

# New Zealand Spinal Cord Injury Destination Policy

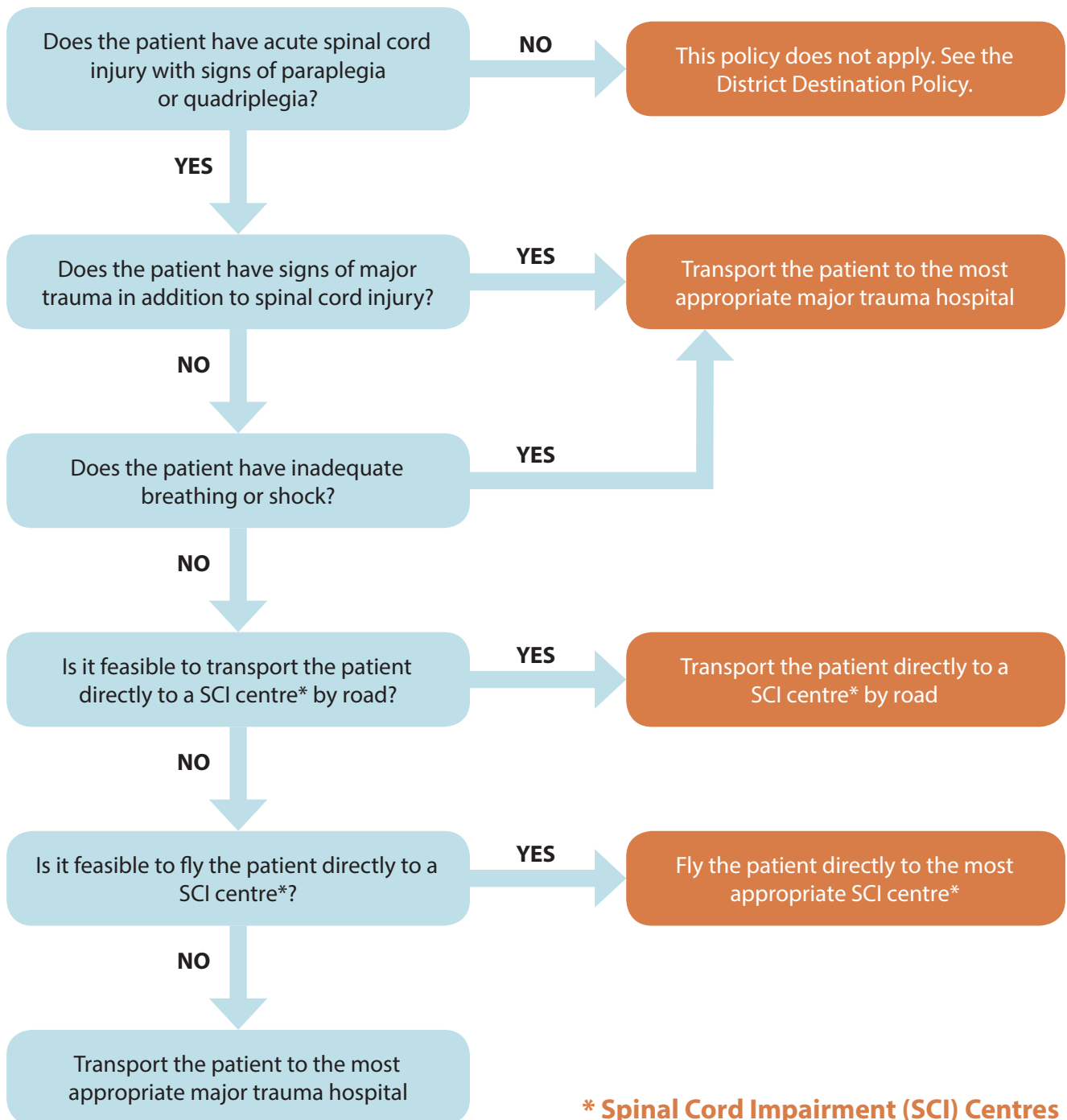
This document is for the use of prehospital personnel when determining the destination of patients with spinal cord injury in New Zealand. It has been developed by the National Spinal Cord Impairment Governance Committee.

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# Spinal Cord Injury Destination Policy

Flowchart for Prehospital Personnel



## \* Spinal Cord Impairment (SCI) Centres

- ▶ Middlemore Hospital (adults)
- ▶ Christchurch Hospital (adults and children)
- ▶ Starship Children's Hospital (children)

# Spinal Cord Injury Destination Policy

## Additional Information

### Introduction

This information complements the spinal cord injury destination policy flowchart for prehospital personnel and should be read in conjunction with it. This policy describes the process for prehospital personnel to determine which hospital patients with spinal cord injury should be transported to.

