Spinal Cord Impairment (SCI)

Have the new triage guidelines made a difference?

Alpesh Patel
Orthopaedic Spine Surgeon
Counties Manukau DHB

Outline

- Overview SCI
- Development of Action Plan
- Cervical Spinal Cord Injury Study
- Future research

Introduction

- SCI – damage to the spinal cord resulting in change in function, either temporary or permanent

- 130 – 180 / year diagnosed with SCI in NZ
- Currently ~1500 with SCI managed by ACC

Spinal Cord Injury

- Most common mechanism of injury - Falls

- Cervical injuries 60%
    - Most common level C5

- Thoracolumbar injuries 40%
    - Most common level T12

- Age increasing
    - Most common range 45-54

In NZ, the current model of care for medical interventions and lifelong supports for people with spinal cord impairment (SCI) is **fragmented and needing better coordination**.

Variable and inconsistent approaches to accessing services do not deliver the best results , well being or life expectancy outcomes.

This also **increases the cost** of providing care and services over a person's lifetime.

The **New Zealand Spinal Cord Impairment Action Plan** was developed with the aim of optimising and coordinating resources to improve the outcomes for people with SCI and their families.

Historic models of care

- Acute SCI not identified as a specialty area apart from self-promotion by Burwood and in the ICU at Middlemore Hospital

- Other than Burwood, there was no clear referral system for people presenting acutely with SCI

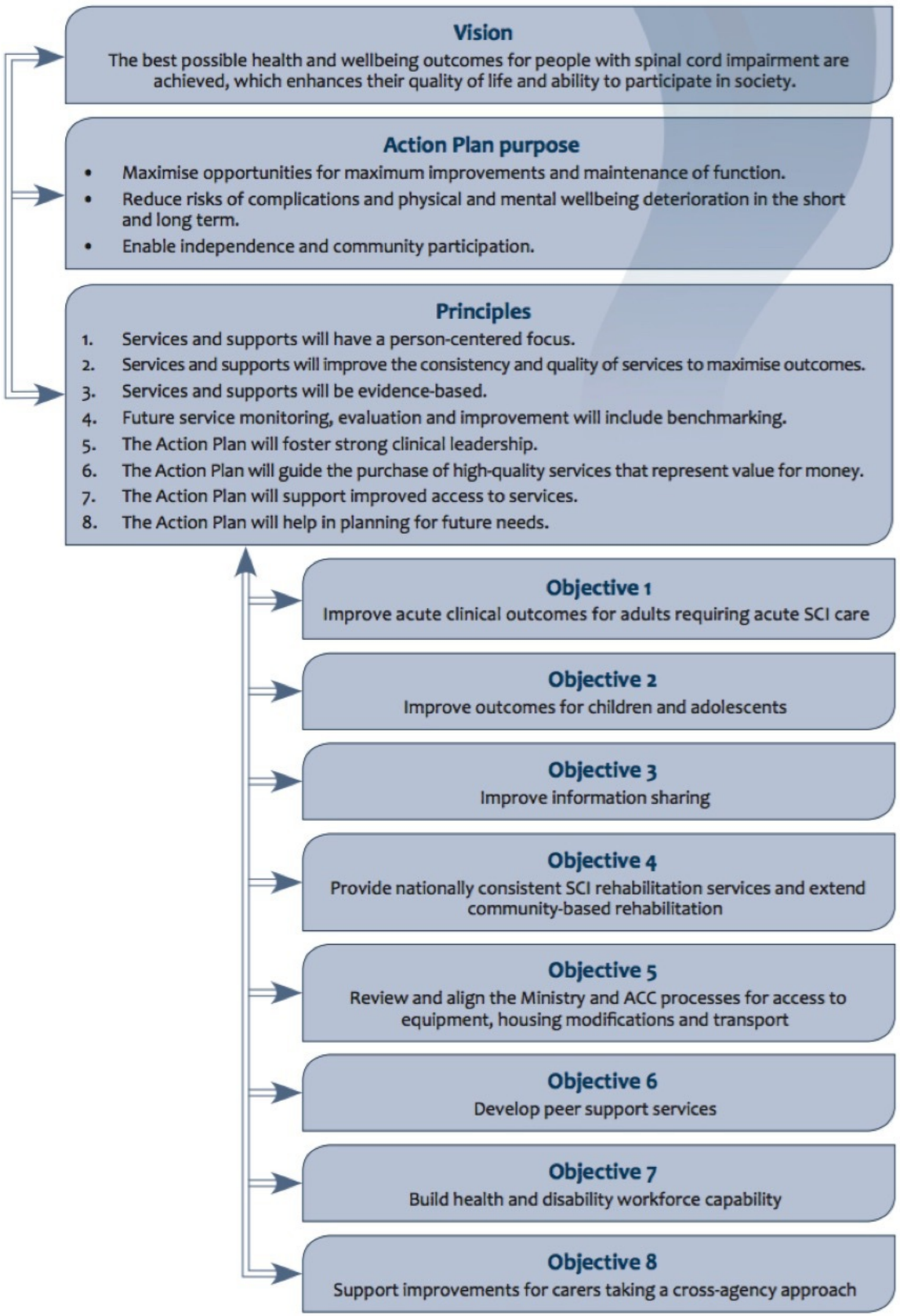
- Decision to keep or transfer a patient was determined by the receiving acute hospital.

