

# Spinal Cord Injury

## Service Delivery Model for Queensland



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# CONTENTS



<table border="0"> <tr> <td><b>Acknowledgement of Country</b></td> <td style="text-align: right;"><b>4</b></td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td><b>Introduction</b></td> <td style="text-align: right;"><b>6</b></td> </tr> <tr> <td>Our commitment to improving spinal cord injury care</td> <td style="text-align: right;">6</td> </tr> <tr> <td>A co-design approach</td> <td style="text-align: right;">7</td> </tr> <tr> <td>How we will realise this service model</td> <td style="text-align: right;">7</td> </tr> <tr> <td>Pivotal events and developments that shape and influence quality of life and healthcare for people with a spinal cord injury</td> <td style="text-align: right;">9</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td><b>PART A: Spinal cord injuries</b></td> <td style="text-align: right;"><b>10</b></td> </tr> <tr> <td>What is a spinal cord injury?</td> <td style="text-align: right;">10</td> </tr> <tr> <td>Traumatic and non-traumatic injuries</td> <td style="text-align: right;">11</td> </tr> <tr> <td>Effects of a spinal cord injury</td> <td style="text-align: right;">11</td> </tr> <tr> <td>The spinal cord injury care continuum</td> <td style="text-align: right;">13</td> </tr> </table>	<b>Acknowledgement of Country</b>	<b>4</b>	<hr/>		<b>Introduction</b>	<b>6</b>	Our commitment to improving spinal cord injury care	6	A co-design approach	7	How we will realise this service model	7	Pivotal events and developments that shape and influence quality of life and healthcare for people with a spinal cord injury	9	<hr/>		<b>PART A: Spinal cord injuries</b>	<b>10</b>	What is a spinal cord injury?	10	Traumatic and non-traumatic injuries	11	Effects of a spinal cord injury	11	The spinal cord injury care continuum	13	<table border="0"> <tr> <td><b>PART B: Current service system</b></td> <td style="text-align: right;"><b>18</b></td> </tr> <tr> <td>Services provided across the care continuum</td> <td style="text-align: right;">18</td> </tr> <tr> <td>System influences for healthcare delivery</td> <td style="text-align: right;">19</td> </tr> <tr> <td>What we learned through co-design about system challenges</td> <td style="text-align: right;">20</td> </tr> <tr> <td>What the data tells us</td> <td style="text-align: right;">21</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td><b>PART C: Future service system</b></td> <td style="text-align: right;"><b>24</b></td> </tr> <tr> <td>Introduction</td> <td style="text-align: right;">24</td> </tr> <tr> <td>A networked approach to service delivery</td> <td style="text-align: right;">25</td> </tr> <tr> <td>Networked service arrangement</td> <td style="text-align: right;">26</td> </tr> <tr> <td>Benefits of a networked service arrangement</td> <td style="text-align: right;">26</td> </tr> <tr> <td><b>Care during the initial injury or diagnosis</b></td> <td style="text-align: right;"><b>28</b></td> </tr> <tr> <td><b>Hospital rehabilitation and community reintegration</b></td> <td style="text-align: right;"><b>32</b></td> </tr> <tr> <td><b>Optimising health and wellbeing across the lifespan</b></td> <td style="text-align: right;"><b>40</b></td> </tr> <tr> <td>Continuous improvement, research and innovation</td> <td style="text-align: right;">46</td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td><b>Next steps</b></td> <td style="text-align: right;"><b>50</b></td> </tr> <tr> <td colspan="2"><hr/></td> </tr> <tr> <td><b>Terminology</b></td> <td style="text-align: right;"><b>52</b></td> </tr> </table>	<b>PART B: Current service system</b>	<b>18</b>	Services provided across the care continuum	18	System influences for healthcare delivery	19	What we learned through co-design about system challenges	20	What the data tells us	21	<hr/>		<b>PART C: Future service system</b>	<b>24</b>	Introduction	24	A networked approach to service delivery	25	Networked service arrangement	26	Benefits of a networked service arrangement	26	<b>Care during the initial injury or diagnosis</b>	<b>28</b>	<b>Hospital rehabilitation and community reintegration</b>	<b>32</b>	<b>Optimising health and wellbeing across the lifespan</b>	<b>40</b>	Continuous improvement, research and innovation	46	<hr/>		<b>Next steps</b>	<b>50</b>	<hr/>		<b>Terminology</b>	<b>52</b>
<b>Acknowledgement of Country</b>	<b>4</b>																																																																
<hr/>																																																																	
<b>Introduction</b>	<b>6</b>																																																																
Our commitment to improving spinal cord injury care	6																																																																
A co-design approach	7																																																																
How we will realise this service model	7																																																																
Pivotal events and developments that shape and influence quality of life and healthcare for people with a spinal cord injury	9																																																																
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<b>PART A: Spinal cord injuries</b>	<b>10</b>																																																																
What is a spinal cord injury?	10																																																																
Traumatic and non-traumatic injuries	11																																																																
Effects of a spinal cord injury	11																																																																
The spinal cord injury care continuum	13																																																																
<b>PART B: Current service system</b>	<b>18</b>																																																																
Services provided across the care continuum	18																																																																
System influences for healthcare delivery	19																																																																
What we learned through co-design about system challenges	20																																																																
What the data tells us	21																																																																
<hr/>																																																																	
<b>PART C: Future service system</b>	<b>24</b>																																																																
Introduction	24																																																																
A networked approach to service delivery	25																																																																
Networked service arrangement	26																																																																
Benefits of a networked service arrangement	26																																																																
<b>Care during the initial injury or diagnosis</b>	<b>28</b>																																																																
<b>Hospital rehabilitation and community reintegration</b>	<b>32</b>																																																																
<b>Optimising health and wellbeing across the lifespan</b>	<b>40</b>																																																																
Continuous improvement, research and innovation	46																																																																
<hr/>																																																																	
<b>Next steps</b>	<b>50</b>																																																																
<hr/>																																																																	
<b>Terminology</b>	<b>52</b>																																																																

## ACKNOWLEDGEMENT OF COUNTRY

Queensland Health respectfully acknowledges the Traditional and Cultural Custodians of the lands, waters and seas across Queensland. We pay our respects to Elders past and present, while recognising the role of current and future leaders in shaping a better health system.

We value the culture, traditions and contributions that the Aboriginal and Torres Strait Islander peoples have made to our communities and recognise that our collective responsibility as government, communities and individuals is to ensure equity and equality, recognition and advancement of Aboriginal and Torres Strait Islander peoples in Queensland in every aspect of our society.

Queensland Health acknowledges the First Nations peoples in Queensland are both Aboriginal peoples and Torres Strait Islander peoples and supports the cultural knowledge, determination and commitment of Aboriginal and Torres Strait Islander communities in caring for their health and wellbeing.

## THANK YOU

We are grateful to everyone who has been involved in co-designing this service delivery model to improve healthcare experiences and outcomes for adults with a spinal cord injury in Queensland.

We acknowledge the complexity of spinal cord injury care and thank the dedicated clinicians working across the care continuum and in all settings. Your expertise, commitment and compassion have been instrumental in shaping this service model.

We are deeply appreciative to the people with a spinal cord injury, their families and loved ones who have shared their experiences and insights. Your contributions have been invaluable.

Special thanks to the organisations collaborating with Queensland Health to continuously improve the delivery of care. This includes dedicated community providers, researchers and colleagues from other jurisdictions.

For further information, this document should be read in conjunction with the *Spinal Cord Injury Service Delivery Model for Queensland: Co-design Process and Outcomes Report*.



# INTRODUCTION

Queensland Health is committed to growing and enhancing adult spinal cord injury services across the state, to be a leader in Australia and the world. Our goal is to enable and empower people with a spinal cord injury, and their families, to have the opportunity to live happy, healthy and socially connected lives. We will achieve this by providing high-quality, person and family-centred care that is equitable and responsive to the needs and preferences of individuals and their loved ones. The *Spinal Cord Injury Service Delivery Model for Queensland* (service model) outlines the future service system and how we will realise our shared goal over the next ten years.

The development of this service model is part of a proactive and system-wide response to concerns voiced by past and present consumers of spinal cord injury services in Queensland. These concerns, raised publicly in early 2023, highlighted challenges in accessing services, inconsistent approaches to care provision and patient safety issues. To actively address these challenges, a multi-pronged program of work has commenced. Improvements include enhancements to the Queensland Spinal Cord Injuries Service (the statewide service) located at the Princess Alexandra Hospital, planned uplift of infrastructure at the statewide service and expansion of specialist rehabilitation services for spinal cord injury across the state.

A collaborative approach using co-design has shaped and informed the development of this service model. People with a spinal cord injury, their loved ones, clinicians and other services partners are at the heart of our future service system. Their lived experience, engagement and participation enables the system to better understand, support and respond to their diverse and personal needs.

Recognising the complexity of spinal cord injuries and the profound and ongoing impact they have, we understand a one-size-fits-all approach is not appropriate. Each person's care journey is different and often not linear. Access to highly specialised, multidisciplinary healthcare tailored to a person's unique circumstances across the care continuum is essential not only for people's initial recovery, but for their lifelong health and wellbeing. This service model describes a future system that focuses on the individual receiving optimal and personalised care with the aim of getting people home and connected to their community in a timely manner.

The service model reflects the outcomes of the co-design process and will drive a whole-of-system response to enhance service provision and advance new spinal cord injury services across the state. It also highlights the need for specialist workforce, infrastructure, education, data, technology and equipment as key enablers for success. A supporting implementation plan will be developed to ensure a phased approach for implementing and operationalising the service model.

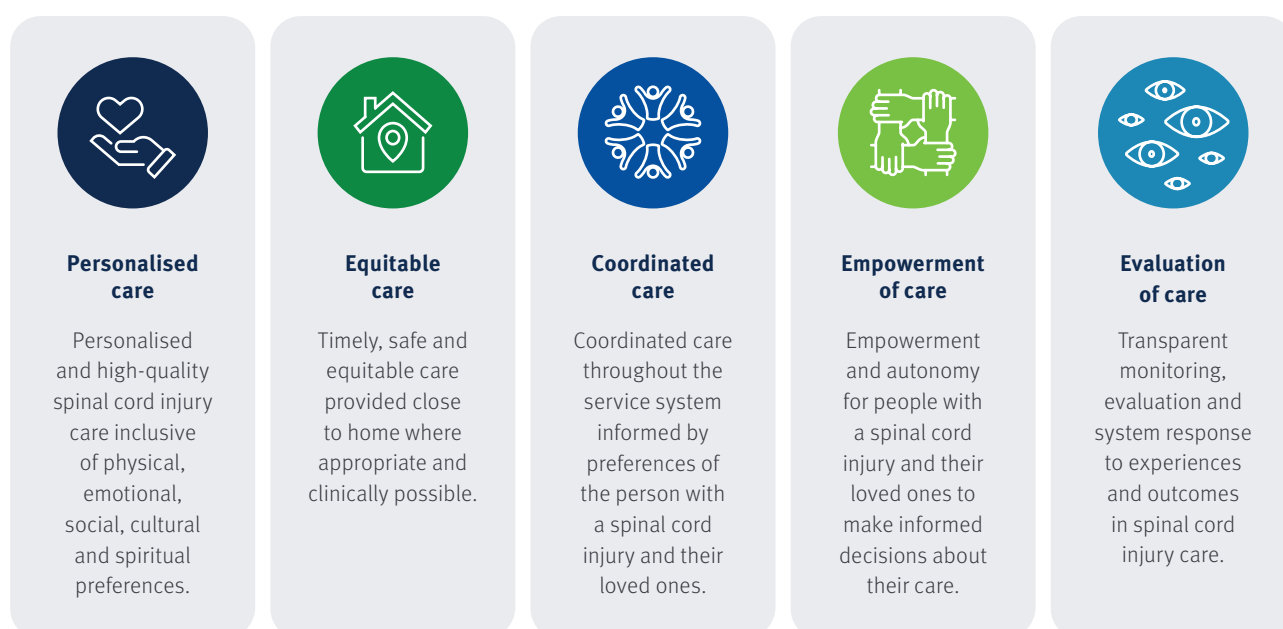
As we move forward, we will foster the partnerships established through this co-design process as they underpin the successful implementation of the service model across Queensland. We acknowledge the role of our service partners. By working together towards a shared goal, we can realise our collective future – a more equitable, consistent and coordinated system delivering high-quality care for Queenslanders with a spinal cord injury.

## A co-design approach

This service model was developed over nine months through a co-design approach. Co-design brings together key stakeholders to design solutions to challenges that can be difficult to overcome through traditional engagement and consultation. It applies a dynamic, collaborative approach that creates an equal relationship among contributors. For further information refer to the *Spinal Cord Injury Service Delivery Model for Queenslanders - Co-design Process and Outcomes Report*.

An outcome from co-design was the development of five shared principles. The shared principles underpin the successful delivery of the service model and support improved access to safe, high-quality and timely spinal cord injury care as close to home as possible throughout a person's journey. *Figure 1* details the shared principles for high-quality spinal cord injury care.

**Figure 1:** Shared principles for high-quality spinal cord injury care



The five shared principles were developed via an iterative process. Initially, principles were drafted separately by consumers and clinicians. These draft principles were presented at the first co-design workshop. Strong alignment emerged between the two stakeholder groups' principles, emphasising the importance of shared language and a common goal and vision, 'To design a statewide service delivery model that enables high-quality, person and family-centred spinal cord injury care across the care continuum'. Following feedback, the groups' draft principles were combined and refined. The shared principles were reaffirmed in subsequent co-design workshops to test ideas and elicit suggestions for improvement.

## How we will realise this service model

The service model is ambitious and will be advanced over the next ten years. Queensland Health will work with stakeholders to develop an action plan for implementation. The co-design process has identified some actions that can start immediately. As a priority, we will begin to establish the networked service arrangements outlined in the service model. We recognise time is required for some elements to build capacity across the system to grow the workforce and infrastructure requirements. These aspects will be implemented in the medium to long term.

## INTRODUCTION

# Jocelyn

If there's a theme that runs through Jocelyn's life, it is helping people reach their potential and live their best lives.

Close involvement in sharing her lived experience during the co-design of the new service model for spinal cord injury is only a small part of the picture.

Jocelyn retired this year from swim coaching after 35 years of 3am wake-ups, hitting the pool deck in the pre-dawn hours with her squad.

In 2009, her career as a Brisbane school principal ended abruptly after a collision with a kangaroo on the road west of Roma left her with tetraplegia. She then spent six weeks in an induced coma followed by 21 months of rehabilitation. It was a long road to recovery for Jocelyn.

Some 15 years after the initial injury, Jocelyn spends much of her professional time mentoring people in the use of assistive technologies at Spinal Life Australia's Healthy Living Centre in Brisbane.

