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CARDIOVASCULAR INTERVENTIONS

Motivational interviewing: a useful approach to improving cardiovascular health?

David R Thompson, Sek Y Chair, Sally W Chan, Felicity Astin, Patricia M Davidson and Chantal F Ski

Aim. To review and synthesise, systematically, the research findings regarding motivational interviewing and to inform education, research and practice in relation to cardiovascular health.

Background. Motivational interviewing is designed to engage ambivalent or resistant clients in the process of health behaviour change, and it has been widely used in different clinical conditions such as substance abuse, dietary adherence and smoking cessation. Motivational interviewing has also been proposed as a method for improving modifiable coronary heart disease risk factors of patients.

Design. Systematic review.

Method. Eligible studies published in 1999–2009 were identified from the following databases: CINAHL, Medline, PsycINFO, Cochrane Library, EBSCO, Web of Science, Embase and British Nursing Index. A manual search was conducted of bibliographies of the identified studies and relevant journals. Two researchers independently reviewed the studies.

Results. Four meta-analyses, one systematic review and three literature reviews of motivational interviewing and five primary studies of motivational interviewing pertaining to cardiovascular health were identified. Despite a dearth of primary studies in cardiovascular health settings, there appears to be strong evidence that motivational interviewing is an effective approach focusing on eliciting the person's intrinsic motivation for change of behaviour.

Conclusion. Motivational interviewing is an effective approach to changing behaviour. It offers promise in improving cardiovascular health status.

Relevance to clinical practice. This review indicates that motivational interviewing is a useful method to help nurses improve health behaviour in people with coronary risk factors.

Key words: coronary heart disease, health behaviour change, motivational interviewing

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Introduction

Cardiovascular disease is largely attributable to adverse health behaviours, such as smoking and physical inactivity. A major challenge facing nurses in improving cardiovascular health is working with individuals to change behaviours that are potentially harmful to health. Many of these behaviours are deeply entrenched in an individual's lifestyle, and attempts to accomplish these changes are often difficult and require considerable time and effort. Of significance, many individuals are ambivalent in wanting to change these behaviours as they are commonly pleasurable or the

Authors: *David R Thompson*, PhD, MBA, RN, FRCN, FAAN, FESC, Professor of Nursing, Cardiovascular Research Centre, Australian Catholic University, Melbourne, Victoria, Australia; *Sek Ying Chair*, PhD, RN, Associate Professor, Nethersole School of Nursing, Chinese University of Hong Kong, Shatin, Hong Kong; *Sally W Chan*, PhD, RN, Professor and Director of Education, Alice Lee Centre for Nursing Studies, National University of Singapore, Singapore; *Felicity Astin*, PhD, RN, Senior Research Fellow, School of Healthcare, University of Leeds, Leeds, UK; *Patricia M Davidson*, PhD, MEd, RN, Professor of Cardiovascular and Chronic Care, Curtin Health Innovation Research Institute, Curtin University, Sydney, New South Wales; *Chantal F Ski*, PhD, MAPS, Associate Professor, Cardiovascular Research Centre, Australian Catholic University, Melbourne, Victoria, Australia

Correspondence: David R Thompson, Professor, Cardiovascular Research Centre, Australian Catholic University, 4/486 Albert Street, Melbourne, Victoria 3002, Australia. Telephone: +613 9953 3680.
E-mail: David.Thompson@acu.edu.au

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individual doubts their ability to change (Rollnick *et al.* 1992).

Mere advice-giving is unlikely to be successful, but there are available methods applicable to any behaviour, such as smoking, physical inactivity and over-eating, which can be used in health promotion, risk reduction and prevention of chronic conditions such as coronary heart disease (CHD) (Rollnick *et al.* 2000). Such methods rely on partnership between clients and health professionals and are designed to satisfy the need for brevity imposed by the realities of contemporary health care as well as opportunistic interventions and the problems of resistance and lack of motivation.

Although behaviour change can often occur spontaneously and some patients can respond to brief advice (five to 10 minutes), this is not always the case. Some patients may require more intensive behaviour change counselling (15–20 minutes) and others a specialist method such as motivational interviewing, which has its roots in the addictions field (Miller 1983). Establishing rapport, setting agendas and assessing importance and confidence (and readiness) to change are integral to this approach (Rollnick *et al.* 2000). This paper aims at giving a brief overview of motivational interviewing and evaluating studies that used this technique in cardiovascular health settings.

