

► DIRECT FROM CDC ENVIRONMENTAL HEALTH SERVICES



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Key Changes in the New Edition of the Model Aquatic Health Code

Editor's Note: The National Environmental Health Association strives to provide up-to-date and relevant information on environmental health and to build partnerships in the profession. In pursuit of these goals, we feature this column on environmental health services from the Centers for Disease Control and Prevention (CDC) in the *Journal*.

In these columns, authors from CDC's Water, Food, and Environmental Health Services Branch, as well as guest authors, will share tools, resources, and guidance for environmental health practitioners. The conclusions in this column are those of the author(s) and do not necessarily represent the views of CDC.

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Pool codes regulate how aquatic venues that are open to the public are designed, constructed, operated, and managed. These codes address topics such as how aquatic facilities are built, how lifeguards are trained and certified, and how chlorine levels in the water are tested. One study showed that one out of eight routine public pool inspections and one in seven routine public hot tub or spa inspections result in immediate closure because of at least one violation representing a serious threat to public health (Hlavsa et al., 2016).

Most health departments and related agencies have programs to help ensure swimmers and aquatics staff stay safe and healthy. Previously, each individual agency had to do its own research to develop or update pool codes because no single science-based reference

existed at the national level. This occurrence means that pool codes can vary across the U.S. from jurisdiction to jurisdiction.

The Model Aquatic Health Code (MAHC) guidance from the Centers for Disease Control and Prevention (CDC) is a tool to prevent injury and illness linked to aquatic venues—such as pools, hot tubs, and splash pads—that are open to the public (Figure 1). CDC created the MAHC at the request of health departments and the aquatics sector to provide scientifically based guidance at the national level. The MAHC is not a federal law. The MAHC is a CDC guidance document and only becomes law if voluntarily adopted (in whole or as individual code sections) by a local, state, territorial, or tribal jurisdiction. This guidance brings together the latest science and best practices to help

jurisdictions save time and resources when they develop and update pool codes. The fifth edition of the MAHC is now available.

Key Changes in Chapter 4

In Chapter 4, Aquatic Facility Design Standards and Construction:

- Portable slides are prohibited as their location is not fixed and the water depth, landing area, and clear spaces are not ensured (MAHC 4.12.2.9.1).
- A clock must now be visible to all spa bathers (MAHC 4.12.1.12).
- Single-pass splash pads are included as an interactive water play aquatic venue and subject to applicable MAHC design standards and construction (MAHC 4.12.8) and facility operation and maintenance requirements (MAHC 5.12.8).

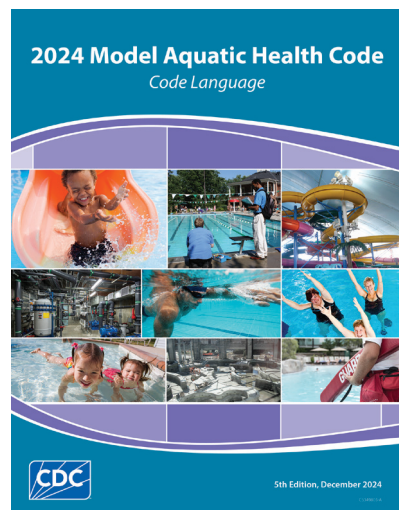
Key Changes in Chapter 5

In Chapter 5, Aquatic Facility Operation and Maintenance:

- Maximum free chlorine concentration shall not exceed limits specified on the product label (MAHC 5.7.3.1.1.5). The change was necessary to adjust language in the MAHC that implied it is acceptable to use chlorine products outside of the range set by the manufacturer.
- Free chlorine greater than 10 ppm while bathers are present was included as an imminent health hazard requiring immediate closure (MAHC 6.3.3.1).
- Cyanuric acid (CYA) at ≥ 300 ppm now requires immediate remediation (MAHC 5.7.3.1.3.3). The effective dose of CYA for the stabilization of chlorine-based disinfectants is far below 300 ppm.

