Mobilisation with Movement
The art and the science

Bill Vicenzino  Wayne Hing  Darren Rivett  Toby Hall

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The need for an appropriate textbook on my concepts has at last been met. Mobilisation with Movement (MWM) has been developing for nearly three decades and the evidence base for its use is mounting. Justification for its use based on such evidence, clinical reasoning and reflection is within these pages making this volume an excellent reference for the researcher, teacher and clinician, and it will become a worthy standard text on my concepts.

What has enabled the successful teaching of the concepts to date, without the much needed scientific backing, has been the fact that MWMs are only to be used as a treatment when, on assessment, they have a ‘PILL’ effect. The acronym stands for pain-free, instant result and long lasting.

Pain-free refers to both the mobilisation and movement components.

Instant result means that at the time of delivery there is an immediate pain-free improvement in function. This is not true of many manual therapy techniques taught.

Long lasting means that all or most of the improvement gained is maintained. If the patient regresses between visits and there is no obvious correctable reason for this, after three visits you can say that MWMs are not indicated.

On this basis MWMs should be used as an assessment tool by all those involved in the field of musculoskeletal therapy to ascertain if they are a valuable and appropriate treatment tool.

Another important acronym we use when teaching MWMs is ‘CROCKS’, which deals with their application.

C stands for the contraindications to manual therapy which, of course, will be known by all manual therapists.

R stands for repetitions. With an extremity joint that has been dysfunctional for weeks or even longer, up to three sets of 10 MWMs can be used. With acute injuries, on day one, it is wise because of irritability to apply the techniques three to six times. With the spine we have ‘the rule of three’. On day one only use MWMs three times. This is because some patients following any form of manual therapy get a latent reaction to their treatment. This is minimised by the rule of three. Even when they get this reaction it is of short duration and when it settles they are still much better and further treatment can be given.

O stands for overpressure. Basically, the mobilisation component of MWM is really a sustained repositioning of the joint surfaces. This, when indicated, enables pain-free function to occur and, when restricted joints are treated, passive overpressure must be given. While painless, maximum movement must be gained and this can only be attained by applying overpressure. With longstanding restrictions the movement gained on day one is usually all passive. If overpressure is not applied the results will not be long lasting.

C stands for communication and cooperation. You must explain in detail to the patient what you are about to do. They must know to tell you immediately if there is any discomfort. Without their feedback you will not succeed.

K stands for knowledge. Manual therapists must have an excellent knowledge of musculoskeletal medicine. They must know their anatomy and it is critical that they know all joint configurations and, in particular, joint planes.

S stands for many things. Sustain your mobilisation throughout the movement. Sustain the repositioning until you return to the starting position.

Skill is required. Handling skills when dealing with sensitive painful structures are important. You need a sensibility in your fingertips to locate accurately and firmly without squeezing. Sometimes a plastic sponge can be used for patient comfort. Handling skills determine how much force you use. With some structures the movement taking place may be less than 1 mm.

Sense — commonsense and sometimes a sixth sense are invaluable.

Subtle changes in direction are required when repositioning joint surfaces to completely eliminate any discomfort. This ties in with handling skills.

To now have this reference book, Mobilisation with Movement: the art and the science, is wonderful. I feel humble and I am personally indebted to Bill Vicenzino, Wayne Hing, Darren Rivett and Toby Hall and all the individual contributors for the immense time and effort that has gone into its creation. I cannot thank them enough.

Brian Mulligan 2010
The term Mobilisation with Movement, or MWM, is in common usage in the vocabulary of manual therapy practitioners worldwide. MWM is a method of manual therapy that is being increasingly incorporated into management regimes for patients with musculoskeletal disorders. The term is also synonymous with New Zealand physiotherapist Brian Mulligan, a gifted and innovative clinician and manual therapist who has developed the approach over several decades, with the assistance of his patients. Brian Mulligan has made a major contribution to the field of manual therapy. He has generously shared his knowledge, clinical expertise and experience. He has taught the MWM approach widely, nationally and internationally, and importantly, he has trained others to teach the approach. Brian Mulligan has also published books and DVDs which detail the indications and applications of techniques for clinicians and patients alike.

The therapeutic approach to MWM has undeniably gained the attention of clinicians because of its effectiveness in the management of patients with musculoskeletal pain and movement disorders. There has been some research investigating its efficacy and the hypotheses for its mechanisms of effect. However, to date the MWM approach has had its seminal basis in clinical observation of responsiveness to the clinically reasoned application of passive movement/positioning in combination with active movement. While the primacy of high level clinical reasoning and practical skills can never be underestimated, there is a current desire by clinicians, researchers and healthcare agencies alike for delivery of practice which is also research informed and evidence based. This text, *Mobilisation with Movement: the art and the science*, embarks upon the process of providing the nexus between a seemingly successful clinical approach and its clinical science base.