That's one area where she has seen a lot of change for the better.

**“Assisted technology and home automation has changes dramatically in the last 10 years,” Jocelyn says.**

“It hadn't changed for a long time, now it's really mainstream. Assistive technology and home automation is much more affordable these days.

“And with home automation, the sky's the limit. It can be deployed to improve people's independence. It's about choice and control. We can have a fully automated home.”

One piece of work Jocelyn has devoted a lot of time to is being leveraged in the development of the new service model.



The Brain and Spinal Cord Injury Project is expanding its spinal cord injury expertise and under the new networked model it will help make hospital rehabilitation services more available closer to home for people.

“Some dark times follow a traumatic spinal cord injury, and that's got to be managed,” Jocelyn says.

“Having loved ones accessible and able to visit can play a big part in a person's rehabilitation.

**“What I will say also is, sustaining a spinal cord injury doesn't change who you are. It doesn't take away your favourite football team. It doesn't change your religion. It doesn't change your beliefs.**

“Your core beliefs are still your core beliefs, whatever they may be.”

Jocelyn stresses she is just one of many, many people, both clinicians and consumers, who have contributed to the co-design of the new service model.

Improving availability of hospital-based rehabilitation closer to home and loved ones and assistive technologies expertise, will be two valuable legacies of her input.

That and the encouragement she has given to peers during the co-design process which has given them confidence to speak up and share their lived experiences.



## Pivotal events and developments that shape and influence quality of life and healthcare for people with a spinal cord injury

This service model acknowledges past, present and future legislative and policy reforms, global events and developments and service innovations that influence and shape healthcare delivery, improving quality of life for people with a spinal cord injury. The co-design process of this model highlights Queensland Health’s commitment to continually evolving spinal cord injury services for the future.

Figure 2: Timeline of the development of spinal cord injury services in Queensland



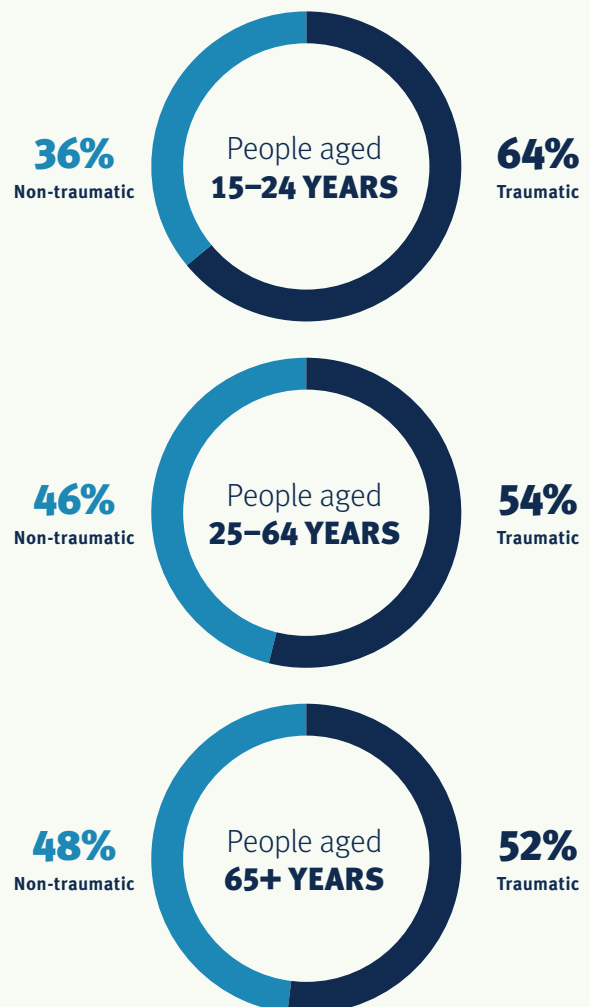
# SPINAL CORD INJURIES

## What is a spinal cord injury?

A spinal cord injury occurs when a person sustains damage to their spinal cord. Every year, around 300 Queenslanders are newly diagnosed with a spinal cord injury. Their injuries are categorised as ‘traumatic’ or ‘non-traumatic’. This is an important consideration for providing high-quality care. Approximately 48% of new spinal cord injuries are traumatic and 52% are non-traumatic (FY2018 to FY2023) – noting that non-traumatic injuries are increasing due to our ageing population.

*Figure 3* shows the incidence rates (new spinal cord injuries) of traumatic and non-traumatic injuries by age group.

**Figure 3:** Incidence rates per 1 million population by age group and type of injury between FY2018 and FY2023 in Queensland



## Traumatic and non-traumatic injuries

Traumatic spinal cord injuries typically result from external physical impacts, such as motor vehicle accidents, falls and sports injuries. A non-traumatic spinal cord injury refers to damage to the spinal cord caused by factors other than physical trauma or external force<sup>1</sup>. Non-traumatic injuries can be classed as congenital or genetic disorders, or an acquired dysfunction of the spinal cord due to internal factors such as vertebral column degenerative disorders, metabolic disorders, vascular disorders, inflammatory/autoimmune diseases, tumours or infectious causes. Due to the heterogenous nature of non-traumatic injuries, early diagnosis and investigations can often be delayed, resulting in prolonged transfer times to access surgical treatments and specialist rehabilitation.

## Effects of a spinal cord injury

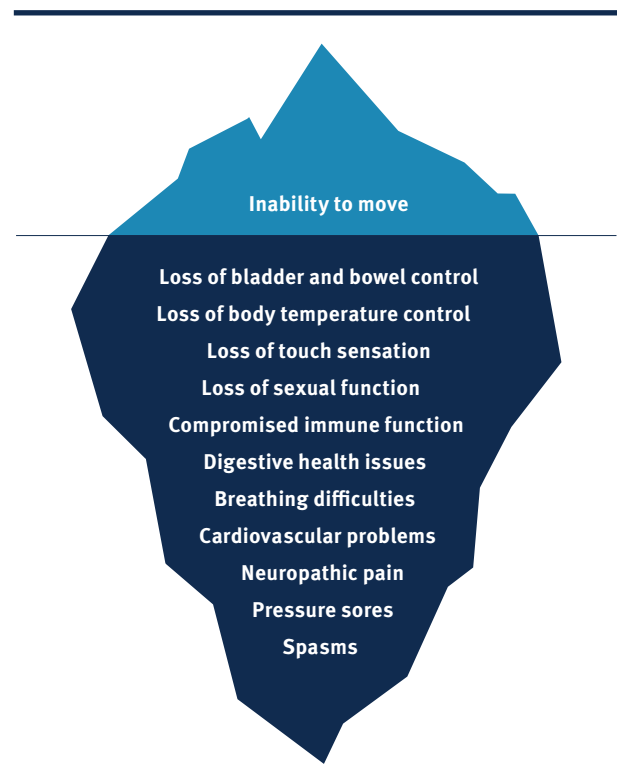
The physical effects of spinal cord injuries vary depending on a range of factors, such as the level and extent of the injury to the spinal cord. Most people experience paralysis (tetraplegia or paraplegia), loss of sensation, issues with bowel and bladder control, sexual dysfunction and for many people, breathing difficulties and ongoing pain. The complexities of health needs are often less visible as shown in *Figure 4*, known as the spinal cord injury iceberg<sup>2</sup>. Regardless of the type or nature of a spinal cord injury, it has profound impacts on the person and their family. People often face significant emotional and psychological challenges during the initial diagnosis of a spinal cord injury and these may persist beyond this initial stage. Familial and social relationship dynamics can change and there may be an adjustment period to new physical limitations and dependence on others for care<sup>3</sup>. It is important to acknowledge that each person's care requirements following a spinal cord injury are different.

Factors that can influence care requirements and complexity include a person's age, level (cervical, thoracic or lumbosacral) and extent of the spinal cord injury and whether the injury is new or pre-existing. Typically, those who suffer higher-level injuries experience more severe physical impairments<sup>4</sup>. Psychosocial factors can also influence complexity<sup>5</sup>. Factors such as childhood trauma, domestic or family violence or drug use can increase the complexity of care needs.

People with a spinal cord injury can also experience a range of secondary conditions and complications, in addition to their initial injury<sup>6</sup>. For instance, pressure injuries are a complication that can result from the loss of sensation, mobility and autonomic regulation in affected areas of the body<sup>7</sup>. In Queensland, over the six year period between FY2018 and FY2023, 24% of spinal cord injury admitted episodes related to care for a pressure injury. Ageing can also bring with it additional challenges<sup>8</sup>. As people age, they may experience a decline in physical function, strength and mobility and develop other comorbidities. These considerations play an important role in the overall management of a person's spinal cord injury.

Common secondary complications that result from a spinal cord injury include spasticity of muscles, respiratory difficulties and neurogenic shock that disrupts the body's ability to regulate blood pressure and blood flow effectively. In addition, bladder and bowel dysfunction can cause complications if managed poorly. Access to a range of medical specialties and multidisciplinary care is required throughout a person's journey to support and manage overall quality of life and changes in health over time.

**Figure 4:** The spinal cord injury iceberg shows that the complexities of health needs are often less visible



Source: SpinalCure Australia website at <https://www.spinalcure.org.au/research/spinal-cord-injury-facts>

**“It’s pretty much a full-time job having a spinal cord injury, you’ve got to look after so many things.”**



## The spinal cord injury care continuum

People with a spinal cord injury require comprehensive care including access to lifelong follow-up care as needed—termed the ‘care continuum’—to manage their condition and prevent complications, ensuring they maintain a high-quality of life and independence. This care journey is unique for each person.

High-quality care delivered throughout the care continuum for a person with a spinal cord injury:

- reflects the clinical and holistic needs and preferences of people, beginning at the point of a suspected or diagnosed spinal cord injury and continuing throughout the lifetime
- requires a comprehensive and coordinated approach to rehabilitation
- intersects with other community-based health and non-health services delivered by the public, non-government and private sector
- involves multi and interdisciplinary care including medical practitioners, nursing and allied health professionals, clinicians specialising in mental health and drug and alcohol services, peer support workers, cultural liaison officers, interpreters, rehabilitation engineers and leisure, music and art therapists, all playing a crucial role in care and support.

Figure 5 is an overview of the care continuum for a person with a spinal cord injury with the arrows indicating this may not always be a linear journey.

**Figure 5:** Care continuum for people with a spinal cord injury



*\*A person with a spinal cord injury may be admitted to hospital to manage complications or other issues but not require hospital rehabilitation or community reintegration services.*

High-quality, person and family-centred care incorporates a range of interventions inclusive of individuals’ physical, functional, psychological, social, cultural and spiritual needs. Queensland Health’s role is to deliver a coordinated approach throughout the care continuum and facilitate cross-sector collaboration, ensuring people with a spinal cord injury live happy, healthy and socially connected lives. The public health system also has an important role in upholding human rights by enabling equitable access, inclusive environments and supporting empowerment, autonomy, choice and control.

## PART A: SPINAL CORD INJURIES



### CARE AT THE TIME OF INITIAL INJURY OR DIAGNOSIS

The initial care for spinal cord injuries varies based on whether the injury is traumatic or non-traumatic, affecting the urgency and specific care requirements<sup>9</sup>. The need for surgical intervention depends on the condition itself and associated complications, with diagnostic challenges and comorbidities also needing consideration. Other services typically provided at this point include pre-hospital care (e.g., ambulance and retrieval), intensive care, trauma management, rehabilitation and respiratory care such as ventilator and complex airways management.

Traumatic injuries necessitate immediate interventions to stabilise the person's condition, manage the spine and airways and address any associated trauma. Rapid emergency transport to a trauma centre is critical during this phase. The aim of spinal surgical interventions for traumatic injuries is to limit proximal secondary damage and prevent further damage to the spinal cord<sup>10</sup>.

There are different considerations for non-traumatic injuries to manage the underlying condition causing spinal compression, such as tumours or infections, or to treat the disease process. Non-traumatic conditions lead to a deterioration of the spinal cord and sensory function over a variable period of time. Early access to diagnostic, medical imaging and surgical services is critical for the identification, diagnosis and treatment of non-traumatic injuries. Referral for surgical decompression surgery improves a person's prognosis and reduces the requirements or intensity of rehabilitation.

For both types of injuries, early treatment aims to reduce spinal pressure, control inflammation and prevent the development of secondary complications. Early referral for specialised spinal cord injury services is essential and reducing the time for a referral to be made is needed. Surgical decompression, when necessary, should be prompt. Early rehabilitation is essential, providing therapies and support to assist individuals in coping with the trauma and adjusting to life with a spinal cord injury. Specialised spinal services offer a tailored, multidisciplinary approach to enhance recovery and quality of life. These services recognise the importance of clear communication, information, guidance and support, especially when individuals face uncertainty and are feeling overwhelmed.



### HOSPITAL REHABILITATION AND COMMUNITY REINTEGRATION

Rehabilitation provides a holistic, personalised and goal-oriented approach to optimising health and functional recovery. It also enables people with a spinal cord injury to self-direct their care needs and reintegrate into the community. Evidence indicates that specialist rehabilitation should commence as soon as the person is medically stable and is correlated with better outcomes, during this phase<sup>11 12 13</sup>. There are many complex and unique factors that influence rehabilitation, including the person's ability to tolerate therapy, the presence of comorbidities, complications, cognition and priorities. Specialist rehabilitation services provide an environment that specifically caters to these unique needs and requirements, enabled by a skilled and expert workforce.

Rehabilitation includes a holistic range of services including, but not limited to, medical, nursing and allied health disciplines to enable optimal functional and psychosocial recovery. Ensuring family members, loved ones and friends are involved is important so they are well-prepared to offer support<sup>14</sup>. Families should be offered psychological, emotional and practical support as they are an integral part of the partnership both in the hospital and in people's care beyond the hospital environment. Advocacy and cultural and peer support play a role in enabling empowerment, choice and autonomy. Vocational rehabilitation, focused on education, training and employment for re-entry to the workforce, is another important component. A personalised approach to rehabilitation requires choice and options to engage in activities focused on an individual's interests. These could include music, art, sport and other physical activities.

A critical component of hospital rehabilitation is discharge planning and preparing for an individual's return to the community<sup>15</sup>. This includes needs assessments and obtaining funding and scripting for equipment, consumable items, personal care support, home and environmental modifications and supporting vocational and recreational goals. Enabling and providing opportunities to access the built, natural and social environments and engage in community life provides a sense of purpose and belonging in this period.

The provision of customised equipment is an important consideration for discharge planning and is supported by rehabilitation engineering services. These services help design and build technology, equipment and devices that aid a person's recovery, enhance their independence and improve overall quality of life. Starting this process well before returning home is beneficial. Driving, for example, is a common but multifaceted goal that requires medical, psychological and practical considerations including vehicle modification and adaptive equipment.



