

# **DISCUSSION PAPER: EVIDENCE BASED PRACTICE AND CHIROPRACTIC**

PHILLIP EBRALL, PhD<sup>1</sup>

<sup>1</sup> Southern Cross University, Australia; International Medical University, Malaysia; Tokyo College of Chiropractic, Japan.

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### ABSTRACT

**Objective:** To present an objective interpretation of the literature reporting evidence based medicine or practice and to raise discussion points based on those findings which, if explored, may advance the chiropractic profession in both its academic and clinical activities.

**Data Sources and Synthesis:** The indexed literature and URLs identified by on-line searching. A contextual narrative identifies specific points that may be worthy of formal discussion, either by individual authors preparing papers for publication, or by symposia.

**Conclusion:** Evidence based medicine is thought by some to have had its day. The concept of best practice seems embedded within chiropractic education. Whether they appreciate it or not, most chiropractors practice a rich form of evidence based practice into which they inject their experience as a chiropractor and the characteristics including preferences of the patient. (Chiropr J Australia 2016;44:308-319)

Key Indexing Terms: Evidence-Based Medicine; Chiropractic; Medical Education

### INTRODUCTION

In 1996 Sackett et al defined evidence-based medicine (EBM) as the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. (1) This notwithstanding EBM was first conceptualised in mid-19th century Paris.<sup>1</sup> Since Sackett's seminal paper in 1996, EBM has been adopted and included in most developed medical and healthcare curricula around the world. (2,3). However, it is acknowledged that medicine rests on an uneven evidence base. Some interventions are supported by large multi-centre randomised controlled trials that have a low risk of bias and are powered for hard endpoints- a high level of evidence. Others depend on retrospective observational data that provide a lower level of evidence. Yet others were theorised and considered biologically or mechanistically plausible and are heirlooms of 'eminence-based medicine.' (4)

Recently, there has been a suggestion the chiropractic profession should become more evidence-based.(5) A 'soft-resistance' to the concept of EBP is given as being a change in terminology to 'evidence-influenced practice,' and a hard resistance as being a claim that the best evidence is that based on practice experience and not research. (5)

Under Australia's National Law (2009) (6), all chiropractors are commonly registered; however, it must be appreciated this does not insulate Australia from world views of chiropractic. Comments have previously been published by me (7) on a position statement or communiqué by half-dozen chiropractic educational institutions (8) in Europe and South Africa. It was formally released coincidentally with the 2015 scientific meeting conducted by the World Federation of Chiropractic in Athens. (9) This communiqué has impact in Australia and includes the following statement:

*The teaching of vertebral subluxation complex as a vitalistic construct that claims that it is the cause of disease is unsupported by evidence. Its inclusion in a modern chiropractic curriculum in anything other than an historical context is therefore inappropriate and unnecessary. (8)*

The intent of this statement is to strongly suggest that chiropractic education should only be based on 'evidence,' whatever 'evidence' may be deemed to be. The same thought is echoed by educators in Australia who argue 'government-funded universities insist on intellectual evidence based rigour in their learning and teaching.' (5)

In contrast to presenting a detailed plan or a communiqué as *faits-accomplis*, this paper calls for discussion among all stakeholders in the chiropractic discipline. Stakeholders include the practitioners who collectively constitute the profession, the academics who attempt to craft the future of the profession, the students who are crafted, the technique interests who concentrate on developing and refining certain approaches, and of course, the consumer, the patients of chiropractors.

The discussion would ideally first determine the actual topic and then speak to its pros and cons with a view to achieving a position on EBP for chiropractic. To help inform such a discussion, the following review of the literature is offered.

