

Speech and language therapy for COVID-19 patients in ICU and beyond

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Speech and language therapy for COVID-19 patients in ICU and beyond

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The role of Speech & Language Therapy in ICU patients with COVID-19

Data on the functional outcomes of patients surviving an intensive care unit (ICU) admission for COVID-19 are as yet sparse. However, anecdotal experience across ICUs indicates that a high proportion have significant physical functional impairment (more than 50 % of those discharged from ICU) and because this is a multi-system disease the range of impairments is diverse. There is an immediate need to provide specialist, tailored and targeted rehabilitation for patients recovering from the disease to improve functional outcomes.

The key role of Speech and Language Therapists within ICU is widely recognised (see [GPICS 2019](#) and [NICE CG 83](#)) and is essential to providing rehabilitation of communication and upper airway functions following critical illness. As the link between communication, swallowing and airway difficulties and broader outcomes for patients after COVID-19 infection is becoming clearer, this guidance will inform models and pathways for speech and language therapy services in the provision of high-quality rehabilitation. This fully integrated multidisciplinary rehabilitation pathway will serve as a lasting legacy for all patients, whether affected by COVID-19 or not, for years to come.

1.0 The likely need of COVID-19 patients after critical care

1.1 Collecting data and outcomes

Speech and language therapy services across the UK are currently collecting clinical data but at the present time it is too early to provide any analysis to inform the likely rehabilitation needs. Instead the guidance is based on early clinical indications, experience and expert opinion.

To support data collection, the RCSLT has developed a [dataset for speech and language therapists](#) (SLTs) to capture the patients with confirmed and suspected COVID-19. The dataset collects information about communication and swallowing clinical impairments and outcomes, as well as the impact of interventions on speech and language therapy service delivery. These data will be used to track the progress of patients through the rehabilitation pathway and link into any larger professional datasets under development by the Intensive Care Society (ICS). The RCSLT recommends that the RCSLT dataset should link to the existing data systems. If this is not possible then the key speech and language therapy data fields should be built into rehabilitation data digital platforms.

1.2 Clinical expert opinion

The emerging clinical presentations of post-ICU COVID-19 patients based on expert opinion to date suggests three main groups (Figure 1.0). There is also a growing understanding of the cohort of patients not admitted to intensive care or hospital who are experiencing ongoing impairments post COVID-19 infection, potentially leading to long-COVID. These problems may include dysphonia, cognitive communication and chronic upper airway and respiratory problems.

Figure 1.0: Levels of patients with likely SLT requirements

#	Description	Likely needs
1	Patients with relatively rapid recovery, who are able to be discharged home safely following acute assessment and intervention in hospital or step-down settings	<p>Short and long-term needs are unknown as not all patients will receive a comprehensive assessment of post-ICU impairments at discharge</p> <p>Critical care interventions following severe acute respiratory syndrome (ARDS), including prolonged trans-laryngeal intubation, ventilation, proning and Extracorporeal Membrane Oxygenation (ECMO) may result in patients experiencing the following:</p> <ul style="list-style-type: none"> • Voice problems (dysphonia) • Swallowing difficulties (dysphagia) • Cognitive-communication difficulties • Chronic laryngeal, upper airway and respiratory problems and ongoing need for a tracheostomy
2	Patients with persistent, moderate-severe rehabilitation needs resulting from neurological or respiratory deficits or Post Intensive Care Syndrome (PICS)	<p>Intensive therapy in the acute post-ICU setting</p> <p>Longer-term rehabilitation input in (tertiary) bedded centres or in community speech and language therapy settings</p>
3	Those who do not survive (30-50%)	N/A

2.0 Physical weakness, muscle atrophy and myopathy

Patients discharged from critical care often present with profound muscle weakness as a result of significant loss of muscle mass and disuse atrophy during critical illness. This is apparent in COVID-19 and non-COVID patients with multi-organ failure, ARDS, multi-morbidity, following ECMO and prolonged lengths of ICU and hospital stay.

2.1 Dysphagia

Previously, swallowing difficulties (dysphagia) have been demonstrated in 91% of patients who have myopathy.^[1] Also 32% of ARDS patients intubated for a median of 7 days have clinically important swallowing changes that persist beyond hospital discharge with 25% taking longer than 6 months to recover.^[2] Some patients presenting with dysphagia may also have had a previously undiagnosed swallowing problem prior to ICU admission. In addition many studies report that dysphagia is common post extubation and in survivors of critical illness⁽³⁾.