- Patient may or may not be transferred to a specialist acute SCI service

Early versus Delayed Decompression for Traumatic Cervical Spinal Cord Injury: Results of the Surgical Timing in Acute Spinal Cord Injury Study (STASCIS)

Michael G. Fehlings[1]*, Alexander Vaccaro[2], Jefferson R. Wilson[1], Anoushka Singh[1], David W. Cadotte[1], James S. Harrop[2], Bizhan Aarabi[3], Christopher Shaffrey[4], Marcel Dvorak[5], Charles Fisher[5], Paul Arnold[6], Eric M. Massicotte[1], Stephen Lewis[1], Raja Rampersaud[1]

- Prospective multicenter non-randomised cohort
- 222 pts from 6 centers
- Results at 6 months
  - 19.8% had > 2 AIS grade improvement with early decompression compared to 8.8% with late surgery
  - Multivariate analysis – odds of ≥ 2 AIS improvement is 2.8 times higher in early group vs late group
  - Complication rate – 24.2% early vs 30.5% in late (p=0.21)



NZ Spinal Impairment Action Plan

- Develop a national model under which two supra-regional acute adult services operate
  - CDHB
  - Auckland Region
- Equivalent and consistent national model

Spinal Cord Impairment Strategy Regional Steering Group

- CMDHB selected as the Regional Acute Spinal Cord Impairment Service
- Service began 18 August 2014 for
    - Northland DHB
    - Waitemata DHB
    - Auckland DHB
    - Middlemore DHB
- Rolled out to other centres throughout upper North Island over following months

◆ Northern Supra Regional Spinal Cord Service ◆

Acute Management of People with Traumatic and Non-Traumatic
Spinal Cord Injury with Neurological Impairment, Middlemore Hospital

Referral Criteria:

- Patients with traumatic spinal cord injury with complete neurological deficit
- Patients with traumatic spinal cord injury with incomplete neurological deficit
- Patients15yrs or older with traumatic spinal cord injury
- Patients with traumatic cauda equina injury
- All patients that fulfil these criteria are required to be discussed with Spinal Consultant on call

Referral Pathway:

- Referring Consultant/Registrar calls MMH operator 09 276 0000 for Spinal Consultant / Clinical Nurse Specialist spines on call
- Mandatory discussion with On Call Spinal Consultant or Clinical Nurse Specialist before transfer
- Transfer should occur as soon as cleared fit for transfer preferably within 24 hours
- Regional DHB sends Radiology Images
- Accepted for transfer. Referring service completes online Spinal Transfer form then fax to 09 276 0288 then send notification by email to: spines@middlemore.co.nz
- Clinical Nurse Specialist Spines will contact referring DHB to discuss time and mode of transfer
- All patients with neurological deficit who are not transferred still require referral to the Auckland Spinal Rehabilitation Unit (ASRU) for spinal rehabilitation and follow up

Contact Information:

On Call Spinal Consultant	ph: 09 276 0000
Clinical Nurse Specialist Spines	ph: 09 276 0000 or 021 221 6011
Orthopaedic Department	fax: 09 276 0288
Email	spines@middlemore.co.nz

COUNTIES MANUKAU HEALTH

Cervical Spinal Cord Injuries – Before/After Regional Policy Change

Dr Peny Lin
Mr Alpesh Patel

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Early Decompression following Cervical Spinal Cord Injury: Examining the Process of Care from Accident Scene to Surgery

Camila R. Battistuzzo,[1] Alex Armstrong,[2] Jillian Clark,[3] Laura Worley,[4] Lisa Sharwood,[5] Peny Lin,[6] Gareth Rooke,[7] Peta Skeers,[1] Sherilyn Nolan,[2] Timothy Geraghty,[4] Andrew Nunn,[8] Doug J. Brown,[9] Steven Hill,[8] Janette Alexander,[8] Melinda Millard,[8] Susan F. Cox,[10] Sudhakar Rao,[11] Ann Watts,[12] Louise Goods,[2] Garry T. Allison,[13] Jacqui Agostinello,[1] Peter A. Cameron,[14] Ian Mosley,[15] Susan M. Liew,[16] Tom Geddes,[6] James Middleton,[5] John Buchanan,[17] Jeffrey V. Rosenfeld,[18] Stephen Bernard,[19] Sridhar Atresh,[4] Alpesh Patel,[6] Rowan Schouten,[7] Brian J.C. Freeman,[20] Sarah A. Dunlop,[2] and Peter E. Batchelor[1]

Retrospective review of pts from 2010 to 2013 (before NZ SCI Action Plan)

- Time to decompression
- Direct vs. non-direct surgical hospital admission
- Paramedic phase
- Pre-admission phase
- Surgical admission phase

Early Decompression following Cervical Spinal Cord Injury: Examining the Process of Care from Accident Scene to Surgery

- 192 patients
- Median time from scene to decompression 21 hrs
- Sig decrease in time from 2010-2013 (31 vs 19 hrs)
- Direct surgical hospital admissions had sig lower time to decompression cf non direct (21 vs 26 hrs)
- Relationship between timing of decompression and number of pts with ≥ 2 AIS improvement

