

Bond University
Research Repository



How do general practitioners and patients make decisions about cardiovascular disease risk?

Bonner, Carissa; Jansen, Jesse; McKinn, Shannon; Irwig, Les; Doust, Jenny; Glasziou, Paul; McCaffery, Kirsten

Published in:
Health Psychology

DOI:
[10.1037/hea0000122](https://doi.org/10.1037/hea0000122)

Licence:
Other

[Link to output in Bond University research repository.](#)

Recommended citation(APA):

Bonner, C., Jansen, J., McKinn, S., Irwig, L., Doust, J., Glasziou, P., & McCaffery, K. (2015). How do general practitioners and patients make decisions about cardiovascular disease risk? *Health Psychology, 34*(3), 253-261. <https://doi.org/10.1037/hea0000122>

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

For more information, or if you believe that this document breaches copyright, please contact the Bond University research repository coordinator.

How do General Practitioners and patients make decisions about cardiovascular disease risk?

Carissa Bonner^{1,2}, Jesse Jansen^{1,2}, Shannon McKinn^{1,2}, Les Irwig¹, Jenny Doust^{1,3},
Paul Glasziou^{1,3}, and Kirsten McCaffery^{1,2}

1. Screening and Test Evaluation Program (STEP), Sydney School of Public Health, The University of Sydney
2. Centre for Medical Psychology and Evidence-based Decision-making (CeMPED), The University of Sydney
3. Faculty of Health Sciences and Medicine, Bond University

Correspondence: A/Prof Kirsten McCaffery

Rm 301, Edward Ford Building A27, The University of Sydney, NSW 2006, Australia

Telephone +61 2 9351 7220; Fax +61 2 9351 5049; Email kirsten.mccaffery@sydney.edu.au

Acknowledgments: We would like to thank the GPs and patients who participated in the study, Haryana Dhillon for assistance with administration and recruitment, and Kristen Pickles for assistance with data collection. The study was funded by the National Health and Medical Research Council (NHMRC), through grants awarded to the Screening and Test Evaluation Program (No. 633003) and Bond University (No. 511217); and the National Heart Foundation, under the Prevention in Primary Health Care Project.

Notice: This article may not exactly replicate the authoritative document published in the APA journal. It is not the copy of record.

Abstract

Objective: Although current guidelines around the world recommend using absolute risk (AR) thresholds to decide whether cardiovascular disease (CVD) risk should be managed with lifestyle or medication, the use of AR in clinical practice is limited. The aim of this study was to explore the factors that influence general practitioner (GP) and patient decision making about CVD risk management, including the role of risk perception.

Methods: Qualitative descriptive study involving semi-structured interviews with 25 GPs and 38 patients in Australia in 2011-2012. Transcribed audio-recordings were thematically coded and a Framework Analysis method was used.

Results: GPs rarely mentioned AR thresholds, but were influenced by their subjective perception of the patient's risk and motivation, and their own attitudes towards prevention, including concerns about medication side effects and the efficacy of lifestyle change. Patients were influenced by individual risk factors, their own motivation to change lifestyle, and attitudes towards medication: initially negative, but this improved if medication was more effective than lifestyle. High perceived risk led to medication being recommended by GPs and accepted by patients, but this was not necessarily based on AR. Patient perceptions of high risk also increased motivation to change lifestyle, particularly if they were resistant to the idea of taking medication.

Conclusions: Perceived risk, motivation and attitudes appeared to be more important than AR thresholds in this study. CVD risk management guidelines could be more useful if they include strategies to help GPs consider patients' risk perception, motivation and attitudes as well as evidence-based recommendations.

Keywords: primary care, cardiovascular disease, prevention, decision making, risk appraisals

How do General Practitioners and patients make decisions about cardiovascular disease risk?

Current guidelines for cardiovascular disease (CVD) prevention recommend absolute risk (AR) assessment to guide the use of preventive medication (Ferket et al., 2010). One of the most commonly used models is the Framingham risk equation, using age, gender, smoking, diabetes, systolic blood pressure and cholesterol ratio to estimate the risk of a cardiovascular event over the next 5 or 10 years (Anderson, Odell, Wilson, & Kannel, 1991; D'Agostino et al., 2008). Cholesterol and blood pressure lowering medication are recommended for high risk (5 year AR greater than 15%), or for moderate risk (between 10-15%) with additional risk factors or no improvement after 3-6 months of lifestyle change. Lifestyle advice is recommended for all patients, with additional support (such as referral to external services) for moderate risk and follow-up for high risk (National Vascular Disease Prevention Alliance (NVDPA), 2009, 2012).

