Clinical Practice Guidelines Speech Pathology Burn Patient Management

NSW Statewide Burn Injury Service

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Background

The Agency for Clinical Innovation (ACI) was established in January 2010 to drive continuous improvement in the way care is provided to patients in the NSW health system.

The ACI is a statutory health corporation that reports to the NSW Minister for Health and the Director-General of the NSW Department of Health - one of four pillars of reform recommended by the Garling inquiry into Acute Care Services in NSW Public Hospitals.

The ACI has a statewide brief to work with doctors, nurses, other health professionals, managers and the community to promote innovation in health service delivery. It does this through a Statewide Clinical Council and its 24 clinical networks, each focusing on a specific area of care, that design and support implementation of new models of care to spread best practice across the NSW health system.

The ACI works closely with the Bureau of Health Information, Clinical Excellence Commission, the Health Education and Training Institute and the Cancer Institute NSW.

The Speech Pathologists at Concord and Royal North Shore Hospitals have collaborated to develop the following *Guidelines* for speech pathology services in the acute burns setting. The speech pathologist's role in the multidisciplinary burn team has evolved over the last several years. Their role in the assessment, treatment and management of communication and swallowing problems arising from burn and inhalation injuries is now well accepted in burn units and burns literature (Edelman et al 2008, Rumbach et al 2009, Rumbach et al 2009a, Carnaby-Mann et al 2007, Clayton et al 2007, Clayton et al 2009, Clayton et al 2010, Brooks et al, Coffey et al unpublished, Shikowitz et al 1996, Ward et al 2001, Williams et al 1992, Snyder et al, 2003). The *Guidelines* are based on standards of care as defined by Speech Pathology Australia.

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1. Introduction

The role of the Speech Pathologist is being increasingly noted in the literature in the following areas:

Assessment and management of swallowing disorders (dysphagia)
This may either be directly caused by the burn injury or secondary to complications such as need for intubation, sepsis, deconditioning, scarring or the presence of a tracheostomy tube (Edelman et al 2008, Rumbach et al 2009, Rumbach et al 2009a, Carnaby-Mann et al 2007, Clayton et al 2010, Clayton et al 2009, Barquist et al 2001, Dikeman & Kazandjian 1995, Logemann 1998, Smith 2002, DuBose et al 2005).

Assessment and management of communication disorders
These may occur in both the acute and sub acute recovery phases, may be associated with intubation or tracheostomy, and may include voice, articulation and pragmatic problems where facial expression and limb gesture are impaired. (Rumbach et al 2009a, Clayton et al 2009, Brooks et al 1986, Casper et al 2002, Chagnon & Mulder 1996, Cobley et al 1999, Lippin et al 1994, Tolep et al 1996).

Assessment and Management of Orofacial Contractures
Orofacial contractures may occur during the acute and/or rehabilitative phases and may impact upon the patient's communicative and swallowing ability, as well as aesthetic appearance and therefore social acceptance (Rumbach et al 2009, Rumbach et al 2009a, Clayton et al 2009, Clayton et al 2007, Bahnof 2000, Dougherty & Warden 2003, Fraulin et al 1996, Heinle et al 1988).

NOTE: the area of orofacial contracture assessment and intervention is conducted in close collaboration with the Occupational Therapist and/or Physiotherapist in accordance with individual site policy.

All speech pathology staff involved in the ongoing care of burn patients participate in relevant professional development and have access to current evidence based literature. They strive for a continuously improved standard of care for the burn patient through research, quality projects, outcome measures and benchmarking activities. They also offer education and support to their colleagues who manage the burn patient when discharged from the acute setting.

Speech pathologists have an ongoing responsibility and commitment to educating staff, carers and patients in the areas of communication, swallowing and orofacial contracture management as they relate to burns. This may be within the same facility or across sites as required.

Ongoing clinical supervision and education is available to ensure that speech pathologists are skilled and competent to treat burn patients.

All speech pathologists working with burn patients in the NSW Statewide Burn Injury Service (SBIS) will have access to the following *Principles and Guidelines* to ensure an awareness of their duty of care.

2. Indicators for referral and discharge planning

2.1 Referral criteria

The Speech Pathologist should screen all burn patients meeting any of the following criteria:

- facial and/or neck burns
- inhalation burns (requiring intubation)
- ingestion of chemicals
- endotracheal tube longer than 48 hours
- presence of a tracheostomy tube
- advanced age / multiple co morbidities (as per site policy)
- concern expressed by patient, family or team about aspects of swallowing, communication or orofacial contracture management in the burn patient.

