Speech and language therapy service provision in spinal injury units compared to major trauma centres in England – are services matched?

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Data availability

This study was undertaken as part of JH's MSc **Speech and** Language Sciences, data is available from the authors on request.

Declaration of Interest

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Ethics approval statement

The study was reviewed by the Research Innovation Centre's Project Evaluation Panel at the Royal National Orthopaedic Hospital and approved as a service evaluation, not requiring formal ethics approval.

Abstract

Background.

National UK guidance makes recommendations for speech and language therapy staffing levels in critical care and rehabilitation settings. Traumatic spinal cord injury patients often require admission primarily to critical care services within a major trauma centre prior to transfer to a specialist spinal injury unit but may not receive similar levels of care. Dysphagia and communication difficulties are recognised features of cervical spinal cord injury, however little is known about access to speech and language therapy services to provide rehabilitation and improve outcomes.

Aims

The aim of this study was to compare the workforce and clinical practices of speech and language therapy services in eight spinal injury units and four major trauma centres in England through an online survey.

Methods & Procedures

An online survey was created with 26 multi-choice questions across 7 sub-sections, with options for free text comments. These were sent to a named speech and language therapy contact at each of the specified units. Responses were uploaded into Excel for analyses, which included descriptive statistics and analysis of themes.

Outcomes & Results

Responses were received from 92% (11/12) speech and language therapy services invited, which included seven out of eight spinal injury units and all four major trauma centres. No units met national staffing recommendations. Staff in spinal injury units provided an average of 27 hours per week input to the unit compared to 80 hours in a major trauma centre. Despite caseload variations, speech and language range of

therapy involvement and prioritisation process were equivalent. Access to instrumental assessment varied, with less use of Fibreoptic Endoscopic Evaluation of Swallowing in spinal injury units despite its clinical value to the spinal cord injury caseload.

Conclusions & Implications.

Speech and language therapy services delivering post-acute and long-term rehabilitation to spinal cord injury patients are limited by their resources and capacity, which restricts the level of therapy delivered to patients. This may have an impact on clinical outcomes for communication and swallowing impairments. Further evidence is needed of the interventions delivered by Speech and Language Therapists and outcomes will be beneficial alongside benchmarking similar services.

Key words

Workforce, Spinal cord injuries, Critical Care, Dysphagia, Communication

What is already known on this subject:

In England, people who sustain a spinal cord injury are admitted to a major trauma centre prior to transfer to a specialist spinal injury unit. Dysphagia and communication impairments are recognised as a complication of cervical spinal cord injury and benefit from speech and language therapy intervention. National recommendations exist for staffing levels, expertise and competencies for Speech and Language Therapists working in critical care and rehabilitation units.

What this study adds:

This study identified variations in the levels of speech and language therapy staffing, seniority, service delivery and access to instrumental assessments for dysphagia between major trauma centres and spinal injury units. None of the services complied with national staffing recommendations.

Clinical implications of this study:

Speech and language therapy services in spinal injury units are often available part-time or have limited access to diagnostic tools which limits the range and intensity of rehabilitation input available. This has clinical implications for outcomes for swallowing and communication as well as long term consequences for integrating back into community.

Introduction

A spinal cord injury (SCI) is a devastating, life changing injury affecting both motor and sensory functions. In addition, there is disruption to the autonomic systems with variations dependent on the level and severity of the injury. During 2018/19 there were 2,500 new injuries registered on the English SCI database (NHS England, 2019b). The concept of specialised spinal injury units was developed by Sir Ludwig Guttman in UK in 1944 which recognised the need for specialist treatment to enhance outcomes for those with SCI (Osman et al., 2017). There are eight SIUs in England, with a total bed capacity of 375 of which approximately 28 beds are designated for those requiring higher levels of care and respiratory support. Individuals who require the higher level of care are typically those who sustain an injury at cervical spinal cord levels 2-5. This type of injury, which disrupts functions originating in the high spinal cord, results in paralysis of the diaphragm and intercostal muscles, necessitating prolonged intubation and need for tracheostomy and ventilation in a critical care setting (Como et al., 2005, Berlly and Shem, 2007). Major Trauma centres were set up in 2012 to provide specialist care immediately post-trauma, including SCI. A SCI patient would be admitted to critical care in a major trauma centre (MTC) for medical stabilisation prior to referral to a specialist spinal injury unit (SIU) within 4 hours and transfer when medically stable for ongoing acute care, rehabilitation and discharge planning (NHS England, 2019a). There are 22 MTCs for adults in England, (National Audit Office, 2010) which admit approximately 20,000 people with a traumatic injury each year.

Whilst the number of SCIs may be small compared to other patient groups, there is a high level of care demands, especially with ongoing respiratory needs, which

requires specialist critical care facilities. There is growing evidence of a link between intubation, tracheostomy and ventilation and disruption to laryngeal functions such as voice and swallowing in the non-SCI population (Brodsky et al., 2018). Dysphagia has been identified as a known risk factor for mechanically ventilated intensive care unit (ICU) patients, with one study reporting a 12.4% incidence of positive screening for dysphagia post-extubation, which persisted through to discharge (Schefold et al., 2017). In comparison, an incidence of 40% dysphagia has been reported in those with SCI to cervical levels 0-8, (Shem et al., 2011), with poor identification of dysphagia until symptoms, such as pneumonia, develop (Hayashi et al., 2020). One reason is that the aetiology of dysphagia remains unclear, with clinical evidence suggesting neurological, mechanical and respiratory disruption as contributing factors (Solley and Ward, 2009). Complications that arise from the presence of dysphagia, such as pneumonia and nutritional compromise, further contribute to increased morbidity and mortality (Kopp et al., 2017). Early screening for risk factors for dysphagia has been widely recommended to prevent secondary complications (Iruthayarajah et al., 2018, Hayashi et al., 2017, Shem et al., 2011). This needs further diagnostic evaluation using instrumental assessments, such as Fibreoptic Endoscopic Evaluation of Swallowing (FEES), and therapeutic interventions that are appropriate for SCI to help swallowing function return to normal (Perren et al., 2019).

It is acknowledged that Speech and Language Therapists (SLTs) have a valuable role working with patients in intensive care and especially SCI patients to manage complex laryngeal and pharyngeal functions affecting swallowing and communication (McGrath and Wallace, 2014, McRae et al., 2019a, Emerich et al., 2012). SLT staff require additional knowledge and competency skills relating to

tracheostomy and ventilator management to be effective in this role (Royal College of Speech and Language Therapists, 2019). Cognitive communication disorders following SCI are linked to an associated head injury and benefit from early and intensive SLT management to improve outcomes (Brougham et al., 2011). Other communication impairments are linked to a loss of voice due to ventilatory needs and reduced respiratory function (Laakso et al., 2011). These may be long term impairments that have great impact on agency and control of environmental needs especially in the community setting, so early identification to optimise clinical management and strategies is important (Johansson et al., 2018).