Dysphagia is also associated with dehydration and malnutrition and patients may need supplemental tube feeding for nutritional support in the short, medium and/or long-term. Early intervention by SLTs enables assessment and management of dysphagia, which is paramount to safe and efficient swallowing and pulmonary recovery. Delivery of mouthcare is of paramount importance, particularly in patients who need to remain Nil by Mouth due to dysphagia risks. Access to instrumental assessments, including Fiberoptic Endoscopic Evaluation of Swallowing (FEES) and Videofluoroscopy (VFS) may be limited but are needed to effectively manage ongoing dysphagia following COVID-19^[4,5]. Tailored rehabilitation of dysphagia will require a variety of swallowing exercises, compensatory techniques and equipment-based therapies such as Pharyngeal Electrical Stimulation (PES), Neuromuscular Electrical Stimulation (NMES) or Surface Electromyography (sEMG). The latter may only be available at selected centres. Unresolved swallowing issues are likely to impact on daily life and increase psychological and nutritional burden.

Dysphagia may be persistent if respiratory and swallowing timing and coordination are impaired, potentially increasing risk of aspiration. Patients who require ongoing respiratory support such as oxygen therapies or non-invasive ventilation (NIV) may struggle with eating and drinking safely and meeting nutritional requirements orally. These patients are also at risk of fatigue during mealtimes and may benefit from compensatory strategies such as a diet and fluid modification. A joint approach with dietetics and occupational therapy is essential for the management of chronic dysphagia in COVID-19 survivors.

2.2 Respiratory consequences

Post critical care, COVID-19 patients are presenting with ongoing respiratory issues and reduced lung function, such as fibrotic lung changes and breathlessness. These problems may lead to chronic difficulties relating to adequacy of respiratory support for voice production or the ability to tolerate swallow apnoea. Poor breath swallow control can lead to aspiration, reduced oral intake and risk of malnutrition and dehydration. Dysphagia also increases the risk of aspiration in these patients who already have a vulnerability to pneumonia, and leads to poor quality of life, further respiratory deterioration and increased mortality^[6]. Whilst respiratory dysphagia is often overlooked, it is treatable^[7,8] and may benefit from a joint approach^[8] within a respiratory multidisciplinary team (MDT) in order to exclude aspiration events and to optimise lung recovery. Selected patients may benefit from specific treatments such as Expiratory Muscle Strengthening Training (EMST) to improve swallow function. However, this is not available in all centres and requires careful patient selection.

2.3 Dysphonia and communication

Compromised respiratory function, as a result of COVID-19 and associated conditions such as lung fibrosis, breathlessness or fatigue, may reduce vocal function, resonance and breath-support for voice and speech. These patients will likely require specialist speech and language therapy and joint SLT/ENT assessment and intervention in voice clinics. Some patients experience bulbar musculature weakness, for various reasons including intubation, myopathy and neurological problems, which leads to dysarthria and reduced intelligibility of speech. Unresolved communication issues often increase patient anxiety, frustration and independence and negatively impact on capacity to return to work and quality of life.

3.0 Tracheostomy

Patients with severe COVID-19 may have undergone tracheostomy during their ICU admission due to a need for prolonged mechanical ventilation, failed extubation or secondary to laryngeal complications. The number of COVID-19 patients undergoing a tracheostomy across different centres has increased but with differences in timing, insertion method and weaning approaches. It is anticipated however that most patients will be weaned off ventilation and decannulated by the time of discharge from hospital. As the different phenotypes of COVID-19 emerge, it is clear that some patients are taking longer to wean than others, with resultant increased ICU-acquired weakness. There is emerging evidence that a small proportion with upper airway complications, such as glottic stenosis, may require longer-term tracheostomy and follow-up care in the community by SLT and ENT due to dysphagia and airway compromise^[9]. Although limited in number, there is likely to be a disproportionately significant burden of care on community services for these patients, due to chronic shortages in the provision of placements for those with long-term tracheostomies. Such patients may also need follow-up at specialist joint ENT/SLT airway or voice clinics, which are not available in all centres.

Multiprofessional consensus guidance for safe tracheostomy care is available [here](#).

Intensive Care Society/FICM Guidance for Tracheostomy care is available [here](#).

Speech and Language Therapy tracheostomy guidance for safe practice for COVID-19 patients is also available [here](#).

3.1 Dysphagia and weaning

Whilst tracheostomy itself does not cause dysphagia, these patients are often weaker and have accompanying comorbidities, respiratory and neurological deficits causing ongoing swallowing difficulties. Issues may include secretion management and high aspiration risk which impact on tracheostomy and ventilator weaning success. SLTs' expertise in assessment, management and rehabilitation of swallowing and laryngeal functions are essential for MDT weaning and decannulation decisions^[10]. The use of SLT-led endoscopic procedures have been gradually reintroduced following initial suspension during the COVID-19 pandemic, and are critical to a successful MDT approach^[11].