2.2 Discharge Planning

- prior to discharge, assessment and therapy goals should be documented and intervention summarised
- appropriate discharge follow-up should be arranged where applicable.

3. General Principles

3.1 Speech Pathology Role

3.1.1 The Speech Pathologist has an awareness of all aspects of the effect of thermal, chemical, electrical and inhalation burns on swallowing and communication (Rumbach et al 2009a, Friedstat et al 2009, Edlich et al 1984, Nguyen et al 1996, Orgill et al 2000).

The Speech Pathologist will be responsible for the assessment and treatment of:

- dysphagia, (disordered swallowing)
- dysphonia (disordered voice) and other communication (speech, language, pragmatics, fluency) disorders,
- tracheostomy, endotracheal tubes and ventilator dependency on communication skills and swallowing,
- limited neck, face and oral mobility due to the presence and risk of scarring and contractures on swallowing and communication.

NOTE: The role of the Speech Pathologist within the Burn Unit may differ across sites. Individual site policies and Speech Pathology Australia (SPA) guidelines should always be consulted to ensure professional boundaries are respected and appropriate care is given.

3.2 Education

3.2.1 The Speech Pathologist provides ongoing education to patients, carers and staff regarding communication and swallowing throughout all phases of recovery.

Education consists of a wide range of techniques including:

- written instructions and information pamphlets
- formal and informal education sessions to patient, family/caregivers and staff members as appropriate
- documentation in medical records
- participation in the development of new resources, guidelines and policies
- participation in family conferences

Education may include information regarding:

- the nature and implications of the patient's communication and/or swallowing disorder
- minimising the effects of and compensating for any communicative disorder
- the use of AAC devices and provision of training in communication partnerships (Brooks & Hammond 1986)
- minimising the effects of burns and intubation on the upper aerodigestive tract (eg vocal health including improving awareness of the consequences of endotracheal intubation and tracheostomy) (Clayton et al 2010, Rumbach et al 2009a)
- the cause for and implications of dysphagia (DuBose et al 2005, Ward et al 2001, Carnaby-Mann et al 2007, Edelman et al 2008, Rumbach et al 2009a, Rumbach et al 2009)
- the effect of tracheostomy and intubation on communication and swallowing and strategies to minimise this (Clayton et al 2010, Tolep et al 1996)
- the effect of oral and facial burns and contractures upon communication and swallowing (Clayton et al 2009, Rumbach et al 2009a, Bahnof 2000)

3.3 Liaison

3.3.1 The Speech Pathologist will liaise with patient family/significant others, medical specialists, nursing staff, members of the allied health burn team, dentists and employers as appropriate.

This may relate to:

- Communication deficits including:
  - articulatory impairments
  - language impairments and implications
  - management of and need for augmentative or alternative communication
  - management of oromotor and orofacial movement
  - management of tracheostomy, including decannulation (as per site policy)
  - management of dysphonia
- Swallowing deficits including:
  - management of dysphagia
  - management of oromotor and orofacial movement
  - management of tracheostomy, including decannulation (as per site policy)

4. Swallowing Management

4.1 Dysphagia

4.1.1 The Speech Pathologist maintains a current knowledge base of the physiology, anatomical structures, pathology, assessment and treatment techniques in the head and neck region as it relates to swallowing and dysphagia in patients with burn injuries (Edelman et al 2008, Rumbach et al 2009, Rumbach et al 2009a, Carnaby-Mann et al 2007, Clayton et al 2010, Clayton et al 2009, Barquist et al 2001, Dikeman & Kazandjian 1995, Logemann 1998, Smith 2002, DuBose et al 2005).

NOTE: Particular reference should be made to the impact of inhalation burn injury and need/duration of intubation upon swallow function (Ajemian et al 2001, Gaissert et al 1993).

4.1.2 The Speech Pathologist evaluates swallowing function using bedside clinical evaluation as per site protocol

The Speech Pathologist gathers all available relevant background information including that specific to this population:

- current medical diagnosis including details of burn injuries
- pulmonary status
- history and duration of endotracheal intubation and / or tracheostomy
- other relevant treatments, dressing regimes, planned theatre/procedures.

