

AQUATIC THERAPY

Aquatic therapy for
clients with a tracheostomy

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Aquatic therapy for clients with a tracheostomy

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Key points

- 1 There is good evidence for the use of aquatic therapy.
- 2 Clinicians highlight the need for careful risk management when using aquatic therapy for clients with tracheostomies.
- 3 This document describes the process used to synthesise the limited evidence base with expert clinical opinion in order to identify key risk assessment considerations to ensure that clients with tracheostomies, who might benefit from aquatic therapy, are appropriately managed.
- 4 Clear recommendations to help risk assessment decision making are provided in relation to individual client clinical features, staff experience and numbers, and the availability of necessary equipment.

Background

The clinical effectiveness of aquatic therapy is established⁽¹⁾. This is a recognised treatment for people with tracheostomies providing staff have been adequately trained and thorough risk assessments are completed. The risks of taking anyone into a pool are already covered by the Chartered Society of Physiotherapy's 2006 Guidance on Good Practice in Hydrotherapy⁽²⁾. The obvious risk when taking someone with a tracheostomy into a pool is that water will enter the airway, leading to aspiration. This guidance was therefore compiled to assist the clinical reasoning and risk assessment process preceding an individual with a tracheostomy commencing water-based activity.

Aims

To produce a useful clinical risk management tool to assist clinicians in deciding whether a client with a tracheostomy is suitable for aquatic therapy.

Methods

Three methods were used:

- 1 A literature search
- 2 A national expert clinician survey
- 3 Stakeholder consultation

- 1 A literature search was performed to identify relevant published articles and guidance pertinent to the topic.

The search terms used were "tracheostomy" OR "laryngectomy" AND "swim" OR "Aquatic" OR "Hydrotherapy" OR "immersion". The databases searched

on August 2nd 2010 were Medline, Embase, AMED, Cinahl, SportDiscus, Pedro, and the CSP online catalogue. Inclusion criteria for review included: papers written in English; papers addressing the use of aquatic therapy for clients with tracheostomies; papers addressing the use of aquatic therapy for clients with ventilators.

To overcome any possible omissions of literature a second literature search was undertaken in January 2012 to identify any papers published between August 2010 and January 2012.

- 2 An expert clinician survey conducted via the InteractiveCSP internet forum for physiotherapists to establish existing practices.

InteractiveCSP is a member-only online website for members of the Chartered Society of Physiotherapy which has specialty specific networks. A questionnaire was posted on both the Aquatic Therapy and Respiratory networks in 2009 asking for shared experiences of using aquatic therapy for clients with a tracheostomy. Questions included asked about: how often clients with a tracheostomy were taken into the water, what protocols were used, what equipment is taken to the pool, how many staff attend, consent gained and reports of any adverse incidents. There were 4,423 registered users on the Aquatic network and 7,947 registered users on the Respiratory network.

A draft Risk Management Tool was then formulated using the results of the literature search and the clinician survey.

- 3 A list of stakeholders for this project was identified. The draft Risk Management Tool was circulated to the following stakeholders:
 - Aquatic Therapy Association of Chartered Physiotherapists
 - Association of Chartered Physiotherapists in Neurology
 - Association of Chartered Physiotherapists in Respiratory Care
 - Association of Paediatric Chartered Physiotherapists
 - Association of Respiratory Nurse Specialists
 - Consultant in Anaesthesia & Critical Care
 - Consultant in Physiotherapy & Hydrotherapy
 - Highly Specialist Physiotherapist for Head and Neck Cancer Surgery
 - Highly Specialist Physiotherapist in Critical Care
 - Lead Respiratory and Ventilator Nurse
 - Leaders and Managers of Physiotherapy Services (LAMPS) professional network
 - National Association of Laryngectomee Clubs
 - Respiratory Physiotherapists Consultants Group
 - Physiotherapist, Neurological Rehabilitation Service

Findings

■ Literature Review

Eleven papers were identified and reviewed by the authors; see Appendix 3. No randomised controlled trials investigating the effectiveness, or management of risk, for people with tracheostomy in aquatic therapy were found. The articles identified from the review were mainly case studies containing limited evidence, but none the less provided some information that was useful in producing the Risk Management Tool.

