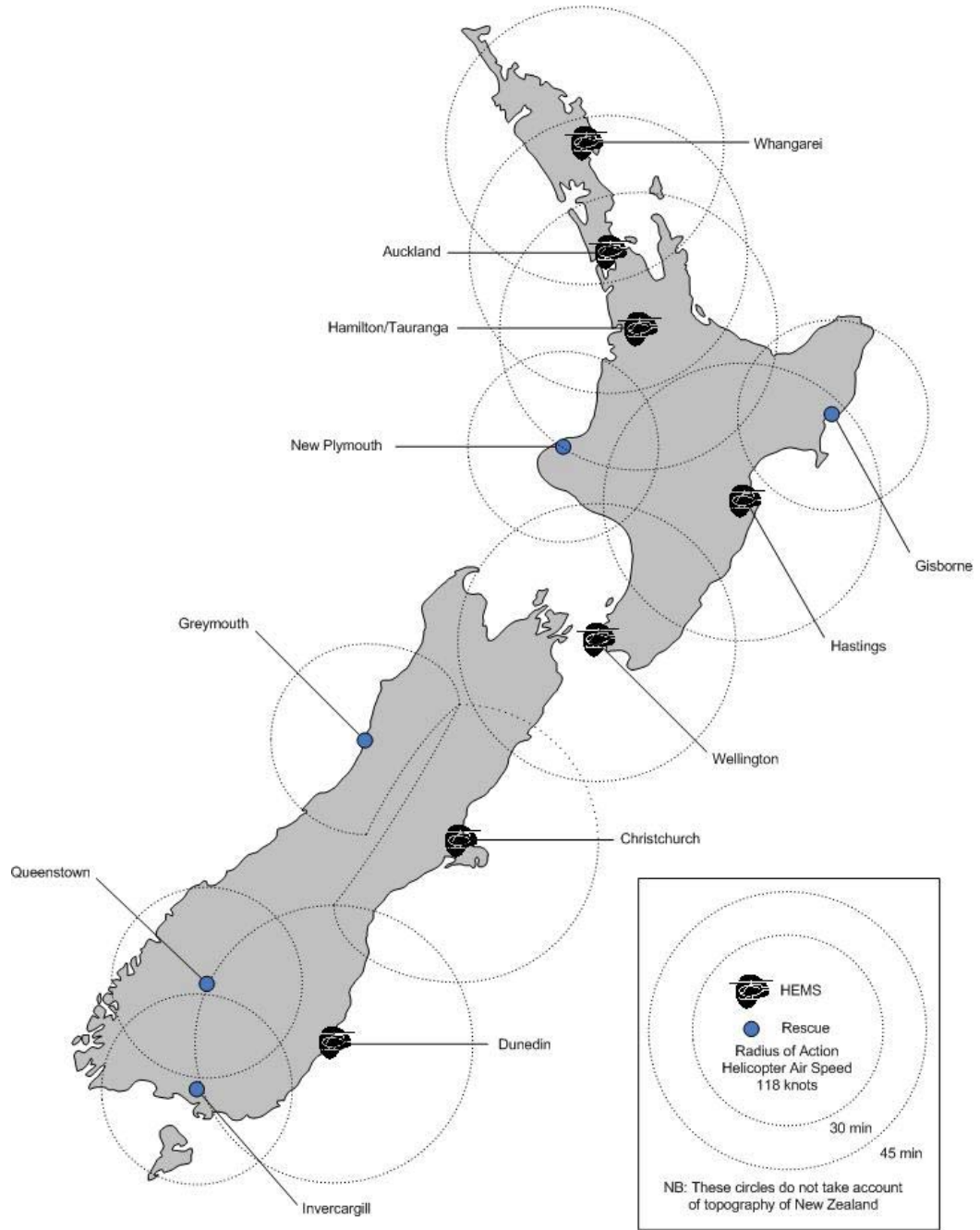
### Aviation Industry Association of NZ Air Rescue/Air Ambulance Standards

AIA Air Rescue/Air Ambulance Standards should be endorsed by ACC, Ministry of Health and DHBs as a minimum foundation as they related to air ambulance services and continue to evolve under sector stewardship.

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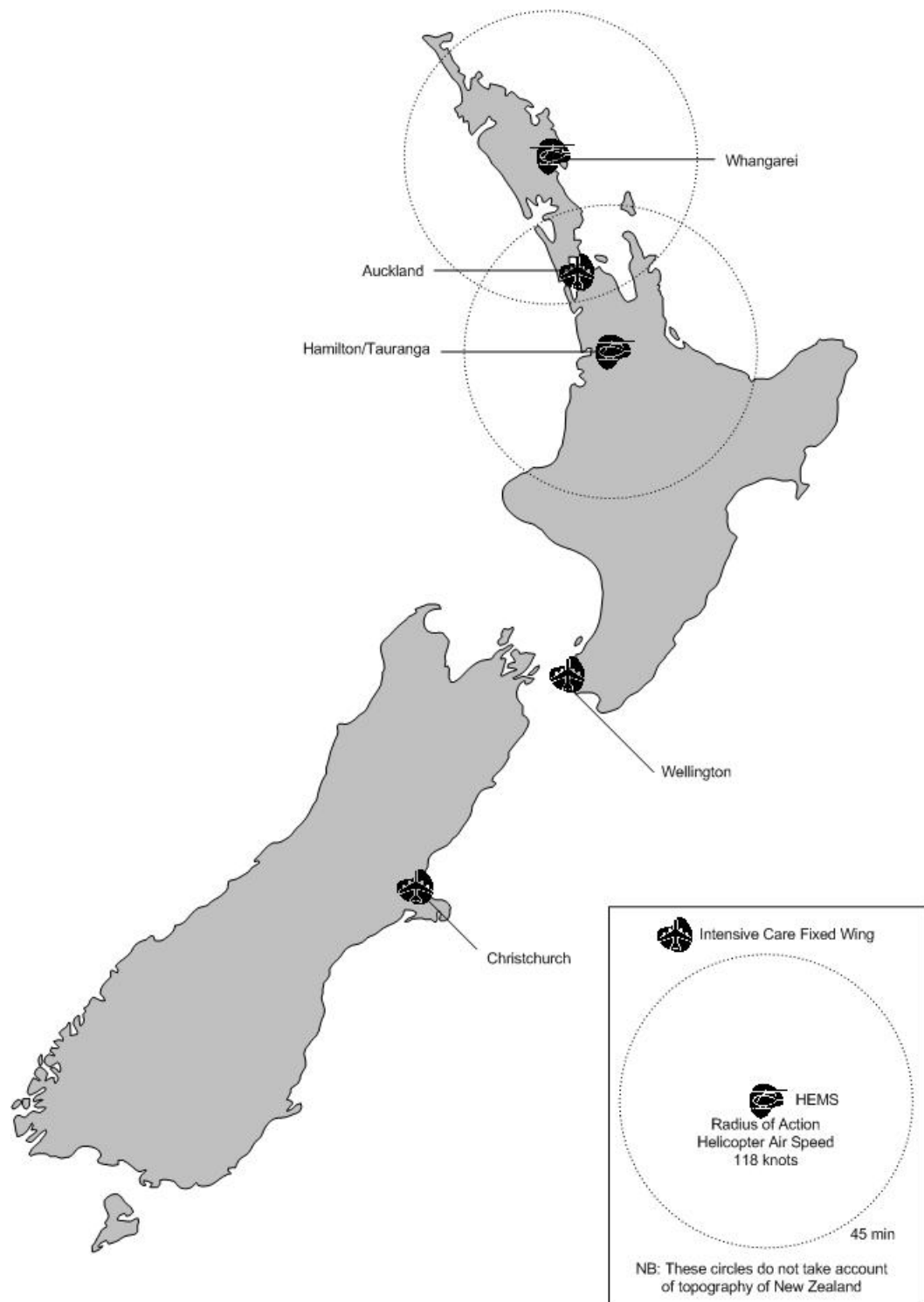
### Geographical Deployment of Air Ambulance Services

