

COVID-19 speech and language therapy rehabilitation pathway

Part of the Intensive Care Society Rehabilitation Working Party

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1. INTRODUCTION

Data on the functional outcomes of patients surviving an intensive care unit (ICU) admission for COVID-19 is sparse. However, anecdotal experience across a number of London ICUs indicates that a high proportion has significant physical functional impairment (more than 50 % of those discharged from ICU) and the range of impairments is diverse.

There is an imminent need to provide effective, appropriate rehabilitation for the large volumes of patients recovering from the disease over the coming weeks and months to ensure they make the best possible recovery.

There is also an opportunity in this time to design and mobilise improved multidisciplinary rehabilitation pathways that will serve as a lasting legacy for all patients in years to come.

Guidance has already been produced, for example by the [British Rehabilitation Society](#).

This speech and language therapy guidance has been developed as part of the [Intensive Care Society's](#) Rehabilitation Working Party's work on rehabilitation pathways for COVID-19 patients, to inform what high quality rehabilitation service models and pathways could look like for COVID-19.

It is now widely recognised that speech and language therapists (SLTs) have a key role within ICU and in optimising patient recovery following critical care^[1, 2].

As the link between communication, swallowing and airway difficulties and broader outcomes for patients after COVID-19 infection is becoming clearer, this guidance offers initial answers to the following questions:

1. Based on the best information available, what is the likely need for COVID-19 patients post infection and after critical care?
2. What already exists in current systems (e.g. practices and policies) nationally and internationally?
3. Based on the evidence and clinical expert opinion, what would excellent practice look like for the patient, the workforce and the NHS?
4. Given the opportunities in the COVID-19 era, what might the next steps be to develop and implement this practice?

2. THE LIKELY NEED OF COVID-19 PATIENTS AFTER CRITICAL CARE

2.1. Available data

2.1.1. 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 and expert opinion.

To support data collection, the RCSLT has developed a [dataset for 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 of speech and language therapy service delivery. This data will be used to track the progress of patients through the rehabilitation pathway and link into a larger professional dataset under development by the Intensive Care Society (ICS). The RCSLT recommends that the RCSLT dataset should link in 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.

2.1.2. Clinical expert opinion

The emerging clinical presentations of post-ICU COVID-19 patients based on expert opinion to date suggests three main groups of patients:

#	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	Short and long-term needs are unknown, as not all patients will receive a comprehensive assessment of post-ICU impairments at discharge
		<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 upper airway and respiratory problems
2	Patients with persistent, moderate-severe rehabilitation needs resulting from neurological or respiratory deficits or post intensive care syndrome (PICS)	Intensive therapy in the acute post-ICU setting
		Longer-term rehabilitation input in (tertiary) bedded centres or in community speech and language therapy settings
3	Those who do not survive (30-50%)	N/A

There is also likely to be a cohort of patients who were not admitted to intensive care or hospital who will experience ongoing impairments post COVID-19 infection. These may include dysphonia, cognitive and chronic upper airway and respiratory problems.

2.2. Physical weakness, muscle atrophy and myopathy

Patients discharged from critical care are presenting 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 patients with multi-organ failure, ARDS, multi-morbidity, following ECMO and prolonged lengths of stay.

2.2.1. Dysphagia

Previously, swallowing difficulties (dysphagia) have been demonstrated in 91% of patients who have myopathy.^[3] 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.^[4]

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 recovery. Access to instrumental assessments, including Fiberoptic Endoscopic Evaluation of Swallowing (FEES) and Videofluoroscopy (VFS) are currently limited but will be needed to effectively manage ongoing dysphagia following COVID-19.^[5, 6] 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.

2.3. Respiratory consequences

Post critical care, COVID-19 patients are presenting with ongoing respiratory issues and reduced lung function, such as cystic lung changes and breathlessness.

2.3.1. Dysphagia

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 management of chronic dysphagia in COVID-19 survivors.

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.^[7] Whilst respiratory dysphagia is often overlooked,

it is treatable^[8, 9] and may benefit from a joint approach within a respiratory multidisciplinary team (MDT) in order to exclude aspiration events and optimise lung recovery. Selected patients may benefit from Expiratory Muscle Strengthening Training (EMST) to improve swallow function, however this is not available in all centres.