## OPTIMISING HEALTH AND WELLBEING ACROSS THE LIFESPAN

Lifelong care for individuals with a spinal cord injury encompasses a holistic approach that aims to enhance overall health, optimise and maintain function, prevent or manage complications and promote quality of life. Key components of a holistic approach include supporting individuals with increased choice to engage in physical activity, healthy eating, sporting pursuits, music, art and participation in community groups or clubs. Participation in these activities is made possible through supportive and accessible environments as well as access to personalised equipment, assistive technologies and therapy<sup>16</sup>.

As individuals age, they face the added challenge of dealing with the intersection of spinal cord injury-related health changes and age-related conditions. During these transitions, ensuring continuity of care while navigating a range of physical, psychosocial and practical challenges and addressing future needs is critical. This necessitates regular biopsychosocial assessments and the adaptation of care plans to align with changing goals and life stages.

For people with a spinal cord injury, and in particular, those with some degenerative conditions, care complexity may increase over time and there can be additional medical needs. These individuals often require specialised services to effectively manage comorbidities. For example, if the spinal cord injury is related to cancer, consulting with an oncologist becomes a critical part of the care plan.

Establishment of a robust support network is fundamental to lifelong care. This network of support may include family, friends, healthcare services, community services and other government providers. The intersection and coordination of formal and informal supports and services is key to delivering comprehensive and timely care throughout an individual's life<sup>17</sup>.

This service model recognises the importance of collaboration across sectors. Physical, psychological and social aspects of health are equally important. Active participation in family and community life promotes physical and mental wellbeing and fosters a sense of purpose and fulfillment<sup>18</sup>. These aspects include cultural and spiritual connections, education, employment, physical activity and recreational pursuits.



## Greg and Brooke

The first time Greg ever heard of cauda equina was in the hospital recovery room after emergency spinal surgery.

The need to raise the profile and improve early diagnosis and treatment of this non-traumatic cause of spinal cord injury is something that he and physiotherapist Brooke agree on.

Greg, who lives in Monto with wife Audrey and Brisbane-based Brooke, worked together during the co-design process mapping the future of spinal cord injury services in Queensland.

Greg had experienced lower back pain symptoms over an extended period, but they were always put down to other possible causes: carrying heavy camera equipment, long hours driving or kidney stones which he developed.

Audrey describes how Greg's 'level 10' pain finally forced the issue, triggering an arduous 52-hour journey to emergency surgery at the Royal Brisbane and Women's Hospital (RBWH) via hospitals in Monto and Bundaberg, emergency departments, CT and MRI scans, transfers by ambulance, LifeFlight helicopter and Royal Flying Doctor Service plane.

"My mind was a blur. Reflecting on that period now, there were some extra difficulties accessing care in a rural area and opportunities for improvement," Greg says.

"For example, there were very few nurses who were trained in catheterising a male at my local hospital when I needed this.

"And some of those multiple hospital transfers for scans and tests were unnecessary and I'm sure could have been avoided.

**"At no point in any of my transfers was there any mention of a possible spinal cord injury, or precautions for a possible spinal cord injury taken.**

"I arrived at the RBWH around 12.30am, transferred onto an MRI machine at around 3am and returned to the ward where I finally got some sleep.

"Then sometime after 5am a doctor woke me and told me I required emergency spinal surgery. He got me to sign the consent form and then left.

**"My mind was a blur. Reflecting on that period now, there were some extra difficulties accessing care in a rural area and opportunities for improvement."**





“The first time I heard of cauda equina was after the surgery.”

Cauda equina, Brooke explains, refers to a collection of signs and symptoms resulting from compression of the descending lumbar and sacral nerve roots that can lead to permanent damage including paralysis.

Damage to these nerves can result in disruption to bladder or bowel function or a lack of sensation between the thighs or genitals which can all be signs.

“If you present with back pain, there are screening questions, but it’s the questions that some people often tiptoe around because they feel awkward having discussions about things like urination, incontinence and sexual feeling and function,” Brooke says.

“And if you present with lower back pain, a GP may or may not fully screen for the signs in a 10 minute consultation because there may be more readily identifiable possible causes of lower back pain.”

Physiotherapists are well placed to screen and escalate for further investigations as they test sensation, muscle strength and usually reflexes when assessing back pain during a much longer consult.

“Even when diagnosed, cauda equina syndrome may not be considered as a spinal cord injury which results in failure to refer to the clinical experts who have the understanding to support the person with this dysfunction.”

Greg’s other main wishes for the future of cauda equina treatment in Queensland are to have more clinicians recognise the person in the patient and to have a second person present during critical conversations to ask the questions the patient might not be able to think of.

Audrey says, often patients will not have access to their own family as they have been flown in from regional areas and families are still in transit or unreachable.

“This all happens in a short span of time.

“Remember Greg was in all kinds of pain and discomfort at the time, not his best mental and emotional state to process such events.”

To have that frontline diagnosis and transfer process more consistent and streamlined is another big item on Greg’s wish list.

**“The model going forward would be that the doctors and the frontline medical staff would be able to pick up the phone or have a database with some questions to ask and if they tick a certain number of boxes there’s a number they can contact at a central location,” he says.**

“There they can ask questions like what’s the best way to move the patient and are we best going to Bundaberg for a possible MRI or do we go straight to Brisbane where they can do the MRI and, if need be, surgery.”



# CURRENT SERVICE SYSTEM

## Services provided across the care continuum

Queensland Health provides many different types of services across the care continuum – from care at the time of initial injury or diagnosis, to ongoing care for optimising health and wellbeing across the lifespan, as shown in *Figure 6*.

**Figure 6:** Current spinal cord injury service system across the care continuum



**Enabled by specialist workforce, data (qualitative and quantitative), infrastructure, research and communication.**

Queensland Health, including the Queensland Ambulance Service, primarily delivers care within the early part of the care continuum through emergency and pre-hospital retrieval services (that is, ambulance or aeromedical transfers), trauma and surgical services. Inpatient rehabilitation is currently delivered at numerous Queensland Health hospitals across the state.

Specialist inpatient rehabilitation is provided at the Spinal Injuries Unit located at the Princess Alexandra Hospital. The Spinal Injuries Unit is part of the broader service offering of the Queensland Spinal Cord Injuries Service (the statewide service). The statewide service provides rehabilitation for both traumatic and non-traumatic injuries<sup>19</sup>. Care for children with a spinal cord injury is largely provided by the Queensland Paediatric Rehabilitation Service within the Queensland Children's Hospital.

In addition to the Spinal Injuries Unit, the statewide service offers a range of inreach, ambulatory and community-based services. These services include a 4-6-week Transition Rehabilitation Program (TRP), which provides multidisciplinary support assisting the transition from hospital to home. The Spinal Outreach Team (SPOT) supports lifelong care and provides a wide range of resources, education and training. Funded by the Commonwealth and State governments from 2021–2025, the Brain and Spinal Cord Injury (BaSCI) project offers a range of initiatives across five Hospital and Health Services (HHS), increasing access to specialist rehabilitation. For example, QuickStart is a BaSCI initiative providing an inreach advisory service to public hospitals across Queensland caring for people with a spinal cord injury.

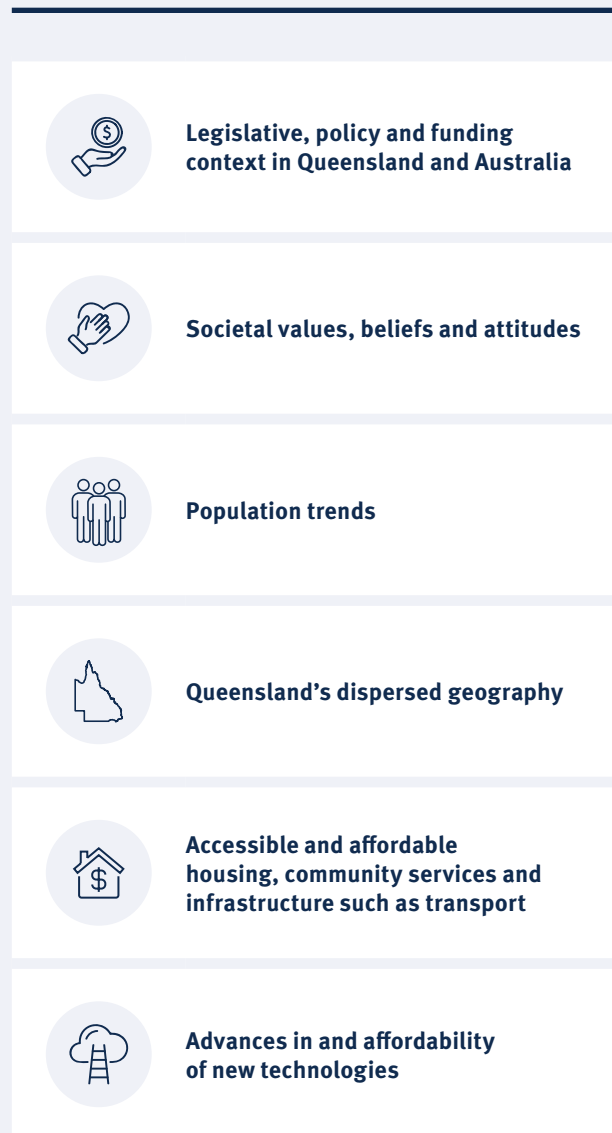
Queensland Health is one of numerous spinal cord injury service providers. The National Disability Insurance Scheme (NDIS) and National Injury Insurance Scheme Queensland (NIISQ) administer programs that provide long-term funding for treatment, care, equipment and support. People who sustain a spinal cord injury aged over 65 years (or who were 65 years or older when the NDIS was implemented) are ineligible for the NDIS. They may qualify for My Aged Care funding if they meet the eligibility criteria. However, funding through My Aged Care is widely regarded as inadequate to cover the cost of care, equipment and consumable items for people with a spinal cord injury.

Other government, non-government and private providers and organisations play an integral role. Universities and the higher education sector are integral to the service system, playing a critical role in innovation, translation of research into service delivery, providing a pipeline of health workforce talent and continuous improvement.

## System influences for healthcare delivery

Broader social, political, economic, cultural, geographic and environmental factors pose both enablers and barriers for the delivery of spinal cord injury services. *Figure 7* includes some of these factors. The timeline in *Figure 2* outlines significant developments in the legislative, policy and funding context that have occurred in parallel with the evolution of spinal cord injury care in Queensland.

**Figure 7:** Enablers and barriers to the delivery of spinal cord injury care



## PART B: CURRENT SERVICE SYSTEM

### What we learned through co-design about system challenges

- There has been limited opportunity for people with a spinal cord injury and their families to influence service and system improvements
- there is a lack of care coordination and trauma-informed approach embedded across the care continuum
- there are currently delays in the identification, referral and transfer of people with a non-traumatic injury
- there is variation in the time to commence rehabilitation and the quantity and frequency of rehabilitation
- there are inequities in access to spinal cord injury services across the state, including transition care and outreach support in rural and remote areas
- there are significant waiting periods to access specialist inpatient rehabilitation at the Spinal Injuries Unit at Princess Alexander Hospital. This results in people spending extensive periods of time in other hospital wards (e.g.; surgical, general medical, orthopaedic)
- some elements for holistic care are insufficient, such as mental health support and drug and alcohol support, peer support and sexual and reproductive health
- there are shortfalls in the physical environment and availability of appropriate equipment
- attracting and maintaining a specialist skilled workforce is difficult
- there are inconsistent standards of care within Queensland hospitals for people with a spinal cord injury
- there are no shared best practice standards for spinal cord injury hospital rehabilitation in Queensland
- there are no formal networked service arrangements for spinal cord injury services
- there is inadequate access to vocational rehabilitation as part of hospital rehabilitation, including return to work or school programs, education or training
- funding for community support is inequitable for people who acquire a spinal cord injury at the age of 65 years or above who do not qualify for disability or accident insurance
- there can be long delays and difficulties re-entering the health system for early identification and management of complications associated with a spinal cord injury.



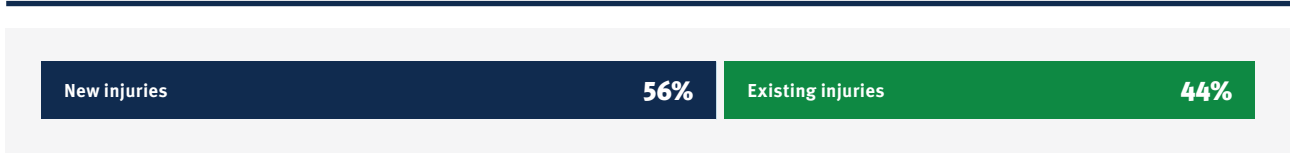
## What the data tells us

The following data snapshot summarises Queensland Health’s provision of care to people with a spinal cord injury and highlights some of the system’s challenges. This data supports the findings of the co-design process about the system’s “current” challenges and explains why we need a service model that enables an expansion of specialist spinal cord injury services across Queensland.

### A significant proportion of care is for people with a pre-existing spinal cord injury.

Between FY2018 and FY2023, there were over 4,700 continuous episodes of care\* across the state relating to a spinal cord injury. Figure 8 includes continuous episodes for both new and existing injuries.

