



Original article

Australian musculoskeletal physiotherapist's perceptions, attitudes and opinions towards pre-manipulative screening of the cervical spine prior to manual therapy: Report from the focus groups

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ABSTRACT

Background: The Australian Physiotherapy Association 2006 VBI Guidelines are used by many of the member organisations of IFOMPT. These Guidelines are due for revision incorporating recent research findings, international guides, and member's recommendations.

Purpose: To identify and consider Australian musculoskeletal physiotherapists' recommendations to inform revision of the 2006 VBI Guidelines.

Methods: Focus groups were conducted in the five larger Australian state capitals by an independent qualitative researcher and a subject expert. Qualitative data were collected from 41 musculoskeletal physiotherapists who were purposefully recruited for their broad range of experience and qualifications. The five stage Framework Analysis approach was used to analyse and interpret data.

Results: Participants recommended that the revised Guidelines have a new title reflecting a broader risk assessment and management approach, encompassing both musculoskeletal and relevant cardio-vascular risks and informed by contemporary research evidence and clinical experience. Participants requested a positively worded stepwise guide to clinical reasoning for all cervical spine manual treatment scenarios including the process of gaining and recording consent. Participants advised on individual components of the Guidelines needing to be revised or removed. The revised Guidelines, once approved, need to be disseminated in written and electronic formats to all clinicians. Training and education are required to ensure appropriate uptake within and beyond the profession.

Conclusions and implications: To ensure their clinical acceptance and utility, the Revised Guidelines need to reflect the current use and recommendations of musculoskeletal physiotherapists. Sound knowledge translation processes are then needed to ensure that the Guidelines are incorporated into practice.

1. Introduction

The Australian Physiotherapy Association 2006 'Clinical Guidelines for Assessing Vertebrobasilar Insufficiency in the Management of Cervical Spine disorders' (Australian Physiotherapy Association, 2006; Rivett et al., 2006) (APA 2006 VBI Guidelines) have been used by physiotherapists in Australia and internationally to inform safe musculoskeletal management of the cervical spine. They are now over 10 years old and due for revision in light of advances in the literature and publication of the IFOMPT 'International Framework for Examining the Cervical Region for the Potential of Cervical Arterial Dysfunction' (Rushton

et al., 2014).

Recommendations were originally introduced (Grant, 1988) as awareness of the rare but catastrophic effects of neck manipulation became known. This protocol was revised (Magarey et al., 2000), largely in response to a landmark legal case (Chalmers et al., 1993) identifying duty of care to accurately convey to patients warning of material risk associated with procedures. The case highlighted a need for more thorough patient assessment and informed consent processes. In the 2006 revision the name was changed to VBI Guidelines, reflecting a more clinical reasoning based approach and included a checklist and flow chart.

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Table 1
Participant characteristics.

| State | N (n female) | Years of practice | Years musculo-skeletal practice | Level of training | Teach musculo-skeletal therapy | Place of work |
|--------------|----------------|-------------------|---------------------------------|--|--------------------------------|---|
| NSW | 13 (5) | 22 (11.7) | 17 (11.5) | 5 specialists 7 titled 2 untitled 1 New grads | 10 | 11 Metropolitan 9 Private (2 hospital, 1 both) 2 consulting) |
| QLD | 9 (4) | 21 (14.2) | 13.5 (11.9) | 4 specialists 7 titled 2 untitled 1 New grads | 6 | 9 Metropolitan 7 Private (2 hospital) |
| VIC | 8 (2) | 27 (11.7) | 21 (12) | 2 specialists 6 titled 2 untitled 0 New grads | 8 | 6 Metropolitan 2 Non-metro 6 Private (2 hospital) |
| SA | 6 (1) | 25 (13.6) | 23 (13.5) | 0 specialists 3 titled 3 untitled 0 New grads | 4 | 6 Metropolitan 5 Private (1 hospital) |
| WA | 7 (0) | 18 (10.4) | 13 (10.5) | 3 specialists 9 titled 0 untitled 0 New grads | 7 | 7 Metropolitan 7 Private (1 + hospital) |
| Total | 39 (12) | 21 (12.3) | 16.9 (11.6) | 14 specialists 32 titled 9 untitled 2 new grads | 33 | 37 Metropolitan 2 Non-metro 22 Private 7 Hospital (2 both) |