## **DISCUSSION**

### *EBM and the Literature*

In general terms, the literature first embraced EBM but recently has become less supportive. The seminal paper has already been cited (1) so it is appropriate to follow Sackett's thoughts. He is considered to be the founding-father of EBM. (10) Sackett summed up EBM in his original paper by saying "It's about integrating individual clinical expertise and the best external evidence." (1) Notwithstanding the clarity of his position he was required to defend it later in the year EBM was announced (11) and later again to emphasise its importance in academic medicine.(12)

Many other clinicians have not been so kind in their assessment. One issue seems to be the rapid dissemination of new knowledge, to which some react "In a world where the evidence generated every week is substantial, we simply do not know what we do not know. In such a state of permanent flux, it is a lot easier to 'stick to what you know' (received dogma) and never change until retirement." (13) From this flows the concern that 'the emphasis on experimental evidence could devalue basic sciences and the tacit knowledge that accumulates with clinical experience.' (14) The fact that leading medical academics have formed an 'Evidence-Based Medicine Renaissance Group' is a concern in itself as it indicates that 'although evidence-based medicine has had many benefits, it has also had some negative unintended consequences.' (14) They argue an agenda for the movement's renaissance, refocusing on providing useable evidence that can be combined with context and professional expertise so that individual patients get optimal treatment. (14)

Others argue the renaissance movement would represent sweeping intellectual revival for evidence-based medicine but propose a breakaway group of concerned followers from orthodoxy to form a separate school of thought.(15) Hence this discussion paper. Given

the observations of a respected academic(5) the question must be asked whether it is time for chiropractic to opt for a separate school of thought. It may well be that any proposal for a 'new chiropractic' is ill-conceived and that instead it is preferable to give renewed scientific understanding to the concepts embodied in chiropractic's major premise. After all this seems to be the direction of chiropractic researchers. (16-18) This is in addition to high level labs developed to better explore the existing, known strengths of chiropractic with common spinal disorders. (19)

A serious problem is 'the distortion of the evidence base by financial interests ... there is a ... need to study hidden biases in sponsored research.' (15) Fuller et al conclude 'educators must train doctors to assess the trustworthiness of evidence, guidelines, and continuing education, not only the methodological rigour of studies. (15) However, this may be a case of too little, too late. Fraud is well-known to exist within the publishing environment. There seems to be a never-ending flow of papers that are withdrawn from publication after they have been critically examined and fraudulence either proven or suspected. (20,21) With such uncertainty there is little wonder why medical practice shows a poor uptake of EBM. (22) A discussion point is whether or not it is reasonable for chiropractic to follow this flawed pathway.

A striking review by Tonelli found 'Despite its promise, EBM currently fails to provide an adequate account of optimal medical practice. A broader understanding of medical knowledge and reasoning is necessary.' (23) In another article, Tonelli made the point that CAM cannot be evidence-based.(24) On the basis of that argument one must ask about the role of the randomised controlled trial (RCT) in chiropractic. A view from the medical world is instructive. Lim et al state 'RCTs assessing operative interventions face particular challenges. Operative procedures are often difficult to standardise and are frequently conducted in an emergency setting.'(25) In this context an 'emergency setting' would be similar to a chiropractic clinic in that patients are cared for as they present, without lengthy in-hospital preparation. A discussion point is whether or not it is possible to standardise chiropractic treatments and the related chiropractic intervention.

It is known that the evidence base for orthopaedics compares unfavourably with other fields of medicine and that only 20% of procedures are estimated to be supported by at least one low-risk-of-bias randomised controlled trial showing that surgery is superior to a non-operative alternative. (25) Lohmander and Roos state similar reviews of the evidence base for sports medicine are not available. (4) Would chiropractic be provoking 'the sacred cow' if it dared question the evidence base for sports chiropractic? Without such evidence how can it be that a group of practitioners form an elitist group promoting a niche market (26) and a 'sports council.' (27)

General medical practice holds a fear that enforced compliance 'creates a culture of fear where doctors are so preoccupied with watching their backs that they no longer watch their patients; they treat the biochemistry rather than the symptoms, and the disease rather than the patient.'(28) Another weakness of EBM is that the published evidence tends to be disease-based, which presents significant hurdles, even in general medical practice, for patients who present with symptoms unexplained by disease.(29)

A final observation of the failure of EBM is found in the *Australian Atlas of Health Care Variation*. (30) The atlas presents a 'clear picture of substantial variation in healthcare use across Australia, across areas such as antibiotic prescribing, surgical, mental health and

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diagnostic services' yet these practices are all meant to be evidence based. What is the reason for such variation? Could it be that EBM has failed?