RCSLT guidance is regularly updated and can be found [here](#).

3.2 Communication difficulties

Patients having undergone tracheostomy will have difficulties communicating and the experience of voicelessness frequently has a significant and long-lasting psychological impact. Speech and language therapy interventions focus on early communication support including alternative communication strategies (using both high and low technology), the management of one-way speaking valves and provision of communication therapy for any impairments with speech, language or voice. Lasting impairments with voice quality may occur where laryngeal injury or hypersensitivity following intubation become a chronic issue.

4.0 Laryngeal and airway complications

The rate of prolonged intubation in COVID-19 survivors is often high and reintubation appears common due in part to acute laryngeal complications, such as glottic and supraglottic oedema and ulceration^[12]. Intubation factors increase the risk of laryngeal injury and can also lead to chronic laryngeal, voice, and airway complications^[13,14,15]. The full extent of these in COVID-19 patients are as yet unknown but due to prolonged durations of intubation may be more prevalent. Problems are likely to include:

Voice complications

- vocal fold palsy (unilateral or bilateral), arytenoid dislocation, avulsion of the vocal process.
- reflux or intubation-related vocal fold granuloma.
- acute and long-term impaired voice quality; aphonia, hoarseness, vocal fatigue, reduced pitch and volume control.

Swallowing complications

- laryngeal sensory impairment – hyposensitivity or hypersensitivity.
- reduced airway protection and consequent aspiration.
- tongue weakness affecting chewing of oral diet and oral control of fluids

Airway complications

- laryngotracheal/glottic stenosis, dynamic airway collapse and laryngomalacia due to increased movement and pressure of endotracheal tubes associated with intubation and proning.
- long-term laryngeal hyper-responsiveness, such as inducible laryngeal obstruction (ILO) and chronic cough.
- long-term tracheal/laryngeal mucosal and epithelial changes due to the impact of the virus.

It is also important to exclude and treat any suspicion of laryngopharyngeal reflux which may be exacerbating laryngeal injury. Understanding the factors leading to altered laryngeal structure and function is important in directing management to support laryngeal and airway complications. This necessitates a joint approach between speech and language therapy, ENT and respiratory teams. SLT expertise in providing specialist assessment and rehabilitation for a range of laryngeal and airway impairments using instrumental, acoustic and auditory perceptual data will be essential. A low threshold for expert laryngeal/airway evaluation and follow-up is recommended and access to specialist multidisciplinary voice and airway clinics will be vital for treatment and targeted rehabilitation.

5.0 Neurological impairments

Neurologic symptoms manifest in a notable proportion of patients with COVID-19. Emerging clinical data suggest approximately 25-30% of COVID-19 survivors are presenting with new neurological impairments. In a case series of 214 patients with COVID-19, neurologic symptoms were seen in 36.4% of patients and were more common in those with severe respiratory infection (45.5%)^[16].

A variety of neurological signs have been reported including agitation and confusion, impaired consciousness, dysexecutive syndrome, acute cerebrovascular events (infarcts and haemorrhagic), encephalopathy, critical illness myopathy/neuropathy and hypoxia^[17, 18]. These acute neurological events may result in cognitive and physical impairments to varying degrees including dysarthria, dysphasia, dyspraxia, dysphonia, cognitive-communication disorders and dysphagia. Speech and language therapy intervention in specialist rehabilitation or community settings will be essential for assessment, differential diagnosis, treatment and management of neurogenic communication and swallowing disorders in post-ICU COVID-19 survivors.

6.0 Psychological, cognitive and communication difficulties

Delirium may develop in 60-80% of patients in the intensive care setting and in COVID-19 the prevalence of delirium is not only common but persisting longer. This may be due to the prolonged use of sedatives required for intubation, including the use of benzodiazepines. Some of these sedative medications such as midazolam may directly impair swallowing through increased pharyngeal weakness ^[19]. Management of dysphagia in conjunction with delirium is more challenging and increases dependency on support for oral feeding and mouth care; known risk factors for developing aspiration pneumonia ^[20]. Severe delirium may delay interventions and ICU discharge and has a negative impact on a person's ability to communicate.