Videofluoroscopy (VFS) and FEES are considered to be gold-standard tools to evaluate swallowing dysfunction and support interventions. SLT services should have routine access to these instrumental assessments to identify and review laryngeal functions and outcomes for weaning, secretion management, phonation and swallowing function (Logemann, 1993, Langmore, 2003, Brady and Donzelli, 2013). Studies have reported how the use of FEES has helped to refine clinical decision-making for dysphagia and improve patient outcomes (Braun et al., 2018, Scheel et al., 2016) so services that do not have access to these resources, may be disadvantaged. There are currently no UK records about the availability of instrumental swallow assessments in SLT services.

SLTs are expected to be part of the multi-disciplinary workforce in critical care as supported by UK national guidance (Faculty of Intensive Care Medicine and Intensive Care Society, 2019, Royal College of Speech and Language Therapists, 2019). These make clear recommendations for staffing levels proposing one SLT clinician for every 10 ICU patients, to enable direct patient intervention, multi-

professional case discussion and goal planning for rehabilitation. Clinicians are expected to have a high level of expertise in the management of dysphagia and tracheostomy weaning in ICU patients. Shortfalls to SLT workforce, training and skills with ICU tracheostomy patients in UK have previously been reported (Ward et al., 2012, Ginnelly and Greenwood, 2016). The most recent UK survey of SLTs working in ICUs revealed that only 23% had dedicated sessions funded in critical care (Mills et al., 2020) and 73% failed to comply with GPICS (2019) requirements to review all tracheostomy patients for communication and swallowing input.

In contrast, there is no parallel guidance for SLT staffing in SIUs where staff are expected to continue to deliver a high level of expertise during the post-acute, rehabilitation and discharge process (NHS England, 2019a). As the rates of survival post-injury improves for those with cSCI, rehabilitation requirements have increased (Savic et al., 2017) especially for those with respiratory impairment (Josefson et al., 2020). Staffing recommendations for general rehabilitation settings have been set at 2-2.5 SLTs for 20 beds (British Society of Rehabilitation Medicine, 2009). In the most recent service specification for SCI, it states that patients should have ‘access to SLT’, which indicates some recognition of the added value and contribution of SLT to the complex management of SCI (NHS England, 2019a). SLT services should be co-located for patients who require this input, and should have “the training and experience to meet the particular needs of this population” (NHS England, 2019a). However, no reference is made to the level of provision or specific competencies required for instrumental assessment of laryngeal function and interventions for tracheostomy management and ventilator weaning to minimise risk of dysphagia post-SCI (Ward and Morgan, 2009).

It is important to establish a baseline for existing SLT service provision to address gaps in service availability. An unpublished survey in 2006 of SLT services in 13 SIUs across the UK (McRae, 2006) identified only three (23%) units with dedicated sessional funding of between one to four sessions a week. Three (23%) services provided an 'assess and advice' service only, and whilst 10 (77%) had access to VFS, only three (23%) used FEES. Five (38%) services attended multidisciplinary ward rounds and only one (8%) attended a tracheostomy ward round. The minimum banding was band 7 with nine (69%) providing a dedicated SLT with clinical support from other SLTs. Re-evaluating SLT service provision in the eight SIUs based in England after 10 years was an opportunity to identify any changes that reflect the reported increase in cSCI injuries and delays to admission (Spinal Injuries Association and All-Party Parliamentary Group, 2015).

This study aims to report on existing SLT service provision in SIUs in England and to compare with SLT services provided in a sample of MTCs, which have established national guidance on service standards.

Aims

To identify and compare the workforce and clinical practices of SLT services in eight SIUs and four MTCs. This will identify whether services meet national standards of service provision and levels of skills required for the management of those with SCI requiring tracheostomy and ventilation and presenting with complex dysphagia and communication impairments.

Methods

Ethics

The study was reviewed by the Research Innovation Centre's Project Evaluation Panel at the Royal National Orthopaedic Hospital and considered a service evaluation, not requiring formal ethics approval.

Survey development

Survey questions were based on those used in a previous audit of SLT services (McRae, 2006). These were updated following a review of the literature regarding SLT working practices in critical care to ensure relevance to current practice, especially within an SIU setting (Ward et al., 2012, Royal College of Speech and Language Therapists, 2014, McGowan et al., 2014). A draft version was piloted with an SLT working in an acute hospital setting and subsequently modified to create a final version that was prepared for distribution online using SurveyMonkey.

The final survey consisted of 26 questions with closed multiple-choice options or free text boxes when a detailed response was required (see supporting information). The questions were divided into 7 sections: service background (8 questions), clinician information (4 questions), caseload information (4 questions) general working (1 question), SLT skills and competencies (2 questions), multidisciplinary team involvement (1 question) and SLT service delivery to the unit (6 questions).

Participant recruitment

Contacts were established with the speech and language therapy departments in the eight SIUs in England and a representative sample of four MTCs based in London, who take primary admissions for SCI patients. They were asked to provide the contact details of a representative SLT for the service to answer a survey on their workforce and service provision. Once the names and email addresses were

collated, each was sent an invitation email with details of the study and a link to the survey with a request for consent included. The survey link remained open for completion for two months from April to June 2016 to allow for staff absences and variations in workforce capacity. The survey could be partially completed and saved for later completion, as an option to ease burden of time. Reminder emails were sent to any participants who had not responded to initial contact after 3 weeks.

Data analysis

Participant consent was indicated through participation in the survey. Responses were collected within SurveyMonkey's database and exported to Microsoft Excel for analysis. Descriptive statistics were used to report numerical data, and no statistical analyses or tests of significance were undertaken due to the small cohort sizes. Free text responses were grouped into similar themes per question. As the subgroups varied in size, results are reported and compared as percentages and free-text responses included as representative comments.

Results

Eleven out of twelve (92%) respondents completed the survey, this includes seven out of eight SLTs in SIUs and four SLTs in MTCs. The results are presented as the whole cohort with comparisons between SLT services in SIUs (n=7) and MTCs (n=4).

Participant demographics

The SLTs working in SIUs were qualified for longer, an average of 21 years, compared to 12 years in MTCs. There was established expertise in those working in SIUs compared to MTCs based on years in that clinical setting, which was on

average 8 years in SIUs compared to 4 years in MTCs. The majority of SIU respondents were appointed at band 7 highly specialist role, whereas half of those in MTCs were at band 8a clinical lead role (table 1).

Staffing

SLT staffing ratio across units varied greatly with an estimated average of 1 SLT for 74 beds in SIUs and 1 SLT for 40 beds in MTCs (table 1) – both are below the national recommended levels set for critical care and rehabilitation settings of approximately one SLT for ten beds. The average weekly hours of SLT service provision in SIUs was 27 hours (range:15-37.5 hours) compared to 80 hours (range: 15-146 hours) provided in MTCs, which covers input to all patients on the unit.

Only 36% (4) respondents reported having dedicated funding for their SLT services in either MTCs or SIUs, whilst the remaining 64% (7) of services reported that SLT input was provided as needed from within existing services.