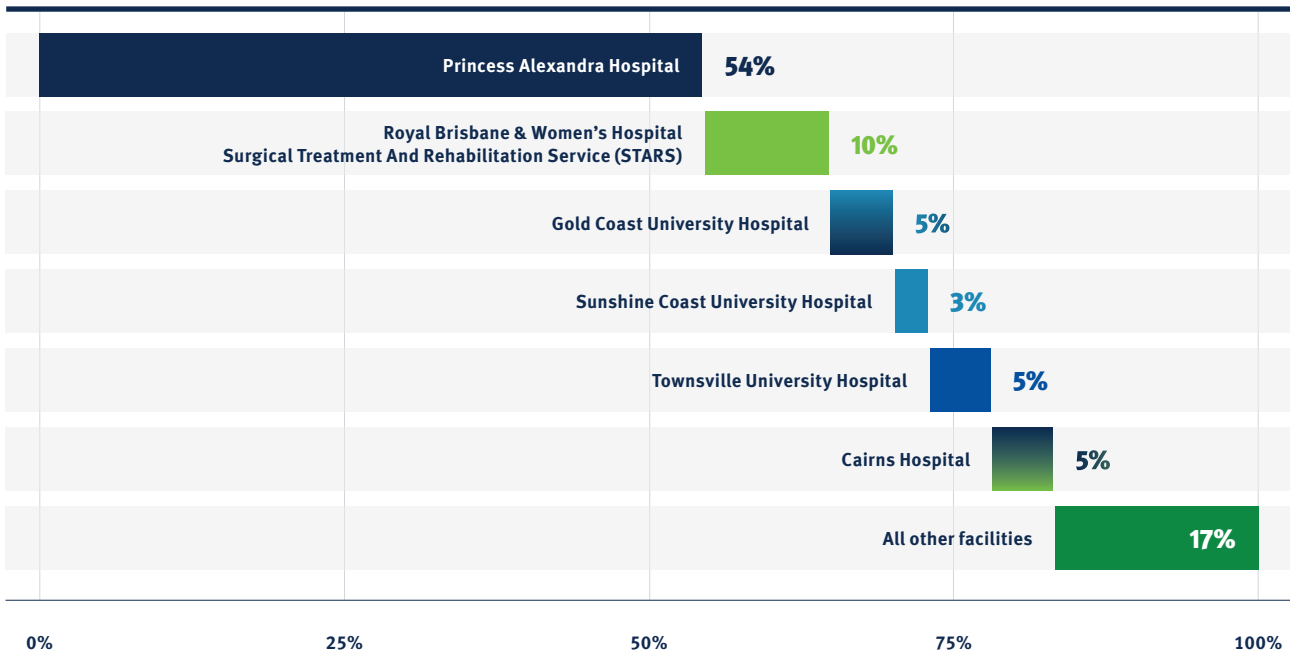
Figure 8: Continuous episodes of care for spinal cord injuries including new injuries and existing injuries



### Most spinal cord injury care is concentrated at a small number of hospital facilities.

Over 83% of admitted hospital days for both acute and rehabilitative care were delivered within tertiary hospital facilities\*\* with the majority (approximately 54%) delivered at the Spinal Injuries Unit at the Princess Alexandra Hospital between FY2018 and FY2023 (Figure 9).

Figure 9: Proportion of hospital days for spinal cord injuries care by place of treatment



\*A continuous episode is the journey across multiple facilities and episodes of care for an individual person with spinal cord injury for one continuous period of time.

\*\*Princess Alexandra Hospital (PAH), Royal Brisbane and Women’s Hospital (RBWH), the Surgical Treatment and Rehabilitation Service (STARS), Gold Coast University Hospital (GCUH), Sunshine Coast University Hospital (SCUH), Townsville University Hospital (TUH), or Cairns Hospital (CH). Note that STARS was only commissioned in 2021 so the data snapshot for STARS is limited.

## PART B: CURRENT SERVICE SYSTEM

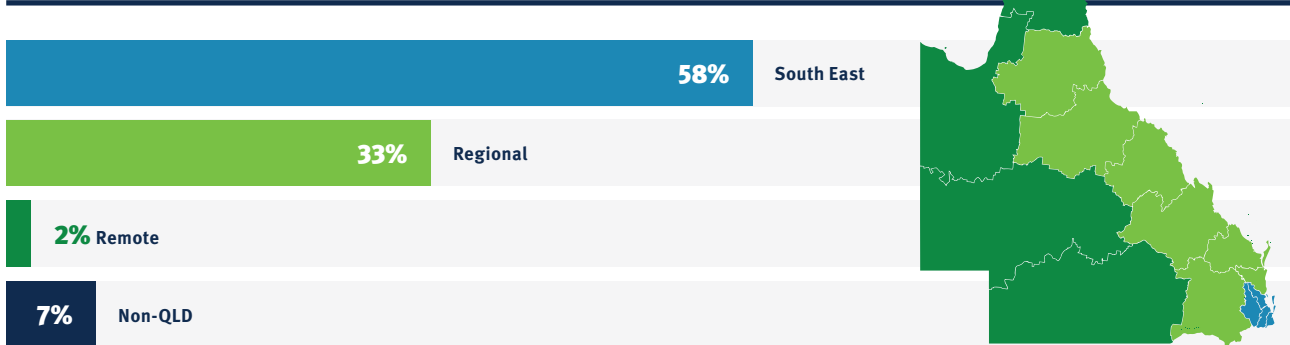
Time to access care at the Spinal Injuries Unit at the Princess Alexandra Hospital more than doubled between FY2018 and FY2023, highlighting increased demand.



More than one third of people who need care for a new spinal cord injury reside outside of South-East Queensland.

Figure 10 illustrates where people with a new spinal cord injury live.

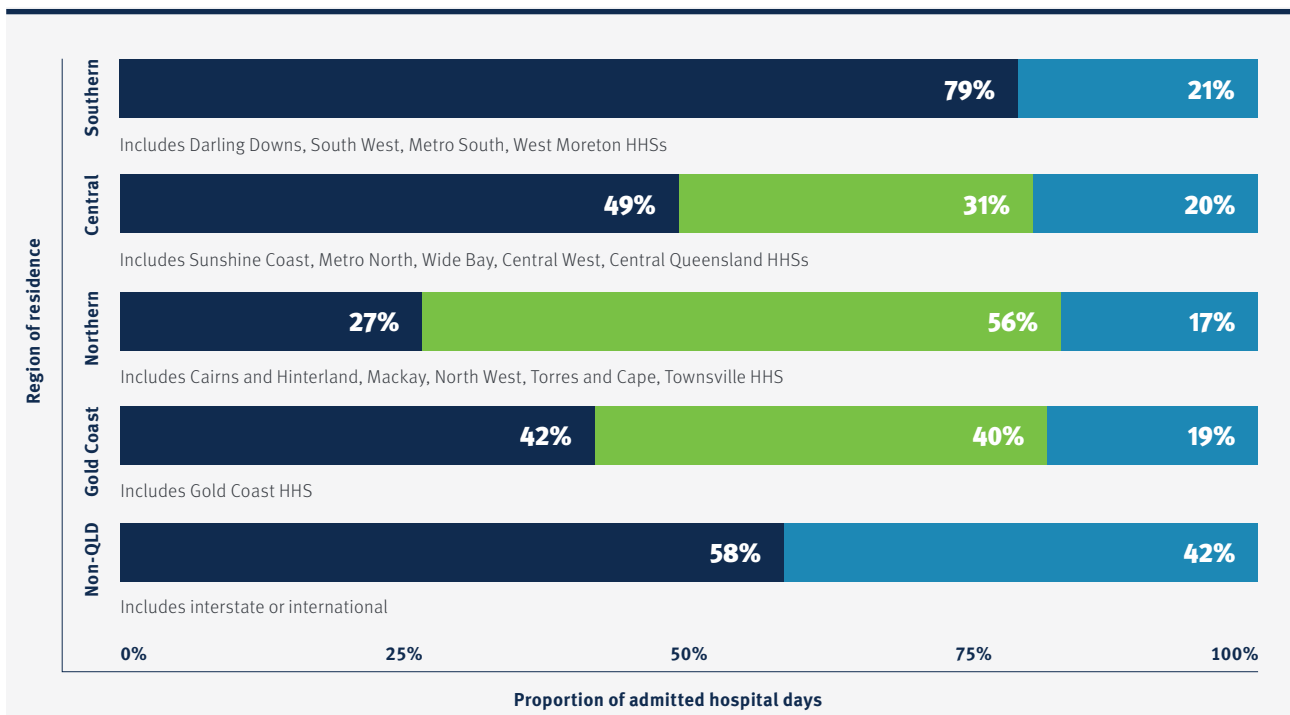
Figure 10: Place of residence for people with a new spinal cord injury accessing care in Queensland



Many people with a spinal cord injury already receive inpatient rehabilitation in their region of residence.

Figure 11 shows where people with a spinal cord injury received inpatient rehabilitation by region of residence. The Spinal Cord Injuries Unit at the Princess Alexandra Hospital provides the majority of admitted hospital days for spinal cord injury especially for residents of their region. However, a significant proportion of inpatient rehabilitation is also being delivered in other facilities located in the region of a person's residence.

Figure 11: Proportion of admitted hospital days by region of residence and facility of treatment



● Princess Alexandra Hospital    ● Tertiary hospital facility in the region of residence    ● Other facility

**“Sustaining a  
spinal cord  
injury doesn’t  
change who  
you are”**



# FUTURE SERVICE SYSTEM

## Future at a glance

### Introduction

The service model is unapologetically ambitious and drives a future-focused, statewide and coordinated approach to delivering high-quality, person and family-centred spinal cord injury care closer to home. The shared principles, developed through co-design, will underpin the way this care is delivered, ensuring personalised care in line with an individual's needs and preferences.

The current spinal cord injury service landscape is complex and has its challenges. Queensland Health has learned from past and current experiences and is positioned to move forward with continued excellence and innovation in delivering spinal cord injury services. We also acknowledge a whole-of-system response is required to enact change.

A key component of the future service model is reinforcing the role of the statewide service at the Princess Alexandra Hospital to care for people with the most complex care needs, while formalising a broader network of services. This network includes Hospital and Health Services and multi-sectoral partnerships with disability services, vocational and employment providers, health promotion, sport and recreation and higher education sectors, to enable better outcomes for people with a spinal cord injury (see *Figure 13*).

The service model is focused primarily on the role of Queensland Health in providing care to adults with a spinal cord injury across the state, including people from northern New South Wales. Each section of the service model is reflective of the care continuum and provides further detail on how this will be delivered for:

- the initial injury or diagnosis
- hospital rehabilitation and community reintegration (including transition from hospital to home)
- optimising health and wellbeing across the lifespan.

Rehabilitation has always been key to spinal cord injury services across the care continuum. We learned through co-design that Queensland Health can do better in delivering specialist rehabilitation services tailored and targeted to individual goals including vocational and educational priorities. This includes the benchmarking of patient outcomes, patient experiences, lengths of stay and complications. The new service model will also enable the provision of world-class hospital rehabilitation and partnerships with public, private and non-government service providers, so people with a spinal cord injury are empowered to optimise their health and wellbeing across the lifespan.

The service model recognises there are similar approaches to care for people with traumatic and non-traumatic spinal cord injury. Where there are differences, these are specifically called out within the relevant sections of the care continuum. Consideration is also given to adolescents under 18 years, some of whom may access acute or rehabilitative care within an adult service, as well as children who transition to adult services and require continuity of care across the lifespan.

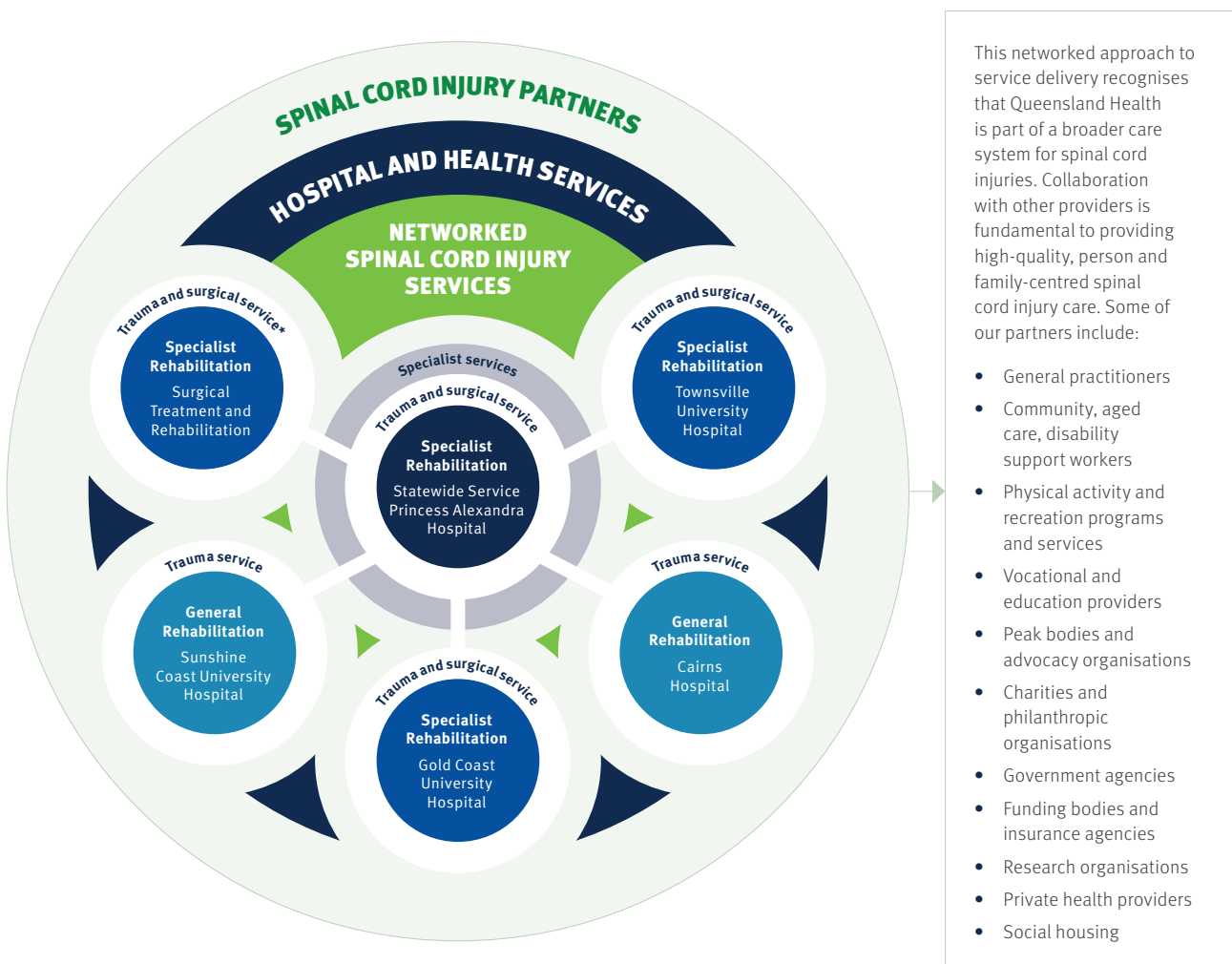


## A networked approach to service delivery

A networked service arrangement enables the provision of high-quality, coordinated and consistent care across Queensland's vast and diverse geography<sup>20</sup>. This approach is consistent with the shared principles and broader *HEALTHQ32*'s vision for the health system<sup>21</sup>, supporting the delivery of equitable care across the continuum.

A phased approach to implementation and service delivery will ensure the sustainability of this service model acknowledging current workforce challenges and the time required to enhance clinical capability across the state. *Figure 13* provides an overview of this service model and its networked arrangement. It shows the interconnectedness of the networked service arrangement that will provide coordinated and comprehensive care. Furthermore, future services in Queensland will be delivered in collaboration with spinal cord injury partners.

**Figure 13:** Future service model for high-quality spinal cord injury care across the continuum



\*Trauma and surgical services are delivered at the Royal Brisbane and Women's Hospital.