A systematic review suggests that the AR approach to CVD prevention may improve the clinical management of patients compared to treating blood pressure and cholesterol as separate risk factors (Sheridan & Crespo, 2008). However, research across the United Kingdom, Australia, Europe, North America and South America has shown that many GPs do not use AR consistently for CVD risk assessment and treatment decision making (Graham, Stewart, Hertog, & Cardiovascular Round Table Task Force, 2006; Heeley et al., 2010; Pound et al., 2005; Sposito et al., 2009; Webster et al., 2009). This may result in over-treatment of patients with isolated risk factors who are at low to moderate overall risk, and under-treatment of patients with low or moderately elevated individual risk factors but high overall risk (Doust, Sanders, Shaw, & Glasziou, 2012; Heeley et al., 2010).

So how do GPs and patients make treatment decisions if they are not using AR thresholds? The shared decision making view that patients should be fully informed about evidence-based recommendations and involved in decisions about their health has been supported by health policy and consumer group initiatives internationally and in Australia, indicating that both GP and patient perspectives are important (McCaffery et al., 2011; Politi, Wolin, & Legare, 2013). However, the AR guidelines are focused on evidence-based recommendations rather than patient involvement in decision making (NVDPA, 2009, 2012). GP decision making about CVD-related medication has traditionally been focused on individual risk factors, with blood pressure and cholesterol treated separately (NVDPA, 2009). Research on GP attitudes towards AR suggests that this is still the default approach for many GPs (Heeley et al., 2010; Hobbs, Jukema, Da Silva, McCormack, & Catapano, 2010; Torley, Zwar, Comino, & Harris, 2005). From the patient perspective, reviews have found that resistance to taking medications is common, adherence to prescribed medication is low, and interventions to improve this are often unsuccessful (Burke, Dunbar-Jacob, & Hill, 1997; Haynes, Ackloo, Sahota, McDonald, & Yao, 2008; Pound et al., 2005). Lifestyle modification is also a significant challenge, with 194 barriers identified in a recent qualitative review of factors affecting lifestyle change for patients at high risk of CVD (Murray, Honey, Hill, Craigs, & House, 2012). A systematic review of lifestyle interventions in primary care found that only 56% of studies reported a significant effect on patient outcomes (Noordman, van der Weijden, & van Dulmen, 2012). Behavioural counselling, motivational interviewing, education and advice can have an effect on patient outcomes, but the underlying mechanisms and acceptability to GPs and patients remain unclear (Noordman et al., 2012).

Health behaviour models such as the extended parallel process model suggest that the decision to undertake risk-reduction behaviours depends on the interaction between risk appraisals and coping appraisals (Sheeran, Harris, & Epton, 2013; Witte, 1992). Risk

appraisals include: 1) risk perception (e.g. perceived chance of having a heart attack), 2) anticipatory emotions about the disease or health threat (e.g. worry about heart attack), 3) anticipated emotions if the risk occurs (e.g. regretting lack of medication adherence after a heart attack), and 4) perceived severity of the risk (e.g. dying from a heart attack). Coping appraisals include: 1) self efficacy (e.g. perceived ability to reduce risk through lifestyle change), 2) response efficacy (e.g. perceived effectiveness of medication), and 3) response cost of the risk-reducing behaviour (e.g. medication side effects). This idea has recently been supported by an extensive meta-analysis of experimental studies, which showed that health-related intentions and behaviours are influenced by both risk and coping appraisals, and that interventions have the largest effects when both aspects are targeted (Sheeran et al., 2013).

Although guidelines are based on AR thresholds to determine whether lifestyle or medication should be used to manage CVD risk, research suggests that their influence is limited. Since little is known about how such decisions *are* being made in practice, this study used a qualitative method to explore the factors that influence both GP and patient decision making about CVD risk management, including the role of risk perception.

Method

Design

A qualitative descriptive study involving semi-structured interviews with 25 GPs and 38 patients in New South Wales, Australia in 2011-2012.

Participants

Participants were purposively selected to cover a range of characteristics known to influence CVD risk management (Christian, Mills, Simpson, & Mosca, 2006; Doroodchi et al., 2008; Pound et al., 2005; Schmittiel et al., 2009). For GPs this included gender, age and years of GP practice). For patients this included gender, age, and CVD medication use. See Tables 1 and 2.

Recruitment

GPs were sent invitation letters through 8 Divisions of General Practice in New South Wales, Australia. Participating GPs invited up to 10 patients aged 35-74 years with at least one CVD risk factor. GPs were reimbursed \$100 for their interview time and \$5 per invited patient to cover administrative costs. Patients did not receive payment. Fifty-seven GPs and 49 patients returned expression of interest forms, of which 25 GPs and 38 patients were enrolled into the study. Analyses suggested saturation of key themes so no further recruitment was conducted (Bowen, 2008). Ethics approval was obtained through the Sydney Local Health District.