Table 1 Demographic details per unit split into Major Trauma Centres (MTCs) and Spinal Injury Units (SIUs)

MTCs	WTE for whole hospital SLT service	Unit bed no.s	WTE for the unit	Dedicated SLT funding for the unit (Y/N)	Clinician WTE	Clinician banding	Time qualified as SLT (years)	Time working on the unit (years)	SLT staff: bed ratio
M1	26.2	43	2.1	N	1.0	8a	16	5.5	1:20
M2	22	50	3.9	Y	1.0	7	11	6	1:13
M3	10	44	0.4*	Y	1.0	8a	15	4	1:110*
M4	2.1	16	variable	N	1.0	7	8	1	1:16
SIUs									
S5	1.6	24	1.0	N	1.0	8a	8	4.5	1:24
S6	3.0	43	1.0	Y	1.0	7	10	NR	1:43
S7	0.6	114	0.6	Y	0.5	7	27	8	1:190
S8	0.7	45	0.7	N	0.7	7	35	12	1:64
S9	5.1	42	As needed	N	0.6	7	32	5	1:42

S10	5.6	64	0.6	N	0.6	7	16	14	1:107
S11	4	20	0.4	Don't know	0.7	7	20	6	1:50

M = Major Trauma Centres S = Spinal cord injury units; NR=no response;
*Additional support provided by general ward staff to deliver daily input

Service provision

None of the SLT services in SIUs provided a 7-day service, whilst 50% (2) of the SLT services in MTCs delivered weekend service to acute medical, neurosciences, stroke or elderly care wards in addition to their core weekday services.

Access to instrumental assessments (FEES and VFS) support the evaluation of swallowing function and structural changes that may present post-trauma. 86% (6) SIUs and 100% MTCs had access to a weekly VFS clinic but only 43% (3) SIUs offered FEES compared to all the MTCs (table 2). Half of MTCs provided FEES at least twice a week, using their own equipment, whilst only 14% (1) SIU could offer FEES more than twice weekly with their own equipment, and 28% (2) SIUs shared equipment with another service with ad hoc availability.

Table 2 Availability and access to instrumental swallowing assessments

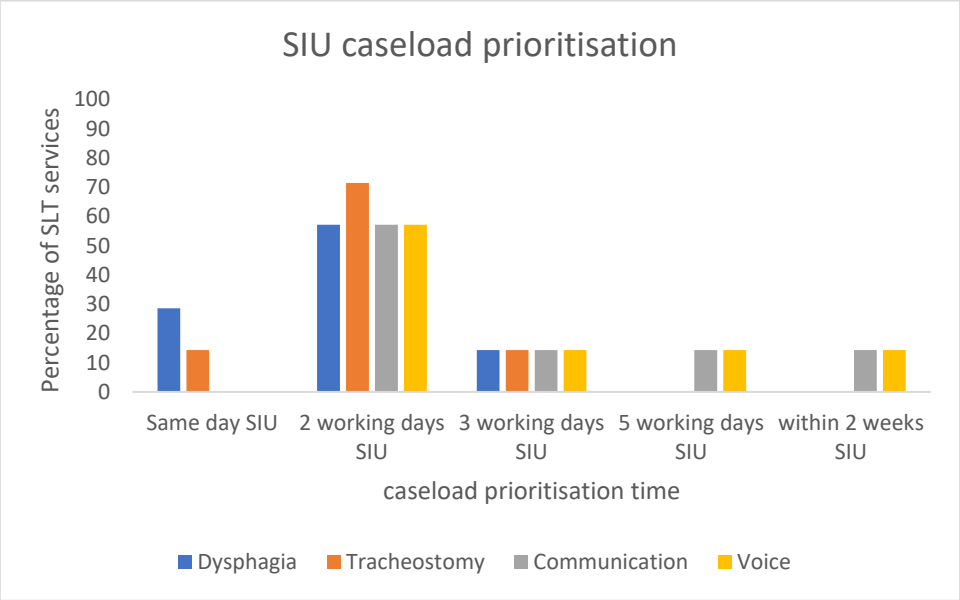
Unit	VFS availability	FEES availability	SLT access to FEES
M1	weekly	weekly	SLT owned
M2	weekly	weekly	SLT owned
M3	weekly	>twice weekly	SLT owned
M4	weekly	>twice weekly	SLT owned
S5	weekly	>twice weekly	SLT owned
S6	weekly	none	-
S7	weekly	ad hoc	shared equipment
S8	none	none	-
S9	weekly	twice weekly	shared equipment
S10	weekly	none	-
S11	weekly	none	-

Levels of SLT involvement

None of the SLTs reported being involved with sedated intubated patients, which is not unusual as patients require a level of consciousness to engage in therapy. Involvement with awake intubated patients was reported by SLTs in 71% (5) of SIUs and 75% (3) of MTCs. All SLT services were involved with ventilated tracheostomy patients, except one SIU that did not admit tracheostomy patients. All SLTs reported being involved with patients who are self-ventilating with a tracheostomy or those post-decannulation. The range of SLT involvement was broadly equivalent across units, despite variations in staffing, caseload and intensity.

Caseload prioritisation

SLT services are usually required to prioritise referrals to balance capacity and demand. All respondents reported prioritising dysphagia and tracheostomy referrals over those for communication and voice referrals (figure 1). For 28% (2) of SIU and 25% (1) of MTC services, referrals for patients with communication and voice problems had a response time to assessment of 5 working days or more.



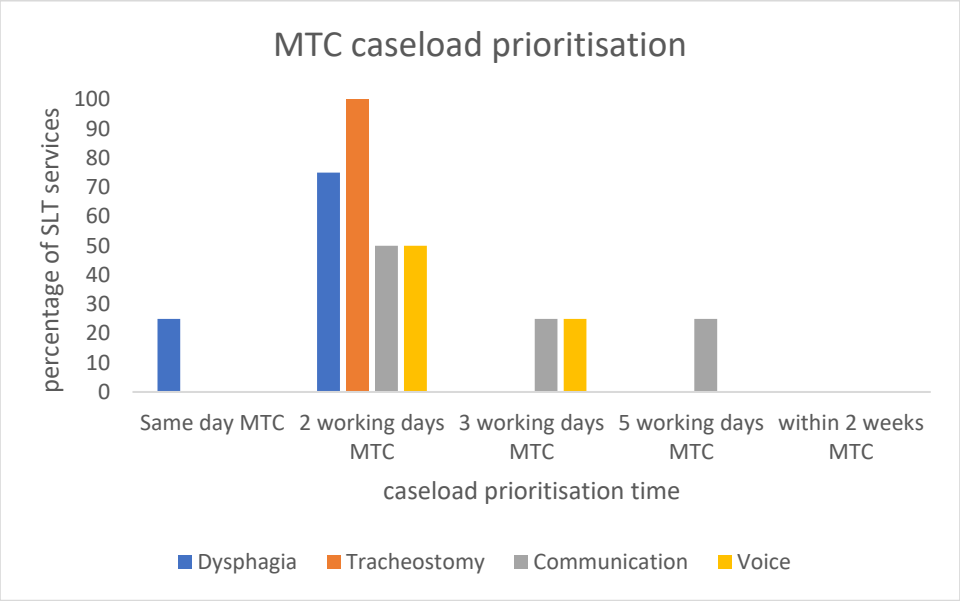


Figure 1 Caseload prioritisation for SLT referrals in SIU and MTC units

Caseload mix

SLTs in SIUs have a homogenous caseload of patients with a confirmed diagnosis of SCI. One service reported that their unit did not accept patients requiring respiratory

support and only patients with a size 6 and cuffless tracheostomy, requiring minimal specialist airway care. MTC caseloads were reported to be heterogenous and included neurotrauma, neurosurgery, SCI, traumatic brain injury, polytrauma, respiratory, medical and post-operative ICU patients.