Figure 2 – Possible Deployment of HEMS Air Ambulances



We seek further feedback and comment around the ranges of HEMS in the North Island, particularly in relation to providing a safe reliable emergency air ambulance service within the geographic, topographic and climatic conditions experienced in this central North Island

Figure 2 - Suggested Deployment of IHT Fixed and Rotary Wing Intensive Care Air Ambulances



## Recommendations

1. That the two tier rotary and fixed wing service models are endorsed by DHBs, Ministry of Health and ACC as the basis of a national air ambulance network.
2. That air ambulance service specifications are revised in line with this strategy by DHBs, Ministry of Health and ACC.
3. That contracting frameworks of DHBs, Ministry of Health and ACC for air ambulance services are revised in line with this strategy.
4. That Roadside to Bedside is endorsed by ACC, Ministry of Health and DHBs as the preferred model for a clinically integrated acute management system for New Zealand.
5. That ACC, Ambulance New Zealand and relevant DHBs continue to implement ACP as soon as is practicable, ensuring the systems and infrastructure capability to provide a national flight desk and standard, robust data on road and air IHTs and patient domicile.
6. That ACC, Ministry of Health and DHBs continue to work towards implementation of Ambulance Service Sector Standards as they relate to air ambulance services.
7. That the National Framework for Delivery, Retrieval and Transfer Protocols is adopted by DHBs under the guidance of ECCTs.
8. That ACC, Ministry of Health and DHBs continue to work towards implementation of AIA Air Rescue/Air Ambulance Standards.
9. That relevant Medical Colleges, Flight Nurse Association (part of New Zealand Nurses Organisation) and Ambulance New Zealand establish and implement standardised flight training requirements for doctors, nurses and advanced paramedics respectively.

## Coordinating Air Ambulance Operations

The need for improved coordination of air ambulance services was the most common issue raised in consultation during the development of this strategy. This section outlines key recommendations for improving the coordination of air ambulance services in New Zealand. It is addressed in two parts: emergency services and IHTs.

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### Emergency Air Ambulance Services

This draft strategy proposes that emergency activation is principally via ambulance communications centre(s).

As the predominant role of rotary wing air ambulance is emergency work, their integration with the communications infrastructure that responds road ambulance services is critical. The decision to activate the helicopter is made by the ambulance dispatcher in response to the information received by the caller. Primary dispatch would be according to protocols, with secondary responses being the most common form of dispatch following a request from an ambulance crew or doctor on scene. Requests, through ambulance communications centres, can also be made from other emergency services (e.g. mountain rescue, coastguard) and, in some remote areas, by GPs.

Sound dispatch protocols, while substantively in place, continue to require refinement while at the same time substantial improvements need to be made in the information on activity, services, quality and patients that is available for audit and service planning and analysis.

Coordination for rotary wing air ambulance services through ambulance control rooms will:

- provide a one-call service to locate the nearest and most appropriate emergency response of skills to the scene
  - coordinate logistics with other services (hospitals, police, fire, road ambulance, first responders, PRIME or other primary care providers)
  - support of the dialogue between at-scene clinical teams and potential receiving hospitals (for stabilisation or definitive care)
  - enable dual dispatch where a HEMS delivers more advanced clinical skills to patients earlier
  - provide robust data on activity, service and quality, casemix etc. through state of the art CAD (Computer Aided Dispatch) systems
  - lead to improved utilisation of air ambulances
  - support better safety and quality.
-

## IHT Air Ambulance Services

The effective coordination of IHTs within New Zealand, given our size, resource constraints, and increasing specialisation of hospital services, requires national management of inter-hospital transfers by air ambulance.

Key elements of an improved and more coordinated national approach to IHTs include:

- Effective regional coordination by Clinical Transport Coordinators located in each tertiary centre, supported by local DHB Transport Coordinators (often a duty nurse in ICU) as per the National Protocols Framework. These coordinators will ensure effective clinical assessment of patients requiring transfer, articulate the clinically time urgency agreed between referring and accepting specialist doctors, clinical skills required during the transfer, clinical capacity at the receiving hospital (including bed availability), and any required clinical equipment. They also confirm necessary last minute arrangements such patient condition prior to instigating the transfer.
- The establishment of a single, specialist flight desk that will provide logistical support to Transport Coordinators, managing aircraft and retrieval team movements and/or a one-call service to locate the nearest and most appropriate air ambulance, coordinate logistics (crews, equipment and road ambulance pick up/delivery) and importantly support the dialogue between clinical teams at the sending and receiving hospitals
- Specialist Clinical advisor for the flight desk to be established as a 24x7 roster of areomedical trained on-duty Intensive Care Specialists (nominally the Director of the ICU or their delegate) rotating through the five tertiary centres (and other ICUs with suitably trained specialists by agreement). Standard procedures will require development, ensuring clinical oversight over the coordination and scheduling of intensive care transfers by the national flight desk.