FIGURE 1

5th Edition of the Model Aquatic Health Code



Learn more about the Model Aquatic Health Code (MAHC): www.cdc.gov/model-aquatic-health-code/php/about/index.html

Get MAHC tools and training: www.cdc.gov/model-aquatic-health-code/php/training/index.html

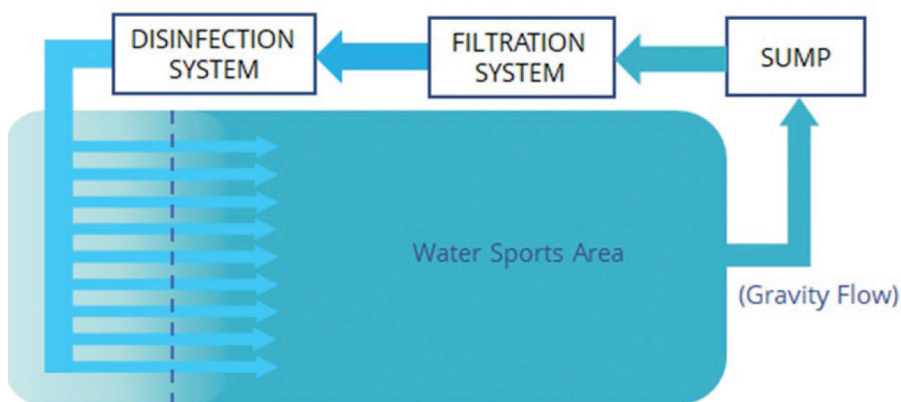
Key Changes in Chapter 6

In Chapter 6, Policies and Management:

- The aquatic venue diarrheal-stool contamination response in the presence of CYA guidance was modified to add dilution credits when draining and refilling to lower the CYA concentration (MAHC 6.5.3.2.1). Some *Cryptosporidium* reduction is achieved by draining and refilling, therefore, the hyperchlorination step does not need to achieve the full 3-log reduction reducing hyperchlorination time. A table was also added to display log reductions based on the initial CYA concentration and the percentage of the aquatic venue drained and refilled.
- Two additional health hazards were added, requiring immediate closure (MAHC 6.6.3.1):
 - » Failure to provide interlock controls and flow meters/flow switches/pressure switches in accordance with MAHC section 4.7.3.2.1.3, or when the interlock controls are not operating properly or have been disabled or bypassed.

FIGURE 2

Artificial Swimming Lagoon Water Flow Schematic From the Model Aquatic Health Code



Water flow in a typical artificial swimming lagoon moves from the designated swimming area (DSA) into the water sports area. The water then follows a gravity flow course through a sump pump, filtration and disinfection systems, and back into the DSA. Image courtesy of Crystal Lagoons.

- » Failure to prevent unauthorized access to pool chemical storage spaces.
- For aquatic facilities that have a single zone of patron surveillance, two qualified lifeguards are required to be present and available to respond to aquatic emergencies (MAHC 6.3.4.3.1).

Key Changes in Chapter 7

In Chapter 7, Special Venues:

- Artificial swimming lagoons (ASLs) have been added.
 - » Design standards and construction, and operation and maintenance requirements are now included in MAHC 7.3 and 7.4 (Figure 2).
 - » ASLs are defined in the MAHC as large-format aquatic venues.
 - » ASLs mimic a natural water body and consist of one or more designated swimming areas with the remainder of the lagoon designated for water sports and nontraditional uses, including kayaking, paddle-boarding, windsurfing, boating, and scuba diving training.

Resources for the Model Aquatic Health Code

The MAHC website (www.cdc.gov/model-aquatic-health-code/php/about/index.html)

Development of the 5th Edition of the Model Aquatic Health Code

The Centers for Disease Control and Prevention (CDC) worked with the Council for the Model Aquatic Health Code (CMAHC) to develop the 5th edition of the Model Aquatic Health Code (MAHC). The CMAHC collected, assessed, and relayed national input on recommended MAHC revisions to CDC for consideration.

The CMAHC received 202 change requests for the 5th edition. The process for these change requests included:

- Proposed changes were presented and discussed at the 2024 CMAHC Vote on the Code Conference at the Association of Aquatic Professionals Annual Conference & Exposition in Reno, Nevada.
- CMAHC membership voted to accept or reject change requests for incorporation into the 5th edition.
- The CMAHC board of directors reviewed all approved change requests and made final recommendations to CDC.
- CDC made final decisions on change requests.

also provides forms, protocols, and other resources for public health officials and aquatics staff using MAHC recommendations or otherwise working to strengthen their aquatic health and safety programs. Some of these resources are editable documents, allowing users to customize them to meet their specific needs.

The MAHC and its tools can help your program prevent injury and illness linked to aquatic venues open to the public. 🌸

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