The text’s authors, Bill Vicenzino, Wayne Hing, Toby Hall and Darren Rivett are all highly regarded clinical researchers and teachers, well versed in the MWM approach. They have all been involved in research into the efficacy and effectiveness of MWM and thus have a strong and authoritative clinical and research base to explore both the art and science of Brian Mulligan’s approach.

A treatment method has a risk of ‘non survival’ without clinical and research paradigms that can be tested and advanced. The authors are to be congratulated on the scholarship evident in this text. They have constructed and presented novel paradigms which stand to advance the understanding and applications of MWM. To advance the field, they have developed a well reasoned clinical paradigm for MWM (Chapter 2) and have introduced a model incorporating what they have named the Client Specific Impairment Measure (CSIM) which acts as a key and central feature of the approach to patient assessment and management. This model is well conceived, comprehensive and stands to guide the clinician’s clinical reasoning in patient assessment and management. Importantly, use of such a model can guide design of future research ranging from, for example, Phase I to Phase III trials.

It is easy for the enthusiast to laud uncritically a management approach and ‘spread the doctrine’. What is appreciated and valuable in this text, is the authors’ balanced approach between the science and the art and their determination to advance the field. The available evidence of benefit of MWM has been presented in an unbiased way using the rigorous methodology of a systematic review. While some preliminary evidence of benefit is emerging, the need for further high quality trials is noted. In relation to mechanisms of action to explain the effects of MWM, the historical positional fault hypothesis of MWM is critically reviewed. While appreciating the available evidence, the authors forge ahead and present a new model for consideration of the mechanisms of action of MWM to advance the field both clinically and in research. Importantly and realistically, there is an expansion of the hypothesis for MWM mechanisms from a previously predominantly biomechanical one, to one which also incorporates the neurosciences (the sensory and motor systems) and the behavioural sciences, and expert input into the field has been provided.

It is often difficult in a theoretical construct, such as a book, to ‘bring to life’ the clinical reasoning and methodologies of the approach together with the nuances of patients, especially when dealing with the heterogeneity in presentation of musculoskeletal disorders. The authors have successfully addressed this challenge by providing several well crafted chapters of patient cases presented by leading clinicians in the field, as well as the authors themselves. What is of enormous value in these chapters for clinicians is the inclusion of the clinical reasoning process that is integrated with the description of the technical aspects of patient management. In addition, the cases serve to display the wide application of the principles and practice of the MWM approach in the musculoskeletal field.
As mentioned, the MWM approach has generated considerable interest and enthusiasm in the field of manual therapy. From a clinical standpoint, it has, over the past two or more decades, provided an advance to the art of manual therapy and assisted many patients with painful musculoskeletal disorders. However, as is commonly encountered, the clinical art of MWM is to date well in advance of its science and evidence base, which is essentially at the beginning of its journey. This text provides a vital basis on which the science can be developed further to ensure that the Mulligan MWM approach will grow and thrive for the benefit of future patients and manual therapists. The authors are to be congratulated on the eloquent way they have brought the art and science of MWM together in this text with due scientific and clinical rigour. It will be appreciated by clinicians and researchers alike.

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We aimed to make this book a comprehensive and unique exposition of the state of the scientific evidence for a relatively new form of manual therapy, Mobilisation with Movement (MWM). When Brian Mulligan first described MWM in 1984 the only evidence base was his expert opinion and a small number of his case reports. In the intervening period the empirical evidence has steadily grown to now include randomised controlled trials and systematic reviews. Moreover, the biological understanding of MWM has evolved from Mulligan’s self-admitted simplistic ‘positional fault hypothesis’ to the testing of scientific hypotheses in sophisticated studies involving MRI and controlled laboratory conditions. It is now timely to review and present the evidence for all forms of MWM (including sustained natural apophyseal glides of the spine) from the past quarter of a century in one volume.

In addition to the science underpinning MWM, this text also describes ‘the art’ inherent in its successful implementation. Basic principles are outlined and more advanced aspects of its clinical application are developed and critiqued, including guidelines on dosage and troubleshooting. Most importantly, the practical art of MWM is illustrated in a series of case studies in which real life clinical presentations elucidate the clinical reasoning underlying its effective application, including consideration of the evidence base, and provide detailed descriptions of selected techniques and home exercises. These cases help bridge the divide that typically separates the science and the art of various approaches in manual therapy.