Middlemore Study

Post NZ Spinal Impairment Action Plan

- Retrospective audit of isolated acute cervical cord injuries
- Patients from August 2014 – August 2015
- Time points:
  - Paramedic intervention
  - Assessments
  - Investigations
  - Diagnostic classifications
  - Time of decompression
- Comparison with ICED study results 2010 – 2013

Inclusion/Exclusion Criteria

Inclusion

- Age 15 – 70
- Isolated C3-T1 fracture, fracture-dislocation, disc and ligamentous injuries resulting in neurological deficits
- Had acute surgical treatment

Exclusion

- Multi-trauma cases: at least one other major organ or system
- Significant head injury (sustained GCS <13)
- Significant chest trauma causing hypoxia or haemothorax
- Intra-abdominal bleeding/ retro-peritoneum bleeding requiring intervention
- Pelvic/long bone fractures requiring intervention
- Pre-injury major neurologic deficits or disease

Numbers

Before Aug 2014

Total: 12

Non-direct: 7

Direct to Surgical Hospital: 5

7 males, 5 females
Mean age: 40.6

After Aug 2014

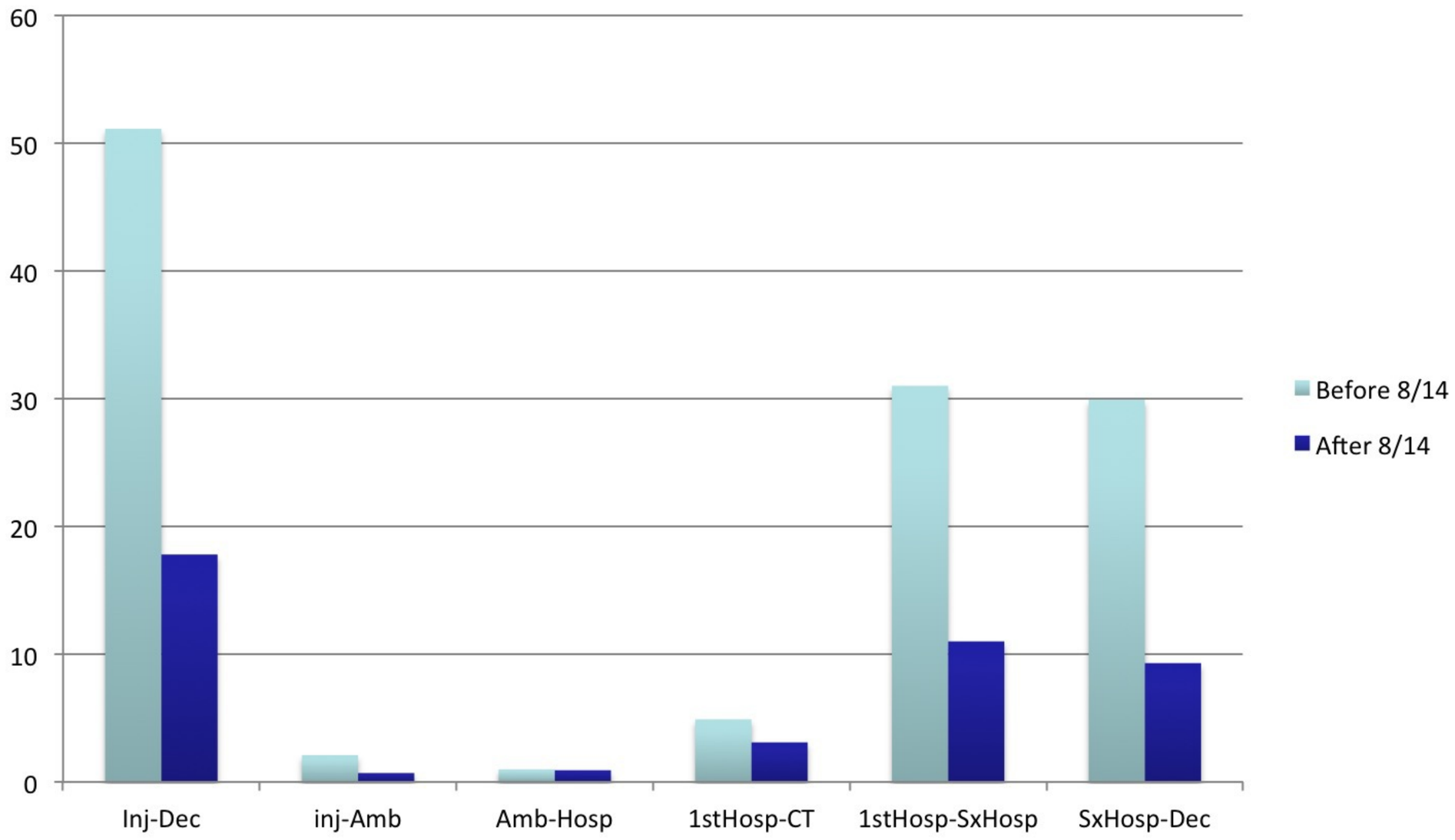
Total: 11

Non-direct: 7

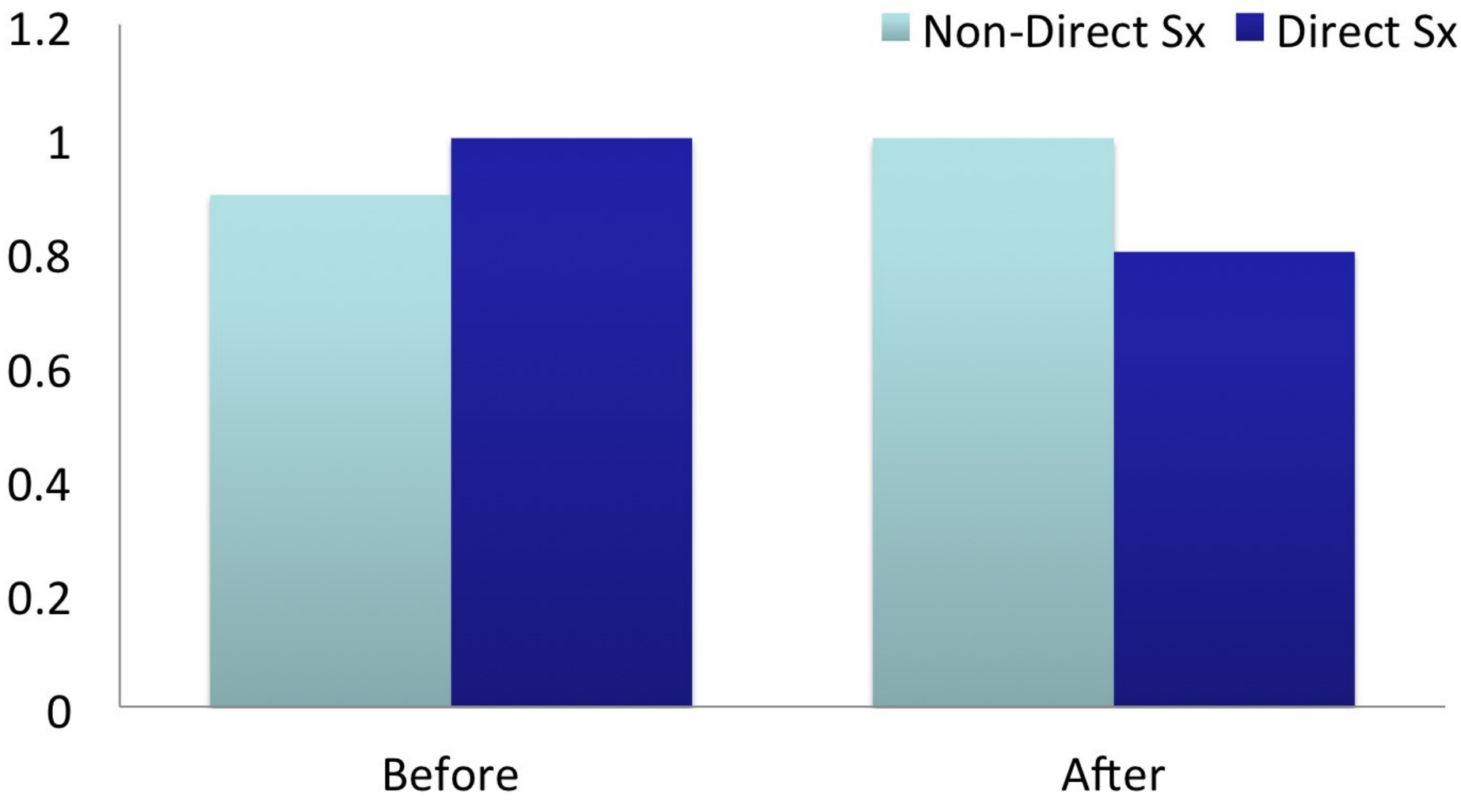
Direct to Surgical Hospital: 4

10 males, 1 female
Mean age: 34.5

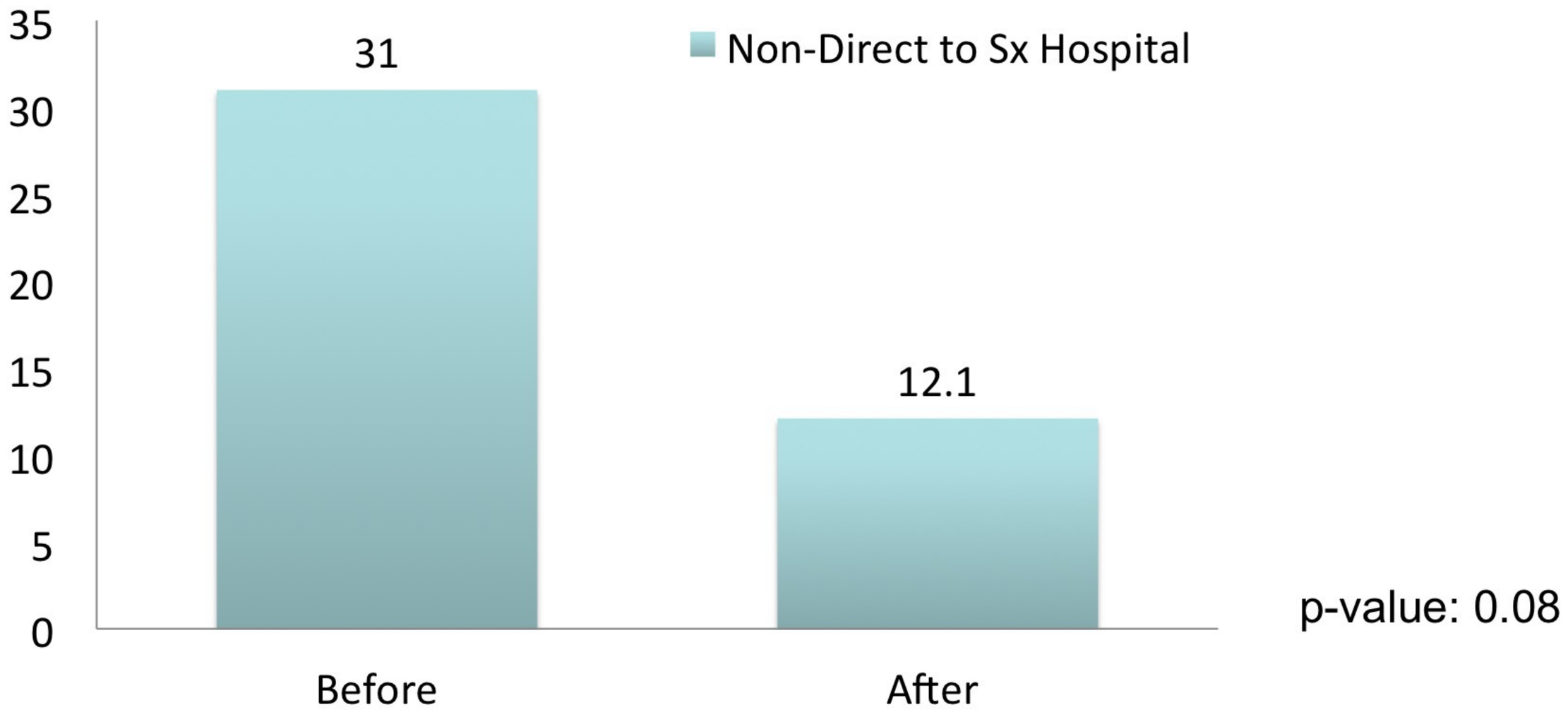
Total Times Summary



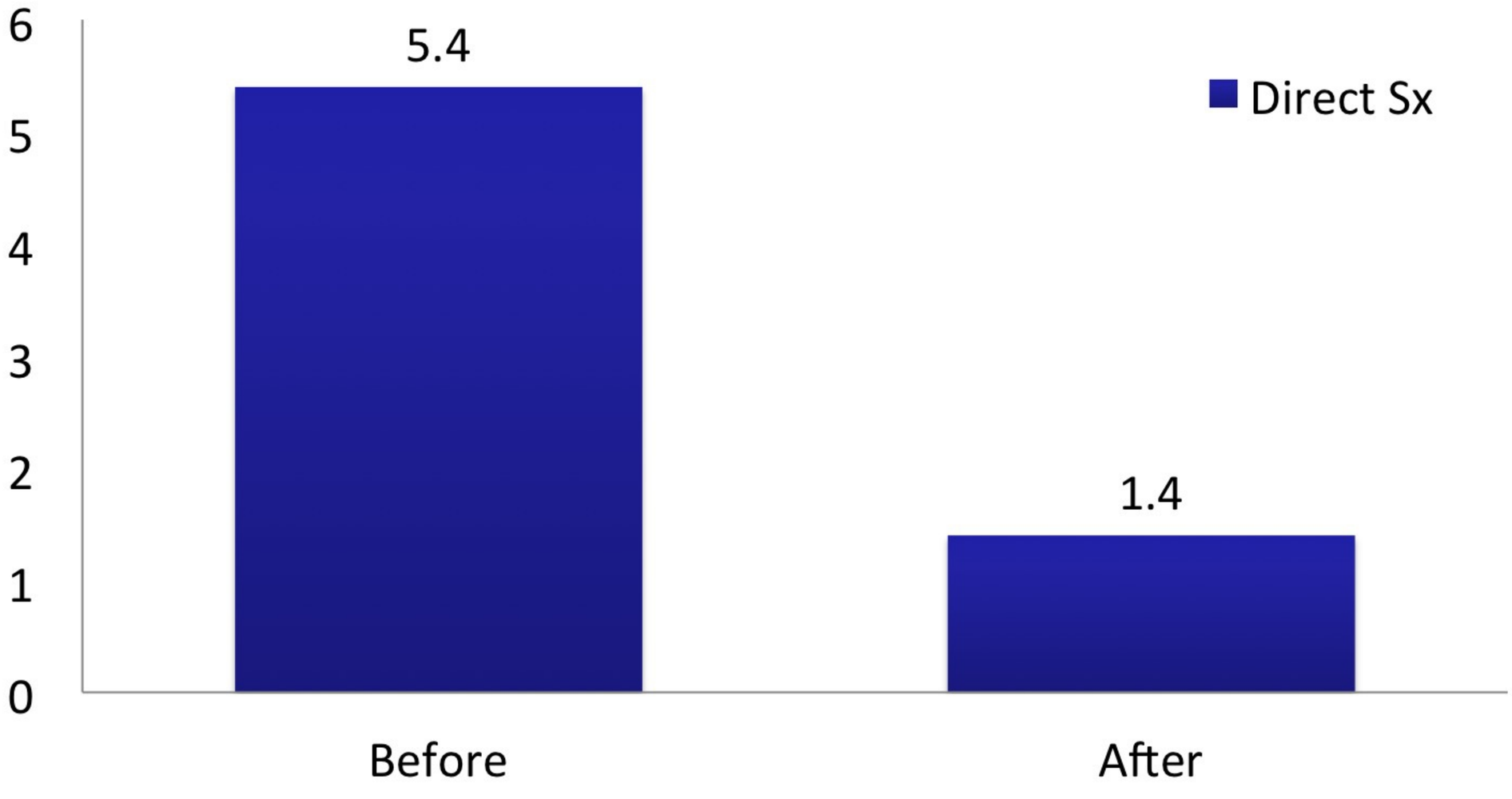
Time for Ambulance to First Hospital Arrival