Current issues that require consideration include:

- a desire expressed by DHBs to be able to accurately and cost effectively monitoring all IHTs, regardless of mode
- a lack of robust and standard data collected on IHT activity and the need for a systems approach to improve available data (preferably as a by-product of the process and not as a compliance activity)
- the limited ability within current system to optimise national IHT air ambulance resources
- existing variations in coordination at regional tertiary level (notably the effective regional coordination by transfer/flight coordinators at Wellington and Canterbury hospitals)
- the cumulative costs of retrieval team staffing across many DHBs
- parochial attitudes within regions that constrain national economies of scale relative to international experience.

Key to improving IHTs by air ambulances will be the data set currently being collected by DHBs through a collective initiative of DHBNZ. In late 2005, DHBs will be in a position to develop a collective agreement as to the national need, resource implications, and configuration of clinical retrieval crewing and air ambulance deployment required for servicing IHTs.

## National Flight Desk

A National Flight Desk will provide benefits of better staff and aircraft utilisation, improved service integration and less compliance for data collection. This strategy recognises existing co-ordination roles in DHBs, particularly those with dedicated transfer teams and the need to encourage DHBs without a nominated transport coordinator role.

The Flight Desk will support DHB staff and transfer/flight coordinators regarding aircraft/equipment/staff logistics, particularly when busy and routine options unavailable. It will provide a knowledge base – one point, one call of capacity and resource now and scheduled over that day. The role is focused on transfer logistics only: DHB to DHB dialogue and clinical co-ordination occurs alongside.

Benefits include the ability to better leverage capacity between regions – where fleet/crews are, and where they are going, while preserving existing regional dispatch practices (particularly the linking with beds and clinical staff) while establishing a national information base.

Obtaining economies of scale requires a national flight desk to provide national coordination of:

- Aircraft movement and mission coordination
- Confirming final clinical capacity/arrangements (e.g. bed availability) with hospital coordinators
- Dispatch
- Management of appropriate clinical tier/urgency/triage/prioritisation, e.g.
  - Back loading
  - Diversion
  - Competing jobs
- Coordination of resources required end to end (road ambulance to airport, aircraft and retrieval staff, road ambulance to destination hospital)
- Clinical stewardship, oversight and advice from on-call senior specialist ICU doctors.

There are several considerations that suggest the national flight desk should be established in the Auckland ambulance communications centre:

- Experience of working with an earlier flight desk model that operated in the Auckland region until the end of 2003
- The necessary systems infrastructure substantively exists now, without having to wait an estimated 18-24 months for ACP implementation to be complete in Wellington or Christchurch.

## National Framework for Ambulance Delivery, Retrieval and Transfer

This draft strategy, in recommending enhanced regional tertiary network coordination with logistical support from a national flight desk, builds on the National Framework for Ambulance Delivery, Retrieval and Transfer.

The framework was published in April 2003 under the auspices of the memorandum of understanding between Ambulance New Zealand, ACC and the Ministry of Health by the



Ambulance Protocol Working Group, representing the ambulance sector and key professional bodies, in consultation with the wider health and disability sector.

It is a protocols framework for the delivery, retrieval and transfer of patients in New Zealand and was designed to provide a national foundation upon which local protocols for the delivery, retrieval and transfer of patients can be built in conjunction with regional Emergency Care Co-ordinating Teams established to implement the vision of Roadside to Bedside.

Relevant to IHTs by air ambulance, the following exert details an expectation as to the roles that DHBs are encouraged to consider so as to develop an integrated and coordinated approach to IHTs.

### 1.3 Arranging Emergency Inter-hospital Transfers

4. That in obtaining agreement to transfer a patient from one hospital to another, the on-site doctor responsible at the sending site is responsible for communicating to the responsible **specialist** at the receiving site.
5. That a referring hospital should ideally only require **one call** to obtain specialist advice from a receiving hospital as to treatment and need for transfer of the patient.
6. That the **receiving specialist clinician** should be responsible for alerting all other relevant specialist services and for determining the urgency of a transfer.
7. That an Emergency Inter-Hospital Transfer should be able to be initiated via a **single call** by either the sending or receiving hospital.

### 1.4 Co-ordination of Emergency Inter-hospital Transfers

8. That the **DHB base hospital** is the default inter-hospital transfer destination within a DHB: Where a patient needs definitive Specialist Skills not available within a DHB base hospital, regional protocols for inter-DHB transfers for patients to definitive Specialist Skills are to be endorsed by regional ECCTs.
9. That **retrieval and transfer team resources** be based around the main tertiary referral services identified in *Roadside to Bedside* (Auckland, Waikato, Wellington, Christchurch and Dunedin) and that the Ministry of Health and ACC consider the funding arrangements for such teams. These teams should predominantly be supernumerary retrieval-trained staff, who would better support the safer retrieval and transfer of patients to and from tertiary centres. The composition and funding of these teams should take account of the role, expertise and funding of qualified ambulance officers, nursing and medical staff.
10. That **Clinical Transport Co-ordinator role** be established in the main tertiary referral services identified in *Roadside to Bedside*. This role would be responsible for implementing the Clinical Transfer Plan agreed between referring and receiving clinicians in conjunction with the Transport Co-ordinator function (see next paragraph). The Clinical Plan includes urgency required, transfer team skills and equipment requirements. The Clinical Transport Co-ordinator would also (as required) support and co-ordinate intra-regional transfers within their regional *Roadside to Bedside* region.<sup>1</sup>
11. That **Transport Co-ordinator function** be established in regions identified in *Roadside to Bedside*. This function would work with the Clinical Transport Co-ordinator and would establish the Transport Plan which co-ordinates logistics between the referring and receiving hospitals, road and air providers. The Transport Plan would incorporate scheduling of transfer resources (level and type of care, equipment and mode). The Transport Co-ordinator would be responsible for communicating arrangements in the Transport Plan to referring and receiving hospitals, dispatching the necessary resources and for filing the plan with the RCC (for monitoring and data capture purposes).

