Aquatic Therapy Association of Chartered Physiotherapists

GUIDANCE ON AQUATIC PHYSIOTHERAPY PRACTICE 2021

The authors of this ATACP Guidance on Aquatic Physiotherapy Practice 2021 are all ATACP committee members with years of experience providing expert opinion in the specialised field of aquatic physiotherapy. They have collaborated to produce this comprehensive guidance document to help those working in hydrotherapy pools provide safe aquatic physiotherapy practice.

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INTRODUCTION

Aquatic physiotherapy is defined by the Aquatic Therapy Association of Chartered Physiotherapists (ATACP) as:

"A physiotherapy programme utilising the properties of water, designed by a suitably qualified physiotherapist. The programme should be specific for an individual to maximise function which can be physical, physiological, or psychosocial. Treatments should be carried out by appropriately trained personnel, ideally in a purpose built, and suitably heated hydrotherapy pool." ATACP 2021

The ATACP is a professional network of the Chartered Society of Physiotherapists (CSP) specialising in water-based rehabilitation. The ATACP promotes aquatic physiotherapy through education, clinical skills, research, publications, study days, webinars and member support.

Users of this document are reminded of the CSP's Code of Professional Values 2019 and Quality Assurance Standards 2017. In particular, the requirement that "Members limit their professional activity to those areas in which they are competent and qualified to work safely and undertake continuing professional development [CPD] to maintain and develop their competence".

Physiotherapists who use aquatic physiotherapy as a physiotherapy modality should be able to demonstrate competence, based on knowledge of physical principles relating to aquatic physiotherapy and its safe application.

This guidance is applicable to all hydrotherapy pool settings where aquatic physiotherapy provision is provided. Aquatic physiotherapy may not necessarily take place in a hospital setting; for example, it may be in a school pool, leisure centre, domestic pool, care home, hospice or other setting.

This document is based around best practise, and although references are used extensively it is not a systematic review of evidence regarding aquatic physiotherapy.

OBJECTIVE

This document has been written to provide guidance to physiotherapy managers, physiotherapists, physiotherapy students, physiotherapy assistants and other healthcare professionals working in aquatic physiotherapy settings in order to provide a safe and effective aquatic physiotherapy service for patients.

This objective will be achieved by providing guidance and recommendations on:

- Developing and maintaining competence in aquatic physiotherapy
- Organisation and management of an aquatic physiotherapy service

DEVELOPING AND MAINTAINING AN INDIVIDUAL'S COMPETENCE TO PRACTISE AQUATIC PHYSIOTHERAPY

COMPETENCE

- It is the responsibility of the individual to ensure aquatic physiotherapy is within their scope of practice.
- The overall guidance given in this document will need to be considered in the light of the needs of the local service, patients and of the individual physiotherapist.
- ATACP accreditation is the gold standard to prove competence.
- The recommended level of competence to work unsupervised in aquatic physiotherapy is to complete the ATACP accreditation process, or equivalent, taking into account appendix 1.
- A physiotherapist who has not yet undertaken learning and development in line with this document should be directly supervised by a physiotherapist who has done so.
- Training and development should be evidenced, for example, by recording in a continuing professional development (CPD) portfolio.

Physiotherapists should have undertaken a structured programme of learning that has developed their competence in aquatic physiotherapy. This must include:

SAFETY

An aquatic physiotherapy environment is potentially hazardous and requires a specific risk assessment that must include:

- Contraindications and precautions
- Pre-immersion screening

- Objective assessment in the water
- Manual handling risk assessment
- Use of equipment
- Length of treatment time
- Pool water quality and environment management
- Normal and emergency operating procedures

MANAGEMENT OF THE PATIENT

Appropriate to the patient's presentation.

- Starting positions
- Use of buoyancy aids
- Use of other aquatic physiotherapy equipment
- Use of appropriate outcome measures to evaluate effectiveness (page 6)
- Progression / modifications of exercise

PRINCIPLES OF IMMERSION

- Physiological effects of immersion
- physical principles and properties of water

CONTINUING PROFESSIONAL DEVELOPMENT

- Physiotherapists should identify their learning needs

ATACP ACCREDITED FOUNDATION AQUATIC PHYSIOTHERAPY PROGRAMME

The Foundation Aquatic Physiotherapy Programme is designed as a starting point for post-qualification aquatic physiotherapy education. The full programme equates to 86 hours of learning. The programme is in 2 parts and charged separately.

Part 1

The taught element (two day course) of this programme is delivered by an ATACP accredited tutor. This comprises of 13 hours of theoretical and practical tuition, including 6 hours of skill development in the pool.

Part 2.

The submission of an 1800 word case study and portfolio relating to aquatic physiotherapy, plus written and practical assessment of skills and reasoning. For recognition and accreditation in aquatic physiotherapy, physiotherapists must undertake and pass the foundation assessment.

Completion of the taught element two day course provides the physiotherapist with the fundamental knowledge and tools to work within their scope of practise in a hydrotherapy pool. The ATACP recommends ongoing reflection and further learning following attendance, in accordance with the Healthcare and Professions Council (HCPC) standards of proficiency. The ATACP recommends completion of the full accreditation programme to evidence competency in aquatic physiotherapy.

AIMS OF THE FOUNDATION AQUATIC PHYSIOTHERAPY TAUGHT ELEMENT (TWO DAY COURSE) ARE TO:

- Understand the relevant physical principles of water
- Relate these principles to therapeutic techniques in the water
- Relate these principles to the treatment of patients, and to the changes that specific conditions may cause to a person's shape and relative density
- Demonstrate an understanding of the physical properties of water to strengthening techniques in the pool
- Appreciate and experience the effects of buoyancy, turbulence and the metacentre on a body in water
- Demonstrate an understanding of the effects of immersion on the physiology of the human body
- Relate these changes to the safe screening of patients prior to aquatic physiotherapy
- Evaluate the effectiveness of aquatic physiotherapy in a variety of clinical settings
- Demonstrate the ability to confidently use various floatation devices in regard to patient handling
- Demonstrate the ability to utilise the physical properties of water to improve range of movement for patients with stiff joints or tight soft tissues
- Demonstrate safe therapeutic handling in water

- Demonstrate treatment skills including group work, relaxation, stabilisations, balance and proprioception, and functional activities. Relate these skills to the management of a variety of patient problems
- Demonstrate clinical reasoning skills in devising a treatment programme for patients with a variety of problems and demonstrate an appropriate selection of treatment techniques
- Demonstrate an understanding of the main health and safety legislation, and its implications on running an aquatic physiotherapy service
- Demonstrate an understanding of water disinfection related to the pool environment
- Relate the above to maintaining a safe environment for staff and users, including the ability to risk assess

AIMS OF THE FOUNDATION AQUATIC PHYSIOTHERAPY ACCREDITATION (ASSESSMENT) ARE:

To assess the competency of a physiotherapist in the knowledge, clinical reasoning and therapeutic skills necessary to work safely and unsupervised in a pool. Successful completion of the programme:

- Ensures competence to practise aquatic physiotherapy
- Allows registration on the ATACP database of accredited aquatic physiotherapists
- Allows for the use of the title 'ATACP Accredited Aquatic Physiotherapist'

TREATMENT AND OUTCOME MEASURES

Physiotherapists using aquatic physiotherapy should adhere to:

- CSP's Quality Assurance Standards (2017)
- CSP's Professional Values and Behaviour (2019)

With reference to Standards 4, 6, 8 and 9 of the Quality Assurance Standards (2017) the following provides aquatic physiotherapy specific standards.

MANAGEMENT (STANDARD 8)

Appropriate information relating to the service user and their presenting problem is collected. Analysis of the information is used to determine if aquatic physiotherapy is appropriate for the service user.

