

It Won't Happen to Me!

by Frank Catt >>

This third part of my cautionary series is very hard to write, as it directly follows Michael Schumacher's accident, with the world's sudden awareness of brain injury accidents. Michael is, of course, not the only injured person lying in a medically induced coma, or a more permanent result of brain damage if the medication has been withdrawn. As I write, Michael is showing little more than reflexive reactions to stimuli, which is not encouraging. There are others, including drivers, lying in similar states after head impact with the framework within their vehicles, and of course those who have succumbed to such potentially fatal injuries.

Medically Induced Coma Can be induced by powerful anaesthetics, and is broadly similar to the sedation and artificial ventilation used during surgery. It is used to shut down many brain functions, and so lower blood flow and pressure.

Taking a patient out of an induced coma by reducing anaesthesia and removing mechanical ventilation is a dedicated process, especially after a prolonged period of sedation. Doctors will be looking for any signs of returning consciousness and recovery. The public perception is that people just wake up and start their everyday activities after a couple of days. **THAT'S NOT THE CASE!**

There has been a lot written in the media over the last 6 weeks about the Schumacher accident, and however you look at it, and as sad as the results (so far) are, the facts are that he was wearing a helmet, he was travelling in open air and at a substantially lower speed than could be anticipated in an enclosed motor vehicle. This accident is very similar to that to Mark Donohue in 1975 in a F1 race car. In both cases, the injured person was cognitive after the accident, was able to talk to their rescuers and was mobile enough to help themselves, but in both cases, the quick onset of deterioration by the build-up of blood pressure within the brain caused rapid decline, and in Donohue's case, death.

Donohue's head injury was officially ruled to be through head impact with a trackside fencing post, but at that time some F1 race cars, which included the car he was driving, had forward-facing roll bar supports very close to the side of the driver's head on each side. At the time it was decided that he was injured by head impact with these bars; this immediately resulted in the ban on such structures.

Of course, both of these guys were wearing crash helmets!

Most of us who have worked on our cars have on occasion moved quickly and knocked our head on a hard surface, and you know it bloody well hurts. Some of us may have fallen from a bike or been knocked in a sports game, and we laugh it off. Do it just a bit harder and the consequences can be far more serious.

I lost a close friend 3 years ago in a road accident.

He and his daughter were travelling together in his road-legal Caterham 7, fitted with the works roll over cage for his club racing and track day use. In a low speed road accident he was killed, and his daughter is, and will be permanently, unable to carry out even the most basic functions for herself, but continues to fight every day with a determination that cannot be imagined. Both of them were injured by head impact onto the foam-covered roll cage steelwork.

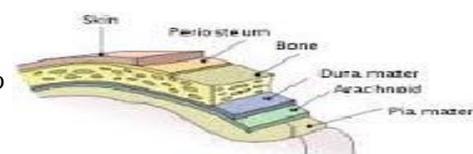
We are also aware of other accidents in this last year involving head impact injuries, causing both death and possible lifetime-permanent injuries through head impacts, and it is imperative that all who read this, or are invited to travel in any vehicle fitted with (supposedly) 'safety cage' structures, should be aware of the dangers that may be just around the next corner, and that your life could be materially changed forever in an instant.

The technical and medical description of head injuries is complex, but let me try to make some of that clear below.

As we all know a head injury can be anything from a minor event to a life threatening situation.

Brain tissue is soft and protected by the skull.

Below the skin of the scalp lies a layer of *periosteum*, which covers the outside of the skull. Below this is the bone of the skull, and below the bone lies the *duramata*. Below this is another layer called the *arachnoid*, with below this, the brain itself.



When we suffer a head injury, there is a risk of **Traumatic Brain Injury** (TBI), which will have consequences ranging from death to permanent or temporary disability.

Brain damage usually occurs as a result of bleeding, with consequent pressure on adjacent brain tissue, which may be deprived of oxygen. Because the brain is surrounded by the skull, an injury may result in a rise of pressure within the brain, known



SUBDURAL HAEMATOMA The arrowed pale grey area is blood putting pressure on the brain

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as raised intra-cranial pressure (ICP). The rise in pressure may be due to brain tissue swelling, due to the trauma, or due to bleeding causing a collection of blood known as a haematoma, which in turn increases the pressure within the skull.

The bleeding may occur within the brain tissue (intra cranial haemorrhage) or under the layers described above. A *subdural haematoma* is a collection of blood under the duramata; a bleed under the arachnoid is known as a *sub-arachnoid haemorrhage*.

