Why we need a new model for 21st century healthcare.

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Why we need a new model for 21st century healthcare

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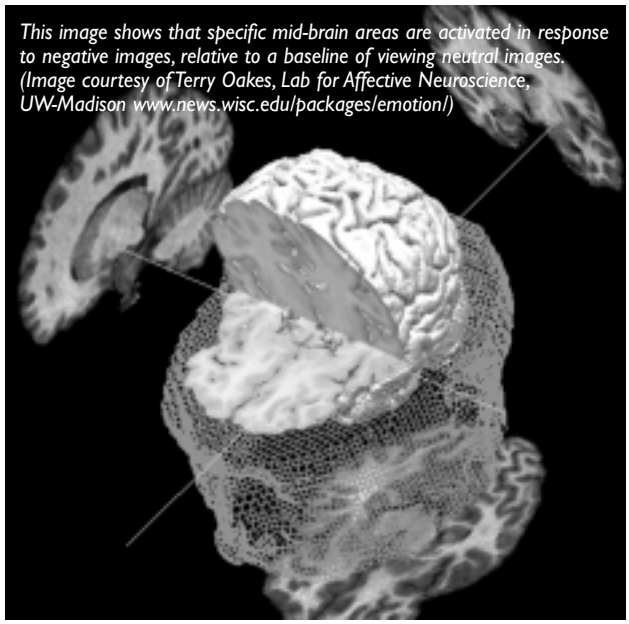
The neatness of medical science is unravelling. Nineteenth century medical science produced categories of disease ordered by cellular pathology and germ theory; 20th century medicine focused the analytic-mechanical model on smaller and smaller parts with astonishing success. Its obvious triumphs include infections, deficiency diseases, surgical excisions and transplants, intensive care and anaesthetics. But 21st century medicine is confronted with whole person problems: chronic degenerative and inflammatory diseases, stress-, environment- and lifestyle-mediated diseases, addictions and psychological disorders. Bio-technical single-solution approaches won't cure them. And, though these approaches still dominate in teaching hospitals where doctors' notions of medicine are moulded, the world of primary healthcare knows that these problems don't fit into neat categories. In this other medical reality, temperament, resources and lifestyle – rather than biochemical pathways – shape health. Here, symptoms cannot always be explained medically, and patients are increasingly unhappy with bio-medical approaches that override their experiences and beliefs. They don't want to feel disempowered or patronised and they share our growing uncertainty about causes and cures, and pharmaceutical side-effects.

So we need new ways of thinking about health and healthcare; ways like mind-body medicine, and holistic healthcare that put health and pathology into their human context. Rather than just confronting disease, medicine will have to catch up with a broader 21st century scientific view that incorporates mind-body holism, co-evolution, a deeper understanding of self-regulation and self-healing processes. The world's healing traditions have always sought to trigger self-healing, using touch, words, movement, art, ceremony, natural substances, food, exercise, harmonious living. But medicine in the West, having focussed in on ways of waging war on disease, has forgotten about self-healing and now has no model for building up the body-mind's natural defences. Clearly the mainstream needs its own framework for understanding health creation, and science really should be more curious about this. The living body maintains stable chemical and physical conditions so that life can be sustained: too hot or cold, too acid or alkaline, excessive waste products or too few nutrients, and we die. The body continually breaks down and rebuilds itself, and most of the time the process works faultlessly. When it doesn't, illness and disease follow. Yet just how organisms control the myriad chemical reactions involved is barely understood. Nor do we know much about the body's ability to turn over its substance yet maintain reliable internal architecture and outer form, to move through space and constantly re-shape itself. And the sense of self is another mystery; seemingly stable, though it emerges out of a torrent of sense impressions and memories, it lets us sense, respond and reflect.