Taylor⁽³⁾ looked at the process of taking a client with Guillain-Barre Syndrome to the pool. It detailed the risks of taking a ventilated client into a pool, which included the *“risk of aspiration, insufficient length and security of the ventilator tubing, inadequate ventilation, reduced access to emergency equipment, accidental de-cannulation of the tracheostomy tube, patient anxiety and difficulties in communication, hypothermia, haemodynamic effects ... and safety aspects for consideration when using equipment in a wet environment (including using battery operated equipment”* [Taylor⁽³⁾]

Many of these risks identified are therefore specifically highlighted within the Risk Management Tool, to act as a checklist. For example, the equipment Taylor considered important to have available at the pool included a “hand ventilation unit, spare tracheostomy tubing, yankauer sucker, gloves, tissues, a resuscitation trolley, oxygen saturation and non-invasive blood pressure monitors”. After the initial session where 8 members of staff were present, they found they were able to reduce their staffing down to 3 members of staff in the pool and 2 members of staff poolside. The article by Taylor, despite being a single case study, provided a basis on which to further consider, a) the most appropriate equipment to have available when providing aquatic therapy for a patient with a tracheostomy, and b) highlighted staffing issues that might prevent a patient being considered for aquatic therapy.

Numerous reports were found reporting the experience of people with tracheostomies undertaking water-based activity successfully; giving credence to the practice of aquatic therapy provision for clients with tracheostomies, providing appropriate safety considerations are assessed^(4, 5, 6, 7, 8, 9, 10, 11, 12 and 13). For example, Crevanna et al⁽¹³⁾ concluded that “a hydrotherapy group for laryngectomised patients proved to be safe, feasible, and effective in this pilot study”, although the measures used to determine effectiveness were unclear.

National Clinician Survey

We received a number of very useful comments through our questionnaire posted on interactiveCSP. For example:

- “We have no specific protocols or risk assessments for taking this group of clients into the pool.”
- “We have taken 3 patients in total (into the pool) in this hospital who have had tracheostomies.”

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- “I have taken paediatric tracheostomy clients in a pool”.
- “There is always a trained pool spotter on the side plus tracheostomy trained member of staff. The decision for a second member of staff in the water with the physiotherapist will be dependent on the individual risk assessment.”
- “For a ventilated patient we took a large oxygen cylinder, an oxygen flow generator, bagging circuit, portable suction unit, suction catheters and gloves. Also a spare tracheostomy tube.”
- “We make sure there is a competent tracheostomy trained member of staff on poolside.”
- “I have not encountered any adverse incidents with taking clients with tracheostomies to the pool.”

Stakeholder Review

Comments were received from:

- Association of Chartered Physiotherapists in Neurology
- Association of Paediatric Chartered Physiotherapists
- Chair of Respiratory Physiotherapists Consultants Group
- Committee member, Aquatic Therapy Association of Chartered Physiotherapists
- Consultant in Anaesthesia & Critical Care, University Hospital of South Manchester
- Consultant in Physiotherapy & Hydrotherapy.
- Highly Specialist Physiotherapist for Head and Neck Cancer Surgery, Guy's and St Thomas' NHS Foundation Trust
- Highly Specialist Physiotherapist in Critical Care, Craigavon Area Hospital, Northern Ireland
- Lead Respiratory and Ventilator nurse, Acorn's Children's Hospice
- Leaders and Managers of Physiotherapy Services
- National Improvement Lead, Association of Chartered Physiotherapists in Respiratory Care
- Physiotherapist, Neurological rehabilitation service, Royal National Hospital for Rheumatic Diseases, Bath
- Respiratory Clinical Nurse Specialist, Association of Respiratory Nurse Specialists
- Senior Hydrotherapist, University Hospital Southampton NHS Foundation Trust
- Senior Physiotherapist, Acorn's Children's Hospice, Worcester
- The National Association of Laryngectomee Clubs

Comments were noted and either accepted (and changes made) or rejected (with a reason recorded). See Table 1, overleaf. The Risk Management Tool was amended in response to our assessment of the feedback received.