Significant cognitive abnormalities have been shown in long-term ARDS survivors, particularly in memory and executive function. Even mild cognitive impairment, which is common after ARDS, may go unnoticed in the acute setting and persists at one year in about a quarter of patients ^[21, 22]. Post intensive care syndrome (PICS) is highly prevalent in patients after prolonged mechanical ventilation (56% after 12 months) which can impact on cognitive communication functions ^[23]. Early indications in COVID-19 patients suggest that as delirium resolves, more significant cognitive impairments may become evident with some patients requiring in-patient rehabilitation. Impairments in cognition appear to be associated with significantly increased anxiety and worse quality of life ^[24]. The scale of this problem is currently unknown particularly in non-hospitalised and Long-Covid populations.

Persisting and severe cognitive impairment frequently impacts on communication performance in daily activities. Communication assessments conducted by SLTs may contribute to differential diagnosis of delirium, communication impairment and cognitive-communication disorder versus aphasia in any setting. Working in conjunction with the psychologist, occupational therapist and the MDT, SLTs may help to guide cognitive therapy and management.

SLTs can support mental capacity assessments related to swallowing and communication issues, such as determining a patient's capacity to make decisions around having a tracheostomy or eating and drinking accepting risks of aspiration (risk feeding). SLTs are also skilled in supporting communication in those with communication impairments to facilitate mental capacity assessment in relation to health and social care decisions undertaken by other members of the MDT.

7.0 Social aspects

The ability to communicate and eat and drink safely is essential for patients' health and wellbeing, quality of life and participation in social activities in daily life. SLTs are skilled in the provision of counselling and advice with respect to short- and longer-term decisions around eating, drinking, swallowing and communication. This includes supportive strategies to enable patients to return to work.

SLTs are key to the development of holistic, integrated approaches to rehabilitation and care planning, and to the development and delivery of strategies to meet ongoing communication, swallowing and tracheostomy needs in the community. This includes supporting patients with communication difficulties to access rehabilitation provided by other members of the MDT. SLT skills may also be key to the training and development of the wider MDT, including carers and volunteers, to support the delivery of interventions.

SLTs also advocate for patients and using strategies, optimise engagement with rehabilitation, support reintroduction into the community and empower management of their own health ^[25].

8.0 Existing guidance and practices

A range of evidence-based approaches to screening, assessment and rehabilitation of communication and swallowing difficulties are available. Some may be undertaken directly by an SLT while others are suitable for use by the wider MDT.

The RCSLT recommends the following national practices that currently exist as examples on which to model novel COVID-19 rehabilitation pathways:

- Early Supported Discharge in stroke.
- Pulmonary and cardiac rehabilitation.
- Cancer survivorship clinics.
- ICU follow-up clinics.

Rehabilitation pathways should encompass early non-SLT triage with signposting to SLT, more in-depth MDT functional screening where needed, and guidance for referral to SLT, specialist clinics, specialist rehabilitation services and different SLT interventions. These pathways will continue to be scoped and developed and may vary dependent on local services and initiatives (see example in Table 2). The PICUPS Tool appended to the National Post ICU Rehabilitation Collaborative Framework is one such recommended screening tool developed alongside ICS and rehabilitation experts.

Table 1 shows a triage framework to be used by members of the multidisciplinary team and General Practitioners in primary care. This should enable identification of communication, voice, swallowing and/or airway needs, triggering timely and appropriate intervention by a Speech and Language Therapist, signposting to resources as needed.

Table 2 shows an example of a dysphonia pathway.

Table 3 shows potential speech and language therapy assessments, outcome measures and approaches to management that may be indicated following referral to Speech and Language Therapy.

In addition, the RCSLT is continuing to work with expert members to revise guidance on specific procedures and approaches to care, within the context of early rehabilitation and the risks of exposure to the virus which may still be shedding, such as SLT-led endoscopic procedures ^[26].

The RCSLT also has well established national and regional clinical excellence networks (CENs) actively engaged in knowledge sharing. RCSLT members have direct close links with international and national experts, multidisciplinary and speech and language therapy professional bodies and key organisations such as the ICS, National Tracheostomy Safety Project (NTSP), Faculty of Intensive Care Medicine (FICM), ENT-UK, British Laryngological Association (BLA), British Thoracic Society (BTS), the Stroke Association and the Intercollegiate Stroke Working Group. Speech and language therapy best practice and clinical guidance have been developed collaboratively and rapidly with the UK leading the way forward internationally.

9.0 Recommendations for practice

The impact of COVID-19 and the resultant clinical presentations indicate a need to provide training and development of skills within the workforce and the wider MDT. This would support a holistic approach to meet the needs of these patients with communication, swallowing and airway issues. There are opportunities to increase capacity through:

- Maximising skill mix.
- Developing new ways of working.
- Providing care in new and innovative transdisciplinary ways.
- Building research capacity to develop knowledge and effective treatment approaches.