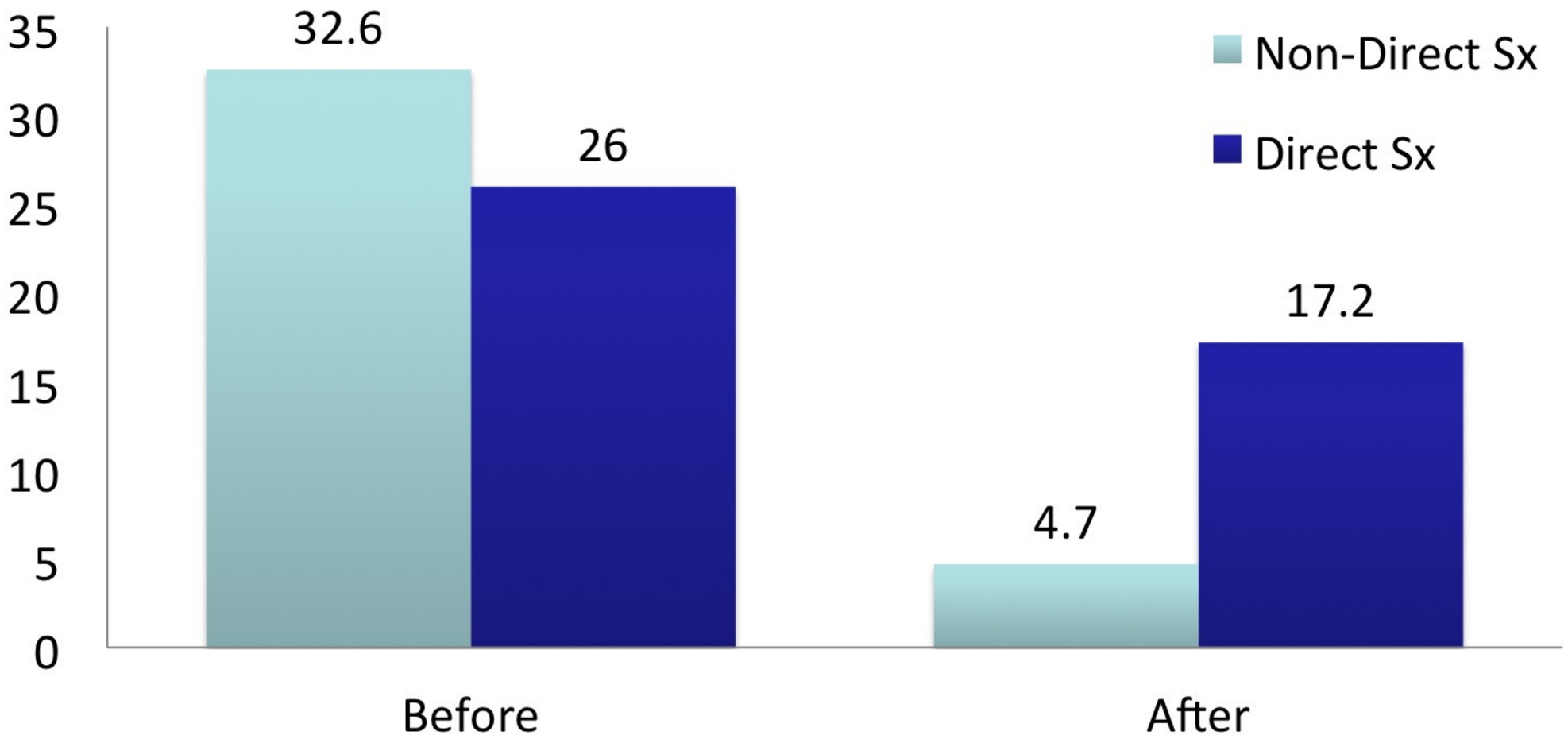
Time from First Hospital to Surgical Hospital