The following may be valuable sources of information:

- Medical notes
- Referral letters
- Multidisciplinary team notes
- Contraindications and precautions
- Risk assessment and screening for the service user
- Health and safety risk assessment of the environment

In many cases, a service user's aquatic physiotherapy will be integrated with land-based physiotherapy management. It is the responsibility of the physiotherapists involved in the service user's care to consider all appropriate modalities.

OBJECTIVE ASSESSMENT (STANDARD 8)

The objective assessment of the service user must include a pool-based assessment. Analysis of the clinical findings enables the formation of a treatment plan.

TREATMENT (STANDARD 8)

- To deliver effective care appropriate treatment options are identified based on the best available evidence.
- When planning treatment, the physiotherapist should consider not only the 'hands-on' treatment, but also the overall management of the service user. This includes consideration of the following:
    - Water confidence and breath control
    - Entry and exit
    - Length of treatment time
    - Starting positions
    - Depth of water
    - Use and position of therapy equipment
    - Dosage e.g. sets, reps, cadence and time
    - Progression of exercise e.g. float size, depth, speed and surface area

EXERCISE TECHNIQUES INCLUDE:

FOUNDATION SKILLS

Strengthening techniques

- buoyancy assisted
- buoyancy counter balanced
- buoyancy resisted concentric
- buoyancy resisted eccentric
- applied turbulence resisted
- drag resisted
- utilising the metacentric effect
- rhythmic stabilisations (therapist resisted and drag resisted)
- stabilising against drag
- reversals

Mobilising and stretching techniques

- buoyancy assisted (slow prolonged and contract / relax)
- buoyancy counterbalanced
- applied turbulence assisted
- drag assisted

Functional activities and techniques

Relaxation

Group activities and management

SPECIALISED SKILLS

If any of the following skills are within your scope of practice, they can be incorporated into treatment plans (Code of Professional Values and Behaviour 1).

Intermediate course skills

- Neurology
- Musculoskeletal
- Paediatrics
- Learning Difficulties
- Complex needs
- Bad Ragaz Ring Method / Aquatic Proprioceptive Neuromuscular Facilitation (PNF)
- Ai Chi
- Halliwick®
- AquaEpps®
- Athletic training including deep water running and plyometrics
- Aqua stretch
- Watsu®
- Water Specific Therapy
- Burdenko

This is not an exhaustive list.

EVALUATION OF CLINICAL CARE AND SERVICES (STANDARD 9)

An appropriate measure is used to evaluate the effect of physiotherapeutic intervention(s)

- The measure chosen is published, standardised, valid, reliable and responsive
- The measure used is the most relevant to the service user's problems to evaluate the change in the service user's health status
- The measure is acceptable to the service user
- The metric is used in an appropriate way for that specific measure (possibly at the start and end of treatment and at appropriate intervals including follow up)

There is an increasing need to evaluate and justify aquatic physiotherapy services to ensure effectiveness and financial viability. The use of outcome measures to produce standardised data, allows services to be

scrutinised and assessed by our users and outside agencies. There are disease / disorder specific outcome measures that can be used as aquatic physiotherapy is provided to multiple specialties and co-morbidities.

- MYMOP (Measure Yourself Medical Outcome Profile) is applicable to any condition, and is available from https://www.meaningfulmeasures.co.uk/mymop
- The CSP outcome measures database link is https://www.csp.org.uk/professional-clinical/research-evaluation/outcome-experience-measures

AUDIT OF SERVICES

Audit is a key part of governance and every service should conduct audits regularly.

- The Quality Assurance Audit tool from the CSP can be used by aquatic physiotherapy services https://www.csp.org.uk/publications/quality-assurance-standards-physiotherapy-service-delivery
- An example of a standardised data collection tool for aquatic physiotherapy is the HyDat (2009) https://www.researchgate.net/publication/278348895_UK_AQUATIC_PHYSIOTHERAPY_STANDARDISED_DATA_COLLECTION_PROJECT.
- In addition, the Burrswood Standardised data collection tool for Multiple Sclerosis https://research.brighton.ac.uk/files/314625/Burrswood's%20SDCT%20for%20people%20with%20MS%20140214%20Ebook.pdf

RECORD KEEPING

Record keeping poses challenges in the aquatic physiotherapy environment. Consideration needs to be given to:

- HCPC Standard of conduct, performance and ethics no: 10 10.3 “You must keep records secure by protecting them from loss, damage or inappropriate access.”
- CSP Quality Assurance Standard 6
- Record Keeping Guidance CSP Information paper PD061 January 2021 https://www.csp.org.uk/system/files/publication_files/RecordKeepingFINAL_Sara Conroy.pdf
- Registration with the Information Commissioners Office (ICO) is a legal requirement if you or your organisation keep patient records. This is essential even if you are an independent provider. https://ico.org.uk/

All record keeping is governed by the Data Protection Act.

CODE OF MEMBERS’ PROFESSIONAL VALUES AND BEHAVIOUR

The CSP acknowledges that aquatic physiotherapy is in the scope of practice of a Chartered Physiotherapist who can demonstrate competency. The ATACP recommend the completion of the ATACP Foundation Accreditation Programme as a robust way of ensuring competence.

Physiotherapists need to understand the theory which underpins each skill to apply them appropriately to treatment. Appendix 1 outlines a service provision and audit framework for theoretical knowledge and practical skills. The individual should use the tool to identify their specific learning needs.

Following aquatic physiotherapy intervention, the physiotherapist should discuss the treatment and outcomes with the referring professional as appropriate. This may be a verbal or written report. A service user may be prescribed exercises to continue independently. There are a number of community-based aquatic activities available and having an awareness of options provided locally is highly recommended. Making professional connections with other services may help the physiotherapist in directing patients to appropriate on going services or activities. This is part of a physiotherapist’s duty of care (CSP Quality Assurance Standard 4).

Examples of water-based activities may include:

- Adult or child Learn to Swim sessions
- General swim sessions
- Disability swim clubs including local Halliwick® clubs
- CP sport galas and swimming.
- Good Boost® Aqua sessions (group sessions with a personalised exercise programme provided via a tablet device on pool side)
- Aquatic Activity for Health sessions- specifically for long-term conditions in the local leisure centre pool
- Ai Chi
- Aqua aerobics
- Aqua stretch sessions
- Aqua natal sessions

- Watsu®
- Some more adventurous service users may want to take part in open water training sessions/ triathlon training

This guidance does not have jurisdiction or opinion on any of the other aquatic activities beyond aquatic physiotherapy in a hydrotherapy pool.

Evidence of CPD and prior learning is required for the CSP's Code of Members Professional Values and Behaviour (2019) Principle 4. Reflection and documentation of the learning experience should be kept in a CPD portfolio. The ATACP has a recommended list of resources:

- ATACP website https://atacp.csp.org.uk/
- iCSP Aquatic Network if you are a CSP member
- CSP www.CSP.org.uk
- Pool Water Treatment Advisory Group (PWTAG) website www.PWTAG.org
- International Organisation of Aquatic Physical therapists (IOAPT) www.world.physio/subgroups/aquatic
- Halliwick Association of Swimming Therapy www.halliwick.org.uk
- International Aquatic Therapy Faculty (IATF) www.halliwicktherapy.org
- International Halliwick Association (IHA) www.halliwick.org
- Swim England www.swimming.org

CONTRAINDICATIONS AND PRECAUTIONS

All pool users must be individually screened for contraindications and precautions prior to treatment, including the environmental considerations for individuals such as pool air and water temperatures or humidity levels.

