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1 **Speech and language therapy service provision to UK intensive care**  
2 **units: a national survey**

3 **BACKGROUND:** The role of Speech and Language Therapists (SLTs) in intensive care  
4 units (ICUs) has become increasingly recognised. This survey was developed in response  
5 to concern amongst UK SLTs that service provision was insufficient.

6 **OBJECTIVE:** The primary objective was to benchmark and describe UK pre-pandemic  
7 SLT ICU service provision. Secondary objectives included: identifying factors which  
8 might explain differences in SLT service provision, identifying unmet needs and good  
9 practice, and informing recommended SLT staffing levels.

10 **METHODS:** An online survey was distributed through UK SLT networks and social  
11 media. Quantitative data were reported descriptively, and content analysis was conducted  
12 with qualitative data.

13 **RESULTS:** Responses were received from 64 hospitals, representing three paediatric  
14 services and 61 adult services. Average staffing ratios of 0.03 and 0.01 whole time  
15 equivalent (WTE) were reported for these respectively. Most services (77%) received no  
16 funding from their ICU for SLT staffing. Few reported an adequate SLT service for  
17 communication (12%), swallowing (16%) and tracheostomy weaning interventions  
18 (11%). Compliance with national guidance for SLT-led communication and swallowing  
19 input for all tracheostomised patients was achieved by 27% of sites.

20 **CONCLUSIONS:** Staffing levels at many sites were insufficient to provide a consistent  
21 and responsive service. The findings contributed to a recommendation of 0.1 WTE SLT  
22 per ICU bed, which was incorporated into Edition 2 of the Guidelines for the Provision of  
23 Intensive Care Services. This survey identified barriers and facilitators to providing an  
24 adequate SLT service for critically ill patients that may assist service development  
25 initiatives and guide further research.

26

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28 Word count = 4277

## 29 **Introduction**

30 The role of Speech and Language Therapists (SLTs) in intensive care units (ICUs) has  
31 developed over the last two decades (McRae et al., 2019). SLTs provide crucial  
32 interventions for swallowing, communication, and tracheostomy weaning (McGrath &  
33 Wallace, 2014). Post-extubation dysphagia, laryngeal injury, and dysphonia are  
34 common (41%, 83%, and 76% respectively) (Brodsky et al., 2018; McIntyre et al.,  
35 2020; Skoretz et al., 2010). SLTs play an important role in identifying and treating these  
36 patients. SLT-led Fiberoptic Endoscopic Evaluation of Swallowing (FEES) provides  
37 objective information regarding swallowing function, saliva management, and laryngeal  
38 function which can guide swallowing rehabilitation, tracheostomy weaning, laryngeal  
39 rehabilitation, and early resumption of oral intake (Hafner et al., 2008; Hales et al.,  
40 2008; Wallace & McGrath, 2021). Voicelessness in ICU can have a devastating  
41 psychological impact on patients (Happ, 2000). SLTs play a vital role in providing  
42 laryngeal rehabilitation through the use of one-way valves, communication aids, therapy  
43 exercises and ICU staff training (Freeman-Sanderson et al., 2016; Zaga et al., 2019).  
44 Despite the growing body of evidence of the value of SLT in ICU, a recent study found  
45 that only 55% (n=137/251) of SLTs internationally are involved in cuff deflation and  
46 one-way valve trials in ventilator-dependent patients, and that 14% of ICU FEES  
47 services do not include SLTs (Rowland et al., 2022).

48 Prior to the development of this study, research investigating the UK SLT  
49 workforce and service delivery in ICU had been lacking. However, since this survey  
50 was disseminated several international studies have explored the ICU SLT workforce

51 and service delivery (Cardinal et al., 2020; Rowland et al., 2022; Spronk et al., 2022;  
52 Twose et al., 2022).