The Speech Pathologist performs a clinical assessment of swallowing (as per site protocol) with particular reference to the impact of:

- intubation injury
- inhalation injury
- analgesia
- splints/neck collars
- dressings
- orofacial burns

on the patient's swallow function.

The Speech Pathologist documents in the medical record (as per site protocol) and reports findings to relevant members of the multidisciplinary burn team, patient and their carer(s). Documentation will include particular reference to burn specific features including:

- details of oro-muscular assessment including functional limitations swallowing recommendations specific to the burn patient's needs eg. dressing change regimes, management of odynophagia (pain on swallowing), medication administration
- liaison with medical staff, dietitian, nursing staff, patient and family/caregivers and other members of the multidisciplinary burn team

4.1.3 The Speech Pathologist uses appropriate instrumental techniques to evaluate swallowing function such as modified barium swallow (MBS) and fibreoptic endoscopic evaluation of swallowing (FEES) as per site protocol (Barquist et al 2001, Partik et al 2000).

The Speech Pathologist discusses the appropriate tool (MBS or FEES) with relevant team members and the patient to establish an appropriate assessment plan and obtain patient and medical team consent. Consideration must be given to the patient's infectious status and ease of transport to the MBS / FEES clinic.

The Speech Pathologist carries out the MBS / FEES assessment as per site protocol, with specific consideration to burn injury related characteristics (as previously detailed in 4.1.2)

4.1.4 The Speech Pathologist develops treatment goals for swallowing in consultation with the patient, caregivers and staff members throughout admission (as per site protocol).

The Speech Pathologist provides specific treatment goals according to the patient's needs and priorities, which may include:

- specific swallowing strategies, manoeuvres and diet modifications based on clinical or instrumental assessment and which is consistent with other goals of the burn team.
- oropharyngeal and orofacial exercises which may overlap or augment multidisciplinary burn care exercises
- prevention or minimisation of skin contracture and hypertrophic scarring through use of:
  - orofacial exercises (including passive, active and active-assisted range of movement) (Clayton et al 2009, Rumbach et al 2009a, Edgar et al 2004)
  - oral and nasal splints (Dougherty et al 2003, Clark et al 1980, Rumbach et al 2009a, Clayton et al 2007)
  - pressured massage (in liaison with the Occupational Therapist / Physiotherapist as per site policy)
- minimisation of odynophagia and the effect it may have on oropharyngeal swallow function (Clayton et al 2007)
- counselling the patient and family/caregivers on therapy regimes
- preparation of home programs.

5. Tracheostomy

5.1.1 The Speech Pathologist is a member of the multidisciplinary team working with burn patients who have a tracheostomy. They maintain specialist knowledge of the effect of tracheostomy on swallowing, communication and airway management (Dikeman & Kazandjian 1995, Clayton et al 2010)

5.1.2 The Speech Pathologist advocates for tracheostomy where appropriate and consults with the ICU / burns team (as per site protocol).

Advocating for tracheostomy in the burns patient includes consideration of:
- Length of intubation
- Presence of orofacial burns
- Plan for grafting or reconstructive surgery

5.1.3 The Speech Pathologist carries out a full clinical bedside evaluation of swallowing (refer to Section 4 Dysphagia) in consultation with specialist staff.

This should include:
- identification of the type and style of tracheostomy tube
- cuff status, appropriateness of cuff deflation
- suctioning requirements and restrictions
- oxygen saturation levels and respiratory status
- appropriateness of occlusion, capping or valving
- assessment of oropharyngeal secretions and oral food/fluid trials.

5.1.4 The Speech Pathologist carries out an evaluation of speech/voice with the presence of a tracheostomy.

Assessment includes:
- evaluation of cuff deflation
- evaluation of vocal function and quality using appropriate perceptual and objective measures
- evaluation of appropriate use of digital occlusion or speaking valves to facilitate communication (see voice management)
- consultation and joint assessment with ENT service as required.

5.1.5 The Speech Pathologist plays a significant role in the decannulation process of patients with a tracheostomy.

(NOTE: Please also refer to individual site policies for guidelines on Speech Pathology involvement in decannulation)

The Speech Pathologist will:
- monitor tolerance of tracheostomy and cuff deflation regime, capping regime and suitability for oral intake
- participate with the multidisciplinary team regarding plans for decannulation (specific consideration must be given to the patient's surgical management plans)
- negotiate and make appropriate changes to management/treatment programme as indicated.