There is an absence of specialist post registration SLT training in critical care however there are a number of existing resources. ACP critical care modules that are multi-professional are accessible to SLTs, tracheostomy competency frameworks (RCSLT and NTSP) and tracheostomy educational resources available at www.tracheostomy.org.uk. Upskilling SLT staff to be able to work within critical care is a recognised need and the RCSLT and ICS are working together to support competency framework development (an SLT Pillar of the AHP framework) and on workforce strategies.

The RCSLT considers the following to be exemplars of best practice for the patient, the workforce, and the NHS:

9.1 Immediate (0-1 month from ICU)

- Identification of need for SLT intervention during in-patient ICU and “step down” ward care
- Telephone triage and structured screening of patients following discharge from hospital to support high and low risk referral to SLT for further assessment. This should encompass psychological, physical and cognitive parameters.
- Multi-disciplinary global tool for COVID-19 patients to include comprehensive screening of any voice, swallowing, cognitive communication, and laryngeal/airway issues identified at initial triage (PICUPS tool recommended).
- Rapid follow-up assessment and intervention where high risk Speech and Language Therapy needs are identified.
- Timely access to SLT specialist dysphagia assessment e.g. Videofluoroscopy and FEES.
- Multidisciplinary clinical data collection.
- Telehealth where appropriate.
- Multi-disciplinary community rehabilitation services to facilitate early and supported discharge.
- Information and educational resources to support patients, family/carers and the MDT (for example, Lancashire Teaching Hospitals NHS Foundation Trust has developed [these resources](#)).

9.2 Short-term (1-3 months from ICU)

- Follow up for those identified as low risk to trigger SLT intervention when problems persist, such as dysphonia persisting beyond 4-6 weeks.
- General Practitioner triage guidance for detection of ongoing or undetected communication, swallowing or airway issues, for signposting to SLT services and resources.
- SLT involvement in multi-disciplinary ICU follow-up clinics.
- Consideration given to dedicated COVID-19 rehabilitation clinics; these may be AHP-led.
- SLT input within multi-disciplinary rehabilitation teams; this may include respiratory or vocational rehabilitation to support return to work for patients with speech, language, and /or cognitive-communication disorders.
- SLT input within specialist secondary and tertiary care joint MDT clinics as needed e.g. voice, tracheostomy, airways.
- Ongoing SLT and multidisciplinary clinical data collection.
- Appropriately funded provision of community services for patients with communication and swallowing needs.
- Training and resources to support the patient, family/carers and community MDTs.

9.3 Medium term (3-6 months from ICU)

- Access to joint ENT/SLT clinics to identify interventions required for persistent voice, tracheostomy and emergent complex laryngeal/airway issues.
- SLT provision of dysphagia therapy and joint SLT and Dietetic interventions as needed to identify persistent dysphagia and nutritional issues and support patients requiring gastrostomy feeding tubes.
- SLT input within neurology multidisciplinary team follow-up for patients with neurogenic communication and swallowing problems.
- SLT input within respiratory MDT clinics for complex breathlessness and laryngeal airway control difficulties.
- SLT input within multi-disciplinary rehabilitation teams for ongoing vocational rehabilitation to support return to work.

9.4 Longer term (6-12 months and beyond)

Focus on survivorship, quality of life, return to usual life occupations:

- Ongoing input within specialist pathways for patients demonstrating rehabilitation potential until goals have been reached.
- SLT input to multi-disciplinary review, ICU follow-up and tertiary clinics such as complex airways as needed.
- Patient and carer self-directed maintenance and long-term strategies and support.
- Onward referral for further evaluation, interventions and support for those with moderate and severe communication, swallowing and airway needs.

10.0 Recommendations for the wider system

There are opportunities to re-design care pathways to maximise patient outcomes and experience. This includes consideration of the following:

1. Services co-produced with patients, carers and service user organisations (in line with the NHS personalised care agenda and nation equivalents) in particular ICU Steps.
2. Establishment of 'one-stop MDT follow-up clinics' to support holistic approaches to care
3. Maximising the skills of the workforce for example developing AHP-led clinics.
4. Utilisation of telephone screening, telehealth, digital prescriptions, accessible digital therapy resources and digital platforms (see RCSLT Telehealth information [here](#) and NHS Your COVID Recovery [here](#)).
5. Outreach models of care that allow continuity between acute and community settings
6. Clinicians taking advocacy roles to support patients in their access to healthcare in line with the Marmot Report 2010. ^[27]
7. Resources required to meet the needs of this new cohort of patients whilst continuing to provide equitable services for non-COVID-19 patients.

