The Integrated Systems Model

The Integrated Systems Model\textsuperscript{31-33} (ISM) is an evidence-informed, clinical reasoning approach to organize knowledge from multiple fields of science and clinical practice for the conservative care of individuals with disability and pain.

Figure 5. The integrated systems model (ISM).

Treating individuals with complex biopsychosocial problems requires an understanding of the relationship between, and the contribution of, various body regions and systems that are ultimately manifesting as cognitive, emotional or sensorial dissonance. Collectively, this dissonance can be interpreted by the cortical body matrix\textsuperscript{38} as threatening and manifested as pain anywhere in the body, fear of movement, movement impairments, anxiety, breathing disorders, and/or incontinence. Chronic LBP patients present with many of these features and have complex histories containing:

1. Multiple past high load or accumulative traumas to several areas of the body many only partly resolved,
2. Beliefs and cognitions that present barriers to recovery, and
3. Poor lifestyle habits.

Ultimately, conservative care should consider the role each system and body region is having on the collective cortical body matrix. This sounds difficult and yet is what clinicians face daily. An ISM assessment aims to simplify this challenge and begins by enquiring about three
dimensions (sensorial, emotional, cognitive) of the patient’s story. Emotional and cognitive barriers are common in complex LBP patients and can be primary barriers. The story also reveals the patient’s goals, which determine the meaningful tasks for assessment. In the ISM, the tasks assessed do not always relate to the location of pain but rather to the meaningful task. For example, evaluating the squat task and sitting posture is meaningful for someone who experiences LBP with sitting. However, these tasks are not relevant for another individual with LBP that intensifies with walking. An evaluation of strategies used for stepping forward and thoracic rotation, two requisite components of walking, are more meaningful for this individual.

The patient is asked to report any sensations evoked as the task is performed while the clinician observes/palpates each region of the body noting any areas of suboptimal alignment, biomechanics and/or control. This requires an understanding of what is optimal for each body region for that task. Subsequently, manual/verbal cues are given to change the alignment, biomechanics and/or control used for one body region and the impact of this correction on the patient’s experience, as well as any change in performance of other body regions, is noted. This is called ‘finding the driver’, the region of the body that when corrected results in the best improvement in both the experience and performance of the task. For an individual with LBP, it may be the hip, foot, pelvis, thorax, neck or a combination of corrections. The low back is often the victim of suboptimal strategies for transferring loads through the trunk regardless of whether the pain stage is acute or chronic. The driver can change both within and between treatment sessions when the whole body is evaluated for each task. The driver merely informs the clinician of the next place to focus treatment.

Further tests reveal the contribution of various system impairments (articular, neural, myofascial, and/or visceral) to determine the individualized treatment since no two patients have exactly the same thoughts, beliefs, and system impairments culminating in the change in the cortical body matrix. These tests are directed to the driver (cognitions, emotions, hip, pelvis, low back, thorax, or foot etc.). Each treatment includes:
1. Release – education to release cognitive beliefs, manual therapy and/or dry needling to release stiff joints, protective, maladaptive neuromuscular patterns, and home exercises to reset the brain for sustaining the release gained
2. Alignment – of knowledge, thoughts, and beliefs to the evidence, posture/body to better receive and transfer loads necessary to achieve goals
3. Control – teach better recruitment strategies for neuromuscular support of joints for both static loading and movement
4. Move – create safe environments and positive experiences during functional movement training relevant to meaningful tasks and goals. Pace the program according to perceived threat.

The clinician’s challenge in the face of a vast amount of evidence and opinion is to decide which approach will work best for the individual patient. The Integrated Systems Model aims to help clinicians use both the evidence and their experience to clinically reason the best way forward for the individual with disability or pain.

Conclusion written by Dr. Julie Hides

**Conclusion**

This clinical commentary resulted from interaction between researchers with a combined wealth of experience in conservative care of people with LBP to attend an international forum and openly discuss commonalities and differences between clinical approaches. Given that LBP is a complex phenomenon with multiple dimensions, and should be considered within the biopsychosocial model, it is not surprising that there is evidence supporting multimodal approaches to management of LBP. This would suggest that no one approach is likely to hold all the answers to the LBP problem. In line with this, results from **TABLE 2** show that there is a
large amount of overlap between clinical approaches, but there are certainly some differences as well. The authors considered that management of people with LBP may be optimised by understanding and applying principles of management rather than rigidly adhering to one specific approach.

One of the features identified and common to all approaches was the importance of a good patient interview and physical examination. Further aspects common to all approaches include understanding the goals and expectation of the patient, use of good and appropriate communication skills, working together with the patient/medical/multidisciplinary team, setting realistic goals, providing re-assurance to minimise fear avoidance, understanding pain processes and their relevance, the importance of pain free movement and a need to promote prevention of LBP. A recent systematic review and meta-analysis of prevention of LBP concluded that there was moderate quality evidence that exercise combined with education (such as psychosocial education, fear avoidance and coping strategies) reduced the risk of an episode of LBP. However, the evidence for education and exercise alone was lower, supporting the biopsychosocial model of LBP.

Another key element identified was the need for clinicians to engage with the clinical reasoning process. It is possible to successfully use elements of all of the approaches presented, but this should be undertaken within a clinical reasoning framework, where the responses to treatment are strategically assessed using a methodical approach to develop appropriate treatment plans. In particular, the Integrated Systems Model, which draws from several other approaches, may provide a very useful framework for clinicians which could incorporate individual aspects of the evidence based approaches presented. Also, there are some patients who are naturally more willing to undertake different types of treatment, are naturally more open to self-management, and who are more likely to adhere to advice and recommendations of healthcare providers. Clinicians also have differing skill sets, levels and types of training, levels of expertise and pattern recognition and previous experiences which may predispose them to selection of specific approaches and techniques. Working and devoting the time to communicating with other health professionals working with the patient is also advised, as medical management of LBP (e.g. appropriate medication usage, timing of pain relief etc.) can enhance the response to physical and neuromuscular treatments.