CONTRAINDICATIONS

If the following are present aquatic physiotherapy is NOT to be considered:

- Diarrhoea and/or vomiting. A minimum of 48 hours clearance after last episode [1,2]
- Medical instability following an acute episode without medical clearance e.g. MI [3], CVA, DVT, PE, status asthmaticus
- Uncontrolled Cardiac Failure [4]
  (Symptoms: progressive worsening of exercise tolerance or shortness of breath at rest over previous 3-5 days, nocturnal paroxysmal dyspnoea [5])
- Unstable Angina [6]
  (Symptoms: prolonged angina at rest > 20 min, new onset, increased frequency, lower onset threshold, symptoms not responding to GTN [7])
- Uncontrolled medical conditions without a medical management plan in place e.g., uncontrolled epilepsy, diabetes mellitus or unstable blood pressure (BP)
- Acute systemic illness with associated pyrexia (> 38°C[8]) e.g. tuberculosis, influenza or viral infection. A minimum of 24 hours of non-raised temperature is required.
- Weight in excess of the emergency evacuation manual handling risk assessment

PRECAUTIONS AND CONSIDERATIONS

Many conditions previously considered to be contraindicated can be treated safely in a well-managed pool when the physiotherapist has robust knowledge of the pathology and the physiological effects of water immersion and temperature. It is the physiotherapist's responsibility to check the pool water quality is maintained within the PWTAG recommended parameters.

Where precautions exist, a risk-benefit analysis should be conducted. The following table will aid this process by highlighting considerations for safe aquatic physiotherapy. This is a guide and not a substitute for sound clinical reasoning based on an individual patient assessment. It should be used in conjunction with local infection control policies.

Precaution	Considerations for Aquatic Physiotherapy
Cardiac Conditions	• Enhanced screening questions such as recent onset or changes in symptoms, investigations, medication or weight. • Enhanced objective assessment may include BP measurements, SpO2 and resting heart rate. Differential measurements prior and during immersion could be taken for comparison. • Consider immersion depth in line with central blood volume shift & body positioning. The vertical position causes a higher cardiovascular load than horizontal. • Ensure relevant medication is poolside e.g. GTN spray. • Heart rate (HR) is not an accurate measure of exercise intensity whilst immersed. **Atrial Fibrillation:** • Ensure resting HR is tested manually < 100 bpm. **Hypotension:** • Ensure supervision on pool exit in case of hypotensive episode. **Hypertension** • Immersion in thermoneutral water is generally considered safe for those with hypertension. **Valve Insufficiency** e.g., mitral valve regurgitation • Enhanced observations with controlled rate and depth of immersion are advised. • Be aware that subjective impressions may not be reliable in determining if the left ventricle is tolerating the increased cardiac load caused by immersion. The service user may report feeling well despite haemodynamic deterioration [(9)].
Respiratory Conditions	• Relevant medications and equipment should be available pool side e.g., bronchodilators, spacers, nebulisers, ventilators, suction. • Nasal prongs and oxygen therapy could be made available poolside. • For patients with a productive cough, tissues and a waste container should be available poolside. • Consider immersion depth. Even at rest there is an increased work of breathing with increasing depth. • Consider water temperature. Cold water can cause a large reduction in vital capacity [(10)]. • Air temperature and humidity may affect respiratory conditions. **Asthma [(11)]** • Ensure safe chemical use for water treatment and cleaning to prevent potential airway irritation. • Encourage use of reliever inhaler as prescribed. **Oxygen-Dependent Pool Users** • Ensure oxygen cylinders are appropriately secured. • Oxygen tubing needs to be of sufficient length for the patient to be able to move about the pool. • Oxygen tubing should be checked for cracking as well as the regulator before use. • Oxygen tubing can be difficult to see in water, ensure sufficient space and supervision around the user. • Pulse oximeters can be used to measure oxygen saturation. Dry the finger prior to placing it in the probe. **Cystic Fibrosis (CF)** • It is recommended that no two users with cystic fibrosis attend the same session due to the risk of transmission of resistant strains of bacteria [(12)]. • In severe CF there may be an increased risk of pneumothorax when diving underwater [(13)].

	Tracheostomy [14] Please refer to CSP Evidence Note 02 entitled "Aquatic therapy for clients with a tracheostomy https://atacp.csp.org.uk/system/files/documents/2019-01/atacp_supporting_document_20121.pdf
Compromised Immune System	Consider treating patients at the beginning of a session and on a one-to-one basis to avoid cross contamination by contact with others. **Oncology / Chemotherapy** • If required, provide information to the MDT regarding infection control measures in hydrotherapy pools for reassurance. • Cytotoxic metabolites may be present in the patient's bodily fluids, but the risk of contamination is minimal. • Be aware of potential chemotherapy induced peripheral neuropathy and the associated risks. **Blood Borne Infections (Hepatitis B/C, AIDS, HIV)** Blood borne pathogens are inactivated in the pool water, provided disinfectant levels and pH values are within recommended ranges.
Neurological Conditions	**Spinal Cord Injury** • Any patient who is deemed at risk of Autonomic Dysreflexia (AD), (T6 level and above) should have a self-management plan [15]. • Prior to aquatic physiotherapy, it should be ensured that all the necessary resources and personnel are available to carry out the management plan should an episode of AD occur. • Due to reduced thermoregulation, care should be taken to ensure that the patient does not become too warm or too cold [16]. **Epilepsy** • Enhanced screening of - Type of seizure - Frequency and date of seizure - Associated symptoms - Warning signs - Triggers e.g.,water reflection, noise, lighting, anxiety - Route of administration and timing of medications - Post seizure management • The patient should be hydrated and blood sugar levels under control. • Ensure the patient has an individual seizure management plan with procedures in place to maintain the airway, administer medication, when to evacuate and / or call for medical assistance. • Evacuation from the pool is not always the priority or necessary. Oral medication can be administered in the pool. **Multiple Sclerosis (MS)** • Heat sensitivity, or Uhthoff's phenomenon, occurs in 60–80% of MS patients where increases in core body temperature (as little as ~ 0.5°C) can trigger temporary worsening of symptoms [17]. • Ensure pool water temperature does not exceed thermoneutral and humidity levels are maintained within recommended parameters. **Aspiration Risk / Impaired Swallow** • It may be necessary to liaise with the speech and language therapist (SALT) regarding any concerns with swallow, cough, and gag in case of accidental aspiration of pool water. • Complete a risk assessment. • Devise a management plan for treatment and procedure in case of aspiration.

	Communication Difficulties Ensure the patient has a method of communicating in the pool if they have no access to the method used out of the water.
Renal Conditions	**Renal Disease / Kidney Failure / Renal Dialysis Patients** • Liaise with renal MDT if any concerns regarding medication, adverse reaction to immersion and dialysis schedule. • Day-to-day variations in endurance are normal for dialysis clients and the schedule of treatment activity may need to be adjusted according to the dialysis schedule. **Continuous Ambulatory Peritoneal Dialysis (CAPD)** • Preferably drain fluid prior to immersion. • The catheter site should be sealed with an appropriate waterproof dressing and cleaned post treatment [18].
Metabolic Conditions	**Thyroid Deficiency** • May be associated with deficient thermoregulation [19]. Consider the pool environment temperatures of the water, pool hall and changing rooms. **Diabetes Mellitus (Diabetes Type I & II, gestational diabetes)** • Ensure a diabetic management plan is in place and avoid aquatic physiotherapy if they had a severe hypoglycaemic event (> 4 mmol/l blood sugar level) in the last 24 hours [20]. • Anybody at increased risk of a hypo- or hyperglycaemic event should have a thorough risk-benefit analysis and have a personal action plan / hypo kit at poolside. • Waterproof insulin pumps can be used for aquatic physiotherapy (check manufacturer's guidelines) [21]. • Encourage service users to check their feet prior to pool entry for redness, cracks, swelling, bruising or blisters and report. • Advise service users to dry their feet thoroughly after immersion. • Service users may avoid being bare foot. It may be beneficial to wear aqua shoes in the pool and on the pool concourse [22].
Genito-Urinary	**Urinary Incontinence** Encourage bladder voidance prior to pool immersion. **Catheters** • Catheters should remain in situ and free draining into the catheter bag. • Bags should be emptied prior to treatment and secured firmly to the leg via a strap, tubular grip, or short leggings. **Urinary Tract Infection (UTI)** • There is no risk of cross contamination or aggravation of symptoms in well maintained pool water. • Ensure users re-hydrate post treatment. **Menstruation** • Water pressure can temporarily slow flow but does not stop it, therefore the use of internal protection (tampons / menstrual cup) is recommended. • Swim wear designed to be worn during menstruation is available. **Pregnancy** • Individual risk assessment with consideration to history of miscarriages, low-lying placenta, foetal growth retardation, incompetent cervix, multiple or IVF pregnancy, any bleeding or discharge, scan results, pre-eclampsia, and gestational diabetes. • If any concerns, liaise with the medical MDT. • Pool water temperature not to exceed 35°C, if so aquatic physiotherapy is not recommended [23]. • For pregnant staff, the immersion time, fatigue and ability to perform the medical emergency evacuation procedure should also be risk assessed.