Average length of stay

The average length of stay (LOS) helps to provide a context for the demands on the service and the size of caseloads. SLTs in SIUs reported that their patients had longer lengths of stays of between 3-6 months (42%) and 6-12 months (42%), with one respondent unsure of the time scale in their unit. In contrast, LOS in MTCs was reported by 50% (2) to be less than a month and two respondents reporting variable LOS from one week to 6 months, and only happened when transfer of a complex patient was delayed. These differences highlight key variations in service needs between a mid to long term rehabilitation service and fast changing acute service. Each demands different levels of skills and expertise to achieve good patient outcomes.

SLT working as part of a team

Asking about the routine involvement of SLTs with the team's clinical decisions, all respondents were involved in nil by mouth decisions (figure 2). Only 28% (2) of SLTs in SIUs were involved in tracheostomy size and type selection compared to 50% (2) of those in MTCs. Eighty six percent (6) SIU SLTs and 100% MTC SLTs were involved in communication aid selection and advice to families. Only 71% (5) SIU SLTs were involved in cuff deflation compared to 100% of SLTs in MTCs. This may be due to reduced need once transferred to SIU. The selection of speaking

valves involved 43% (3) SIU SLTs and 75% (3) SLTs in MTC, although SLTs in all settings were equally involved in the use of speaking valves. With regards to oral hygiene practices, 86% (6) of SLTs in SIUs were involved compared to 75% (3) of MTC SLTs. Involvement as a key worker was only reported by one SLT in a MTC.

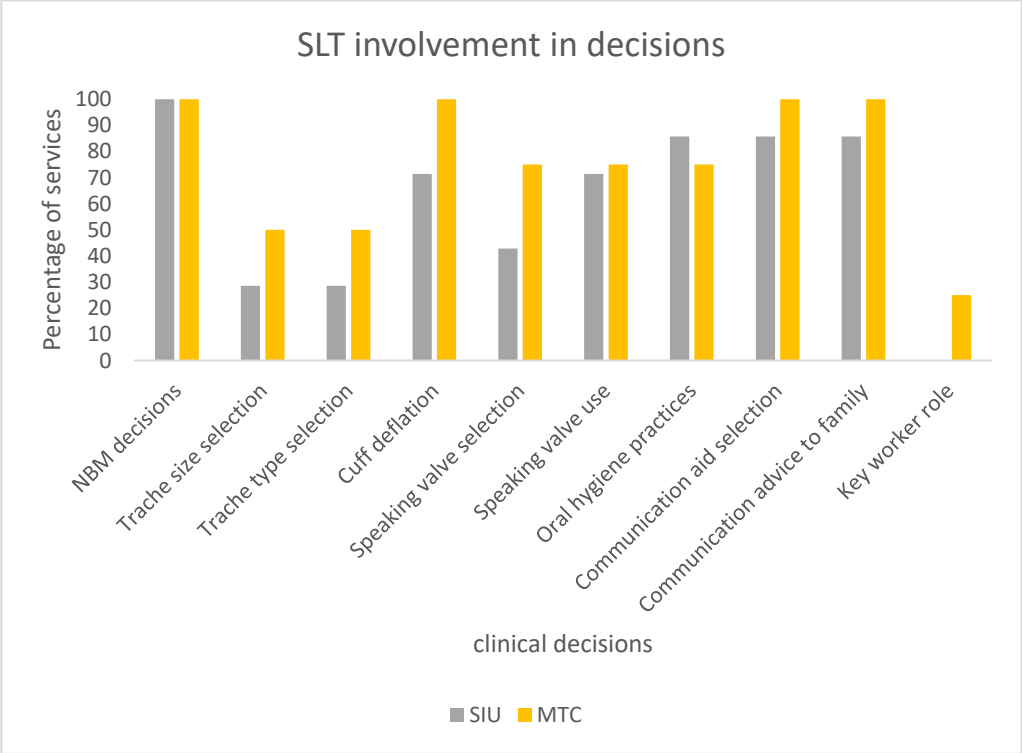


Figure 2 SLT involvement in clinical decisions in MTCs and SIUs

Training

When asked what additional training is required to work in the unit 43% (3) of SIU and 75% (3) of MTC SLTs responded with postgraduate training and competency training whilst informal training was comparable with 71% (5) SIU and 75% (3) MTC SLTs. Details of the training were not sought, so it is unknown whether it is specific to patient groups such as SCI, or impairment such as dysphagia or tracheostomy management.

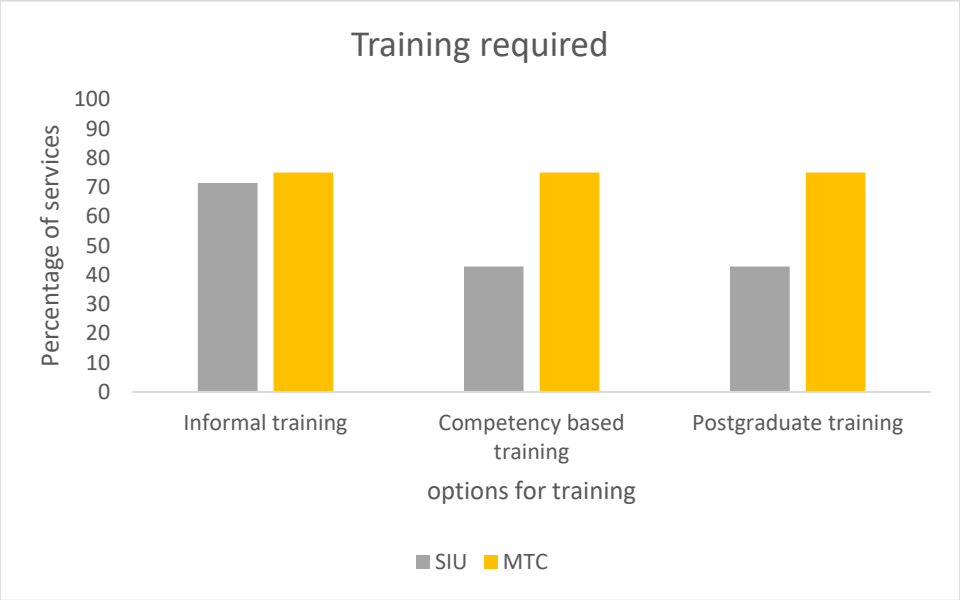


Figure 3 SLT training required for SLT role in SIU and MTC

**multiple response option*

Access to clinical support

All respondents reported having access to SLT peer support with 86% (6) of SIU SLTs reporting access to clinical supervision and MDT support compared to all MTC SLTs. Independent study time was reported by only 71% (5) of SIU and 100% (4) of MTC SLTs. Of note, only 43% (3) SIU and 50% (2) MTC SLTs had access to journal clubs.