Motivational interviewing

Motivational interviewing (Rollnick & Miller 1995, Miller & Rollnick 2002) has been defined as 'a client-centred, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence' (Miller & Rollnick 2002, p. 25). It is not founded on theory but has evolved from the client-centred counselling approach of Rogers (1951). It is a method of communication rather than a set of techniques and its focus is on eliciting the person's intrinsic motivation for change. Concepts such as reflective listening are balanced with a directive approach. The 'spirit' (Miller & Rollnick 2002, p. 35) of motivational interviewing includes collaboration (as opposed to confrontation), evocation (as opposed to education) and autonomy (as opposed to authority).

Four broad guiding principles underlie motivational interviewing (Miller & Rollnick 2002):

1 Express empathy (acceptance facilitates change; skilful reflective listening is fundamental; ambivalence is normal).
2 Develop discrepancy (client rather than counsellor should present the arguments for change; change is motivated by a perceived discrepancy between present behaviour and important personal goals or values).
3 Roll with resistance (avoid arguing for change; resistance is not directly opposed; new perspectives are invited but not imposed; client is primary resource in finding answers and solutions; resistance is a signal to respond differently).
4 Support self-efficacy (person's belief in the possibility of change is an important motivator; client, not counsellor, is responsible for choosing and carrying out change; counsellor's own belief in person's ability to change becomes a self-fulfilling prophecy).

Motivational interviewing consists of two phases. During the first phase, intrinsic motivation for change is enhanced, whereas in the second phase, commitment to change is strengthened (Miller & Rollnick 2002). It is a dynamic and interactive process where there is reciprocity between the individual and counsellor.

Motivational interviewing is an empirically supported, theoretically consistent and rapidly diffusing approach to health behaviour change (Antiss 2009). There is a growing body of literature pertaining to the use of motivational interviewing in health settings in general (Britt *et al.* 2004), as well as in specific conditions and areas such as substance abuse (Noonan & Moyers 1997), dietary adherence (Berg-Smith *et al.* 1999), pregnancy (Tappin *et al.* 2005) and diabetes (Greaves *et al.* 2008). Commonly, patients with cardiovascular disease face the need to change multiple behaviours; therefore, identifying the behaviour that is most important to the client to change is a useful strategy. The aim of this review was to review and synthesise systematically the research findings regarding motivational interviewing so as to inform education, research and practice in relation to cardiovascular health.

Method

Inclusion criteria

Types of studies

This review included secondary studies (meta-analyses, systematic reviews and literature reviews) of motivational interviewing. It also included primary studies that examined the effect of motivational interviewing on cardiovascular risk factors. With a paucity of randomised controlled trials (RCTs), other research designs such as quasi-experimental, cohort and case–control and pre- and post-test studies were considered for inclusion.

Types of participants

The secondary studies in this review included adults (aged > 18 years). The primary studies included adults (aged > 18 years) with at least one, or more, newly diagnosed or existing cardiovascular risk factors.

Type of intervention

This review targeted the intervention of 'motivational interviewing' delineated akin to engaging ambivalent or resistant clients in the process of guiding to elicit and strengthen motivation for health behaviour change.

Outcome measures

The outcomes that were considered for inclusion were major cardiovascular risk factors:

- Obesity
- Smoking
- Treatment non-compliance
- Physical inactivity
- High alcohol consumption/abuse
- Diabetes
- Hypertension
- Poor diet/nutrition
- High blood pressure
- High blood cholesterol.

The identified outcomes were evaluated in a variety of ways, for example questionnaires on lifestyle changes, smoking and exercise behaviour, assessment instruments on nutrition and audits of medical records.

Search strategy

The search strategy aimed at finding published literature sources in the English language for the period January 1999–December 2009. Before starting the search, the search terms and key words were reviewed by a librarian.

Key search terms for the literature included the following:

- Motivational interviewing
- Cardiovascular risk factors
- Cardiovascular
- Heart disease
- Health outcomes.

In the second step, all identified keywords were used for searching the databases listed below.