Stability in the midst of flux is the theme here; stability at different levels of organisation: bio-chemical, structural, personal. Science promotes DNA as its explanation; traditional healing systems talk about vital forces and elemental qualities. Their timeless models might well provide us with useful imaginal hooks on which to hang ideas about health, but they are a world away from the style of science that builds explanations up from parts, since holistic healing works down from an understanding of the whole. The two perspectives ought to be complementary, but until lately traditional medicine's holism and vitalism were anathema to science; those who took the healing path usually abandoned the scientific way, or at least learned to live with two apparently irreconcilable concepts of health. Or is this no longer true? Might there be a convergence between traditional healing systems' views and science's growing interest in whole system behaviour? Science now supports some of traditional healing's key principles: that body and mind are effectively inseparable; that the body-mind has untapped in-built healing responses; that complex systems are self-sustaining because a flow of information organises them. Health professionals' growing interest in complementary therapies, bodywork and new approaches to psycho-therapy all reflect a desire to put these ideas into practice.

Science moves on

Medical science has had spectacular success by pursuing the analytic approach. It learned a lot about taking the body apart, next to nothing about what keeps it together. Now science is realising its limitations. Information science provides one example of this. When parts function in a whole system, properties emerge which cannot be inferred by studying them in isolation for the whole changes the parts. Developments in psycho-immunology and neuro-biology are fuelling interest in pattern and process, whole systems and information flow. In parallel, sensitive new technologies now allow us to witness how thoughts affect blood flow in the brain, how an emotion affects the cardiac electrical energy spectrum, how molecules of emotion bathe the brain in information drawn from every cell in the body. Take a look, for instance, at the superb images coming out of University of Wisconsin-Madison's Centre for the Neuro-biology of Emotion. These functional MRI scans demonstrate the living brain's response to emotions and mindfulness meditation, and how they affect immune, circulatory and endocrine systems. Wisconsin's findings already affirm a seamless mind-body wholeness.



This image shows that specific mid-brain areas are activated in response to negative images, relative to a baseline of viewing neutral images. (Image courtesy of Terry Oakes, Lab for Affective Neuroscience, UW-Madison www.news.wisc.edu/packages/emotion/)

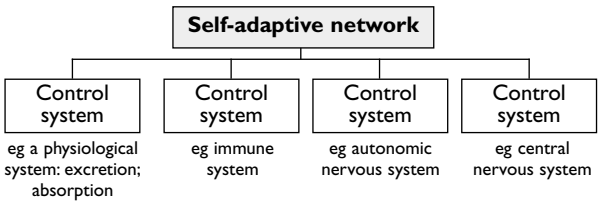
The intelligent body

Michael Hyland's 'intelligent body' hypothesis (Hyland, 2002) builds a conceptual bridge between information theory and vitalistic ideas. Hyland – Professor of Health Psychology at Peninsular University – explains how complexity theory (Cilliers, 1998) predicts that complex systems will function in quite different ways from simple ones, and that complex networks of highly interconnected nodes have properties we associate with intelligence. Hyland's contention is that our stereotypical western scientific views (the brain is intelligent and the body stupid; the brain sits on top of spine controlling the body) are thoroughly outdated, because the body's interacting organ systems form an intensively connected network of interactive nodes. Therefore characteristics of intelligence are distributed throughout the body, and the brain is no longer master over the slave- body, since the intelligent body has its own kind of pattern-recognition, problem-solving and memory.

Hyland offers a new way of thinking about health and information flow in the body: for instance that disease begins as an information error and that two kinds of error are possible in the body–mind. Conventional western medicine deals with the first type – 'serial' error – a cause and effect chain of events where the body behaves as a biological machine. This approach works well when it can identify an organic disease (the 'broken part') – diabetes, cancer, ischaemic heart disease or arthritis. It then fixes or removes it, replacing the missing hormone, killing bacteria with antibiotics, reducing blood pressure with a drug, suppressing inflammation with steroids, replacing a blocked artery with an artificial graft, or cutting away a tumour. But the other type of error affects information processing in the whole network. In 'network' error no single organ or biochemical system can be pinpointed and repaired, because the information needed to produce health and healing processes is spread over the entire network. To correct this kind of error, successful treatments have to exchange information with the network itself. Hyland suggests that complementary therapies may be an effective way of doing so, providing they actually trigger the intelligent body's self-healing responses.