Circulatory Disorders	**Deep Vein Thrombosis / Pulmonary Embolism [24].** • Liaise closely with the medical MDT to check if anticoagulant treatment has been initiated and follow medical advice. • Anti-coagulants such as Apixaban, Dabigatran or Rivaroxaban do not need regular INR monitoring. **Neutropenia** In a well-maintained hydrotherapy pool, there should be no increased risk to the user **Haemophilia** Clotting factors VIII and IX must be between 20-40% [25].
Gastro-Intestinal	**Faecal Incontinence** • A bowel management program should be established before aquatic physiotherapy starts. This should include timing and administration • of medication, timing of bowel voidance and the patient's bowel control ability. • Incontinence swim wear should be worn when a bowel management program is not yet established or is disrupted. **Stoma / Colostomy** • The adhesive on stoma bags is effective in water. Flange extenders can give more security. • Gelling agents solidify liquid contents and reduce or eliminate excess gas, helping to prevent leakage and enabling the user to achieve a more discreet pouch. • Care is required with manual handling and float application to protect the stoma site. • For further information see: Top tips for swimming with a stoma
Wounds	• Well managed hydrotherapy pools pose no increased risk of wound infection at any stage of healing [26]. • Check for signs of oozing / fresh bleeding. Aquatic physiotherapy will need to be postponed if a wound is actively bleeding or presents with excess exudate • For surgical wounds, it is recommended to leave the original post-operative dressing in situ and cover with an appropriate waterproof dressing ensuring a large overlap margin. If the original dressing is waterproof, check the seal all around the edges or apply a bio-occlusive dressing over the top. Ideally waterproof dressings should be applied in a non-humid environment, an hour before immersion to ensure optimal adhesion. • Ensure the dressing is applied with the affected joint at the maximum available range of movement to prevent the dressing being compromised or restricting movement i.e., end of available knee flexion for a total knee replacement. • Watertight sleeves / covers can be used as extra protection or when covering casts. Immerse gradually releasing the air from the top of sleeve (use your finger to release as it is lowered but ensure a full seal is achieved before fully immersing) to allow the hydrostatic pressure to form a vacuum. • Wound dressings should be inspected post immersion and replaced if wet. **External Fixators** • Review pin sites for excessive oozing and or potential infection. • Waterproofing sprays may be used. • Patients will need to follow their pin care protocols post immersion.
Skin Conditions	When skin integrity is impaired, a risk-benefit analysis should be made to ensure further deterioration does not occur. **Eczema and Psoriasis** • Barrier creams or non-perfumed ointments can be used prior to immersion to help protect the skin. • Post immersion showers and the use of emollient gels / moisturising cream applied to damp skin can help protect the area **Chlorine Sensitivity**

	Characterised by a red itchy rash which is usually due to exposure to excessive combined chlorine (by-products of chlorine known as chloramines). Usually this would occur within 24 hours, in contrast to bacterial rashes which can take longer to occur. **Verrucae / Athlete's Foot** • Exclusion is not needed. • Pool users can wear aqua shoes specifically for use on the poolside. **Radiotherapy** [27] • Liaise closely with the radiology team. • Skin can be irritated by heat, pool water chemicals, therapist handling and equipment. • Consider swimwear fit and comfort with contact on affected skin. • Radiotherapy induced skin effects can be latent by up to 2-4 weeks after treatment has ceased, with a potential for skin reactions to worsen and peak around 10-14 days after the last radiotherapy session. • Avoid immersion of the affected area if skin is broken, blistered or peeling. • Avoid using adherent dressings on the area. • If using barrier creams to protect the affected skin, ensure they are sodium lauryl sulphate (SLS) free (avoid aqueous cream) [28]. **Invasive Tubes / Lines** All invasive lines such as Central, Periphery Inserted Central Catheter (PICC), Percutaneous Endoscopic Gastrostomy (PEG), and Radiologically Inserted Gastrostomy (RIG) lines should be covered with a waterproof dressing to prevent them from becoming dislodged in the water.
Impaired Vision / Hearing	**Grommets** [29] Follow medical team's recommendations, often swimming is permitted but no diving under the water. **Perforated Ear Drum** • Follow medical recommendations. • Waterproof ear plugs can be used. • Keep ear canal dry [30]. **Ear Infection (Otitis Externa, Glue Ear)** • Commonly caused by Pseudomonas Aureus or Staphylococcus Aureus. There is a low transmission risk when water chemistry levels are within recommended parameters. • Try to keep ears dry. • Encourage thorough drying of the ears after immersion (e.g.hair dryer on cool). **Conjunctivitis** • This is not a contraindication. • Can be spread by contact with discharge from the eye. Sharing equipment and towels is not recommended.
Behavioural Problems	• Risk assess and manage challenging behaviour. It is important to understand an individual's triggers that will exacerbate unwanted behaviours. Individuals may have a behavioural management plan available. • It may be necessary to increase the minimum level of staffing when treating this patient group. • For the aquatic physiotherapist, it may be necessary to consider choice of swimwear and handling techniques.
Transdermal Patches	• Immersion at thermoneutral temperatures does not pose any increased risk of drug overdose, if the pool water exceeds 35.5°C it is contraindicated. • For further CSP guidance see https://www.csp.org.uk/system/files/transdermalpatches_may2017.pdf [31].

Widespread MRSA	• Pool water which is properly maintained does not spread MRSA [32] • Standard infection control precautions [33] - Cover all cuts, abrasions and lesions with a waterproof dressing - Maintain hand hygiene at all times - Patients with MRSA should be seen last in the session if possible - All dry contact surfaces, including hoist, handrails, seats / benches, should be cleaned as per protocols using personal protective equipment (PPE).
Babies / Toddlers	• Babies / toddlers who are not toilet trained should wear a swim nappy covered by a second watertight nappy. • Standard nappies should not be worn as they fill with water and can cause the baby / toddler to sink. • The NHS no longer recommends vaccination (including polio) prior to going in a pool [34]. • Babies have inefficient thermoregulation and so care should be taken to ensure they do not get too hot / cold.
Palliative Care / Life Limiting Conditions	It is possible to justify aquatic physiotherapy for those with terminally ill or life limiting conditions who may have absolute contraindications. A risk benefit assessment should be discussed with all involved.

EXAMPLE SCREENING FORM FOR AQUATIC PHYSIOTHERAPY

This form should be adapted for the facility and user group. It is not an exhaustive precautions list.

