POOL WATER TREATMENT ADVISORY GROUP

Canine Therapy Pool Operator Certificate

Syllabus and Assessment v2 2023

The Owners/Operators of canine therapy pools and treadmills must carry out their own assessment of risk presented by infections that can be carried and transmitted by canine users, that could affect human therapists, whilst working within the pool.

The water quality provided in these practices are appropriate to people, and do not include risks of infection between canines undertaking the water therapy that are unique to canine species.

A separate assessment of risk must also be carried out to determine the protective personal equipment and clothing that should be worn by assistants who may be required to work within the pool. This must take into account the possibility of accidental lacerations caused by canine users; infections entering the human body; and inhalation of water droplets.

On no account should water from a canine pool be ingested by therapists.

This is what people studying for PWTAG-approved Canine Therapy Pool Operators Certificate qualification should be taught.

THEORY

1. **What is a canine hydrotherapy pool**
   - 1.1 Types of pool and uses, differences between canine therapy pool and treadmill pool.
   - 1.2 Types of pool tank and finish.
   - 1.3 How canine hydrotherapy pools work – the recirculation cycle:
     a. circulation system including balance tank, (if installed)
     b. filtration
     c. chemical
     d. disinfection

2. **Pollution and hygiene**
   - 2.1 Pollution from canines:
     a. skin scales, urine, mucus from the nose and chest, saliva, hair, faecal matter
   - 2.2 Pollution not from canines:
     a. dust, floating debris, grass, dirt (soil/stones) precipitated chemicals, sand from filters, byproducts of chemical treatment
   - 2.3 Infections related to canine-human transmission:
     a. Campylobacteriosis (Campylobacter spp.)
     b. Dog Tapeworm (Dipylidium caninum)
     c. Hookworm (Zoonotic) (Ancylostoma caninum, Ancylostoma braziliense, Uncinaria stenocephala)
     d. Tapeworm

e. Roundworm (Toxocara spp.)

and, but less common:

- Brucellosis (Brucella spp.)
- Capnocytophaga spp.
- Cryptosporidiosis (Cryptosporidium spp.)
- Echinococcosis (Echinococcus spp.)
- Ehrlichiosis (Ehrlichia spp.)
- Giardiasis (Giardia spp.)
- Leishmaniasis (Leishmania spp.)
- Leptospirosis (Leptospira spp.)
- Lyme Disease (Borrelia burgdorferi)
- MRSA (Methicillin-Resistant Staphylococcus aureus)
- Pasteurellosis (Pasteurella spp.)
- Ringworm (Microsporum canis)
- Rocky Mountain Spotted Fever (Rickettsia rickettsii)
- Salmonellosis (Salmonella spp.)
- Sarcoptic Mange (Sarcoptes scabeii), also known as Mange

2.4 Non-infectious hazards:

a. respiratory irritation – including Legionella and asthma
b. skin irritation – bromine, *Pseudomonas aeruginosa*, folliculitis
c. ear infections, including otitis externa
d. electrocution; slip, trip, falls; fainting; entrapment; drowning

2.5 Pre-swim cleansing:

a. showers and washing facilities
b. the value of pre swim cleansing

3 Management, health and safety regulation and training

3.1 Staffing structure and management systems – their impact on water quality
3.2 Health and Safety – the legal requirements
3.3 HSG 179 – the written procedures (PSOP and method statement)
3.4 COSHH – substances hazardous to health in a pool, chemicals and microorganisms
3.5 ACoP HSG282/L8 Legionnaires' disease. The control of legionella bacteria in water systems
3.6 Confined spaces – and its application
3.7 O&M manual and schematic drawing
3.8 Training – who, when and how much is needed
3.9 PWTAG Code of Practice – the need for written procedures

4 Design

4.1 Design issues impacting on water quality
4.2 Pre-cleanse facilities for canines and humans
4.3 Floor surfaces in wet areas
4.4 The plant room – location, size and access
4.5 Chemical store
4.6 Temperature and humidity
4.7 Energy management

5 Hydraulics and water circulation

5.1 Circulation rate – calculations
5.2 Turnover period – calculations and alignment with PWTAG standards
5.3 Hydraulic design – different design solutions
5.4 Surface water removal – focusing on removing pollution:
- deck-level
- skimmers