The APA 2006 Guidelines represent an important standard, adopted by many organisations worldwide, and are the most commonly used pre-manipulative screening tool amongst member organisations of the International Federation of Orthopaedic Manipulative Physical Therapists (IFOMPT) (Carlesso and Rivett, 2011). Though adverse events following cervical manipulative therapy are rare, they are potentially catastrophic (Thomas, 2016). The Physiotherapy profession should be seen as taking strong leadership on patient safety in cervical spine management (Refshauge et al., 2002).

The APA 2006 Guidelines have however been subject to criticism over the years in respect of their time-consuming nature, validity and indeed safety of the positional tests, and legal recommendations for gaining informed consent (Magarey et al., 2004). A survey of members reported considerable variability in the use and interpretation of the Guidelines (Magarey et al., 2004). More recently, introduction of the IFOMPT Framework with its greater focus on ‘vascular profiling’ has sparked considerable discussion amongst clinicians about how the two documents relate to each other and how much additional information should now be included in screening procedures prior to cervical manipulative therapy (Scholten-Peeters et al., 2014).

An extensive literature review was initially performed to inform the updated recommendations. Then wide consultation was undertaken, reported here, with practicing physiotherapists at all levels of experience, from new graduates to highly experienced, specialist level clinicians. As musculoskeletal practice is diverse, with regional, national and international differences of opinion and methods of clinical practice, consultation needed to be representative of a broad range of views.

The revised Guidelines need to address not only new research findings and the publication of IFOMPT Framework, but also reflect the experiences and views of members about the needs of the profession in contemporary musculoskeletal therapy practice.

The specific research questions for this study were:

1. What are the experiences of physiotherapists using the APA 2006 Guidelines for the treatment of the cervical spine?
2. What recommendations do practicing physiotherapists have to inform revised Guidelines for the safe management of cervical spine disorders?

The research was instigated by Musculoskeletal Physiotherapy

Australia (MPA), an APA special interest groups with 3 tiers of membership; graduates with an interest in musculoskeletal physiotherapy, Titled members with post graduate training (or equivalent) in musculoskeletal physiotherapy, and specialists - highly experienced musculoskeletal physiotherapists admitted by clinical examination as a Fellow of the Australian College of Physiotherapy.

2. Method

2.1. Design

A qualitative research design was used to explore and interpret participants' perceptions and experiences in using the 2006 Guidelines (Blaikie, 2000). It formed a key aspect informing the revision in order to reflect the safety requirements of musculoskeletal physiotherapists in contemporary practice. The current study examined participants' familiarity with and experiences of using the APA 2006 Guidelines and their detailed recommendations for the next iteration. Ethical approval was obtained from the University of Queensland Human Research Ethics committee [No. 2015000367].

2.2. Participants

Forty-one MPA members (10 specialists, 30 titled, 9 untitled members, 2 observers), were purposefully selected for their broad range of experience and qualifications by committee members of State MPA Chapters (Table 1). Participants included clinicians and clinical educators, academics, those recently graduated to those with over 30 years of experience (Table 1). All were practising clinicians representing 8 universities with accredited MPA programs and one trained in the UK. There were three participants who had undergraduate training and recently practiced in the UK and/or Canada. Observers were past and present members of the MPA executive. Participants were recruited at state meetings where the research was explained and participation invited. Interested members signed an Informed Consent Form after receiving a Participant Information Sheet. Participant anonymity is protected in the report with a sequential number and the focus group number each attended (e.g., P4FG1).