It may be hard for some to accept but the evidence is that EBM has philosophical limits .(23) A discussion point is whether or not chiropractic wishes to self-impose such limits on its own practice.

### *How Does Practice And Education Improve?*

Petty argues that expertise develops through experience with patients, formal postgraduate education and direct observation of practice with a mentor.(31) Petty proposes that critical reflection on practice enhanced by direct observation of practice with a mentor and formal postgraduate education each provide a potentially powerful tool for learning and the development of clinical expertise. A discussion point would be how to apply this principle to academic chiropractors to further improve their teaching.

The publication record shows academic chiropractors are already engaged with their teaching through investigations into 'best practice.' (32) An attempt has been made to shift from 'best practice'; however, the very question of 'what constitutes evidence for best practice' remains live. (33) Triano makes the point clinicians and academics need 'resources to understand the available evidence that informs individual treatment approaches.' Triano cites an authority on clinical practice, Joy Higgs, as stating 'the authors argue against basing clinical practice on narrow definitions of evidence, relying solely on experimental findings or, even more exclusively, on randomised controlled trials.' (33)

An important discussion point would expand on this position and explore, with evidence and not opinion, the make-up of ideal clinical practice and the optimal manner in which the evidence based triad may best be blended for the good of the patient.

### *Is Any of Chiropractic Evidenced Based?*

One must respond in the affirmative for both education and clinical practice. There are many reports of outcomes of certain educational approaches presented over the years at conferences in various countries. Whether or not academic chiropractors at a specific institution take any notice and change their practices is another matter. Similarly the literature is replete with evidence of the effectiveness of chiropractic. To suggest otherwise is to admit to an ignorance of the literature. The question becomes how one places a weighting or ranking on the evidence that is published.

Rosner presents a pyramid of evidence (34) and states 'paradoxically, because the double-blind study is so controlled, this most rigorous member of the clinical research hierarchy presents its own difficulties in its limited generalisability.' (34) It must be remembered that 'contrary to what many people think, EBM is not restricted to randomised trials and meta-analyses. It involves tracking down the best external evidence there is.' (35). In short, should one rely only on the traditional ranking of 'evidence' depicted in the commonly known triangle or pyramid one may become like a small dog with a very large bone, it has something but does not quite know how to use it. For this reason a matrix has far greater utility. This approach is now taken by the Agency for Healthcare Research and Quality (AHRQ). (36)

A modified matrix is given as Figure 1. The benefit of this approach is its lack of dichotomy. It is no longer relevant to think an RCT is better than a Case Report. The matrix approach provides a deeper level of interpretation of the best available evidence, and weighs danger to the public against risk and benefit. The AHQR views evidence as being derived from many sources, in fact, a number of guidelines on the AHQR website state evidence is even located by hand-searching journals. Another powerful benefit is the allowance of guidelines ranking by age group, which would remove criticism of a supposed 'adult' technique being applied to an infant, for example.