6. Communication Management

6.1.1 The Speech Pathologist will demonstrate an understanding of communication disorders likely to impact on burn patients (Brooks & Hammond 1986, Clayton et al 2009).

The Speech Pathologist will have knowledge of the consequences of disorders (Alden et al 1993, Macarthur & Moore 1975) which may contribute to or complicate recovery including:

- inhalational injury
- orofacial burns
- intubation injury
- hypoxia
- traumatic brain injury
- developmental language disorders
- language disorders associated with degenerative conditions
- critical care neuropathy

6.1.2 The Speech Pathologist will evaluate the patient's communication needs considering previous status, current needs and limitations, and develop a plan for maximising the patient's ability to communicate within limits imposed by medical / surgical treatment.

The Speech Pathologist will suggest strategies to overcome the limits imposed by a language disorder so interaction can be provided in a form suitable to the patient's language competence.

6.2 Alternative augmentative communication

6.2.1 The Speech Pathologist is familiar with the application of augmentative communication techniques for non-verbal patients especially where this is secondary to the primary burn injury or morbidity associated with the burn injury. (See also Section 5 Tracheostomy)

Assessment for augmentative communication will include consideration of:

- limitations of upper limb function (including presence of dressings)
- speech/voice disorders
- cognitive/linguistic status, current and premorbid
- psychological state
- vision and hearing
- CALD

The Speech Pathologist will design or provide augmentative communication systems for patients unable to communicate orally and will educate the patient, family and staff members in its use.

6.3 Pragmatics

Please refer to section on Orofacial Contracture Management.

6.4 Voice Management

6.4.1 The Speech Pathologist demonstrates a sound knowledge of normal laryngeal, pharyngeal and nasal functioning and their contributions to normal voice.

The Speech Pathologist has an appreciation of the effects of thermal burns, intubation, tracheostomy, periods of aphonia (Lippin et al 1994, Casper et al 2002, Muelberger et al 1998, Sheridan, Gaissert et al 1993, Hunt et al 1975), and the potential for:

- changes to glottic closure
- laryngeal scarring and contractures

- heterotopic ossification
- reduction in vocal fold dynamics
- alteration of respiratory support and other subglottic structures
- alteration of supraglottic structures affecting resonance.

6.4.2 The Speech Pathologist evaluates vocal function as per site protocol.

The Speech Pathologist conducts a clinical evaluation of voice that may include standard site protocols but paying specific attention to:

- record of inhalation burns (including nature of injury ie. thermal/chemical)
- history of intubation (including duration of intubation and size of ETT) and future planned intubations for surgery
- assessment of upper respiratory tract
- results of medical/surgical assessment of the respiratory tract
- evaluation of vocal function and quality
- evaluation of the impact of other limitations to voice use such as emotion, vocal style, abusive vocal behaviours and medical conditions such as laryngo-pharyngeal reflux.

6.4.3 The Speech Pathologist (with ENT service where indicated) assesses and interprets laryngeal, pharyngeal and nasopharyngeal function using instrumental techniques (Casper et al 2002).

The Speech Pathologist participates in and evaluates vocal function through instrumental assessments (including nasendoscopic assessment acoustic sampling analysis and interpretation, aerodynamic sampling analysis and interpretation). Specific assessment may include:

- evaluation of laryngeal and supraglottic structures and their function for voicing
- stroboscopic evaluation of vocal fold mechanics
- evaluation and documentation using a structured proforma.

6.4.4 The Speech Pathologist develops specific treatment goals for minimising the effect of dysphonia, in consultation with the patient, caregiver(s) and staff members.

The Speech Pathologist develops an effective vocal therapy regime to maximise vocal functioning and to support communication according to the patient's needs. This may include general therapy regimes with specific emphasis on:

- specific vocal exercises targeting aspects of voice production including
  - breath support and respiratory control for voice
  - vocal fold and laryngeal structure ranging and strengthening
- institution of vocal styles to minimise harm to the laryngeal structures

The Speech Pathologist may also liaise with the anaesthetics and surgical teams regarding planned intubations for surgery and advocate for smaller endotracheal tube size or laryngeal mask airway (LMA) as appropriate, with the view to prevent further laryngeal trauma.

