

## APPENDIX A

### *Glossary of medical biological terms*

#### **Aetiology**

A causing factor of a medical condition.

#### **Anaerobic**

A biological process in which oxygen is not used.

#### **Analgesia**

Pain reduction or relief.

#### **Anaphylaxis**

Increasing sensitivity of the body to a protein after an initial reaction that may have been mild. The second or third exposure to this protein may cause severe respiratory or circulatory embarrassment, leading to death.

#### **Anemone**

A usually colourful, plant-like group of **Anthozoans** common on reefs. However, contact with human skin of divers or snorkelers they may cause severe, localised skin reactions, and **systemic** symptoms including severe tiredness.

#### **Anthozoa**

The taxonomic Class including sea anemones, and hard and soft corals.

#### **Antibodies**

An **immunoglobulin** or protein formed in the body in response to a specific **antigen** or foreign protein such as bacteria or viruses or venom. Their presence helps prevent symptoms or disease processes on further exposures to the same antigen.

#### **Antigen**

Any protein (including toxins) encountered that may cause the body to produce **antibodies** against it.

#### **Antivenom**

Antibody mixtures produced by an animal after exposure to small doses of injected venom that may be harmful to man. As the doses are small, the injection is not lethal and antibodies are formed. This resultant antibody mixture is then collected from the animal's blood, purified, concentrated, and thus becomes antivenom. It can then be injected into humans to counteract symptoms (or death) produced by the venom of the animal potentially lethal to humans. Antivenom is specific for the venom against which it is prepared, and does not neutralise other venom. A rare exception to this is Tiger snake (*Notechis scutatus*) antivenom that can be used to effectively counteract the venom of the sea snakes if specific CSL sea snake antivenom is not available.

#### **Asystole**

Absence of visible contraction of the heart, and consequent circulation of the blood, which rapidly results in death. This may occur after envenomation.

**Bite**

The use of teeth or other similar hard substance to puncture the skin of a victim, possibly resulting in the introduction of venom (e.g. snake bite). *C/f.* poison and sting.

**Blubber**

Colloquial term for *Catostylus*, the most common rhizostome jellyfish in Australia.

**Bluebottle**

Colloquial term for the single-tentacled *Physalia utriculus*.

**Box-jellyfish**

Colloquial term used by most Australians to refer to *Chironex fleckeri*, but which actually includes every species of the Class Cubozoa.

**Catecholamines**

Hormones released by the body under any stressful reaction, or after envenomation (e.g. Irukandji), that affect the circulatory system, often increasing heart rate and blood pressure.

**Cardiac arrest**

Absence of a palpable pulse, and thus of circulation of blood around the body by the heart contraction. The cause may be asystole or ventricular fibrillation.

**Cardiopulmonary resuscitation**

A combination of mouth to mouth resuscitation (E.A.R.) to oxygenate the blood, and external chest compression (E.C.C.) to compress the heart to help pump this artificially oxygenated blood around the body to maintain tissue oxygen concentration and prevent death.

***Carybdea rastoni***

A small box-jellyfish with a single tentacle in each corner. Common in non-tropical areas such as Western Australia and South Australia, the sting is usually mild, but occasionally may cause severe skin pain. Commonly known as **Jimble**.

**Carybdeids**

Jellyfish members of the Class Cubozoa with a single tentacle in each of the four corners (except in certain rare species).

***Carukia barnesi***

Also known as the Irukandji, *Carukia* is a small, usually invisible, box-jellyfish with a single tentacle in each corner (carybdeid). The sting may be quite mild, and is sometimes not visible on the skin. However, some 30 minutes after the sting a number of severe systemic symptoms called the Irukandji syndrome occur. The symptoms include severe low back pain, muscle cramps in all 4 limbs and the chest wall, restlessness, anxiety, and a "feeling of potential doom" (often shared by the first aider!). Severe hypertension and pulmonary oedema may occur, which may become life threatening, although no deaths have been reported to date. The effects are believed to be due to the excess release of catecholamines.