Patient's Name DOB NHS number

Fear of water	None		Mild		Severe
Mobility	Independent		With walking aid/s		Wheelchair user
Weight-bearing status	Full		Partial		Non
Transfers	Independent		With assistance		Fully dependent
Personal care (e.g. dressing)	Independent		With assistance		Fully dependent
Method of pool entry and exit	Steps	Chair Hoist	Plinth Hoist	Sling Hoist	Other

Contraindications ***Aquatic physiotherapy not to be considered at all***	**No**	**Yes**	**Further Information**
Diarrhoea and vomiting A minimum of 48hrs clearance after last episode			
Medical instability following an acute episode without medical clearance (MI, CVA, DVT, PE, Status Asthmaticus)			
Uncontrolled cardiac failure (Progressive worsening of exercise tolerance or shortness of breath at rest over previous 3-5 days, nocturnal paroxysmal dyspnoea)			
Unstable angina (Prolonged angina at rest > 20 min, new onset, increased frequency, lower onset threshold, not responding to GTN)			
Uncontrolled medical conditions without a medical management plan in place (Uncontrolled epilepsy, diabetes or blood pressure)			
Acute systemic illness with associated pyrexia (A minimum of 24 hours of non-raised temperature)			
Weight in excess of evacuation manual handling risk assessment			

Precautions This is not an exhaustive list. These are to be aware of and managed appropriately. They should not prevent aquatic physiotherapy.	**No**	**Yes**	**Further Information**
Cardiorespiratory compromise			
Renal compromise			
Compromised Immune System			
Controlled epilepsy & diabetes			
Impaired skin integrity (open wounds, radiotherapy, altered sensation)			
Urinary or faecal incontinence			
Infectious conditions including widespread MRSA			
Impaired vision, hearing or sensation			
Behavioural problems			
Invasive lines / tubes e.g. PEG, IV, catheters, Central and PICC lines			
Pregnancy (if the pool water exceeds 35°C aquatic physiotherapy is not recommended)			
Transdermal patches			
Other			
If any of the above have been ticked YES discuss with the aquatic physiotherapist for clarification of the patient's suitability for treatment in a hydrotherapy pool			
Print name: Signature: Date:			

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HYDROTHERAPY POOL MANAGEMENT AND HEALTH AND SAFETY

INTRODUCTION

A hydrotherapy pool requires specific policies and procedures to ensure both its smooth running and to maintain health and safety standards.

The Health and Safety at Work Act (1974) states it is the duty for every employer “to ensure as far as is reasonably practicable the health, safety and welfare at work of all employees, visitors etc.”

Key points of the act are:

- Assess risk
- Devise preventive measures
- Establish emergency procedures and feedback
- Ensure the safe use, handling & storage of articles & substances in accordance with the Control of Substances Hazardous to Health Regulations 2002 (COSHH)
- Provide information and training
- Provide a safe workplace
- Provide a safe working environment

In order to consider the health and safety risks and to maintain a safe environment the following questions need to be answered:

- What is the designated aquatic physiotherapist role?
- What needs to be included in a hydrotherapy pool policy / Pool Safety Operating Procedure (PSOP)
- What are the risk assessment considerations for a hydrotherapy pool?
- What is involved in maintaining water quality?

- What are the monitoring and recording requirements for a hydrotherapy pool?
- What are the cleaning recommendations?
- When should a hydrotherapy pool need emptying?
- What advice is there regarding an emergency evacuation procedure?
- What actions must be taken if there is faecal, blood or vomit contamination?

WHAT IS THE DESIGNATED AQUATIC PHYSIOTHERAPIST'S ROLE?

All hydrotherapy pools should have a named, designated aquatic physiotherapist, who has appropriate skills, experience and competence to coordinate the service, and report to the health care water safety group.

The designated aquatic physiotherapist is a point of contact for all members of the MDT which for a hydrotherapy pool includes:

- Pool engineer / operators
- Microbiologist
- Infection prevention control team
- Health & Safety team
- Cleaners
- Physiotherapy assistants, physiotherapists and other pool users
- Managers of e.g. physiotherapy, school, college, leisure centre or care services

It is important there is good communication and understanding of roles and responsibilities between all members to ensure the smooth running and compliance with all health and safety standards.

The designated aquatic physiotherapist needs sufficient training to understand:

- Individual service user needs and risk factors
- All potential microbial, viral, chemical and physical hazards and the risks to health associated with them
- Pool plant flow dynamics and pool water treatment
- Monitoring requirements and interpretation of the results mean
- Appropriate remedial actions
- When the pool should be closed and criteria for reopening

The designated aquatic physiotherapist's role should include:

- Facilitating the development of the PSOP, a policy for the therapeutic use of the pool
- Ensuring an accurate log of the pool parameters and microbiology testing is maintained, is available for all users to view and kept for as long as appropriate in accordance with retention of patient notes
- Staff training to ensure all other therapists and therapy staff have adequate knowledge, skills and supervision to work within the pool.

WHAT NEEDS TO BE INCLUDED IN A HYDROTHERAPY POOL POLICY / POOL SAFETY OPERATING PROCEDURE (PSOP)?

All pools must have a pool policy / PSOP in place. It should include:

- Statement of policy
- Description of the hydrotherapy pool including size, depth, steps or gradient, any hoists, bather load, turnover period, filtration and disinfection
- Responsibilities of those involved in the running of the pool
- Pool user screening
- Staff training and competency requirements
- Referrals
- Risk assessment
- Pool water Normal Operating Procedures (NOPs) and Emergency Action Plan (EAP)
- Emergency evacuation procedures
- Procedure when water chemistry readings are out of recommended parameters
- Procedure when of a positive microbiology sample result
- Procedures when of pool water contamination
- Cleaning schedules

WHAT ARE THE RISK ASSESSMENT CONSIDERATIONS FOR A HYDROTHERAPY POOL?

For an example risk assessment see appendix 2.

Hazards can be categorised into environmental, or staff / service user related

Environmental	Staff & Service User
Slippery surfaces / excess water	Staffing levels and training
Walking aids	Emergency procedures
Submerged objects / pool available space	Manual handling
Faulty equipment	Patient / pool user screening
Pool chemistry and temperature	Fatigue (prolonged immersion / humidity / temperature)
Air humidity and temperature	Accidental submersion
Footwear	Infection
COSHH	Challenging behaviour
Lighting	Dehydration
Microbiology	Viral

To compile a risk assessment, consider risks associated with:

INFECTION

Most sources of infection cannot be transmitted in chlorinated water. It usually only occurs when pool water treatment is inadequate, or poolside cleanliness is poor. MRSA, HIV, AIDS, Hep B, COVID-19 and Herpes are sensitive to disinfection. Ensure appropriate PPE is worn poolside and surfaces in contact with the pool user are cleaned after use.

Factors to consider:

- Water treatment testing
- Bather loading
- Filter management through backwashing
- Pre-immersion toileting and showering
- Pool user screening
- No outdoor footwear (unless covered) or mobility aids / wheelchairs*, only designated walking frames on poolside
- Weekly microbiology testing
- Wound management
- Cleaning of pool area and surrounds
- Equipment cleaning

* Best practice would be to transfer the patient from their outdoor wheelchair to a designated poolside wheelchair or hoist. If this is not feasible then the wheels need to be either covered or appropriately cleaned and disinfected.

PHYSICAL INJURY

e.g. accidents (slips, falls and collisions), incorrect manual handling, fatigue or fainting and near drowning.

The pool area is high-risk due to potentially slippery surfaces, humidity levels, and risk related to water activities. Therefore,

- patients should not be permitted to use the pool without appropriate supervision.
- Due to the high incidence of falls using single point contact walking aids, the ATACP does not recommend their use on the poolside
- Any excess water must be mopped from pool surrounds when the pool is in use.
- Access routes must be kept clear of obstructions with equipment stored appropriately.