The rehabilitation of COVID-19 survivors will be complex; COVID-19 is a multi-system disease and individuals are heterogeneous presenting with an array of symptoms. The impact on individual patients is likely to be highly variable. Not all COVID-19 complications will occur in every patient, nor in the same patient at the same time. The ‘treatable traits’ approach implements personalised medicine and identifies disease characteristics that are clinically relevant and modifiable ^[28]. This approach is increasingly being adopted for managing chronic airways diseases within Australian respiratory centres with positive effect ^[29] and implementation of this model of care may lend itself to the COVID-19 population. A ‘one-size fits all’ rehabilitation pathway is a less than helpful approach. Instead we should aim for one that is timely, high-quality, holistic and responsive to the individual patient needs serving as a legacy suitable for rehabilitation of all patients post intensive care.

ANNEX 1: Triage Framework

Table 1: Non-SLT triage: MDT Follow-up post hospital discharge and General Practitioners in primary care

Non-SLT triage		
MDT Follow-up post hospital discharge and General Practitioners in primary care		
Domain	Patient rated impact	Risk level and advice
Tracheostomy		Considered high risk Refer all patients to SLT or MDT tracheostomy clinic
<p>Voice</p> <p>Have you or your family noticed any changes to your voice such as difficulty being heard, altered quality of the voice, your voice tiring by the end of the day or an inability to alter the pitch of your voice?</p> <p>Yes / No</p>	<p>If Yes:</p> <p>0 1 2 3 4 5</p> <p>0 = no impact 5 = significant impact</p>	<p>High Rating 1-5</p> <ol style="list-style-type: none"> Ask patient to complete Voice Handicap Index-10 (VHI-10) <ul style="list-style-type: none"> Scores above 11 (out of 40), refer to joint ENT/SLT voice clinic Scores below 11, signpost to BBC dysphonia resources, voice care advice leaflet, cardiac/pulmonary COVID-19 rehab digital programme https://www.britishlaryngological.org/news/advice-people-experiencing-voice-problems-after-COVID-19 If persistent dysphonia for more than 4-6 weeks or if patient is concerned, refer directly to joint ENT/SLT voice clinic <p>Low Rating 0</p> <ol style="list-style-type: none"> Repeat question at next appointment if signs of dysphonia

<p>Swallowing</p> <p>Are you having difficulties eating, drinking or swallowing such as coughing, choking or avoiding any food or drinks?</p> <p>Yes / No</p>	<p>If Yes:</p> <p>0 1 2 3 4 5</p> <p>0 = no impact 5 = significant impact</p>	<p>High Rating 1-5</p> <ol style="list-style-type: none"> 1. Refer directly to SLT if patient or carer concerned 2. Ask patient to complete Dysphagia Handicap Index (DHI) <ul style="list-style-type: none"> - Score higher than 6, refer to SLT 3. If patient has additional weight loss, consider completing the MUST score <p>Low Rating 0 or less than 6 on DHI with signs of dysphagia</p> <ol style="list-style-type: none"> 1. Monitor, repeat question and rating at next appointment and refer to SLT if patient, carer or clinical concern <p>Rating 0 and no signs of dysphagia:</p> <ol style="list-style-type: none"> 1. No action
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<p>Cognitive communication</p> <p>Have you or your family noticed any change in the way you communicate with people, such as making sense of things people say to you, putting thoughts or feelings into words, difficulty reading or having a conversation?</p> <p>Yes / No</p>	<p>If Yes:</p> <p>0 1 2 3 4 5</p> <p>0 = no impact 5 = significant impact</p>	<p>High Rating 1-5</p> <ol style="list-style-type: none"> 1. Refer to SLT if significant impact on functional, social and/or vocational activities e.g. returning to work or usual life occupations, significantly altered social interactions impacting on relationships 2. Consider screening for depression and anxiety using validated tool 3. Ask patient and carer to complete La Trobe Communication Questionnaires <p>Low Rating 0</p> <ol style="list-style-type: none"> 1. No action
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<p>Laryngeal/airway complications</p> <p>Have you developed any changes in the sensitivity of your throat such as troublesome cough or noisy breathing?</p> <p>Yes / No</p>	<p>If Yes</p> <p>0 1 2 3 4 5</p> <p>0 = no impact 5 = significant impact</p>	<p>High Rating 1-5</p> <ol style="list-style-type: none"> 1. Ask patient to complete Newcastle Laryngeal Hypersensitivity Questionnaire (LHQ) <ul style="list-style-type: none"> - Scores below 17, refer to specialist MDT airways clinic - Scores above 17, signpost to BBC resources, advice leaflets (RCSLT Giving Voice; British Thoracic Society), cardiac/pulmonary COVID-19 rehab digital programme <p>Low Rating 0</p> <ol style="list-style-type: none"> 1. No action
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Table 2. Dysphonia Management Pathway in COVID-19 patients – Community service example.

