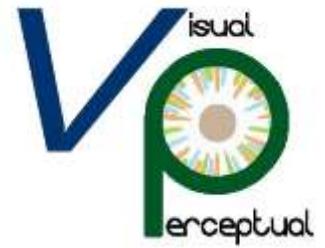


# VPP & Understanding Traumatic Brain Injury



***Improving upon cognition is really no  
different to taking the kink out of the garden hose***



In recent years, concussion has become an area of great focus, especially in the sporting world. The potential for ongoing issues to occur, as a result of a blow to the head, is very real.

I have been involved in the treatment of neurological and cognitive deficits from head injuries, for nearly 30 years. In the early days of my career, I found this to be a frustrating experience, because I knew my clients were capable of achieving far greater progress, than the therapy of the time ever allowed them to achieve. As I write this I have to say that, unlike so many other areas of our world, the treatment of neurological cognitive based disorders has not really advanced at all. We might have a great many more labels and diagnoses, but the nature of the therapies and other interventions they have access to, has not really changed at all.

I intuitively knew that there was more to discover about neurological and cognitive conditions and their treatment and I wanted to know what I was missing. 1996 found me in the USA, again being confronted by my frustrations, only this time I got the answer to my question. A moment of insight revealed something deeper, something that is typically beyond our vision.

That moment of insight has led to over 20 years of exploration of the world of visual perceptual performance and it has informed everything I now do in treating traumatic brain injuries. It has allowed me to identify the exact point where every client's performance breaks down,

resulting in the deficits and struggles we see in their everyday life. But not only does this change in perspective allow me to see what has gone wrong for my clients, it allows me to intervene and improve upon their performance in ways I could not have imagined were possible.

## Concussion

Concussion is generally defined as: a temporary unconsciousness or confusion, and other symptoms, caused by a blow on the head. However, I do find it interesting that this term has been adopted for use when referring to mild traumatic brain injury. In my conversations with members of the public I find that most people typically believe that concussion is not as significant as a brain injury and that its consequences are not as severe or debilitating, and that people tend to 'get over it.' Personally I find the use of the word concussion to be a minimisation of traumatic brain injury and that we are doing no one any favours in using it. I have seen many a person who has suffered a relatively minor head injury and it has been devastating in terms of its impact on their lives and function. A brain injury is a brain injury and, while head injuries present in a wide range of different ways, it doesn't actually alter many of the issues faced by people who have suffered such an event.

The reality is that there is actually no way of knowing whether or not the symptoms of a head injury are temporary or going to continue on into the future. I tend to also find that the symptoms of minor head trauma often go overlooked, or blamed onto other issues, by people who do not have a background in the functional performance associated with such injuries. I am quite happy to say that, unless the person offering advice has been involved in the active treatment of the cognitive deficits that head injuries typically cause, what they have to say should probably be checked out with people who do provide such treatment. Simple memory tests and the like are no replacement for a solid evaluation of cognitive function.

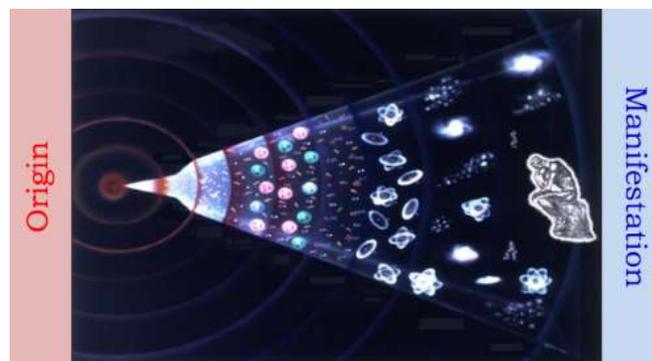
The reality is that the functional performance of the client is the bottom line. How is that person performing after the fact? What are they demonstrating by way of their actions and performance and what are they experiencing in their everyday life? And the reason why it is so important to receive a full and competent evaluation following a head injury is that any subsequent injuries often compound the previous injury, and do so exponentially, even when the person is seen to have made a 'full recovery.'