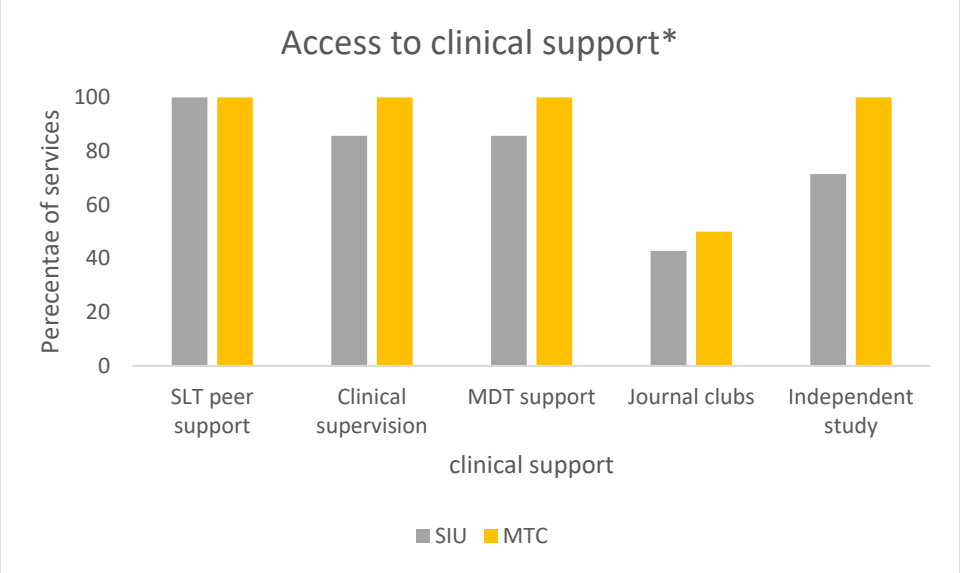


Figure 4 Access to clinical support in SIU and MTC

**multiple response option*

Team involvement

Overall, SLTs in MTCs reported greater team involvement than their SIU colleagues. MDT ward rounds were attended by only 28% (2) SIU and 75% (3) MTC SLTs. Joint MDT therapy sessions were reported by 86% (6) of SIU and 100% (4) MTC SLTs, whilst only 57% (4) SIU and 75% (3) MTC SLTs attended MDT meetings. MDT teaching was undertaken by 28% (2) SIU and 50% (2) MTC SLTs. SIUs SLTs commented that they only attended meetings if their working days overlapped and if there was anything relevant to share, whereas MTC SLTs often attended weekly MDT meetings rather than medical ward rounds. In SIUs joint working was undertaken with respiratory therapists for communication options and with occupational therapists (OTs) for setting up environmental controls and communication aids. Examples of joint working in MTCs included working with

physiotherapists for cuff deflation and weaning and working with OTs for cognitive management.

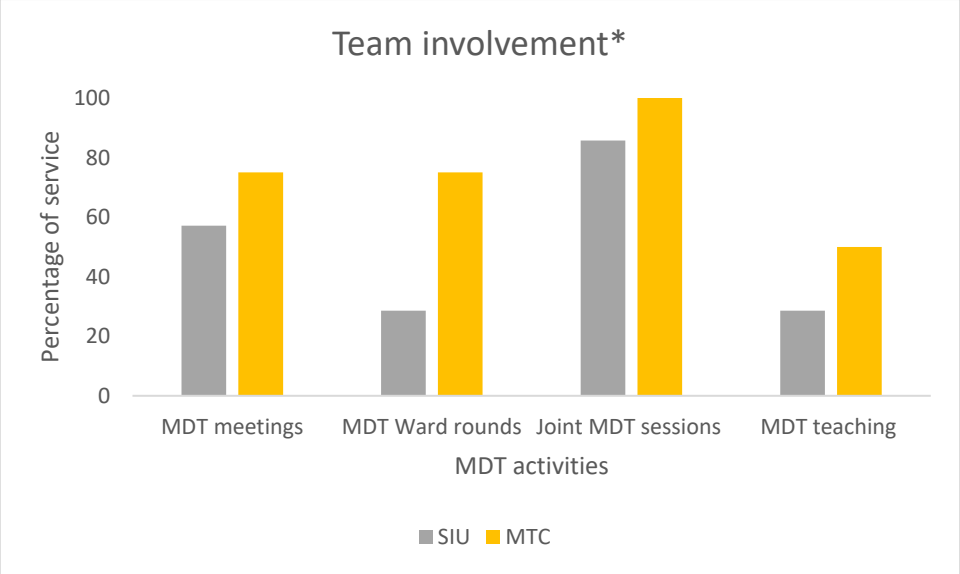


Figure 5 SLT involvement in MDT activities in SIUs and MTCs

**multiple response option*

Use of screening tools

In enquiring about practices for screening for swallowing and communication impairments (figure 6), 57% (4) SLTs in SIUs reported using no screening tools, whilst 43% (3) used SLT administered screens for swallowing and 28% (2) for communication; 75% (3) SLTs in MTCs used nurse administered screening for both swallowing and communication.

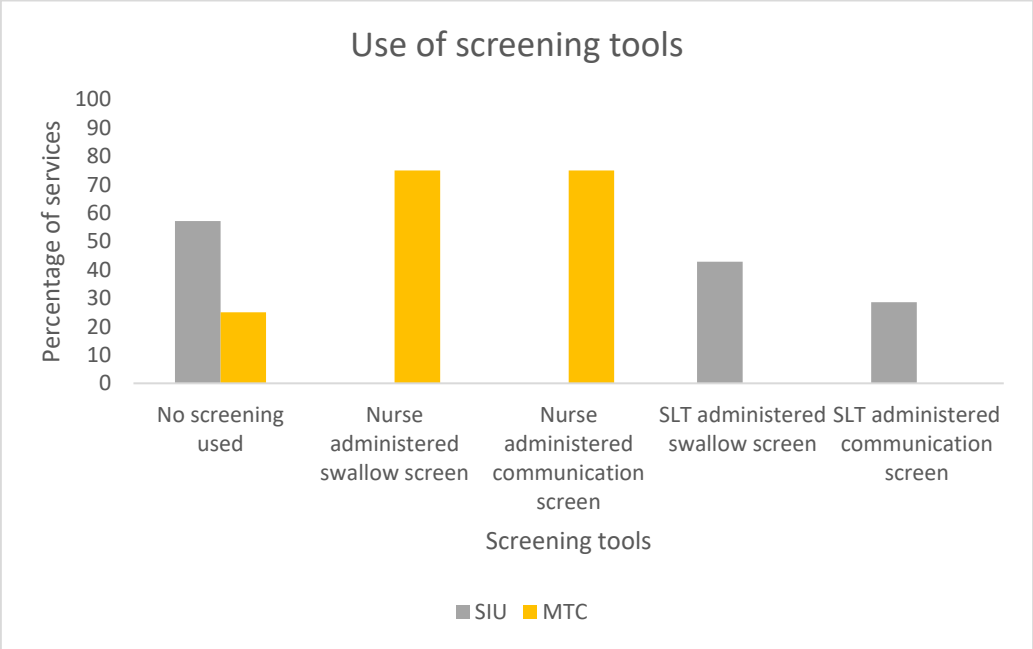


Figure 6 Use of swallow and communication screening tools by SLTs in SIUs and MTCs