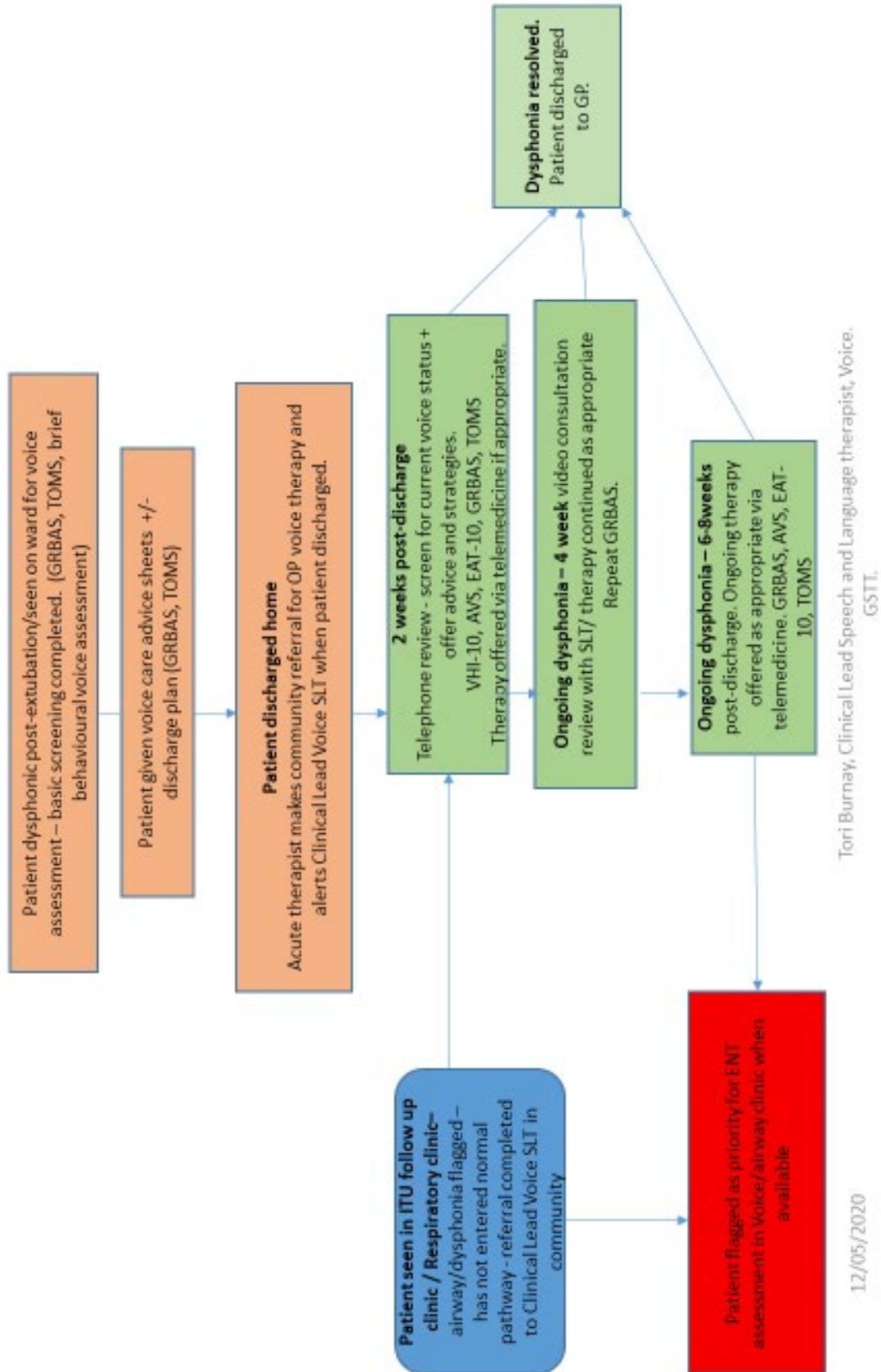


Table 3. Speech and Language Therapist assessment and interventions

Speech and language therapy assessment and intervention			
Timepoint	Outcome tools	Interventions	Risk level
Tracheostomy			
0-1 month	TOMs New Zealand Secretion Rating Scale Penetration-Aspiration Scale	One-way valves Secretion management - pharmacological agents, Botox injection Communication support, voice, dysphagia and communication therapy FEES VFS	High <ul style="list-style-type: none"> Slow wean, airway/laryngeal concerns Severe dysphagia Discharged home with tracheostomy Ongoing input with MDT for tracheostomy weaning - consider joint ENT/SLT endoscopy Low Input for routine weaning and decannulation
1-3 months & beyond			If still tracheostomised, consider as high risk
Dysphonia			
0-1 month	VHI-10 or 30 Reflux Symptom Index (RSI) GRBAS, CAPEv TOMs Acoustic analysis Behavioural evaluation - pitch change, maximum phonation time	Specialist laryngeal evaluation Joint SLT/ENT clinics Endoscopic Evaluation of the Larynx (EEL) Direct (exercise) and indirect (advice, education, strategies) voice therapy techniques Voice amplifier Psychological - Solution focused brief therapy, counselling, cognitive-behavioural therapy Expiratory Muscle Strength Training (EMST) Surgical options assisted by SLT in some centres (e.g. vocal cord medialisation, injection/thyroplasty)	High Dysphonia persisting after 4-6 weeks Follow local voice pathway where they exist Low Advise, review if indicated
1-3 months & beyond			Therapy and monitor progress

Dysphagia			
0-1 month	<p>Dysphagia Handicap Index (DHI)</p> <p>EAT-10</p> <p>Modified SWAL-QOL</p> <p>Functional Oral Intake Scale</p> <p>IDDSI Functional Diet Scale</p> <p>Sydney Swallow Questionnaire (SSQ)</p> <p>IOPI</p> <p>sEMG</p> <p>TOMs</p> <p>New Zealand Secretion Rating Scale</p> <p>Penetration-Aspiration Scale</p> <p>Yale residue score</p>	<p>Dysphagia therapy, compensatory strategies and rehabilitation exercises</p> <p>Tongue-palate resistance exercises (potentially measured with IOPI)</p> <p>EMST if respiratory or bulbar muscle weakness</p> <p>Ampcare Effective Swallowing Protocol (NMES)</p> <p>Pharyngeal Electrical Stimulation</p> <p>sEMG</p> <p>FEES, including biofeedback</p> <p>VFS</p> <p>Surgical options assisted by SLT in some centres such as vocal cord medialisation, injection/thyroplasty, dilatation</p>	