- All hoisting and emergency equipment, including telephones and alarm systems should be checked routinely.
- Daily immersion time for staff should be individually risk assessed, especially in circumstances such as return to work or pregnancy.
- Service user treatment time recommendations vary considerably based on the individual risk assessment and screening, e.g. level of condition irritability, fatigue, and temperature control.

CHEMICAL INJURY

Chemical hazards are related to the pool water chemical treatment and poolside cleaning products.

- Pool water treatment chemicals must be stored away from public areas in designated locked plant rooms according to COSHH regulations.
- Cleaning products need to be compatible with the pool water and stored in a lockable designated cupboard.
- No one must enter the pool without ensuring pool testing has been undertaken prior to the treatment session and chemical parameters are safe for immersion.

WHAT IS INVOLVED IN MAINTAINING WATER QUALITY?

The main source of pollution in hydrotherapy pools comes from bathers in the form of; particles (hair, skin, float debris), oil-based products (body grease, cosmetics, skin cream), ammonia based (perspiration and urine) and faecal matter.

The best way to minimise bather pollution is to ensure:

- Pre-immersion toileting before showering
- Pre-immersion showering (ideally with soap)
- Hair clean, tied up if long or covered

FACTORS INFLUENCING POOL WATER QUALITY:

TURNOVER PERIOD

The time taken for the entire pool water volume to pass through the filter and plant and return to the pool

It is recommended hydrotherapy pools have a turnover period of 60 minutes or less. In an older pool it may be longer, but it is important to factor this into bather load calculations and procedure in case of contamination.

CIRCULATION RATE

The flow of water in m³/h to and from the pool through all the pipework and the treatment system

The speed determines the turnover period and the calculation is:

Circulation rate (m³/h) = Instantaneous bather load x 1.7 (PWTAG)

BATHER LOAD

There are two considerations with the bather load:

- Treatment space as guided by the ATACP
- Water quality as guided by Pool Water Treatment Advisory Group (PWTAG). Water quality must not be put at risk.

The two types of bather load are:

Instantaneous

The number of bathers that can be in the pool at the same time.

- The ATACP recommend 4m2 of pool space as the treatment space required for an individual's treatment, which includes the therapist, or for group treatment 2m² per patient of pool space. The therapeutic treatment area does not include entry / exit steps, slopes or depths exceeding 1.35m.
- PWTAG state 2.7 m² per bather in a water depth 1-1.5m, however they have acknowledged that this may on occasions be exceeded to the 2m² per patient as long as the operational bather load is not exceeded.

Operational

The number of bathers which can be put in the pool in one day (a 12-hour period).

- PWTAG state 2.7m² of pool space per bather for 1-1.5m depth of water.

- If the pool has ideal disinfection, filtration with coagulant and optimal turnover period use 50% of 2.7 (m^2) per bather x 12 (12-hour period) as a maximum operational bather calculation. Reduce the percentage if not ideal plant operation.
- The operational bather load must not be exceeded so water quality is not put at risk.

An example for a 5m x 6m pool

Instantaneous load is 30 ÷ 2 = 15 bathers at any one time according to ATACP recommendation for treatment space (exclude any space taken by steps).

Operational load is (30 ÷ 2.7) x 12 = 133 at 50% = 66 bathers in total in one 12-hour period day.

Please note the instantaneous bather load cannot be used every 30 minutes as the operational bather load would be exceeded within 2.5hrs, and therefore the water quality will be put at risk.

FILTRATION AND BACKWASHING

The filter mechanically removes debris and small particles from the water. The filter should:

- have sufficient filter capacity to cope with the circulation rate and turnover period
- run 24 hours a day
- have its medium physically checked annually with the recommendation to be replaced according to manufacturer's recommendations e.g. every 3-5 years if sand
- be backwashed (the reversal of water flow through the filter medium which removes trapped particles to waste down the drain) at least weekly. If there are two filters, then backwashing should alternate between both filters (two backwashes a week)
- not be backwashed just before or during pool use, or too frequently, because it can make the filter medium less effective as it needs time to settle
- operate within acceptable pressure levels

WATER DISINFECTION

Disinfection is required to kill pathogenic bacteria and oxidise contaminants in the water to remove the risk of infection.

Chlorine is the primary disinfectant recommended for hydrotherapy pools (PWTAG). Secondary disinfection with UV or Ozone will significantly reduce combined chlorine, remove more chloramines (reducing skin and eye irritability) and can remove >90% cryptosporidium. Bromine is no longer recommended for hydrotherapy pools by the ATACP, or PWTAG, due to the high incidence of skin irritation.

CHLORINE ACTION

- Chlorine when combined with water produces hypochlorous acid which is the Free Chlorine (FC) or Free Available Chlorine (FAC).
- Hypochlorous acid reacts with pollutants to neutralise them and oxidises nitrogenous waste. The by-product of hypochlorous acid and nitrogenous waste are chloramines. This is the Residual (RC) or Combined Chlorine (CC) which are irritants potentially causing a strong smell, skin and eye irritation.
- Together the free chlorine and combined chlorine are known as Total Chlorine (TC).

PH CONTROL

pH range 7.0-7.4 with the ideal 7.0-7.2

pH levels must be controlled for:

- Bather Comfort
    - pH 7.4 = Human body fluids
- Effectiveness of Disinfectant
    - pH 6.5 Chlorine is 90% efficient
    - pH 7.0 Chlorine is 74% efficient
    - pH 7.5 Chlorine is 47% efficient
    - pH 8.0 Chlorine is 22% efficient

Small changes in pH can have profound effects, as it is a logarithmic scale, which means a pH of 8.0 is 10 times more alkaline than a pH of 7.0.

WATER BALANCE

The water chemistry must be balanced to ensure it is neither corrosive nor scale forming. To get a water balance reading the following are required:

- Total Alkalinity

- Calcium Hardness
- pH
- Water temperature
- Total Dissolved Solids (TDS)

The formula known as the Langelier Index is used to produce a result.

WHAT ARE THE MONITORING AND RECORDING REQUIREMENTS FOR A HYDROTHERAPY POOL?

Pool water chemistry and environmental factors should be monitored, recorded and maintained in accordance with PWTAG. Tests required, frequency and levels expected are shown in the table based on chlorine disinfection alone:

Test	Recommended Levels	Test Period
Water temperature	32°C – 35.5°C (optimum 34°C - 35°C thermoneutral 34.5°C) Not to exceed 35.5°C	3x per day
Ambient air temperature in pool area	5°C below water temperature (optimum 28-30°C)	3x per day
Ambient air temperature in changing rooms	25-28°C	3x per day
Atmospheric humidity	50-60% (+/-10%)	3x per day
pH (phenol red)	Ideal 7.0 - 7.2 not recommended above 7.4	3x per day
Free chlorine (FC) (DPD 1)	If pH 7.0-7.2 ideal 1mg/l not lower than 0.75mg/l If pH 7.2-7.4 increase to 2mg/l No pool needs a FC level > 3mg/l	3x per day
Total chlorine (TC) (DPD 3)	FC + CC = TC	3x per day
Combined chlorine (CC)	TC – FC = CC Ideally as low as possible Never more than half the FC or Never more than 1mg/l no matter what the level of FC	3x per day
Calcium hardness	80-200mg/l	1x per week
Total alkalinity	80-200mg/l	1x per week
Total Dissolved Solids (TDS)	Not > 1000mg/l above source water	1x per week
Water balance	Langelier saturation 12.1 ± 0.5	1x per week

MICROBIOLOGY MONITORING AND RECORDING

Hydrotherapy pools should have a weekly microbiological sample of pool water sent to an United Kingdom Accreditation Service (UKAS) accredited laboratory to be analysed for bacterial counts. The results must be within the following parameters:

Colony count (TVC) at 37°C for 24hrs	Not > 10cfu
Coliforms	Absent in 100ml (<10 per 100ml if not consecutive samples, no Escherichia coli, colony count <10cfu)
Escherichia coli	Absent in 100ml

Pseudomonas aeruginosa	Absent in 100ml (<10 per 100ml if not consecutive samples, no Escherichia coli, colony count <10cfu and disinfectant and pH within optimal levels)

If any of the above results are positive, a second sample must be taken immediately. The pool can remain open whilst waiting to act on the 24-hour interim report, unless gross contamination.