Networks can take in many different kinds of information, and Hyland suggests that errors in the information network body respond to diverse kinds of 'natural' input – diet, botanical medicines, movement and touch; to more refined information as well – art, communication with a therapist, perhaps even some kind of subtle information conveyed by a homeopathic medicine or by the effect of an acupuncture needle. And the entire information body could be influenced by lifestyle packages impacting on the combined biochemical, structural and mental information systems.

The intelligent body hypothesis



Both internal (ie physiological) and external (ie behavioural) control loops are controlled by the same intelligent network.

Courtesy of Michael Hyland

We can imagine the whole system of information flow – the body's intelligence – as an orchestra of countless players. Their tunes need no score or conductor, for the parts play themselves and each one responds to the entire chorale – more or less harmoniously. The songs are played on three kinds of instrument: biochemical codes and electrical impulses, structural pressure waves and rhythms, language and symbols from the conscious and unconscious mind. Hyland's intelligent body can be conceived as a fourth level of information emerging from these three and meta-organising them; perhaps rather like a conductor, directing but at the same time moved by the musical totality. This is complexity in action, where information flow emerges from the interweaving of biochemical, structural and mental information systems, but at the same time it forms and shapes them all.

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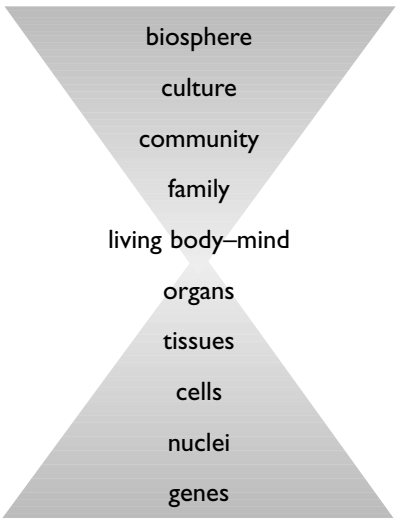
Science, information flow and holism

In the 1970s George Engel presented his biopsycho-social model, explaining that bio-medicine was harming itself and its users by failing to recognises human beings' complexity and connectedness. His systems approach was based on the understanding that inputs at any level in the system would spread upwards and downwards. Reductionism maintained a focus on the lower levels, and that, said Engels, is bio-medicine's fundamental flaw. Engels' flaw as far as reductionist science was concerned was the lack of a physiological vehicle for such a seamless information flow. He was, after all, at least 10 years ahead of psycho-neuro-immunology's first glimmer.

Thirty years after Engel, it is easier to see that diverse forms of information flow are involved in mind-body integrity: the nervous system digitises the information as electrical impulses; molecular

messages flow in the blood and cellular fluid creating waves of two-way biochemical conversation; heart, gut and muscle cells encode a flow of pulsations and vibrations that spreads through the connective tissue and down via individual cells' cytoskeletons into every nucleus in the body. Hyland points out that just as mobile phones and landline phones connect seamlessly into a single phone system, these different forms of communication are no barrier to seamless connection between the different organ systems of the body.

The bio-psycho-social model: two-way information flow



These elements are lining up into a scientific model of the organism as a living matrix integrated and shaped by an incalculable traffic of regulatory information. This flow of organising information has similarities with what the traditional systems called 'vital energy'; except – as James Oschmann points out (2000) – rather than involving some single, paranormal or 'subtle' life force, this information is modulated by forces that science already knows about: the organism's electro-magnetic flux, its clouds of neuro-receptor traffic, its rhythmic impulses of sound, heat, gravity, elasticity and pressure. If this information flow is what the traditional healers call 'life force', then what Hyland terms the intelligent body could correspond to complementary medicine's 'energy body'; though perhaps it would be would be more accurate to call it the 'information body'. Science is now in a position to explore how such flows are encoded in the living matrix, how they mal-function and how treatments might engage with errors in the information body.

