As a pool or spa owner, you have a legal obligation to maintain and operate your pool or spa safely. Failure to do so can expose your family and friends to unnecessary risks such as water-borne communicable diseases and potentially life-threatening injuries.

Toronto Public Health has created this guide to help you maintain a safe pool or spa. This information is also available online at www.toronto.ca/health.

Public Health Inspectors are available to answer any questions or concerns you may have. Please call 311 to reach an inspector.

Thank you for providing a safe and healthy pool and spa environment at your home.

Dr. David McKeown
Medical Officer of Health
Your swimming pool or spa can be lots of fun for you, your family and your friends. Swimming is also an excellent way to stay fit and keep healthy. Unfortunately, swimming pools and spas can lead to illness, injuries and even death when health and safety is not taken into consideration. Drowning is one of the leading causes of death every year for Canadian children between the ages of 1 to 4. These tragedies can be prevented if we take the time to learn about safety around your pool or spa.

This pamphlet was designed to help you to understand the health and safety, and maintenance requirements for your swimming pool or spa. It will also help you to understand the best practices, guidelines and laws related to pool and spa operation in the City of Toronto.
Installation

• Prior to swimming pool or spa construction, a permit must be obtained from the City of Toronto.

• Pool and Spa installation must comply with Municipal By-Law.

• Hire a reputable company to install your pool or spa.

• Underwater lights must be installed by a certified electrician. Electric outlets within the pool enclosure must have ground fault circuit interrupters to prevent accidental electrocution.

• Install above ground and inflatable pools according to the manufacturer’s instructions.

• Visit www.toronto.ca for more information about pool installation permits and by-laws.
Enclosures and Safeguards

• All pools and spas must be enclosed by a fence equipped with a self closing gate. The enclosure must have four sides. Walls are not considered a part of the fencing.

• The gate must be equipped with a self closing latch and must be capable of locking.

• The height of the fencing must meet the municipal code requirements.

• The gate must be locked when the pool or spa is not in use.

• Additional safety features can be outfitted for three sided enclosures if the forth side is part of the side of the house. Juliet fencing, isolation fencing and access alarms can be installed.

• Adults should always supervise their children. Mechanical and electrical safety provisions (motion detectors and safety immersion wrist alarms) do not replace adult supervision.

• Visit www.toronto.ca for more information about pool enclosure municipal code requirements and by-laws.
**Rules**

- Establish a set of rules and make sure everyone using the pool or spa obeys them.
- Restrict access to the pool or spa when not in use.
- Do not allow intoxicated bathers into the pool or spa.
- Discourage boisterous play in and around a pool or spa.
- Post Signs such as NO DIVING and POOL RULES to help encourage safe behaviour.
- Visit [www.poolcouncil.ca](http://www.poolcouncil.ca) for more information about signs.

**Safety**

- Remove the cover completely when the pool is not in use.
- Store the cover away from the pool area.
- Evacuate the pool or spa during an emergency (e.g. lightning storms or power outage).
- Never allow glass containers within the pool enclosure.
- Do not allow diving.
- Always enter the pool or spa feet first.
- Encourage walking and prohibit running in the pool area.
Chemistry

- Balance your pool or spa chemistry to avoid transmission of water-borne diseases.
- Test the water chemistry before using the pool or spa.
- Pool water should have a minimum free available chlorine or bromine concentration of 2.0 ppm.
- Spa water should have a free available chlorine or bromine concentration between 5.0 - 10 ppm.
- The pH for a pool or spa should be maintained between 7.2 - 7.8.
- Appendices 8 - 12 have more information on troubleshooting and on the chemicals used in pools and spas.

Clarity

- Do not use a pool or spa if the water is not clear.
- The bottom of the pool should be clearly visible at the deepest end.
- Toronto Public Health recommends that a 150mm (6 inch) diameter black disc on a white background be used to check the water clarity.
- The black disc should be placed at the deepest point of the pool and it should be clearly visible from anywhere on the pool deck.
- The bottom of the spa should be clearly visible when the jets are off.
- Provide lighting when the pool or spa is being used after dusk or at night.
Drains and Covers

• Check all drains and outlet covers and make sure they are secure and in good condition.
• Do not use a pool or spa if any of the drains and outlet covers are loose, damaged or missing.
• The force from the suction of a broken drain can trap long hair and body parts leading to injury or death.
• Keep children away from main drain(s) and outlet(s).