One of the main principles within the National Spinal Cord Impairment Action Plan is that patients with spinal cord impairment (SCI) following trauma should be treated in a designated SCI centre as soon as possible after their injury. Patient outcomes are optimised when surgery (if indicated) to decompress the spinal cord is performed urgently and this is usually only feasible when patients are transported directly to a designated SCI centre. From a prehospital perspective this means that:

- ▶ Patients with spinal cord injury and **no other signs of major trauma** will be transported directly from the scene to a SCI centre, whenever this is feasible. This means that even in a metropolitan setting that is close to another major hospital, patients will be transported directly to a SCI centre even if that SCI centre is a significant distance away.
- ▶ Patients with **other signs of major trauma** in addition to spinal cord injury will be transported to the most appropriate major trauma hospital and then secondarily referred to a SCI centre when clinically appropriate.

### Patients not covered by this policy

- ▶ Patients with non-traumatic spinal cord impairment are not covered by this policy. They will be transported to the most appropriate hospital and then secondarily referred to a SCI centre when clinically appropriate.
- ▶ Inter-hospital referrals and inter-hospital transfers are not covered by this policy.

### Defining spinal cord injury in the prehospital setting

- ▶ For the purposes of this policy, signs of spinal cord injury require the patient to have signs of paralysis with either paraplegia or quadriplegia.
- ▶ Altered sensation and/or weakness (without paralysis) are not sufficient because it is relatively common for patients in the prehospital setting to have these symptoms in the absence of spinal cord injury. Transporting such patients directly to a SCI centre risks large numbers of patients being inappropriately transported to a SCI centre that do not require it.

### Mechanism of injury

- ▶ The decision to transport a patient directly to a SCI centre is not affected by the mechanism of injury.
- ▶ However, if the mechanism involves high velocity (for example a high speed road crash) and another major trauma hospital is significantly closer to the scene than a SCI centre, it is vital to exclude other signs of major trauma prior to making a decision to transport the patient directly to a SCI centre.

### **Other signs of major trauma in addition to spinal cord injury**

- ▶ The patient must be transported to the most appropriate major trauma hospital (and then secondarily referred to a SCI centre when clinically appropriate) if there are any signs of major trauma in addition to that of spinal cord injury.
- ▶ Personnel must seek clinical advice if they are uncertain.
- ▶ All of the SCI centres are within hospitals that are also designated as major trauma hospitals and thus patients with additional injuries will receive appropriate treatment at the SCI centres.
- ▶ See the major trauma destination policy for further details.

### **The adequacy of breathing**

- ▶ If breathing is clinically inadequate the patient must be transported to the most appropriate major trauma hospital and then secondarily referred to a SCI centre when clinically appropriate.
- ▶ Clinically inadequate breathing is uncommon in the prehospital setting following spinal cord injury and usually only occurs with a high cervical cord injury.
- ▶ Most patients with diaphragmatic breathing following spinal cord injury have clinically adequate breathing but an inadequate cough. In this setting the patient should be transported directly to a SCI centre provided this is feasible, the patient has adequate oxygenation with supplemental oxygen and their breathing is not deteriorating.

### **Shock**

- ▶ If shock is present the patient should be transported to the most appropriate major trauma hospital (and then secondarily referred to a SCI centre when clinically appropriate) because the patient should be presumed to have hypovolaemic shock until proven otherwise.
- ▶ Loss of sympathetic outflow from the spinal cord following spinal cord injury can cause shock and in this setting the patient is usually vasodilated below the site of injury. It is appropriate to consider transporting the patient directly to a SCI centre if personnel are confident the patient has spinal shock (particularly if the mechanism of injury involved low velocity) and the patient is clearly not deteriorating, but personnel must seek clinical advice in this setting.

### **Transport to a SCI centre by road**

- ▶ It is usually only feasible to transport a patient directly to a SCI centre by road when the patient is injured in, or around the fringes of, the Auckland district and the Canterbury district.
- ▶ In the Auckland district:
  - Adults should be transported to Middlemore Hospital unless there is a compelling clinical reason to transport them to Auckland City Hospital instead.
  - Children should be transported to Starship Hospital unless there is a compelling clinical reason to transport them to Middlemore Hospital instead.
- ▶ On the fringes of the Auckland district (for example the southern area of Northland and the northern area of Waikato and Hauraki), if helicopter transport is not indicated (or is not available), it is preferable to transport the patient directly to a SCI centre by road, rather than transporting to Whangarei Hospital or Waikato Hospital. This is because a secondary transfer incurs a clinically significant delay that may worsen the patient's outcome.
- ▶ In the Canterbury district the only hospital suitable for patients with major trauma is Christchurch Hospital and all patients should be transported there directly.