Although the primary focus of the book is MWM, much of its content is applicable to manual therapy in general. In particular, the chapters describing the current understanding of potential mechanisms of action provide a summary of the contemporary theories explaining the clinical benefits of manual therapy. Similarly, the case reports stand alone as a resource to foster the development of skills in clinical reasoning as they relate to the management of musculoskeletal disorders.

The book is essentially in five parts. The first part introduces the concept of MWM and its principles of application. Part two provides a systematic review of the evidence for its efficacy. The third part focuses on possible underlying mechanisms of action, an examination of potential sensory and motor effects, and an evaluation of Mulligan’s positional fault hypothesis. Part four is comprised of twelve case reports in which the authors and other expert case contributors describe the application (with underpinning clinical reasoning) of MWM for a wide range of musculoskeletal disorders of varying complexity. The reader will get most value from these case reports if the preceding chapters have been first digested, as the cases incorporate discussion and commentary integrating the scientific evidence with the clinical guidelines in the context of the patient’s unique presentation. The book concludes with the fifth part; a troubleshooting section that aims to guide practitioners in optimising their application of MWM.

This book has been written for the clinician, teacher and post-graduate student interested in furthering their understanding and skill in MWM, and indeed manual therapy more broadly. It builds on but does not replace Mulligan’s texts as it is not intended to be a catalogue of techniques. We have also provided the undergraduate student with information that will benefit them in their studies of manual therapy and evidence-based management of musculoskeletal disorders.

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As testament to my father Romeo’s belief in the benefits of study and also the support of Mary Vicenzino and Dorothy-May Ritchie.

Bill Vicenzino

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Wayne Hing

To my children Cameron and Karina, and to my mentor in manual therapy and father Dr Howard Rivett.

Darren Rivett

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Toby Hall

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SECTION ONE

Mobilisation with Movement: its application
In the history of manual therapy revolutionary changes in clinical practice have appeared from time to time. The individuals responsible for such impacting changes have each contributed innovative and original insights, and developed novel manual therapeutic approaches and techniques. Maitland, McKenzie, Kaltenborn, Paris, Jull and Elvey are just a few of the leading practitioners who, utilising their sophisticated skills in clinical observation, palpation and reasoning, opened new fields in manual therapy which effectively shifted practice paradigms and transcended professional boundaries. Indeed, their names have over time become synonymous with manual therapy itself. Almost without exception, these outliers of manual therapy exhibited self-deprecation and a continual drive to share their ideas, techniques and experiences with other practitioners. Brian Mulligan (Figure 1.1) is a recent addition to this pantheon of leading manual therapy practitioners, with his unique ‘Mobilisation with Movement’ (MWM) concept significantly impacting on manual therapy practice worldwide over the last two decades.

In Chapter 2 we explain in detail the nuances of MWM, however, simply, MWM can be described as a combination of a sustained passive accessory joint mobilisation with an active or functional movement. This book is a complete and comprehensive presentation and exploration of the principles of application, potential underpinning mechanisms and evidence base for Mulligan’s MWM. Since the early 1990s when MWMs first come to prominence, there has been a rapid expansion in the number of techniques described which can be used for differing clinical scenarios, and a steady increase in the quantity and quality of supporting research. Indeed, from Mulligan’s early descriptive case reports and videotaped patient treatments from his clinic in New Zealand, scientific investigation into MWM has progressively advanced such that we now have high quality randomised controlled trials being published in top ranked peer-reviewed international journals (see Chapter 3). Similarly, from Mulligan’s relatively simple ‘positional fault’ hypothesis as to the possible mechanistic basis for the clinically observed effects of his techniques, there are in recent years studies testing this hypothesis using cutting-edge imaging and other research tools. It is timely that this emerging science is linked to the clinical art of MWM; that is, the evidence for MWM should be integrated with its clinical practice.

Bogduk and Mercer[1] contend that any form of treatment can be appraised against three distinct, complementary axes of evidence: convention, biological basis and empirical proof. A substantial part of this text will be concerned with the latter two forms of evidence; that is, the biological mechanisms that may explain the effects of MWM reported by practitioners and increasingly observed in empirical quantitative trials of its efficacy. The remaining axis of convention, albeit the weakest type of evidence, is clearly supported by the widespread uptake of MWM by manual therapists, the increasing number of publications describing the techniques including entry-level professional texts (Petty, for example[2]), and the growing number of Mulligan courses run annually across 25 countries (see www.bmulligan.com for current courses), as well as the incorporation of MWM into undergraduate and postgraduate university curricula. Moreover, there is now a regular international conference on the Mulligan Concept and an international teachers’ association, with a hierarchy of practitioner credentialing.

Before further discussing MWM and to truly understand the concept, it is arguably first necessary to appreciate the history of the individual who initiated and developed this original form of manual therapy, Brian Mulligan himself.