Phone

• Keep a phone nearby in case of an emergency.
• Toronto Public Health recommends using a landline phone because it can help emergency services to confirm the location of the pool.
• The person(s) supervising should be aware of the location of the phone.
• Keep a list of emergency contacts together with the address of the pool next to the phone.
• If a cell phone is being used, make sure the battery is charged and clearly identify the location of the pool to the operator.
Lifesaving Equipment

• Lifesaving equipment must be accessible on-site.
• Buoyant throw aids must be attached to a rope and the rope must be as long as the length of the pool.
• Do not allow the misuse of lifesaving equipment.
• Lifejackets or personal floatation devices should be available for inexperienced or weak swimmers.

First Aid Kit

• A fully stocked first aid kit should be available near the pool or spa.
• The first aid kit should include a pair of scissors and a CPR mask.
• The person(s) supervising should know the location of the first aid kit and be trained in first aid and CPR.

CPR and First Aid

• The person(s) who is supervising should be trained in first aid and CPR.
• Visit the Life Saving Society website www.lifesavingsociety.com to find out about first aid and CPR courses.
Personal Hygiene

• Toronto Public Health recommends showering before using a pool or spa.
• Showering reduces the amount of contaminants entering the pool or spa water.
• Wash your hands with soap and water after using the bathroom or changing a diaper.
• Children should take regular bathroom breaks in order to avoid accidents.

Supervision

• Designate a qualified person to supervise when the pool or spa is in use.
• The person supervising must not leave the area while bathers are in the pool or spa.
• Never leave children unattended.
• The ratio of children to supervisors should be one to one, for children under the age of five.
• Keep non-swimmers within arm’s reach.
• Keep children away from main drain(s) and outlet(s).
• Lifejackets or inflatable toys are not a substitute for supervision.
Swimming

• Encourage bathers to attend swimming lessons.
• Never swim alone, always swim with a friend.
• Be aware of guests who are inexperienced or weak swimmers.
• Ask inexperienced or weak swimmers to wear an approved lifejacket.
• Ask inexperienced or weak swimmers to bring and wear their own lifejacket during large social gatherings.

Inflatable Toys

• Do not leave toys in the pool or spa.
• Toys can stop you from seeing a bather who is in trouble underwater.
• Toys can attract children to water causing them to fall in accidentally.
• Do not use inflatable toys as floatation devices.
Water

• Teach children not to drink pool water because pool water has chemicals that may cause illness if swallowed.

• It is illegal to dispose pool or spa water directly into the storm sewer system.

• Chemicals in pool and spa water are harmful to the environment.

• Visit www.toronto.ca for more information on how to properly dispose of pool or spa water or contact Toronto Water by calling 3-1-1.

Chemical Storage

• All chemical containers must be labeled.

• Make sure chemicals are kept out of reach of children.

• Store chemicals separately in a cool, dry, well ventilated room that can be locked.

• Follow label directions carefully.

• Never mix any two chemicals together.

• Never add chemicals when bathers are in the pool.

• Always add chemicals to water – NEVER add water to chemicals.

• Never smoke around chemicals.

• Always wash your hands with soap and water after handling chemicals.

• Appendix 13 provides more information on chemical storage.
Pool Closing

- Secure all entrances to the pool with a lock when closing the pool for the season.
- Never walk on pool covers.
- Remove rain water that collects on the pool cover.

Ladder

- Always remove the ladder on an above-ground pool when the pool is not in use.
Spas Use

• Cover and lock the spa when it is not in use.
• Do not allow underwater play in a spa.
• Avoid contact with the drain and suction outlets.
• Drain and refill a spa after heavy use.

Entering and Exiting a Spa

• Enter and exit a spa slowly to prevent slipping.
• Use the handrail and steps when entering and exiting the spa.
• Avoid entering the spa when the jets are on.
• Discourage boisterous play in and around a spa.
• Post sign(s) such as NO DIVING and SPA RULES to help encourage safe behaviour.
Over-exposure to Heat

- Over-exposure to heat for a prolonged period can result in fainting or drowning.
- Spa temperature should be maintained at a maximum of 40°C (104°F).
- Check the water temperature before using the spa.
- To cool down, exit from the spa water every 10-15 minutes.
- Drink water regularly to rehydrate.
- Do not allow intoxicated bathers into the spa.

