

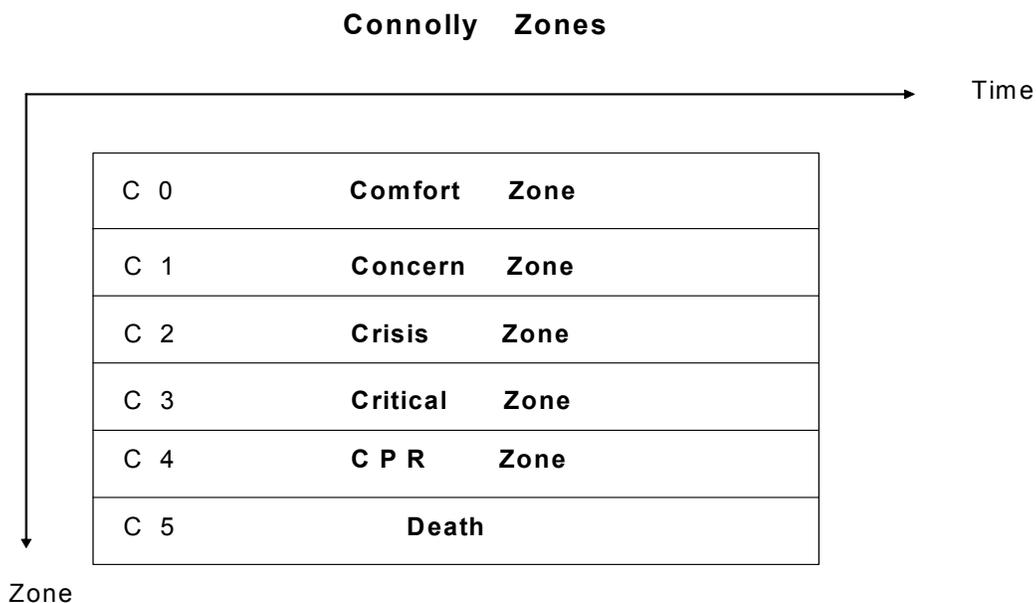
C Zones - The Connolly Framework

Purpose

Lifesavers, when gathered together, often discuss and analyse rescue and drowning incidents. This framework is intended as an aid in such discussions ; simple enough to be easily remembered and quickly drawn on a piece of paper yet sufficiently detailed to be a serious analytical tool. It also serves as a teaching aid offering a visual overview of rescue options and their consequences at various stages in the drowning process. The use of multi-coloured or broken / wave lines permits the comparison of numerous casualty variations and outcomes on one framework.

Method

Vertical, horizontal and diagonal lines drawn on a series of six connected rectangular zones on an **X** (seriousness) and **Y** (time) axes are used to model the progress of any water incident from its beginning to either a survival or fatal conclusion.



C 0 : Comfort Zone

A person feels comfortable and non-threatened - near, in or on water.

C 1 : Concern Zone

The person's feelings change from being comfortable to being concerned e.g. a fall into deep water.

C 2 : Crisis Zone

The person believes that his / her life is threatened. It is possible to drop from **C 0** to **C 2**.

C 3 : Critical Zone

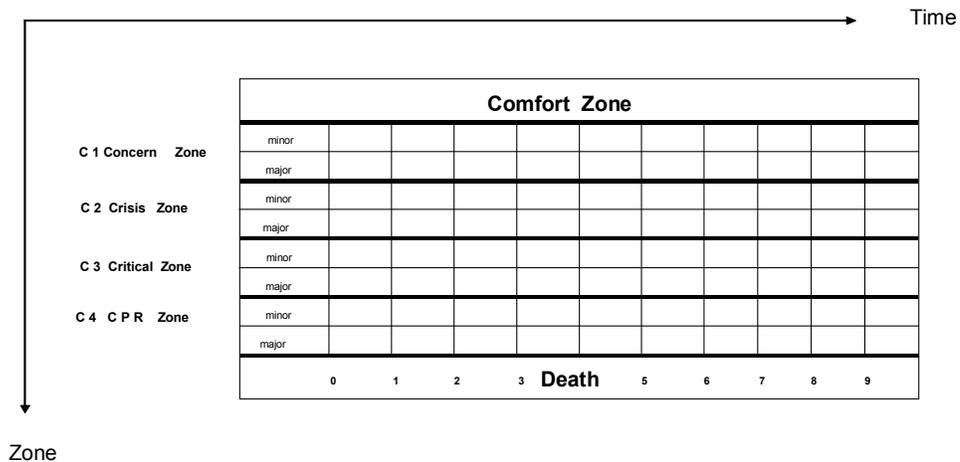
The person is unable to self-help or is close to exhaustion, may be about to panic or already there. Survival time is measured in seconds.