Box 1

Focus group stimulus questions

- How do the guidelines help/don't help/hinder you?
- How could they be improved to reflect current evidence and contemporary viewpoints?
 - To what extent do you use/follow the APA 2006 guidelines?
 - Which components do you find useful?
 - Do any components hinder your practice?
 - In your opinion, which components should be retained, modified or discarded?
 - Have you experienced any unexpected adverse neurovascular events in your practice?
 - If so did the guidelines help you identify the problem?
 - Do you have any suggestions to improve the guidelines to make them more contemporary to meet current practice standards and demands?
 - Do you follow the guidelines in respect of the positional tests?
 - Do you use any other tests?
 - Do you follow the guidelines in respect to high velocity manipulation? and end-range techniques?
 - Do you gain written informed consent for manipulation? or end –range techniques?
 - What information do you include in your consent process?
 - How useful do you find the additional materials (flowchart, checklist, App)

2.3. Data collection

Focus groups were chosen to gain a range of perspectives and experiences through organised discussions between participants (Kitzinger, 2007). An interview topic guide with stimulus questions (Box 1) was used to elicit participants' experiences and perceptions regarding the APA 2006 VBI Guidelines. Participants were asked about their familiarity with the Guidelines, and asked to discuss how they could better assist musculoskeletal physiotherapists.

The interview topic guide was distributed to participants at recruitment to allow time for reflection and therefore expedite data collection during the focus groups. They were asked not to discuss topics prior to this. The qualitative data were collected between 12th May and August 5th 2016 from five focus groups with an average of eight participants, as follows: Brisbane (n = 9), Sydney (n = 11), Adelaide (n = 6), Melbourne (n = 8), and Perth (n = 7). Furthermore, as the Sydney focus group was already large with nine members, data were also collected from two additional observers immediately following the focus group.

The Focus groups ran for 1.5–2 hours, in the evenings, conducted by an independent qualitative researcher (xx) who moderated the discussion, and a subject expert (xx) who addressed the specific musculoskeletal content. The moderator's role included encouraging discussion, giving everyone an opportunity to contribute, and deflecting questions from the subject expert, which might influence their responses.

2.4. Data analysis

Audiotapes from the focus groups were fully transcribed verbatim, before the five stage Framework Analysis approach to policy research was used to analyse and interpret the data (Bryman and Burgess, 1994; Mays and Pope, 2006; Ritchie and Lewis, 2003). The Framework Approach is suited to research seeking specific answers to research questions and where a thematic framework of *a priori* codes is derived from them.

In the first stage, familiarisation, transcripts were edited to correct any transcriber misunderstandings of technical jargon (LT), then read and re-read (MA & LT), to note responses answering the research questions. In the second stage, the transcripts were electronically coded line by line to develop a draft thematic framework and returned to the principal researcher (LT) for comments and discussion. A thematic coding framework was agreed to by all authors. In the third stage, all transcript data were indexed (i.e., coded and/or annotated) before being summarised. Illustrative and interesting quotes were noted as

comments. During the fourth stage of the framework analysis charting, indexed data were tabulated in separate documents according to these codes/indexes/themes and sequenced by focus groups for ease of comparison. Finally, the data were mapped and interpreted to find associations that answered the research questions. The emerging findings were reviewed by the research team to clarify and confirm interpretations.

Several methods were used to avoid bias and retain sensitivity to the rich subjective data. These included: (a) gaining multiple opinions at five sites to ensure triangulation of data; (b) use of opened-ended questions; (c) frequent discussion by researchers from two professional backgrounds; and (d) consideration of disconfirming data. Careful interpretation of the disconfirming data led to more nuanced understanding of participant experiences. While it was not possible for everyone to comment on every question, the use of a moderator ensured all participants' views were captured. Views were gained only from those attending the focus groups in five capital cities.

3. Results

Findings arising from the focus groups contained 2 main themes: familiarity with and use of the Guidelines (Box 2); and recommendations to improve clinical utility and applicability of the Guidelines (Box 3). A number of sub-themes emerged which are reported with representative quotes.

3.1. Theme 1: familiarity with and experience using the guidelines in practice

Participants expressed both positive and negative perceptions about their familiarity and use of the Guidelines and supporting materials. They were also asked to comment on their awareness and extent of overlap with the IFOMPT Framework (Rushton et al., 2012, 2014).