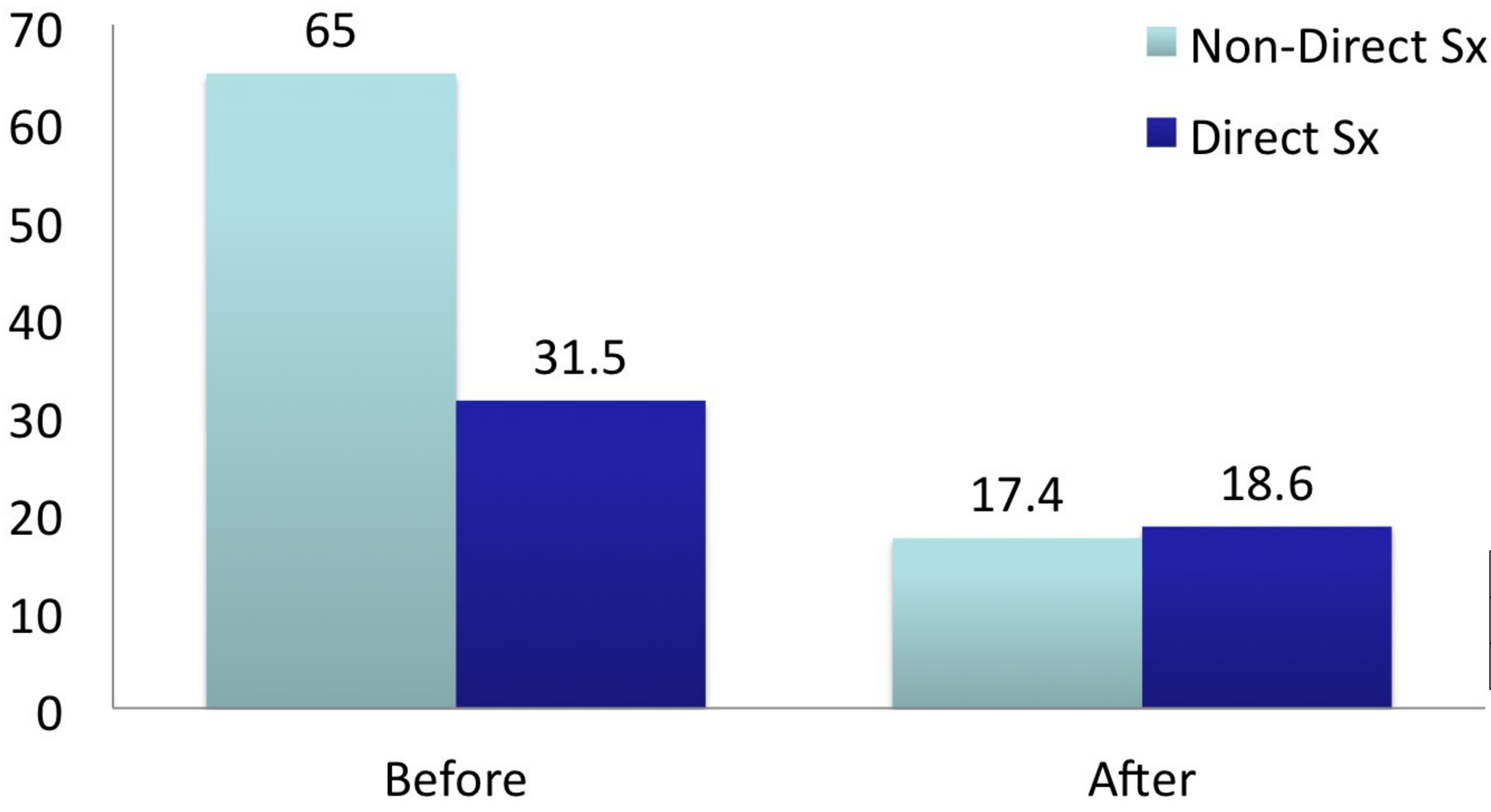
Time from Injury to Surgical Hospital



Time at Surgical Hospital to Decompression



Time from Injury to Decompression



	p-value
Non-Direct	0.01
Direct	0.02

Conclusions

- Similar ambulance times before and after policy change
- Significant decrease in transfer time from first hospital to surgical hospital
- Reduced time from scene direct to surgical hospital
- Once at surgical hospital reduced time to decompression
- Non-direct vs direct admissions (after 2014)
    - Similar times to decompression

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.