C 4 : C P R Zone

The person is unconscious and in need of immediate life support.

C 5 : Conclusion (Death)

The person is dead and beyond all help.



C 1 : Concern Zone

Something happens to change a person's feelings from being comfortable to being concerned. The new feeling can range from **minor concern** (a strong swimmer trips and falls into a harbour and is simply annoyed at getting her clothes wet) to **major concern** (a weak swimmer falls into a harbour, is having difficulty swimming and breathing , but still thinks that he can swim the short distance to safety). **Some action, either self-help, external aid or a combination of both, is needed to restore the comfortable feeling .**

C 2 : Crisis Zone

The person believes that their life is threatened. In the **minor crisis zone** a person is aware that there is a serious problem that could end in death but this is not thought to be a likely outcome. It could be the weak swimmer who thought that he could swim to safety and is realising that he cannot. He thinks that he may be able to remove some of his outer clothing and complete the swim or swim to a nearby mooring rope and wait for help holding on. In a short period of time he has dropped from the Comfort Zone, through the Concern Zone and into the Crisis Zone. In the **major crisis zone** the person believes that unless something positive happens immediately they will die; a non-swimmer entering deep water would drop straight into this zone. Our swimmer, in the minor crisis zone may successfully remove some of his outer clothing but swallows so much water in the process that he can no longer breathe and is close to total swim failure and has therefore entered the major crisis zone. Should he, however, reach the rope and holding on gradually restore his breathing he would plateau in the minor crisis zone awaiting rescue or after a period of rest and acclimatisation may be able to complete the swim unaided, thereby returning to the comfort zone.

C 3 : Critical Zone

The person is unable to self-help or is physically exhausted and may be close to a state of panic or already there - survival time is now measured in seconds. In the **minor critical zone** the person has not panicked yet and may have enough energy for one last effort. In the **major critical zone** the person is unable to self-help and is in a panic. The weak swimmer fails to reach the mooring rope, and is drowning. Persons in the major critical level are in need of immediate rescue or they will lose consciousness.

C 4 : C P R Zone

In this zone the person is unconscious and in need of immediate life support. Immediate removal from the water followed by the performance of **Cardio Pulmonary Resuscitation** is **minor CPR**. **Advanced Life Support - CPR** combined with the use of resuscitation equipment, oxygen and drugs is **major CPR**. Factors such as length of submersion before resuscitation, water type and temperature, body size and age influence how long it will take a person to move through this zone i.e. from falling unconscious to clinical death (cardiac failure) and finally biological death.

AXES :

Seriousness: The lower down the person is in the framework (vertical axis) the closer he/she is to death. The provision of help can lift the person up to the Concern Zone or back to the Comfort Zone. Casualties can drop vertically through a zone e.g. through C1 to C2 or even into C3 .



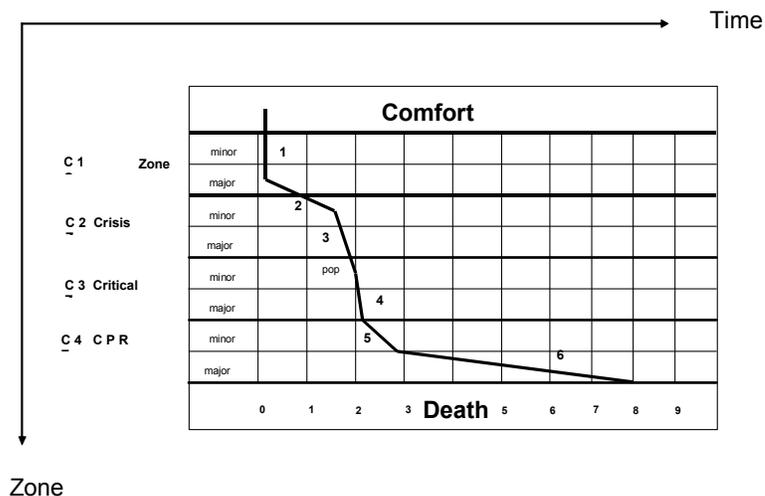
Time : The horizontal axis shows elapsed time starting at entry to the Concern Zone and ending at the return to the Comfort Zone or a drop into the Death zone. This can be in units of minutes or even hours as desired. The standard will be 10 one minute units.

PI : Point of Intervention **The point at which help is made available.**

It cannot be assumed that the further down the zones that help is offered the greater the help will need to be. A reaching rescue may be sufficient to rescue a casualty in the Major Critical Zone but greater self-safety awareness is required.