Table 1 Stakeholder feedback

Response	Response Accepted or Rejected
Staffing:	
Should there be an extra staff member in first pool session	Recommended minimum of 2 staff in water and 1 poolside initially
Had 3 staff members in pool and 5 staff members poolside initially. As patient progressed to being capped off they had 2 staff in pool and 1 staff poolside	Recommended 2 staff in water and 1 poolside initially
Risk assessment of staffing levels rather than prescribing fixed numbers. It will depend on the individuals needs (are those staff ready to enter water in order to carry out trache change?)	Partially accepted. See comment on staffing above
Consider having anaesthetic cover for ventilated patients Recommended having someone who is expert on ventilatory equipment present	Accepted. Recommended having someone expert in ventilators at poolside
How is the assessment of head size and weight carried out? Just consider head support required	Accepted. Minimum of 2 staff in water for first session so head support required can be assessed
Lead physiotherapist should be in the water	Accepted
Equipment:	
For ventilated clients they took oxygen, oxygen flow generator, bagging circuit, portable suction machine, suction catheters, gloves, spare tracheostomy tube	Accepted
Remove tracheostomy dilators from list	Accepted
Have a tracheostomy trained member of staff on pool side with a spare tracheostomy set. Physiotherapist in the water	Accepted
We do not have a defibrillator or blood pressure monitors in the Hospice.	Risk assessment of facilities recommended including dealing with an emergency
Would take cuffed and uncuffed into pool as long as could ensure airway was clear of the water	Accepted. Recommended to assess stage of weaning and type of tube used
Spare ventilator	Accepted
Tracheostomy splash cap	Rejected, as only laryngectomy stoma compatible
Waterproof equipment	Accepted
10ml syringe, Spare inner tube, Waterproof dressings, HME "Swedish nose", Tapes, bag and mask, scissors needed, Spare tubing, Cuff manometer, Smaller size tracheostomy	Accepted
Questions the need to impose equipment for Aquatic sessions, rather than risk-assess each client.	Accepted that all clients must be individually risk assessed
Used "sleek" around tube	Rejected, as no longer recommended for use
For ventilated clients have an exhalation valve next to the client and smooth bore tubing to mitigate effects of increased dead space with increased length of ventilator tubing.	Accepted
Paramedic staff advised on availability of a paediatric face mask to oxygenate clients with a tracheostomy in an emergency situation	Accepted
Other comments:	
Clients must have an established stoma and had at least one [presumably uneventful] tracheostomy change	Accepted
Consideration of location and procedure for tracheostomy change (poolside or in water)	Accepted. Staff should be proficient in tracheostomy change for the client. Tracheostomy change should occur on poolside.

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Response	Response Accepted or Rejected
Waiving of contraindications if child terminally ill as per CSP guidelines	Accepted
Experience shows that some tracheostomies are difficult to change. Staff should have changed the client's tracheostomy before	Accepted
Should include client consent. Parent or advocate could give signed consent	Accepted. Signed consent from patient's GP or consultant recommended in decision tree. Also recommended parental consent
Consider starting your treatment in supine for ventilated patient to see how the client is able to adapt to the increased respiratory effort required in water.	Accepted
It would be unsafe to change a tracheostomy in the water	Accepted
Has a risk management protocol been carried out to suit the local facilities and client group? Including consideration of how the emergency situation would be escalated?	Accepted. Recommended that a risk assessment be carried out on the client and the facilities to be used.

The Risk Management Tool has been endorsed by the SKIPP Endorsement Panel of the Chartered Society of Physiotherapy.

Recommendations

- Risk assessment is important and the risk assessment process needs to be carried out on an individual basis for the specific client.
- Risk assessment needs to be undertaken for the specific client on the staffing required, the staff available, their expertise, and the equipment available.
- Specific individual client considerations are:
 - Their type of tracheostomy tubing,
 - Their stage of weaning,
 - Their ability to cough secretions into the mouth,
 - Whether they can use a speaking valve to aid communication,
 - Whether they have a usable upper airway in case of emergency,
 - Whether their tracheostomy can be capped.
 - For ventilated clients – whether they have the strength to adapt to the increased respiratory effort required in water or in a supine position.
- Specific staffing considerations are:
 - Whether all staff involved are competent to deal with any potential emergency situation that might arise. In particular what to do if the client aspirates (see appendix 4).
 - Whether staff are knowledgeable about the layout and equipment available at the pool and aware of how to call for outside help if required.
 - Whether the appropriate numbers of staff needed for the initial session are available, accepting that this might be able to be scaled down as the sessions continue if the risk assessment identifies this to be safe and appropriate.
 - Whether a therapist has specifically been identified as being responsible for maintaining the client's head support in water to prevent aspiration. It is recommended that a minimum of
- Specific equipment considerations are whether:
 - The equipment at the pool is battery operated and/or waterproof.
 - A spare ventilator is needed at the poolside.
 - The equipment list in appendix 1 is available. This list is not intended to be exhaustive but covers all the main areas needing consideration.
 - Longer length oxygen tubing is required. If so, then it is important to consider the effect of pressure changes in the circuit and the potential for the build – up of carbon dioxide with the increase in dead space. These effects can be mitigated by using smooth bore tubing with laminar air flow so there is no alteration in pressure, and an exhalation valve in the circuit next to the patient to allow carbon dioxide to be exhaled. Advice about these areas can be sought from the ventilators manufacturer and the technical team supplying and working with the ventilator.
 - If the patient is ventilated then it is imperative to have someone who is expert in its use poolside.
- Further research is required – particularly to standardise the recording of adverse events and the outcome measures used for this client group.

