

Cardiovascular disease continues to be one of the biggest causes of death in Britain and it would appear that lifestyle factors are a major issue when it comes to affairs of the heart. The current orthodox medical treatment (Camm, 2002, p759) for heart disease is to work on the physical body by alleviating hypertension, a precursor to heart disease, and by attempting to regulate cardiac output, rebalance plasma lipids and decrease platelet aggregation in order to prevent exhaustion and congestion of the heart and arteries. However, although these interventions prolong the life of cardiac patients they only address the physical body and thus only one aspect of a multifaceted being. This makes treatment only marginally successful. Frequently, dramatic changes in lifestyle need to take place in order to address other facets of the individual patient and this can be difficult to achieve as our modern day life only ever seems to place more detrimental lifestyle demands upon us. In this work, I have attempted to show how Cranial-sacral therapy and Somato-emotional release can help treat the cardiac patient's emotional body and so help add another dimension to treatment of cardiovascular disease.

Type A Behaviour and Nervous System Hyperactivity

It is well understood that poor diet, lack of exercise and excessive alcohol intake are major factors in cardiovascular disease (Camm, 2002, p759) but what is less well recognised is the Type A Behaviour pattern (TAB) which is characterised by 'hurry sickness' and easily aroused irritability or anger and was first linked to heart disease in 1959 (Friedman and Rosenham, 1959, p1286). Friedman believes that the nervous system is chronically hyperactive in people who suffer from TAB because of their race against time and their conflict with other people. It is believed that there are approximately 35 different manifestations of TAB and 18 of these are detectable physical signs including continuous sweating at normal room temperature, permanently raised eyelids which give a staring impression, a visible bulge from a clenched jaw and pursed lips from the muscles around the mouth being pulled tight (Friedman and Ghandour, 1993, p 607). What Friedman really appears to be describing is a continuous 'fight or flight' response – with the decision to 'fight' predominating. Figure 1 sums up our 50 year old stockbroker and his TAB succinctly.

But where does this common type of behaviour pattern really arise from? What is the anatomical and physiological basis for such a negative response to the world? Most importantly, what are the implications for the spiritual being?

The Limbic Forebrain

The limbic system is thought to be a major substrate for regulation of emotional responsiveness and behaviour, individual response to sensory stimuli and for integrated memory tasks. These structures are found in a ring (limbus) that circles the diencephalon. The two major structures of the limbic forebrain are the *hippocampus* with its axonal projections called the fornix and the *amygdala nuclei* with its axonal projections known as the stria terminalis. These axons encircle and penetrate the thalamus and hypothalamus (the diencephalon) and can be seen in Figure 2 (Felton and Josefowicz, 2003, p 288).

'Memories of Emotion' and 'Emotional Memory'

According to Ledoux (1998, p202) these structures work in parallel together. When someone is faced with a stressor **the Hippocampal system retains the facts about the event, ie the time, the place, the people involved and as a plain perceptual experience – how awful it was. This system forms the explicit memory of the emotional situation. The Amygdaloid system processes the implicit emotional memory, - that means the physiological response that occurs throughout the body.**

Unconscious Amygdala Fear Conditioning

There are several different anatomical connections between the central nucleus of the amygdala and other brain structures that are involved in fear and anxiety. **Pathways to the *lateral hypothalamus* appear to be involved in the activation of the sympathetic nervous system** and the release of adrenaline and noradrenaline to the adrenergic receptors. This initiates tachycardia, skin responses, pupil dilatation and peripheral vasoconstriction causing blood pressure elevation. **The *paraventricular nucleus of the hypothalamus* has axons that feed CRF into the pituitary which in turn releases ACTH to the adrenal cortex** (Davis, 2000, p 215). The adrenal cortex then releases cortisol which travels in the blood stream to various organs including the brain. **Cortisol then binds to receptors and *inhibits hippocampal* function and *stimulates amygdala* function. Thus, stress *impairs* explicit memory and *enhances* implicit memory by altering the associated structures functioning** (LeDoux, 2002, p224; Davis, 2000, p300). **So although explicit memory of emotion fades with time, implicit emotional memory is capable of becoming stronger.** Take for example, the memory of a blowing horn in a Road Traffic Accident. Although the memory of the details of this traumatic situation can cease to have an impact on consciousness over time, the body is still capable of going into implicit emotional arousal if the sound of a horn is still heard – even if it has only been a background sound – unconsciously screened. What is important to remember here is that the implicit emotional response gives arousal to the explicit emotional memory – it gives the 'facts' more 'life'.