BRIAN MULLIGAN

The following historical recount is based on an interview with Brian Mulligan.

Brian Mulligan began his career as a physiotherapist after a chance conversation with a work colleague early in 1951. A friend was about to take up physiotherapy studies in Dunedin on the South Island of New Zealand, when the conversation took place. This life-changing discussion regarding physiotherapy completely changed the course of Mulligan’s life and set in place a chain of events that had major implications for manual therapy.
Mulligan was in his early 20s in 1954 when he graduated from the Otago School of Physiotherapy in Dunedin. This was the same era that two other well known physiotherapists also graduated in Dunedin, Robin McKenzie and Stanley Paris. Mulligan’s first job was at Wellington Hospital on the North Island of New Zealand, but he quickly moved out of the public hospital system into private practice. His first private practice work was a two-week private clinic locum position for Robin McKenzie. At that time there were only five private physiotherapy practices in Wellington. Mulligan enjoyed the experience immensely, and decided that this type of physiotherapy practice would be his career path in the future. Accordingly, he started his own private practice in Wellington and was very well supported by the local referring medical practitioners.

Mulligan was very active in the New Zealand Society of Physiotherapists (NZSP). He joined the NZSP after graduation, becoming the secretary of the local Wellington Branch at the end of his first year, and took on the presidency soon after. He attended as many meetings as he could in those early years to increase his clinical knowledge and to develop his skills in practice, being acutely aware of the general lack of understanding in managing patients with musculoskeletal problems at that time.

In the late 1950s, Jennifer Hickling from London gave seminars in New Zealand on Dr James Cyriax’s approach to orthopaedic medicine, which included spinal manipulation (high velocity thrust) and passive joint mobilisation techniques.[3] Mulligan attended those seminars and was deeply impressed by Hickling’s knowledge and expertise. Mulligan’s interest in manual therapy was greatly stimulated by these seminars. About this time, Paris and McKenzie were similarly developing their interests in manual therapy. Both Paris and McKenzie went to Europe to study with Freddy Kaltenborn and returned to New Zealand to teach this new approach in physiotherapy to Mulligan and other physiotherapists. These were exciting times for young ambitious physiotherapists, but there was still a great deal of frustration with more to be learnt about when to apply these new manual therapy techniques in clinical practice.

The significance of these developments in physiotherapy should be considered in the context of the times. The Otago school and indeed almost all undergraduate programs in physiotherapy in the 1950s did not include any form of manual therapy. Treatments largely consisted of exercise therapy and massage, as well as modalities such as ultraviolet radiation. Faradism, microwave and short-wave diathermy were also common treatments. Ultrasound was a latter addition to the therapeutic armamentarium that required a special licence in New Zealand. In those heady days, manual therapy was a very new and exciting advance in physiotherapy.

Mulligan sought to expand his knowledge in manual therapy and was keen to learn about peripheral joint mobilisation. In 1970 Mulligan was New Zealand’s representative at the World Confederation for Physical Therapy (WCPT) conference. Following this he travelled to Helsinki to attend a Kaltenborn peripheral joint mobilisation course. It was the first time he had been exposed to mobilisation techniques for the extremity joints. Shortly after his return to New Zealand he was asked to teach the new skills he had learnt to the local private practitioners’ group. He ran his first weekend course on Kaltenborn mobilisation techniques in 1970. Shortly afterwards, in 1972, he was asked to teach a similar course in Perth and Sydney, in Australia. Mulligan then taught regularly in Australia, especially Melbourne, where he visited for 15 consecutive years.

In 1984 Mulligan had his first MWM success, which completely changed his whole approach to manual therapy. The patient was someone he had been treating for some time but could not alter the status of their condition. The patient presented with a grossly swollen finger with painfully limited flexion and extension following a sporting injury. Mulligan used contemporary treatment techniques of the day, which included ultrasound and traction as well as medial and lateral joint glide mobilisations. Nothing appeared to significantly improve the patient’s condition.

Mulligan again attempted a medial glide technique but the patient reported this as being painful. He then applied a lateral glide, which the patient stated did not hurt. In a moment of inspired lateral thinking, Mulligan asked the patient to try to flex the injured finger while he sustained the pain-free lateral glide (Figure 1.2). The technique was immediately successful and restored the full range of pain-free movement to the
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joint in both flexion and extension. Further repetitions rendered the patient symptom-free after only one treatment session. A telephone call several days later revealed that the pain had not returned and the swelling had completely reduced following this single application of MWM. For Mulligan, this was a Louis Pasteur moment: ‘Chance favours the prepared mind’.