***Catostylus***

Commonly known as the blubber, *Catostylus* is a rhizostome jellyfish with no tentacles but which has 8 modified feeding 'arms' armed with the nematocysts. Usually causes a very mild sting with slight skin irritation, although more severe stings have been rarely reported.

**Chiropodids**

Jellyfish members of the Class Cubozoa with more than one (and up to 15) tentacles in each corner. This jellyfish group causes more morbidity and mortality than any other in the world does. At present there are 5 common species acknowledged, but current research may change this.

***Chiropodus gorilla***

A multi-tentacled box-jellyfish present on the western coast of tropical Africa. Has the potential to cause human death, although none have been reported to date.

***Chironex fleckeri***

A multi-tentacled box-jellyfish present in tropical Australian waters and responsible for at least 63 deaths since first reported in 1883. Specimens have recently been discovered in Borneo, and are currently believed to be even more widespread in the Indo-Pacific.

***Chiropsalmus quadrigatus***

A multi-tentacled box-jellyfish present throughout the Indo-Pacific, and currently believed to be responsible for regular deaths in many Indo-Pacific countries, amounting to many thousands of deaths over time. Similar in appearance to *Chironex*, leading to some difficulties in identification.

***Chiropsalmus quadrumanus***

A multi-tentacled box-jellyfish present on the eastern coastline of tropical America. It has caused at least one documented death in Texas, U.S.A.

***Chiropsalmus buitendijki***

A multi-tentacled box-jellyfish present in the tropical eastern Indian Ocean, but particularly common around south India, Sri Lanka and eastwards towards Java.

***Chrysaora quinquecirrha***

A jellyfish very common on the eastern seaboard of the United States where vast numbers of nuisance stings occur seasonally (summer) each year. It causes mainly an irritating skin rash, but may cause systemic symptoms including painful breathing, nasal and respiratory catarrh and cough. No deaths have ever been reported. Possibly also present in Western Australia.

**Cilia**

Tiny hair-like cells that beat together, 'wafting', like a field of corn. They have the specialised function of moving substances (e.g.. food) across an area.

**Class**

The taxonomic group below a Phylum, and above Order. See Taxonomy.

**Cnidaria**

The specific term now used by biologists to describe members of a Phylum which are principally marine animals, radially symmetrical, and which have tentacles (i.e. jellyfish). Reproduction usually encompasses a polyp and/or medusa stage. Previously this Phylum was aggregated with others under the term coelenterates.

**Coelenterates**

Animals that have no spine. This group originally contained Spongiaria, Cnidaria and Ctenophora. Coelenterata is a term that generally includes the cnidarians and ctenophores.

As the phylum Cnidaria does not include the ctenophores, the two terms are not interchangeable.

**Cold packs**

An excellent analgesic treatment for the skin pain of many envenomations, especially that of jellyfish stings. It is usually less effective than heat for the treatment of stonefish, stingray and other venomous-spined fish envenomations.

**Compression/immobilisation bandage**

A firmly applied, broad, elastic bandage applied to a limb to prevent the spread of venom injected after certain bites or stings. The pressure is enough to compress veins and lymphatic vessels, but not to cut off arterial supply and so it can remain on indefinitely. The bandage is first applied directly over the envenomated area, and then extended over the entire limb, which is then immobilised in a splint.

**Conjunctivitis**

Inflammation and redness of the lining of the white part (cornea) of the eye.

**Coronatae**

The taxonomic order of grooved jellyfish.

**CPR**

See cardiopulmonary resuscitation above.

**Cubomedusae**

A term that included all box jellyfish species, now mainly replaced by Cubozoa.

**Cubos**

Colloquial name used in the Philippines and other Indo-Pacific countries to describe *Chiropsalmus quadrigatus*.

**Cubozoa**

The taxonomic class of box-shaped jellyfish consisting both of chirodropids and carybdeids.