Data Collection

Semi-structured interview schedules were developed by the research team, piloted with a convenience sample of GPs and patients, and revised to improve question clarity. The interview schedules covered CVD risk assessment, management and communication (see Appendix A and B). Findings on risk assessment (Bonner et al., 2013) and risk communication (in preparation) will be reported separately to enable a sufficiently detailed description of our findings. Participants signed a consent form before being interviewed in person or by telephone. Audio-recordings were transcribed verbatim. Two authors trained in public health qualitative methods (CB, SM) conducted interviews between October 2011-May 2012 for GPs and February-August 2012 for patients.

Analysis

The research reflects a subtle realist approach, and a Framework Analysis method was used to ensure rigour (Ritchie, Spencer, & O'Connor, 2003). This is a matrix-based method of thematic analysis involving five steps: 1) familiarisation with the data - three researchers read a sample of interview transcripts and discussed emerging themes; 2) creating a thematic framework - a themes list was developed and discussed with all authors, and a framework was

created with participants as rows and themes as columns in a series of charts; 3) indexing - the remaining transcripts were coded according to the framework, with any new themes discussed and added to the framework; 4) charting - themes and supporting quotes from each transcript were independently summarised in the framework by two researchers, with any disagreement resolved through discussion of the best representation of the data, with reference back to the original transcripts; 5) mapping and interpretation - to identify overarching themes and relationships, the synthesised data were examined within and across themes and participants, and discussed with all authors. This process was conducted independently for the GP and patient datasets, with the final findings only brought together for comparison at the end. Qualitative software was not used for this study. Instead, researchers independently coded themes using the comments function in Microsoft Word (2010), wrote a summary for each transcript, then summarised the data in the form of a Framework using Microsoft Excel (2010), with overarching themes as separate spreadsheets, subthemes as columns, and participants as rows. Each step of the Framework Analysis process was carefully followed and documented (Ritchie, Spencer, & O'Connor, 2003). Methodological rigour was addressed by: repeated coding of transcripts by different team members to ensure a comprehensive themes list and framework was achieved; an iterative process of constant comparison between the existing framework and new data; detailed documentation of the analysis process; and discussion of emerging and final themes with all authors, including an experienced qualitative researcher and two academic GPs (Barbour, 2001).

Results

Three main themes were identified: risk perception, motivation to change lifestyle, and attitudes towards preventive medication. Supporting quotes from participants for each theme are provided in Table 3.

Theme 1: Perceived risk

GP perceptions of risk. The decision to recommend medication for ‘high risk’ patients was influenced by AR for some GPs, but the 15% threshold for high risk used in the guidelines was rarely mentioned. GPs who assessed AR were willing to prescribe medication for lower individual risk factors to reduce high AR. Conversely, when AR was not considered, GPs were willing to prescribe medication for individual risk factors in presented cases where the AR was actually low. The need for medication appeared to be clearer when lifestyle change was ineffective or there were multiple risk factors, but the amount of time allowed for lifestyle change before medication varied widely.

Patient perceptions of risk. Most patients were unaware of their AR. Perceptions of high risk increased motivation for lifestyle change and acceptance of medication, and were based on having consistently elevated, increasing, or multiple risk factors, rather than their overall risk of a heart attack or stroke. Some patients were aware of the concept of AR, but in one case this led a patient who met the guidelines criteria for cholesterol medication to incorrectly believe that her overall risk of a heart attack or stroke was low. In this case, the perception of lower risk led to her refusing to take the medication recommended by her GP.

Theme 2: Motivation to change lifestyle

GP perceptions of motivation. GPs perceived some patients to be very motivated, in which case GPs were willing to give them more time before suggesting medication. Many GPs reported patient resistance to the idea of taking medication for CVD risk when they had no symptoms, and some described using this resistance to motivate lifestyle change. However, not all patients could achieve sufficient lifestyle change to avoid medication, in which case a period of lifestyle change was sometimes used to help them to get used to the idea. This was reported to improve high risk patients' acceptance of the need for medication if there was no improvement within a few months. In contrast, some patients were perceived to

be unmotivated to make lifestyle changes, preferring the 'instant cure' of a 'magic pill'. For these patients GPs would sometimes prescribe medication at an earlier stage.

Patient motivation. For patients not taking medication, lifestyle change was facilitated if the GP's advice confirmed existing beliefs about the benefits of this. Motivation appeared to be increased by experiencing reduced risk factor levels after making changes. Conversely, the experience of lifestyle change not making a difference increased acceptance of the future need for medication.

For patients taking medication, lifestyle management was facilitated by beliefs about its benefits in addition to medication, for CVD risk or more general health. Some patients taking medication were simply unwilling to change their lifestyle or found it too difficult, so medication was considered an easier option. However, many had tried lifestyle change before medication but found it to be ineffective for reducing CVD risk, or attributed their risk to genetics. This increased acceptance of medication.

Patients found lifestyle change easier when GPs adapted recommendations to the patient's specific situation, and were supportive of patients' ability to change lifestyle and avoid medication. On the other hand, some GPs convinced patients to take medication or normalised medication as the only option.