53 An expert committee of the UK-wide body representing SLTs working within  
54 ICU (the Royal College of Speech and Language Therapy Tracheostomy Clinical  
55 Excellence Network, RCSLT Tracheostomy CEN) was aware of significant issues  
56 relating to SLT service provision in ICUs in the UK from communication from RCSLT  
57 Trache CEN members. Concerns included a national shortage of appropriately trained  
58 and competent SLTs within ICU, variation in SLT service provision, and inability to  
59 meet best practice as outlined in national guidance (GPICS, 2015; National Institute for  
60 Health and Clinical Excellence (NICE), 2009; NCEPOD, 2014; RCSLT, 2014; Royal  
61 College of Speech & Language Therapists, 2014). At the time of conducting this study,  
62 national guidance recommended:

- 63 • Early intervention for communication and swallowing and for all patients with  
64 tracheostomies
- 65 • A minimum of 45 minutes daily therapy, Monday to Friday, with SLT
- 66 • SLT should be a key and fully integrated member of the ICU multi-disciplinary  
67 team (MDT)

68 The primary objective of this study was to benchmark and describe UK SLT  
69 ICU service provision. Secondary objectives included: identifying factors which might  
70 explain differences in SLT service provision, identifying unmet needs and good  
71 practice, and informing SLT staffing levels for revised versions of the Guidelines for  
72 the Provision of Intensive Care Services (GPICS); a multi-disciplinary document that is  
73 considered the ‘definitive reference source for planning and delivery of UK Intensive  
74 Care Services’ (GPICS, 2019).

75 **Methods**

76 This descriptive observational study used a cross-sectional, online, single-event survey  
77 to evaluate SLT service provision to adult and paediatric ICUs in the UK. Ethical  
78 approval was obtained from the School of Medicine Research Ethics Committee at the  
79 University of Leeds on 23 November 2018 (MREC: 18-007). This study conforms with  
80 the Code of Ethics of the World Medical Association (Declaration of Helsinki) and was  
81 undertaken with the understanding and written consent of each subject. The open,  
82 online survey was developed and compiled by the RCSLT Tracheostomy CEN  
83 committee using *Jisc Online Surveys* as required by the University of Leeds. The survey  
84 was piloted by three, ICU SLTs and the final survey comprised 42 questions exploring:  
85 service demographics, response times and access to SLT, referral and assessment,  
86 patient management, MDT collaboration, best practice and service improvement and  
87 innovation. The survey included both closed questions (multiple choice and Likert  
88 scales) and open, free text questions. Items were not randomised or alternated and  
89 adaptive questioning was not employed and mandatory questions were avoided, as they  
90 disregard the voluntary nature of a survey (Dillman, 1999). Participants were able to  
91 review and edit their responses and save and complete the survey later. In order to  
92 protect participants' anonymity cookies, log files, and IP addresses were not recorded,  
93 which also prevented calculation of unique site visitors and view rate. Participant  
94 registration was not required, and timestamps were not recorded. Duplication of survey  
95 completion could be analysed via the name of the hospital and Trust provided by  
96 participants. Supplemental Appendix A presents the survey and embedded participation  
97 information sheet.

98 Convenience sampling was employed, with distribution via social media and  
99 through UK SLT networks, between December 2018 and March 2019. The survey

100 targeted SLTs working in adult, paediatric and neonatal ICUs and respondents were  
101 asked to complete one survey per SLT service. Survey completion was voluntary, with  
102 no incentives offered. See Appendix B for the survey adverts used.

103 All data were analysed, including incomplete responses, with omissions of  
104 questions recorded as 'no response'. Quantitative data were analysed using Microsoft  
105 Excel® (2016) and reported descriptively with percentages (n, %) and ranges. with no  
106 statistical analysis or correction. In order to identify any good practice that might be  
107 associated with better staffing, a sub-analysis was conducted on three adult services  
108 with the highest staffing levels. Inductive, content analysis of the qualitative data was  
109 carried out using NVivo ® version 12 (QSR International). Qualitative data were coded  
110 by members of the study team (CM, SW, CI, HN) with a minimum of 3 people  
111 independently coding each question. Discrepancies were resolved through discussion  
112 and a consensus decision was made. In order to contribute recommended staffing levels  
113 to the revised GPICS guidance, a committee review of the participant estimated staffing  
114 requirements for an adequate 5-day service responses was conducted. The survey was  
115 reported in line with the Checklist for Reporting Results of Internet E-Surveys  
116 (CHERRIES) (Eysenbach, 2004) including recommended reporting of participation  
117 and completion rates, rather than response rate. See supplemental Appendix C for the  
118 complete CHERRIES checklist.