**Cyanea**

The most-common worldwide jellyfish with a flat, contracting bell with hundreds (thousands in large specimens) of fine tentacles hanging beneath. The size varies from a few centimetres bell diameter with 50cm long tentacles, to bell diameters up to 2.3 meters, with 30 meter long tentacles. Fortunately the sting, although it may cause moderately severe skin pain, usually causes no systemic symptoms, although nausea, vomiting and dizziness have been reported.

**Decompression illness (DCI)**

An illness suffered by divers when diving too deep, or too long and characterised by nitrogen bubbles forming in the tissues of the body. This may cause a multitude of symptoms although joint pains are those most-commonly encountered. Confusion may be caused in divers that have suffered an Irukandji sting as the symptoms have some similarities. See also, cerebral gas embolism.

**Distal**

Description of part of the body that is furthest from the heart.

**EAR**

See expired air resuscitation.

**ECC**

See external cardiac compression.

**Ectoderm**

The outer tissues of an organism from which nerve, gland and nematocyst cells will develop.

**Embolism**

A blockage of blood vessels either by blood clot, fat or air (see gas embolism).

**Endoderm**

The inner tissues of an organism.

**Envenomation**

The injection of a venom into the tissues by teeth, spines, miniature harpoons (nematocysts) or drills. C/f. bite and sting.

**Expired air resuscitation**

The use of expired (used) air blown from a rescuer into the airway and lungs of an unconscious victim who is not breathing, sufficient to sustain his life.

**External cardiac compression**

Compression of the outside of the sternum and ribs, effectively emptying and filling the heart to push blood through arteries to supply oxygen to the body - particularly to the brain.

**Family**

A taxonomic group of similar, related, animals. The taxonomic group that is below Order, but above Genus.

**Fire jelly**

See Morbakka.

**Genus**

A taxonomic grouping of closely related species. The taxonomic category below Family, but above Species.

**Gonad**

Reproductive organ

Lateral gonad – in chirodropids the gonad tissue often originates on the side wall of the bell and is referred to as the lateral gonad.

Superior gonad – chirodropids also have another gonad on the top of the bell which arises on a raised area referred to as the perradial core, or perradial eminence.

**Hypersensitivity**

Extreme sensitivity to any protein, over and above its normal effect. It usually occurs in certain sensitive people after more than one exposure to the offending protein.

**Hypoxia**

Low oxygen saturation (levels) in the body.

**Gametes**

Sperm or ova.

**Gastric cirri**

Hair-like appendages in the stomach of most cubozoan jellyfish. They contain nematocysts and aid in the digestion of the jellyfish prey.

**Gastrovascular cavity**

The digestive system of the cnidarian, consisting of the stomach and its connecting canals which perform a similar task to vascular system of higher orders.

**Genus**

A taxonomic grouping of closely related varieties above Species, but below Family. See Taxonomy.

**Gonad**

A group of male or female reproductive cells, which in jellyfish often line the sides of the stomach, but may extend through the bell of a jellyfish in the most mature specimens, especially the chirodropids.

**Gonionemus**

A small hydroid found around the world. It is usually innocuous, but in one small area of the northern Honshu island of Japan, and in a similar area on the opposite side of the Sea of Japan around Vladivostock, (USSR -originally), a sting causes severe systemic symptoms very similar to the Irukandji syndrome. Similar to Irukandji stings, *Gonionemus* stings occur in epidemics with more in some years than others do. It has not caused a proven death, although some unproven deaths have been claimed in the past.

**Hair jellyfish**

The Australian colloquial term for *Cyanea* - also known as Lion's Mane in many other countries.

**Heat**

An effective **analgesic** for some deeply injected envenomations including stonefish, stingray and other venomous-spined fish.

**Hydroid**

A plant-like member of the class Hydrozoa.

**Hydrozoa**

The taxonomic class including the plume-like hydroids, hard stinging "corals", small jellyfish with bells (i.e. bell-shaped bodies), and members of the order Siphonophora which may be buoyed up by gaseous floats.

**Hypertension**

High blood pressure - usually above 150/95mm Hg.

**Hypotension**

Low blood pressure - usually with the diastolic (the lower level) below 60mm Hg., and sufficient to cause symptoms (e.g.. dizziness/collapse).