Other pathways (Davis, 2000, p 215) which appear to be relevant to our asthmatic TAB stockbroker patient are the connection from the central amygdaloid nucleus to the parabrachial nucleus in the brain stem, whose activation can cause respiratory distress and also from the amygdala to the facial and trigeminal nerves causing the facial expressions of fear otherwise known as the typical 'stressed out' perspiring, eyebrows raised and jaw clenching city worker. The major efferent connections of the amygdala are illustrated in Fig. 3 (Felton and Josefowicz, 2003, p293).

Glucocorticoids and their interactions with the immune system and their role in behaviour

Apart from altering limbic system function directly, cortisol also works indirectly by modifying the immune cells known as cytokines. Glucocorticoids are known to suppress the **proinflammatory cytokines IL-1b, IL-2, IL-6 and TNFa** whilst stimulating the anti-inflammatory cytokines IL-4 and IL-10 (Webster et al, 2002, p 135). It is the **proinflammatory cytokines that are known to act on the limbic system and influence autonomic and neuroendocrine regulation, affective behaviour, cognitive behaviour and illness behaviour** (Mulla and Buckingham, 1999, p506). Locally produced cytokines at the periphery can also travel up to the brain via the blood and the vagus nerve and further modulate limbic system function (Mulla and Buckingham, 1999, p506; Webster et al, 2002, p125). **This is why when emotionally distressed we are unable to clearly remember facts, make focused decisions or be fully capable of making sense of what is happening to us.** For a detailed diagram of cytokine influences on the brain see Fig. 4 (Felton and Josefowicz, 2003, p270)

Unconscious Amygdala fear conditioning and cardiovascular disease

Because the hypothalamus continually receives signals from the amygdala in its cortisol induced feedback loop, the sympathetic nervous system is always activated and an *unconscious* fear conditioning in the amygdala increases until the body is in a permanent state of emotional arousal/stress – **regardless of whether the brain is actually currently screening a threat or not.** Over time the heart rate becomes permanently raised and vasoconstriction increases causing peripheral resistance. Of course we know that increased cardiac output and peripheral resistance causes hypertension – the precursor to heart disease and Myocardial Infarction (Camm, 2004, p819). As well as these factors it is believed that the sympathetic response causes blood to clot faster in order to prevent bleeding to death in an endangered situation (Friedman and Rosenham, 1959, p1290), so platelet aggregation is also increased in our patient adding to the burden on this heart.

The Heart as its own Entity

But is the heart just a passive organ, dragged along helplessly by the CNS?

The heart conducts its beat via the Sinoatrial (SA) node which then follows a much speculated and unidentified pathway to the Atrioventricular (AV) node and then down the bundle of His into the ventricles. **The SA node itself is mainly innervated by cholinergics from the vagus nerve via muscarinic receptors.** Adrenergic nerves supply the atrium and ventricle as well as the conduction system. B1 receptors are the main receptors in the heart with adrenaline and noradrenaline having the positively inotropic and negatively chronotropic effects on the heart. So from this perspective the heart appears to be very much at the mercy of the CNS. However, the heart is an **endocrine organ in its own right through the vascular endothelium.** This is the interface between blood and other tissues and as such gives the heart its own role in regulation of immune responses, vascular cell growth, vasomotor control and pro and anti-thrombotic mechanisms. Various substances that are derived from this endothelium and of particular relevance to the relaxation and contraction of the coronary circulation is Nitric Oxide (Camm, 2002, p705). Recent research has also shown that the heart possesses its own nervous system known as the **Intrinsic Cardiac Adrenergic (ICA) system** with alpha 1 and 2; and beta 1 and 2 adrenoreceptors present with in it (Armour, 1997, p277). Very recently it has been found that **intrinsic cardiac catecholamines** help to maintain beating rates in neonatal rat cardiomyocyte cultures via stimulation of alpha1- and beta-adrenergic receptors (Natarajan et al, 2004, p411). This begins to answer the question about how the heart starts beating of its own accord in the 3 week old embryo, but also begins to provide evidence that the heart is an entity in its own right outside of the CNS.