## 119 **Results**

### 120 *Response sources*

121 Sixty-four responses were received from a range of university teaching (n=30, 47%),  
122 district general (n=29, 45%), and specialist (n=5, 8%) hospitals. Three paediatric and 61  
123 adult services were represented, with no duplicate responses. The distribution of

124 responses across the UK is shown in Figure 1. The participation rate – the percentage of  
125 visitors to the online survey webpage who participated in the survey – was 11%. The  
126 completion rate of those participating in the survey was 100%. The UK response rate  
127 for Trusts/Health Boards was 35% (based on the figure of 160 Trusts/Health Boards  
128 (Health and Social Care Online, 2021; NHS Improvement, 2019; NHS Inform, 2021;  
129 NHS Wales, 2006).

130 [Insert Fig. 1 here]

### 131 *Staffing*

132 The reported median SLT staffing ratio (the number of staff per ICU bed) for  
133 paediatrics and neonatal services was 0.03 (range: 0.01-0.04) whole time equivalent  
134 (WTE), and 0.01 (range: 0.001-0.05) WTE for adults. Seventeen services (27%)  
135 employed a band 8a (Clinical Specialist or Clinical Lead) or 8b (Consultant) SLT. Of  
136 these, 94% (n=16/17) were either employed in management roles or part-time and not  
137 routinely clinical in ICU (Table 1). The majority of services were unable to provide  
138 daily (n=44/66, 69%), weekend (n=62/64, 97%) or bank holiday cover (n=60/63, 94%).  
139 Reasons given for insufficient resources included: lack of funding (n=32/59, 54%),  
140 business cases for staffing being declined (n=6/59, 10%), historical staffing levels not  
141 increased with changing role or demand (n=5/59, 8%), increased demand from  
142 increased referrals (n=5/59, 8%), skill limitation (n=5/59, 8%), service pressures  
143 elsewhere (n=3/59, 5%) and a perceived lack of MDT understanding of SLT role  
144 (n=3/59, 5%). The majority of services received no ring-fenced funding from their ICU  
145 for SLT (shown in Fig. 2). Thirty respondents (47%) stated that their SLT service in  
146 ICU was provided by in-reach from the generic hospital SLT cover (which may or may  
147 not have included SLTs with ICU skills), and 16 (25%) specifically stated that their

148 service was provided by non-ICU specialist SLTs. In the two years preceding the  
149 survey, respondents reported staffing levels had improved in 20% (n=13/64) of services,  
150 deteriorated in 14% (n=9/64) and stayed the same in 66% (n=42/64).

151 Various potential risks were felt to be associated with inadequate staffing (see  
152 Table 2). Respondents also identified a range of facilitators to improving SLT service  
153 provision, including management support improving relationships “*presence on ICUs*  
154 *combined with good working relationships with the wider MDT*”, and funding for posts  
155 “*dedicated funding for a full time Band 7 SLT*”.

156 [Insert Table 1 here]

157 [Insert Fig. 2 here]

158 [Insert Table 2 here]

### 159 ***Clinical Service Provision***

160 Response times to referrals varied greatly; 16% (n=10/64) reported patients were seen  
161 on the same working day, 45% (n=29/64) within one working day, and 23% (n=15/64)  
162 reported waits of up to two working days. Few respondents reported an adequate SLT  
163 service for communication (n=8/64, 12%), swallowing (n=10/64, 16%), and  
164 tracheostomy weaning (n=7/64, 11%). Access to FEES occurred in 58% of sites  
165 (n=37/64), however, waiting times varied. Sixty percent of services (n=22/37)  
166 conducted 1–5 FEES per month, 14% (n=5/37) conducted 6-20 per month, with one  
167 service providing 31 – 35 FEES per month. A wait time of 1-3 days for FEES was  
168 reported by 70% of services (n=26/37), while 11% (n=4/37) had a wait of  $\geq 7$  days.  
169 Barriers to delivering a FEES service in ICU were funding “*not able to secure funding*  
170 *for the equipment*”, and skill-mix based “*no-one trained in FEES, no funding to train*”.



171 Less than a third of SLTs reported being often (n=19/64, 32%) or always  
172 (n=10/64, 17%) involved in trials of Passy Muir Valves (PMV); a key aspect of  
173 laryngeal assessment and weaning in tracheostomised patients (Wallace et al., 2022).  
174 SLT involvement in identifying Augmentative and Alternative Communication (AAC)  
175 techniques was even less frequent (often: n=15/64, 23%; always: n=8/64, 13%).  
176 Compliance with the GPICS guidance of SLT-led communication and swallowing input  
177 for all patients with a tracheostomy was reportedly achieved at 27% (n=17/64) of sites.  
178 Ability to meet the GPICS guidelines (GPICS, 2015) of 45 minutes of SLT rehab 5 days  
179 a week was rare (n=2/64, 3%), with 84% (n=52/62) of respondents citing staffing as a  
180 barrier to achieving this.