Note: Trauma and surgical services refer to specialist surgical services with orthopaedic and neurosurgical capability.

## PART C: FUTURE SERVICE SYSTEM

### Networked service arrangement

Key features of a networked service arrangement include integration across services, collaborative provision of care, resource sharing and the use of technology to connect services. This includes expansion of telehealth and virtual modes of care to enable the coordination and delivery of spinal cord injury care across the state. Multi-sectoral partnerships are also integral to the success of this service model, in particular care delivered in the community. *Table 1* provides further detail on the facilities included in the future networked arrangement.

- Care at the time of injury or diagnosis will be delivered through an existing network of trauma and spinal surgical services. These services are underpinned by clear referral guidelines which inform the delivery of this networked arrangement.
- Hospital rehabilitation (including community reintegration) will be expanded through a broader network of rehabilitation services, including the statewide service. The new services include specialist rehabilitation and general rehabilitation with a special interest in spinal cord injury management. These will be additional services and do not replace existing general rehabilitation services.
- Health and wellbeing across the lifespan will be provided through a network of Queensland Health outpatient and specialist inpatient services. These include complex urology, plastics and reconstructive surgery, and respiratory medicine.

### Benefits of a networked service arrangement

There are many benefits to a networked service arrangement.



Delivery of care in a coordinated way across different HHSs.



Sustainability of a specialised service, requiring highly skilled workforce and purpose built infrastructure.



Services working together in a formal agreement and supported by clear governance.



Clinical service delivery and other aspects to support capability building, such as through advice, training, education and research.



Coordination of services to ensure care is integrated across the continuum.



Partnerships with a range of providers to support continuous improvement, research and innovation.



Equity of access and care provided closer to home.

**Table 1:** Queensland Health facilities providing spinal cord injury care in the future service model

	Care at the time of initial injury or diagnosis		Hospital rehabilitation		Health and wellbeing across the lifespan	
	Trauma and surgical service	Trauma service**	Specialist Rehabilitation	General Rehabilitation with a special interest in spinal cord injuries	Inpatient specialties***	Outpatient services****
Princess Alexandra Hospital, Metro South HHS*	✓		✓		✓	✓
Gold Coast University Hospital, Gold Coast HHS	✓		✓			✓
Royal Brisbane and Women's Hospital, Metro North HHS	✓					✓
Surgical Treatment and Rehabilitation, Metro North HHS			✓			✓
Sunshine Coast University Hospital, Sunshine Coast HHS		✓		✓		
Townsville University Hospital, Townsville HHS	✓		✓			✓
Cairns Hospital, Cairns and Hinterland HHS		✓		✓		

\*Statewide spinal cord injury service.

\*\* Trauma service facilities have some trauma and spinal surgical capability (i.e. orthopaedics). Refer to the Queensland Health Clinical Service Capability Framework for further information.

\*\*\*Complex surgical urology, plastics and reconstructive surgery and respiratory and sleep medicine.

\*\*\*\*Dedicated spinal outpatient services include medical, rehabilitation and specialist services such as urology, respiratory and sleep clinics and plastics. Note: Not all specialist rehabilitation services will be required to provide every spinal outpatient service. A service capability framework will underpin the full range of these outpatient services.

### Future in focus

# Care at the time of initial injury or diagnosis

## Overview

This section of the care continuum is the start of a person's journey. It encompasses the traumatic injury, or the initial diagnosis for a non-traumatic injury. Care is delivered across Queensland through an existing service system of pre-hospital, emergency, intensive care, trauma and surgical services.

The future service model will advance the current service system, building on what was identified as important during the co-design process. This includes an emphasis on trauma-informed care, earlier diagnosis of non-traumatic injuries, timely access to rehabilitation services and consistent and dignified care including appropriate bowel and bladder management. Learnings from the co-design process at this point in the care continuum can be found in the *Spinal Cord Injury Service Delivery Model for Queensland: Co-design Process and Outcomes Report*.

## What this service model will provide

- increased access to spinal surgical services across the state via a networked service approach. The facilities providing trauma and spinal surgical services are:
  - Princess Alexandra Hospital, Metro South HHS
  - Royal Brisbane and Women's Hospital, Metro North HHS
  - Gold Coast University Hospital, Gold Coast HHS
  - Townsville University Hospital, Townsville HHS
- reduction in the delay to access spinal surgical treatments, considering the urgency of transfer for non-traumatic injuries
- minimised unnecessary transitions during a person's hospital admission through the co-location of acute trauma, surgical and specialist rehabilitation services. Note: specialist rehabilitation services are located within the four trauma and surgical services listed above
- timely and early commencement of rehabilitation
- clinical education and referral pathways that support early identification, diagnosis and referral of non-traumatic spinal cord injuries across Queensland Health facilities.



## Future service delivery

Care at the time of initial injury or diagnosis will be provided through a networked arrangement. This network is already established across the four trauma and surgical services in Queensland. In addition, the service model enables multi-sectoral partnerships for the delivery of clinical and non-clinical supports such as peer support for the person with a spinal cord injury, their family and loved ones.

Access to trauma and specialist surgical services is time critical and clinically recommended for improving neurological outcomes within the first 24 hours following a traumatic spinal cord injury<sup>22</sup>. All specialised spinal surgical procedures will be provided by the four trauma and surgical services (e.g., those with orthopaedic and neurosurgical capability). Each of these facilities has clinical capability in complex trauma and spinal cord injury surgical management. These services will also be co-located within the facilities to offer specialist rehabilitation for spinal cord injuries.

To achieve the best possible clinical outcomes, closer to home, Sunshine Coast University Hospital and Cairns Hospital will work closely with the trauma and surgical services. Their role and capability in the network will be underpinned by service standards and guidelines, including the Queensland Health Clinical Service Capability Framework. The four trauma and surgical services will provide care beyond their HHS's geographic boundaries, aligned with the Queensland Health pathways for trauma\*.

The networked arrangement will support the provision of care that is coordinated, consistent and delivered to a high quality regardless of where a person's initial injury or diagnosis occurs. This means pre-hospital, emergency departments, trauma, intensive care and rehabilitation services are collectively engaged early in a person's journey.

People with a suspected spinal cord injury will be connected to an appropriate facility in line with their care needs. This referral pathway may vary for traumatic versus non-traumatic injuries and will be underpinned by best-practice evidence. Referrals and transfers for the older adolescent cohort (who may be managed in an adult surgical or rehabilitation service) will be jointly undertaken with the Queensland Children's Hospital (QCH). Children under the age of 15 years will be transferred to the QCH on-call spinal surgical team. This is consistent with the current pathway for children and adolescents.

For traumatic spinal cord injuries, the transfer pathway is guided by the current and future Queensland Trauma Clinical Guidelines. Further consideration is required for non-traumatic injuries to ensure there are clear referral protocols in place (for emergency and urgent transfers) between the spinal surgical teams and local referring hospitals. This referral process will be supported by training and a telehealth hotline for advice for clinicians in the early diagnosis, identification and investigations of non-traumatic injuries.

A centralised triaging and referral system for rehabilitation will support shared care and communication across facilities to enable timely access to specialist trauma, surgical and rehabilitative care. Pre-hospital and acute care clinicians will be able to refer patients into a specialist rehabilitation service at this point in the care continuum. Further detail on this centralised triaging and referral system is provided in the following section.

\*Source: <https://www.health.qld.gov.au/system-governance/policies-standards/guidelines/referral-pathways-major-trauma-adult#1-purpose>



### INTRODUCING ARI

#### **A fictional account of a person with a spinal cord injury**

*This fictional scenario demonstrates a future spinal cord injury care journey. It is an example only. Each person's journey will be unique and varied.*

#### **Future proposed journey at the initial time of traumatic spinal cord injury (first 24-72 hours)**

Ari fell off a ladder at his home in Mackay, Queensland. He has multiple injuries, including a suspected spinal cord injury. What does his care pathway look like under our new, future service model at the time of his initial injury?

- Ambulance attends to Ari at home. Immediate spinal motion restriction and other medical procedures are undertaken onsite.
- Ari is taken to his nearest emergency department (Mackay Base Hospital) for assessment and management of his immediate injuries. Medical imaging is undertaken within the emergency department. Referral to a trauma and surgical service with co-located specialist rehabilitation is initiated by the treating team at Mackay Base Hospital. Ari's partner is kept informed and supported by the treating teams.
- A centralised triaging and referral multidisciplinary team for Queensland, liaises with the local team to undertake a holistic assessment of Ari's needs to determine the most appropriate facility for specialist rehabilitation. This facility is Townsville University Hospital which will provide both surgical management and specialist rehabilitation, minimising unnecessary transitions.
- Retrieval services transport Ari to the nearest trauma and surgical service at Townsville University Hospital. This is in line with referral guidelines for trauma and/or a suspected spinal cord injury. He is managed by a team of trauma specialists, the surgical team, other specialists and rehabilitation clinicians taking a trauma-informed approach.
- Ari receives spinal decompression surgery within 24 hours of his injury at Townsville University Hospital.



## Mikayla

Rehabilitation delivered closer to home and loved ones is important for everyone. For Mikayla, a proud Eastern Arrernte and Wakaya woman from her grandfather and Kalkadoon and Waanyi woman from her grandmother, care closer to home is spiritual.

Mikayla says connection to culture and beliefs is big in a person’s rehabilitation journey because it’s a part of who they are.

“In that time of vulnerability, it’s all they have because they don’t know anything about life ahead,” she says.

For Mikayla, Mount Isa represents home, family, community and connection to country and culture.

Right now she’s in Townsville, which is a long way from Mount Isa, but a lot closer than, say, Brisbane, where she ended up in hospital after sustaining an acquired brain injury and spinal cord injury in 2021.

“That’s a long long way from home. It’s been better for me to come here to Townsville for my rehabilitation. It’s not my forever, but for right now it’s the right place.

**“There were many times during my early stay in hospital, where I was scared and confused. You need the support of another person with you.**

“I had no real understanding of my injuries and went through different wards where I felt staff were not trained in how to treat me and my spinal cord injury.

“And it’s not just the patient who needs care. You need to provide support to their family because ultimately, it’s not just the patient’s life that’s changed, it’s everybody around them. Family is part of the team and without one person the team doesn’t work.

“My son is one of my main motivators. He pushes me to do things. His ideas drive me. We both love to travel, and we love nature. We are slowly getting back into life and embracing the leisurely things.

**“Rehabilitation has helped me get back to being myself – being a mum and returning to my community.**

“During rehab, it was so valuable seeing different kinds of equipment. It gave me a boost to see that I could have a life after my injury.

“Peer support is another important factor for rehabilitation, especially for people’s mental health, Mikayla says.

“To connect with somebody else who has taken that life changing injury and still continued. It’s needed because it just shows that there’s life after this.

“Now I want to do things outside of rehab, so I’ve started studying and I joined the co-design program [for the service model]. Doing these things has allowed me to have a voice and has helped my speech after my brain injury.

Together with Townsville-based Indigenous Health Liaison Officer, Earl and rehabilitation physician Tracey, Mikayla is excited to see the new service model in action, especially outreach services bringing specialist spinal cord injury expertise closer to people’s homes and communities.

**“I’m excited for things to change and to see how it’s going to work. Because in my journey, you know, everything didn’t go as planned. So I feel like one step closer to getting it right is going to improve another person’s journey and that’s amazing.**

Earl sees improvement ahead in getting people home, while stressing the need for thorough advance checking of everything about the person’s home location.

“In some places even the weather alone can change everything. Some places run out of water just like that, and all of these things need to be taken into account,” he says.

Tracey says the long-term aim is to keep people out of hospital and well.

In the future Mikayla hopes to return home to country and mob. She hopes that telehealth will enable her care team in Mt Isa to connect with her specialist care team in Townsville, to support her ongoing care needs.

### Future in focus

# Hospital rehabilitation and community reintegration

## Overview

Through a networked arrangements, the future service model will provide greater access to holistic rehabilitation, delivered closer to home and actively focused on community reintegration. Rehabilitation will commence early and be delivered by a multidisciplinary team, through a trauma-informed approach involving a person with the spinal cord injury, their family and loved ones, and actively focused on community reintegration. Multi-sectoral partnerships are also integral and include structured programs delivered by Queensland Health and community partners collaboratively. This whole-of-system approach will support a holistic approach to rehabilitation.

Rehabilitation aims to help individuals regain optimal independence and quality of life. This includes reintegrating the person back into their community as soon as medically safe and in line with their physical, psychosocial, emotional, cultural and spiritual needs. The service model is future-focused and supports innovative approaches for community services to inreach into the hospital to offer a range of services, including peer support, vocational and education support, art, music, sport or other recreational activities.

Learnings from the co-design process at this point in the care continuum can be found in the *Spinal Cord Injury Service Delivery Model for Queensland: Co-design Process and Outcomes Report*.

## What this service model will provide

- expanded access to (and greater intensity of) rehabilitation and community reintegration support enabled by new specialist rehabilitation services and a multidisciplinary workforce. The Queensland Health facilities that will provide this rehabilitation include:
  - Princess Alexandra Hospital, Metro South HHS (statewide service)
  - Surgical Treatment and Rehabilitation Service, Metro North HHS
  - Gold Coast University Hospital, Gold Coast HHS
  - Townsville University Hospital, Townsville HHS
  - Sunshine Coast University Hospital, Sunshine Coast HHS
  - Cairns Hospital, Cairns and Hinterland HHS
- embedded inreach and clinical care coordinator positions within the facilities above, to support timely access to specialist rehabilitation and better connectivity with local service providers
- two dedicated interdisciplinary transition teams to support people with new and pre-existing spinal cord injury reintegrate in the community
- holistic, person and family-centred rehabilitation, informed by best-practice, contemporary evidence and continuous improvement
- a centralised triaging and referral system that ensures access to hospital rehabilitation at the right time and in the right place.





## Future service delivery

The future service model consists of the statewide service, three new specialist rehabilitation services and two general rehabilitation services with a special interest in spinal cord injury management. The role of the statewide service in caring for people with the most complex care needs is reinforced throughout this service model. Together, these six services will provide hospital rehabilitation and community reintegration care to people with a spinal cord injury across Queensland.

The location of these rehabilitation services will be established within the four trauma centres in Queensland. This decision has been informed by extensive consultation, best-practice evidence, current and historical service activity, existing clinical service capability and an adequate caseload in spinal cord injury management. Access to a comprehensive and holistic range of clinical and non-clinical services is essential for providing high-quality spinal cord injury care. This includes ensuring the cultural safety of services to improve experiences and health outcomes for First Nations people.