### 1.5 Organisation of ALL Inter-hospital Transfers

12. That funders consider establishing a function that provides a single source of information related to the retrieval and transfer of patients by air throughout on-shore New Zealand. This information may be used to improve the co-ordination, effectiveness and efficiency of inter-hospital transfer. Such a co-ordination service may take into account all air movements and aircraft locations and would co-ordinate staffing, choice of air modes (rotary wing,

Figure 1: Exert from National Framework for Ambulance Delivery, Retrieval and Transfer, April 2003

Decision trees that were developed appear in appendix 4 and are useful in articulating the clinical coordination between referring and receiving hospitals and the point at which a flight desk supports operational logistics of a transfer.

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## Recommendations

10. Ambulance Communications Centres continue to dispatch air ambulance missions:
  - a. exclusive dispatch of HEMS
  - b. dispatch of Rescue Helicopters (i.e. also able to be dispatched by other emergency services as required after notification to Ambulance Communications Centre)
11. ACC and relevant DHBs to consider the establishment of a National Flight Desk as soon as practicable, building on the existing capability of the Auckland Ambulance Communications Centre conjunction with ACP
12. That Auckland Ambulance Communications Centre and DHBs establish knowledge management systems to support the coordination of IHTs and functioning of the Flight Desk as described in this strategy
13. DHBs establish retrieval teams in at least the five tertiary centres and limit the establishment of additional retrieval teams until the completion of a DHB IHT Air Ambulance Collective Agreement (refer Funding and Contracting Recommendations)
14. Regional Tertiary DHBs establish clinical transport coordinators and transport coordinator functions, and regional DHBs.

## Funding and Contracting of Air Ambulance Services

Ambulance Operators and Air Ambulance Operators have concerns about the present methods of funding. A number of DHBs have a capped funding arrangement with emergency ambulance providers which includes a budgeted amount for air ambulance work. Some air ambulance operators believe that this funding arrangement at times governs whether the air ambulance will be used or not.

Air ambulance operators have large amounts of capital and fixed costs committed to ensure their services are available when required. The operators have suggested that uncertainty of work and income makes it difficult for them to plan their business operations.

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### Funding

A range of funding models were considered and consulted on. In light of the current multiple funding approaches, the high cumulative compliance costs for DHBs and operators and the mix of incentives (both promoting and discouraging air ambulance use), reviewing the funding model for Crown funds is a key part of moving the air ambulance sector forward into the future.

Moving to a philosophy of HEMS and intensive care fixed wing air ambulances requires consideration of funding model implications on the part of DHBs, Ministry of Health and ACC.

Any change to a funding model, particularly involving 23 Crown agencies (21 DHBs, Ministry of Health and ACC), is not without challenge e.g. the need for a clear process and collective agreement to support a combined DHB approach to improving IHT air ambulance services. There are also costs – both time and effort – required to transition to an improved funding model.

The draft strategy recommends a mixed model for the future funding of air ambulance services that provides a consistent pricing framework for national Crown funding: ACC, Ministry of Health and DHBs. A first priority should be to address the recommended mixed capacity and fee for service funding recommendations for first tier services (i.e. HEMS and intensive care fixed wing air ambulances).

This will provide the flexibility to enhance current services in a cost effective manner and reduce compliance costs for the sector (which in light of the relative proportion of funding from the Crown, is particularly onerous).

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### Recommendations

Revision of the funding model for air ambulances should provide an improved set of incentives for quality, effectiveness, probity and efficiency. The timelines of current contracts and the lead time in establishing collaborative funding arrangements means that transition to a new funding model will take a number of years.

Funding recommendations include:

15. That DHBs continue the collection of 12 months of baseline information on IHT node-node volumes and retrieval team activity to June 2005 to improve understanding of activity, costs and casemix.
16. That a national price list is developed for air ambulance services including transfer and retrieval teams.
17. That HEMS are funded on a mixed capacity and fee for service basis, providing for lower missions costs (on a fee for service arrangement).
18. That national intensive care fixed wing air ambulances are funded on a mixed capacity and fee for service basis, providing for lower missions costs (on a fee for service arrangement).
19. That DHBs develop an IHT Air Ambulance collective agreement by the end of 2005 encompassing:
  - a. National supply agreement for DHB clinical retrieval teams
  - b. National deployment of fixed and rotary wing aircraft for IHTs
  - c. National flight desk operating costs.

# Draft National Air Ambulance Strategy

## Appendices

### Appendix 1 – People and Organisations Consulted

There are a substantial number of people who contributed to the development of the strategy for which the project team and sponsors are grateful. Gratitude is expressed to all of the many contributors through consultation and workshops; in particular the individuals and organisations identified below.

#### New Zealand – People and Organisations Consulted

##### Civil Aviation Authority

██████████  
Manager of Rotary Wing – General Aviation

##### Police – SAR

██████████  
National SAR Co-ordinator

##### Order of St John

██████████  
Director of Ambulance Operations (Northern Region)

##### Northland Health

██████████  
Manager of Surgery and Critical Care

##### Ambulance New Zealand

██████████ - Chief Executive  
██████████ – Previous Chief Executive

##### Aviation Industry Association and Air Rescue New Zealand

██████████

##### Canterbury DHB

██████████  
Canterbury ECCT Chair / NAAS Clinical Reference Group

##### Waikato DHB

██████████  
Midland Trauma Systems Co-ordinator (Regional Trauma Service)

##### Philips Search and Rescue Trust

██████████  
Secretary

##### Life Flight

██████████  
General Manager

##### Taranaki Rescue Helicopter Trust

██████████  
Manager

##### Auckland Rescue Helicopter Trust

██████████ - Chief Executive  
██████████ – Medical Advisor / NAAS Clinical Reference Group

##### Hawkes Bay Helicopter Rescue Trust

██████████  
Chief Executive

##### Garden City Helicopters Ltd

██████████  
General Manager

##### Northland Emergency Services Trust

██████████  
Chairman

##### The Square Trust Rescue Helicopter

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Operations Assistant/Flight Nurse

**Otago DHB**

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Otago ECCT Chair / NAAS Clinical Reference Group

**Helicopters Otago Ltd**

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**Hawkes Bay DHB**

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Intensivist / NAAS Clinical Reference Group

**Capital Coast DHB**

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Intensivist / Clinical Reference Group