Communication and swallowing assessments

All 100% SLT respondents in SIUs (7) and MTCs (4) reported that they undertook clinical observation, clinical swallow assessments and food/fluid trials, whilst 71% (5) SIU and 75% (3) MTC SLTs used instrumental dysphagia assessments.

Similarly, all 100% SLTs reported using informal communication assessments whilst informal adaptations of language assessments were undertaken by 86% (6) SIU and 100% (4) MTC SLTs. In contrast, formal language assessments were used by 43% (3) SIU and 50% (2) MTC SLTs.

Frequency of input

The frequency of SLT input varied at each site and reflected the demands of the caseload. Acute input was reported to be provided 2-3 times a week by 86% (6) SIU and 75% (3) MTC SLTs whilst more than once daily provision was offered by 14%

(1) SIU and once daily by 25% (1) MTC SLTs (figure 7). SIU services were focused on rehabilitation,14% (1) provided input more than once daily, 43% (3) two to three times a week and 43% (3) once a week. 25% (1) of MTC services provided rehabilitation input once daily and 50% (2) two to three times a week. For patients not in active therapy, 43% (3) of SIUs provided an SLT review once a week by and 57% (4) less than once a week whereas 50% (2) MTC SLTs provided reviews two to three times a week and 25% (1) once a week.

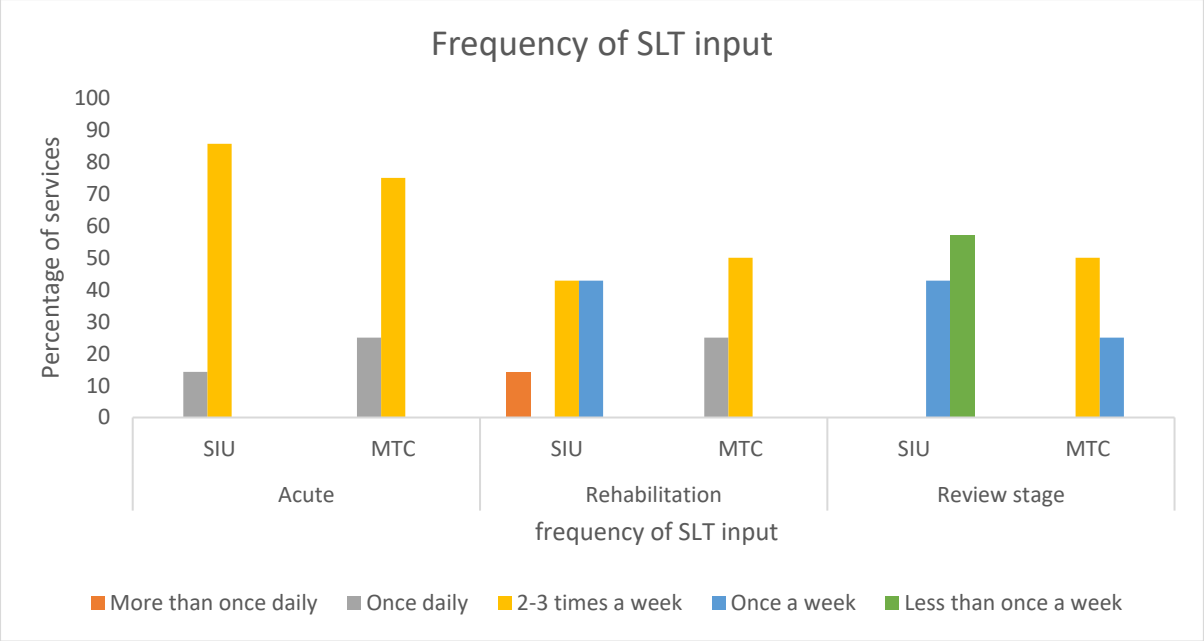


Figure 7 Comparative frequency of SLT input during acute, rehabilitation and review stages in SIUs and MTCs

Discussion

This is the first study to evaluate levels of service provision delivered by SLTs in specialist SIUs compared to MTCs. Key differences were identified in the workforce capacity, service delivery and access to instrumental equipment demanded by the services, with variations in staffing and skills. Despite variations, both unit types required similar high-level expertise in the clinical management of complex dysphagia and communication difficulties whilst working as part of a multi-professional team. Caseloads varied, with MTCs admitting patients with a range of aetiologies, whereas SIUs were focussed on traumatic and non-traumatic SCI only. Lengths of stay varied with SIUs focusing on delivering post-acute rehabilitation through to discharge whereas MTCs admitted and stabilised acute patients before transferring on to specialist or local services, which may include a SIU. In MTCs, the role of healthcare staff is crucial in preventing complications whilst SIU staff have to help patients to establish new skills, adapt to their long-term injury and sustain change for a return to their community.

Staffing ratios for SLTs in MTCs were closer to national recommendations of 1 SLT to 10 beds and availability of a 7-day service (Faculty of Intensive Care Medicine and Intensive Care Society, 2019), which may be due to more high acuity cases with a rapid turnover requiring a responsive service. In contrast, the majority of SLT services in SIUs were delivered part time and were not compliant with UK recommendations of for acute or rehabilitation settings (British Society of Rehabilitation Medicine, 2009), so could not deliver the minimum standard for daily therapy input for a minimum of five days, as specified for Stroke services (National Institute for Health and Care Excellence, 2013). At present, there are no designated recommendations specifically

for therapy interventions in SIUs, despite evidence that regular treatment has a beneficial impact on outcomes (Maharaj et al., 2016).

Variations in the levels of expertise and seniority between MTCs and SIUs were highlighted in the survey results, with only one band 8 role reported across all SIUs compared to 50% in MTCs, regardless of the number of years since qualifying. This higher grading may be awarded for greater expertise in managing multiple aetiologies in an MTC compared to single aetiology in a SIU, or that part-time roles, as set up in SIUs, attract lower pay banding. On average there was less than half of SLT time spent in SIUs compared to MTCs, despite having more beds. This is a problematic finding and one could argue that a part-time role in a specialist unit should have higher levels of expertise than SLTs in MTCs and attract at an equally senior pay banding as an expert clinician.