Medical Conditions

- Pregnant women or those with medical conditions should consult a doctor before using a spa.
- Children under 12 years should not be allowed in a spa.
- Bather’s experiencing diarrhea should avoid using the spa.
Appendix 1
Recommendations for Cleaning a Pool Fouling (Liquid stool or Diarrhea)

Normal chlorine levels cannot cope with a pool grossly fouled by vomit or faeces. It is important that quick action be taken when this happens.

1. Evacuate bathers and close the pool immediately as soon as a fouling is observed.
2. Switch off the recirculation and disinfection systems.
3. Remove foreign matter by skimming and vacuuming. Wash off the pool deck, if necessary.
4. Direct discharges from skimming and vacuuming to the sewer; if this is not possible, operate recirculation pump but by-pass the filter.
5. Raise the chlorine level in the pool water to 20 ppm free available chlorine by adding chlorine directly to the pool while the recirculation system is off and ensure the pH is in the range of 7.2 to 7.5.
6. Test the pool water after adding chlorine to ensure that 20 ppm free available chlorine residual level has been reached. Maintain pH at 7.2 to 7.5.
7. Resume recirculation systems ½ hour after adding chlorine. Let circulate for 8 hours and then perform backwash procedures. Backwashing helps to reduce high chlorine levels. You may need to add fresh make-up water to the pool after backwashing.
8. If necessary, clean the pool and deck surfaces and sanitize them with a disinfectant solution having a strength equivalent to at least 50 ppm chlorine.

9. Test the pool water levels for free available chlorine and pH. Free available chlorine residual should be within the range of 1.0 - 2.0 ppm, and pH within the range of 7.2 - 7.8. Addition of chlorine neutralizer can be used to lower chlorine levels faster.

10. Disinfect all equipment that was used by immersing the equipment in a disinfectant solution that has a strength equivalent to at least 50 ppm chlorine.
Appendix 2
Recommendations on Localizing Minor Fouling (Liquid stool or Diarrhea)

1. Evacuate bathers and close the pool immediately as soon as a fouling is observed.

2. Switch off the recirculation and disinfection system.

3. Scoop up as much of the fouling as you can by skimming and or vacuuming.

4. Raise the free available chlorine to 2 ppm by adding chlorine directly to the pool while the recirculation system is switched off, and ensure the pH is within the range of 7.2 - 7.5.

5. Apply a local shock treatment at the point of fouling, suggest minimum of 1 gallon of 12% liquid chlorine (bleach), ensuring residual of at least 1.5 ppm free available chlorine to all areas of the pool.

6. Resume recirculation and disinfection system for at least ½ hour.

7. Re-open to bathers after a minimum of ½ hour has elapsed since shock treatment and the pH of the water is within the range of 7.2 to 7.8.

8. Disinfect all equipment used by immersion in disinfectant solution having a strength equivalent to at least 50 ppm chlorine.
Appendix 3
Pool Circulation

Inlet
- where water enters the pool
- usually has an adjustable eye for directing the water flow

Pool Flow
- direction of flow of the pool water
- water should move around the pool towards the skimmers

Skimmers
- draws surface water from the pool

Main Drain
- draws water from the bottom of the pool
Appendix 4

Skimmer

**Skimmer Opening**
- water level of the pool should be maintained at the center of the opening
- depth of the pool designed to the level
- skimmer designed to be most efficient at this level

**Floating Weir**
- a device that provides proper skimming action

**Skimmer Basket**
- intended to strain out large debris (hair, leaves) before the pool water enters the piping system

**Skimmer Lid**
- allows access to the skimmer for cleaning and maintenance
- must be kept in good condition and properly installed to protect bathers
Appendix 5
Filtration

Filtration is the mechanical process of removing solid matter from swimming pool water.

A pool filter consists of a tank containing some fine grain material such as sand or diatomaceous earth through which water is forced.

Pool water carrying particles is passed through the filter media and returned to the pool clearer with each passing.

**Filter Head Operation**

Filter head settings have different titles or require slightly different or additional steps to perform procedures such as filtration, circulation, backwashing and draining.