		Size of treatment effect			
		CLASS I	CLASS IIa	CLASS IIb	CLASS III
		Benefit >>> Risk	Benefit >> Risk	Benefit ≥ Risk	Risk ≥ Benefit
		Treatment should be performed	Additional studies with focussed objectives needed  It is reasonable to perform treatment	Additional studies with broad objectives needed  Treatment may be considered	No additional studies needed  Treatment should not be performed since it is not helpful and may be harmful
Estimate of certainty (precision) of treatment effect	<b>LEVEL A</b> Multiple (3-5) population risk strata evaluated. General consistency of direction and magnitude of effect	<ul style="list-style-type: none"> <li>Recommendation that treatment is useful/effective</li> <li>Sufficient evidence from multiple randomised trials or meta-analyses</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation in favour of treatment being useful/effective</li> <li>Some conflicting evidence from multiple randomised trials or meta-analyses</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation's usefulness/efficacy less well established</li> <li>Greater conflicting evidence from multiple randomised trials or meta-analyses</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation that treatment is not useful/effective and may be harmful</li> <li>Sufficient evidence from multiple randomised trials or meta-analyses</li> </ul>
	<b>Level B</b> Limited (2-3) population risk strata evaluated	<ul style="list-style-type: none"> <li>Recommendation that treatment is useful/effective</li> <li>Limited evidence from single randomised trial or non-randomised studies</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation in favour of treatment being useful/effective</li> <li>Some conflicting evidence from single randomised trial or non-randomised studies</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation's usefulness/efficacy less well established</li> <li>Greater conflicting evidence from single randomised trial or non-randomised studies</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation that treatment is not useful/effective and may be harmful</li> <li>Limited evidence from single randomised trial or non-randomised studies</li> </ul>
	<b>Level C</b> Very limited (1-2) population risk strata evaluated	<ul style="list-style-type: none"> <li>Recommendation that treatment is useful/effective</li> <li>Only expert opinion, case studies, or standard of care</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation in favour of treatment being useful/effective</li> <li>Only diverging expert opinion, case studies, or standard-of-care</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation's usefulness/efficacy less well established</li> <li>Only diverging expert opinion, case studies, or standard-of-care</li> </ul>	<ul style="list-style-type: none"> <li>Recommendation that treatment is not useful/effective and may be harmful</li> <li>Only expert opinion, case studies, or standard-of-care</li> </ul>

Figure 1. The contemporary process to interpret and apply evidence. [Adapted for chiropractic from materials available at <https://guideline.gov> (Agency for Healthcare Research and Quality)].

The beauty of this matrix lies in its contrast of science with the humanistic element of practice as in expert opinion, practice guidelines, and of course, case studies. The traditional pyramid ranks humanism low and science high and seems to be the referent for other’s opinions. (5) The matrix weighs the certainty or precision of treatment, as in the most likely and predictable outcomes, against risk to the patient and the size of the treatment effect. Every chiropractor will have cases to recite in which their considered expert opinion together with the evidence of the patient before them led to an intervention or adjustment that produced a very significant positive effect. In the same vein, all will be familiar with the patient who never ‘gets better’ and in whom there is a minimal treatment effect. The matrix accounts for this variation while the traditional pyramid does not.

The standard Johari window, based on a 2x2 table, may be created from consideration of the matrix given in Figure 1. The upper left cell is important as it suggests treatment is reasonably expected to be beneficial and offers supportive reasons. These range from the RCT to a standard-of-care guideline. No matter, each and every matter considered by the practitioner in this zone is valued as ‘evidence.’ The lower right cell is the worry. It represents the ‘no-go’ zone in which no practitioner wishes to find themselves. The intent inherent in the Johari Window style of depiction is to enlarge the top left cell while shrinking the lower right.

	<b>Practitioner experience is evidence based</b>	<b>Practitioner experience is not evidence based</b>
<b>Treatment will be acknowledged as appropriate by peers</b>	Treatment is reasonably expected to be beneficial, based on evidence from multiple randomised trials or meta-analyses, a single randomised trial or non-randomised study, or expert opinion, case studies, or a standard-of-care guideline	Treatment is not expected to be beneficial. There is no evidence of any form in the literature and neither the practitioner or patient have a record of therapeutic care in this case.
<b>Treatment will be judged as inappropriate by peers</b>	Treatment is not reasonably expected to be beneficial as there is no evidence from multiple randomised trials or meta-analyses, a single randomised trial or non-randomised study, or expert opinion, case studies, or a standard-of-care guideline	Treatment is not expected to be beneficial. There is no evidence of any form in the literature and no peers have a record of beneficial therapeutic care in this case.