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Appendices

■ Appendix 1: Equipment which may be required poolside after risk benefit analysis

- Patient's own usual tracheostomy care equipment e.g. spare non fenestrated inner cannula
- Spare tracheostomy and smaller size for client
- Scissors
- Oxygen saturation monitor (battery operated)
- Oxygen and appropriate humidification device for clients requiring oxygen
- Flow generator/venturi valve
- Bagging circuit compatible with clients tracheostomy tube and face mask
- Suction machine (battery powered)
- Catheters and gloves
- Syringe
- Lubricant jelly
- Ventilator for ventilated patients (battery powered) with spare ventilator and tubing
- Defibrillator (battery powered)
- Blood pressure monitor (battery powered)
- Cuff manometer for clients with cuffed tracheostomy tubes.

- Stethoscope
- Paediatric face mask

■ Appendix 2: Definitions

Aquatic Therapy: "A therapy programme utilising the properties of water, designed by a suitably qualified physiotherapist specifically for an individual to improve function, carried out by appropriately trained personnel, ideally in a purpose built and suitably heated hydrotherapy pool"⁽²⁾.

Larkel Device: A laryngectomy breathing device for "use with a snorkel or use with a mouth piece"⁽¹⁰⁾ to allow swimming.

Laryngectomy: Removal of the Larynx which is "frequently performed as a definitive treatment for laryngeal and hypopharyngeal cancer"⁽⁸⁾.

Tracheostomy: A surgical operation to create an opening (stoma) into the windpipe (trachea)⁽¹⁴⁾.

Appendix 3: Literature

Primary Author	Group Diagnosis	Control Group	Intervention Group Size	Control Group Size	Dropouts	Assessor blind	Location	Outcome measure used
Cancer Research UK	Patients with laryngectomy	No	n/a	n/a	n/a	n/a	UK	No formal outcome measure used
Crevanna	Patients with laryngectomy	No	6	None	None	No	Austria	Posturography, ergometry, 6 min weak test, visual analogue scale, SF-36
Edwards	Patients with laryngectomy	No	n/a	n/a	n/a	n/a	UK	No formal outcome measure used
Gray	Patient with laryngectomy	No	1	None	None	No	UK	No formal outcome measure used
Honeysett	Patients with laryngectomy	No	4	None	None	No	UK	No formal outcome measure used
Karamzadeh	Patients with laryngectomy	No	4	None	None	No	USA	No formal outcome measure used
Landis	Patient with laryngectomy	No	1	None	None	No	Switzerland	No formal outcome measure used
NALC	Patients with laryngectomy	No	n/a	n/a	n/a	n/a	UK	No formal outcome measure used
Nigam	Patients with laryngectomy	No	n/a	n/a	n/a	n/a	UK	No formal outcome measure used
Taylor	Patients with Guillain Barre	No	1	None	None	No	Australia	No formal outcome measure used
Thomas	Patients with laryngectomy	No	n/a	n/a	n/a	n/a	UK	No formal outcome measure used

■ Appendix 4: Aspiration Guidelines

Signs of aspiration:

- Coughing
- Choking
- Gasping for breath
- Change their breathing pattern
- Eyes watering
- Grimacing
- Gurgling

At the poolside the lead physiotherapist should carry out a respiratory assessment including auscultation. If required the client should be treated using suction and / or manual techniques.

The client should then be monitored very closely over the next few days for signs of a chest infection. These include:

- Increased temperature
- Coughing
- Producing sputum
- Increased heart rate
- Increased breathing rate
- Increase in saliva
- Drowsiness
- Change in colour (redness or pale)

If any of these symptoms occur you should contact the client's medical team.