Databases for published literature searched included the following:

- CINAHL
- Medline
- PsycINFO
- Cochrane Library
- EBSCO
- Web of Science
- Embase
- British Nursing Index.

A manual search was conducted of bibliographies of the identified studies and relevant journals. The electronic search and journal exploration resulted in 26 papers that seemed to be relevant for the review. Based on the information given in the title and abstract, these papers were assessed against the inclusion criteria by two reviewers. The reference lists of the retrieved articles were assessed for inclusion based on their title, but no new articles were identified. Finally, eight secondary source papers and five primary source papers were left for appraisal, and full-text articles were retrieved.

Quality assessment

Identified studies that met the inclusion criteria were grouped into one of the following categories as defined by the National Heart, Lung and Blood Institute categories for levels of evidence (Table 1). Each paper was assessed by two independent reviewers for methodological quality prior to inclusion in the review using an appropriate critical appraisal instrument. Disagreements between the two reviewers about

Table 1 National Heart, Lung, and Blood Institute (NHLBI) categories for levels of evidence

NHLBI category	Sources of evidence	Definition
A	Randomised controlled trials (RCTs). Extensive body of data	Evidence is from endpoints of well-designed RCTs that provide a consistent pattern of findings in the population for which the recommendation is made. Category A requires substantial numbers of studies involving substantial number of participants.
B	RCTs. Limited body of data	Evidence is from endpoints of intervention studies that include only a limited number of patients, *post hoc* or subgroup analysis of RCTs or meta-analysis of RCTs. In general, category B pertains when few randomised trials exist, they are small in size, they were undertaken in a population that differs from the target population of the recommendation or the results are somewhat inconsistent.
C	Non-randomised trials, observational studies	Evidence is from outcomes of uncontrolled or non-randomised trials or from observational studies.
D	Panel consensus, judgement	The panel consensus is based on clinical experience or knowledge that does not meet the above criteria.

whether to include a particular research paper were resolved by a third reviewer. Owing to the paucity of RCTs, the majority of the research papers meeting the inclusion criteria were level C. Papers meeting the inclusion criteria were assessed with the use of a validity checklist.

Data extraction

The first author abstracted the data and included characteristics of the studies including participant demographics, intervention descriptions, cardiovascular risk factors, outcomes and additional notes including the results. All decisions on inclusion and allocation of the outcomes measures were based on a consensus by all authors. Whenever necessary, unpublished or missing data were requested by a second or third reviewer.

Data synthesis

For the main reason that studies were clinically diverse with outcomes that were insufficiently homogeneous, a meta-analysis of the included studies was not undertaken. A narrative analysis of the key findings from primary and secondary studies was therefore provided. Synthesis and aggregation of findings and conclusions made in relation to the intervention were amalgamated to shape a credible accurate conclusion of the research studies and to identify the area of need of further research.

Results

Studies of motivational interviewing

The results from primary studies are generally mixed, whereas those from secondary studies (systematic reviews and meta-analyses) are generally positive. A systematic review of 29 randomised trials of motivational interviewing in the areas of substance abuse, smoking, HIV risk behaviours and diet and exercise (Dunn *et al.* 2001) found that it was an effective substance abuse intervention method when used by clinicians who are non-specialists in substance abuse treatment. Sparse and inconsistent findings revealed little about the mechanism by which motivational interviewing works or for whom it works best. Sparse data regarding intervention fidelity and high rates of attrition make it challenging to interpret these studies.

A meta-analysis of 30 controlled clinical trials of adaptations of motivational interviewing in the areas of alcohol abuse, smoking cessation, drug addiction, HIV risk behaviours, treatment adherence and diet and exercise (Burke *et al.* 2003) found them be as effective as other treatments and more effective than no-treatment or placebo controls, in the areas of alcohol, drugs and diet and exercise, but reported contradictory evidence in the areas of smoking cessation and HIV risk behaviours. A later and extended meta-analytic and qualitative enquiry of 39 studies examined the effectiveness of adaptations of motivational interviewing in the same areas but with the addition of treatment compliance, eating disorders, asthma management and injury-risk behaviours (Burke *et al.* 2004) found them to be as effective as other general interventions and yielded moderate effect sizes in areas such as substance abuse and diet and exercise. The issue here with these two reviews is the definition of 'adaptations'. It is not clear from either review what is meant by 'adaptations' and to what extent they occur, and this necessarily casts doubts on the veracity of whether it is really motivational interviewing, particularly in the absence of reporting intervention fidelity.