3.1.1. Positive perceptions

The majority were familiar with and supportive of the Guidelines, although not all followed their recommendations fully. Most felt they are logical and comprehensive and that they are important for the profession when making decisions about manipulation or other cervical musculoskeletal techniques.

P30FG4: "...even partial adherence to the guidelines has produced an almost flawless record of cervical manipulation. 'Following the Guidelines...matters. It's an issue of being a physiotherapist.'

P19FG3: I think that having young physiotherapists mobilise

Box 2

Familiarity with and experience using the Guidelines in practice

Positive perceptions

- Important profession standard
 - Important to have a professional protocol to follow for manipulation
- Medicolegal safeguard to cover legal requirements for informed consent
- Useful guide to history and clinical reasoning
 - Useful guide for new graduates and less experienced clinicians
 - History taking component is helpful
 - Useful for differential diagnosis of dizziness
 - Good comprehensive guide, logical process to follow

Negative perceptions

- Time factors
 - Too long
 - Do not follow in full
- Misunderstanding of scope and relevance to practice –
 - Not relevant to me because I don't manipulate the neck.
 - Not using for end-range techniques
 - Only using for legal requirements
- Limit practice because of medico legal requirements
 - Gets in the way of clinicians' own clinical reasoning
 - Consent process raising unnecessary risk awareness, impacting on manual therapy practice
 - Need for guidelines questioned given low risk of adverse outcomes
 - Legal implications of **not** following guidelines unclear
- Limited scope
 - Too great a focus on dizziness and VBI.
 - Not helpful to identify CAD
 - Confusion about interface with IFOMPT
 - Not helpful to identify when safe to manipulate
- Accessibility
 - Flowchart difficult to follow
 - Poor accessibility of additional materials -flow chart and App

cervical spines possibly without any consideration of the vascular system is not a desirable thing.

There was general agreement that the Guidelines are important

standard for the profession and medico legal safeguard.

P2FG1: *“From the safety perspective and a legal perspective, I would try to keep with the guidelines.”*

Box 3

Recommendations to improve clinical utility and applicability of Guidelines:

- Broader scope
 - New title to reflect broader safety approach and scope,
 - Relevance to all treatment involving the neck
- Main emphasis on history:
 - Recognition of CAD
 - Differential diagnosis of dizziness
- Succinct guide supporting clinician's own clinical reasoning
 - What to check and what to test with
 - Links to additional details if required
 - Positively worded and supportive of MT
 - Clarifying the low risk of MT
- Clear guidance on informed consent requirements
 - legal perspective
 - but not prescriptive
 - implications of not following guidelines
- Accessibility
 - wide dissemination
 - Freely available
 - Multiple formats to reach different types of target audience

Many felt the Guidelines are useful in assisting with differential diagnosis of dizziness and identification of VBI but are less useful for clinical reasoning about whether to manipulate or identifying red flags e.g. an arterial dissection in progress. Those more experience preferred to rely on a combination of their own skill and clinical reasoning with selective use of the Guidelines for decision making about manipulation.

P7FG1: I found that the subjective part of it has at times helped me quite a bit.... As a newer grad that might be a really helpful thing...

P2FG1: ... they assist you and guide you in your differential diagnostics. ... from a reassurance point of view, that you've done what you can from legal perspective and from the clinical reasoning perspective, to apply the more risky techniques,....or the strong techniques.

3.1.2. Negative perceptions

A common perception was that the recommended screening process was too long and time constraints limited full implementation.

P20FG3: The biggest barrier I find to implementing both [IFOMPT] and the APA ones is a time thing in a clinical practice setting

P15FG2 [*The current Guidelines are*] cumbersome ... you don't necessarily need that level of detail to inform your decision about manipulation....