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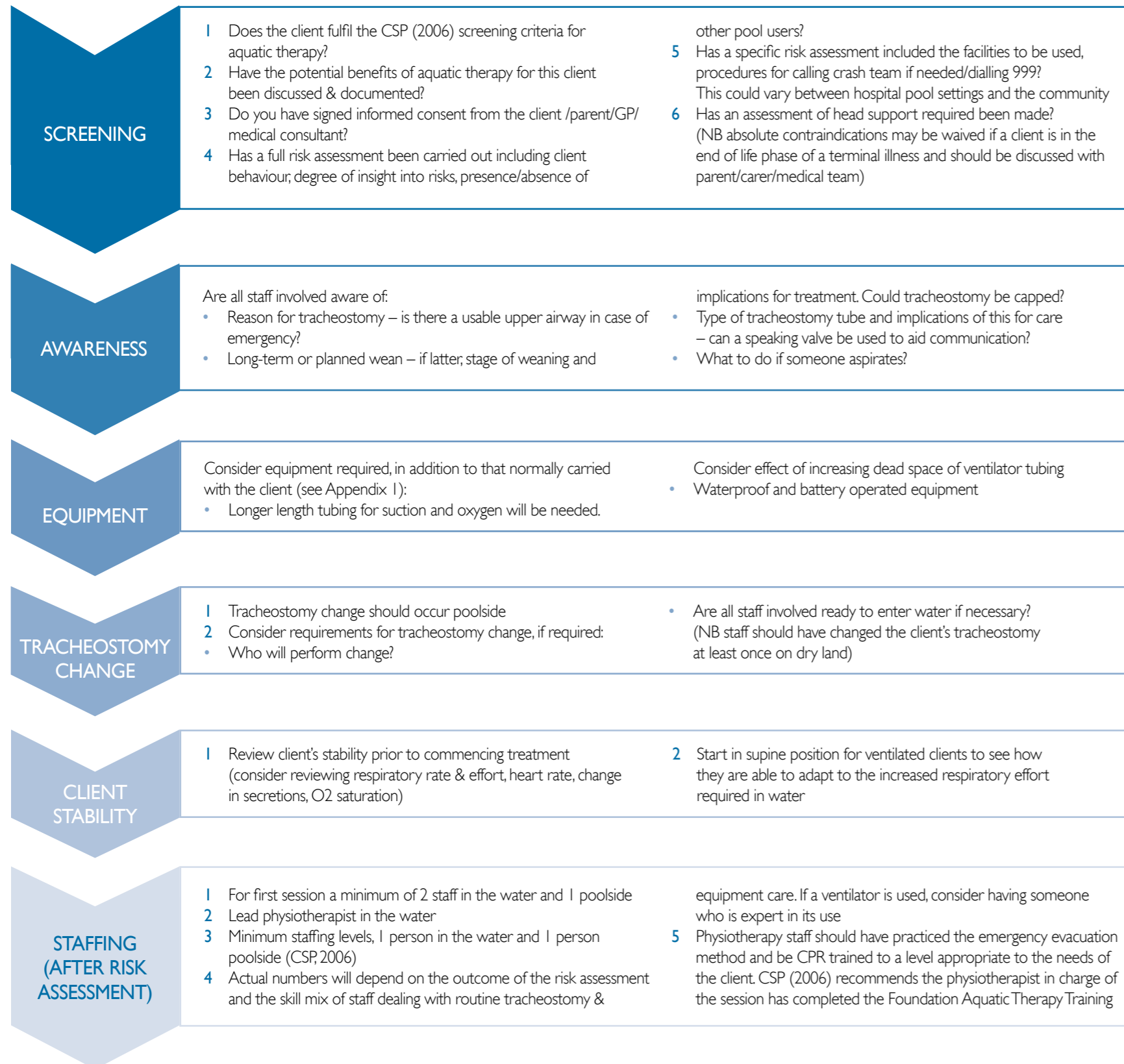


INVESTOR IN PEOPLE



Should a client with a tracheostomy attend aquatic therapy?

A RISK MANAGEMENT TOOL PATHWAY



APPENDIX I

Equipment which may be required poolside after risk benefit analysis

- 1 Client's own usual tracheostomy care equipment e.g. spare non fenestrated inner cannula
- 2 Spare tracheostomy and smaller size for client
- 3 Scissors
- 4 Oxygen saturation monitor (battery operated)
- 5 Oxygen and appropriate humidification device for clients requiring oxygen
- 6 Flow generator / venturi valve
7. Bagging circuit compatible with client's tracheostomy tube and face mask
- 8 Suction machine (battery powered)
- 9 Catheters and gloves
- 10 Syringe
- 11 Lubricant jelly
- 12 Ventilator for clients using ventilator (battery powered) with spare ventilator and tubing
- 13 Defibrillator (battery powered)
- 14 Blood pressure monitor (battery powered)
- 15 Cuff manometer for clients with cuffed tracheostomy tubes.
- 16 Stethoscope
- 17 Paediatric face mask

CPR = cardiopulmonary resuscitation

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