

1600, Monday 24 August 2009

**URGENT: ADVICE FOR GPs and EMERGENCY CLINICS
TOXIC SEA SLUGS**

In the event of a suspected human case of tetrodotoxin poisoning

Initial management advice for GPs and Emergency Clinics:

Ring the National Poisons Centre 0800 764 766.

- **If the person is asymptomatic but there is a high index of suspicion of ingestion:** immediately arrange for observation and assessment in a hospital setting providing access to intensive care facilities. (If ingestion has occurred, there may be rapid onset of serious effects including respiratory difficulty, requiring airway protection and assisted ventilation. Decisions on the pros and cons of giving activated charcoal (within 1 to 2 hours of ingestion) are best made once the patient reaches hospital. Patients should be observed there for 8 hours post ingestion. If no systemic symptoms occur during this period, they can be discharged (with instructions to return should symptoms develop).
- **If the person is symptomatic:** arrange urgent transfer to hospital; ideally via ambulance team equipped to provide emergency treatments (e.g. airways protection, respiratory support, IV fluids and adrenaline if in shock). **Do not** give activated charcoal if vomiting and/or drowsy. Symptomatic patients should be monitoring for at least 24 hours. Those with significant symptoms should be admitted to an intensive care facility. Patients should not be discharged until they are clearly improving.
- **If only exposure via puncture wounds has occurred:** treat symptomatically, refer to hospital if symptoms more than mild, follow up.
- **With brief dermal exposures,** any symptoms are generally mild; asymptomatic patients can be observed at home for 8 hours.

**Further questions relating to public health issues can be directed to:
Auckland Regional Public Health Service 623 4600.**

**For information on diagnosis and treatment, please ring the National
Poisons Centre 0800 764 766.**

**To notify Public Health in the event of a suspected human case of
tetrodotoxin poisoning: please ring the on-call Medical Officer of Health
on 021 938 490. Public Health will immediately investigate the potential
cause of any poisoning to help ensure public safety.**

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Background and symptoms explained:

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TOXIC SEA SLUGS**

During August, several dogs have died and several others have become sick after visiting Hauraki Gulf beaches. Some of these dogs suffered severe gastrointestinal symptoms and vomiting, while others exhibited neurological symptoms.

Scientists from the Cawthron Institute laboratory have isolated a potent neurotoxin from sea slugs found on Narrow Neck Beach, and this toxin has also been isolated from the vomitus of a dog that died on Narrow Neck Beach. The toxin is **TETRODOTOXIN**, an extremely potent neurotoxin normally found overseas in species such as puffer fish, cone shells and the blue ringed octopus. This is the first time this toxin has been found in New Zealand and the first time it has been found in sea slugs. At this stage it is not known how sea slugs came to ingest this toxin and investigations into other coastal sea life that might contain the poison are continuing. These results indicate that at least one dog death was likely due to the dog eating sea slugs that contained tetrodotoxin.

Tetrodotoxin (TTX) is a potent neurotoxin that is 100x more poisonous than potassium cyanide. It inhibits action potentials (depolarisation) and hence impulse transmission in nerves by binding to the pores of voltage-gated Na⁺ channels, and has no known antidote. Scientists have roughly estimated that the amount of TTX contained in one small sea slug from Narrow Neck Beach would be sufficient to kill a child or dog if eaten. It can cause paralysis of the diaphragm (and other muscles) and death due to respiratory failure, although it is not always fatal.

The toxin found in sea slugs has not been well-characterised as yet and it is not known how similar it is to that found overseas in puffer fish and other sea life. Symptoms due to puffer fish poisoning typically develop within 30 minutes of ingestion but may be delayed by up to four hours; although death has been known to occur within 17 minutes of ingestion. Paraesthesias of the lips and tongue can be followed by sialorrhoea, sweating, headache, weakness, lethargy, ataxia, incoordination, tremor, paralysis, cyanosis, aphonia, dysphagia, seizures, dyspnoea, bronchorrhoea, bronchospasm, respiratory failure, coma, and hypotension. Gastric symptoms are often severe and include nausea, vomiting, diarrhoea, and abdominal pain. Cardiac arrhythmias may precede complete respiratory failure and cardiovascular collapse.

People developing any symptoms within one to two hours of exposure to sea water or sea life should seek immediate medical attention.