Faced as we are now with a new reductionism born of genome projects and smart drugs, holists are faced with a challenge: to depict living organisms as form-building fields that support a self-sustaining flow of materials, energy and information. A combined biopsychosocial-intelligent body model is one way of imagining how these flows of information link all the way from gene to biosphere and back again. And in this model, consciousness is not some electrical secretion of the cerebral cortex, but an emergent property of our entire organism – blood, gut and sinew as well as nerve and brain. And this is why medicine must comprehend the entire lived body, for its reptilian and mammalian origins formed the triune brain. Our thoughts and feelings, though culture-shaped, also arise from a body moulded by this phylo-genetic past; just as our embodied responses – for instance to stress and trauma – are a psycho-physiological inheritance from our plains-dwelling hunter-gatherer forebears.

Science as myth-maker

Co-evolution spins a new creation story; a story about the beginning of time and space, and the evolution of stars and planets, some with biospheres. In this story, complexity – parts forming greater wholes – is the rule up and down the scale from particles to galaxies. Connectedness is another universal rule, since fields are a property of space-time. The emergence of new properties when parts form wholes makes the universe creative: just as matter itself evolved after the big bang, so do organisms of every possible form and function emerge as life co-evolves in response to a changing world. Over eons, increasingly complex forms of sentient life have emerged, driven by the exchange and storage of unfathomable amounts of life-supporting information. This tapestry of information stretches back to the beginning of time, and most of it is shared by all living organisms. In fact each developing human foetus reiterates the evolutionary process as it transforms from reptile to fish to mammal.

Science tells us that in the last million years, a biped mammal evolved a brain with a novel capacity. In early life, gradually and traumatically, their power to think is moulded by a world of objects, and they learn to reflect on experience and emotion. These creatures use language and make up stories about themselves and the world; stories for instance like science, and the story I have just told, whose mythic resonance is nevertheless couched in science-speak. This is possible because so much of what science is now reaching for has mythic dimensions. Another example of this is the way systems theory views the biosphere – rather in the way Michael Hyland sees the body – as a complex system of interconnected causal nodes; so something intelligent self-sustains it, and it has been named Gaia.

Until recently, scientists ignored consciousness and left questions about the self to philosophers and psychoanalysts. Yet thoughts and feelings can make the body blush or shiver; conversion symptoms and voodoo-death are more dramatic examples. Psychologists and neuroscientists have accumulated a great deal of evidence on how states of mind affect the body and conversely how the body affects consciousness. They tell us that attitude influences health outcomes; that a person with a terminal disease can postpone their death until after a significant date; that placebos and hypnosis can reverse established pathology; even that the immune system can be classically conditioned (Clow, 2001). The clinical implications guarantee exponential growth in this area of research. On the positive side, there are reliable accounts of spontaneous remission from catastrophic disease, and much research illustrating how temperamental factors, social support or practices like mindfulness meditation can improve health outcomes.

Conclusion

Medicine stands at a threshold; the morbidity figures, theoretical, educational and organisational crises, and the failure of current practice to meet rapidly changing expectations, all make progress towards holism inevitable. Moreover, a less alienated medical model will help the medical profession heal itself. Given the current levels of distress and impairment among doctors and nurses, and the rate at which they are leaving the field, the challenge to develop a new model must be faced.

In the 80s information science and systems theory sparked off late 20th century holism. Now we have complexity theory, neurobiology and psychoneuroimmunology to support 21st century holism. Cognitive neuroscience and real-time imaging technology provide startling insights into the mind-body connection; PNI tells new stories about how words become flesh, and how happiness or anguish gets into cells. This century's holism has a biological backbone we can hold on to and new knowledge at its fingertips: knowledge that connects. We must use it to create 21st century holistic healthcare.

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