Existing clinical capability was assessed using the Queensland Clinical Services Capability Framework and considered access to trauma services, rehabilitation services and support services including but not limited to, medical imaging, surgical, intensive care and a range of specialist inpatient and outpatient services (for example, urology, plastics, prosthetics). In addition, the co-location of acute trauma, surgical and rehabilitation services will enable better access to timely and coordinated care, in line with the shared principles developed during co-design. The service model recognises that the clinical capability of services will evolve over time and the role of each of the rehabilitation services and facilities outlined may shift in line with these changes.

In this service model, the statewide service will provide care to people with a spinal cord injury from across the state and within Metro South HHS. The other specialist rehabilitation services will provide care across a designated service catchment, beyond the treating

facility's HHS boundary. The two general rehabilitation services, with a special interest in spinal cord injuries, will provide care within their treating facility's HHS boundary, or as otherwise locally determined. Natural patient flows such as those between Torres and Cape HHS and Cairns and Hinterland HHS will continue in line with local service provision. The service catchments for rehabilitation services will align with future networked arrangements. A centralised referral and triaging system will underpin the service model, ensuring the provision of the best possible rehabilitation to achieve holistic care, closer to home.

In addition to the designated service catchments, there are key distinguishers between specialist rehabilitation, general rehabilitation with a special interest in spinal cord injuries and general rehabilitation. These relate to the availability of a highly specialised workforce, appropriate infrastructure and services (including rehabilitation and other clinical specialties) to deliver high-quality care and adequate volume of activity to maintain clinical recency of practice in spinal cord injury management.

The statewide service is further distinguished by its access to inpatient sub-specialties within the Princess Alexandra Hospital. Some of these sub-specialties include complex urology, complex plastics and reconstructive surgery, intensive care and respiratory medical support for permanently ventilated patients and advanced spasticity management. Access to these sub-specialties enables the statewide service to deliver care to people with the most complex spinal cord injuries in an inpatient setting.

A networked arrangement between the rehabilitation services supports the delivery of sustainable and equitable care. A clinical capability service framework for spinal cord injuries will outline the range of services provided by each rehabilitation service. In line with best-practice evidence, a minimum suite of inpatient and outpatient services will be delivered by the specialist rehabilitation services ensuring greater access to spinal cord injury care across the state.

## PART C: FUTURE SERVICE SYSTEM

The rehabilitation services in the networked arrangement do not replace existing general rehabilitation services but increase the availability of specialist spinal cord injury care in Queensland. General rehabilitation plays an important role in providing ongoing and routine care to people with a spinal cord injury. This may include care not related to a person's spinal cord injury, or readmission to a general rehabilitation ward where it is safe and appropriate to do so (that is, in line with the clinical capability and capacity of the facility). A centralised triaging and referral system will support decision making regarding where a person receives care. The pathway for each person's care will be considered based on clinical need and service capability, aiming to minimise unnecessary transitions between facilities.

In time, the clinical capability to manage and treat spinal cord injuries will be enhanced through this service model. This means people will receive a higher standard of personalised and specialised care across more Queensland Health facilities, including within general rehabilitation services. *Table 2* provides an overview of the future network of rehabilitation services and their high-level roles and responsibilities.

**Table 2:** Overview of future network of rehabilitation services for spinal cord injuries

<b>Statewide service</b>	<ul style="list-style-type: none"> <li>• for people with the most complex acute and rehabilitative care needs in line with the statewide service criteria for a low-volume activity and highly complex service</li> <li>• statewide leadership role for advancing research, education, training and resource development for spinal cord injury care</li> <li>• partnerships and advocacy for cross-sector and system continuous improvement such as equitable funding for care in the community</li> <li>• provide services across the care continuum including inreach, inpatient rehabilitation, community reintegration and outreach</li> <li>• holistic inpatient rehabilitation delivered by a multidisciplinary team</li> <li>• highly specialised workforce, infrastructure and equipment</li> <li>• adequate caseload and experience in spinal cord injury management to maintain expertise</li> <li>• co-located with trauma centres, surgical and other clinical specialties, including spinal outpatient services.</li> </ul>
<b>Specialist rehabilitation services</b>	<ul style="list-style-type: none"> <li>• provides specialist rehabilitation to the majority of people with a spinal cord injury in Queensland</li> <li>• provide services across the care continuum including inreach, inpatient rehabilitation, community reintegration and outreach</li> <li>• holistic inpatient rehabilitation delivered by a multidisciplinary team</li> <li>• highly specialised workforce, infrastructure and equipment</li> <li>• adequate caseload and experience in spinal cord injury management to maintain expertise</li> <li>• co-located with trauma centres, surgical and other clinical specialties, including spinal outpatient services.</li> </ul>
<b>General rehabilitation services with a special interest in spinal cord injuries</b>	<ul style="list-style-type: none"> <li>• provides specialist rehabilitation to some people with a spinal cord injury in Queensland, however, will not have the same activity levels as the specialist rehabilitation services or the complexity of the statewide service</li> <li>• provide services across the care continuum including inreach, inpatient rehabilitation, community reintegration and outreach</li> <li>• clinical care coordinator positions with experience in spinal cord injury management who support the delivery of community reintegration and outreach within the HHS</li> <li>• may not have onsite access to the full range of services provided by the specialist rehabilitation services or have dedicated equipment and infrastructure for spinal cord injury management</li> <li>• co-located with services with some trauma capability and other clinical specialties, including general outpatient services.</li> </ul>
<b>General rehabilitation services</b>	<ul style="list-style-type: none"> <li>• provides general rehabilitation to people with a spinal cord injury where appropriate and with clinical support from other rehabilitation services in this networked arrangement</li> <li>• closely liaise with the embedded inreach teams, clinical care coordinators, outreach and community reintegration teams to jointly support the delivery of rehabilitation closer to home</li> <li>• participate in clinical education, training and upskilling in spinal cord injury management via the statewide service</li> <li>• may not be co-located within a facility with access to trauma services or other inpatient and outpatient clinical specialties.</li> </ul>
<b>Enablers underpinning the service model</b>	<ul style="list-style-type: none"> <li>• centralised triaging referral system and data management</li> <li>• resource sharing and capability building across the network of services</li> <li>• formal governance structures to ensure care is provided equitably, consistently and to a high-quality across the state.</li> </ul>

## STATEWIDE SPINAL CORD INJURY SERVICE

As clinical champions, the statewide service will continue to lead Queensland, setting the gold standard for spinal cord injury care. Within the networked arrangements, the statewide service will provide strong leadership to foster a cohesive service system, ensuring consistent, best-practice care, in line with the service model. This will be supported by performance monitoring and evaluation. The statewide service will drive clinical excellence, setting a benchmark that other services, jurisdictions and nations will continue to drive.

Distinguished by its clinical expertise, experience and co-location within the Princess Alexandra Hospital, the statewide service is uniquely positioned to manage the most complex spinal cord injury. This includes caring for people with high levels of functional impairment, such as those with cervical injuries, prolonged ventilator needs, or other conditions that require the highest level of care. The role of the service is aligned with the statewide service assessment criteria of a low volume, high-cost service requiring highly specialised infrastructure, equipment and workforce.

With a steadfast commitment to excellence, the statewide service will continue to transform spinal cord injury care across Queensland, empowering clinicians and consumers alike. In addition to the above, the statewide service will:

### Champion workforce excellence

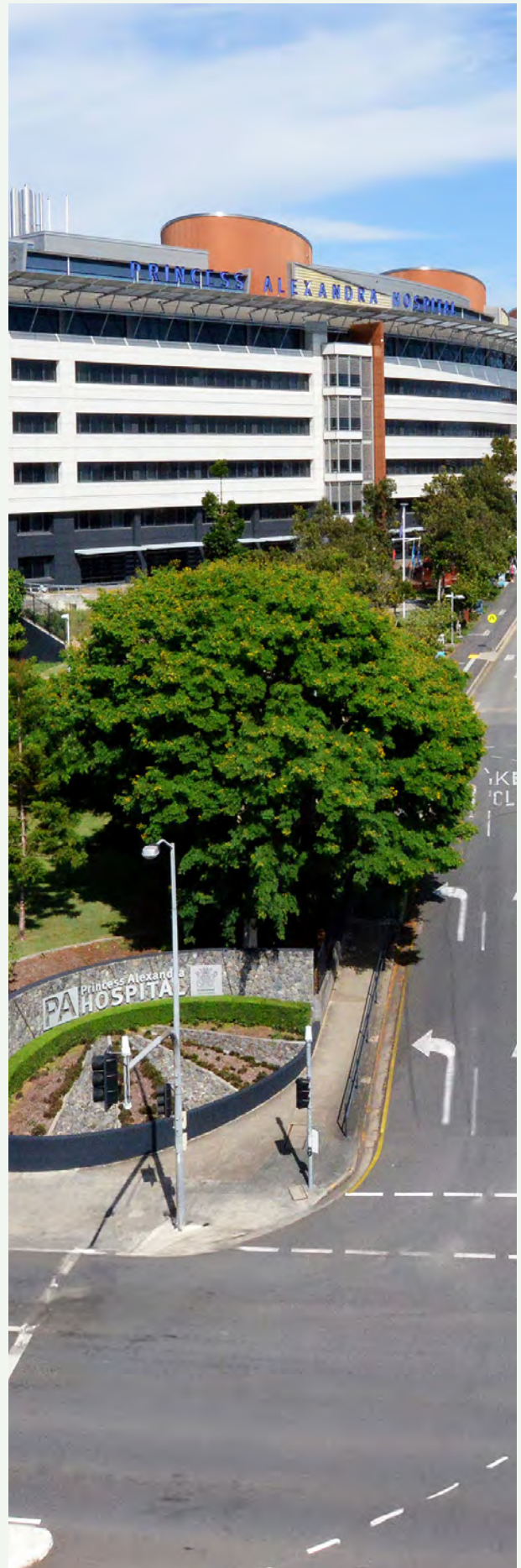
By providing clinical expertise, training and upskilling opportunities, to empower clinicians across the state and grow their capability to manage spinal cord injury with improved confidence and quality of care. This will be enabled through formal resource sharing opportunities, community of practice arrangements and the networked service approach.

### Lead education, research and innovation

Through a commitment to education, research and innovation, ensure continuous improvements in service delivery, staying at the forefront of advancements in spinal cord injury care. Collaboration with research partners, consumers and families will embed translational research into clinical practice, ensuring the latest evidence is translated into better experiences and outcomes.

### Ensure seamless and coordinated care

Clear escalation pathways and triaging protocols will be established to guarantee that every person receives the right care, at the right time and in the right place.



## PART C: FUTURE SERVICE SYSTEM

### SERVICE COMPONENTS OF REHABILITATION

Core service components of specialist rehabilitation in the future service system include:

- a centralised triaging and referral system
- a telehealth clinician advice service
- inreach support for early rehabilitation
- inpatient rehabilitation (including equipment prescription)
- community reintegration.

The following section outlines how each of these will be delivered in the future via a networked arrangement.

#### Centralised triaging and referral system

A centralised triaging and referral system will underpin how and where people with a spinal cord injury receive hospital rehabilitation into the future. A multidisciplinary team, with representation of clinicians from the six rehabilitation services will review referrals to determine the preferred service location. Queensland Health clinicians and general practitioners will be able to initiate a referral via this centralised system.

All referrals for a new spinal cord injury will be triaged through the system. This includes consideration of older adolescents being referred into adult services (in consultation with the Queensland Children's Hospital). Elective procedures (such as urology or skin management) will not be triaged via this centralised referral system. Eligibility criteria for the specialist rehabilitation services will be developed during the implementation of this service model.

Following a referral, care will be coordinated by and provided within, one of the six rehabilitation services in the networked arrangement. This decision making will be undertaken in consultation with local services and other treating teams such as spinal surgeons and trauma physicians. The triaging process will be an assessment of referrals on a case-by-case basis taking into consideration the complexity and intensity of treatment required during this period. This will occur daily ensuring timely and early referral to a specialist centre if required.

The service model includes centralisation of data collection to inform future need and ensure quality of care. Referrals will be supported by a centralised data management system ensuring early identification of all spinal cord injuries across Queensland.

#### Telehealth clinician advice service

A spinal cord injury telehealth advice service will be advanced in this service model. This will be in addition to the spinal outreach service currently offered at the statewide service. It will be a clinical service that provides advice and education to clinicians across the state. The service will be operated by the specialist rehabilitation services and will enable better access to spinal cord injury clinical expertise. Community sector providers, general practitioners and private hospitals will be able to access this telehealth service. It will also support the growth in clinical capability across Queensland and aid clinicians in determining whether or not a referral to a specialist spinal cord injury service is required.

#### Embedded inreach

Access to early specialist rehabilitation is an essential component of high-quality spinal cord injury care. As such, an inreach service will be a core offering of this service model.

The specialist rehabilitation and general rehabilitation services, with a special interest in spinal cord injury management, will have clinicians locally embedded to deliver specialist rehabilitation across different wards in their hospital or at other hospital sites, via an inreach team. These clinicians may include nurse practitioners, clinical nurse consultants or other medical or allied health staff with clinical expertise in spinal cord injury management. The remit of this inreach service will be aligned to the networked service arrangement.

The purpose of this inreach is to provide support to people with a spinal cord injury and clinicians in different hospital settings, or non-specialist rehabilitation wards. Examples of early rehabilitation may include commencing a gradual sitting program, implementing service communication technology and strategies and bladder and bowel education. The service is typically delivered at the time of initial injury or diagnosis once a person is medically stable. Inreach may be offered onsite (if clinicians are based locally, or travel to another service or facility) or via telehealth. Embedded positions within the six rehabilitation services will support capability building in spinal cord injury management. This will also support the early diagnosis of non-traumatic injuries and prevention of spinal cord injury related complications.

The networked arrangement supports resource sharing and a consistent approach to providing inreach support for the state. As clinical leaders, the statewide service will provide ongoing education, resources and advice to the embedded inreach teams across the six rehabilitation services, ensuring a sustainable and specialised workforce.

### **Inpatient rehabilitation, infrastructure and equipment**

Each of the six rehabilitation services will provide onsite access to consistent, high-quality spinal cord injury care, infrastructure and equipment. People with a spinal cord injury and families will have access to a minimum suite of specialist rehabilitation services (including peer support, cultural support, patient information, education and vocational rehabilitation), tailored to their unique needs. This suite of services will be underpinned by a clinical capability framework for spinal cord injury management.

The service model allows for flexibility in the delivery of some non-clinical services, such as peer support, music therapy and physical activity. These services may be provided via other providers through a tender process and memorandum of understanding. This approach recognises the importance of multi-sectoral partnerships and collaboration across the service system within and outside of Queensland Health.