2.3.2. Dysphonia

Compromised respiratory function as a result of COVID-19 and associated conditions such as lung fibrosis may reduce vocal function, resonance and breath support for speech. These patients will likely require specialist speech and language therapy and joint speech and language therapy/ENT assessment and intervention in voice clinics. Unresolved communication issues may increase patient anxiety and negatively impact on capacity to return to work and quality of life.

2.4. 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 also a possibility that a small proportion may require longer-term tracheostomy and follow-up care in the community. 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.

2.4.1. Dysphagia and weaning

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

2.4.2. 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 will 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 difficulties with speech, language or voice.

2.5. 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.^[11] Intubation factors increase the risk of laryngeal injury and can also lead to chronic laryngeal, voice and airway complications.^[12,13] It is too early to know the full extent of these but problems are likely to include:

Voice complications

- vocal fold palsy, arytenoid dislocation, avulsion of the vocal process
- acute and long-term impaired voice quality; aphonia, hoarseness, vocal fatigue, reduced pitch and volume control

Swallowing complications

- laryngeal sensory impairment
- reduced airway protection and consequent aspiration

Airway complications

- laryngotracheal 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. Speech and language therapy 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.

2.6. 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%).^[14]

A variety of neurological signs have been reported including agitation and confusion, impaired consciousness, dysexecutive syndrome, acute cerebrovascular events, encephalopathy, critical illness myopathy/neuropathy and hypoxia.^[15, 16] 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.

2.7. Psychological, cognitive and communication difficulties

Delirium may develop in 60-80% of patients in the critical 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 impair swallowing through increased pharyngeal weakness.^[17] Management of dysphagia in conjunction with delirium is more challenging and increases dependency on support for oral feeding and mouth care, which are known risk factors for developing aspiration pneumonia.^[18] Severe delirium may delay interventions and ICU discharge and also has a negative impact on communication.

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.^[19, 20] Post intensive care syndrome (PICS) is highly prevalent in patients after prolonged mechanical ventilation (56% after 12 months).^[21] Early indications in COVID-19 patients suggest that as delirium resolves, more significant cognitive impairments may become evident and some patients may require in-patient rehabilitation. Impairments in cognition appear to be associated with significantly increased anxiety and worse quality of life.^[22] The scale of this problem is currently unknown.

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. 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 eating and drinking. 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.

2.8. 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 and swallowing and communication. This includes supportive strategies to enable patients to return to work.

SLTs will be key to the development of holistic approaches to rehabilitation and care planning, and to developing and delivering 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 volunteers, to support the delivery of interventions.

SLTs can advocate for patients and through the use of strategies, optimise engagement with rehabilitation, support reintroduction into the community and empower management of their own health.^[23]

3. EXISTING PRACTICES AND POLICIES IN CURRENT NATIONAL AND INTERNATIONAL SYSTEMS

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-speech and language therapy triage and more in-depth MDT functional screening where needed, and include guidance for referral to speech and language therapy, specialist clinics, specialist rehabilitation services and different speech and language therapy interventions. These pathways will continue to be scoped and developed and may differ dependent on local services and initiatives. See **Annex 2** for an example of a dysphonia pathway.

Table 1 in Annex 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, swallowing and/or airway needs, triggering timely and appropriate intervention by an SLT and signposting to resources as needed.

Table 2 shows an example of the speech and language therapy elements of a more comprehensive multidisciplinary functional screening tool to inform rehabilitation needs. This has been developed alongside the ICS and rehabilitation experts.

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.^[24]

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 \(NTSP\)](#), [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.

4. WHAT EXCELLENT PRACTICE WOULD LOOK LIKE FOR THE PATIENT, THE WORKFORCE AND THE NHS

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 the 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 speech and language therapy training in critical care, however there are existing advanced clinical practitioner (ACP) critical care modules that are multi-professional and accessible to SLTs, tracheostomy and critical care competency frameworks within the RCSLT and tracheostomy educational resources available through [NTSP](#).

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

0-1 month

- Identification of need for speech and language therapy 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 speech and language therapy 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

- Rapid follow-up assessment and intervention where high risk speech and language therapy needs are identified
- Timely access to speech and language therapy specialist assessment based on urgency of need e.g. VF 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](#)).