**Waikato DHB**

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Midland ECCT Chair

**Garden City Helicopters Ltd**

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Chief Pilot

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Chief of Air Staff

### Contributors of Written Feedback to Current State Assessment

**Providers**

- Air Hawkes Bay Ltd
- Air Wanganui
- Auckland Rescue Helicopter Trust
- Eastland Helicopter Rescue Trust
- Fixed wing air ambulance pilot
- Garden City Helicopters Ltd
- Hawkes Bay Helicopter Rescue Trust
- Helipro
- Lakes District Air Rescue Trust
- Northland Emergency Services Trust
- Peet Aviation Ltd
- Philips Search and Rescue Trust
- Order of St John
- Taranaki Rescue Helicopter Trust
- The Life Flight Trust
- Wanganui Air Ambulance Trust

**District Health Boards**

- Auckland DHB
- Canterbury DHB
- Capital and Coast DHB
- Good Health Wanganui
- Hawkes Bay DHB
- Lakes DHB
- MidCentral DHB
- Southland DHB
- Tairāwhiti DHB
- Taranaki DHB
- Waikato DHB

**Local Government**

- Far North District Council
- Hastings District Council
- Hawkes Bay District Council
- Hawkes Bay Regional Council
- Invercargill City Council – Civil Defence Emergency Management
- Napier City Council
- Nelson City Council
- New Plymouth District Mayor
- South Taranaki District Mayor
- Stratford District Deputy Mayor
- Taranaki Regional Council
- Wairoa District Council
- Wanganui District Mayor

**Clinicians**

- Anaesthetic Department – Northland Base Hospital
- CDHB provider arm of air ambulance services
- Central Region Emergency Care Coordinating Team
- Flight Nurse
- Intensive Care Specialist – Auckland City Hospital
- Intensive Care Unit – Northland Health
- Intensive Care Unit – Tauranga Hospital
- Joint Faculty of Intensive Care Medicine (JFICM)

**Industry**

- Air Rescue New Zealand
- Aviation Industry Association
- New Plymouth Police
- Rescue Coordination Centre New Zealand (RCCNZ) – Manager
- Rescue Coordination Centre New Zealand (RCCNZ) – Training Manager
- SAR - Police
- Midland Region Emergency Care Coordinating Team
- Midland Regional Trauma Director
- Neonatal Service – Christchurch Women’s Hospital
- New Zealand Committee of Australian and New Zealand College of Anaesthetists (ANZCA)
- Otago/Southland Region Emergency Care Coordinating Team
- Royal Australasian College of Surgeons
- Royal Australian and New Zealand College of Obstetricians and Gynaecologists
- Royal New Zealand College of General Practitioners

**International – People and Organisations Consulted**

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Operations Manager

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Head of Ambulance and Emergency Services

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**Queensland Emergency Medical Services**

██████████  
Executive Officer

## Appendix 2: Progress on Air Ambulance Issues Identified by Cull<sup>9</sup>

The following is a summary of the key issues identified during research, consultations and observations of the industry and any progress made to resolve issues:

Issue Identified by Cull	Progress
Lack of adequate, or variations between, dispatch protocols	Remains contentious, however, in reality Cull protocols substantially implemented. The Ambulance Communications Project and the Protocols Framework for Retrieval, Delivery and Transfer provide a basis to continue to refine.
Lack of protocols or guidelines in some ambulance regions resulting, in some cases, in delays or inappropriate use of ambulance helicopters and ambulances	
A need to improve training of ambulance control room staff in the complexities of emergency ambulance related telephone triage	ProQA addresses variations in dispatch protocols. Currently in Auckland, being adopted nationally via Ambulance Communications Project. ACP will enhance transparency and audit capability
Shortage of road ambulance resources, both vehicles and staff, in smaller remote areas and in large metropolitan areas where single crewed ambulances can still attend emergencies	Additional analysis required to inform this issue, particularly well populated areas of New Zealand that do not have access to advanced paramedic skills locally.
Training (qualifications) and experience of road ambulance staff, particularly volunteers	This remains an issue in some regions – refer above issue.
Lack of inter-control room liaison (in some regions), which results in poor co-ordination and use of resources, and possible delays to incidents occurring near regional borders	The Ambulance Communications Project will address this issue through newer technologies and ability for 3 proposed new Ambulance Control Rooms to act as a 'virtual' single Control Room
Lack of national and regional co-ordination of non-emergency air ambulance flights (in some regions), resulting in higher costs per trip and less than optimal use of resources	This remains an issue. The National Flight Desk proposed in this strategy should resolve.
Lack of protocols or guidelines (in some regions), to ensure patients are transported to the most appropriate medical facility for the patient's injury or illness	The Protocols Framework for Retrieval, Delivery and Transfer provides framework for ECCTs to develop regional protocols. However, remains an issue in some regions and is a key issue for ECCTs to address.
Lack of protocols or guidelines (in some regions), to ensure the services of rural doctors are utilised when necessary	PRIME (Primary Response in Medical Emergency) aims to ensure high quality access to medical emergency treatment. The scheme funds general practitioners and practice nurses to attend emergencies and has the support of ACC, the HFA, the New Zealand Rural GP Network, and the Order of St John.
Lack of emergency ambulance service contracts (in some regions) with clear service delivery standards and monitoring and auditing requirements	Ministry of Health and ACC have developed standard service specifications and intend to have a joint funding manager



## Current Air Ambulance Issues

The following is a summary of the key issues identified during research, consultations and observations of the industry and any progress made to resolve issues:

Current Issue	Progress
Over capacity exists within the air ambulance service resulting in low utilisation of aircraft.	This still remains an issue. The HEMS network proposed in this strategy, with support from local rescue capability, will address this issue. DHB collective agreement on IHTs also proposed in this strategy should address fixed wing aircraft.
In some regions, resources are used inefficiently and are poorly co-ordinated	The proposed HEMS network provides greater consistency in quality and access.
Variance with call out procedures in some ambulance areas, and a reluctance to use air ambulances in some parts of New Zealand	The National Flight Desk proposed in this strategy should resolve.
Transportation of patients, at times, to inappropriate care facilities	This remains an issue in two main areas: <ol style="list-style-type: none"> <li>1. Not all DHBs have yet to implement National Delivery, Retrieval and Transfer Protocols Framework in conjunction with their ECCT</li> <li>2. Lack of clarity in role for immediate extrication by “rescue” helicopters with subsequent clinical support from “air ambulance” helicopter. The proposed HEMS network provides greater consistency in quality and access.</li> </ol>
Lack of accessible, valid and reliable information on which to base decisions	ACP will enhance transparency and audit capability. Contracting frameworks to address integrity and transparency of air ambulance services.
Lack of conclusive research, both nationally and internationally, on patient outcomes and cost benefit of air ambulance use	The proposed HEMS network provides greater consistency in quality and access, combined in appropriate areas with local rescue capability.
Lack of common service standards	Membership of AIA and Ambulance New Zealand should be mandatory for all services funded by DHBs, as is the case for Ministry of Health and ACC now.
Lack of appropriate helicopter access to some major hospitals	Hospitals where a lack of suitable landing pads result in undue patient delays and additional road ambulance use include: <ul style="list-style-type: none"> <li>- Akaroa</li> <li>- Ashburton</li> <li>- Christchurch</li> <li>- Greymouth</li> <li>- Hutt Valley</li> <li>- New Plymouth</li> <li>- Palmerston North</li> <li>- Tauranga</li> <li>- Timaru and</li> </ul>