A meta-analysis of 72 clinical trials of the effectiveness of motivational interviewing in the areas of alcohol, smoking, HIV/AIDS, drug abuse, treatment compliance, gambling, intimate relationships, water purification/safety, eating disorders and diet and exercise (Hettema *et al.* 2005) found small to medium effects in improving health outcomes.

Similarly, a meta-analysis of 72 randomised controlled studies in the areas of smoking cessation, diabetes, asthma, weight loss and physical activity, alcohol abuse and addiction (Rubak *et al.* 2005) found a significant effect of motivational interviewing in 74% of the studies reviewed (though this increased to 81% among motivational interviewing sessions lasting one hour). The authors suggested that the likelihood of an effect was positively correlated with the number of encounters and with a prolonged follow-up period. They concluded that motivational interviewing outperforms traditional advice-giving. However, methods of tailoring the timing and dosing of interventions may augment the potential of the intervention to leverage behaviour change.

A systematic review of motivational interviewing in physical health care settings (Knight *et al.* 2006) found eight studies in the fields of diabetes, asthma, hypertension, hyperlipidaemia and heart disease. The majority of these studies found positive results for the effects of motivational interviewing on psychological, physiological and lifestyle change outcomes. However, some of the studies reported the use of motivational interviewing in conjunction with other interventions, such as skill-based counselling and health education, thereby making delineation of the influence of motivational interviewing impossible.

A review of five studies using motivational interviewing to control paediatric weight, diet and physical activity and

others to control diabetes and smoking (Resnicow *et al.* 2006) suggests that although its use might be feasible with children and adolescents, more studies with youths are needed in these areas to determine the clinical utility of motivational in the prevention or treatment of child obesity.

Another review of ten studies examining the effectiveness of motivational interviewing for weight loss and exercise (Van Dorsten 2007) found that it significantly improved both as well as diet and regimen adherence. However, Van Dorsten makes the important point that meta-analysis of specific motivational interviewing effects has proven difficult given that many adaptations of motivational interviewing have been used in empirical studies.

An up-to-date review of 37 studies of motivational interviewing for diet and exercise, diabetes and oral health suggests that it is effective in all these areas, although additional research is needed in the oral health arena (Martins & McNeil 2009).

Although these reviews attest to the benefits of motivational interviewing, problems identified by most of them included the following: small sample sizes, lack of statistical power, use of disparate multiple outcomes, inadequate validation of measures, poorly described interventions, minimal description of intervention fidelity and training (Knight *et al.* 2006). Many studies reporting the outcome of motivational interviewing do not provide adequate information on what the intervention involved or how it may have been modified for a particular problem or population, thus making it difficult to draw conclusions and make comparisons (Britt *et al.* 2004). There is a pressing need to understand and specify how motivational interviewing exerts its effects (Hettema *et al.* 2005) and for studies to examine the long-term effects of motivational interviewing (Martins & McNeil 2009), including cost-effectiveness (Resnicow *et al.* 2006). The findings to date suggest that this model of intervention has significant potential and with refining may be an important strategy in changing behaviours. To date, the majority of the studies conducted and reviewed and which provide the greatest support for motivational interviewing address addictive behaviours, particularly problem drinkers (Britt *et al.* 2004) and comparatively few address behaviour change among the chronically ill (Konkle-Parker 2001, Mesters 2009).

Use of motivational interviewing in cardiovascular health settings

Rather surprisingly, in view of the growing body of evidence attesting to its effectiveness, there is a comparative dearth of research examining the effectiveness of motivational interviewing in cardiovascular health (Hancock *et al.* 2005). Table 2 gives an overview of empirical studies using motivational interviewing in clients at risk of or with established CHD or heart failure. Of these six studies, one reported the use of motivational interviewing alone in outpatient cardiac rehabilitation (Everett *et al.* 2008), one to improve heart failure self-care (Riegel *et al.* 2006), one to promote physical activity (Brodie & Inoue 2005) and enhance quality of life for people with chronic heart failure (Brodie *et al.* 2008), one in a hospital dietetic department to provide dietary advice for people with hyperlipidaemia (Mhurchu *et al.* 1998) and one in a primary health care setting for counselling patients at risk of CHD (Hardcastle *et al.* 2008) but using a modified motivational interviewing approach. Hancock *et al.* (2005), in their review of research evaluating motivational interviewing, reported that many studies used small samples (22–61 patients) and those with large samples did not show a significant difference between groups. They reported evidence of effect in controlling substance abuse but a lack of information on the quality of the technique.