1-3 months

- Follow up for those identified as low risk to trigger speech and language therapy intervention if problems persist, such as dysphonia persisting beyond 6 weeks
- General practitioner triage guidance for detection of ongoing or undetected communication, swallowing or airway issues and for signposting to speech and language therapy services and resources
- Speech and language therapy involvement in multi-disciplinary ICU follow-up clinics
- Consideration should be given to dedicated COVID-19 rehabilitation clinics; these may be AHP-led
- Speech and language therapy 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
- Speech and language therapy input within specialist secondary and tertiary care joint MDT clinics as needed e.g. voice, tracheostomy, airways
- Ongoing 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.

3-6 months

- Access to joint ENT and speech and language therapy clinics to identify interventions required for persistent voice, tracheostomy and emergent complex laryngeal/airway issues
- Speech and language therapy provision of swallowing therapy and joint speech and language therapy and dietetics interventions as needed to identify persistent dysphagia and nutritional issues and to support patients requiring gastrostomy feeding tubes

- Speech and language therapy input within neurology multidisciplinary team follow-up for patients with neurogenic communication and swallowing problems
- Speech and language therapy input within respiratory MDT clinics for complex breathlessness and laryngeal airway control
- Speech and language therapy input within multi-disciplinary rehabilitation teams for ongoing vocational rehabilitation to support return to work.

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
- Speech and language therapy 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 needs.

5. NEXT STEPS TO DEVELOP AND IMPLEMENT PRACTICE

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
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^[25]
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; individuals are heterogenous and present with an array of symptoms and 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.^[26] This approach is increasingly being adopted for managing chronic airways diseases within Australian respiratory centres with positive effect^[27] and implementation 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.

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	N/A	Considered high risk Refer all patients to SLT or MDT tracheostomy clinic
<p>Voice</p> <p><i>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?</i></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 (for example this one), cardiac/pulmonary COVID-19 rehab digital programme. If persistent dysphonia for more than 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

Non-SLT triage

MDT follow-up post hospital discharge and general practitioners in primary care

Domain	Patient rated impact	Risk level and advice
<p>Swallowing</p> <p><i>Are you having difficulties eating, drinking or swallowing such as coughing, choking or avoiding any food or drinks?</i></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) - 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
<p>Cognitive-communication</p> <p><i>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?</i></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

Non-SLT triage

MDT follow-up post hospital discharge and general practitioners in primary care

Domain	Patient rated impact	Risk level and advice
		<p align="center">Communication Questionnaires</p> <p>Low Rating 0</p> <p>1. No action</p>
<p>Laryngeal/airway complications</p> <p><i>Have you developed any changes in the sensitivity of your throat such as troublesome cough or noisy breathing?</i></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> <p>1. Ask patient to complete Newcastle Laryngeal Hypersensitivity Questionnaire (LHQ)</p> <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> <p>1. No action</p>

Table 2. MDT functional screening tool to inform rehabilitation needs – speech and language therapy parameters

Item	0	1	2	3	4	5
Breathing and Nutrition						
Tracheostomy weaning stage	Cuffed tracheostomy. Cuff up all the time	Cuff partially deflated or periods of cuff deflation	Tolerating continuous cuff deflation or cuffless tracheostomy in situ	Cuff deflated/cuffless tube. Tolerating one way valve continuously	Cuff deflated/cuffless tube. Tolerates capping trials	Decannulated
Dyspnoea	Too dyspneic to leave the house or breathless when dressing	Stops for breath after walking 100 yards or after a few inutes	Walks slower than people of the same age because of dyspnoea or has to stop for breath when walking at own pace	Dyspnoea when hurrying or walking up a slight hill	Dyspnoea only with strenuous exercise	No dyspnoea
Swallowing	Nil by mouth ; difficulty managing secretions or aspirates secretions; nil by mouth	Commencing oral intake ; tolerates small amounts of oral intake for therapeutic purposes	Significant dysphagia requiring more than two IDDSI diet/fluid level restrictions, fatigue limiting oral intake	Dysphagia requiring 1-2 IDDSI diet/fluid level restrictions, and/or consistent use of compensatory swallow strategy	Able to eat (near) usual diet with some difficulty or supervision required, e.g. no more than one IDDSI diet level restriction, difficulty with specific foods, longer mealtimes, coughing when drinking liquids quickly	Eating and drinking at pre-morbid level
Communication / Cognition / Behaviour						
Communication	No consistent functional communication	Unable to attract attention , but responds to direct questions about basic care needs using Yes/No or gestures.	Able to attract attention and communicate at the level of expressing basic needs/ information	Communicates within context to familiar people – but substantial listener burden	Some listener burden, but communicates with a broad range of people and out of context	Unrestricted Able to understand and express complex information and to communicate with anyone
Cognition	Unconscious – in coma (Including if still fully sedated)	Awake but still disordered consciousness, or delirium	Emerged into consciousness , but severe cognitive deficit	Moderate cognitive problems. Not fully orientated	Fully orientated but some higher level problems with memory and attention and/or executive function	Normal cognition
Voice	No voice (aphonic)	Severe voice problem ; can only produce a weak whisper, at times aphonic	Significant voice problem ; voice is very rough/ strained/breathy or is effortful all the time, difficulties on the telephone and in conversation	Moderate voice problem ; voice is occasionally rough/strained/breathy or effortful to produce, occasional difficulties being understood in conversation	Mild voice problem ; difficulties being heard in loud environments, sound of voice varies throughout the day	No voice problems