Theme 3: Attitudes towards preventive medication

GP attitudes. Overall, most GPs had a preference for trying lifestyle change before medication, even for high risk patients, and some were reluctant to prescribe preventive medication at all. Reasons for this included patient resistance to medication if not given an opportunity to try lifestyle first, GP preference to focus on lifestyle change, and ethical concerns about giving medication to asymptomatic patients if they weren't willing to try changing their lifestyle.

Other GPs were much less positive about lifestyle approaches, viewing it as difficult and often ineffective. These GPs appeared to be less willing to spend a lot of time addressing lifestyle unless the patient was very motivated.

Patient attitudes. For many patients, avoiding medication provided strong motivation for changing lifestyle due to a general aversion to medication, feeling too young to need medication, and concerns about the harms of medication. Other patients accepted the possibility that they would need medication in future and were happy to trust their GP's advice or request medication in order to prevent a CVD event.

For patients taking medication, negative attitudes to medication were influenced by experienced side effects, perceived harms, and preference for 'natural' remedies, and many were motivated to change their lifestyle by a desire to stop or reduce medication. Several of these patients described trial periods without medication, during which they were highly motivated to achieve a healthy lifestyle to 'prove' that they did not need to go back on preventive medication.

Positive attitudes to medication were evident amongst patients already taking them, which motivated adherence to recommended medication. Although resistance to medication was a common first reaction, many patients had come to view medication as a positive way to control risk and enable an active lifestyle. Awareness of the benefits of medication was reinforced through research, media, friends, family, trust in their GP's advice, and trial periods off medication. Other patients just accepted it as part of their daily routine or a normal consequence of ageing.

Relationships between themes

Three key relationships between perceived risk, motivation to change lifestyle, and attitudes towards preventive medication were identified through Framework Analysis: higher perceived risk by GPs was required before medication was recommended, whether this was

based on AR or a more subjective assessment of overall risk; higher perceived risk by the patient could increase acceptance of recommended medication and/or increase motivation to change lifestyle; and resistance to medication by the patient led to higher motivation to change lifestyle. The arrows in Figure 1 show these relationships between the main themes.

Discussion

Our interviews suggest that decision making about CVD risk management is influenced by: GP and patient perceptions of risk, which may or may not include a formal assessment of AR by the GP; patient motivation to change lifestyle; and attitudes towards preventive medication; rather than AR thresholds. These factors appeared to influence decision making about CVD risk management for both GPs and patients, although they did not always interpret them in the same way: patients' risk perception may be lower or higher than the GPs' assessment, patients may be unmotivated to change their lifestyle even when GPs make a concerted effort to help them achieve this, and high risk patients may choose not to take medication recommended by the GP due to negative attitudes towards this approach.

Our qualitative findings support the view that both risk appraisals and coping appraisals are important in decision making about CVD risk management (Sheeran et al., 2013; Witte, 1992). Patients and GPs both described the importance of risk perception, but patients generally focused on individual risk factors, while GPs were more aware of the overall risk of heart attack and stroke, and the consequences of such events (perceived severity). Motivation to change lifestyle was considered by both GPs and patients, as reducing risk without medication (response efficacy) was perceived to require considerable effort from the patient (self efficacy). Medication was resisted by most patients at first due to concerns about side effects (response cost), unless their risk was perceived as high and medication was viewed as more effective than lifestyle change (risk perception and response efficacy). Some GPs and patients mentioned worry about CVD risk factors (anticipatory emotions), and how

they would feel if a CVD event did occur (anticipated regret), but emotions were not identified as a major decision making factor in our analysis. Table 4 provides a summary of how the findings relate to the concepts of risk and coping appraisal. This conceptual model places the findings in the broader context of risk-related behaviour change, but was considered after the Framework Analysis process had been completed to avoid biasing the results.

Both GPs and patients were more influenced by subjective perceptions of CVD risk than objective absolute risk assessment, and these perceptions did not always match. An objective risk assessment is required before an evidence-based recommendation can be provided by the GP, to enable the patient to make an informed choice about management options together with their GP (Politi et al., 2013). This highlights the importance of evidence-based risk assessment by GPs, and communication of this to the patient. Previous research has found that GPs do not estimate overall CVD risk accurately when AR is not objectively calculated, which may lead to over- or under-treatment (Doust et al., 2012; Heeley et al., 2010). Patients may perceive CVD risk differently to GPs, often focusing on particular risk factors that may or may not reflect their overall CVD risk (Damman & Timmermans, 2012). Calculating AR may therefore correct misperceptions of risk by both the patient and the GP, and enable shared decision making. The risk communication literature has not identified a single 'best' way of communicating such risks to patients, but the International Patient Decision Aid Standards (IPDAS) suggest using equivalent numerical, verbal and graphical formats to help explain probabilities to patients with different levels of literacy (Trevena et al., 2013). Accessible AR assessment tools that incorporate patient communication strategies, including the role of specific risk factors, may also improve the accuracy of, and agreement between, GP and patient risk perceptions (Peiris et al., 2012). However, even if AR is assessed and communicated effectively, other factors may prevent