### 181 ***Referrals***

182 Eighty percent of respondents (n=51/64) felt under-referral to SLT was a problem and  
183 half of respondents (n=33/64, 52%) reported that there was an issue with timeliness of  
184 referrals. Reasons identified for this included a perceived lack of MDT understanding of  
185 the SLT role and impact, lack of awareness of a problem (particularly relating to post-  
186 extubation dysphagia), MDT perception of lack of SLT service capacity to respond to  
187 referrals, and lack of understanding when to refer, and a lack of SLT presence on ICU.  
188 Referrals came from a wide range of professions with nursing as the most common  
189 referral source (n=54/64; 84%) followed by physiotherapy (n=34/64; 53%).

### 190 ***Multi-Disciplinary Team Integration***

191 Respondents reported limited attendance at MDT meetings, with weekly MDT meetings  
192 the most frequently attended (n=16/64, 25% 'always') and 75% (n=48/65) of  
193 respondents reported never having capacity to attend morbidity and mortality meetings

194 (shown in Fig. 3). Whilst 88% (n=56/64) of sites reported involvement in teaching and  
195 training staff, 63% (n=35/56) also reported this occurred only a few times a year.

196 [Insert Fig. 3 here]

### 197 *Audit and Research*

198 Thirty-three percent (n=21/64) reported involvement in ICU-related audit or research,  
199 including: audit (n=12/21, 57%), service evaluation (n=3/21, 14%), Global  
200 Tracheostomy Collaborative data collection (n=3/21, 14%) and clinical research  
201 (n=2/21, 11%).

### 202 *Good practice sub-analysis*

203 Sub-analysis of three adult services with the highest staffing levels revealed that all  
204 were able to provide a daily service, five days per week. Two services were able to meet  
205 the Gpics guidance for all tracheostomised patients to be seen, two services were  
206 100% funded by ICU and the third service received partial funding from ICU (1-25%).  
207 All services reported that referrals were timely and appropriate, and patients were seen  
208 within one working day of referral by one service, and within 4-15 hours for the two  
209 other services. All services were often involved in PMV assessment, and all services  
210 were involved in AAC identification. Two services were conducting research, and all  
211 were providing teaching for the MDT. However, one service had wait times of 5 days  
212 for FEES and MDT training only occurred a few times per year. Two services reported  
213 that their staffing had improved in the past 2 years, due to additional funding for extra  
214 beds and service re-configuration.

215 **Discussion**

216 This is the first UK survey detailing ICU SLT workforce and service provision.  
217 Findings indicated insufficient SLT staffing to provide a consistent and responsive  
218 expert service to meet ICU patients' needs or achieve UK national guidance.

219 ***Staffing***

220 Average SLT staffing in ICUs was very low and slightly greater for paediatric and  
221 neonatal services, although the sample size for this group was very low (n=3). Staffing  
222 tended to be Band 6 and 7 with fewer than a third of services having staff at band 8a  
223 (Clinical Specialist or Clinical Lead) or 8b (Consultant) level. This lack of ring-fenced  
224 funding may have contributed to low SLT staffing provision across the UK and many  
225 services providing a non-specialist service from their generic SLT hospital cover. In the  
226 National Health Service there is an expectation that an equitable service be provided to  
227 all patients, which may lead to diluting of staffing across service areas and to the use of  
228 generic and non-ICU specialist staff, as observed in these results.

229         There are a number of UK SLT competencies to support development of ICU-  
230 specific skills such as: the RCSLT Tracheostomy competencies (RCSLT, 2014), the  
231 Intensive Care Society (ICS) Allied Health Professionals Critical Care Professional  
232 Development Framework (*Allied Health Professionals: Critical Care Professional*  
233 *Development Framework*, 2018), the ICS SLT Pillar (*The Speech and Language*  
234 *Therapy Pillar: A Supplementary Resource of the Allied Health Professionals (AHP)*  
235 *Critical Care Professional Development Framework (CCPDF)*, 2021). However,  
236 completing these competencies requires access to appropriately trained supervisors,  
237 which can be problematic, and may contribute to the reliance on non-specialist SLT  
238 staff providing services to ICUs in the UK.