Figure 2. Prediction to the Johari Window. [Created for chiropractic by applying the principles of the Johari Window which plots self against others in a standard 2x2 table].

The discussion point these matrices raise is how may chiropractic introduce this approach and produce tables populated with found evidence at all levels. The AHQR specialises in producing evidence-based guidelines. It has actually been reported that chiropractors appear to adhere to clinical practice guidelines more so than physiotherapists and medical practitioners, although there is scope for improvement across all three professions. (37)

Should this be a commonplace finding one must explore the benefits, if any, of a swing more towards EBM.

Alcantara considers paediatric chiropractic to be evidence-informed and concludes ‘those who consider the chiropractic care of children as “experimental or investigational” have antiquated values and have no place in 21st century healthcare.’ (38) On this theme it can be said that those who deny chiropractic has a level of effectiveness in treating neck pain, headache or low back pain are simply out of touch with the literature.

The counter-argument run by critics of chiropractic seems to always revert to ‘show me the evidence to prove chiropractic is effective.’ A wise rebuttal is to take the stance that says ‘show me your evidence chiropractic is not effective.’ However in this milieu it must be remembered that from multiple perspectives, EBM is now largely discounted.

### *Evidence for the Target of Therapeutic Intervention*

The final discussion point that remains is what to do with the identification and labelling of the target within the spine of the therapeutic intervention delivered by chiropractors, which we will take as the chiropractic adjustment. This paper raises no issues with the mode of intervention in the understanding that 2 arms of the evidence triad are always considered. These are the experience of the chiropractor and the preference of the patient. In this regard one must admit evidence based practice is a daily reality in chiropractic clinics world-wide.

However pathetic it may seem, the ‘elephant in the room’ is the name given to the ‘thing’ chiropractors ‘treat.’ Subluxation came into the chiropractic dialect in 1904/05. (39) The term was introduced by BJ Palmer, not forgetting of course it was used by Harrison in the 1820s (40) and perhaps by others before him. Some claim another early chiropractor used the term a year before Palmer but the evidence is difficult to locate. A related matter of which we can be sure is that regardless of his claims for the impact of ‘luxation’ on the nervous system, DD Palmer refused in court to admit he could cure disease. (41)

Given Rome’s remarkable revelation there are nearly 300 terms loosely used to suggest spinal subluxation (42), it is interesting that derision is aimed at one, ‘subluxation.’ To relegate the term to an historical concept (8) could be seen as a lack of academic judgement. It begs the question of what a subluxation-denier actually terms the target of their intervention. The discussion point that flows from this observation relates to how an academic and a clinician may meet on what is obviously entrenched terminology in the profession. (43)

## **CONCLUSION**

It is one thing to argue a point of view. It is another thing entirely to understand both sides of the argument and to demonstrate a knowledge, dare one say an evidence based knowledge, of one’s viewpoint.

It is hoped that the points raised in this discussion paper will be addressed, either in writing and publication, or by symposia, and the chiropractic profession can continue to grow its areas of best practice, both clinical and academic.



## **DECLARATION OF INTEREST**

This paper derives from research being undertaken by the author for a doctoral thesis with the research question *The impact of evidence-based practice on chiropractic education* with Southern Cross University Australia. There are no known overt or covert conflicts of interest with this paper parts of which will contribute to the final thesis submission.

The author is a retired Professor of Chiropractic and holds appointment as an Adjunct Professor with the International Medical University in Kuala Lumpur and as Vice-President (International) with the Tokyo College of Chiropractic in Tokyo. His first doctorate was in the field of male adolescent low-back pain, awarded in 2000.

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