Gross contamination means either:

- Escherichia coli >10 per 100ml with either a colony count over 10cfu per ml or/and Pseudomonas aeruginosa >10 per 100ml

Or

- Pseudomonas aeruginosa >50 per 100ml and colony count over 100 per ml

IN THE EVENT OF GROSS CONTAMINATION:

- the pool must be immediately closed
- the plant must be run for six turnover periods maintaining optimal pool water chemistry and coagulant dosing
- the pool water should then be re-sampled and await the 24hr interim report
- all equipment used within the pool, including the pool cover, must be cleaned with a 100mg/l chlorine solution before re-using to prevent re-contaminating the water.

A record of all microbiology reports must be kept for the same length of time as the patient records.

WHAT ARE THE CLEANING RECOMMENDATIONS?

Area	Frequency
Changing areas, showers and toilet	Cleaned at the start of the day with 1000mg/l hypochlorite solution and as necessary thereafter. Ensure floors are kept free of excessive water and dirt. Shower heads cleaned and descaled approximately 4 times a year.
Pool concourse / surrounds	Cleaned at the start of the day with 1000mg/l hypochlorite solution and as necessary thereafter. Ensure cleaning residues go to drain and not into the pool system. It is not enough to clean the pool surround with either swimming pool water or tap water alone. Proprietary chemical cleaners formulated for pool use may be necessary for stubborn dirt. General detergents must not be used as they may not be compatible with the pool disinfection. Mechanical cleaners are ideal as they suck up the dirty water preventing it going into the pool. They must be emptied, disinfected and dried after use.
Pool floor	Deck level pools need suction cleaning daily, for other pools the minimum is weekly. Moveable floors may require qualified divers to clean twice a year as per manufacturer's recommendations.
Pool scum line	At least a minimum of weekly to remove body grease and oils using damp scourer +/- sodium bicarbonate or the use of a pool vacuum cleaner that mounts the walls.
Transfer channels	Once a month channels and grilles should be flushed with 100mg/l chlorinated water. Grilles should be removed and scrubbed using soda ash or sodium bicarbonate with a damp scourer.
Balance tanks	Inspected annually and cleaned by draining and flushing with 100mg/l chlorinated water.

Pool equipment	All equipment used within the pool including floatation aids, evacuation board, removable steps and plinth must be frequently cleaned and disinfected. Permeable or open celled equipment can be submerged in a solution of either 100mg/l hypochlorite for 10 minutes or 1000mg/l for 1 minute, then rinsed off with tap water before re-use. Impermeable or closed celled equipment can be wiped down with 60% v/v ethanol or 70% v/v isopropanol. All equipment is then allowed to air dry and is stored off the floor in drainable designated storage areas. If equipment has not been used regularly, clean as above prior to reuse. Slings need to be cleaned or laundered as per manufacturer's instructions and in line with local infection prevention and control recommendations.
Pool cover	Checked regularly for build-up and cleaned as required with 100mg/l chlorinated water or if a positive microbiology result.

WHEN SHOULD A HYDROTHERAPY POOL NEED EMPTYING?

PARTIAL EMPTYING

- to reduce excessive chlorine / chloramines in the water
- to reduce excessive Total Dissolved Solids (TDS)
- to rapidly reduce the pool water temperature

TOTAL EMPTYING

This should not be routine practice as the pressure and temperature changes can damage the pool structure. It is not necessary to empty the pool after faecal contamination.

- for any major maintenance to the pool structure
- if there is a persistent presence of bacteria
- if there is any broken glass in the pool water

WHAT ADVICE IS THERE REGARDING AN EMERGENCY EVACUATION PROCEDURE?

An emergency evacuation procedure must be in place. The evacuation method and training should be agreed with the Health and Safety Officer of the organisation. It should be practiced at least annually, and for any new staff responsible for pool users within the hydrotherapy pool. A suitable trainer will have knowledge to be able to risk assess the procedure, understanding the most appropriate evacuation point and method of exit. If there is no suitable member of staff to train others, then an external training provider should be sourced.

Each hydrotherapy pool requires a risk assessment for the procedure ensuring the technique achieves the safest and fastest method of exit.

Considerations should include weight limits for a manual technique versus equipment limits. A water rescue board is commonly used for the evacuation procedure. It is important to risk assess each pool and the individual pool user, in determining the most appropriate and time efficient method of evacuation. Electric and battery hoists are not recommended to be used as the only method of evacuation in an emergency due to risk of failure from inadequate charging or power failure. If a plinth attachment manual hoist is to be used, it should be attached and in position for the duration of the treatment session.

The recommendation is that in addition to the treating staff member, at least one other person, who is trained in the evacuation procedure and basic life support, is available to respond rapidly in an emergency situation.

The emergency equipment should be checked before pool use, including the alarm system, rescue board, towels, shears/scissors, and one way valve mask.

WHAT TO DO IF THERE IS FAECAL, BLOOD OR VOMIT CONTAMINATION?

FAECAL

In the event of faecal contamination of the pool water, all patients should leave the pool. The PWTAG guidelines should be followed, which are dependent on whether the faeces are:

- Solid
    - The stools should be immediately removed from the pool using a scoop or fine mesh net and flushed down the toilet. If the pool is operating properly with ideal disinfectant residuals and pH values, no further action is necessary and the pool can continue to be used.
    - If there is any risk of possible widespread distribution of the faeces in the pool, the pool must be closed and the procedure for loose / runny faeces followed.
- Loose / runny
    - The pool must be closed. The free chlorine level increased to its upper limit 3mg/l and pH 7.0 in addition to dosing coagulant. After six turnover periods the pool should be vacuumed, swept and the filters backwashed. The filter media must be allowed to settle by running water to drain for a few minutes before reconnecting the filter to the pool.

Check disinfection levels and pH are within recommended levels before re-opening the pool.

BLOOD OR VOMIT CONTAMINATION

Pool disinfectants should kill any pathogenic microorganisms in blood or vomit.

If there are significant amounts of blood in the pool, it should be temporarily cleared of people to allow the blood to disperse. This should be within one turnover period.

If there is a blood spill on poolside, follow the local blood spill procedure ensuring no products are washed into the pool.

PWTAG recommends that vomit in the pool or poolside should be treated as if it were blood. If there is any solid matter it can be removed with a net.