All MWMs that have since been developed arose from this single observation of a recalcitrant clinical problem. Mulligan thought a great deal about this patient, and soon realised the whole concept of positional faults and MWM. He was keen to apply the same idea to all his patients with finger joint problems, and then to other joints. Medial and lateral glides and rotations with movement were developed first in the fingers, shortly followed by the wrist. The concept of MWM was rapidly evolving. Sustained Natural Apophyseal Glides (SNAGs) were also being developed in the spine at the same time. Mulligan realised that the effects of MWM in the peripheral joints were similar to the effects of SNAGs in the spine. All these techniques essentially involved sustained accessory joint glides together with physiological movement. He rationalised that the techniques somehow restore a positional fault which arose from either trauma or muscle imbalance.

Momentum gathered quickly from this early inception of MWM. Mulligan was very excited by his discovery and knew he had to share it with other physiotherapists. He started to teach these new techniques at courses in New Zealand through the manual therapy special interest group of the NZSP known as the New Zealand Manipulative Therapists Association (NZMTA). At that time Mulligan was teaching a range of techniques from different concepts, including those of Geoff Maitland and Kaltenborn, but gradually his own techniques replaced these other concepts. His first Mulligan Concept course was held in 1986.

Mulligan wrote his first textbook on his concept of manual therapy in 1989. Every few years a new updated version was written as more and more techniques were being developed. Currently the book is in its sixth edition and has sold more than 75,000 copies worldwide. It has also been translated into 10 languages, including Mandarin, Polish, Korean, Portuguese and Spanish. A further publication followed in 2003 based on self-treatment techniques entitled Self treatments for the back, neck and limbs, and is currently in its second edition. Techniques from the Mulligan Concept are also now described in CDROM and DVD products (see www.bmulligan.com for a description of these products). Mulligan started to teach his new techniques in many other countries, starting with Australia and the USA. From the beginning, an important focus of these courses has been actual patient treatment demonstrations to clearly show the benefits of the concept.

In 1990 Mulligan lectured at Curtin University of Technology in Perth, Western Australia. Three UK physiotherapists, Toby Hall, Linda Exelby and Sarah Counsel were attending postgraduate courses at the university at the time and were impressed by the approach Mulligan presented. These three physiotherapists took Mulligan’s techniques back to the UK and started teaching them to their colleagues. Such interest was generated that this eventually led to invitations for Mulligan to teach in the UK and Europe and to the development of the international Mulligan Concept Teachers Association (MCTA), which had its inaugural meeting in Stevenage, UK in 1998. This teaching group was set up to standardise the teaching of the Mulligan Concept around the world. There are now more than 47 members of MCTA providing courses for physiotherapists all over the world. In addition, due to the demand from clinicians in the USA, and eventually elsewhere, who wished to be acknowledged as competent Mulligan Concept practitioners, Certified

Figure 1.2 (a) Manual application of a lateral glide MWM for a loss of flexion of the proximal inter-phalangeal joint of the index finger
(b) Application of a lateral glide MWM for a loss of hip flexion using a treatment belt
Mulligan Practitioner (CMP) competency examinations were established. To date, there are over 300 clinicians worldwide who have gained this certification.

In recognition of his significant contribution to manual therapy and the physiotherapy profession, Mulligan has received a number of awards. In chronological order of presentation these include: Life Membership of the NZMTA (1988); Honorary Teaching Fellowship from Curtin University of Technology (1991); Honorary Fellowship of the NZSP (1996); Life Membership of the New Zealand College of Physiotherapy (1998); Life Membership of the NZSP (1999); Honorary Teaching Fellowship from the University of Otago (2003); WCPT Award for International Services to the Physiotherapy Profession (2007). The impact that the Mulligan Concept has had on clinical practice was highlighted when Mulligan was named one of ‘The Seven Most Influential Persons in Orthopaedic Manual Therapy’ as the result of a poll of members of the American Physical Therapy Association.

MOBILISATION WITH MOVEMENT

The fundamental components of the MWM techniques are still as they were when in 1984 Mulligan first observed immediate full restoration of pain-free movement after he sustained a lateral glide mobilisation to an inter-phalangeal joint and asked the patient to actively flex that joint. Furthermore, he observed that it only took one session of this first MWM to bring about long lasting changes. This was especially impressive because the finger joint had not responded to a range of contemporary physical therapies applied over several sessions. This immediate, pain-free and long lasting response has become the key principle guiding MWM application today.

