

Shellfish poisonings in British Columbia: Commercial product as source

Should we be concerned about commercially harvested shellfish in BC? Definitely. Three separate outbreaks of shellfish poisoning were traced to commercially harvested, government-inspected product in recent years. In 2010, a norovirus outbreak that caused 36 illnesses among raw oyster consumers was attributed to commercial harvesters discharging vomitus overboard a boat within the harvest area.¹ In 2011, 62 people became ill during the first recorded outbreak of diarrhetic shellfish poisoning on the Pacific Northwest coast. In 2012, four linked cases of paralytic shellfish poisoning were reported.^{2,3} The illnesses reported in both 2011 and 2012 were caused by marine biotoxins from bivalve shellfish harvested in approved open areas. Several patients experienced symptoms so severe they sought care in hospital emergency departments. Thus far in BC, marine biotoxin illnesses have been limited to paralytic shellfish poisoning and diarrhetic shellfish poisoning.

Prior to 2012, there had been no cases of paralytic shellfish poisoning linked to commercially sold shellfish in Canada for over 30 years.⁴ Canada has an extensive, well-managed shellfish control program. Three federal agencies coordinate the Canadian Shellfish Sanitation Program: the Canadian Food Inspection Agency, Environment Canada, and the Department of Fisheries and Oceans. Regulatory limits for toxins in the edible tissues of shellfish are set by Health Canada and include domoic acid (responsible

for amnesic shellfish poisoning), okadaic acid (diarrhetic shellfish poisoning), and saxitoxin (paralytic shellfish poisoning). Federal regulations require that bivalve shellfish be processed in federally registered facilities, be harvested in approved areas, and be tagged for commercial distribution such that batches can be traced from producer to consumer.

BC physicians should be aware of the potential for shellfish poisonings to occur in both commercial and self-harvested products. Shellfish poisoning can lead to significant morbidity and possible mortality.

Shellfish poisoning was described as early as 1793, when one of Captain George Vancouver's crew died and four others became ill after consuming mussels in Poison Cove.⁵ The first Canadian cases of amnesic shellfish poisoning were documented on Prince Edward Island in 1987 among consumers of mussels.⁶ Cases of paralytic shellfish poisoning and diarrhetic shellfish poisoning have been detected on both east and west coasts of Canada, while cases of amnesic shellfish poisoning have only been found on the east coast.^{4,6} Monitoring for amnesic shellfish poisoning has been successful in Canada and elsewhere, with no cases reported since 1987 in any

country with a monitoring program.⁷

Marine biotoxins are produced by harmful algal blooms that can affect the waters where shellfish feed. Algal blooms are influenced by temperature spikes, introduction of nutrients and fresh water during spring freshets, and changing thermoclines, all of which are affected by anthropogenic activities (agriculture runoff and marine ballast water transfer) and climate change.⁸⁻¹⁰ Changes in these factors over the last 30 years have impacted commercial shellfish in BC. Although shellfish are generally tested for marine toxins on a weekly basis, some sites are tested less frequently. Further, harmful algal blooms can develop in less than one week, so there is potential for contaminated shellfish to reach the marketplace despite extensive control measures. A review of the online Canadian Food Inspection Agency recall database indicates 17 marine biotoxin recalls in 2011–2012, four involving public warnings for paralytic shellfish poisoning and diarrhetic shellfish poisoning, and 13 directed to commercial retailers. Fourteen (80%) of the products were from BC waters, and three were from Quebec and New Brunswick.

With recent cases reported along the Pacific Northwest coast, BC physicians should be aware of the potential for shellfish poisonings to occur in both commercial and self-harvested products. Shellfish poisoning can lead to significant morbidity and possible mortality. Clinicians should report patients with shellfish poisoning to public health agencies in order to facilitate case identification, public health messaging, and harvest management (including product recalls and site area closures). Contact the

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British Columbia Drug and Poison Information Centre for inquiries around unusual toxic exposures (1 800 567-8911). As there are no clinical tests for toxic shellfish poisoning, diagnosis is based on symptoms and identification of toxins in leftover shellfish. Physicians, working with their local health authority, are encouraged to secure shellfish for testing to confirm diagnoses. In the case of suspected shellfish-related reactions, it is important to obtain a detailed history, asking about recent consumption and co-exposed individuals. Patients should then be monitored closely for signs of neurological or respiratory compromise, and provided with symptomatic management.

—Lorraine McIntyre, MSc

**Food Safety Specialist,
Environmental Health Services,
BC Centre for Disease Control**

—Tom Kosatsky, MD

**Medical Director,
Environmental Health Services,
BC Centre for Disease Control**

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Continued from page 287

Finally, patients with a diagnosis of early dementia should be encouraged to set up financial planning initiatives, update their will, consider end-of-life advanced directives,⁷ and communicate with their family practitioner, friends, and family. Taking measures like these in advance is one of the best gifts patients can give their families and loved ones. Instead of struggling to make decisions in a crisis, families can be comforted in knowing that they are carrying out their loved ones' final wishes.

—A. Maria Chung, MD

**Clinical Assistant Professor
and Acting Co-Head,
UBC Division of Geriatric Medicine
Geriatrics and Palliative Care
Committee**

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