Current Issue	Progress
	- Waitakere.
Fragmentation of purchasing (e.g. DHB payments to ambulance operators for emergency medical cases and inter-hospital fee for services, ACC fee for service for accident cases as required by current regulations)	Funding approach proposed in this strategy should address.
Lack of a review system to audit nationally the use of air ambulance services	ACP will enhance transparency and audit capability. Contracting frameworks to address integrity and transparency of air ambulance services.
Tensions between operators of helicopter services, especially in rural areas	ACP will enhance transparency and audit capability.
Varying skill mix of attendant services for different levels of mission training and credentialing	The proposed HEMS network provides greater consistency in staff training, competency and workload.
Significant increase in use of air ambulances in recent years, which has lead to concerns about costs	DHB collective agreement on IHTs proposed by this strategy should address.
Lack of integration at many levels concerning: <ul style="list-style-type: none"> <li>■ Fixed wing and helicopters</li> <li>■ Funding</li> <li>■ Emergency services/inter-hospital services</li> <li>■ Links between air ambulance services and hospital based emergency departments and intensive care</li> </ul>	The National Flight Desk, funding approach proposed in this strategy should contribute to improvements as will ACP.
Lack of formally defined relationships between road and air ambulance operators	Continued efforts to improve stakeholder engagement – by AIA and Ambulance NZ will improve.
Impact of changes in current air ambulance infrastructure for patient outcomes (e.g. equipment, cost for providers)	The proposed HEMS network provides greater consistency in quality and access, combined in appropriate areas with local rescue capability.
Infection control issues in terms of movement of patients between service facilities	DHB collective agreement on IHTs proposed by this strategy should address.

## Appendix 3: Aircraft Type and Standards

AIA, together with CAA involvement, have put together standards for various categories of air ambulance<sup>10</sup>. AIA also have auditing procedures to ensure that aircraft registered in particular categories meet the Standards. However, currently operators are not contractually bound to adhere to AIA categories (except for ACC contracts that require AIA accreditation to any one of the following categories). Accreditation to AIA categories is mandatory for all members of the Air Ambulance/Air Rescue Division of AIA, but not for operators who do not belong to AIA.

AIA is currently reviewing these categories with a view to simplifying and improving the framework. Existing categories are:

### Category A – Intensive Care Air Ambulance (IFR)

An 'Intensive Care Air Ambulance' shall be used to transport patients who may require continuous attachment to a ventilator, other means of life support and/or physiological monitoring throughout the flight.

### Category B – Rapid Response Air Ambulance (VFR)

A 'Rapid Response Air Ambulance' shall be used to transport patients needing intensive care and continuous treatment and/or monitoring prior to initial hospitalisation, and usually needing emplanement at or near the site of an accident soon after its occurrence.

### Category C – Stretcher Care Air Ambulance

A 'Stretcher Care Air Ambulance' shall be used to transport patients needing to be transferred on a stretcher and needing some medical attention, but not intensive care during flight. Some monitoring might be required. The patient would usually be transferring from one hospital to another.

### Category D – Seated Care Air Ambulance

A 'Seated Care Air Ambulance' shall be used to transport patients who are semi-mobile, perhaps convalescent (or a walking casualty) and who may need to be embarked/disembarked using a wheelchair or other forms of assistance. There is little need for on-going care, but a risk of some form of incapacitation during flight could arise. Seated care patients include post-operative stable patients transferring between hospitals.

### Category E – Independent Patient Air Transport (VFR/IFR)

An 'Independent Patient Air Transport' aircraft may be used to transport patients who do not require an air ambulance or attendant. No wheelchair is needed during embarkation/disembarkation.

### Category F – Search and Rescue Aircraft

A 'Search and Rescue' aircraft may be fixed wing or rotary wing suitably equipped with navigation, communications and rescue capabilities and may include any category of air ambulance.

## Appendix 4: Decision Trees for Delivery, Retrieval and Transfer

The following material has been copied from the National Framework for Delivery Retrieval and Transfer Protocols.

### A Continuum of Decisions

Key decisions in the emergency response and transportation of patients with illness or injury are shown in the following figure. In particular, it shows the alignment of Dispatch Protocols (encompassing the priority and type of an emergency response) with the three protocol components documented here.

Note that in the following figure:

- ALS means Advanced Life Support, BLS means Basic Life Support and are defined in national Ambulance Standards
- RCC means the Regional Communications Centres, envisaged by the Ambulance Communications Project
- SSP means a Specialist Skill Provider, ASP means an Advanced Skill Provider and are defined in [the National Framework for Delivery Retrieval and Transfer Protocols] document.