MWM can be defined as the application of a sustained passive accessory force to a joint while the patient actively performs a task that was previously identified as being problematic. A critical aspect of MWM is the identification of a task that the patient has difficulty completing, usually due to pain or joint stiffness (see Chapter 2 for more detail). This task is most frequently a movement or a muscle contraction performed to the onset of pain, or to the end of available range of motion (ROM) or maximum muscle contraction. In this text, we will refer to this as the Client Specific Impairment Measure (CSIM, see Chapter 2 for more detailed description). The passive accessory force usually exerts a translatory or rotatory glide at the joint and as such must be applied close to the joint line to avoid undesirable movements. It may be applied manually or sometimes via a treatment belt (Figure 1.2b).

The direction of the accessory movement that is used is the one that effects the greatest improvement in the CSIM. It is somewhat surprising that a lateral glide is the most commonly cited successful technique used in peripheral joints, but if this direction is not effective then other directions may be tested. Alternate glides may follow the convex–concave rule of joints[6] but in some cases in the opposite direction to the mechanism of injury movement. Sometimes a little trial and error is needed to find the right direction. One distinction with SNAGs, which are effectively the ‘MWM of the spine’, is that the gliding motion is always in the direction of the facet joint plane. Mulligan generally recommends three sets of 10 repetitions of MWM, or fewer if the impaired task is pain-free on reassessment following the application of a set of MWM or if irritability or acuteness is a factor in the spine when using SNAGs. There are many nuances to the successful application of MWM and these are covered in depth in Chapter 2.

MWM can be easily integrated into the standard manual therapy physical examination to evaluate its potential as an intervention. A seamless integration can be undertaken after examining the active/functional movements, static muscles tests in some cases, and passive accessory movements. They can be readily trialled and implemented in the treatment. Reassessment is generally just a matter of the practitioner taking their hands off the patient and asking them to move (without having to change position), and frequently the treatment and its reassessment can be applied in weight-bearing positions for lower limb and lumbopelvic problems. Mulligan recommends discarding the technique immediately if no positive change is evident on initial reassessment.[7]

The indications for MWM in both the physical examination and for treatment are essentially the same as for other ‘hands-on’ manual therapy approaches, as are the contraindications. This is discussed more comprehensively in Chapter 2. Generally, mobilisation techniques, including MWM have been conceptualised as being indicated for mechanically induced joint pain and joint stiffness limiting ROM. However, MWM has also been proposed by Mulligan to effect what appear to be soft tissue conditions, such as lateral epicondylalgia of the elbow and lateral ankle ligament sprain, and indeed there is growing evidence to support his assertion (see Chapter 3). The various potential mechanisms by which MWM may exert its effects are considered in Chapters 4, 5, 6 and 7.

While innovative and original in nature, the MWM concept has parallels to other ‘traditional’ mainstream approaches to manual therapy that would facilitate ready adoption by the experienced manual therapist. For example, the consideration of joint mechanics in some MWM techniques is akin to the approach advocated by Kaltenborn,[6] and the strong emphasis on self-management using repeated movements would be familiar to McKenzie practitioners.[8] This is not surprising given that Mulligan was heavily influenced early in his career by both these practitioners through direct mentoring. In common with both the Maitland[9] and McKenzie approaches a change in pain response is used as an indication that the correct technique is being
applied, although rather than provoking or localising pain the aim of MWM is its immediate and total elimination. In contrast, there are no ‘grades’ of mobilisation in MWM as there are in the Maitland approach and some other approaches, and MWM combines both passive and active elements rather than just focusing on one (e.g. passive joint movement as per Kaltenborn) or the other. In regard to the latter, there is some similarity to the combined movement approach described by Brian Edwards in which pain-free joint positioning is used to enable end-range passive mobilisation. The other interesting parallel is the story about how Mulligan ‘discovered’ MWM, not dissimilar to the account given by McKenzie as to how he chanced upon the therapeutic value of lumbar spine extension for low back pain. These outliers of the manual therapy world appear to share an ability to creatively clinically reason or think outside the box.

MWM AND CLINICAL REASONING

Some approaches to manual therapy have been criticised for fostering ‘recipe book’ clinical practice. That is, rather than promoting skilled clinical reasoning in autonomous practitioners, some approaches could be considered to relegate the role of the manual therapist to that of a technician, required simply to deliver a predetermined course of therapeutic action. A cursory view of the MWM concept might similarly suggest it simply requires the clinician to routinely follow several basic rules (e.g. the treatment plane rule, convex–concave rule) and therefore is at odds with the development of skilled clinical reasoning. However, on closer inspection it is clear that MWM actually incorporates many of the desirable aspects of contemporary, exemplary clinical reasoning. In particular, these relate to a patient-centred approach to healthcare and promotion of the ongoing development of the practitioner’s clinical skills.