239           The findings of limited SLT staffing are consistent with other international data.  
240 Cardinal *et al.* found that 71% of participants reported that they provided a service to  
241 ICU of  $\leq 10$  hours per week and dedicated funding was available in 23% of services  
242 (Cardinal *et al.*, 2020). The UK critical care workforce survey reported that SLT were  
243 the least funded of all professional groups, at 23% (Twose *et al.*, 2022). This study  
244 reported SLT staffing ratios of 1 WTE per 30 ICU beds in services with ring-fenced  
245 funding, and 1 WTE per 158 ICU beds in services without dedicated funding (Twose *et*  
246 *al.*, 2022). The UK data (sample size = 52 ICUs) from the Dysphagia in Intensive Care  
247 Evaluation (DICE) study, conducted between November 2017 and June 2019, reported  
248 similar findings with 98% of services having SLT provision to ICU, but just 13% of this  
249 provision was dedicated solely to ICU (Spronk *et al.*, 2022). However, the DICE study  
250 also presents Australian data where 100% of ICUs (n=12/12) had SLT provision, with  
251 92% (n=11/12) of this dedicated to ICU (Spronk *et al.*, 2022). This presents a very  
252 different picture to the focused Australian study with a larger sample size of 165 sites  
253 (Cardinal *et al.*, 2020). An international survey of SLTs found that 10% were working  
254 exclusively in ICU (Rowland *et al.*, 2022). It also suggests that UK provision is much  
255 better than many countries in Europe where a high proportion of services had no SLT  
256 provision: Greece (n=36/36, 100%), Turkey (n=36/39, 92%), Slovakia (n=16/19, 84%),  
257 Spain (n=24/36, 67%), Italy (n=29/46, 63%), Norway (n=14/31, 45%) (Spronk *et al.*,  
258 2022). However, staffing levels in the UK were not improving at the same rate as other  
259 countries, with international reports of 35% improvement in the previous 3 years  
260 compared with 20% found in this study (Rowland *et al.*, 2022). This situation seems to  
261 have reversed more recently, potentially as a result of the COVID-19 pandemic, and  
262 increasing awareness of the value of SLT in ICU (Mills *et al.*, Manuscript submitted for  
263 publication). The sub-analysis of the three services with the highest staffing levels

264 shows they were able to provide a better service in various areas and highlights the  
265 importance of continuing to work towards improving SLT staffing in ICU. The  
266 secondary aim of this study was to provide evidence to support decision-making  
267 regarding recommended SLT staffing ratios for ICU. Participants were asked to  
268 estimate what staffing they required to provide an adequate 5-day service. However,  
269 these were not uniformly described, perhaps due to the wording of the question and free  
270 text responses, and could not be reported. However, after thorough analysis of the  
271 complete dataset the RCSLT Tracheostomy CEN's committee agreed on a  
272 recommendation of 0.1 WTE SLT per ICU bed, which was incorporated into Edition 2  
273 of GPICS (GPICS, 2019).

#### 274 *Clinical Service Provision*

275 Most respondents stated that their service provision for communication, swallowing and  
276 tracheostomy weaning was inadequate. There was considerable variety in referral  
277 response times, although most services reported that patients were seen within two  
278 working days. Less than a third of respondents reported that all patients with a  
279 tracheostomy were assessed by SLT for both communication and swallowing.  
280 Similarly, 30% of international respondents reported that all patients with a  
281 tracheostomy are seen by SLT (Rowland et al., 2022). The DICE study reported that  
282 dysphagia assessment was completed for tracheostomised patients >50% of the time  
283 (Spronk et al., 2022).

284 More than half of respondents were able to access FEES, and wait times were 1–  
285 3 days for the majority of these services. UK access to FEES appears to be much better  
286 than in some other countries, with Australian SLTs reporting 36% of services able to  
287 access FEES (Cardinal et al., 2020). Thirty-nine percent of Irish SLTs were able to  
288 access FEES, and 60% of other international services were able to access FEES, though

289 this was not always SLT-led (Rowland et al., 2022). The DICE international study  
290 reported that more than 30% of services did not have access to FEES or were not  
291 familiar with it (Spronk et al., 2022). Reliable and regular access to FEES is important  
292 for tracheostomy weaning, decannulation, and patients' early safe return to oral intake  
293 (Hafner et al., 2008; Hales et al., 2008; McGowan et al., 2007; Wallace & McGrath,  
294 2021).