As an occupational therapist, I am a member of a profession that has historically treated head injuries. To this day occupational therapy is the only profession addressing function across all areas of human performance ie: neurological, cognitive, physiological, psychological, social and emotional areas of performance. I have watched with some interest, as other professions have moved into the



treatment of these injuries, often without the understanding of the functionality of neurological and cognitive based performance. Such understanding needs to be a fundamental requirement, in determining what level a person is performing at and what level of engagement they are ready for. Understanding such things from a superficial or cursory perspective will always have an adverse impact on outcomes simply because the client's situation will not be managed effectively and the likelihood of exacerbating their situation is substantially

Understanding human function also allows us to understand how skills, abilities and processes translate into outcomes; however, my understanding of visual perceptual performance has done much, much more for my clients and their return to full function. For a start, we can achieve much better outcomes and do so a whole lot quicker, because we are no longer attempting to improve upon performance from a superficial or symptomatic perspective. Treating these conditions from the point our functionality arises from, widens our perspective on what is actually going on for the client and where their performance is breaking down, allowing for targeted interventions to occur.



One of the other downsides of contemporary treatments for neurological and cognitive deficits is that, because the actual problem is not identified at its core, a client can compensate for a deficit and the clinician will not know this. These days I have a natural aversion for requiring anyone to perform complex and multiple demand tasks<sup>1</sup> as a part of their therapy program because it is pretty much guaranteed to facilitate the use of compensatory techniques and, such techniques always has a downside and will mean that the client will never actually achieve their maximum level of performance.

Over the years, I have worked with many people who have been allowed to compensate. Often what I find they are doing is missing out or skipping over vital steps in the process associated with performing tasks. The reason why they do this is that they do actually achieve an

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<sup>1</sup> Complex and multiple demand tasks are tasks which contain a lot of information and are anything but simple. They often have more than the 3 basic steps required, in order to promote functional mode of performance. Walking (especially with an assistive device), dressing, meal preparation, reading, writing, social interactions are all complex and/or multiple demand tasks

outcome; it's just that it's never fully functional and just doesn't quite work out how it needs to or results in the development of other issues down the track. And I always find that this has been allowed to happen because 'it's better than nothing' or because the clinician is ignorant of the consequences of their action. However, there is another reason why this happens and that is because the clinician does not understand, or even know about, the level of performance underpinning everything that we do – visual perceptual performance.

## *Treatment of Traumatic Brain Injury*

Concussion is a traumatic brain injury. It is an injury caused by a blow to the head, either by something connecting with the head or the head connecting with something, with or without the skull being penetrated. These injuries also cause the brain to be thrown around inside the skull, which is not only another hard surface, but also a very rough surface as well. The brain is bruised, exposed to various sheering forces and thrown across the rough inner surface of the skull. It is possible to suffer some rather catastrophic damage from some relatively minor forces.



When I discovered the world of visual perceptual performance, a whole new understanding of traumatic brain injuries emerged. While I began working in this field over 20 years ago, I had been trained into the same contemporary understanding of neurological and cognitive performance that is still in use today. However, probably one of the most amazing things visual perceptual performance revealed to me was how much we assume about the tasks we perform. We assume so much of what we do is simple or easy when the opposite is actually true and this is the primary reason why complex and multiple demand tasks are typically used in rehabilitation. Ultimately, the only thing that makes a task simple or complex is the amount of sensory information it contains.

Fundamentally, simple is best in the treatment of traumatic brain injury, but we also need to understand how it is we actually perform the tasks we do. What I have found is that we have some very basic and core skills, which are used in absolutely everything we do. However, people with cognitive deficits always demonstrate a breakdown in these skills. Conversely, when they regain those skills, their struggle resolves and they no longer demonstrate cognitive deficits. It turns out that terms such as: memory, judgment and reasoning, motor planning, problem solving and decision making, comprehension, etc are only ever outcomes of the consequence of something deeper and more subtle ie: our perceptual performance.<sup>2</sup>

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<sup>2</sup> Perceptual performance is the term used to represent the entirety of perception. Visual perceptual performance has the priority within human beings, simply because it is visual perceptual performance that allows us to refine our performance and perform the amazing tasks we can.



Believing we are treating cognitive issues from a cognitive perspective is no more than smoke and mirrors – very much like believing in sea monsters because we have never looked beneath the surface of the waves and discovered ‘fish.’

My exploration of visual perceptual performance gave me a revelatory understanding of where our capacities arise from, and what was underpinning the skills and abilities we commonly believe we possess and are performing. Ultimately, these things we commonly refer to in life – memory, judgement, decision making, motor skills, etc, reveal themselves to be an appearance only and that something else, far more profound is going on beneath the surface.

In order to understand where what we are observing is actually arising from, we need someone to show us the way. I’m going to do that now by using memory as an example.