## **Transport to a SCI centre by helicopter**

- ▶ If it is not feasible to transport a patient directly to a SCI centre by road, the patient should be transported directly to a SCI centre by helicopter, provided a helicopter is available and it is feasible to do so. This will occur even if another major hospital is substantially closer. In many metropolitan areas of New Zealand this will involve the patient being driven to a helicopter base (or rendezvous point) that may be very close to (or onsite at), a major hospital and then flying the patient directly to a SCI centre, without the patient entering that major hospital. Provided a helicopter is available and it is feasible to fly to the SCI centre, this is preferable to the patient being transported to that major hospital and then secondarily transferred. This is because such a secondary transfer incurs a clinically significant delay that may worsen the patient's outcome.
- ▶ If the flight involves the patient 'overflying' another major trauma hospital, it is essential that helicopter personnel re-evaluate the patient prior to flight, in order to ensure that there are no other signs of major trauma in addition to spinal cord injury. Personnel must have a very low threshold for seeking clinical advice if they are uncertain.
- ▶ If a helicopter is not available within a suitable time frame, or it is not feasible (for example due to weather) to fly to a SCI centre, the patient will be transported to the most appropriate major trauma hospital and then secondarily referred to a SCI centre when clinically appropriate. A 'suitable time frame' cannot be tightly defined and requires clinical judgement. If a helicopter is not immediately available personnel should seek clinical advice regarding the options for transport and the destination.
- ▶ Refueling may be required en route to a SCI centre. This is preferable to flying to another major trauma hospital and the patient being secondarily transferred.
- ▶ It is not usually feasible to transport a patient by fixed wing aircraft. In very unusual circumstances a fixed wing aircraft may be used, but in this setting personnel must seek clinical advice.
- ▶ The patient must be removed from extrication devices (such as a spine board, scoop stretcher or combi-carrier) and transported directly on the stretcher, unless the total time on the extrication device is going to be less than thirty minutes.
- ▶ Additional care must be taken to ensure the patient is kept warm.
- ▶ Urinary catheterisation is not required.

## **Seeking clinical advice**

- ▶ Personnel requiring advice will contact the doctor on call for the ambulance service via the Clinical Desk within the Ambulance Clinical Control Centre.
- ▶ In the event that further advice is required, the doctor on call for the ambulance service will contact the on call spinal consultant within the appropriate SCI centre.

## **Communication with receiving hospital staff**

- ▶ No specific additional communication is required with receiving hospital staff other than the usual notification process for a patient with major trauma, however this notification should occur with as much advance warning as possible.

## SCI centre catchment areas and transport destination

- ▶ New Zealand has three designated SCI centres and each has an associated catchment area. They are:
  - **Middlemore Hospital** for adults (15 years or older) from the upper two thirds of the North Island (the area marked in orange on the map on the next page).
  - **Christchurch Hospital** for adults (15 years or older) from the lower third of the North Island (the area marked in blue on the map on the next page) and all of the South Island.
  - **Starship Hospital** for children (younger than 15 years) from all areas of New Zealand.
- ▶ Patients will be preferably transported to the catchment area SCI centre, provided it is feasible to do so. This means that some patients will be flown to a SCI centre that is not the closest SCI centre to the scene, particularly when the scene is in the upper part of the area marked in blue on the map. This is preferable to always flying to the closest SCI because it is important to balance the patient load between the SCI centres and this reduces secondary inter-hospital transfers.
- ▶ It will not always be feasible to fly the patient to the catchment area SCI centre. In particular, it is not always feasible to fly an adult from the lower third of the North Island to Christchurch Hospital and it is rarely feasible to fly a child from the South Island directly to Starship Hospital. Thus, for the purposes of prehospital decision making, the patient will be transported to the most appropriate SCI centre and then referred (if required) to the catchment area SCI centre. The following will be taken into account when determining which SCI centre the patient is transported to:
  - The catchment area boundaries and the location of the scene.
  - The location and availability of helicopters.
  - The weather.
  - Where the patient lives.
- ▶ Examples:
  - An adult in the orange area will usually be flown to Middlemore Hospital.
  - An adult in the blue area will usually be flown to Christchurch Hospital.
  - An adult in the South Island will usually be flown to Christchurch Hospital.
  - A child in the North Island will usually be flown to Starship Hospital.
  - A child in the South Island will usually be flown to Christchurch Hospital and then secondarily referred to Starship Hospital when clinically appropriate. This is because Christchurch Hospital is a SCI centre with the staff and facilities to provide urgent decompressive surgery if required.
- ▶ It may seem counterintuitive for adult patients from the lower North Island to be flown to Christchurch but it is important to balance the workload between the SCI centres. In addition, patients that are transported to a SCI centre that does not align with their catchment area will be subsequently referred to the appropriate SCI centre and it is more efficient for the healthcare system if patients are transported directly to their catchment area SCI centre whenever this is feasible.
- ▶ Personnel must seek clinical advice if they are uncertain which SCI centre the patient should be transported to.

# Spinal Cord Injury Destination Policy

## Catchment Area Boundaries

### Key

- Middlemore Hospital
- Christchurch Hospital
- Starship Hospital (all of NZ)