295 Most SLTs had limited input into tracheostomy weaning, PMV trials, and the  
296 identification of AAC. Comparatively, 55% of international SLTs reported involvement  
297 in PMV trials and 35% reported that all non-speaking patients were referred to SLT  
298 (Rowland et al., 2022). Inconsistency of communication input for tracheostomised  
299 patients means patients are more likely to be voiceless for longer, leading to higher  
300 levels of psychological distress (Happ, 2000). Irregularity of involvement with PMV  
301 trials may mean missed identification of vocal fold dysfunction or other functional  
302 impairments in the upper airway (McRae et al., 2019). Likewise, the provision of daily  
303 rehabilitation was rare, with poor compliance of the GPICS recommendation for  
304 rehabilitation, and this may delay restoration of communication and swallowing  
305 function and contribute to lower patient quality-of-life. This recommendation has since  
306 been removed in the updated guidelines due to lack of supporting evidence, which  
307 highlights the need for further research to establish the rehabilitation needs of ICU  
308 patients (GPICS, 2019).

### 309 ***Referrals***

310 Under-referral and untimely referrals were a problem in most services. These issues  
311 were also identified in the National Confidential Enquiry into Patient Outcome and  
312 Death report conducted in 2013 (NCEPOD, 2014). Untimely referrals appear to be more  
313 of a problem in the UK than internationally, where 36% reported an issue (Rowland et

314 al., 2022). Increasing the SLT presence on ICU could help to improve MDT education  
315 regarding the SLT role and the nature of ICU-related dysphagia and communication  
316 impairment, and identification of problems and consequently improve referrals.

### 317 ***Multi-Disciplinary Team Integration***

318 There was a lack of integration within ICU MDTs, with most respondents unable to  
319 attend unit meetings. This appears to be worse in the UK than in Australia where 32%  
320 had no involvement (Cardinal et al., 2020). Frequency of attendance at MDT meetings  
321 is considerably lower for SLTs than for physiotherapists or dietitians (Twose et al.,  
322 2022). Most respondents were able to provide teaching and training on their ICUs, but  
323 this was limited in most cases to a few times per year. These figures are similar to that  
324 seen in Australia where 90% of respondents were able to provide training to nursing  
325 staff (Cardinal et al., 2020). Improving SLT integration within the MDT and  
326 participation in unit activities would improve awareness of communication and  
327 swallowing impairment.

### 328 ***Audit and Research***

329 A third of respondents were involved in ICU-related audit and research, and this is  
330 likely due to the limited staffing available in most centres. Research has demonstrated  
331 that there is an association between the level of clinician-engagement in research and  
332 improved patient outcomes and care processes (Boaz et al., 2015). Additionally, patients  
333 that are admitted to hospitals with higher levels of research activity have greater  
334 confidence in staff, receive better quality information about their care, and have a better  
335 inpatient experience (Jonker et al., 2020). Improving SLT staffing to allow increased  
336 participation in collaborative research in ICU has the potential to have substantial  
337 positive effects for services and patients.

338 ***Implications for Clinicians, Service Providers, and Researchers***

339 A lack of direct funding for dedicated ICU SLTs often results in inexperienced SLTs  
340 from other clinical areas providing input into ICU. This poses a risk for the quality and  
341 safety of the service provided, and working relations with other MDT members  
342 (Cardinal et al., 2020; McGrath et al., 2020). It can also lead to reduced service  
343 provision in other areas of the hospital. Insufficient staffing, in terms of expertise and  
344 numbers of SLTs, is likely to contribute to a lower standard of service provision and  
345 worse patient outcomes. Research supports positive patient outcomes and financial  
346 benefits of having an integrated, experienced SLT service in ICU (McGrath et al., 2020;  
347 McGrath & Wallace, 2014). However, with increasing financial pressures within the  
348 UK National Health Service, more evidence is needed to support the cost-effectiveness  
349 of SLT services in ICU. On the basis of our findings, specific areas for focus include:  
350 the impact of increased SLT staffing (e.g. MDT knowledge and awareness of the SLT  
351 role and dysphagia and communication impairment; patient outcomes, including early  
352 restoration of voice and oral intake; and patient quality-of-life), the impact of improved  
353 patient access to communication, the impact of improved access to FEES (including the  
354 impact on tracheostomy weaning), and the impact of early and daily rehabilitation.  
355 Local and national service evaluation, quality improvement projects, as well as larger  
356 scale research would all help to improve evidence base in these areas. Improving the  
357 evidence base will help to: ensure that cost-effective interventions are implemented,  
358 provide more support for increased funding for SLT staffing, and ensure that patients  
359 receive an optimal service.