Memory is something we all talk about and seem to have a first-hand experience of; however, no one understands how it works. There are certainly have a lot of **ideas** about memory and we can also put someone under a functional MRI and see what areas of the brain light up when remembering; but how it works is remains a mystery.

One of my earliest observations around memory was that people were ‘forgetting’ the peripheral aspects of the task ie: anything but the central theme or core of the task. This also showed up in my evaluation of these clients; however, it soon became apparent that ‘memory was not the issue and it was all about the integration or, rather, the lack of integration of information contained within the task. I also saw how quickly these ‘memory deficits’ could be resolved, usually in our first therapy session.

Fundamentally, a brain injury damages the fibres of the brain, severing connections.

Because the function of the brain is refined on the basis of how we integrate sensory information, any damage done to it doesn’t only affect just one area of performance; it will affect all areas of performance. By this I mean that whatever a client is doing in one task, they will be doing in all tasks, and so, if they are skipping vital steps in one place, they will be doing this across the board.

Improving upon or refining performance is a process whereby a substantial amount of information is integrated into a pattern of performance.

Integration is a state where something is known and does not need to be thought about. For example, walking is a highly integrated task that we perform without a moment’s consideration. Interestingly, for most of us we can get up in the morning without ‘remembering’ how to do it.

Integration, by nature, is experiential, spontaneous, harmonious, fluid, instantaneous and, when we look to our experience of performing such tasks, it immediately becomes apparent that we have no idea how we are doing it.

Now integration has an interesting relationship to the brain. The brain’s structures are changed and modified on the basis of it interfacing with information that is integrated into patterns. In the new born baby it is not this way, because they have yet to develop this



capacity. If we look at that baby, on thing that immediately becomes apparent is that it is in sensory overload. Sensory overload is the consequence, of not being able to integrate sensory information into patterns, and having to deal with a barrage of undifferentiated sensory information or noise.

Once information has been integrated it cannot be un-integrated and it remains integrated and accessible, forming the basis of the rehabilitation services I provide. Knowing how integration works, and how integrated information interfaces with the brain, allows me to target performance in a very subtle way, resulting in very rapid and profound recovery of performance. The reality is that the brain modifies and adapts itself on the basis of how that interfacing is occurring and there is a very specific set of skills, abilities and processes required, in order to do this.

Ultimately, memory deficits are always an issue of not having the capacity to process and integrate all sensory information that is available to us. Consequently, when a person appears to 'forget' what was forgotten was never included in what was integrated, therefore it was also not included in the task performance that was generated - task performance always follows perception and what is missing in the former will also always be missing in the later.

## *Here's how it works:*

The brain injury reduces the client's capacity to deal with the volume of sensory loading within their environment. Various fibres in the brain have been damaged or severed. The flow of sensory information through these fibres ceases or is disrupted, leading to the nervous system being overwhelmed by sensory information it cannot process and integrate. The client goes into sensory overload. When the client engages in a task, they will make use of the information they can and the rest will get overlooked and left out.



Sensory overload occurs because the client lacks the capacity to integrate all sensory information into patterns. Integrating information into patterns means we respond to the patterns of information, not the individual pieces of information, thereby naturally diminishing sensory overload.

We only have to look at a new born baby, to see that they have yet to start making sense of their world through integrating sensory information into patterns, and that they are in sensory overload.



The inability to integrate sensory information means the client will be beset by volumes of undifferentiated sensory information or 'sensory noise.' This can be very unpleasant indeed.

We also need to understand that any and all actions we perform in the world are performed on the basis of what we have perceived ie: sensory information that has been processed and integrated. When this process is broken, any action generated, will be generated on the basis that not all available sensory information has been utilised, hence the diminished level of performance.

Visual perceptual performance allows us to use those observations we have about a person's performance - the memory, problem solving, decision making, judgment, etc – as pointers to what is going on at that level of perception; and we need to do this because we cannot see this directly because there is simply too much information contained within our worldview and it obscures how that worldview is being generated.

## *Visual Perceptual Performance*

Stepping into the world of visual perceptual performance marks the advent of a whole new understanding of human performance, where we are now able to go beyond the limitations of the past. Suddenly we can see what was not apparent to us before; where our worldview emerges from and how we are doing this. I often refer to visual perceptual performance as the quantum realm of functional performance because it takes us deeper than we have ever gone before.

Visual perceptual performance allows us to understand neurological cognitive based disorders in a way that was not possible before and to treat these conditions in a far more effective way.

*Welcome to my world, the world of visual perceptual performance*

*Natoya Rose*  
*Occupational Therapist*



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