The Heart as another Emotional Memory Centre

In his book the hearts code, Paul Pearsall (1998) documents qualitative research on the emotional experiences of heart transplant patients. He has found that patients can take on the emotional preferences of their donor to an astonishing degree. For instance, a rare situation occurred where a heart transplant recipient was able to meet his still alive donor who had also received a new heart. What transpired in that meeting between the recipient, the donor and their respective wives was that in the height of passionate love making the recipient of the heart would call out the *donors* wife's name despite the fact that at that stage he had no idea who the donor or his wife were (Pearsall, 1998, p124)! In domino effect, the donor's wife stated that since he had received his new heart from an unknown source his temperament had changed greatly including how he behaved romantically. Pearsall has many examples of how heart recipient's personalities have changed. He even gives an example of how a small child received the heart from a

murdered eight year old only to have nightmares about the murder to the point that the police were called and the murderer was caught! (Pearsall, 1998, p7).

A holistic approach to the management of heart disease – Cranial Sacral Therapy and its counterpart Somato-emotional Release.

What is Cranial-sacral therapy and Somato-emotional Release?

In part a) I discussed the anatomical and physiological basis on how the mind can cause *contraction* in the body. When undergoing the stress response, our skeletal muscles contract, vascular smooth muscle contracts and contraction can be seen very clearly in the face. From a cranial-sacral therapists perspective (Kern, 2001, p 108) this contraction is an energy form called 'biokinetic potency'. When the body goes into a perpetual state of contraction (as provoked by unconscious amygdala fear) the biokinetic potency becomes overwhelmed and a 'biokinetic force' becomes stored. If we are unable to dissipate these forces – in other words if we don't somehow manage to relax the contraction sufficiently – the body starts to centre them in a particular place in order to minimise the damage. If these focalised points of contraction or sites of inertia remain inert then physical disease sets in.

Cranial-sacral therapists work to release these blockages by manipulating the flow of Cerebrospinal Fluid (CSF). They do this by simply placing their hands on the patient's cranium in order to gently and subtly ease the fluid flow through the brain so it can move efficiently to the spinal cord unhindered. Somato-emotional release therapists take this one step further by moving into the viscera and releasing inertia in the organs. CSF completely surrounds and bathes all the surfaces of the CNS. It is produced in the choroid plexus which is a combination of ependymal cells and permeable capillaries (Martini, 1998, p 451). The choroid plexus is found predominantly in the lateral and third ventricles but is also in the fourth ventricle. CSF circulates through the ventricles and down into the central canal of the spinal cord. It also reaches the subarachnoid space through apertures in the fourth ventricle and protects the brain and coats the spinal cord and cauda equina. Figs.5 & 6 illustrates (Felton and Josefowicz, 2003, p45) the site of the ventricles and the production and flow of CSF. According to Martini (1998, p 451) the functions of CSF are to support the brain and cushion neural structures.

Deeper into the CNS

However, the Cranial-sacral therapist and SomatoEmotional Release practitioner John Upledger has gained deeper insights into these matters. In his book 'Cell Talk' (2003, p129-180) he discusses intuitive dialogues that he has had with the brain during cranial-

sacral/somato-emotional release treatments and how the brain has communicated some of its scientifically unknown functions and purposes in relation to spirit. Of particular interest are the communications he has had with the lesser known 'centrum' and the CSF itself. The centrum is a pyramid like structure located in the centre of the brain using the paired hippocampi as support and with the thalamus resting on it (see fig. 7). According to Upledger (2003, p137) the centrum has communicated that it receives information transmitted in the form of energy via circular antennae that are situated about four inches above the top of the head. This information comes directly from the cosmos/God and is all knowing. If the brain structures are not central (such as from cranial pressure from the birthing process) this can cause disruption in the reception of this cosmic information. The Centrum also claims that past-life experiences are stored in double-walled capsules in the medulla and that the Centrum decides if and when these memories are released into conscious awareness. The CSF has informed Upledger that it contains the spiritual energy that is received from the centrum and that this energy relates to the individual souls purpose and development in life. It holds emotional energy that is pure and unconditional such as the maternal instinct or pure sadness. So not only does CSF protect and cushion our physical body it also contains the very essence of our being as transmitted from the cosmos. CSF also claims to have powerful influences over the electromagnetic fields of the CNS. This is interesting as Pearsall speculates (1998, p118) that there maybe an undiscovered electromagnetic connection between the heart and the brain. In another conversation, the fornix -the axonal projection from the hippocampus - has claimed that it is the storage site for trust.