A phenomenon known as *contra coup injury* may result in damage to the brain on the other side from the site of impact.

Skull fractures are a common result of direct trauma to the head. Any fracture of the skull indicates that considerable force has been applied to the skull and consequently underlying TBI may have occurred.

A *simple linear fracture*, in which the bone is not displaced, may not require any specific treatment but may be associated with TBI. A *depressed fracture* is diagnosed when the bone of the skull is pushed in towards the brain tissue.

If there has been a laceration to the scalp or injury to the sinuses or middle ear the fracture is called a *compound fracture* and carries the serious risk of infection of the meninges of the brain (*meningitis*) which may itself be life threatening.

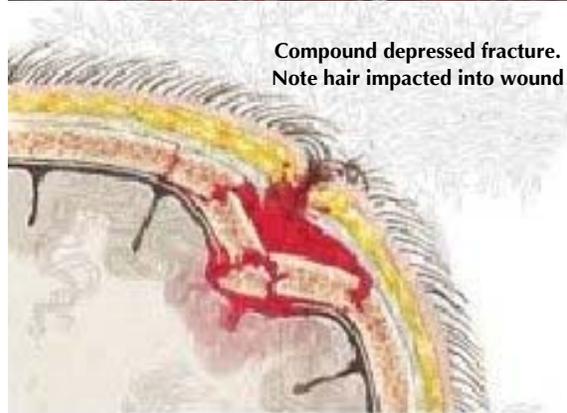
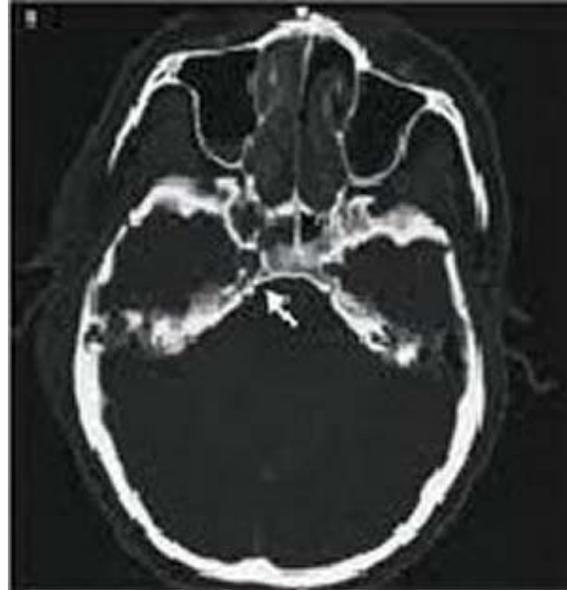
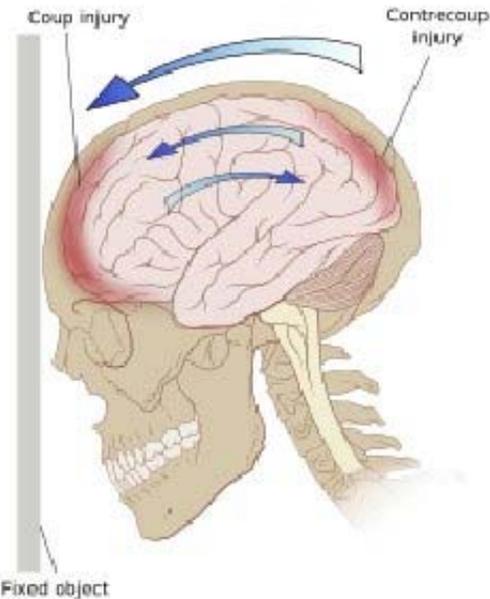
A penetrating skull fracture, as suffered by Felipe Massa, carries this risk obviously accompanied by direct damage to the brain from the penetrating object.

A *basilar fracture* is a fracture occurring at the base of the skull. These can be difficult to diagnose and may cause serious damage to vital brain structures. There is also an increased risk of infection and loss of cerebro-spinal fluid (the fluid that usually surrounds the brain and spinal cord).