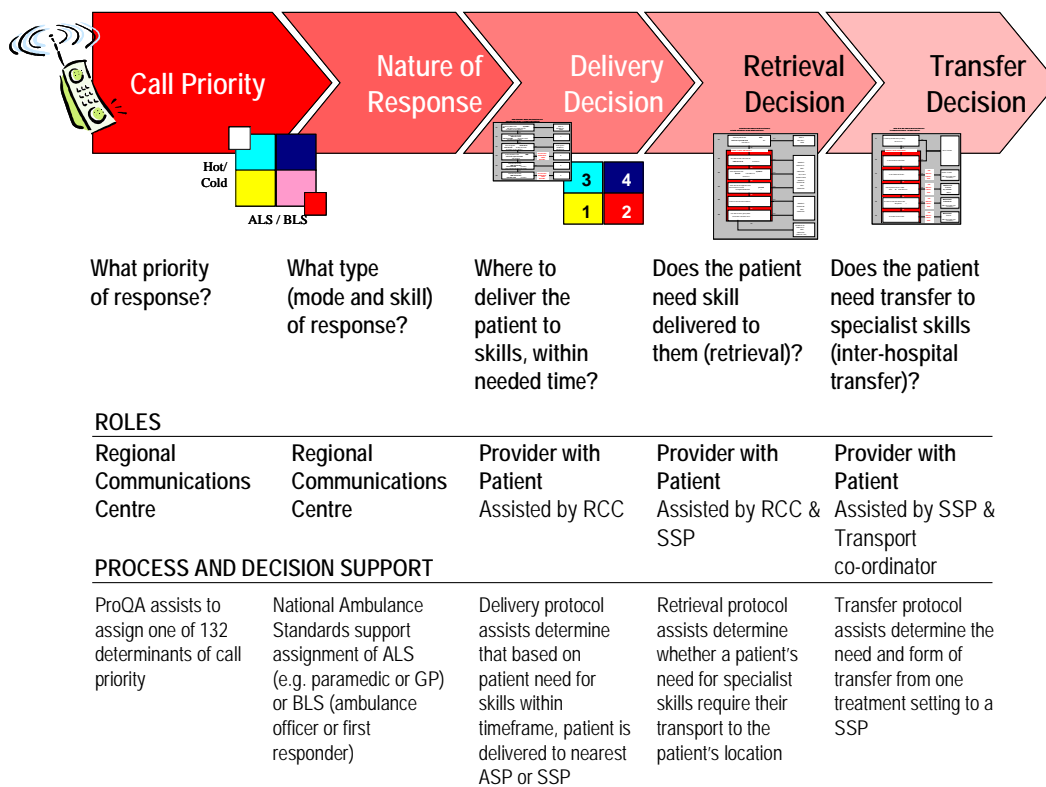


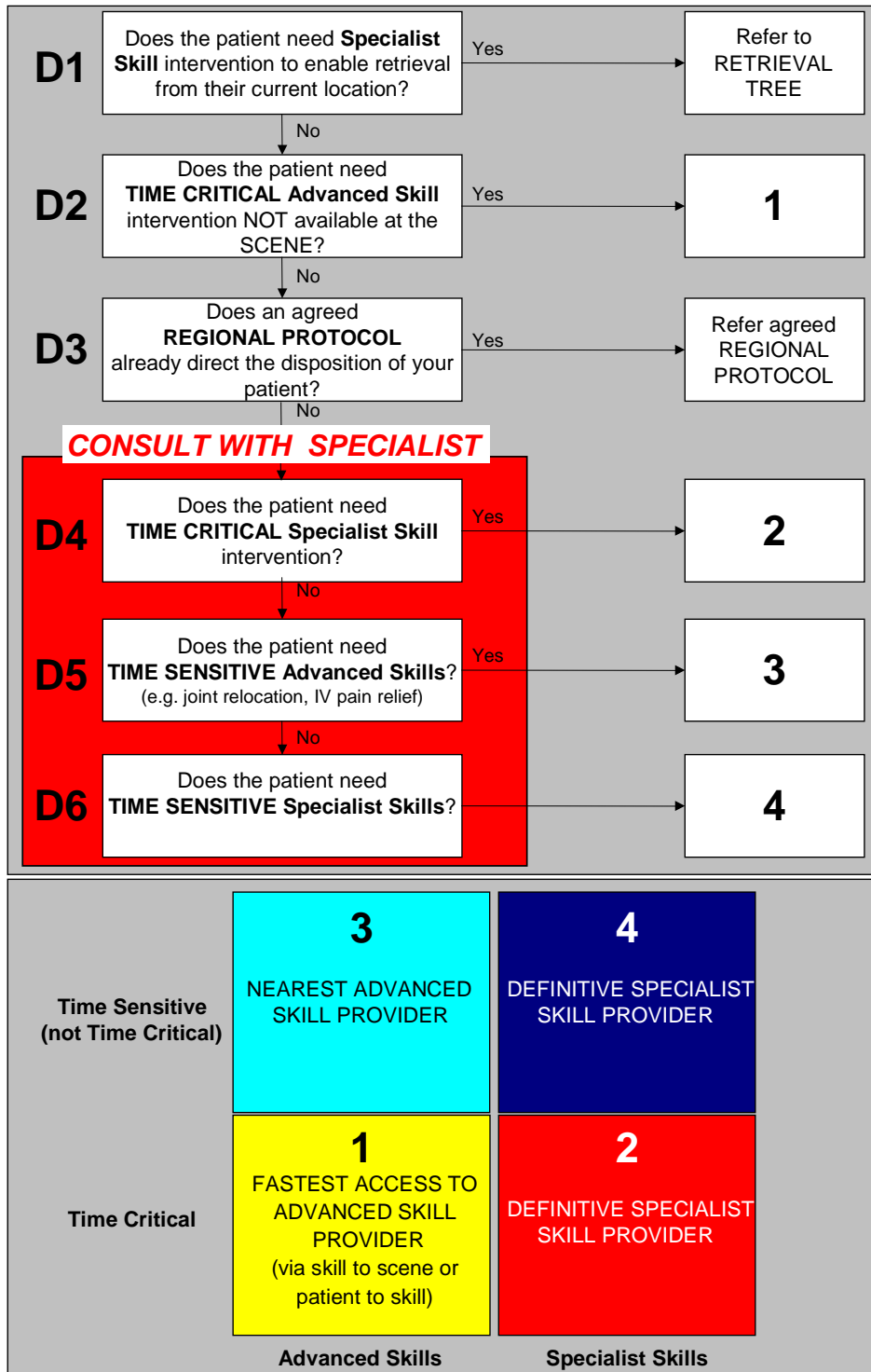
Figure 2 - Continuum of Decisions in an Emergency Response

Three decision trees were developed to provide a simple, timely and practical process to assist the decision-makers. The decision trees are relatively generic in nature and consequently should have wide application. Equally they are not overly prescriptive and allow the decision-maker some flexibility. They are as follows:

- Decision Tree 1 – Delivery
- Decision Tree 2 – Retrieval from Scene
- Decision Tree 3 – Transfer (Inter-hospital).