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 and beyond			If still tracheostomised, consider as high risk
Dysphonia			
0-1 month	VHI-10 or 30 Reflux Symptom Index (RSI) GRBAS, CAPEv	Specialist laryngeal evaluation Joint SLT/ENT clinics Endoscopic Evaluation of the Larynx (EEL)	High Dysphonia persisting after 6 weeks Follow local voice pathway where they exist Low Advise, review if indicated

Speech and language therapy assessment and intervention

Timepoint	Outcome tools	Interventions	Risk level
	<p>TOMs</p> <p>Acoustic analysis</p> <p>Behavioural evaluation - pitch change, maximum phonation time</p>	<p>Direct (exercise) and indirect (advice, education, strategies) voice therapy techniques</p> <p>Voice amplifier</p> <p>Psychological - Solution focused brief therapy, counselling, cognitive-behavioural therapy</p> <p>Expiratory Muscle Strength Training (EMST)</p> <p>Surgical options assisted by SLT in some centres (e.g. vocal cord medialisation, injection/thyroplasty)</p>	
1-3 months and 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>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>High</p> <p>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</p> <p>Dysphagia resolving</p>

Speech and language therapy assessment and intervention

Timepoint	Outcome tools	Interventions	Risk level
	Sydney Swallow Questionnaire (SSQ) IOPI sEMG TOMs New Zealand Secretion Rating Scale Penetration-Aspiration Scale Yale residue score	Pharyngeal Electrical Stimulation sEMG FEES, including biofeedback VFS Surgical options assisted by SLT in some centres such as vocal cord medialisation, injection/thyroplasty, dilatation	<ul style="list-style-type: none"> • therapy exercises • patient and carer advice • review as needed
1-3 months and beyond			Consider long-term alternative feeding if limited progress