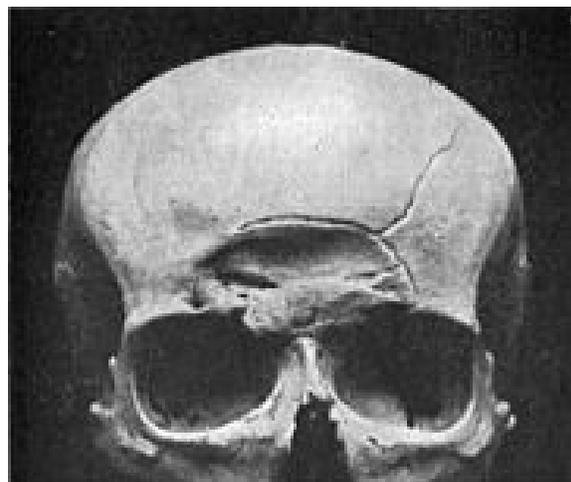
Prompt diagnosis and treatment is essential. The use of CT (computerised tomography) and MRI (magnetic resonance imaging) has transformed the management of head injury in the last few decades; nevertheless TBI remains a major threat to life and a serious cause of sometimes profound disability.

TBI can cause a wide range of problems including death, physical impairment, such as loss of movement or sensation, but may also result in cognitive impairment such as poor memory, emotional impairment and behavioural difficulties. The long term outcome ranges from permanent disability to complete recovery.

As I said at the beginning of this article, we all, you and me, do not consider it can ever happen to us, and we find it totally shattering to be told that a family member or close friend is dead, as I know when I was to be told that the guy I had spent a day with at



Compound depressed fracture. Note hair impacted into wound



Brands Hatch was killed the next day in a road accident.

If you have not done so, please read the 2 foregoing articles of this trilogy in *Fortyfication* 97 and 100, and be aware that the "safety cage" or as some call it "roll over cage" might just be a silent killer you never suspected.

The relevance of all this started long before the Schumacher injury, but it has now been brought into sharp public notice by media interest. We can of course say that the media sensationalise these stories, there is nothing sensational about lying comatose in a hospital bed with half a skull removed and pipes connected to every part.

This is a very complex subject that could take up the whole of this publication, yet could still miss an argument or point of detail; it is very much intended to make you stop and think, hopefully to save an injury and the distress of others who rely on, or even love you.

Further and much more in depth research is going to continue; we are talking to the Motor Sports Association, insurance companies, research and development companies and more.

Of interest, one company have made the following comment.

"We have reviewed the articles written by Frank Catt and published in the GT40 Enthusiasts Club magazines and will be reviewing guidelines in relation to these 'safety cages'. Additional investigative work will also be carried out. Safety is, and always will be, the number one factor when using a vehicle. If there are clear elements that reduce safety in a vehicle then it is likely that companies will react with caution when being asked to approve vehicles fitted with such or similar structures."

Now ask yourself,

1. 'Why have I got/why am I considering fitting an internal roll-over safety cage inside my car?'
2. 'What is its purpose?'
3. 'Am I more likely to have an impact crash, or

am I more likely to roll the car over onto its roof?'

4. 'If I have an impact crash, will my head be likely to impact the steel structure?'
5. 'If I have a roll over accident, am I going to be able to exit the car quickly, considering that it will not be possible to open the doors without external assistance?'
6. 'Am I more likely to be at greater risk if I am trapped inside the car, considering that I am surrounded by a potentially leaking fuel system?'
7. 'Have I fitted/am I considering fitting the cage for alternative reasons?
 - a. because I am a poser and want to impress my mates that I am a race driver?'

b. because the I think/ am advised that the structure of my car needs the additional bracing that the cage may give to the original chassis design?'

8. 'If I have an impact crash, will my head or my passenger's head be likely to impact the steel tube roll over cage?' *I know, repeat of 4, but it is the question you must ask yourself again and again. The answer is YES, however you look at it and try to*

reason that the answer is NO. It's YES!

9. 'I can fit sponge bar protector over the steelwork which I AM ASSURED will be safe.' *No, it will not, unless your impact is at less than 20 mph AND you are wearing a helmet!*
10. 'If I have a fully fitted MSA/FIA certified and approved race belts; there is no way my head can reach a position to impact onto the cage steelwork.' *Don't believe that either; the human body has remarkable flexibility, and in extreme conditions can stretch the vertical column (your spine and neck) considerably more than its rest position, to a point that it will impact onto something well beyond its normal capability in normal conditions. Add to that, the seat belts and mountings will stretch to a degree, and any crash-caused deformity in the car's structure itself will add to the distance the head can travel in a very short space of time.*

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