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A consensus statement for the management and rehabilitation of communication and swallowing function in the ICU: A global response to COVID-19

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81 **ABSTRACT**

82 **Objective**

83 To identify core practices for workforce management of communication and swallowing
84 functions in COVID-19 positive patients within the ICU.

85

86 **Design**

87 A modified Delphi methodology was utilized, with 3 electronic voting rounds. AGREE II and
88 an adapted COVID-19 survey framework from physiotherapy were used to develop survey
89 statements. Sixty-six statements pertaining to workforce planning and management of
90 communication and swallowing function in the ICU were included.

91

92 **Setting**

93 Electronic modified Delphi process.

94

95 **Participants**

96 35 speech-language pathologists (SLPs) from 6 continents representing 12 countries.

97

98 **Interventions**

99 Not applicable.

100

101 **Main Outcome Measures**

102 The main outcome was consensus agreement, defined *a priori* as $\geq 70\%$ of participants with
103 a mean Likert score ≥ 7.0 (11-point scale: "0" = strongly disagree, "10" strongly agree).

104 Prioritization rank order of statements in a 4th round was also conducted.

105

106

107

108 **Results**

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109 SLPs with a median of 15 years ICU experience, working primarily in clinical (54%), in
110 academic (29%) or managerial (17%) positions, completed all voting rounds. After the third
111 round, 64 statements (97%) met criteria. Rank ordering identified issues of high importance.

112

113 **Conclusions**

114 A set of global consensus statements to facilitate planning and delivery of rehabilitative care
115 for patients admitted to the ICU during the COVID-19 pandemic were agreed by an
116 international expert SLP group. Statements focus on considerations for workforce
117 preparation, resourcing and training, and the management of communication and swallowing
118 functions. These statements support and provide direction for all members of the
119 rehabilitation team to use for patients admitted to the ICU during a global pandemic.

120

121

122 **ABBREVIATIONS**

123	AAC	augmentative and alternative communication
124	AGP	aerosol generating procedure
125	COVID-19	coronavirus disease 2019
126	ICU	intensive care unit
127	FEES	flexible endoscopic evaluation of swallowing
128	SARS-CoV-2	severe acute respiratory syndrome coronavirus 2
129	SLP	Speech-Language Pathologist
130	VFSS	videofluoroscopic swallow study

131

132 Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a highly
133 contagious virus responsible for the coronavirus disease 2019 (COVID-19) outbreak and
134 consequential global pandemic.^{1,2} As of October 6, 2020, there were 35.5 million cases and
135 a sobering 1,044,490 deaths from COVID-19.³ ICU admissions with infected patients have
136 increased,^{1,4} ranging 5% to 16%^{5,6} in China, 9% - 46% in Italy,^{7,8} and as high as 30% in
137 California and Washington.⁹ Patients positive for COVID-19 who are intubated, frequently
138 endure lengthy durations of mechanical ventilation, including being turned prone to improve
139 respiratory function, resulting in higher levels of sedation and longer durations of
140 immobilization resulting in iatrogenic impairments that include muscle weakness, fatigue,
141 dysphagia, (neuro)psychological impairments, and impaired activities of daily living.¹⁰⁻¹²
142 Moreover, severe SARS-CoV-2 infection has also resulted in patients acquiring neurological
143 conditions such as Guillain-Barre syndrome, stroke, and/or corticospinal tract signs following
144 hospital discharge,¹³⁻¹⁷ emphasizing rehabilitation needs.

145 Rehabilitation specialists have been historically underutilized in the intensive care
146 unit (ICU). Speech-language pathologists (SLPs) are part of the modern ICU team, providing
147 a key role in intensive care¹⁸⁻²⁰ and tracheostomy teams.²¹⁻²³ SLPs provide clinical expertise
148 in cognitive/communication²⁴ and swallowing functions^{25,26} in the clinical management of
149 patients during and after mechanical ventilation, regardless of the presence of an oral or
150 nasal endotracheal tube or a tracheostomy.