A key issue with limited service hours is restricted access to SLT input, with some respondents reporting that dysphagia rehabilitation and reviews in SIUs could only be offered once a week or less compared to MTC services who reviewed two to three times a week. This may reflect a more rapid change expected in MTC patients who may be waiting to commence active therapy, whereas the SIU patients may have completed therapy so no new changes are expected. Reduced frequency of SLT input would have an impact on clinical outcomes as many communication and swallowing interventions benefit from intensive input (Morgan and McRae, 2015, McRae and Morgan, 2014). For example, Facial Oral Tract Therapy requires daily intervention to stimulate motor and sensory activity (Hansen and Jakobsen, 2010), whilst Expiratory Muscle Strength Training improves strength and skill with daily monitored practice for a minimum of four weeks (Brooks et al., 2019, Park et al.,

2016). If SLT staff are unavailable, then access to these interventions will be limited which is likely to delay or restrict recovery, prolong length of stay and have a negative impact on quality of life. These concerns have been reported in recent studies on the lived experiences of those with SCI rehabilitation (Wall et al., 2020, McRae et al., 2020).

The added value of multi-disciplinary team involvement is reported in a number of studies especially the contribution to clinical decision-making for tracheostomy management (Cameron et al., 2009, Garrubba et al., 2009, Speed and Harding, 2013, Mitchell et al., 2013, Brodsky et al., 2019). The survey identified joint working for therapy sessions, however links with the wider team for meetings, ward rounds and teaching only happened in SIUs if this overlapped with working days. This reduces the sense of integration and makes the SLT less embedded with the team and less able to coordinate plans for discharge and future care. Having a daily visible presence on a unit should be a priority for SLT services in SIUs as they deliver SLT expertise specific to SCI that can enhance rehabilitation input and support improved outcomes for speech and swallowing, which are key areas of concern for patients and families (McRae et al., 2020).

The use of nurse screening tools was significantly different between MTCs and SIUs, with SLTs in SIUs not making use of any nurse screening tools; instead they undertook all assessments of impairments themselves. This may be because screening tools are not condition-specific and may not be sensitive to detecting subtle impairments or specific needs of those with SCI. Additionally, there may be a lack of time to provide training and support for nurses to use screening tools. Further diagnostic assessment using videofluoroscopy was available to almost all SLT

services, however access for SCI patients may be limited due to the physical requirements to transfer to radiology, be upright in a chair, with added challenges for those requiring ventilation and suction. The alternative instrumental assessment for dysphagia was FEES, which can be undertaken at bedside. SLTs in SIUs had limited access to FEES compared to MTCs which leaves SLTs reliant on clinical assessments which are not sensitive to silent aspiration, known to be a feature of dysphagia in the cSCI population (Shin et al., 2011). The use of FEES is increasingly becoming the gold-standard assessment for post-extubation dysphagia with specific competency training requirements for SLTs set out by the professional body (Royal College of Speech and Language Therapists, 2020) and benefits the identification of pharyngeal and laryngeal dysfunction especially for those post-cervical surgery fixation (Mukherjee et al., 2014). Reduced access to FEES means a lack of specific information about the nature of laryngeal impairment and may delay onward referral to Ear, Nose and Throat or Gastroenterology for further investigations. In turn this increases unnecessary time in hospital, increased need for additional interventions such as non-oral enteral feeding and poorer functional outcomes (Scheel et al., 2016). Delayed dysphagia diagnosis can lead to increased risks of pneumonia (Shin et al., 2011) which is detrimental to both short term and long term clinical outcomes (Kopp et al., 2017). It is important to address this gap in service provision and facilitate access to instrumental equipment and competency training for SLTs to ensure equity of care for patients in MTCs and SIUs.

Whilst dysphagia and tracheostomy management are prioritised over communication impairments for patients in both MTCs and SIUs, communication is often cited by ICU patients as a key need for enabling participation and control of their environment

(Karlsson et al., 2012, Tolotti et al., 2018, Freeman-Sanderson et al., 2016). This is especially challenging for those with cSCI who have physical restrictions to upper limb functions that limit access to alternative communication options and rely on their ability to communicate as a means of securing independence both during in the rehabilitation and community settings (McRae et al., 2020, Hartley, 2015). In a qualitative study by Wall et al. (2020), participants with cSCI reported receiving little support with communication from healthcare professionals, whilst also not understanding the role or contribution of a SLT. Many devised their own strategies through trial and error, to enhance their communicate abilities. Johansson et al. (2018) reported that only one out of 19 cSCI participants had contact with SLT despite reporting significant changes to voice and communication abilities. As a result, many individuals with cSCI developed compensatory habits that put additional strain on their voice function. Although SLT involvement during the acute phase is growing there is a gap in provision for communication impairment, which may be longer term intervention and need ongoing support for functional reintegration (MacBean et al., 2013).

In a survey of clinical management of oropharyngeal dysphagia in cSCI in different types of hospital settings, variations were identified in the knowledge and skills of those working in units that did not specialise in SCI (McRae et al., 2019b), highlighting the importance of expertise and early interventions in SIUs to achieve optimal outcomes for dysphagia. However, the findings from this current survey demonstrate that in reality there is limited SLT staffing capacity and service provision in UK SIUs compared to MTCs, suggesting that these are inadequate to deliver to the communication and swallowing rehabilitation needs of cSCI patients. Future

evaluation of the quality of SLT service provision is required, to identify caseload demands and therapy requirements.

SLTs require post-registration training to work with dysphagia, with on-site supervision to develop competencies. Currently there are no specific training programmes for SLTs working with ICU patients and the survey identified a high reliance on informal training by both groups as a key source of advancing knowledge. SLTs in SIUs had less access to supervision, MDT support and journal clubs and this is likely to have an impact on their practice being evidence-based. When time is limited healthcare professionals will prioritise clinical demands and opportunities for continuing professional development are de-prioritised.

Strengths and limitations

A key strength of this study is the recognition of involvement of SLTs with SCI patients and an understanding of SLT service delivery and service needs, which help to provide a baseline for future service evaluation, quality improvement and research. A limitation of the study is that the data was originally gathered in 2016 as part of a MSc student project and is being published to support a national review of therapy service provision, especially as the previous survey in 2006 was not published. The authors would like to acknowledge that services may have changed in the past five years, although it is evident that between 2006 and 2016 little progress was made to fund SLT services despite their inclusion in national service specification. It is hoped that this evidence can be used to support a more focused change to SLT staffing levels. The small sample size is a further limitation, although this was due to the small number of spinal units that exist across England and the selection of only one individual to complete the survey to prevent duplication of responses. Only four MTCs were chosen as a

representative sample of MTCs who were known to take primary admissions of SCI patients and a future study may want to include all 22 MTCs. The survey was a preliminary study to identify variations in practice and it is acknowledged that multiple choice options may have restricted the depth of responses. Although free text was an option, it was often used to refine question responses. A follow-up study with interviews would provide an opportunity to probe the issues reported.