360 ***Strengths and Limitations***

361 There was high survey completion rate (100%), with no drop out, implying that the



362 survey was an appropriate length. Both participation rate (11%) and response rate (35%)  
363 were relatively low. A low participation rate is to be expected with online surveys, as it  
364 includes all visits to the initial page of the website in the denominator. It is typical for  
365 many individuals to click on the survey link to find out more information. The numbers  
366 visiting the initial page may have been further increased by individuals clicking on the  
367 survey link from a mobile device but choosing to complete the survey later on a  
368 computer, as well as multiple individuals from the same team viewing the survey. The  
369 relatively low response rate may be due to the dissemination approach via SLT  
370 professional networks and social media. Units whose SLT staff were not part of these  
371 networks may have been unaware of the survey. This may particularly have been the  
372 case for the lack of respondents from Scotland and Northern Ireland, where there is  
373 currently no representation from these countries on the committee and minimal  
374 representation in the membership. Additionally, units with no SLT service may not have  
375 been aware of the survey. Moreover, the results may be biased towards units with better  
376 SLT provision, therefore, and the reported findings may provide an overly optimistic  
377 picture of service provision. This is supported by the recent UK AHP workforce survey  
378 which reported much lower staff to bed ratios in the 77% of services without dedicated  
379 funding (Twose et al., 2022). Unfortunately, estimated requirements for an adequate 5-  
380 day service were not uniformly reported, perhaps due to the wording of the question and  
381 free text responses. In future surveys, these limitations could be mitigated through more  
382 extensive piloting of the survey and distribution via the Intensive Care Society and  
383 individual ICUs.

### 384 ***Conclusions***

385 This study highlights a number of areas for improvement for SLT service provision in

386 UK ICUs. Prior to this survey, there were no recommended SLT staffing ratios for ICU.  
387 Few hospitals meet the new recommended SLT staffing ratios, developed from these  
388 data, and many fall significantly below these. Improving SLT service provision to  
389 critically ill patients will involve a number of challenges including: training and  
390 upskilling ICU specialist SLTs, funding a larger ICU SLT workforce, improving access  
391 to specialist equipment, and increasing MDT awareness of the specific roles and  
392 benefits of SLT input to improving patient outcomes and quality-of-life. In a climate of  
393 financial pressures, this will require ongoing innovative thinking, collaboration and  
394 support from a range of stakeholders (e.g. the Intensive Care Society and the Faculty of  
395 Intensive Care Medicine) to explore all options. Future research should focus on further  
396 demonstrating the benefits of SLT interventions, promoting optimised recovery of ICU  
397 patients, and the potential for cost savings. It would be beneficial to monitor progress  
398 and improvements to SLT service provision in UK ICUs working collaboratively with  
399 the MDT to address future challenges.

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514

**Table 1: Banding of staff**

| Banding of Staff                       | Number of Services with Staff<br>at Banding (%) |
|--|---|
| 8c (Consultant)                        | 0 (0%)  |
| 8b (Consultant/Head of Service)        | 2 (3%)  |
| 8a (Clinical Specialist/Clinical Lead) | 15 (23%)  |
| 7 (Highly Specialist)                  | 52 (81%)  |
| 6 (Specialist)                         | 27 (42%)  |
| 5 (Basic Grade)                        | 2 (3%)  |
| 4 (Technical Instructor/Assistant)     | 1 (2%)  |
| 3 (Assistant)                          | 0 (0%)  |