151 Survivors of critical illness require access to care and resources for effective recovery
152 and return to work.²⁷ However, little is known about communication and swallowing
153 management or rehabilitation needs for patients with COVID-19. Empirical studies regarding
154 the rehabilitation of patients with COVID-19 are yet to emerge and peer-reviewed guidelines
155 for the management of patients with COVID-19 admitted to ICUs to date have focused on
156 nursing, medical, and physiotherapy practice.^{28,29} Clinical considerations and guidance for
157 acute, subacute, and rehabilitation practices,^{30,31} specifically to support SLP management of
158 communication and swallowing function during the COVID-19 pandemic, are emerging.³²⁻³⁵
159 The aim of this study was to determine consensus on core SLP practices for workforce

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160 management and the management of both communication and swallowing functions in
161 patients diagnosed with COVID-19 admitted to the ICU.

162

163

164 **METHODS**

165 Participant Recruitment

166 SLPs with at least 5 years of clinical experience working in ICUs were invited to
167 participate by the principal investigators (PIs: AFS, MBB). All SLPs recruited were either
168 known to the investigators or identified by peers as recognized experts with publications
169 and/or presentations at major international conferences and with expertise in assessing and
170 treating patients in the ICU for communication and swallowing disorders. Experts were
171 sought across 6 continents to provide a global lens with varied clinical, managerial, and
172 research experiences, and varied COVID-19 pandemic experiences. Ethics approval was
173 obtained from University of Technology Sydney and Johns Hopkins University, and all
174 participants provided informed consent.

175

176 Survey development

177 AGREE II³⁶ and an adapted framework of questions²⁹ were used to develop tools for
178 consensus ratings. The statements contained in the survey were developed from guidelines
179 and published research accessible from web searches, speech-language pathology,
180 otolaryngology, and intensive care societies published earlier than April 8, 2020 in
181 conjunction with expert opinion from the authorship group. A pre-study virtual meeting was
182 held on April 7, 2020 to outline study aims, methods, and timeline. The group was then
183 asked to: 1) individually and anonymously review and comment on the 72 draft statements
184 planned for inclusion in the survey and 2) contribute up to 3 additional statements for
185 consideration. In total, the group provided 22 additional statements and after duplicates were
186 removed, 15 statements were included. The PIs consolidated and refined the statements
187 further to exclude statements outlining standard practice, with the final set of 66 statements
188 included in the May 11, 2020 distribution.

189

190 Modified Delphi Methods

191 The Delphi process convenes a group of experts for decision-making during an
192 iterative process of questions, anonymous responses, and controlled feedback to the
193 respondents.³⁷ This study involved 3 rounds of modified Delphi consensus voting. The online
194 platform Qualtrics (2019) was used to collect both the demographic and questionnaire data
195 (Qualtrics, <https://www.qualtrics.com>, Provo, UT). Each round, participants were reminded
196 that the content was confidential and they were not to share, discuss, or distribute any
197 content. Participants were further reminded to respond using his/her own knowledge and
198 expertise independent of his/her country, place of business, affiliation, society membership,
199 guideline, or other external guidance.

200 Each participant was sent the link to Round 1 on May 11, 2020, categorized into 3
201 domains: 1) Workforce planning, preparation, and management, including statements (n=25)
202 relating to organization of personnel and resources to address clinical surge and distribution
203 across service lines, 2) Management of communication function, which considered the
204 organization and resources for assessing and promoting effective patient understanding and
205 expression, regardless of whether the patient was intubated with mechanical ventilation,
206 post-extubation, or not intubated (n=15 statements), and 3) Management of swallowing
207 function (n=26 statements), which considered the organization and resources for assessing
208 and promoting safe and effective swallowing (see Supplemental Material 1). An 11-point
209 Likert scale was used to rate each statement (0=strongly disagree, 10=strongly agree).
210 Consensus agreement was operationally defined *a priori* as $\geq 70\%$ ^{29,38,39} of the participants
211 with a mean Likert score ≥ 7.0 for any statement.