MWM promotes patient-centred reasoning

Jones and Rivett have advanced a model of clinical reasoning in manual therapy that places the patient firmly at the centre of the clinical encounter and the associated clinical reasoning processes. Their model is consistent with the patient-centred approach to evidence-based medicine advocated by Sackett et al. Evidence-based medicine has been defined by Sackett et al (p.71) as ‘the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients’. These authors further stress that evidence-based medicine is an integration of the practitioner’s clinical expertise with both the best external clinical research evidence and the patient’s preferences in making decisions about their care. While for treatment the ‘gold standard’ for evidence is the randomised clinical trial or a systematic review of such trials, where this is limited or not available we must use the next best external evidence (see Chapter 3, Table 3.1 for the various levels of evidence), whether it be a case report or from the basic sciences. We therefore prefer the term ‘evidence-informed practice’, and particularly use this in the case studies which comprise the latter part of the text, as the cases strive to illustrate how expert clinicians apply the external research evidence for MWM within a clinical reasoning framework and without losing the uniqueness and individuality of the patient. The patient is considered an active and equal partner in the clinical problem-solving exercise, as they bring their own beliefs, understandings, expectations and experiences to the unfolding clinical journey. In addition, consistent with the biopsychosocial model of healthcare, the patient is required to actively engage in their treatment and management, as opposed to just passively receiving the ‘laying on of hands’ implicit in many traditional manual therapy approaches.

The MWM concept arguably promotes patient-centred clinical reasoning in several ways:

- Collaborative clinical reasoning in treatment, as promulgated by Jones and Rivett is central to MWM. First, the patient needs to understand that the technique is completely pain-free and that they must report any pain immediately to the therapist. Second, in most MWM applications, the patient is required to perform an active movement or functional task that is problematic and for which treatment was sought (e.g. a painful or limited movement). Third, many MWM techniques involve the patient applying overpressure at the end of range, and indeed Mulligan considers this component critical in effecting an optimal response. Finally, and perhaps most importantly in this context, some MWMs can be adapted for home exercise as self-MWMs or by using tape to simulate the accessory movement (or mobilisation) component of the technique. Of course, all of the above elements of MWM necessitate that the patient understands the principles of MWM and is willing to actively participate in their own management; thereby rendering the patient a central and necessary factor in successful MWM treatment. The importance of collaboration and patient cooperation to the success of MWM is highlighted in an acronym favoured by Mulligan (personal communication, 2009) in his teaching – CROCKS:
  - Contraindications to manual therapy as for any manual therapy techniques
  - Repetitions of the technique are required, but with care on initial application and in acute injuries for which three to six repetitions are recommended
  - Overpressure to ensure optimal ongoing improvements
  - Communication and cooperation is essential for safe and effective MWM application with
practitioners informing patients of expected effects and for patients informing practitioners of any discomfort or pain
• Knowledge of musculoskeletal medicine, biomechanics and anatomy
• Sustain the glide for the entire duration of the repetition. S also stands for skill in the manual handling of the physical application of the MWM, sensibility of the sensing fingertips to accurately locate MWM forces and to detect movement, subtle changes in glide direction are often required, and common sense.
• The practitioner can facilitate patient compliance with treatment, especially the self-management component, by demonstrating to the patient that application of MWM can produce an immediate pain-free response in their ‘worst’ movement or activity. Moreover, such a powerful response has significant potential to change any negative beliefs or expectations that the patient may have brought to the clinical encounter. Another of the acronyms that Mulligan (personal communication, 2009) uses when teaching MWM is PILL, indicating the desired response from the technique’s application:
  • Pain-free application of the mobilisation and movement components
  • Instant result at the time of application
  • Long Lasting effects beyond the technique’s application.
• Effective communication is pivotal to the effective application of MWM. The patient must immediately communicate the onset of any pain with either the ‘Mobilisation’ or the ‘Movement’ component, or else the technique will be rendered ineffectual. Similarly, the therapist must clearly communicate what is expected of the patient, as outlined in the previous point. Effective communication is also unambiguously the foundation of effective collaborative clinical reasoning.
• Central to the MWM concept is that each patient is an individual and their clinical presentation is unique, although they may share some common features with others. This consideration of individuality and uniqueness is consistent with the ‘mature organism model’ which proposes that each patient’s illness or pain experience is influenced by their own life experiences and immediate contextual circumstances, and therefore their clinical presentation cannot be exactly the same as that of another patient. The ‘Movement’ component of MWM requires that a movement or functional activity be identified that is most painful or limited for that individual, and which has a significant impact on their daily life. This movement is also used in reassessment as a ‘comparable sign’ (i.e. a clinical sign that relates to their functional limitation and pain) as described by Maitland et al. Similarily, the use of a CSIM in relation to MWM recognises the unique clinical presentation of the individual patient.
• Arguably, MWM provides a means by which various types of clinical reasoning hypotheses can be tested, aside from the obvious one of management and treatment. Most notably, the degree of response to MWM can potentially expedite and refine the clinical prognosis.