**Ice**

An excellent analgesic to stop the skin pain of many envenomations, especially those of jellyfish stings. It is usually less effective than heat for the treatment of stonefish, stingray and other venomous-spined fish envenomations.

**Immunoglobulin**

Body proteins that act as antibodies.

IgG: The immunoglobulin that can be measured in the serum approximately two weeks after a challenge by an antigen.

IgM: The immunoglobulin that can be measured very soon after a challenge by an antigen. The level returns to a non-measurable level very quickly and so this measurement is useful as a test for recent envenomation (or illness).

***In vitro***

In an artificial environment.

***In vivo***

In a living body.

**Irukandji**

A jellyfish and a syndrome name derived from the name of a tribe of Aboriginals near Palm Cove, Cairns in north Queensland where many jellyfish stings with severe systemic symptoms were first reported (and still occur).

**Ischaemia**

Lack of tissue oxygen and nutrients usually due to impaired (arterial) blood flow.

**Jimble**

Colloquial term for *Carybdea rastoni*.

**Kingdom**

The highest taxonomic level. See Taxonomy.

**Lability**

Chemical instability.

**Lion's mane**

A colloquial term for *Cyanea* - used in many Countries other than Australia.

**Little mauve stinger**

Colloquial term for *Pelagia noctiluca*.

**Lymphadenopathy**

Swelling of the body lymph glands which is sometimes painful, especially after **envenomation**. Lymph glands when swollen may be almost anywhere in the body, but are more easily felt in the neck, under the arms (axillae) and in the groins.

**Manubrium**

The tube between the stomach and the mouth of a jellyfish - equivalent to the oesophagus in humans.

**Medusa**

The adult, recognisable stage of a free-swimming jellyfish.

**Mesogloea**

The jelly part of a jellyfish - the thickened substance between the **epidermis** and **gastrodermis** that gives the jellyfish its shape.

**Morphology**

The type of form or structure of a plant or animal.

**Morbakka**

The colloquial name for a number of large box-jellyfish with a single tentacle in each corner. There are probably a number of species that are grouped under this name. The sting causes a burning pain to the skin and rarely, a mild Irukandji syndrome. See also: Moreton Bay carybdeid, and Fire jelly.

**Morbidity**

Something that affects the normal body functioning, but not causing death.

**Moreton Bay carybdeid**

A Morbakka that is often caught in the Moreton Bay area, just north of Brisbane, Queensland. See also: Fire jelly.

**Mortality**

The effects of something that results in death.

**Muscle pump**

The contraction and relaxation of the limb muscles that helps pump the low pressure venous blood from the extremities back to the central collecting system.

**Nematocyst**

The stinging cells present on the tentacles (and the bell of some species) of **cnidarian**. Each nematocyst contains a **nematocyte** – the actual injecting mechanism: -

**Nematocyte**

consists of an coiled tube that may be bathed in venom. When the trigger on the outside of the nematocyte is touched, the tube rapidly inverts itself firing rather like a harpoon into the tissues of the prey. Venom on the outside of this tube is thus deposited in the tissues, and possibly into blood vessels during this trajectory. Finally, in some specialised **nematocysts**, venom is then discharged through the open end of this thread tube and is deposited in the tissues of the prey.

**Neurone**

The cell of a nerve responsible for transmission of the signal along the nerve fibre.

**Ocellus**

The "eye", present midway between the corners of cubozoan ("box") jellyfish. It is capable of distinguishing light and dark, and is probably responsible for evasive action by the jellyfish.

**Oral**

Relating to the mouth. The area of a jellyfish with the mouth opening.

**Order**

The taxonomic term for a group above Genus, but below Class. See Taxonomy.

**Pacific man-o'-war**

The colloquial term for the multi-tentacled hydrozoan colony *Physalia physalis*, recently described on the eastern coast of Australia.

**Parental**

Administration, other than orally, of a substance e.g. intramuscular or intravenous.