212 In Round 1, participants were asked to rate agreement with all 66 statements. During
213 Rounds 2 and 3, participants were asked to rate only those statements that failed to meet
214 consensus on Round 1 or 2 respectively, and explain why they chose that rating for each
215 statement. In both Round 2 (beginning May 15, 2020) and 3 (beginning May 19, 2020) the
216 mean score and standard deviation (obtained from previous round) for any included
217 statement was provided as feedback. Additionally, Round 3 feedback included two
218 anonymous remarks each from participants who scored statements ≤ 2 and ≥ 8 from Round 2

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219 that represented reasons for why these “extreme” scores were chosen. These remarks were
220 included as feedback for Round 3 and chosen for inclusion by the PIs. All participants were
221 advised in advance of the planned dates and timing of each rounds of consultation, with
222 each round sent to participants with 96 hours to complete.

223 An exploratory fourth round (beginning May 24, 2020) of anonymous voting and
224 unrelated to the modified Delphi procedures was added to rank order priorities within each of
225 the 3 domains of questions. Statements that scored a mean Likert score ≥ 9 and $\geq 90\%$
226 consensus were included.

227

228 Statistical analysis

229 Descriptive statistics were used to analyze demographic and statement data.
230 Differences between groups were analyzed using the Kruskal-Wallis H test. Weighted rank
231 ordering was used to determine prioritization. Stata version 12.1 (College Station, TX) and
232 Microsoft Excel 2019 (Redmond, WA) were used for statistical analyses.

233

234

235 **RESULTS**

236 Thirty-five invitations were sent to experts representing 6 continents (12 countries).
237 All agreed to participate. Participants self-identified their current primary role as 19 (54%)
238 clinical, 10 (29%) academic/research, and 6 (17%) managerial/administrative, with a median
239 of 19 (interquartile range [IQR]: 10, 24) years of experience. Years of experience did not
240 differ significantly between groups ($H(2) = 3.438, p = 0.18$). Participants collectively had a
241 median of 15 (IQR: 10, 20) years clinical ICU experience with no significant difference
242 between groups ($H(2) = 1.896, p = 0.38$).

243

244 Modified Delphi Results

245 The 3 modified Delphi rounds each had a response rate of 100% (35/35 participants)
246 and was completed within 96 hours of the electronic questionnaire distribution. All
247 participants attested that there was no communication between the PIs, the participants, or
248 other colleagues regarding the content of the questionnaire throughout the modified Delphi
249 rounds.

250 Round 1 resulted in consensus for 61/66 (92%) statements across the 3 domains.
251 Round 2 included the 5 items that failed to meet consensus, and agreement was reached for
252 2 of the 5 statements. Round 3 contained 3 statements, with consensus reached for 1. At the
253 end of 3 modified Delphi rounds, 64/66 (97%) statements reached consensus (Table 1), with
254 1 statement in *management of communication function* and 1 statement in *management of*
255 *swallowing function* that did not reach consensus.

256

257 *Workforce planning, preparation, and management*

258 In Round 1, 24/25 (96%) of the statements reached consensus. The statement that
259 did not reach consensus was: "Strategies, considering patient/family goals, should be posted
260 outside of the patient's room immediately after evaluation or change in recommendations,"
261 (M=7.1, SD=2.2, consensus 57%). In Round 2, consensus was reached (M=7.3, SD = 2.2,
262 74% consensus).

263

264 *Management of communication function*

265 In Round 1, 14/15 (93%) communication statements reached consensus. The
266 statement that did not reach consensus was: "Speaking (i.e., oral communication) is a low
267 risk aerosol generating procedure (AGP)" (M=5.9, SD=2.9, 49% consensus). In both Rounds
268 2 and 3, this statement failed to reach consensus (Round 2: M=5.8, SD=2.8, 57%
269 consensus; Round 3: M=5.9, SD=2.8, 63% consensus).