Publication date June 2015

ACC PREVENTION. CARE. RECOVERY. Te Kaporeihana Āwhina Hunga Whara

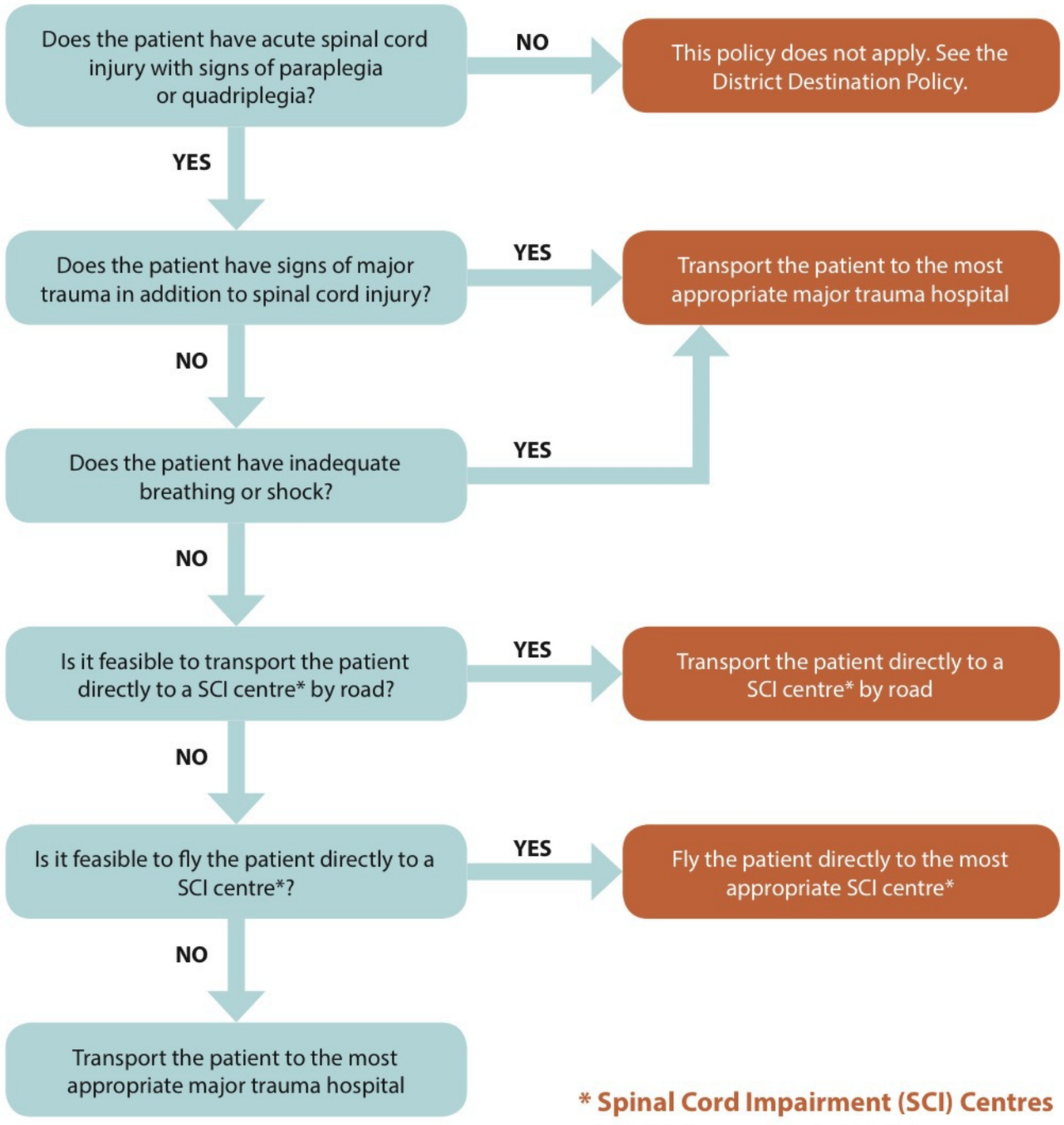
MINISTRY OF HEALTH MANATŪ HAUORA

St John

WELLINGTON FREE AMBULANCE kia ora te tangata

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

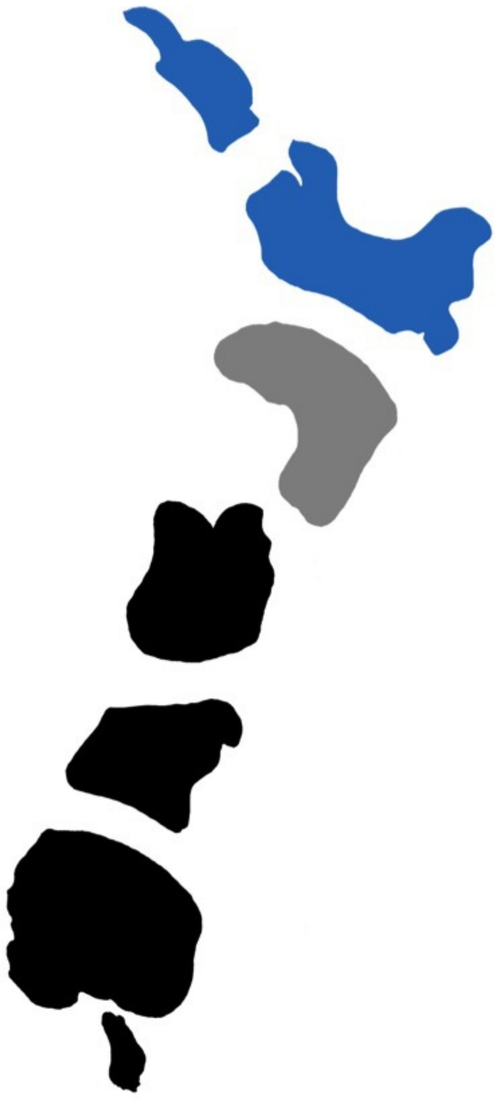
Catchment Area Boundaries

Key

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

Future Research

- Collaboration with Burwood Spinal Unit
- Pre and Post Destination Policy Implementation
- August 2014 – 2015 vs August 2015 – 2016
- Includes all levels of spinal cord impairment



NZ Spinal Cord Injury Registry

In Partnership With The Rick Hansen Institute