A filter has 4 major settings:

1. **Filter**
   - normal operation
   - directs water down through the filter medium prior to going to the pool

2. **Re-circulate**
   - allows sand and water to settle
   - directs water directly back to pool by passing the filter

3. **Backwash**
   - to clean the filter medium
   - directs water up through the filter medium and to waste (opposite flow to “Filter” setting)

4. **Drain**
   - directs water directly to waste by by-passing the filter
Appendix 6
Gauges

Filters are provided with a pressure gauge which is usually located on the filter head since you can’t see into a filter to determine how clogged it is.

Single Pressure Gauge System

The single gauge measures the back pressure the filter medium places on the water being pumped into the filter. A clean filter will have a low reading. As it collects dirt and begins to clog, the pressure level will begin to rise. The filter requires backwashing when the pressure gauge indicates an increase of 8 - 10 lbs/in² or manufacturers’ recommendation on pressure increase.

Appendix 7
Pool Circulation

How to Backwash

Note: Prior to changing valve position turn the pump(s) off.

1. Turn filtered setting from “filter” to “re-circulate” for 20 seconds. This allows the water in the filter to settle.

2. Turn filter head to “backwash” and start the pump. Leave it there until the water running to waste is clear.

3. Turn filter head to “drain” for 20 seconds. This allows the sand and the water to settle.

4. Turn filter head to “filter” and start the pump. This returns filter to normal operation.
Appendix 8
pH

• pH is the measure of acid or base
• ideal range for pH is 7.2 - 7.8
• pH should be tested 2 or more times daily

Problems with Low pH
• free chlorine active
• eye irritation
• overactive chlorine
• corrosion
• pool liner wrinkles

Solutions
• add soda ash (sodium carbonate)

Problems with High pH
• chlorine effectiveness decreases
• eye irritation
• chlorine inefficiency
• short filter runs
• scaling

Solutions
• add muriatic acid or,
• add carbon dioxide or,
Chlorination is the addition of chlorine to pool water. Chlorine is added to sanitize and destroy harmful bacteria.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Limit</th>
<th>Frequency of Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chlorine Pool</td>
<td>Minimum 2.0 mg/l</td>
<td>2 or more times daily (before and after use)</td>
</tr>
<tr>
<td></td>
<td>Maximum 10.0 mg/l</td>
<td></td>
</tr>
<tr>
<td>Spa</td>
<td>Minimum 5.0 mg/l</td>
<td>2 or more times daily (before and after use)</td>
</tr>
<tr>
<td></td>
<td>Maximum 10.0 mg/l</td>
<td></td>
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</tbody>
</table>

**Electronic Chlorine Generators/Salt Generators**

A process in which salt is added directly into the pool water. As the dissolved salt passes through the electronic cell(s), gas chlorine, caustic soda and hydrogen gas are created. Gas chlorine is rapidly absorbed into the water, thus resulting in chlorination of pool water.

Salt levels 2500 - 3500 ppm

**Advantages**
- Relative pH neutral

**Disadvantages**
- Must maintain salt level
**Sodium Hypochlorite**

Liquid form  
Strength 10% - 15%  
pH 13  
Large acid demand

**Advantages**
- Low cost  
- Readily available  
- Useful for sanitation of other surfaces

**Disadvantages**
- Loses effectiveness during storage  
- Large storage area

**Calcium Hypochlorite**

Calcium Hypochlorite is a white granule with a strong chorine odour. Sometimes called High Test Hypochlorite (HTH).

Active Strength 70%  
Available chlorine content 70%  
pH 11

**Advantages**
- Easily handled  
- No significant storage

**Disadvantages**
- Can cause turbidity, scale, or clogged filters if pH and or total alkalinity are high.
Super-chlorination is the addition of high doses (10 - 20 mg/l) of chlorine to remove organic contaminants and improve water quality. The continual addition of chlorine, dirt and microorganisms eventually causing a build-up of combined chlorine compounds. Combined chlorine causes eye irritation and chlorine odour. To rid the pool of these, add large doses of chlorine, raising the free available chlorine level to approximately 10 - 20 mg/l. This high dosage oxidizes the combined chlorine forming nitrogen gas and kills algae. Depending on bather load, the recommended frequency of super-chlorination is every 1-2 weeks. Do not use the pool until the chlorine has returned to the recommended level of 2.0 mg/l.
Stabilization is the addition of cyanuric acid to pool water to help minimize chlorine loss due to evaporation from sunlight. Stabilized chlorine contains both stabilizer and chlorine in its composition.