270

271 *Management of swallow function*

272 In Round 1, 23/26 (88%) of statements reached consensus. The 3 statements that
273 did not reach consensus were: 1) "Assessment of the gag reflex is considered an aerosol
274 generating procedure (AGP). Assessment should be discussed with the treating ICU team"
275 (M=7.1, SD=3.0, 66% consensus), 2) "A voluntary cough (i.e., asking the patient to cough) is
276 considered an aerosol generating procedure. Assessment should be discussed with the
277 treating ICU team" (M=7.2, SD=3.1, 63% consensus), and 3) "Swallowing therapy tasks that
278 are aerosol generating tasks should be provided to patients" (M=6.9, SD=2.7, 57%
279 consensus). After Round 2, participants only agreed that a voluntary cough is an AGP
280 (M=7.7, SD=2.6, 86% consensus), whereas "testing the gag reflex" (M=6.9, SD=2.5, 71%
281 consensus) and "swallowing therapy tasks" (M= 6.8, SD=2.6, 63% consensus) failed to
282 reach consensus. At the end of Round 3, "swallowing therapy tasks" reached consensus
283 (M=7.3, SD=2.7, 77% consensus), but "testing the gag reflex" did not reach consensus
284 (M=5.3, SD=3.2, 49% consensus).

285

286 *Post-hoc Analysis*

287 A *post-hoc* analysis was completed to address the 17 statements that contained an
288 additional phrase: "...should be discussed with the treating ICU team" (or similar). All of
289 these statements regarded AGPs. On June 17, 2020, a questionnaire was distributed,
290 specifically removing this phrase from each statement (supplemental material 2). Two

291 additional questions asked participants to average how frequently and how much weight the
292 “discuss with the treating ICU team” phrase influenced the ratings across all questions
293 containing this phrase using a 0-10 scale (i.e., 0=never; 10=always). There was 100%
294 (35/35 participants) response rate. Consensus was reached on 15/17 (88%) statements
295 using previously stated criteria for consensus. The 2 statements that did not reach
296 consensus were: 1) “Swallowing/feeding trials may be considered an aerosol generating
297 procedure” (M=7.4, SD=2.7, 66% consensus) and 2) “Videofluoroscopic swallow studies
298 (VFSS) may be considered an aerosol generating procedure” (M=7.5, SD=2.6, 66%
299 consensus). Finally, for the phrase “...should be discussed with the treating ICU team” (or
300 similar), participants reported a mean of 7.3 (SD=2.7) for how frequently they regarded the
301 phrase and a mean of 6.5 (SD=2.3) for how much weight they placed on the phrase.

302

303 Rank Order Results

304 Thirty-three statements resulted in a mean ≥ 9.0 for $\geq 90\%$ of participants during
305 voting rounds. These statements were ranked in priority order across the three survey
306 sections (Table 2) which encompassed five themes (Table 3). The top three statements
307 included: identify staff with ICU-specific skills in relation to communication, swallow, and
308 tracheostomy management; access to resources e.g., glasses, hearing aids, call bells,
309 augmentative and alternative communication (AAC) to enable increased patient
310 communication; and staff should meet regularly with ICU staff (i.e., physicians, nurses) to
311 determine indications for swallowing management in patients with (or suspected) COVID-19.

312

313 **DISCUSSION**

314 This study engaged a global expert panel of SLPs to determine consensus in 3
315 domains of SLP practice in the ICU that apply more broadly to rehabilitation professionals
316 and the ICU multidisciplinary teams in several countries. Our criteria for defining consensus
317 ensured a high threshold for final inclusion. We achieved consensus for 97% of the
318 questionnaire’s 66 statements across three distinct groups of professionals (i.e., clinicians,

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319 academics/researchers, managers/administrators) from 12 countries on 6 continents
320 regardless of ICU specialty. The 2 statements that did not reach consensus both related to
321 classifying tasks/behaviors as AGPs, one related to communication, the other related to
322 swallowing. Considering the current lack of clarity regarding exactly what SLP tasks meet
323 the criteria for classification as AGPs this finding is not unexpected.^{40,41} However, it does
324 highlight a potential difference in perceived approaches in management of safety risk, work,
325 and health. Prioritization for our panel of SLPs differed across domains. For workforce
326 planning, preparation and management, highest priority was given to specialist training for
327 SLPs and caseload management strategies. For management of communication, highest
328 priority was given to communication access for patients in the ICU. Finally, for management
329 of swallowing, focus was almost entirely on viral containment and enabling patients to
330 continue to receive appropriate and timely swallow assessments and rehabilitation without
331 risking the health of the health professionals (Table 3).