Speech and language therapy assessment and intervention

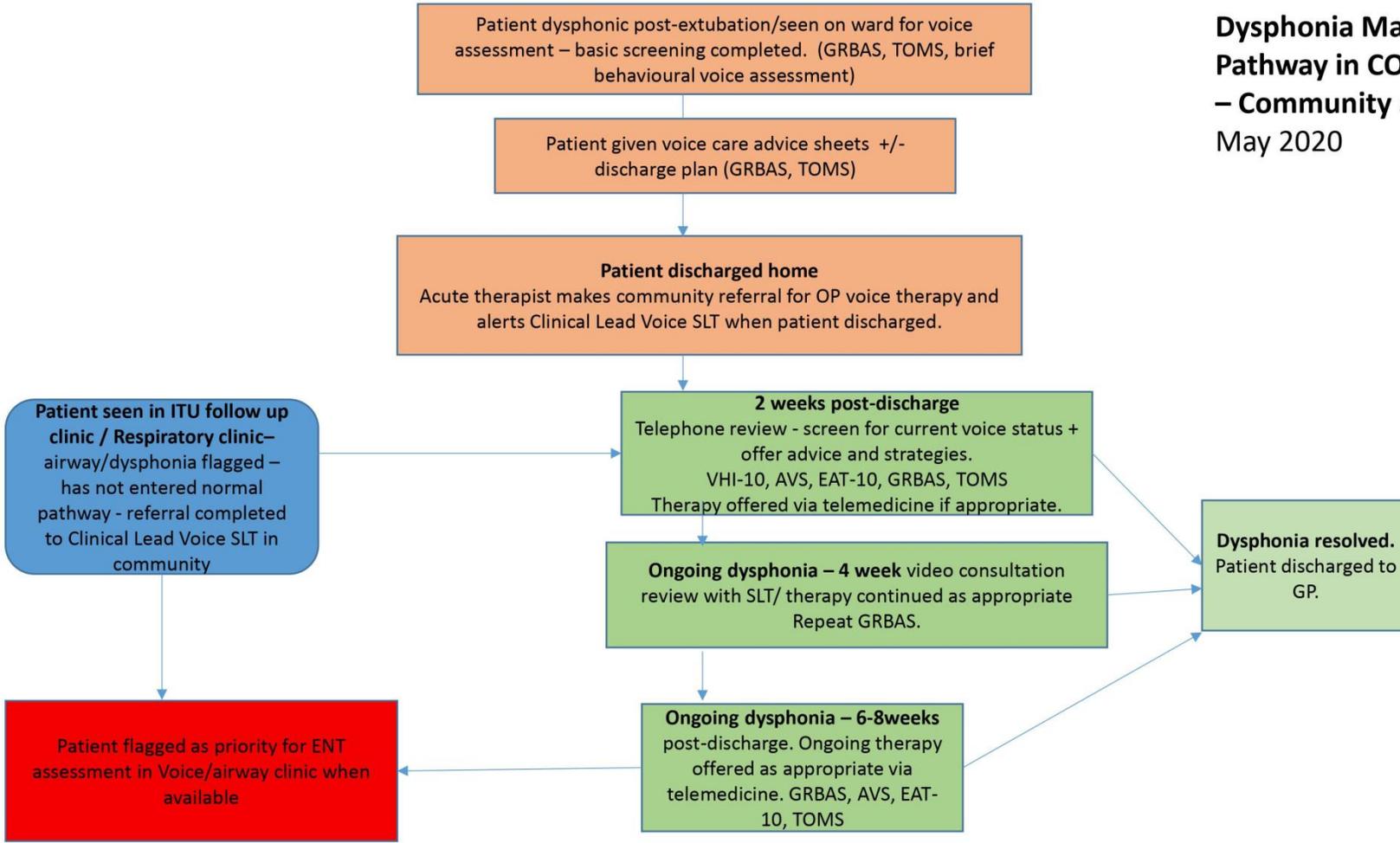
Timepoint	Outcome tools	Interventions	Risk level
Speech, language and cognitive-communication disorders			
0-1 month	Dysarthria and Aphasia TOMs La Trobe Communication Questionnaire MCLA family questionnaire Intelligibility rating scales Dysarthria Impact Profile	Cognitive communication therapy Specialist speech and language assessments e.g. Comprehensive Aphasia Test, Western Aphasia Battery, Frenchay Dysarthria Profile, Functional Assessment of Verbal Reasoning and Executive Strategies (FAVRES)	High 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 <ul style="list-style-type: none"> • Tailored therapy programmes Low Patient has functional communication Low impact on life occupations <ul style="list-style-type: none"> • therapy exercises • patient and carer advice
1-3 months and beyond			Persisting problems requiring ongoing SLT intervention
Laryngeal/airway complications			
0-1 month	Airway Voice Swallow Scale (AVS) Vocal Cord Dysfunction Questionnaire (VCDQ) Leicester Cough	Continuous Laryngoscopy during Provocation Laryngeal airway control therapy Upper airway health advice Cough control therapy	High Persistent stridor that significantly limits activity → advise patient to attend A&E No respiratory symptom improvement despite escalating pharmacological burden; persistent cough >8 weeks; transient stridulous episodes →refer to

Speech and language therapy assessment and intervention

Timepoint	Outcome tools	Interventions	Risk level
	Questionnaire Newcastle Laryngeal Hypersensitivity Questionnaire	Psychoeducational training	tertiary Airways clinic
1-3 months and 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

ANNEX 2: Example of dysphonia pathway

Dysphonia Management Pathway in COVID-19 patients – Community service example May 2020



12/05/2020

Tori Burnay, Clinical Lead Speech and Language therapist, Voice. GSTT.

ANNEX 3: Authors of guidance

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