<p>High Persistent / severe dysphagia</p> <ul style="list-style-type: none"> • intensive therapy • instrumental assessment for management • therapeutic tastes, need strategies • require alternative feeding • patient and carer support <p>Low Dysphagia resolving</p> <ul style="list-style-type: none"> • therapy exercises • patient and carer advice • review as needed
1-3 months & beyond		<p>Consider long-term alternative feeding if limited progress</p>	

Speech, language and cognitive-communication disorders			
0-1 month	Dysarthria and Aphasia TOMs	Cognitive communication therapy	<p>High</p> <p>Significant impact on functional, social and/or vocational activities e.g. returning to work or usual life occupations</p> <p>Significantly altered social interactions impacting on relationships</p> <ul style="list-style-type: none"> Tailored therapy programmes <p>Low</p> <p>Patient has functional communication</p> <p>Low impact on life occupations</p> <ul style="list-style-type: none"> therapy exercises patient and carer advice
	La Trobe Communication Questionnaire	Specialist speech and language assessments e.g. Comprehensive Aphasia Test, Western Aphasia Battery, Frenchay Dysarthria Profile, Functional Assessment of Verbal Reasoning and Executive Strategies (FAVRES)	
	MCLA family questionnaire		
	Intelligibility rating scales		
	Dysarthria Impact Profile		
1-3 months & beyond			Persisting problems requiring ongoing SLT intervention
Laryngeal/airway complications			
0-1 month	Airway Voice Swallow Scale (AVS)	Continuous Laryngoscopy during Provocation	<p>High</p> <p>Persistent stridor that significantly limits activity → advise patient to attend A&E</p> <p>No respiratory symptom improvement despite escalating pharmacological burden; persistent cough >8 weeks; transient stridulous episodes → refer to tertiary Airways clinic</p>
	Vocal Cord Dysfunction Questionnaire (VCDQ)	Laryngeal airway control therapy	
	Leicester Cough Questionnaire	Upper airway health advice	
	Newcastle Laryngeal Hypersensitivity Questionnaire	Cough control therapy Psychoeducational training	
1-3 months & beyond		Surgical options assisted by SLT in some centres (e.g. laser procedures, balloon dilatation, steroid injection airway reconstruction)	Airway/laryngeal complications such as stenosis → refer to tertiary Airways clinic

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