332 Participants agreed that rehabilitation occurs within and beyond the ICU. As a group,
333 participants' highest ranked item for the workforce planning and management section, was
334 the need to identify SLPs with specific skills for the provision of communication and
335 swallowing rehabilitation in ICU patients. To bolster extent and continuity of care, a
336 multidisciplinary team inclusive of physicians, advanced-practice providers (e.g., nurse
337 practitioner, physician assistant), nurses, respiratory therapists, physical therapists,
338 occupational therapists, dieticians, and social workers is also necessary, but this is only a
339 first step.²⁰ Strategic planning, including contingencies for service delivery of independent
340 and specialized clinical practices within the changing nature of the pandemic, should be
341 considered. In fact, as an autonomous clinical provider, the weight and frequency of how
342 SLPs regarded the phrase: "...should be discussed with the treating ICU team" influenced
343 their ratings. Prioritizing staffing is paramount to deliver rehabilitation services that will
344 reduce morbidities and to promote improved functional outcomes in survivors of critical
345 illness.

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346 Access to equipment and resources for purposes of enabling patient communication
347 function, was regarded as the highest statement within the communication management
348 survey section. Communication difficulties in the ICU arise from a variety of factors, including
349 loss of voice with mechanical ventilation. Other communication difficulties can co-occur with
350 onset of acquired weaknesses. As a result, patients have diverse communication needs
351 during admission to the ICU, and may require communication supports with all members of
352 the rehabilitation team during periods on and off mechanical ventilation.

353 Consideration of AGPs is a concept that arose particularly within swallowing function
354 at the start of the COVID-19 pandemic. There were 14/15 (93%) AGP statements in the
355 management of swallowing function section of questionnaire that reached consensus. From
356 January to May, AGP definitions and their delineation of risks continued to mature.^{40,42,43} The
357 timing of the questionnaire distributions began during the time of full lockdown, arguably the
358 time of most conservative thinking and uncertainty. Interestingly, the *post-hoc* questionnaire
359 underscored these findings, but also demonstrated a shift in opinions concerning swallowing
360 feeding trials and the VFSS, i.e., more disagreement that these two procedures should be
361 regarded as AGPs. Distribution of this *post-hoc* questionnaire in mid-June was
362 approximately 1 month after several countries began phases of reopening. VFSS
363 services/clinics, in particular, were largely shut down across many institutions prior to June
364 when they began reopening.⁴⁴ With 5 weeks between Round 1 and the *post-hoc*
365 questionnaires, this shift in opinions may reflect practice changes and clinical experience, as
366 we learned that differences with the density and potential transmission of SARS-CoV-2
367 during AGPs can vary across physiological functions of speaking and breathing. This new
368 evidence may have been reflected in the variation of opinions in the expert group.⁴⁵⁻⁴⁹

369 Ongoing research into the rehabilitation needs and outcomes of survivors of COVID-
370 19 is needed to assist with ongoing workforce planning and delivery of healthcare. Full
371 participation across all Delphi rounds and our panelists' experience, individually spanning
372 multiple countries, attests to the robustness of our findings and the broad applicability across
373 geographic boundaries in practice.

374

375 Limitations

376 Despite efforts to ensure rigorous methodology, the study has limitations that need to
377 be considered. Recruitment was through a network of experienced ICU clinicians and clinical
378 researchers, and hence may not represent the views of all clinicians. Also, it is
379 acknowledged that although 12 countries were within the participant cohort, the majority
380 (66%) came from 3 specific countries (i.e., Australia, United Kingdom, United States).
381 However, both between and within these countries, variation is evident with SARS-CoV-2
382 infection rates, pandemic response, and clinical practice.⁵⁰ As such we believe each
383 participating clinician brought differing perspectives and experiences to the study,
384 independent of demographic or country composition.