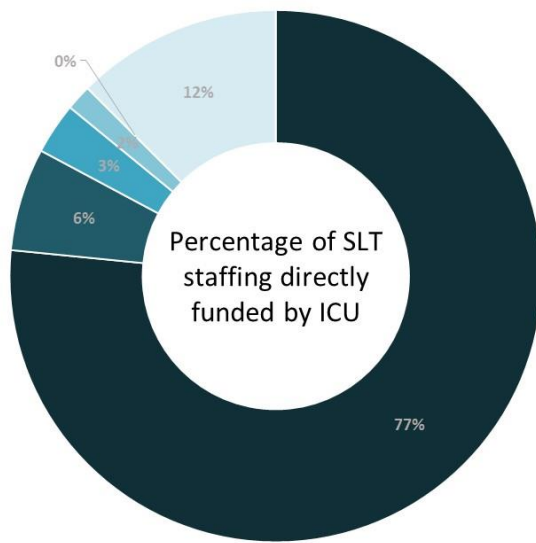


**Table 2 – Potential risks associated with insufficient SLT staffing**

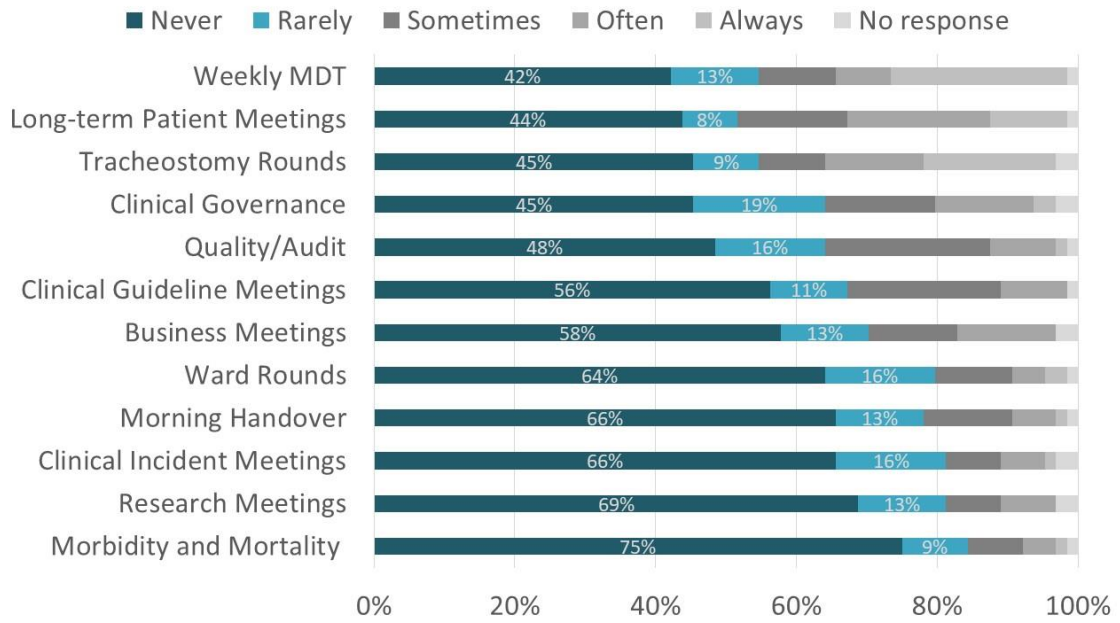
| Risk   | Number of Services (%) |
|--|------------------------|
| Increased length of stay   | 20 (53%)               |
| Increased frequency of aspiration or aspiration pneumonia              | 24 (42%)               |
| Difficulty communicating with staff/family                             | 17 (30%)               |
| Negative impact on patients' psychological well-being                  | 17 (30%)               |
| Lack of support for communication difficulties                         | 15 (26%)               |
| Increased days with tracheostomy                                       | 13 (23%)               |
| Increased duration of requiring enteral nutrition                      | 12 (21%)               |
| Slow SLT response times  | 12 (21%)               |
| Little or no rehabilitation for swallowing/communication difficulties  | 11 (19%)               |
| Delayed commencement of oral intake                                    | 10 (18%)               |
| Delayed weaning  | 10 (18%)               |
| Negative impact on patient outcomes                                    | 10 (18%)               |
| Poor swallowing management   | 7 (12%)                |
| Difficulty for patients to participate in care decisions and treatment | 7 (12%)                |
| Reduced quality of life for patients                                   | 7 (12%)                |
| Other professional taking on SLT roles                                 | 6 (11%)                |
| Risks associated with dysphagia  | 6 (11%)                |
| Under-diagnosed dysphagia  | 6 (11%)                |

Percentage of respondents





- 0% funded by critical care
- up to 25% funded by critical care
- 26-50% funded by critical care
- 51-75% funded by critical care
- 76-99% funded by critical care
- 100% funded by critical care



## **Figure Legends**

Fig. 1. Map of the distribution of hospital or NHS Trust respondents by region of the UK

Fig. 2. Percentage of ICU SLT staffing funded directly by ICU

Fig. 3. SLT attendance at intensive care unit meetings