The Speech Pathologist will be familiar with techniques a tracheostomised patient may implement to achieve voice (see Section 5 Tracheostomy). Intervention should include consideration of:

- evaluation and instruction in use of phonation valves
- alteration of tracheostomy tube type
- advantages and disadvantages of digital occlusion.
- Consideration other HME/valve combinations

6.5 Speech Management

6.5.1 The Speech Pathologist has an awareness of the effect of thermal, chemical and inhalation burns on speech articulation (Fraulin et al 1996, Clayton et al 2009).

The Speech Pathologist has an adequate understanding of pharyngeal, nasal and oral functioning and their contribution to normal speech.

The Speech Pathologist understands the use and effects of pressure garments on movements of the face and mouth.

The Speech Pathologist maintains current knowledge of treatment and assessment techniques of the upper respiratory tract as it relates to speech.

6.5.2 The speech pathologist assesses articulatory function.

The speech pathologist will assess and document alterations in articulatory agility from the patient's premorbid state. This will include:

- assessment of the upper respiratory tract
- assessment of oral, facial and neck function
- record of location and depth of burn injuries
- record of the patient's existing phonology

Consideration should be given to presence of wound dressings and grafts at the time of assessment and when devising/ implementing therapy regimes.

6.5.3 The Speech Pathologist institutes appropriate management of articulatory disorders especially where they relate to the burn injury.

Therapy will aim to minimise the effect of limited neck, face and oral mobility on articulation. Therapy may include:

- oromotor exercises with an emphasis on range of movement (ROM)
- other general articulatory strategies including self monitoring, reducing speech rate, biofeedback through auditory and visual channels.

7. Orofacial Contracture Management

This area of burn management requires close collaboration between the Speech Pathologist, Occupational Therapist and Physiotherapist. Individual site policies should be consulted to determine specific roles and responsibilities for each team member within this domain.

7.1.1 The Speech Pathologist demonstrates an understanding of the effect of severe head and neck burns on oral and facial range of movement, and consequently the impact upon communicative (Fricke et al 1999, Pallua et al 2002) and swallowing function (Clayton et al 2009, Rumbach et al 2009a) as well as aesthetic appearance (Partridge 2010).

7.1.2 The Speech Pathologist assesses head and neck range of movement and functional limitations, in consultation and collaboration with the Occupational Therapist and Physiotherapist as per site protocol (Rumbach et al 2009a, Edgar et al 2004).

The Speech Pathologist evaluates:

- orofacial range of movement (this includes neck range of movement)
- risk for and presence of scar tissue and contractures
- risk for and presence of hypertrophic scar tissue
- presence of oedema
- presence of grafting and specific dressing materials

- communicative ability via facial expression and risk for impairment
- oral phase swallowing ability and risk for impairment

7.1.3 The Speech Pathologist formulates a treatment program designed to prevent or minimise contracture formation and hypertrophic scarring, in consultation with the Occupational Therapist and Physiotherapist as per site protocol (Fraulin et al 1996, Rumbach et al 2009a, Edgar et al 2004).

The Speech Pathologist demonstrates knowledge and uses a variety of treatment modalities to prevent and minimise the effect of contracture and hypertrophic scarring formation (Patino et al 1999). These treatment modalities may include:

- microstomia/mouth splints
- jaw / mouth range of movement devices
- pressured massage
- passive range of motion exercises
- active range of motion exercises
- active-assisted range of motion exercises
- appropriate dressings
- appropriate use of pressure garments and procedures

7.1.4 The Speech Pathologist conducts treatment with consideration to medical and surgical procedures. For example: use of splints and range of motion exercises are not appropriate until 5 days post grafting and consultation with the managing surgeon (Rumbach et al 2009a, Edgar et al 2004).

The Speech Pathologist designs and implements a treatment plan focusing on:

- oral and facial mobility to maintain the use of facial expression for communication of affect, and supra-segmental linguistic elements such as humour, irony etc.
- oral and facial mobility to maintain the use of oral structures required for articulatory movements and therefore speech intelligibility
- mouth range of movement to facilitate oral feeding and mouth care.

7.1.4 The Speech Pathologist advocates for surgical management of contractures, liaising with the managing surgical team as per site protocol.

The Speech Pathologist demonstrates knowledge of the indicators for surgical management of orofacial contractures, contacts the managing surgical team and discusses treatment options as appropriate. This may include mouth angle release, ectropian repair, lip eversion release, pedicled flap construction etc.

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