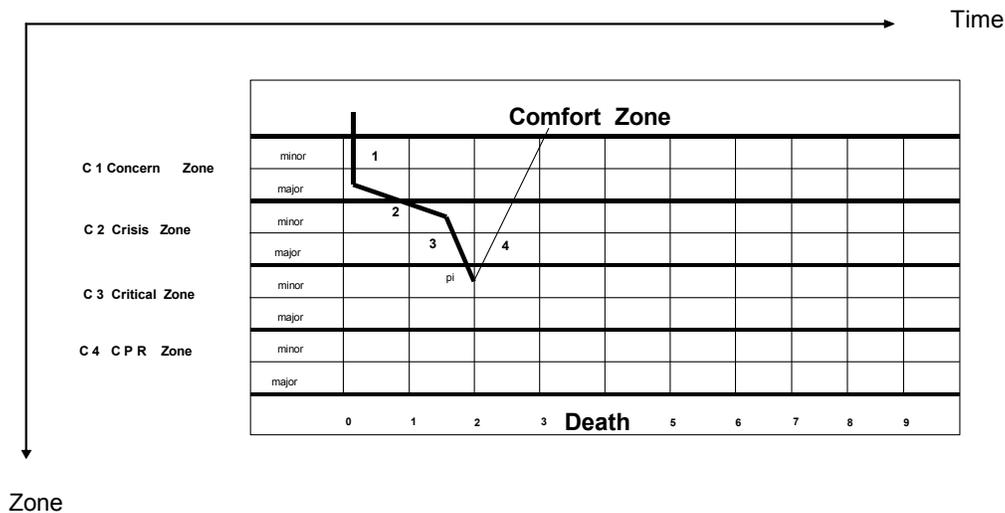
POP : Point of Panic **The point at which the person panics.**

At this point the person loses the ability to self-help and becomes a serious danger to rescuers. Progress downwards through the zones is accelerated (close to vertical) after this point to the CPR Zone when the person has lost consciousness.

Examples**Weak Swimmer falls**

1. A swimmer unexpectedly falls into a dock fully clothed
2. He starts to slowly swim in clothing towards safety
3. Experiencing great difficulty he stops to tread water and remove some clothing
4. Having stopped and dropped his legs he has difficulty keeping his head above water and breathing so he panics (pop)
5. Unable to breathe or swim he sinks and falls unconscious; his heart stops and he becomes clinically dead
6. Starved of oxygen his brain cells begin to die and soon he is biologically dead

Weak Swimmer falls into Dock / Rescue



1. A swimmer unexpectedly falls into a dock fully clothed
2. He starts to slowly swim in clothing towards safety
3. Experiencing great difficulty he stops to tread water and remove some clothing
- pi . Point of Intervention - a ring buoy is thrown to the swimmer
4. The swimmer is towed to safety and helped from the water.

SWIM FAILURE

In their book *Essentials of Sea Survival (2002)* Golden and Tipton describe their swimming experiments with fully clothed fit competent swimmers and conclude '... that swim failure during the first minutes of cold immersion is related to raised respiratory frequency, possibly by making it extremely difficult to co-ordinate swim stroke with breathing. Normally, a swimming individual will breathe once per swim-stroke cycle, and the ratio of swim stroke to breaths therefore equals one. When respiratory frequency soars on immersion, voluntary control of breathing becomes almost impossible. A large mismatch in the ratio of swim strokes to breathing results, increasing the chances of aspirating water and drowning. Another consequence is that swimming becomes inefficient. The person assumes a more upright position, attempting to keep the mouth clear of the water by using rapid, relatively inefficient paddling movements. In turn, this upright position increases sinking force and drag, necessitating even greater effort. A vicious circle results. The person begins to panic and sink.' (p.71)

They also state 'A popular misconception about drowning is that it is caused by the weight of saturated clothing 'dragging people under.' This belief has led to the misguided advice to undress in the water, an action that reduces total insulation. But because water does not weigh anything in water, it is not this that drags people under. Rather, a loss of buoyancy occurs when air escapes from within the fabric of the clothing. On initial immersion, air contained within clothing provides helpful buoyancy. After a time, which varies from seconds to minutes depending on the clothing worn and movement, the air escapes, thereby lowering the body in the water and reducing the distance from mouth to water. This requires the person to lift the head higher out of the water to breathe, which may cause the person to enter the vicious circle described previously.' (p.74)

Golden, Frank. and Tipton, Michael. (2002) *Essentials of Sea Survival* Human Kinetics

John Connolly (2004)

11 Iveragh Close, Lismore Lawn, Waterford City, Ireland.
lifesavingfoundation@ireland.com