The Relationship between sites of inertia and emotions

If a site of inertia builds up around the heart both directly from limbic-hypothalamo-sympathetic stimulation and indirectly from peripheral resistance the heart has to work harder in order to counteract this. However, many different organs are regulated by sympathetic nervous activity and also by its counterpart the parasympathetic nervous system. Can actual named emotions be systematically stored at particular sites as inertia - and if so which emotions are related to which anatomical regions?

In her book 'The Anatomy of the Spirit' theologian and medical intuitive Dr Caroline Myss (1996) crosses over ancient perspectives on mind-body relationships from the Hindu Chakra System, the Christian Sacraments and the Kabbalah. These traditional concepts have not been evolved through scientific understanding of anatomical and physiological processes but through the intuitive knowing of our ancient ancestors. According to her interpretations there are seven emotional 'energy' centres in the body cited in all three traditions and the heart is seen as the fourth energy centre. According to her interpretations of the chakra system (1998, p98) when the fourth wheel of energy at the heart becomes blocked we are holding hatred, resentment, bitterness, grief and anger; self centeredness and loneliness in

the heart energy centre. The opposing emotions that release this blockage are love, compassion, forgiveness, hope and trust.

Obviously we are all capable of experiencing these negative emotions, but if they dominate the individual's emotional response, as for instance in the highly competitive TAB city worker, then disease can occur. The physical dysfunctions that Myss interprets as being related to these emotions are congestive heart failure, MI, mitral prolapse, cardiomegaly, asthma, lung cancer, pneumonia, breast cancer and shoulder and upper back problems. **So we have a correlation of ancient perspectives and modern scientific understanding for our TAB patient.**

Conclusion

So what does this all mean for our TAB stockbroker? The TAB pattern is a *continual fear* response to simple everyday life. It is the remnants of our primitive past still guiding us in our perception and response to the external environment. Of course there is very little actual physical aggression coming out of our modern day 'civilised' stockbroker, it all remains as a contraction within his being – there is no physical or emotional release. So the endocrine and immune systems increase the physiological pressure on the amygdala until it has whipped the physical body into a constant frenzy. The Hippocampus becomes competitively inhibited by the amygdala which causes impaired reasoning, further disabling us from responding rationally. But would the rational mind being in better control really help us anyway? Or would it further push our implicit emotional memory deeper into our physical bodies causing more disease? What TAB/CNS hyperactivity really means is that our paranoid negative minds rule the roost and there is physiological basis for this being capable of destroying the heart through disease.

But now, thanks to modern science and heart transplants, it is coming to light that the heart is almost like another brain, with its own intrinsic nervous, endocrine and immunomodulation systems. But unfortunately this poorly understood second brain-our emotional and intuitive heart- is losing out to its competitive and aggressive CNS sibling. In our bid for survival we are switching off our hearts. This is plain to see everyday in the news as we witness the tremendous suffering on the planet through war. No wonder our current prime minister has a supraventricular tachycardia.

Now in these cataclysmic times we need to urgently start responding to the world with the emotions that Dr. Myss believes ancient traditions felt were associated with a healthy heart. Those are love and compassion rather than fear and aggression; hope and trust rather than resentment and bitterness but perhaps most importantly in these times – forgiveness and *real* commitment. It is easier said than done. Many inhabitants of the world, most unfortunately including the world's leaders, are in their own

feedback loop of negative emotions breeding more negative emotions. The world has become a frenzied global amygdala.

Although scientific interpretation of the emotional brain by neurologists such as Joseph LeDoux is indeed fascinating, it does not explain how our ancient ancestors managed to develop parallel belief systems around the emotional body – it does not explain our intuitive knowing. Can our emotions really just be a continual stream of anatomical and physiological CNS processes or is there really a higher energy force external to our three dimensional world that is transmitting energy information to us unconsciously? Furthermore, can this information energy be carried around the body to the heart? If the CSF is carrying this information energy around the CNS and exerting powerful influences over electromagnetic fields as Upledger suggests then surely this energy is capable of being passed onto the body's biggest generator of electromagnetic energy- the heart. Perhaps this is Pearsall's unknown link between CNS and heart in his Electro-magnetic field theory (1998, p118).

On an individual and personal level, Cranial-sacra therapy and Somato-emotional release cannot only help to release stored negative emotions that help create disease but it can also structurally realign the brain so that the centrum is central and can receive the incoming information energy from the cosmos. Perhaps if we receive this energy more clearly we will better able to carry this information in our CSF and follow our life's purpose with greater clarity and knowing. If we can do this, we may well be able to stop acting out of fear and start responding out of love.