**Paraesthesiae**

Tingling and burning in the skin frequently described as "pins and needles". It is caused by irritation of cutaneous nerves by a variety of causes including trauma and envenomation.

**Pedanium (pl. pedalia)**

The four flattened "corners" of cubozoan (box) jellyfish from which arise the tentacles - unlike other jellyfish where the tentacles arise from many, or any, areas of the bell.

***Pelagia noctiluca***



A very common jellyfish known as the little mauve stinger, which has occurred in severe 'swarms' in the Mediterranean Sea. The sting causes moderate skin pain, but may also cause systemic symptoms such as cough, sneezing, painful breathing and nasal catarrh. It has not caused death, but one severe case of potentially fatal anaphylaxis occurred in Greece.

**Pelagic**

The open sea (ocean) habitat of some animals.

**Perradial core/eminence**

A rounded protuberance from the top of the bell of chirodropids from which gonad tissue develops – referred to as the superior gonad

**Phylum**

The taxonomic group below a Kingdom, and above a Class. See Taxonomy.

***Physalia***

A siphonophore or hydrozoan colony that is usually regarded as a jellyfish by non-biological people. It has a float, rather than a bell and the tentacle(s) hang beneath. There are two main varieties:

*Physalia utriculus*. A single-tentacled species common in the warmer waters of the world.

*Physalia physalis*. The multi-tentacled species found worldwide, but commonly on both sides of the North Atlantic.

**Placebo**

An inert substance with no actual effect, but administration of which may produce a beneficial effect to help a patient (e.g. pain relief).

**Polyp**

The immature life-cycle form of a jellyfish (or other cnidarian) which is attached to a substrate.

**Poison**

A toxin which introduced to the body via the gastrointestinal tract or the respiratory tract.

**Portuguese man-o-war**

The colloquial term used for the multi-tentacled hydrozoan colony of *Physalia physalis* common in the North Atlantic Ocean.

**Proximal**

The area of the body that is closest to the heart.

**Pulmonary oedema**

Fluid in the small air sacs of the lungs, from inefficient pumping by the heart or leakage of fluid from the blood vessels in the lungs (possibly from envenomation). As it prevents air exchange in the lungs it causes hypoxia and may lead to death.

**Pyrexia**

A fever - a raised body temperature (above 37°C in humans).

**Quaddies**

Colloquial name used in northern Queensland to describe the Australian *Chiropsalmus quadrigatus* (there is currently some doubt about the accuracy of this species name).

**Renal failure (acute)**

Inefficient functioning of the kidney, leading to death unless acute medical attention is available. Rare but reported after jellyfish envenomation.

**Respiratory arrest**

Cessation of breathing, often caused by envenomation (or poisoning).

**Rhizostome**

A member in the Order of jellyfish having 8 modified mouth arms armed with nematocysts, rather than the usual tentacles. Each mouth arm has numerous small mouth openings rather than the usual single manubrium.

**Rhopalium (pl. rhopalia)**

The specialised structures present in the sensory niches between the four pedalia of cubozoan (box) jellyfish. It houses the ocellus (eye) and statocyst (balance organ). Rhopalia are also present, although less obvious, in scyphozoan jellyfish.

**Scyphozoa**

The taxonomic Class for most jellyfish except the cubozoans.

**SCUBA**

Self-contained underwater breathing apparatus.

**Sea lice**

A colloquial term used for any creature or anything present in seawater causing a mild irritation of the skin, either with or without a rash. There is no single creature responsible for this stinging effect.

**Sea nettle**

Colloquial term for the North American *Chrysaora quinquecirrha*.

**Semaeostomeae**

The taxonomic order of scalloped jellyfish.

**Serum sickness**

A complex systemic reaction that may become evident any time up to 14 days after antivenom use. Symptoms are fever, generalised lymphadenopathy and an urticarial rash. Severe cases of serum sickness may have to be treated with oral steroids. The incidence of serum sickness is often related to the amount of antivenom used.

**Shock**

Collapse of the circulation resulting in inadequate tissue perfusion to the body cells.