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<tr>
<th>Chemical</th>
<th>Limit</th>
<th>Frequency of Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyanuric Acid</td>
<td>Maximum 60 mg/l</td>
<td>Daily</td>
</tr>
</tbody>
</table>

Cyanuric acid is a weak organic acid which binds the chlorine residual of the pool water and greatly reduces chlorine loss by the sun’s ultraviolet rays. Chlorine residuals that have been stabilized will last 3 to 4 times longer. The cyanurates slightly reduce the disinfection power of the chlorine, thus higher levels of chlorine must be maintained at 2.0 mg/l or greater.

Stabilizer does not dissipate or wear-out, therefore, high levels of cyanurates can only be reduced by adding fresh water. This must be done if levels are greater than 60 mg/l. Stabilizer is most effective in the range of 25 - 50 mg/l.
Bromination is the addition of bromine to the pool water to prevent the growth of disease causing organisms.

When bromine is dissolved in water it produces Hypobromous Acid, an extremely powerful disinfectant. Comparisons to Hypochlorous acid shows certain advantages e.g. increasing bacterial kill efficiencies relative to chlorine at pH values above 7.5.

Bromine sanitizer efficiency is essentially independent of the pH, however, its use reduces the pH of pool water and subsequently reduces the total alkalinity. No known bromine stabilizer.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Limit</th>
<th>Frequency of Test</th>
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</thead>
<tbody>
<tr>
<td>Bromine</td>
<td>Pool</td>
<td>2 or more times daily (before and after use)</td>
</tr>
<tr>
<td></td>
<td>Spa</td>
<td>2 or more times daily (before and after use)</td>
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### Effects of Bromination

<table>
<thead>
<tr>
<th>Problem</th>
<th>Solution</th>
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<tbody>
<tr>
<td>• Destroys Total Alkalinity (TA) therefore, pool could be corrosive. Causes bicarbonate to leave the pool as carbon dioxide, therefore, lowers TA</td>
<td>• Use Sodium Bicarbonate to increase Total Alkalinity</td>
</tr>
<tr>
<td>• Reduces pH</td>
<td>• Total Alkalinity not to exceed 100 ppm</td>
</tr>
<tr>
<td>• Causes pH reaction with reagent changing the colour to look as though the pH is higher</td>
<td></td>
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</tbody>
</table>
Appendix 13
Handling Chemicals Safely

• Store pool chemicals in a cool, dry and ventilated area.
• Keep corrosive materials away from other chemicals.
• Keep all chemicals away from hot surfaces and flames.
• Have personal protective equipment available as required.
• Material Safety Data Sheets must be made available for every chemical on site.
• Do not eat, drink or smoke in the chemical storage area.
• Ensure the chemical storage room is inaccessible to unauthorized persons.
• Handle chemicals with clean and dry scoops only. Each chemical must have its own scoop. Use scoops provided by the manufacturer if available.
• Keep containers closed when chemicals are not in use.
• Label all containers with the chemical name.
• Never re-use empty chemical containers for the storage of other chemicals.
• Never mix contaminated chemicals with your fresh supply.
• When mixing chemicals, add them slowly. Never add water to the chemicals, always add the chemical to the water.
Appendix 14
Detail view of a typical pool setup

Appendix 15
Detail view of a typical spa setup
The following organization websites provide more information on pool and spa safety.

Canadian Red Cross
www.redcross.ca

Centre for Disease Control (U.S.) CDC
www.cdc.gov

Caring For Kids Canadian Pediatric Society
www.caringforkids.cps.ca

Health Canada
www.hc-sc.gc.ca

Life Saving Society of Canada
www.lifesavingsociety.com

Pool and Hot Tub Council of Canada
www.poolcouncil.ca

Safe Kids Canada
www.safekidscanada.ca

St. John’s Ambulance
www.sja.ca

Think First Foundation of Canada
www.thinkfirst.ca

Toronto Parks, Forestry and Recreation
www.toronto.ca/parks

Toronto Public Health
www.toronto.ca/health

Toronto Water
www.toronto.ca/water

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