385 Governing bodies and professional organizations were frequently updating opinions
386 and offering new guidance for safety, clinical procedures, and clinical management. To this
387 point, the World Health Organization (WHO) declared COVID-19 a pandemic on March 11,
388 2020.⁵¹ This questionnaire was finalized April 14, 2020 and distributed with ethics committee
389 approvals on May 11, 2020, during the time when the evidence base was emerging.
390 Generally speaking, survey instruments are quick and responsive to obtaining new
391 information. In the rapidly changing environment of a new pandemic, changes in
392 understanding SARS-CoV-2 continued to drive daily policy changes.⁵²⁻⁵⁴ These changes
393 may not have been updated between the questionnaire's development and its distribution.
394 Global dissemination and relative acquisition of the latest information may not have been
395 equal, potentially leading to differing professional opinions on these two AGP statements.
396 Moreover, we were unable to determine whether the variable opinions among participants
397 was a reflection of regional differences, general ICU experience, or service experience
398 during the COVID-19 pandemic.

399 Despite the global variability that is known to exist with COVID-19 infection rates and
400 the personal experiences of clinicians in each service and each country, the current study
401 was able to obtain consensus on all but 2 of the items. Because of this, we believe the

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402 current findings objectively represent a group of professionals with differing experiences, but
403 who maintain a unified mindset and approach to the management, assessment, and
404 treatment of communication and swallowing management for patients in ICU diagnosed with
405 COVID-19. Further research is need to explore regional and country needs with the
406 changing nature of COVID-19.

407

408 Conclusion

409 Rehabilitation during the COVID-19 pandemic brings challenges for patients,
410 healthcare workers, and organizations with the added complexity of the highly infectious and
411 transmissible nature of SARS-CoV-2. Key areas of patient rehabilitation within the ICU
412 include communication and swallowing functions. The statements contained in the
413 questionnaire help guide the design and delivery of services to improve communication and
414 swallowing function, while protecting staff and limiting the risk of virus spread. For managers,
415 the workforce statements also support decisions regarding the management of the SLP
416 workforce providing these services. The consensus statements from this work provide a
417 unified voice to guide clinicians in the planning, implementation of initiatives, and
418 prioritization of services for swallowing and communication management in the ICU, and
419 then into the post ICU rehabilitation phase.

420

421

422

423 **Table 1. Delphi Voting Rounds**

424

425

Survey components	Round 1		Round 2		Round 3	
	Statements voted	Consensus reached	Statements voted	Consensus reached	Statements voted	Consensus reached
Workforce planning, preparation and management	25	24	1	1		
Management of communication function	15	14	1	0	1	0
Management of swallowing function	26	23	3	1	2	1
Total statements	66	61	5	2	3	1

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429 **Table 2. Prioritization Results**
430

Workforce planning, preparation and management	Total Rank Score	Rank
Identify staff with ICU-specific clinical skills in relation to communication, swallow, and tracheostomy patient management.	369	1
Transparent, clear, and timely communication of COVID-19 infection information relating to ICU care.	334	2
Review of current caseload service delivery to identify capacity for increased service provision to higher acuity and increased clinical demand.	304	3
Transparent, clear, and timely communication of COVID-19 infection information from federal authorities for training in COVID-19 appropriate PPE	304	3
Educate staff to minimize environmental cross contamination with equipment.	284	5
Facilitate clinical education for ICU specific clinical skills in relation to communication, swallow, and tracheostomy patient management.	282	6
Educate staff for the developments of COVID-19-specific disease progression (e.g., delayed onset of new laryngeal symptoms, post intensive care syndrome-PICS).	256	7
Monitor staff mental well-being.	213	8
Consider provision of rehabilitation services for post-ICU discharge, including access for ongoing swallow and communication therapies.	190	9
Staff access to uniforms (e.g., scrubs) for provision of care in ICU.	187	10
Educate staff of reporting guidelines for clinical incidents related to COVID-19.	180	11
Consider additional resources (including training) for the acquisition of telehealth capabilities.	143	12
Consider staff training needs for provision of rehabilitation services post-ICU discharge (i.e., post intensive care syndrome; PICS)	139	13
Management of communication function	Total Rank Score	Rank
Access to resources (e.g., glasses, hearing aids, call bells, AAC) to enable increased patient communication.	247	1
Make accessible a range of communication options to address diverse communication profiles, including alternative and augmentative communication systems and strategies, to non-SLP staff (e.g., nurses, physicians).	220	2
Patients should be provided with support for engaging with family and support networks using communication aids and technologies.	209	3
First consider non-aerosol generating communication supports and aids.	195	4
Consider interpreting services (via phone or electronics) to enhance communication (to include culturally and linguistically diverse backgrounds).	172	5
Cuff deflation is an aerosol generating procedure. Communication procedures for patients with a tracheostomy that require cuff deflation (e.g., speaking valves, leak speech) during mechanical ventilation should be discussed with the treating ICU team.	159	6
Cuff deflation is an aerosol generating procedure. Communication procedures for patients with a tracheostomy that require cuff deflation (e.g., speaking valves, leak speech) without mechanical ventilation should be discussed with the treating ICU team.	147	7
Above cuff phonation is an aerosol generating procedure. Management and use should be discussed with the treating ICU team.	129	8
Communication procedures for patients with a stoma (i.e., laryngectomy including voice prostheses) should be discussed with the treating ICU team.	97	9