5.5 Balance tanks – purpose, design and maintenance
5.6 Outlet and inlet safety: the entrapment: PWTAG Code, BS EN 13451–1 and 3
5.7 Circulation pumps – the principles, self priming pumps, variable speed drives
5.8 Valves – types, uses and safe operation
5.9 Flow meters and pressure gauges – calibration, maintenance
5.10 Treadmill pool – separate treatment systems if independent from main hydrotherapy pool

6 Filtration

6.1 Clarity of water –importance
6.2 Filtration:
- medium-rate
- high-rate

6.3 The filter media bed – grades, depths and types
- glass
- membrane
- zeolite

6.4 Underdrains – how they work, how they are best constructed
6.5 Backwashing – the principles:
- how to backwash, fluidisation of the bed, the rinse cycle
- strainer basket – part of the process
- when to backwash – PWTAG Code and guidance, on site risk assessment

6.6 Filter design – materials, sizes and fittings Filter maintenance – the annual programme
6.7 Coagulation – what it is
- how it works – agglomeration and flocculation
- high-rate filters – and coagulants
- available coagulants
- dosing – quantities and rates
- injection – where to apply

7 Pool water chemistry

7.1 Source water quality
7.2 Alkalinity – the effect on pH
7.3 Hardness – PWTAG guidelines, grout and scale
7.4 Sulphate- effects on cementitious materials
7.5 Dissolved solids – Corrosion, erosion and PWTAG guidelines
7.6 Water balance – what it is
7.7 Disinfection by-products – the health effects:
- nitrogen trichloride – effects, monitoring and mitigation
- THMs – role of humic acid, monitoring and removal

7.8 Frequency of water replacement and how to calculate

8 Primary disinfection

8.1 What is disinfection – in a swimming pool setting
8.2 Suitability and compatibility of disinfection types
8.3 Choosing a primary disinfectant – sodium/calcium hypochlorite; bromine; chlorinated isocyanurates
8.4 The chemistry of chlorine disinfection – an understanding:
- how chlorine forms a residual – hypochlorous acid and hypochlorite ion
- the effects of pH on disinfection – the values to pursue and why
- breakpoint chlorination – understanding the crucial role of breakpoint
- chlorine plus ammonia – urea, chloramines
- nitrogen trichloride – its causes
- organic chloramines – how they are caused, their effects and removal

8.5 Free and combined chlorine – the relationship and target levels
8.6 pH value – its influence on disinfection and target levels
8.7 The importance of dilution – why disinfection and filtration is not enough

9 Secondary disinfection

9.1 The effects and benefits of secondary disinfection
9.2 Dealing with Cryptosporidium
9.3 Ozone – what it is, how it is applied, the pros and cons
9.4 UV – what it is, how it is applied, maintenance and monitoring, pros and cons

10 Dosing chemicals

10.1 Principles – key requirements when dosing chemicals
10.2 Components – the system design and infrastructure
10.3 Dosing practice – where, when and how
10.4 Hand dosing in emergencies
10.5 Diluting chemicals – how and when to dilute
10.6 Dissolving dry chemicals
10.7 Dose strength – calculations
10.8 Day tanks – use, construction and fittings
10.9 Dosing pumps – type, construction and capacity
10.10 Pipework – construction and application
10.11 Valves and fittings – that may be incorporated into the dosing system
10.12 Calibration – checking the dosing rate
10.13 Faults – fail safe systems
10.14 Automatic control – optimising dosing treatment:
- closed loop – how the control works
- sample mixing – representative sample; sampling point
- calibration – independent analysis of the sensor to verify

- the desired effect
- sensors – amperometric, redox, pH value
- controllers – the levels of sophistication

10.15 Circulation feeders – what they are and how they work:

- brominators
- calcium hypochlorite

10.16 Super-chlorination: purpose and method

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11.8 Frequency of water replacement and how to calculate

12 Testing and controlling pool water chemistry

12.1 Comparator and photometer – how to use them
12.2 How to sample and test for:

- free chlorine
- combined chlorine
- pH
- total alkalinity
- calcium hardness
- total; dissolved solids