GPs from using an AR-based approach to management. High risk patients over the 15% threshold may decline medication if they don't think their risk is high enough to justify the potential side effects (Pound et al., 2005). Lower risk patients may be unable or unwilling to change their lifestyle (Murray et al., 2012), and may request medication if they think that is an easier or more effective option. This is consistent with a study showing that GPs in the UK prioritise patient-centred care over prescribing guidelines when these two aims are incompatible (Solomon, Raynor, Knapp, & Atkin, 2012).

CVD risk management guidelines could be more useful if they include strategies to help GPs consider patients' risk perception, motivation and attitudes as well as evidence-based recommendations (van der Weijden et al., 2010). For example, the guidelines indicate that high risk patients should take medication and change their lifestyle, but do not describe what to do if the patient is unwilling to do this. If the patient misunderstands their level of risk or has just seen a negative article about medication in the media, an educational approach may be sufficient to address the issue. If the patient is highly motivated to change their lifestyle and avoid medication, supporting their stated preferences for a period of time may be a useful strategy to either achieve sufficient lifestyle change to reduce risk to a lower level, or increase acceptance of medication if lifestyle is shown to be ineffective. If the GP is finding it difficult to motivate the patient to change their lifestyle, referral to external services could be considered as an explicit option in the guidelines.

The strengths of this study include a heterogeneous sample with a wide range of characteristics, and comparison of themes between GPs and patients. The sampling strategy aimed to maximise the range of experiences and views rather than being representative of the general population. Ethnicity data was not specifically collected, but GP and patient transcripts include references to Chinese, Indian, Eastern European, Anglo-Saxon and Hispanic ethnicities/languages. However, no Aboriginal or Torres Strait Islander participants

were recruited, which limits the relevance of the findings for the Australian context. Future research could investigate differences between GP and patient perceptions more directly by comparing GP-patient dyads.

This study investigated both GP and patient perspectives on decision making about CVD risk management, and found that perceived risk, motivation and attitudes appeared to be more important than AR thresholds across GPs and patients. Even when AR assessment is used, management guidelines may not be followed due to the influence of motivation and attitudes. CVD risk management could be improved through clearer guidelines that acknowledge the role of patient preferences and the difference between perceived risk and calculated risk.

References

- Anderson, K., Odell, P., Wilson, P., & Kannel, W. (1991). Cardiovascular disease risk profiles. *American Heart Journal*, *121*(1 Pt 2), 293 - 298.
- Barbour, R. S. (2001). Checklists for improving rigour in qualitative research: A case of the tail wagging the dog? *British Medical Journal*, *322*(7294), 1115-1117. doi: 10.1136/bmj.322.7294.1115
- Bonner, C., Jansen, J., McKinn, S., Irwig, L., Doust, J., Glasziou, P., . . . McCaffery, K. (2013). General practitioners' use of different cardiovascular risk assessment strategies: A qualitative study. *Medical Journal of Australia*, *199*(7), 485-489.
- Bowen, G. A. (2008). Naturalistic inquiry and the saturation concept: A research note. *Qualitative Research*, *8*(1), 137-152. doi: 10.1177/1468794107085301
- Burke, L. E., Dunbar-Jacob, J. M., & Hill, M. N. (1997). Compliance with cardiovascular disease prevention strategies: A review of the research. *Annals of Behavioral Medicine*, *19*(3), 239-263. doi: 10.1007/bf02892289
- Christian, A. H., Mills, T., Simpson, S. L., & Mosca, L. (2006). Quality of cardiovascular disease preventive care and physician/practice characteristics. *Journal of General Internal Medicine*, *21*(3), 231-237. doi: 10.1111/j.1525-1497.2006.00331.x
- D'Agostino, R., Ramachandran, S., Vasan, R., Pencina, M., Wolff, P., Cobain, M., . . . Kannel, W. (2008). General cardiovascular risk profile for use in primary care: The Framingham Heart Study. *Circulation*, *117*, 743 - 753. doi: 10.1161/CIRCULATIONAHA.107.699579
- Damman, O. C., & Timmermans, D. R. M. (2012). Educating health consumers about cardio-metabolic health risk: What can we learn from lay mental models of risk? *Patient Education and Counseling*, *89*(2), 300-308. doi: 10.1016/j.pec.2012.06.030