To gain insights into a nurse-delivered motivational interviewing intervention in the outpatient cardiac rehabilitation setting, Everett *et al.* (2008), as part of an RCT of 104 patients, assigned the intervention group to participate in two one-hour sessions with a nurse trained in the technique of motivational interviewing. The technique was well received, and the authors concluded that it has significant promise in the cardiac rehabilitation setting. In two studies by Brodie and Inoue (2005) and Brodie *et al.* (2008), eight one-hour home-based sessions of motivational interviewing were compared to and combined with standard care in 60 older patients with heart failure. Results showed improvements in reported physical activity (Brodie & Inoue 2005) and in health-related quality of life in the treatment group (Brodie *et al.* 2008).

Riegel *et al.* (2006) used a motivational 'approach' designed to improve self-care in 15 patients with heart failure. A mixed method, pre-test post-test design, was used to evaluate the proportion of patients in whom the intervention was beneficial and the mechanism of effectiveness. Patients received home visits from a nurse trained in motivational interviewing and family counselling. The researchers reported improved self-care in 71·4% of the patients receiving the intervention.

However, some caution is warranted because their success might be because the patients were aware they had a chronic condition, and their comments indicate a desire to improve their symptoms. There was only one nurse involved in the intervention who was given thorough

Table 2 Summary of empirical studies using motivational interviewing in clients at risk of or with established CHD

Authors, population, and setting	Study aim, design, intervention and concurrent treatment	Fidelity measures	Follow-up and attrition	Outcome
Brodie and Inoue (2005) Older adults (60+) with HF (n = 60) UK hospital wards	Promote physical activity RCT (three groups) Three groups: MI (22); standard care (18); MI and standard care (20) Eight times per hour sessions No concurrent treatment reported	None reported	5 months (35%)	All three groups showed a significant increase in distance, but there was no difference between groups
Brodie *et al.* (2008) Same sample as above (data collected 2002)	Assess whether MI improves quality of life Used SF-12, MLHFQ and Motivation and Readiness for Physical Activity Scale As above	As above	As above	MI group showed a significant increase in three domains of SF-12 compared to standard care group
Hardcastle *et al.* (2008) Adults (18–65) at risk of developing CHD (n = 218) UK primary care	Determine whether multiple patient-centred lifestyle counselling sessions of interest to patients at risk of CHD RCT Two groups: counselling/ AMI (125); control (93) Up to five 20–30 minutes sessions Exercise and nutrition leaflet	Review of audiotapes and monthly consultation meetings	6 months (35%)	AMI group showed a significant decrease in BMI and increase in physical activity levels compared to control group. Both groups reported a significant increase in fruit and vegetable consumption and a reduction in dietary fat
Mhurchu *et al.* (1998) Adults with hyperlipidaemia (n = 97) UK hospital clinic	Promote reduction of fat intake RCT Two groups: MI (47); standard care (50) Three times sessions (mean 1 hour 42 minutes) No concurrent treatment reported	Used a coding system to determine if were different	3 months (20%)	No difference between groups; both showed reductions in total and saturated fat
Riegel *et al.* (2006) Adults with HF (n = 15) US home visits	Improve HF self-care using MI Mixed methods with pre-test, post-test design and qualitative component Each participant received three (± 1·5) visits from a specialist nurse over 3 months	None reported? used 'core elements' of MI	3 months	Self-care improved

MI, motivational interviewing; AMI, adapted motivational interviewing; HF, heart failure; CHD, coronary heart disease; RCT, randomised controlled trial.

training. The patients therefore had greater continuity, and the nurse had the opportunity to become more proficient.

