



ENVIRONMENTAL MEDICINE 101 BOOTCAMP

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Water: Fountain of Aging & Disease? The Why and How of Water Contamination and Filtration

WATER QUALITY REPORTS

EWG:

- Since 2010, water utilities' testing has found pollutants in Americans' tap water, according to an EWG drinking water quality analysis of 30 million state water records.
 - https://www.ewg.org/tapwater/#.WZcOTYr_pE4

Local Municipal Water Works:

- Annual Water Quality Reports or Consumer Confidence Report

EPA:

- Office of Ground Water and Drinking Water (OGWDW)
 - Oversees implementation of the Safe Drinking Water Act. This system offers the capability to query the Safe Drinking Water Information System (SDWIS) Fed Data Warehouse via report filters and various reporting options. Includes violation and enforcement information.
 - <https://ofmpub.epa.gov/apex/sfdw/f?p=108:200:.....>
- Drinking Water Mapping Application to Protect Source Waters (DWMAPS)
 - An online mapping tool to locate drinking water providers, potential sources of contamination, polluted waterways as well as information on protection projects and Source Water Collaborative initiatives in their area.
 - <https://geopub.epa.gov/DWWidgetApp/>
- Enforcement and Compliance History Online (ECHO) database
 - Air emissions, Surface water discharges, Hazardous waste & Drinking water systems
 - <https://echo.epa.gov/>

Testing Labs:

- National Testing Laboratories, NTL, <http://www.ntllabs.com/index.html>
- Kar Laboratories, <http://www.karlabs.com/>

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Carbon Filtration:

1. Sources of Carbon

Coal

- Large pores and cheaper, not very good for LMW chemicals (ie., VOCs & drug residues) good for food colorant

Wood based carbon

- Medium sized pores

Coconut shell

- Micro pores, cleaner & best for wider variety of chemicals

If you combine all three together, get wider range of contaminant removal

2. Carbon Structure & Size

Carbon block

- Preferred, Better structure

Granulated carbon

- Contaminates can go around granules

3. Microns

Lower is typically better

- .5 microns is optimal, if you go too low, can get clogged

4. Catalytic carbon

- Needed to remove chloramine

Vetting Point of Use Filtration Devices:

1. First step, check the contamination levels of your water supply and take note of any high levels of contaminants that might exceed the established range the filter can remove. If very high level of contaminants, consult with manufacturer to explore options of compensating by using additional media or increased frequency of replacing media.
2. Screen filtration devices using above recommendations on carbon.
3. Ask questions about chloramine & fluoride as these are very challenging to filter and are the first contaminants to exhaust the media.
 - a. Chloramine removal requires catalytic-grade carbon
 - b. Chlorine is one of the easiest to remove
4. Questions to pose:
 - a. Do you use catalytic-activated carbon?
 - b. How many gallons and to what percentage can they remove chloramine, radionucleotides or fluoride?
 - i. Look for a response of high percentage (95% or greater) for 500- 1,000 gallons.

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1. Make sure they used tap water (with all it's contaminants and not deionized water with just one contaminant) for testing.

Vetting Filtration Devices Whole House Filters:

1. Size of filtration/media unit should be 2 cu ft preferably with catalytic carbon
2. Custom-made back-washing system often preferred so carbon can't channel, must rebed media, but not necessary or always practical and there are effective systems without back-washing.
3. Sediment filters before the main filter- needs to be changed. If back-washing system that does it once a week, don't need sediment filter
4. Ask if system takes out Hexavalent chromium