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## A review of the literature in applied and specialised kinesiology

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### CRD summary

The review concluded that there was insufficient evidence for the diagnostic accuracy or specific therapeutic benefit of kinesiology in any condition, or for the validity of muscle testing. Despite limitations of the review, the authors' conclusion seemed to accurately reflect the paucity of the evidence presented.

### Authors' objectives

To determine the therapeutic effectiveness of kinesiology and ascertain if diagnostic accuracy and inter-examiner reliability of kinesiology had been established.

### Searching

MEDLINE, EMBASE, CINAHL and AMED were searched from inception without language restriction; upper search limit (date) was not reported. Search terms were reported. Kinesiology associations and practitioners were contacted and topic-specific websites and conference proceedings were searched for relevant unpublished literature. One reviewer selected studies for inclusion in the review.

### Study selection

Any clinical study of any type of kinesiology for any outcome on patients or volunteers were eligible for inclusion in the review. Studies looking at the mechanical measurement of muscle strength or studies considering muscle strength tests where kinesiology measured the ability of the nervous system to adapt to the pressure of the test, rather than the power a muscle produces (for example, orthopaedic testing) were excluded from the review.

The majority of the included studies describe the type of kinesiology used as applied kinesiology (AK). AK can be used for both diagnostic and therapeutic purposes. A broad range of participants were included in the review: chiropractic students/spouses; volunteers (with or without symptoms); people with a history of anaphylaxis after insect stings; people with chronic diseases; dental students; AK seminar attendees; phobic volunteers; college students; patients with mastalgia; and people with recurring dreams. Where reported, examiners included AK practitioners, chiropractors, trained testers and AK dentists. A wide range of outcomes were reported for each study type. Further details were in the paper.

One reviewer selected studies for inclusion in the review.

### Assessment of study quality

Clinical effectiveness studies were assessed for methodological quality and quality of reporting using the Jadad scale and the CONSORT statement. Diagnostic studies were assessed for methodological quality and quality of reporting using QUADAS and STARD criteria. Studies looking at inter-examiner reliability and muscle response were assessed against: randomisation; inclusion criteria; blinding of examiners to each other's results; representative sample of examiners; appropriate statistical methods; and sample size. The authors did not state how many reviewers performed the quality assessment.

### Data extraction

The authors stated neither how data were extracted nor how many reviewers performed the data extraction.

### Methods of synthesis

Studies were combined in a narrative synthesis grouped by type of study (diagnostic, inter-examiner reliability, muscle response and effectiveness).

### Results of the review

Twenty-two studies were included in the review: seven diagnostic studies (n=518); seven inter-examiner reliability

studies (n=318); five muscle response to stimuli studies (n=at least 393); and three clinical effectiveness studies (n=115).

#### Diagnostic accuracy studies

QUADAS scores ranged from 1 to 11 (out of a maximum of 14). STARD scores ranged from 6 to 13 (out of a maximum of 25). Comparators included laboratory tests for food allergies, biochemical tests for nutrient status, chiropractic clinical observations and a mechanical muscle test. None of the studies found a positive effect of kinesiology.

#### Inter-examiner reliability

Quality scores and scores for the quality of reporting (based on the same criteria) ranged from 0 to 5 (out of a possible 6). Studies compared the reliability of examiners to detect the presence of weak or strong muscles, sensitivity to dental materials or foods, pressure on specific vertebrae and to a phobic stimulus. The most promising results were for the detection of the presence of weak or strong muscles.

#### Muscle response

Quality scores and scores for the quality of reporting (based on the same criteria) ranged from 0 to 3 (out of a possible 6). These studies tested the presence of weak or strong muscles in relation to foods, a kinesiology technique, magnets and verbal statements. Three studies reported a positive result.

#### Effectiveness

All the studies scored 0 on the Jadad scale (out of a maximum of 5). The number of CONSORT items reported ranged from 4 to 6 (out of a maximum of 22). Studies assessed the effectiveness of kinesiology for mastalgia, stress, and recurring dreams. All three studies reported statistically significant results in favour of kinesiology.

### **Authors' conclusions**

There was insufficient evidence to show: diagnostic accuracy within kinesiology; that kinesiology had a specific therapeutic benefit for any condition; and that the validity of muscle testing had been established.

### **CRD commentary**

The review question was supported by very broad inclusion/exclusion criteria. Several sources were searched without language restriction and the authors attempted to locate unpublished literature, minimising the likelihood of language and publication bias. Only one reviewer selected studies for inclusion in the review, increasing the possibility of reviewer error and bias. The authors did not report methods used to extract data or assess study quality, so the likelihood of reviewer error and bias being introduced at these stages could not be assessed. Study quality was assessed using standardised tools and the authors considered study findings in light of these results. Studies were appropriately combined in a narrative synthesis given the differences between the included studies. Despite limitations in the review, the authors' conclusion seemed to accurately reflect the paucity of the evidence presented.

### **Implications of the review for practice and research**

Practice: The authors did not report any implications for practice.

Research: The authors recommended a pragmatic single blind randomised controlled study of the effectiveness of kinesiology for any condition.

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