P3FG1: *But to formally go through all of this before I do manipulation, I would never do it.*

Importantly, there was considerable misunderstanding of the scope and relevance of the Guidelines to practice; many participants considered them only the VBI positional tests, and did not recognise them as a progressive protocol to follow throughout assessment and treatment. Another common misconception was that the Guidelines applied only to the pre-manipulative context (i.e., high velocity thrust [HVT]) but not necessarily to mobilisation and other end range techniques. Several participants therefore did not use them because they did not use HVT. Most did not apply the principles to other musculoskeletal techniques. There was also misunderstanding about how and when to use the positional tests.

P23FG3: if I manipulated I would follow them to a T and probably... do additional testing as well because of the medico-legal requirement to do that.

Some participants were only using the Guidelines and positional tests for medico legal reasons. Others questioned the need for guidelines at all given the low incidence of adverse events.

P15FG2: ... one of the reasons [*Guidelines*] may not have been mandated is because, in reality while this is an important meeting, the risk we're talking about is infinitesimally small...

Others were concerned the Guidelines were raising unnecessary risk awareness incommensurate with the actual risk of adverse events.

P2FG1: *It turns into such an event. In that, it's like, almost like a person thinking they're on their way to be assassinated*

P3FG1: *I think these things [*Guidelines*] had a major fear factor, and an unjustified fear factor. Absolutely unjustified. ... with the incidence. Like, most people would go through their entire professional life and never, ever, ever see a [*an adverse event/dissection*]*

Some participants raised the suggestion that these factors could be limiting the use of manual therapy.

P36FG5 *I think the mere existence of [*Guidelines*] is the reason – graduates who haven't done manip or musculoskeletal specialty studies.... won't even consider it [*manipulation*] as a treatment approach. I think it's scared them from manual therapy, to be honest.*

Some participants perceived the focus of the VBI guidelines to be mainly on blood flow and dizziness, potentially missing other risk factors for adverse events. There was some confusion about the similarities and differences between the Guidelines and the IFOMPT framework, which some perceive, provide excessive detail and raise unnecessary risk awareness. For others, the IFOMPT framework, was viewed favourably because it recommends comprehensive assessment and risk management

P3FG1: *I think the way [*IFOMPT*] is set them up is quite good. But content just needs to [*be revised*] ... it's the accuracies and the need for it. It's a very ultra-conservative document.... trying to cover all bases. A whole lot of them [*tests*]are unnecessary.*

Accessibility, particularly of the additional materials was a limitation highlighted by all participants.

3.2. Theme 2: recommendations to improve clinical utility and applicability of guidelines

A number of sub-themes emerged as recommendations. These are summarised in Box 3 and reported with representative quotes in italics. Additional quotes in the Appendix.

3.2.1. Broader scope

Participants suggested the revised Guidelines should reflect contemporary practice concerns through both their title and scope.

P24FG3: ...' *the profession would benefit far more from identifying those people with red flags and picking up those than just spending a lot of time on VBI assessment...*'

P39FG5 '*... more emphasis should be given to identifying people who are having a vascular event*'

P38FG5: '*...I think that [*history*] should be the most important part of the document... potentially having someone with a CAD coming in, and that's probably the bigger risk than the manipulation...*'

A change of title, structure and approach were universally recommended by the groups. Suggested titles included: "Safety Considerations in Treating Cervical Spine," or "Risk Assessment for Cervical Spine Disorders."

P32FG4 stated: "*... you're going to have to have a wide variety of ways of getting the message out, because it's a big change of concept [*from manipulation to a broader risk management approach*] ... a big conceptual change.*" P27FG4 agreed that "*changing the title is going to be a big thing...*"

Similarly, the application and relevance of the Guidelines to wider cervical musculoskeletal treatment than manipulation, such as mobilisation and end range techniques was discussed. Clarity is needed about P36FG5 '*What is meant by "End range" techniques?*' whether techniques such as Mulligan and self-mobilisation are actually end range and whether physical testing should extend to patient-controlled techniques.

3.2.2. Emphasis on history

All agreed the revision should continue to emphasise the importance of good history taking, the value of a thorough assessment, P31FG4 agreed "*the history is one of the absolute essential components.*"

P19FG3... *part of a clinical reasoning process that you would use with each individual patient to ...determine whether you would even mobilise the neck, let alone manipulate it...*'

They should support and develop clinical reasoning more overtly so physiotherapists are clear about how to recognise potentially serious conditions (eg cervical artery dissection, VBI), what physical screening should be done prior to cervical manipulation.