Conclusions & Implications

Speech and language therapy service provision in SIUs in UK are not matched to those in MTCs and neither fulfil national staffing recommendations to deliver short to medium term rehabilitation to people with complex conditions. SIUs demand a multi-disciplinary approach that embeds SLT management as part of care, preparing for discharge and adaptation to a life-long injury. Spinal injury patients benefit from specialist rehabilitation delivering intensive and focused interventions to achieve good outcomes for communication and swallowing difficulties and this level of input is lacking in the majority of SIUs. Minimum standards for staffing levels are required, ensuring access to diagnostic equipment, training and supervision to enhance existing services. Further evidence is needed of the impact of SLT rehabilitation with patients following cSCI and benchmarking with similar settings around the world would be valuable.

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Speech and language therapy service provision in spinal injury units compared to major trauma centres in England – are services matched?

SUPPORTING INFORMATION

Online survey content

Thank you for participating in this survey.

WHO?

This survey is to be completed by a lead member of the Speech and Language Therapy team who work in a Major Trauma Centre intensive care unit or spinal cord injury unit in England.

WHAT?

This survey aims to gather information regarding SLT service delivery within intensive care units and spinal cord injury units, in order to identify any differences in practice.

The questions asked will be about the SLT service as a whole, your role and the service delivery to your particular unit.

There are 25 questions in total, and many of the questions are multiple choice, with the option of free text. There are no right or wrong answers. No patient details will be required and your responses will remain anonymous. Although the name of your hospital is requested, this will be kept confidential in future reports.

The study is supported by University College London and the Royal National Orthopaedic Hospital.

HOW?

This survey should take approximately 10 minutes of your time. Please ensure you submit finish at the end

This project is part of a larger study, called the DAISY project (www.daisyproject.info) looking at improving the identification and management of dysphagia in cervical spinal cord injury patients.

The data from this survey will be used for a MSc thesis and possible future publication.

If you have any queries please contact:

xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx

By clicking next you consent that you are willing to participate in this survey.

Speech and language therapy service provision in spinal injury units compared to major trauma centres in England – are services matched?

SLT Service Delivery Project

Please provide some general information about your Speech and Language Therapy service

A. SLT Service Information

1. Name of Unit/Hospital

2. What is the whole time equivalent for the whole SLT service at your hospital?

3. Do you provide a 7-day working SLT service?

yes

no

Please include any relevant information, e.g Stroke services only

Service Information

4. How many beds does your unit have?

5. Does the SLT service have dedicated funding for your unit?

Yes

No

Don't know

6. What is the whole time equivalent SLT service provision for the UNIT?

Service Information

7. Please detail the availability of these services to your unit

Videofluoroscopy

FEES

Other (please specify)

Specific clinic timings Ad hoc/patient need
Equipment shared by other service (e.g. ENT/radiology)
SLT owned equipment
Not applicable

8. We want to ask more about the availability of Videofluoroscopy and FEES. Please select the frequency of their availability

More than twice weekly

Twice weekly

Weekly

Speech and language therapy service provision in spinal injury units compared to major trauma centres in England – are services matched?

Monthly

Less than monthly

N/A

Please provide some information about yourself

B. Clinician Information

9. What is your whole time equivalent?

10. What is your banding?

11. How long have you been qualified as a Speech and Language Therapist?

12. How long have you worked on this particular unit?

C. Caseload information

13. For each of the scenarios below, please indicate if your service will be involved? Yes/No/not applicable

sedated intubated patient

awake intubated patient

tracheostomy/ventilated patient

tracheostomy/self ventilating patient

decannulated patient

14. From receiving a referral, what is the time frame in which a patient is seen for assessment?

Dysphagia

Tracheostomy

Communication

Voice

Other

Other (please specify)

same day
within 2 working days
within 3 working days
within 5 working days within 2 weeks

D. Caseload Information

15. Can you describe the medical diagnoses of the caseload on your unit (e.g COPD, Head Injury, SCI)?

16. What is the average length of stay for patients on the unit?

Less than a week

Less than a month

1 - 3 months

3 - 6 months

6 - 12 months

More than 12 months

Other (please specify)

E. General Working

17. Are the SLTs routinely involved in the following clinical situations on your unit;

Nil by mouth decisions (requirement for non-oral enteral feeding, e.g. NG, PEG)

Tracheostomy size selection

Tracheostomy type selection (features, e.g. suction aid, fenestration)

Utilisation of cuff deflation

Speaking valve selection

Speaking valve use

Oral hygiene practices (frequency and tools)

Communication aid selection

Communication advice to family

Key worker role

Other (please specify)

These questions relate to skills and competencies relevant to working on your unit

F. SLT Skills and Competencies

18. What additional experience or training is required to work within your UNIT?

Informal training undertaken on site

Competency based training

Postgraduate training

Other (please specify)

19. What clinical support is currently available for SLTs within your team?

SLT peer support

Clinical supervision

MDT support

Journal clubs

Independent study

None

Other (please specify)

G. Multidisciplinary Team Involvement within the unit

Please give examples

20. Which of the following do you routinely participate in as part of the unit team?

MDT meetings

MDT Ward rounds

Joint therapy sessions with other members of the MDT

MDT teaching

This question relates to the use of screening tools in your setting

SLT Service Delivery to the Unit

Please specify the names of the screening tools used

21. What screening practices are used with your caseload?

No screening used

Nurse administered swallow screen

Nurse administered communication screen

SLT administered swallow screen

SLT administered communication screen

These questions relate to the use of instrumental swallow assessments within your setting

SLT Service Delivery to the Unit

22. Which instrumental swallow assessments do you routinely use with the following example patients?

Supine - patient unable to be sat upright

Patient with tracheostomy (no ventilation)

Patient being ventilated through tracheostomy

Patient who is breathing on their own and can be sat upright for short periods of time

Other (please specify)

None – no instrumental assessment used
Patient not on caseload
Videofluoroscopy
FEES
Other

These questions relate to any SLT assessments that you routinely use within your

setting

SLT Service Delivery to your Unit

23. What methods do you routinely use to assess dysphagia at bedside?

Clinical observation

Bedside swallow assessment

Food/fluid trials

Instrumental assessment

Other (please specify)

24. What methods do you routinely use to assess communication at bedside?

Informal assessment of basic communication skills

Informal adaptation of language assessments

Formal language assessments

Other (please specify)

This question relates to dysphagia therapy within your setting

SLT Service Delivery to your Unit

25. On average, how many times a week do you see an individual patient for dysphagia

intervention at each stage?

Acute stage	More than once daily Once daily 2-3 times a week Once a week Less than once a week N/A
Rehabilitation stage	
Review stage	
Other (please specify)	

Final comments

26. Please provide any other comments you wish to make regarding the SLT service delivery within your unit

Thank you for taking the time to complete this survey, your input is valuable to understanding SLT service delivery in different units.

This data will be used in a University College London MSc Speech and Language Sciences project, aiming to highlight similarities and differences in UK SLT service delivery across major trauma centres and spinal cord injury units.

For any further queries, please contact xxxxxxxxxxxxxxxxxxxxxxx

End of survey

Speech and language therapy service provision in spinal injury units compared to major trauma centres in England – are services matched?