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Management of swallowing function	Total Rank Score	Rank
Staff should meet regularly with ICU staff (i.e., physicians, nurses) to determine indications for swallowing management in patients with (or suspected) COVID-19.	322	1
Cuff deflation is an aerosol generating procedure. Swallowing procedures for patients with a tracheostomy that require cuff deflation (e.g., speaking valves) during mechanical ventilation should be discussed with the treating ICU team	240	2
Cuff deflation is an aerosol generating procedure. Swallowing procedures for patients with a tracheostomy that require cuff deflation (e.g., speaking valves) without mechanical ventilation should be discussed with the treating ICU team	231	3
Flexible endoscopic evaluation of swallowing (FEES) is considered an aerosol generating procedure. Assessment should be discussed with the treating ICU team.	227	4
Patients should be supported to independently complete aspects of swallow rehabilitation as able.	217	5
Non-invasive ventilation (e.g., high flow nasal oxygen, BiPAP) is considered an aerosol generating procedure. A swallowing assessment in this context should be discussed with the treating ICU team.	210	6
Patients should be encouraged to self-feed where able.	210	6
Swallowing therapy tasks that are not aerosol generating tasks should be provided to patients.	208	8
Videofluoroscopic swallow studies (VFSS) may be considered an aerosol generating procedure. Assessment should be discussed with the treating ICU team.	183	9
Cleaning non-invasive equipment (e.g., stethoscopes, flashlights, ultrasound) between patients should be discussed with the ICU staff due to risk of cross contamination and healthcare worker infection.	167	10
Respiratory muscle strength training (i.e., EMST and IMST) is considered an aerosol generating procedure. Implementation should be discussed with the treating ICU team.	95	11

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Table 3. Prioritization Statements Themed

Theme	No. of statements	Examples
Viral containment	16	<p>Transparent, clear, and timely communication of COVID-19 infection information relating to ICU care.</p> <p>Videofluoroscopic swallow studies (VFSS) may be considered an aerosol generating procedure. Assessment should be discussed with the treating ICU team.</p>
Managing extreme workloads / influx of patients	2	<p>Review of current caseload service delivery to identify capacity for increased service provision to higher acuity and increased clinical demand.</p> <p>Staff should meet regularly with ICU staff (i.e., physicians, nurses) to determine indications for swallowing management in patients with (or suspected) COVID-19.</p>
Specialist training and staff well being	5	<p>Identify staff with ICU-specific clinical skills in relation to communication, swallow, and tracheostomy patient management.</p> <p>Consider staff training needs for provision of rehabilitation services post-ICU discharge (i.e., post intensive care syndrome; PICS)</p>
Communication accessibility	7	<p>Access to resources (e.g., glasses, hearing aids, call bells, AAC) to enable increased patient communication.</p> <p>Consider additional resources (including training) for the acquisition of telehealth capabilities.</p>
Swallow intervention accessibility	5	<p>Patients should be supported to independently complete aspects of swallow rehabilitation as able.</p> <p>Swallowing therapy tasks that are not aerosol generating tasks should be provided to patients.</p>

435 NB: Some statements crossed over two themes

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