NARCH Guidance for water management

All NARCH guidelines follow PWTAG code of practice: https://www.pwtag.org/download/pwtag-code-of-practice/?wpdmdl=2378&refresh=61483edc46a791632124636

Daily you should:

- Test the pool/treadmill water at least 3 times per day for a standard 8-hour day when the pool/treadmill is operational but more for longer operational hours or if re-tests are required following the addition of chemicals. The first test must be carried out before you use the pool or treadmill that day.
- The following should be recorded when testing:
    - Free chlorine
    - Total chlorine or bromine
    - pH
    - Temperature
    - Who did the test and at what time?
    - Any action taken
    - Re-test results if chemicals added

Note: Action taken may include the addition of any chemicals, the quantity of chemicals added, cleaning of pump baskets/skimmer baskets, backwashing

Weekly you should:

- Backwash or clean filters (more often in pools/water treadmills with a heavy load or low water volume and whenever the pressure across the filter media bed reaches the level specified by the filter manufacturer, at the end of the day)
- Coagulant dosing (flocculant)
- Calculate water balance (LSI) – is water corrosive or scale forming? temperature, hardness, alkalinity, total dissolved solids (see 'Maintaining Water Balance' below)
- Review test results/patterns and adjust standard operating procedures if necessary to maintain correct disinfection levels

Monthly you should:

- Send a sample of both pool/water treadmill water for microbiological water testing. The testing should include Total Viable Count (TVC), Coliforms / E. coli and Pseudomonas aeruginosa.
- Occasional positive samples may occur if the pool has been sampled immediately after a contamination event before the disinfection system had time to be effective.

Acting on failures When to close the pool:

- If a microbiological result is unsatisfactory, the test should be repeated as soon as practicable.
- If the second result is also unsatisfactory, the pool's management and operation should be investigated and the test repeated.

- If the third result is still unsatisfactory, immediate remedial action is required, which may mean closing the pool.
- The pool should be closed if there is chemical or physical evidence of unsatisfactory disinfection.
- The pool should be closed if microbiological testing discloses gross contamination*. Gross contamination is indicated by either:
- E coli over 10 per 100ml PLUS either colony count over 10cfu per ml or P. aeruginosa over 10 per 100ml (or, of course, both) or
- P. aeruginosa over 50 per 100ml and colony count over 100 per ml. Closure procedures for microbiological failure should be included in the pools EAP

*In the event of gross contamination, the pool/treadmill must be immediately closed and a sequence of backwashing, shocking, adding flocculant and specific cleaning measures is advised. Then run for 6 turnover periods while maintaining optimal water chemistry and coagulant (flocculant) dosing. After this period, the pool/treadmill water should be re-sampled and await the 24-hr interim report. All equipment used within the pool//treadmill, including pool cover must be cleaned with a 10ppm/mg/l chlorine solution before using in the pool/treadmill to prevent re-contaminating the water.

For guidance on the frequency of microbiological testing, interpreting results and recommended actions go to Hydrotherapy Pool Water Safety | Water Treatment Services

Quarterly you should:

- Send a sample of Spa pool and/or hot tub water (If used at your centre) for Legionella testing (Pools and treadmills do not need to be routinely tested for Legionella providing you have carried out a risk assessment)

NB. Showers (and jets) are a potential source of Legionella so operators must be aware of this and carry out a risk assessment. If the shower is well maintained, flushed through after prolonged non-use and the temperature kept above 50^0C then the risk is minimal. So, no regular testing is needed. For more information on legionnaires disease testing follow these links: Managing legionella in hot and cold water systems (hse.gov.uk) and HSE - Legionella and Legionnaires' disease

Annually you should:

- Service all electrical and mechanical equipment
- test/calibrate water testing equipment.
- Change the filter agent if required (not all filter agents need to be changed every year, but filter efficiency (pump pressure) and water quality should be assessed to determine the right time for filter agent change for the individual centre)

When required:

Shocking (Super Chlorination) should generally only be carried out if a problem has been identified (this will vary between pools and advise should be sought from your own pool water engineer if you have any queries).

Reasons to shock could be:

- If the combined Chlorine (Chloramines) are above half of the free chlorine level or above 1ppm, as per the PWTAG COP 9.7, shocking should resolve this and reduce/remove the chloramines.
- Microbiological test fail, with retest performed as soon as practically possible.
- If Cryptosporidium is present.
- If Algae is present.
- Other sources of contamination, such as organic matter, or a runny faecal incident (PWTAG state that if a solid faecal incident occurs and the pool is operating well with good Ph and disinfectant level then no further action is required).
- If, following a water balance test, your pool water quality is poor

Shocking to 10 ppm/mg/l should be achieved by following the user instructions providing on the shock chemical container.

It needs to be followed by dechlorination – if only by allowing sufficient time for residuals to fall to acceptable levels.

In the case of Cryptosporidium being present, 20ppm/mg/l should be achieved.

Maintaining water balance

Maintaining good water balance is all about taking measurements for pH, alkalinity, hardness, total dissolved solids (TDS) and other factors, and trying to keep these various factors balanced.

If the level of total dissolved solids gets too high (>1500mg/l), this can mean that the metal parts of the pool/treadmill workings will start to rust more quickly.

Steps should also be taken to control the alkalinity and calcium hardness of the water.

If the calcium hardness levels of the water become too low, corrosive water conditions can occur.

If the calcium hardness is too high, scale can start to form. Scale reduces the effectiveness of the pool filter system, can encourage microbiological contamination, and can raise energy costs.

The Lovibond PoolM8 app can help you calculate this and is available free of charge for both android and I-Phones

Recommended levels:

Free Chlorine 2ppm-4ppm. Do not treat dogs if < 1ppm. If free Chlorine levels reach 5ppm then dosing should be stopped, if they continue to rise above 6ppm then sessions should be stopped until levels have reduced.

pH: 7.0 - 7.6 acceptable (7.2 – 7.4 ideal)

Bromine 4ppm-6ppm. Do not treat dogs if < 2ppm or > 10 ppm

TDS should be no more than 1500mg/l

Temp: The safe and comfortable temperature range is 28.0 – 31^{0}C. However, it is strongly advised to maintain at 29 - 30^{0}C to obtain maximum therapeutic benefits for patients. If the hydrotherapy environment is particularly warm e.g., in hot weather conditions, it is advisable to keep the water temperature at 28-29^{0}C.

For more information: PWTAG Standards and Guidance | Pool Water Treatment Advisory Group

Approved equipment for testing:

- Photometer

NB. Pool and Spa test strips and Comparators may only be used as a backup in the event of a photometer malfunction.