P3FG1: I think the whole issue of dizziness and everything has to be conceptualised much, much better...[2006 Guidelines] are fixated on the VBI, they haven't satisfactorily talked about other causes of dizziness.

P38FG5 *[There should be less emphasis on VBI and greater emphasis on] cervical arterial dysfunction.*

P23FG3 *So, if you know what the signs and symptoms are and how these things might present and even if it's in a young person, you should be able to pick up the warning signs and then hopefully send them off to be evaluated medically before anything catastrophic happens*

All focus groups discussed adverse events giving anecdotal and direct examples, experience reviewing medicolegal cases, and reports in the media or literature. They suggested physiotherapists would benefit from some case examples to illustrate the decision-making process.

P6FG1: *.... retrospectively, looking back at that patient, did I learn anything from that? And then would others benefit from what I saw in that patient's presentation....?*

3.2.3. Succinct guide supporting clinician's own clinical reasoning

There was strong support for a *stepwise guide to clinical reasoning*; relevant for all musculoskeletal treatment of the cervical spine and supported by research evidence, so physiotherapists know that.

P38FG5 *'these are the things I need to check, these are the things I need to do', but this should not be prescriptive to allow for clinician's own clinical reasoning.*

P3FG1: *.... clear indications of things to listen for that would make you suspicious that the person is having a carotid or vertebral artery dissection.*

P31FG4 *...evidence, indications and then some sort of risk stratification system, which starts heavily with subjective examination"*

Importantly, the revision should not be too long, with links to additional information if required.

P38FG5: it should be concise ... [and not] too much for the average person to decipher.

P38FG5...[IFOMPT and 2006 VBI] it's just too much to read and too much to decipher for the average person. .

Some participants supported having two parts in the revised Guidelines.

P16FG2:.....so I think we need a simple risk management tool for manipulation.....and then we also need this detailed vascular assessment.

However, others cautioned that a two-part Guideline could be confusing and it would be better to clarify the different purposes within one document.

Many participants supported the continued use of the VBI positional tests and some suggested additional physical testing, as suggested by the history, such as neurological, blood pressure or vestibular testing should be encouraged. Others recommended strongly that positional VBI tests should be removed in the light of studies showing poor validity to predict risk of adverse event. The revision should be presented as positively worded "how-to" guide satisfying safety requirements but supporting musculoskeletal therapy rather than inducing undue fear of medico legal impacts.

P38FG5... *some sort of weighing of evidence in terms of what are the best things to look for and most important things and most reliable things,*

To further support this participants wanted estimates of the real risk of adverse event following musculoskeletal therapy outlined to confirm

the low-risk.

P37FG5 *"quantifying what is the risk. That would be the important thing."*

3.2.4. Clear guidance on informed consent requirements

Whether to gain verbal or written consent was a moot point in all the focus groups. Participants reported that a cumbersome process deters the likelihood of gaining consent while simplifying it would likely increase compliance. An approach which constructively explained and did not overstate the risks of manipulative therapy was proposed; risk should be put in the context with other daily life events (e.g., reversing a car, crossing a road).

P38FG5: *...I think we need guidance in what we should be doing, which has sound medicolegal support for it so we're covered..."*

P20FG3: *.... you put words like death in there and that kind of stuff, and there's no way they're going to understand how that fits into context..., it just rings the alarm bells..."*

Clarity was requested about requirements for informed consent in line with medico-legal recommendations. Several wanted flexibility in the consent process and raised concerns for those preferring freedom of choice to use their own clinical reasoning:

P38FG What are the implications of not following the Guidelines?

Other recommendations included updating the current patient information brochure on manipulation to a simply written document, which could facilitate the process of gaining informed consent for all treatments.