- Doroodchi, H., Abdolrasulnia, M., Foster, J. A., Foster, E., Turakhia, M. P., Skelding, K. A., . . . Casebeer, L. L. (2008). Knowledge and attitudes of primary care physicians in the management of patients at risk for cardiovascular events. *BMC Family Practice, 9*. doi: 10.1186/1471-2296-9-42
- Doust, J., Sanders, S., Shaw, J., & Glasziou, P. (2012). Prioritising CVD prevention therapy: Absolute risk versus individual risk factors. *Australian Family Physician, 41*(10), 805-809.
- Ferret, B. S., Colkesen, E. B., Visser, J. J., Spronk, S., Kraaijenhagen, R. A., Steyerberg, E. W., & Hunink, M. G. M. (2010). Systematic review of guidelines on cardiovascular risk assessment: Which recommendations should clinicians follow for a cardiovascular health check? *Archives of Internal Medicine, 170*(1), 27-40. doi: 10.1001/archinternmed.2009.434
- Graham, I. M., Stewart, M., Hertog, M. G. L., & Cardiovascular Round Table Task Force. (2006). Factors impeding the implementation of cardiovascular prevention guidelines: Findings from a survey conducted by the European Society of Cardiology. *European Journal of Cardiovascular Prevention & Rehabilitation, 13*(5), 839-845. doi: 10.1097/01.hjr.0000219112.02544.24
- Haynes, R. B., Ackloo, E., Sahota, N., McDonald, H. P., & Yao, X. (2008). Interventions for enhancing medication adherence. *Cochrane Database of Systematic Reviews, (2)*, CD000011. doi: 10.1002/14651858.CD000011.pub3
- Heeley, E. L., Peiris, D. P., Patel, A. A., Cass, A., Weekes, A., Morgan, C., . . . Chalmers, J. P. (2010). Cardiovascular risk perception and evidence-practice gaps in Australian general practice (the AusHEART study). *Medical Journal of Australia, 192*(5), 254-259.

- Hobbs, F. D. R., Jukema, J. W., Da Silva, P. M., McCormack, T., & Catapano, A. L. (2010). Barriers to cardiovascular disease risk scoring and primary prevention in Europe. *QJM: An International Journal of Medicine*, *103*(10), 727-739. doi: 10.1093/qjmed/hcq122
- McCaffery, K. J., Smith, S., Shepherd, H. L., Sze, M., Dhillon, H., Jansen, J., . . . Barratt, A. (2011). Shared decision making in Australia in 2011. *Zeitschrift fur Evidenz, Fortbildung und Qualitat im Gesundheitswesen*, *105*(4). doi: 10.1016/j.zefq.2011.04.010
- Murray, J., Honey, S., Hill, K., Craigs, C., & House, A. (2012). Individual influences on lifestyle change to reduce vascular risk: a qualitative literature review. *British Journal of General Practitioners*, *62*(599), e403-410. doi: 10.3399/bjgp12X649089
- National Vascular Disease Precention Alliance (NVDPA) (2009). *Guidelines for the assessment of absolute cardiovascular disease risk*. ISBN: 978-1-921226-38-0
- National Vascular Disease Precention Alliance (NVDPA) (2012). *Guidelines for the management of absolute cardiovascular disease risk*. ISBN: 978-0-9872830-1-6
- Noordman, J., van der Weijden, T., & van Dulmen, S. (2012). Communication-related behavior change techniques used in face-to-face lifestyle interventions in primary care: A systematic review of the literature. *Patient Education and Counseling*, *89*(2), 227-244. doi: 10.1016/j.pec.2012.07.006
- Peiris, D., Usherwood, T., Panaretto, K., Harris, M., Hunt, J., Patel, B., . . . Patel, A. (2012). The Treatment of cardiovascular Risk in Primary care using Electronic Decision supOrt (TORPEDO) study-intervention development and protocol for a cluster randomised, controlled trial of an electronic decision support and quality improvement intervention in Australian primary healthcare. *British Medical Journal Open*, *2*(6). doi: 10.1136/bmjopen-2012-002177

