## Marine Toxins and Associated Syndromes

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| **Paralytic Shellfish Poisoning (PSP)** -saxitoxins | *Alexandrium* spp.*, Gymnodinium catenatum, Pyrodinium bahemense* (dinoflagellate) | Shellfish (including, crabs, lobsters, puffer fish) in Pacific Coast, New England, Florida | - Perioral tingling  
- Numbness of face and neck  
- Headache  
- Nausea and vomiting  
- Respiratory difficulty  
- Death | Few minutes – 10 hrs |
| ***Observed coincidental health effects but not scientifically confirmed -Goniodomin A** | *Alexandrium monilatum* | Direct skin contact  
Inhalational | - Skin rash  
- Mild burning and itching  
- Tingling around the lips  
- Respiratory difficulty | Immediate – 15 min |
| **Diarrhetic Shellfish Poisoning (DSP)** -okadaic acid and derivatives | *Dinophysis* spp.  
*Prorocentrum* spp. (dinoflagellate) | Shellfish (Gulf Coast of Texas) | - Diarrhea (most prominent)  
- Nausea and vomiting  
- Abdominal pain | 30 min – 2 hrs |
| **Ciguatera Fish Poisoning (CSP)** -ciguatoxins, maitotoxin | *Gambierdiscus toxicus, Prorocentrum* spp. (dinoflagellate) | Reef fish (tropical/subtropical) | Early onset  
- Diarrhea, abdominal pain  
- Nausea, vomiting  
Later onset  
- Reversal of hot and cold sensations  
- Paresthesias  
- Blurred vision  
- Headache  
- Arrhythmias  
- Paralysis | 2 – 6 hrs  
12-24 hrs |
| **Neurotoxic Shellfish Poisoning (NSP)** -brevetoxin | *Karenia brevis* (dinoflagellate)  
*Chattonella subsalsa* (Raphidophyte) | Shellfish (Mid-Atlantic and Gulf of Mexico)  
Inhalation of aerosolized toxins | GI and neuro symptoms  
- Similar to those of PSP except NSP not known to cause death  
Irritation:  
- Eyes  
- Throat | Few min - hours |
| **Domoic Acid Poisoning / Amnesiac Shellfish Poisoning (ASP)** -domoic acid | *Pseudo-nitzschia* spp. (diatom) | Shellfish (Pacific Coast, Northeast Coast, Western Coast of Florida) | - Diarrhea  
- Nausea and vomiting  
- Confusion  
- Memory loss  
- Seizures  
- Coma  
- Death | Nausea and vomiting usually within 24 hrs; other symptoms 24 – 48 hrs |

*Range of symptoms reported in Virginia as a result of direct contact to *A. monilatum.*

*Not included above, is Azaspiracid Shellfish Poisoning (AZP), caused by toxins of a dinoflagellate in Ireland, Netherlands, Belgium, Morocco, and eastern Canada.*