MWM promotes knowledge organisation
A well-organised knowledge base has been identified as one of the hallmarks of clinical expertise. It is not just the degree of knowledge in its three main types — propositional (essentially basic and applied science), non-propositional (including practical and other professional skills) and personal (an individual’s life experiences) — that is important in clinical reasoning, but how these understandings and skills are stored and held together using clinical patterns. A well-organised knowledge base will facilitate the application of advanced clinical reasoning processes, particularly that of pattern recognition which has been shown to be more accurate than hypothetico–deductive processes in manual therapy diagnosis and is typically used by experts.

It can be argued that the MWM concept promotes knowledge organisation by:
• Stimulating research and a growing evidence base which can be used to help guide and inform clinical reasoning. As later chapters demonstrate, there is a burgeoning evidence base, both biological and empirical for MWM.
• Highlighting and integrating key physical examination findings, most notably passive accessory movement findings (the ‘Mobilisation’) with the ‘comparable’ active/functional movement findings (the ‘Movement’).
• Facilitating clinical pattern acquisition through the immediate response to the application of MWM. Effectively this constitutes feedback to the therapist on the accuracy of the related clinical decision(s) and helps to reinforce the association of key clinical findings with correct clinical actions.
• Fostering the development of metacognitive skills through the need to continually adapt the application of MWM on the basis of the patient’s initial and changing responses. Metacognitive skills are higher order thinking skills of self-monitoring and reflective appraisal of one’s own reasoning, and are a well-recognised characteristic of clinical expertise.

While the Mulligan Concept as it relates to MWM may promote the development of skills in clinical reasoning, there is a risk that an unquestioning inflexibility of thinking may set in if vigilance is not maintained. The writings of Mulligan should be used as a guide to the application of MWM with the techniques adapted for the needs of a particular patient, and not treated as gospel from which heated debates arise over differing
interpretations and trivial technical issues. The history of manual therapy is replete with examples where a far-sighted pioneer has been feted like a guru by his followers, who, with the fervour of religious zealots then proceed to construct a framework that stifles creativity and the further evolution of the protagonist’s approach,[17] and which misdirects future practitioners and advocates of the approach away from the originator’s fundamental underpinning concepts.

AIMS AND STRUCTURE OF THIS BOOK

The primary aim of this book is to present a comprehensive and contemporary discourse on Mulligan’s MWM management approach for musculoskeletal pain, injury and disability. In particular, it strives to integrate the evidence base for MWM into clinical practice, with an emphasis on explicating the underpinning clinical reasoning.

This book will cover the spectrum of the MWM treatment approach from: (a) the evidence base for its clinical efficacy, clinical and laboratory based effects, and underlying mechanisms; (b) best evidence guidelines for MWM treatment selection and application; and (c) the current state of play with regard to Mulligan’s ‘positional fault’ hypothesis, as well as other impairments/deficits in the pain, sensory, sensorimotor and motor systems that may well be plausibly addressed by the MWM approach; through to (d) a series of case studies (Chapters 8 to 19) that demonstrate how the former considerations can be utilised in the clinical reasoning process. The latter will also demonstrate the framework within which the practitioner is able to design and implement customised MWM techniques for the individual patient, as illustrated by some prominent Mulligan Concept practitioners. By presenting these cases within a clinical reasoning framework it is further intended to demonstrate that the use of MWM is very much dependent on the individual patient’s presentation and requires a sophisticated level of thinking by the practitioner. These are not ‘recipe book’ treatments. Key MWM techniques, particularly those for which evidence is supportive, will be described in detail and depicted. In the event that a practitioner confronts issues in putting into practice the MWM techniques, we have included a technique troubleshooting section (Chapter 20), which is geared towards practitioners self-reflecting and appraising their performances in order to develop strategies and solutions to these issues.

This book will be of benefit for students of manual therapy and for the various health professionals working clinically in this field, and it should provide a valuable resource for instructors and researchers. It is not intended to replace the technical books of Mulligan, but rather is complementary. To make the most of this book, the reader should strive to first understand the principles and evidence underpinning MWM, and to do so with an open but healthily sceptical mind. The case studies comprising the bulk of the chapters will provide the novice reader with the confidence to take the concept of MWM into their clinic, and the experienced clinician with the opportunity to develop their clinical reasoning skill by comparing their reasoning to that of other Mulligan Concept practitioners.

References