- Politi, M. C., Wolin, K. Y., & Legare, F. (2013). Implementing Clinical Practice Guidelines About Health Promotion and Disease Prevention Through Shared Decision Making. *Journal of General Internal Medicine*, 28(6), 838-844. doi: 10.1007/s11606-012-2321-0
- Pound, P., Britten, N., Morgan, M., Yardley, L., Pope, C., Daker-White, G., & Campbell, R. (2005). Resisting medicines: a synthesis of qualitative studies of medicine taking. *Social Science & Medicine*, 61(1), 133-155. doi: 10.1016/j.socscimed.2004.11.063
- Ritchie, J., Spencer, L., & O'Connor, W. (2003). Carrying out qualitative analysis. In J. Ritchie & L. Spencer (Eds.), *Qualitative Research Practice: A Guide for Social Science Students and Researchers* (pp. 219–262). London: Sage Publications.
- Schmittiel, J. A., Traylor, A., Uratsu, C. S., Mangione, C. M., Ferrara, A., & Subramanian, U. (2009). The Association of Patient-Physician Gender Concordance with Cardiovascular Disease Risk Factor Control and Treatment in Diabetes. *Journal of Womens Health*, 18(12), 2065-2070. doi: 10.1089/jwh.2009.1406
- Sheeran, P., Harris, P., & Epton, T. (2013). Does heightening risk appraisals change people's intentions and behavior? A meta-analysis of experimental studies. *Psychological Bulletin*. doi: 10.1037/a0033065
- Sheridan, S., & Crespo, E. (2008). Does the routine use of global coronary heart disease risk scores translate into clinical benefits or harms? A systematic review of the literature. *BMC Health Services Research*, 8(1), 60. doi:10.1186/1472-6963-8-60
- Solomon, J., Raynor, D. K., Knapp, P., & Atkin, K. (2012). The compatibility of prescribing guidelines and the doctor-patient partnership: a primary care mixed-methods study. *British Journal of General Practice*, 62(597), 196-197. doi: 10.3399/bjgp12X636119
- Sposito, A. C., Ramires, J. A. F., Jukema, J. W., Molina, J. C., Silva, P. M. d., Ghadanfar, M. M., & Wilson, P. W. F. (2009). Physicians' attitudes and adherence to use of risk

- scores for primary prevention of cardiovascular disease: cross-sectional survey in three world regions. *Current Medical Research and Opinion*, 25(5), 1171-1178. doi:doi:10.1185/03007990902846423
- Torley, D., Zwar, N., Comino, E., & Harris, M. (2005). GPs' views of absolute cardiovascular risk and its role in primary prevention. *Australian Family Physician*, 34(6), 503 - 504.
- Trevena, L.J., Zikmund-Fisher, B.J., Edwards, A., Gaissmaier, W., Galesic, M., Han, P.K.J., . . . Woloshin, S. (2013). Presenting quantitative information about decision outcomes: a risk communication primer for patient decision aid developers. *BMC Medical Informatics and Decision Making*, 13(Suppl 2), S7. doi:10.1186/1472-6947-13-S2-S7
- van der Weijden, T., Légaré, F., Boivin, A., Burgers, J., van Veenendaal, H., Stiggelbout, A., . . . Elwyn, G. (2010). How to integrate individual patient values and preferences in clinical practice guidelines? A research protocol. *Implementation Science*, 5(10). doi:10.1186/1748-5908-5-10
- Webster, R. J., Heeley, E. L., Peiris, D. P., Bayram, C., Cass, A., & Patel, A. A. (2009). Gaps in cardiovascular disease risk management in Australian general practice. *Medical Journal of Australia*, 191(6), 324-329.
- Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, 59(4), 329-349.

Table 1

GP participant characteristics (n=25)

Characteristic	Category	n
Gender	Female	15
	Male	10
Age (years)	<40	6
	40-49	8
	50-59	7
	60+	4
Years of practice	<10	5
	10-19	6
	20-29	9
	30+	5
GP role in practice	Registrar/in training	1
	Contractor/sessional/retainer/salaried	14
	Partner/principal	10
Medical record system	Electronic only	23
	Electronic and paper	1
	Paper only	1
Number of GPs in practice	1-5	10
	6-10	13
	11-15	2

Table 2

Patient participant characteristics (n=38)

Characteristic	Category	n
Gender	Female	21
	Male	17
Age (years)	35-39	3
	40-49	2
	50-59	15
	60-69	14
	70-74	4
Highest education	Year 10 or below	7
	Year 12	3
	Technical Diploma	10
	Undergraduate university degree	8
	Postgraduate university degree	10
Marital status	Never married	7
	De facto	7
	Married	16
	Divorced	5
	Widowed	3
Country of birth	Australia	23
	United Kingdom	5
	Europe	3
	North America	3
	Asia	2
	New Zealand	2
CVD medication use	Medication not recommended	15
	Not taking recommended medication	2
	Taking preventive medication	16
	Taking medication after CVD event	5