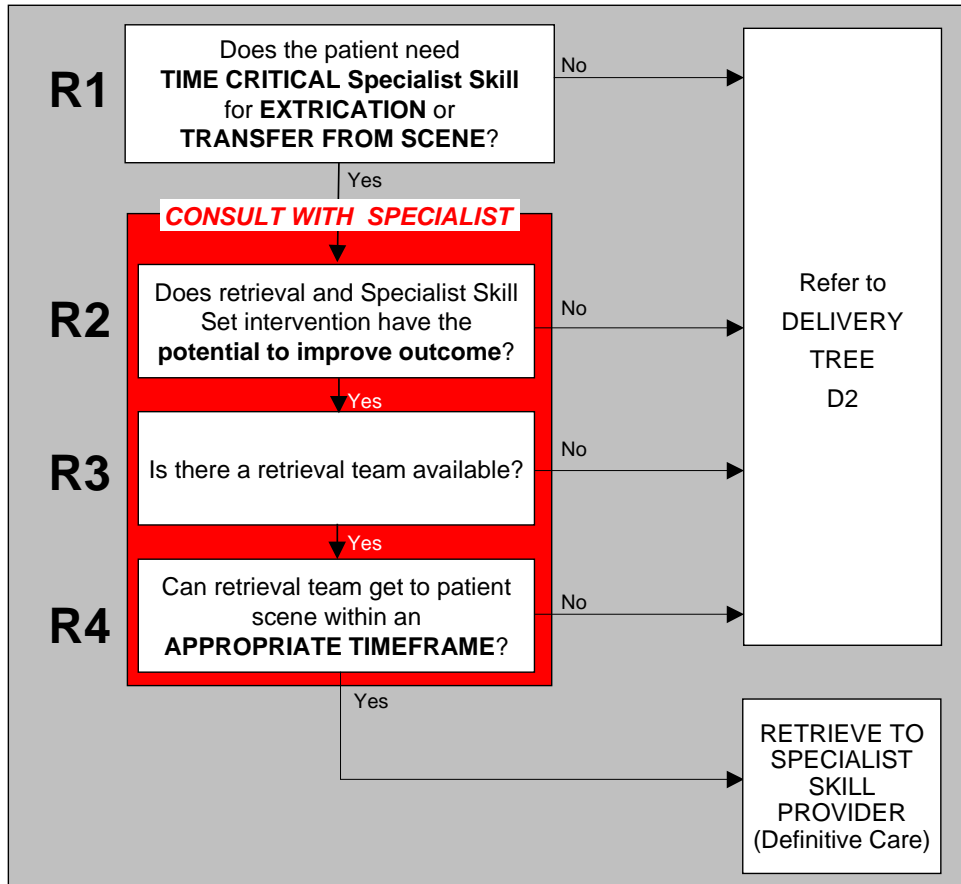
Decision Tree 1 – Delivery

**NEW ZEALAND AMBULANCE PROTOCOLS  
DELIVERY PROTOCOL - PATIENT DESTINATION**



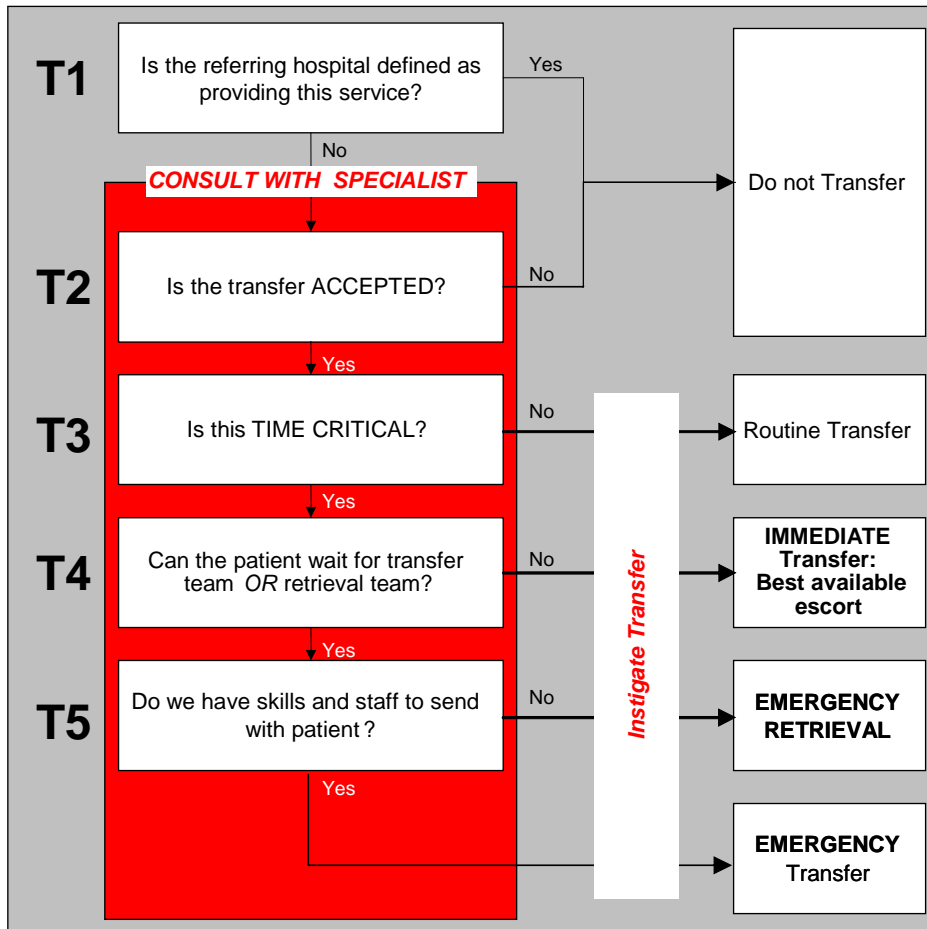
Decision Tree 2 – Retrieval from Scene

**NEW ZEALAND AMBULANCE PROTOCOLS  
PATIENT RETRIEVAL FROM SCENE PROTOCOL**



Decision Tree 3 – Transfer (Inter-hospital)

**NEW ZEALAND AMBULANCE PROTOCOLS  
TRANSFER PROTOCOL - INTER-HOSPITAL**



## References

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- <sup>2</sup> Ambulance Communications Project. Ambulance New Zealand. February 2004.
- <sup>3</sup> National Framework for Ambulance Delivery, Retrieval and Transfer. The Ambulance Protocols Working Group. March 2003.
- <sup>4</sup> The Ambulance Protocols Working Group. National Framework for Ambulance Delivery Retrieval and Transfer. Published April 2003 by Ambulance New Zealand, the Ministry of Health and ACC under their Memorandum of Understanding. Section 6.
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