**Siphonophora**

The taxonomic group of hydroids that are not single animals, but colonies of animals. They may be either free swimming or floating, with or without a float. The genus of dominating medical importance is *Physalia*.

**Snottie**

A colloquial term for *Cyanea*. Also known as the Lion's mane and Hair jellyfish.

**Somatic**

Of the body.

**Species**

The lowest taxonomic grouping of closely related varieties - below a Genus. See Taxonomy.

**Statocyst**

A jellyfish balance organ, usually consisting of a calcium or magnesium carbonate crystal, the movement of which against surrounding cilia enables the medusa to determine its position in the water.

### **Sting**

The painful injection of a venom through skin or mucous membranes of a victim. *C/f.* bite and envenomation.

### **Stingers**

A colloquial term to be avoided. In tropical Australia the term usually refers to the lethal box-jellyfish *Chironex fleckeri*, whereas in the rest of Australia it may refer to any stinging jellyfish which are non-lethal.

### **Stingose**

20% aluminium sulphate solution - useful for itching caused by some insect stings, but less effective (or ineffective) for the skin pain of jellyfish envenomations.

### **Stomolophus**

Usually an innocuous **genus** of jellyfish represented by *Stomolophus meleagris* worldwide. However, in areas of East China around Behoe, on the East China Sea, there have now been 8 reported deaths from a rare species called *S. nomurai*.

### **Strobilation**

A form of asexual reproduction in some **cubezoan** jellyfish in which miniature medusa-like structures are formed, often one on top of the other, resembling stacked dinner plates.

### **Subumbrella**

The area of a jellyfish under the bell.

### **Symbiotic**

A close relationship between two species which usually works to the advantage of both.

### **Systemic**

Involving the whole body or organism, and not just individual parts.

### **Tamoya**

A Genus consisting of large carybdeid jellyfish from around the world possibly covered by the colloquial term, Morbakka.

### **T-cell**

A specialised white cell (lymphocyte) responsible for cell-mediated immunity.

### **Taxonomy**

Systematic binomial classification of all living things.

e.g.	Kingdom	Animalia
	Phylum	Cnidaria
	Class	Cubozoa
	Order	Chirodropidae
	Genus	<i>Chironex</i>
	Species	<i>Chironex fleckeri</i>

**Tentacle**

Long, usually thick, hair-like structures that contain the nematocysts needed for the capture of food. They may also be used to deliver such food to the mouth of the jellyfish. They may contract up to a tenth of their extended state.

**Tourniquet**

A very tight ligature applied over the **proximal** portion of an extremity (limb) to occlude the artery to prevent blood reaching the distal part of the limb. Useful for severe, uncontrolled arterial bleeding, but dangerous when used for envenomation.

**Toxin**

A substance that is harmful to the tissues.

**Trauma**

An injury to the body from a mechanical force.

**Vaccination**

Injection of a vaccine to prevent certain diseases.

**Vaccine**

A preparation of dead or weakened bacteria or virus prepared for injection into the body so that antibodies are formed to prevent disease (e.g. tetanus).

**Velarium**

A folded-in extension of the edge of the bell in Cubozoa that helps create a jet of water to propel the jellyfish forwards. It may contract differentially to enable a change of direction.

**Venom**

A toxin which usually enters the body by injection through intact skin (e.g.. a jellyfish sting).

**Ventricular fibrillation**

A very fast 'flickering' of the heart with no measurable circulation of blood by the heart. This usually occurs after a heart attack (or electrocution).

**Vesicle**

A fluid-containing blister on the skin, often quite itchy.

**Vinegar**

Acetic acid (4-6%) - this totally de-activates the nematocysts of all cubozoans (box-jellyfish) tested to date. Despite popular misconception it has no effect on the venom injected and does not help pain.

**Zoid**

A specialised structure serving as an organ of a **siphonophore** such as *Physalia*. Different individuals in the colony often take on specialised functions such as feeding, defence and reproduction - up to a thousand zooids may be found in a single colony.