13 Preventing outbreaks

13.1 What goes wrong – definition of an outbreak
13.2 Problems that have led to outbreaks
13.3 Dealing with a faecal incident

- solid faeces
- runny faeces
- procedure for medium-rate filters
- procedure for high-rate filters
- prevention
- blood and vomit

13.4 Legionella risk assessment – requirement and frequency

14 Microbiological testing

14.1 Sampling – must include chemical tests
- Aerobic colony counts (TVC)
- Coliform and E coli – potential faecal or environmental pollution
- Pseudomonas aeruginosa – the reasons for testing

14.2 Legionella – testing for showers and water storage
14.3 Test requirements – monthly analysis
14.4 Interpreting results – assessing microbiological quality,
14.5 Remedial action
14.6 Gross contamination and closure of the pool

15 Pool chemical safety

15.1 Safety data sheets – provision and use
15.2 Risk and COSHH assessment – the process and elimination
15.3 Chemical awareness
- access
- unloading
- storage
- transporting chemicals

15.4 The chemical store
- siting
- fire risk
- spillage
- ventilation

15.5 Storage of disinfectants and other chemicals including:
- sodium hypochlorite
- calcium hypochlorite
- chlorinated isocyanurates
- sodium bisulphate
- BCDMH
- Hydrochloric Acid
- sulphuric acid
- soda ash (sodium carbonate)
- sodium bicarbonate

16 Plant maintenance

16.1 Servicing and frequency
16.2 Calibration
16.3 Daily monitoring and maintenance, fault finding

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17 Cleaning and hygiene

17.1 Floor surfaces – dirt, slips trips and falls and bacteria
17.2 Around the pool – PWTAG technical note
17.3 Scale removal
17.4 Pool covers – cleaning both sides to control mould and Pseudomonas aeruginosa
17.5 Transfer channels and balance tanks – regular maintenance
17.6 The pool bottom –particularly deck-level pools
17.7 Stainless steel – preventing corrosion
17.8 Safeguarding the fabric of the building – preventing steel corrosion cracking, pool grout, filling and emptying treadmill pools
17.9 Algae

18 PPE and plant room emergency procedures

18.1 The regulations – assessment, provision and use
18.2 Harmful effects – the potential risks to health from chemical exposure
18.3 PPE – what to use and when, use of SDS
18.4 In an emergency – what to do for chemical contact/inhalation/ingestion
18.5 Emergency showers and eye baths
18.6 Toxic gasses, fires and explosions
18.7 Spillages – PWTAG Code and technical guidance (sodium hypochlorite)
18.8 PWTAG Code and emergency procedures – chemicals emergency part of the EAP

THEORY ASSESSMENT EXAM

A wholly written exam shall at a minimum cover a fair representation of the essential topics as outlined in the theory element of the syllabus (above).

THE PRACTICAL ASSIGNMENT

There are **four** basic areas of practical ability that can be **taught** in any suitable location, and should then be **assessed** in the student's workplace, as part of the **exam:**

Doing a full set of water tests for canine therapy pool water
This should include:

- free chlorine
- total chlorine
- pH
- total alkalinity
- calcium hardness
- total dissolved solids (TDS).

Drawing a schematic diagram of the layout of a canine hydrotherapy pool plant: This should indicate clearly (using arrows to indicate the direction of flow) each of the main components, including:

- filters
- pumps
- strainers
- automatic dosing units
- monitoring equipment
- main valves.

Demonstrate how to backwash the filtration system
This should be of a chosen canine hydrotherapy pool, in accordance with normal operating procedures. It should include an explanation of why and when this must be carried out.

Carry out a chemical audit for water treatment within a canine therapy pool/treadmill.
This should include all chemicals stored and used in the plant room of a chosen canine hydrotherapy pool. It should include identifying the types and uses of chemicals, and include images of the storage, handling and use of the chemicals, and the required personal protective equipment.

ASSESSMENT

Documentation of these tasks shall be provided to the pool manager, who must sign them off to show that they are based upon the pool used in the assignment. The PWTAG Accredited Trainer course organiser will assess the evidence presented and determine if the student has demonstrated sufficient knowledge and practical skills and provide this as part of the assessment record