Determining adherence to the 'spirit' and technique of motivational interviewing can be performed using tools such as the Motivational Interviewing Skills Code and Motivational Interviewing Treatment Integrity. These tools are important to use to not only demonstrate intervention fidelity or adherence with the motivational interviewing technique but also as a reflective tool for the practitioner. The absence of reporting of intervention fidelity makes it difficult to interpret findings.

Discussion

The evidence indicates that motivational interviewing is a useful approach to behaviour change. It is superior to 'traditional' advice, improves with increased intensity (number and length of encounters) and appears effective even with brief encounters. In addition, it has greater congruence with trends to ensure patient-centred care and to engage and involve individuals in self-management. But, implementation into routine clinical practice needs to be demonstrated (Rubak *et al.* 2005, Mesters 2009). Finally, there is a need for appropriate training and evaluation. As pointed out by Mesters (2009), training in motivational interviewing is often delivered through a single workshop, and whether this amount of training is sufficient to make a difference in clients' responses is not clear. Although it appears that developing the attitude and knowledge necessary may not be too time-consuming, the skills required for effective motivational interviewing may take longer to develop (Britt *et al.* 2004). There is also the danger that in a mutual participation model, where patients are assigned more responsibility, the responsibility of the health professional is abrogated and more intensive strategies are precluded.

There is great appeal in motivational interviewing being a practical front-line approach that is consistent with the call for more patient-centred approaches in health care where the health practitioner and patient relationship is seen as a partnership (Emmons & Rollnick 2001, Antiss 2009). However, there are some gaps in the evidence base that need to be addressed before it can be applied with confidence in routine practice.

For instance, motivational interviewing does not specifically ask patients about their misconceptions or understanding of the risk of their health behaviour, and these are important considerations that may inhibit a successful outcome. The urgency to change some behaviours associated with an acute cardiac event, for example, may require more didactic and emphatic approaches.

Supporting self-efficacy is a central principle of the motivational interviewing approach, with the latter attempting to increase the patient's belief in his or her ability to change his or her behaviour. But this concept is often poorly understood and applied, and there is a need to develop a precise understanding of the effectiveness of specific rather than general self-efficacy to support patients appropriately in their self-management (Lau-Walker & Thompson 2009).

The use of a motivational interviewing approach in high-volume and fast-paced health care environments, such as cardiovascular clinics, is challenging. However, using this technique particularly in opportunistic encounters may be of use in leveraging behaviour change. Ensuring adequate training, skill development and monitoring is important.

Finally, more research is needed to understand how motivational interviewing exerts its effect and what elements of motivational interviewing are essential. It is also unclear which patients would benefit most from motivational interviewing and this is important in targeting individuals (Britt *et al.* 2004). Further evaluation of motivational interviewing should involve obtaining the views and perspectives of participants. Pawson and Tilley (1997) advocate asking clients whether they feel the intervention has achieved its goals and if not why. Also, identifying the cultural appropriateness of this method, particularly in cultures where a more authoritative approach is expected, is important. Further, the focus of the motivational interviewing approach is on the individual, rather than the more collective focus in some cultures.

Limitations

Limitations of motivational interviewing have been acknowledged by Miller and Rollnick (2002). They conclude that there is reasonable evidence that it works in certain applications but that the data are less clear regarding how and why it works. They do not regard it as a panacea but as one method that can be used in concert with others, and they acknowledge that, in some contexts, it is appropriate to educate, offer clear advice, teach skills, coerce or make decisions for another. This is sage advice; commonly, strategies and techniques are adopted with minimal critique. Identifying individuals most likely to respond to this technique is critical to adopt this in cardiovascular care. Many individuals at high risk or with cardiovascular disease have multiple risk factors, which poses a major challenge as most studies of motivational interviewing have targeted a single behaviour only.

Conclusion

The evidence thus far attests to motivational interviewing being an attractive and effective means of changing behaviour and the potential to offer great promise. Identifying the niche for this technique in cardiovascular care is an important focus for future research.

Relevance to clinical practice

Nurses can play a key role in improving modifiable CHD risk factors of patients. This review indicates that motivational interviewing is a useful method to help nurses accomplish such health behaviour change, but there remain

some gaps in the evidence base that need to be addressed before it can be applied with confidence in routine practice. Ensuring adequate training, skill development and monitoring is important.

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Conflict of interest

None.

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