3.2.5. Accessibility

Focus groups universally recommended wide dissemination of the revised guidelines to raise the profile of safe musculoskeletal practice. Suggestions included short and longer versions and formats targeting audiences at all levels of experience. These should also be appropriately promoted and include guidance on education, training, and governance.

P17FG1 recommended *"different versions ...for different stakeholders or audiences. ... a technical guide which has all that background research [and] a quick reference guide which is a one pager [for clinicians]."*

P11FG2... *infographics type page [is] going to offer a lot more than just a whole bunch of words in 10 or 5 seconds.*

P34FG4 *You need mixed media. You cannot just rely on one format. ... It's going to have to be on the iPad.*

P17FG2 also recommended that the material be free *"if you want to get things across you've got to make it easily accessible and cheap."*

4. Discussion

This study explored the experiences of a representative group of Australian musculoskeletal physiotherapists using the APA 2006 VBI Guidelines and sought their recommendations for revision. Both positive and negative perceptions emerged which informed recommendations for updating the document to a more contemporary format (Box 3).

While experiences were generally favourable, findings need to be addressed carefully in any revision. Misunderstanding of the scope and relevance to practice, unless performing HVT, supports recommendations to broaden their applicability to all musculoskeletal treatment of the neck. The findings are consistent with Magarey et al., (2004), and may reflect their origins as a pre-manipulative protocol and limitations in dissemination. The fact that many participants considered that the

guidelines comprised only the positional tests for VBI, missing the clinical reasoning/differential diagnosis purpose, confirms the need to present this aspect more overtly. Concerns about accessibility of materials, similar to Magarey et al.'s findings, are perhaps indicative of changing practice as well as major technological changes to information access over the intervening decade.

The focus groups generated a number of constructive recommendations: Importantly, broadening the scope to more general safety considerations in the cervical spine and better recognition of serious pathologies such as cervical arterial dissection. This is in line with more recent research evidence (Puentedura et al., 2012; Thomas et al., 2015) increasing applicability of the guidelines to broader cervical musculoskeletal management. A full guide to differential diagnosis of dizziness would be outside the scope of such a document. However, considering comments about the IFOMPT framework (Rushton et al., 2012), information should also be accurate and time critical.

Conflicting requirements arose with some wanting a stepwise guide and others who felt the guidelines got in the way of a clinician's own clinical reasoning. This probably reflects different needs of experienced and novice clinicians. A balance between information provision and current research evidence, with relative freedom of clinical decision-making will be important, while still fulfilling medico-legal requirements and clarify minimum standards of practice. However, suggestions by some of a general waiver given at the start of treatment would not be in line with contemporary medico legal advice.

The importance of presenting the information in a succinct form and in multiple formats to improve utility will be critical to the successful uptake of the revised version. In addition, advice should be widely visible both within and outside the APA, in order to reach all clinicians in contemporary practice and raise the profile of the profession as setting the standard for responsible practice in the cervical spine.

Clarity about the true incidence of adverse events remains a challenge and while this may be higher than current literature suggests, it is still likely to be low, particularly amongst physiotherapists (Kranenburg et al., 2017). Nonetheless, given the serious nature of adverse events and contemporary media perceptions, a standard of practice amongst physiotherapists seems requisite.

4.1. Strengths of the study and limitations

The study followed a structured iterative process with broad consultation across different geographical regions in Australia, building on previous research which was confined to postal surveys or focus groups in conference settings (Magarey et al., 2004; Rivett et al., 2006). Engagement of clinicians from all levels of the profession made the focus groups broadly representative of the musculoskeletal physiotherapy community allowing us to better encompass regional differences of opinion than has previously been possible. The study was largely metropolitan based which may limit interpretation of the findings in more rural contexts although one group did include non-metropolitan clinicians.

5. Conclusions and implications

This study identified the strengths and limitations of the 2006 guidelines and provided clear recommendations for revision. Recommendations included a broader scope incorporating more consideration of red flags and vascular conditions reported in association with cervical manipulative therapy. Clear guidance on informed consent and provision of information in succinct, easy to access formats will be needed.

Conflict of interest

None declared.

Ethical approval

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.msksp.2018.12.005>.

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