From an equipment perspective, a range of aids will be required to support this care including onsite access to respiratory support, mobility and transfer aids, rehabilitation equipment, ventilation equipment, pressure injury prevention and management (for example, beds and mattresses), bowel and bladder management consumable items and assistive technologies. The prescription of equipment will be provided within the six rehabilitation services. The feasibility of a statewide loan program for specialised equipment and a networked approach for other complex services, including rehabilitation engineering will be further considered in the implementation of this service model.

### **Community reintegration**

Transitioning from the hospital to home environment presents challenges and opportunities for people with a spinal cord injury. Community reintegration supports an individual and their loved ones to adapt to community living with the appropriate equipment, home environment and community supports. It is acknowledged community support and availability within local communities varies across Queensland.

The service model will build upon the existing transitional rehabilitation program to offer everyone across Queensland the opportunity to access this service through home visits, telehealth or other virtual modes of care. There will be two interdisciplinary teams delivering transition care programs. These teams will be based at the statewide service at the Princess Alexandra Hospital and the specialist rehabilitation service within Townsville University Hospital. Collectively, they will deliver care

across the state. Independent living facilities and centres will enable individuals and families who live in regional, rural and remote areas to trial being in a home-like environment before returning to their local communities.

Transition care teams will provide a time limited service. However, there will be flexibility in the length of time the service supports an individual in recognition that each person's needs are different and there may be challenges in accessing local services in some areas, especially regional and rural areas.

The transition care team located within the statewide service will provide community reintegration support to the HHSs in the south of Queensland (Gold Coast, Metro South, Metro North, West Moreton, Darling Downs, Wide Bay, South West and Central West). The team located at Townsville University Hospital will provide care to the HHSs in the north of Queensland (Mackay, Townsville, North West, Cairns and Hinterland and Torres and Cape). In addition, the statewide service will provide leadership and coordinate ongoing education and training for clinicians including collaboration with research institutes and community providers to improve community reintegration.

To support the network of transition care teams, clinical care coordinator positions will be embedded across the other rehabilitation services. These sites include the Surgical Treatment and Rehabilitation Service, Gold Coast University Hospital, Sunshine Coast University Hospital and Cairns Hospital. The role of the care coordinator positions will be multifaceted, encompassing system navigation, coordination of comprehensive discharge handover and facilitate continuity of care in community rehabilitation. This is a separate function and role to the embedded inreach positions described for hospital rehabilitation. Transition care teams will have strong connections with community providers in each region which will also be enabled through these care coordinator positions. These connections are important for accessing knowledge of different local community environments and the services available across various regions in Queensland.

Resource sharing across different services is an integral part of the networked arrangement and will support formalised pathways for a coordinated approach to community reintegration. This will allow for resource capability development, providing clinicians the opportunity to rotate across different service sites and locations in the state.



### REVISITING ARI

#### **A fictional account of a person with a spinal cord injury**

*This fictional scenario demonstrates a future spinal cord injury care journey. It is an example only. Each person's journey will be unique and varied.*

#### **Future proposed journey during hospital rehabilitation and community reintegration**

Ari fell off a ladder at his home in Mackay, Queensland. He has multiple injuries, including a suspected spinal cord injury. What does his care pathway look like under our new, future service approach during hospital rehabilitation and community reintegration?

- Once Ari is medically stable, an inreach team commences early rehabilitation while he is still in the surgical ward at Townsville University Hospital. This rehabilitation is personalised and trauma-informed, encompassing the holistic needs of Ari, his partner and children.
- A few days after surgery, Ari transfers to a different ward within Townsville University Hospital and now commences specialist hospital rehabilitation for his spinal cord injury.
- Although Ari is in hospital for a total of three months, he is supported by a multidisciplinary team that actively works towards reintegration into his home community and to achieve this goal as soon as possible. He is offered peer support while he processes and adjusts to this life changing event and participates in rehabilitation focused on his short, medium and long term goals. This includes working with Ari's employer to initiate return to work opportunities while in rehabilitation. Rehabilitation is holistic and consistent with evidenced based guidelines for specialist hospital rehabilitation in Queensland.
- Ari's partner and children visit on weekends. His partner joins regular family meetings via telehealth.
- Funding, scripting and purchasing equipment and home modifications are completed along with establishment of support services prior to Ari leaving hospital. Ari and his partner are introduced to the transition care team who will ensure a smooth transition to his home in Mackay. This service is interdisciplinary and has strong links with primary care and community services in Mackay.
- Upon discharge, Ari and his partner stay for one week in an independent living centre in Townsville before returning home.
- Ari returns home with the support of the transition care team while he reintegrates into his local community. The team works closely with his general practitioner, employer and community providers, including personal support workers, to ensure Ari has appropriate funding, equipment and support for his physical, emotional, cultural, social and vocational needs. This support extends to Ari's personal care workers ensuring they have skills and knowledge to provide safe and personalised care.
- Upon completion of his transition care program, Ari is referred to the community outreach team based in Townsville and his local hospital outpatient services (Mackay Base Hospital). The outreach team conduct a routine needs assessment within three months upon completion of the transition care program.



### Future in focus

# Optimising health and wellbeing across the lifespan

## Overview

For people with a spinal cord injury, rehabilitation supports health and wellbeing across the lifespan. While this is the longest phase of the care continuum, it can look quite different for each person. However, this service model seeks to ensure there are suitable ongoing supports in the community for people to live a happy, healthy and socially connected life. This includes access to employment, recreational and leisure activities, physical activity and exercise, healthy and supportive environments, support for families, peer support and community participation. Ensuring people have coordinated access to services requires close collaboration and partnerships between Queensland Health, primary care and community providers.

Queensland Health's role at this point in the care continuum will be to:

- provide routine outpatient and outreach services for the prevention, early detection and management of secondary complications
- support and train community providers to deliver best-practice care
- deliver specialist inpatient and outpatient services for the management and treatment of secondary complications
- enable consistent care practice, for example, bowel care, autonomic dysreflexia identification across all Queensland Health facilities
- interface with community providers, non-government organisations and peak bodies to provide capability building and establish clear referral pathways between the community, primary care and hospital where needed.

Learnings from the co-design process at this point in the care continuum can be found in the *Spinal Cord Injury Service Delivery Model for Queensland: Co-design Process and Outcomes Report*.

## What this service model will provide

- Expanded access to specialist outpatient services for the prevention and management of spinal cord injury. The Queensland Health facilities that will provide these outpatient services include:
  - Princess Alexandra Hospital, Metro South HHS (statewide service)
  - Royal Brisbane and Women's Hospital and/or Surgical Treatment and Rehabilitation Service, Metro North HHS
  - Gold Coast University Hospital, Gold Coast HHS
  - Townsville University Hospital, Townsville HHS.
- two dedicated interdisciplinary teams to deliver regular community outreach care across Queensland and facilitate timely access to specialist care
- specialist inpatient services for the treatment and management of secondary complications (that is, complex urology, plastics and reconstructive surgery and respiratory medicine).





## Future service delivery

Services and support to optimise health and wellbeing across the lifespan will continue to be delivered by Queensland Health. These will be delivered in collaboration with primary care and community providers who will drive the day-to-day delivery of care in the community. This approach builds on the current service system to provide expanded access to outreach services, outpatient services and specialist hospital services.

The service model will also improve the standard and consistency of care for people with a spinal cord injury delivered in other hospitals for non-spinal cord injury related admissions. A networked arrangement will enable the delivery of these services across Queensland. *Table 3* provides an overview of the Queensland Health services in this network.

**Table 3:** Services embedded at Queensland Health facilities for optimising health and wellbeing across the lifespan

	Outpatient services*	Complex respiratory medicine**	Complex urology (inpatient)	Complex skin management (inpatient plastics and reconstructive surgery)	Persistent pain management
Princess Alexandra Hospital, Metro South HHS	✓	✓	✓	✓	✓
Gold Coast University Hospital, Gold Coast HHS	✓				✓
Royal Brisbane and Women's Hospital, Metro North HHS	✓				✓
Surgical Treatment and Rehabilitation Centre, Metro North HHS	✓				
Sunshine Coast University Hospital, Sunshine Coast HHS					✓
Townsville University Hospital, Townsville HHS	✓				✓
Cairns Hospital, Cairns and Hinterland HHS					

\*dedicated spinal outpatient services including rehabilitation and specialist services such as urology, respiratory and sleep clinics and plastics. Note: Not all specialist rehabilitation services will be required to provide every spinal outpatient service. A service capability framework will underpin the full range of these outpatient services.

\*\*complex respiratory and sleep medicine in an inpatient setting to support people with invasive and long-term ventilator requirements.

## PART C: FUTURE SERVICE SYSTEM

### SERVICE COMPONENTS OF HEALTH AND WELLBEING ACROSS THE LIFESPAN

Core components of health and wellbeing across the lifespan include outreach services and specialist inpatient and outpatient services. The following section outlines how each component will be delivered.

#### Outpatient services

Each of the four specialist rehabilitation services will provide onsite and telehealth access to a minimum suite of spinal outpatient services. Services may include multidisciplinary rehabilitation, including vocational rehabilitation and driving support, reproductive and sexual health, urology, skin management, respiratory, upper limb management, rehabilitation engineering, prosthetics and orthotics, dietetics, hydrotherapy and spasticity clinics. A supporting clinical capability framework for spinal cord injury services will outline the full detail of these service requirements.

The dedicated outpatient clinics will be located at the Princess Alexandra Hospital, Gold Coast University Hospital, Royal Brisbane Womens Hospital, Surgical Treatment and Rehabilitation Service and Townsville University Hospital. For people in the Metro North HHS catchment, some outpatient services may be provided by Metro South HHS due to the highly specialised nature of services and proximity of location.

Through a networked arrangement, individuals will be able to access outpatient clinics via their nearest specialist rehabilitation service. Referral to the appropriate outpatient clinic will be facilitated through the clinical care coordinators, community outreach teams, primary care and other community providers.

#### Community outreach services

Community outreach teams provide specialist advice, support and care coordination to individuals, families, health professionals and community providers to address the needs of people with a spinal cord injury across their lifespan. This includes enabling timely access to specialist services as needed. Community outreach teams will have a pivotal role in providing resources, education and training about prevention, early detection and management of health issues and complications which is especially important as needs change across the lifespan.

Similar to the networked approach for transition care and community reintegration, two interdisciplinary teams will provide outreach care across Queensland. One of these teams will cover the north of the state, based at Townsville University Hospital and the other team will be based within the statewide service at the Princess Alexandra Hospital covering the rest of the state. The service catchments for each team are consistent with the community reintegration teams outlined earlier. To support continuity of care, the HHSs with clinical coordinator positions, will support community outreach teams. This is a separate function and role to the embedded inreach positions described for hospital rehabilitation.

The purpose of the clinical care coordinators is to enable access to local knowledge of services and supports in the community that may otherwise not be known by the community outreach teams. Clinical care coordinators will support individuals to find and access community supports. The two community outreach teams will liaise closely with the care coordinators across the state to provide clinical support, upskilling and additional outreach care where required. The outreach teams provide care across multiple HHSs whereas the clinical care coordinators will provide care within their local HHS.

In this service model, people with a spinal cord injury will have the option to participate in regularly scheduled community outreach team appointments. These appointments enable a proactive approach to prevention and management of health issues and complications. Community outreach services will be delivered either in-person within the person's community or via telehealth.

The statewide service will have responsibility for leadership and continuous improvement in promoting health and wellbeing across the lifespan including the development of centralised digital resources, tools and educational materials aligned with current and emerging evidence.

### **Complex urology, respiratory medicine and skin management**

Specialist inpatient services, including complex urology, plastics and reconstructive surgery (such as upper limb nerve and tendon transfers) and respiratory and sleep medicine for prolonged ventilation will be provided at the Princess Alexandra Hospital. Some of these procedures, in particular skin management, relate to secondary complications which require an admission to hospital. However, increased access to prevention and early identification of spinal cord injury related complications will minimise the number of complex surgical procedures required over time. Appropriate equipment, seating and rehabilitation engineering services important in the prevention of pressure injuries and other skin complications. People will be able to access outpatient urology, plastics and respiratory and sleep clinics through their nearest specialist rehabilitation service for assessment and referral to an inpatient service if required.

A prioritisation system for referrals will ensure people with high-risk complications are able to access specialist care in a timely manner. Complex urology and surgical skin procedures will be provided across the state via planned admissions to the Princess Alexandra Hospital. Multidisciplinary rehabilitation and post-operative care after a complex surgical procedure will be provided from the statewide service.

### **Persistent pain management**

Persistent pain management requires a holistic and person-centred approach. A combination of pharmacological treatments with non-pharmacological strategies, interventional procedures and lifestyle modifications can help improve quality of life and reduce the burden of chronic pain. This requires input from a multidisciplinary team including pain specialists, rehabilitation clinicians, general practitioners with a special interest in spinal cord injuries, psychiatrists, neurologists, psychologists and other allied health clinicians.

Existing persistent pain clinics may provide regular visiting services to other facilities including advice and support to inpatients and outpatients. These services may be delivered via telehealth where appropriate.





### REVISITING ARI

#### **A fictional account of a person with a spinal cord injury**

*This fictional scenario demonstrates a future spinal cord injury care journey. It is an example only. Each person's journey will be unique and varied.*

#### **Future proposed journey for optimising health and wellbeing across the lifespan**

Ari fell off a ladder at his home in Mackay, Queensland. He has multiple injuries, including a suspected spinal cord injury. What does his care pathway look like under our new, future service model to optimise health and wellbeing across the lifespan?

- Ari is at home in Mackay after inpatient rehabilitation at Townsville University Hospital. He has a scheduled in-person appointment with the community outreach team. He identifies he would like to get back into fishing. The community outreach team helps facilitate this by linking with community providers and ensuring he has the right equipment to undertake this activity. The outreach team also supports Ari with his ongoing rehabilitation and care, including providing personalised education and training to local community providers in Mackay.
- Six months after Ari's initial spinal cord injury, he starts to develop pressure sores that begin to worsen. Ari contacts his community outreach team who provide a prompt telehealth assessment and referral to the plastics outpatient clinic at Townsville University Hospital. Ari accesses this outpatient clinic via telehealth from his home or nearest hospital.
- The plastics team at Townsville University Hospital indicate that Ari's pressure sore is severe and he requires surgical management and admission to the hospital. The surgical procedure is scheduled within one month of his outpatient appointment. Ari is referred by Townsville University Hospital to the Princess Alexandra Hospital for this procedure.
- Ari access the Patient Travel Subsidy Scheme (which provides financial assistance for eligible patients to access specialist medical services not available locally) to travel to the Princess Alexandra Hospital. There, he receives the surgical procedure to manage and treat the pressure sore. The surgery is a success and Ari stays in hospital for a couple of months afterwards where he receives rehabilitation at the Spinal Injuries Unit, Princess Alexandra Hospital.
- The community outreach team at Townsville University Hospital liaises with the statewide service to update Ari's community supports to ensure a smooth transition to his home in Mackay.
- Ari's team of community providers in Mackay provide ongoing care and support, in conjunction with his general practitioner. However, if he or his care team has concerns or need additional support, they are able to contact the community outreach team at Townsville University Hospital.