APPENDIX 1 SERVICE PROVISION AND AUDIT FRAMEWORK

for Theoretical Knowledge and Practical Skills

Physical properties of water									
CSP Quality Assurance Standard 2	Buoyancy	Hydrostatic Pressure	Turbulence / Drag	Stability in water / equilibrium	Metacentre	Relative density	Refraction		
Understands and can Explain									
Understands practical application									
Applies theory of exercise in water									

Physiological effects of immersion									
CSP Quality Assurance Standard 2	Cardiovascular	Pulmonary	Renal	Haematological	Central and peripheral nervous system	Musculoskeletal	Brain Health		
Understands and can Explain									
Applies to precautions and contraindications									

Health and safety									
CSP Quality Assurance Standard 2	Pool Safety Operating Procedure (PSOP) / risk assessment	Chemical testing of the water	Microbiological testing	Contamination procedures	Cleaning requirements	Emergency evacuation drills	Pre-swim hygiene	Manual handling / use of hoists	Environmental hazards
Understands and can Explain									
Understands and can apply in practice									

Therapeutic handling of									
CSP Quality Assurance Standard 2	Involuntary or uncontrolled movements	Decreased weight bearing	Altered tone	Pain	Decreased water confidence	Older person / paediatric	Behavioural implications		
Understands and can Explain									
Can app in practice									

Aquatic Physiotherapy Treatment									
CSP Quality Assurance Standard 2	Strengthening exercises	Stretching and mobilising	Stabilisation exercises	Functional exercises	Relaxation	Group exercise (CSP Quality Assurance Standards 8,9,10)			
Assessment selection									
Selection of techniques									
Applies techniques									
Monitors service users progress									
Modifies techniques accordingly									
Understands progression									
Evaluates outcome (CSP Quality Assurance Standard)									

Consent record keeping and information governance									
CSP Quality Assurance Standard 5,6,7	Written consent	Verbal consent	GDPR	Effective communication	Legal requirements	Use of appropriate abbreviations	Record keeping (CSP Jan 2021)	Outcome measures	Audit tools
Understands and can explain in relation to Aquatic Physiotherapy									
Can apply in practice									

APPENDIX 2. EXAMPLE RISK ASSESSMENT

ESTABLISHMENT	
DATE	
DEPARTMENT	Hydrotherapy Pool
ACTIVITY PROCESS:	Hydrotherapy Pool use
WHO IS AT RISK:	Staff
	Operators and / or maintenance staff
	Patients, carers or visitors

REF	**HAZARD**
1	Slips falls and collisions
2	Drowning, fainting and medically unwell
3	Infection
4	Manual handling injury
5	Chemical injury
6	
7	

LIKELIHOOD		**RISK MATRIX**		
Common, regular or frequent occurrence.	**3**	3 Med	6 High	9 High
Occasional occurrence.	**2**	2 Low	4 Med	6 High
Rare or improbable occurrence.	**1**	1 Low	2 Low	3 Med
		1 Minor injury or illness	2 Serious injury or illness	3 Fatalities, major injury or illness.
		SEVERITY		

Hazard Ref	Risk Associated with Hazard	Control Measures	Risk Rating (Note 1)	Additional measures	Review frequency (Note 2)
1	Physical injury due to slip, fall, or collision on the pool concourse or changing rooms	• All staff must read and demonstrate an understanding of the PSOP and safety requirements • Patient mobility screening • All patients to be supervised on the pool concourse • All mobility equipment e.g. walking frames, chairs and hoist systems checked prior to use • Floor surfaces to be kept swept of excess water • No running in the pool environment • No use of single point contact walking aids (walking sticks or elbow crutches) on the pool concourse, a designated walking frame should be used • Walkways and emergency exits to be kept clear of obstructions • All equipment to be stored off the floor in designated areas provided • Strict control of access to the pool area with no patients permitted without a staff member present	1 x 1 or 2 Low		Annually
2	Drowning, fainting or medically unwell	• All patients must be medically screened prior to treatment within the hydrotherapy pool with appropriate measures in place for those at risk • Appropriate staff supervision of patients during treatment with attention to entry and exit • All staff responsible for patients within the hydrotherapy pool to have current basic life support training and in date hydrotherapy pool evacuation training • The emergency alarm system is to be tested at least minimally weekly • All emergency equipment to be checked daily before pool use • Patients are not permitted to enter the pool area without staff supervision • Two staff members who have current evacuation training to be present in the pool area during patient treatment within the hydrotherapy pool • Diving and jumping into the pool are forbidden • Staff to orientate patients to the pool environment with attention to pool depth changes and submerged objects • Staff immersion time risk assessed • The hydrotherapy pool water temperature is not to exceed 35.5°C, air temperature 30°C and humidity 60% • Drinking water to be available in the near vicinity to the pool for staff and patient re-hydration • Doors to access the pool are locked when not in use	1 x 2 Low		Annually

3	Infection through physical contact or ingestion of water	• All patients must be screened for contraindications and precautions. Each staff member to be aware of the precautions and measures in place • Open wounds to be covered with an appropriate fitted waterproof cover and reviewed post immersion • All staff and patients to adhere to pre-swim hygiene by toileting and showering immediately prior to immersion • No outdoor shoes to be worn (remove or use overshoe covers) • No outdoor walking aids on the pool concourse • Optimal pool water chemistry to be maintained and tested at least minimally three times a day with the results documented and available to view by staff • Weekly water microbiology sampling to be conducted with reports kept in accordance with timescales for patient notes (note domestic pool guidance may differ) • Appropriate cleaning schedules • All equipment to be cleaned, disinfected, air dried and stored in accordance with best practice guidance • Appropriate patient timetabling for those with known infections such as MRSA or are at risk of faecal incontinence • EAPs in place for faecal contamination, out of parameter water chemistry or positive microbiology sampling	1 x 1 Low		Annually
4	Physical injury due to incorrect manual handling	• Staff to have had appropriate manual handling training • All hoists to be appropriately serviced and checked before use by designated staff • Staff and patients to be orientated to the correct and safe use of pool equipment and safe working depth • All staff responsible for patients in the hydrotherapy pool or to assist in the evacuation procedure are to have completed annual evacuation training • Weight limit risk assessment completed for emergency pool evacuation procedure	1 x 1 Low		Annually
5	Chemical injury due to physical contact, inhalation or ingestion	• Pool water chemistry to be tested at least minimally three times a day. No staff member or patient to enter the pool if the water chemistry has not been tested for the appropriate time period or if out of acceptable parameters • All pool water treatment chemicals to be stored only in a designated plant room area according to COSHH regulations • All cleaning products to be stored in a lockable allocated cupboard with restricted access according to COSHH regulations. Only pool water compatible cleaning products to be used on the pool concourse • Restricted access to plant rooms for those with appropriate training and PPE • Pool water chemistry records should be kept accessible to staff	1 x 2 Low		Annually

APPENDIX 3 GLOSSARY AND ABBREVIATIONS

Ai Chi	Slow progressive, postural control movements based on Watsu, Qi Qong and Tai Chi
ATA	Applied Turbulence Assisted
ATACP	Aquatic Therapy Association of Chartered Physiotherapists
ATR	Applied Turbulence Resisted
Aqua Epps ®	Aquatic Therapy using predominantly paediatric and neuro techniques
AquaStretch™	Hands-on myofascial release technique using properties of water
Aquatic PNF/ BRRM	Bad Ragaz Ring Method is an Aquatic therapy treatment approach that uses water-based strengthening and mobilising resistive exercises based on proprioceptive muscular facilitation (PNF)
BA	Buoyancy Assisted
BCB	Buoyancy Counterbalanced
BR	Buoyancy Resisted
Burdenko	A combination of water and land exercises following the idea of six essential qualities of human movement
CC	Combined Chlorine
CSP	Chartered Society of Physiotherapy
CVA	Cerebrovascular Accident
DA	Drag Assisted
DR	Drag Resisted
DRS	Drag Resisted Stabilisations
FC	Free Chlorine
FL	Float
GTN	Glyceryl Trinitrate (to treat angina - usually in spray form)
Halliwick©	A disability swimming method following a 10-point programme without the use of floats or swim goggles but working with swimmers and helpers in the pool to engage in water activity and breath control.
HCPC	Health and Care Professions Council
IPC	Infection Prevention Control
MC	Metacentric effect
MI	Myocardial Infarction
MRS	Manual Rhythmical Stabilisations
PE	Pulmonary Embolism
ppm	Parts per million
PWTAG	Pool Water Treatment Advisory Group
TDS	Total Dissolved Solids
TC	Total Chlorine
WST	Water Specific Therapy includes elements of the Halliwick 10-point-programme and uses a task directed problem solving approach.
Watsu ®	A set of passive movements and stetches in the water (with Shiatsu-like massage) to stimulate deep relaxation