Table 3

Supporting quotes from GPs (shaded) and patients by theme

Theme 1: Perceived risk	
Higher risk perception increases preference for medication	<i>"If say a patient is obese or they have a very strong family history...I would probably have a lower threshold starting medication." (GP)</i>
Lower risk perception decreases preference for medication	<i>"You have to look at heart disease in a total package. And I don't have enough of the total package to have a heart attack. When I start having more of that package then it's, you know, I've got to...do what I'm told. But at the moment they are prepared for me to think through this... I know mine's really high (cholesterol). I know it's genetic. But it...couldn't be depositing much plaque down because my blood pressure's good." (patient not taking recommended medication)</i>
Theme 2: Motivation to change lifestyle	
Lifestyle change motivated by avoiding medication	<i>"Once you've explained to them their risk most of them understand very well where they're going and what they need to do and they always, most of them are pretty keen on the lifestyle modification. Doc if I do that do you think it will come down, I don't have to take a tablet." (GP)</i>
Period of lifestyle change used to increase medication acceptance	<i>"He may not be willing to start any medication...even if I give him the script he is not going to take it... in that case I have to tell him that 'look try all these changes, come back in 3 months or 2 months'...when he comes back and we see that the levels haven't gone down...he would be more amenable to the idea of starting medication." (GP)</i>
Lifestyle change seen as too difficult	<i>"They all want a pill (laughter) for everything and that's the main challenge we find...not many patients are willing to change their lifestyle unfortunately...they want the easy way out. A pill for everything." (GP)</i>
Belief in additional benefits of lifestyle change	<i>"You cannot do one thing without the other...no use starting those tablets if you go overboard with the diet, I mean people say 'oh it doesn't matter, take the tablets I can do anything I like'. That's not true...you have to have a good diet as well as taking the tablets. The tablets alone is not going to fix everything." (patient taking medication)</i>
Lifestyle change proven to be ineffective	<i>"For a long time I avoided doing it, didn't want to do it and tried it just to go through all the lifestyle...sort of good eating and everything but it just didn't budge so eventually I agreed to go on medication... I put it off...for a long time and then realised no matter what I did it just, it was high every time." (patient taking medication)</i>

Lifestyle change not discussed as an option *"You hear lots of nasty stories about side effects and things not working well together but she reassured me that what I was on was sort of fairly standard generic medication and I didn't have to worry about those sorts of things...at the time the solution was medication. I have since changed doctors...and have lost 18 kilos in that time and reduced my blood pressure medication...less than impressed that that conversation didn't happen when I was first diagnosed." (patient taking medication)*

Theme 3: Attitudes towards preventive medication

Preference to focus on lifestyle change *"From every point of view, from patient care, cost...if you can make the changes which have the least amount of cost to everyone then I think that's usually lifestyle. So that's usually the way that I start with and then use medication if we're not getting there." (GP)*

Ethical concerns about giving medication *"The problem with a lot of patients is they don't want to change what they do and if...they're quite often happy to take a tablet and want that to be the instant cure and I don't agree with that." (GP)*

Medication viewed as easier/more effective *"These things are a lot easier said than done. So achieving those results [through lifestyle change] and bringing blood pressure, bringing the cholesterol down, quitting smoking – they are time consuming and difficult." (GP)*

Perceived harms of medication *"I wouldn't like to take statins...especially with all the issues going on with statins and the FDA [Food and Drug Administration] about looking at the diabetes too and all the other issues, liver problems...I try to stay away from drugs." (patient not taking medication)*

Perceived benefits of medication *"It will put me in a better place by taking medication...I don't want to have an ego where I don't want to take medication because of my age, and find that I have got problems down the track...I'm quite happy to be directed." (patient not taking medication)*

Motivated to reduce/stop medication to avoid side effects *"I am desperately trying to get off them ...there are negative effects of the medication. So I want to reduce weight...I'm due to go back there and say look we want to knock down, halve one of the tablets. The reason I want to reduce them or get rid of them is that they do have negative effects on you, like a little bit light headedness and so that's one of the pushes to try and get off them." (patient taking medication)*

Medication accepted as normal/part of routine *"I resisted it to start with but I realised if I didn't take it, I could have other complications so it didn't really worry me...if I take my tablets...it hasn't interrupted with my lifestyle and...I've just accepted it." (patient taking medication)*

Table 4

Role of risk and coping appraisals in decision making about CVD risk

Risk appraisals	GP conceptualisation	Patient conceptualisation
Risk perception	Mix of overall risk and individual risk factors	Based more on individual risk factors, little awareness of absolute risk, enhanced after CVD event
Anticipatory emotions	Conveyed to patients in terms of being worried or concerned	Worry more if experience with CVD events (self or family)
Anticipated emotions	Some anticipation of regret if fail to prevent CVD event	Not a main consideration for patients
Perceived severity	High awareness of severe consequences of CVD risk	Link between individual risk factors, overall risk and CVD events not clear, enhanced after CVD event
Coping appraisals	GP conceptualisation	Patient conceptualisation
Self-efficacy	Perceived as low for lifestyle, high for medication	Perceived as high for both lifestyle and medication; increased for lifestyle if they want to avoid medication
Response efficacy	Perceived as low for lifestyle, high for medication	Perceived as higher for medication than lifestyle especially after unsuccessful lifestyle change
Response cost	Some concern amongst GPs but patient concerns more important	Perceived as very high for medication and lower for lifestyle

[SEE SEPARATE PPT FILE]

Figure 1. Summary of GP and patient decision making factors identified through Framework Analysis. Arrows indicate key relationships between themes.