# Sean

Sean is only too aware of the importance of physical activity and sport for people with a spinal cord injury.

Now a professor leading the Para Sport and Adapted Physical Activity Group at the University of Queensland, after 40 years working in the field it would be safe to say this has been Sean's life's work. As fate would have it, Sean has also had personal experience of spinal cord injury – his youngest son Conor sustained a C4-5 incomplete injury following a rugby scrum collapse in a school rugby match in 2018.

“We know that people with a spinal cord injury experience significant barriers to being physically active and consequently have a disproportionately high incidence of preventable diseases such as cardiovascular disease and Type II diabetes,” says Sean.

“Physical activity is any muscle movement that increases energy expenditure and there are many reported benefits of physical activity and many ways to engage in physical activity for people with a spinal cord injury. This can be exercise, but it can also be incidental activity like wheeling to the shops, social or competitive sport, active recreation such as camping and going to the beach or dance.

**“The focus is on helping people with paralysis find new ways to move that work for them, that are enjoyable, safe, meaningful and sustainable.”**

Improved physical health outcomes are just one benefit – evidence indicates people with a spinal cord injury who are physically active are fitter and stronger, have greater functional independence, reduced risk of shoulder pain and have better mental health and quality of life.



“Sport is a particularly interesting form of physical activity, especially for young people with a spinal cord injury. It has huge cultural significance in Australia and in our research group we often talk about ‘the magic of sport’.

“It provides great avenues for social interaction, is self-directed, fun and encourages people to set goals and strive for excellence – to be as good as they possibly can be. Employment rates even tend to be higher among people who play sport.”

“Interest in the Paris Paralympics and the forthcoming 2032 Games in Brisbane can provide impetus for change alongside the new service model.

“The Paralympics is the third biggest sports event on the planet and the biggest sports event for people with a disability.

“Queensland has an incredible opportunity to transform spinal cord injury rehabilitation to provide the breadth and choice of physical activity for people with a spinal cord injury that is missing.”

Sean sees many opportunities to integrate research on physical activity and sport into clinical settings.

“This can happen if we take a systems approach with community providers engaged early during hospital rehabilitation,” he says.

“A networked approach across the state, bringing together the research, health and community sectors to harness this opportunity would offer choice, safety and effectiveness for individuals in both physical activity and sport.”

**“An integrated approach puts the person at the centre supported by a workforce in the hospital and community that collaborates to ensure high-quality care, enabling individuals to pursue their goals and aspirations.”**

# CONTINUOUS IMPROVEMENT, RESEARCH AND INNOVATION

The service model, supported by a co-design approach, enables opportunities for collaboration in research, innovation and continuous improvement.

Ongoing research drives the development of evidence based practices, innovative therapies and advanced technologies to improve functional recovery, reduce complications and enhance person-centred outcomes. The public-facing Database of Research Activity provides real-time details of spinal cord injury research conducted within Queensland Health. These projects provide opportunities to participate in cutting-edge research and clinical trials with innovative treatment options.

“The foremost models of quality health care internationally are characteristically built on three essential and co-dependent pillars – evidence-informed clinical care; clinically-relevant research and innovation; and workforce development through continuous education and training.

Developing a world-class spinal cord injury service delivery model for Queensland needs to intentionally enhance and integrate all three of these pillars to ensure that not only is the importance of research and education acknowledged but time and space are created to permit the effective nurturing and integration of each of the pillars.”

**Professor Bruce Abernethy AM**

*Executive Director of the University of Queensland's Engagement with the 2032 Olympic and Paralympic Games*

Collaboration facilitates a dynamic environment for generating new ideas and approaches to high-quality, person and family-centred care across their lifespan. It also enables embedded translational research into clinical practice, ensuring the latest evidence leads to better outcomes. Opportunities for collaboration include:

- advancing research, co-produced with people with a spinal cord injury and their families
- exploring and integrating new approaches to delivering care and leveraging emerging technologies
- expanding the use of telehealth and virtual modes of care to provide specialist care and connect clinicians working across Queensland
- developing and implementing evidence-based standards and best practice guidelines for spinal cord injury care
- supporting and growing service capability to deliver trauma-informed practice across the care continuum, supported by mental health expertise and therapies such as music and art
- measuring and evaluating service improvements and patient experiences and outcomes
- clinical education, supervision, training and job rotation opportunities across Queensland, fostering a culture of collaboration across multidisciplinary teams
- workforce development, recruitment and retention strategies
- establishing communities of practice for peer support and multi-sectoral partnerships to advance consistent, high-quality care across the system.



**PART C:** FUTURE SERVICE SYSTEM





# The Hopkins Centre

The Hopkins Centre is leading ‘close to practice’, co-designed research with clinicians and consumers to improve spinal cord injury rehabilitation and services.

The Hopkins Centre is a leader in translational research, working closely with clinicians and consumers to enhance spinal cord injury rehabilitation and services. Established in 2017 by Griffith University and the Department of Rehabilitation at Princess Alexandra Hospital, it builds on a 30-year legacy of collaboration and research. The focus includes people with a spinal cord injury, as well as those with an acquired brain injury, other disabilities and chronic conditions. Through partnerships with clinicians and researchers in the Queensland Spinal Cord Injuries Service and more broadly, significant innovations in clinical practice, policy, and health service delivery have been achieved, greatly improving the quality of life for people with disabilities and their families in Queensland.

The unique ‘close to practice’ model at The Hopkins Centre embeds research within health services, emphasising dignified engagement and co-design with consumers. This approach ensures that research translates into practical service development and delivery, making a real impact on spinal cord injury care. By bringing together people with lived experiences, practising clinicians, academic researchers and other key stakeholders, the centre fosters innovative teams that tackle complex problems and translate findings back into practice, policy or community settings.

The Hopkins Centre is committed to advancing rehabilitation and services for people with a disability through innovative, collaborative projects. These include co-creating and testing assistive technologies in an innovation hub, where consumers, clinicians, researchers, designers and technologists work together to develop personalised rehabilitation tools that enhance independence and wellbeing.

**Other initiatives seek to address systemic barriers to dignified experiences in healthcare, transport, education and employment for people with disabilities. Through inclusive research and advocacy, these initiatives aim to improve outcomes by involving people with a disability in the design and implementation of solutions.**

Additionally, a longitudinal study examines rehabilitation data to plan future service accessibility and delivery. It tracks the wellbeing and support of people post-discharge from inpatient rehabilitation, providing valuable insights for improving services.

The Clinical Fellowships Program empowers clinicians to engage in research while maintaining their clinical roles, fostering interdisciplinary collaboration and enhancing the integration of research into practice.

**This field of research is incredibly exciting, driving real-world improvements in healthcare through collaborative efforts and innovative solutions.**

## NEXT STEPS

# NEXT STEPS

This service model has been co-created with the shared goal to ensure all Queenslanders with a spinal cord injury have access to high-quality, person and family-centred care. In the spirit of continued collaboration, an implementation plan will be developed with key stakeholders to guide and refine how this ambitious service model is achieved. The implementation plan will outline a phased approach to delivery over the next 10 years.

The co-design process has identified some actions that can start immediately. As a priority, we will begin to establish the networked service arrangements outlined in the service model. We recognise time is required for some elements to build capacity across the system to grow the workforce and infrastructure requirements. These aspects will be implemented in the medium to long term.

Partnerships with consumers, clinicians, community providers and other government agencies and researchers are critical. The relationships established through co-design will be leveraged to implement the service model.

We thank everyone who has contributed their time and expertise to help shape this service model. A special thanks to consumers who shared their personal experiences and journeys, reminding us why this service model is important. We are committed to continuous improvement. An evaluation of the co-design approach and lessons learned will be applied to future service design, especially other networked service arrangements.





# TERMINOLOGY

Term	Description
<b>Allied health</b>	The allied health workforce in Queensland comprises allied health professionals, technicians, assistants and support workers. This includes allied health assistants, audiology, clinical measurements, exercise physiology, medical radiation professionals, music therapy, nutrition and dieticians, occupational therapy, pharmacy, physiotherapy, podiatry, prosthetics and orthotics, psychology, rehabilitation engineering, social work and speech pathology.
<b>Collaboration</b>	Involves the collective efforts of health professionals/providers to provide optimal healthcare. It emphasises effective teamwork, communication and coordination among health professionals and providers. By working together, they enhance efficiency and promote better patient experiences and outcomes.
<b>Community sector</b>	Includes service providers operating in the community such as non-government organisations and private providers.
<b>Computed tomography (CT) scan</b>	A computed tomography scan is a medical imaging technique used to obtain detailed internal images of the body.
<b>Consumer</b>	People who use, or are potential users, of health services, including their family and carers.
<b>Clinician</b>	A practitioner who is involved in the diagnosis and/or treatment of patients, including recommending preventative action (includes doctors, nurses and allied health professionals).
<b>Clinical Service Capability Framework (CSCF)</b>	A framework that outlines the minimum support services, staffing, safety standards and other requirements required in both public and private health facilities to ensure safe and appropriately supported clinical services. It provides a standard set of capability requirements for most acute and sub-acute health facility services provided in Queensland by public and private health facilities.
<b>Experience-based co-design</b>	Collaborative approach that involves patients and healthcare staff working together to improve healthcare services. This method combines narrative-based research with service design techniques to enhance both patient and provider experiences.
<b>General practitioner (GP)</b>	Doctors who provide general healthcare for acute and chronic illness, usually in a community setting. GPs are usually the first point of contact with the health system and refer people with specific symptoms or conditions to specialist care.
<b>Hospital and Health Service (HHS)</b>	Providers of Queensland Health hospital services and other health services to specific geographic areas across the state. Each HHS is managed by its own Board.
<b>Inreach</b>	An inreach health service refers to a team of health professionals providing a particular service to a target cohort of patients currently receiving treatment and care in other hospitals or facilities. These types of services are often provided beyond the usual catchment of the hospital and health service where the inreach service is based.
<b>Interdisciplinary care team</b>	An interdisciplinary care team is a group of healthcare professionals from various disciplines who collaborate to address a patient's comprehensive needs. Unlike a multidisciplinary team, where each professional works independently (from their professional perspective), an interdisciplinary team actively coordinates and integrates their efforts to achieve shared treatment goals.
<b>International Standards for Neurological Classification of Spinal Cord Injury (ISNCSCI)</b>	A standardised examination used to score the motor and sensory impairment and severity of a spinal cord injury.

Term	Description
<b>Magnetic Resonance Imaging (MRI)</b>	A medical imaging technique used in radiology to form pictures of the anatomy and the physiological processes inside the body.
<b>Multidisciplinary care team (MDT)</b>	Multidisciplinary care team is a treating team usually comprised of doctors, nurses and/or allied health professionals who are all involved in treating one consumer. Spinal treatment is often complex and requires multiple different professionals with specialist experience and an MDT approach helps to coordinate care and make decisions about best treatment.
<b>Multi-sectoral partnership</b>	Collaborative arrangements where entities from different sectors (such as government, health service provider, advocacy, research and community services) work together to address complex issues. These partnerships leverage the unique strengths and resources of each sector to address systemic problems and aim to create more comprehensive and sustainable solutions than any single sector could achieve alone.
<b>My Aged Care (MAC)</b>	An Australian Government service that acts as the main entry point to gain access to Australia's government-funded aged care services. Aged care services are available for Australians 65 years and over and Aboriginal and Torres Strait Islanders over the age of 50.
<b>National Disability Insurance Scheme (NDIS)</b>	The National Disability Insurance Scheme is a scheme of the Australian Government that funds costs associated with disability for people under 65 years old.
<b>National Injury Insurance Scheme Queensland (NIISQ)</b>	The National Injury Insurance Scheme Queensland is a no-fault scheme that provides necessary and reasonable lifetime treatment, care and support to those who sustain eligible serious personal injuries in a motor vehicle accident or work-related accident in Queensland, on or after 1 July 2016.
<b>Networked service arrangement</b>	A service which is part of a greater network, to provide centralised care.
<b>Outreach</b>	A team of health professionals providing a particular service to a target cohort of consumers in the community.
<b>Partnership</b>	Partnerships in the context of this document refers to collaborative efforts between service providers and service recipients (ie. consumers) to improve health and quality of life.
<b>Rehabilitation</b>	Rehabilitation is a structured process aimed at helping individuals recover and regain optimal function, independence and quality of life following injury, illness, or disability. It involves a range of therapeutic interventions designed to address physical, psychological and social challenges. The main objectives of rehabilitation are to restore lost abilities, adapt to new limitations and improve overall wellbeing.
<b>Specialised</b>	A quality necessary to deliver unique, tailored services or products.
<b>Specialist</b>	Specialist services refer to a range of advanced and focused healthcare services provided by professionals with expertise in specific areas. These services are designed to address complex or unique health needs that go beyond general care.
<b>Specialty</b>	A branch of medical practice that is focused on a defined group of patients, diseases, skills or philosophy. Examples include those branches of medicine that deal exclusively with children (paediatrics), cancer (oncology), laboratory medicine (pathology) or primary care (general practice).
<b>Statewide services</b>	Statewide services can be broadly described as clinical and clinical support services that have a high degree of specialisation and complexity and are delivered by one or two Hospital and Health Services (HHSs) across the state.
<b>Trauma-informed care</b>	Trauma-informed care shifts the focus from "What's wrong with you?" to "What happened to you?" A trauma-informed approach to care acknowledges that healthcare organisations and care teams need to have a complete picture of a patient's life situation—past and present—in order to provide effective health care services with a healing orientation that emphasises physical, psychological, and emotional safety for both patients and providers.
<b>Queensland Spinal Cord Injury Service (QSCIS) – referred to as the statewide service. Spinal Injury Unit (SIU)</b>	The Queensland Spinal Cord Injury Service (also known as the statewide service), provides acute care, rehabilitation services and ongoing management for individuals with spinal cord injury. The Spinal Injury Unit is located at the Princess Alexandra Hospital and is the statewide specialist adult spinal injuries acute and rehabilitation unit in Queensland. SIU has acute beds.
<b>Vocational rehabilitation</b>	Vocational rehabilitation for people with a spinal cord injury is a personalised process that helps individuals return to work, education or pursue new career opportunities. It includes assessing functional abilities and employment interests, developing a customised rehabilitation plan with goals and skills training which may include recommend workplace modifications and assistive technologies. The process also involves job search assistance, employer liaison and on-the-job support, along with psychosocial support and advocacy for rights and accommodation.

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