How simple mistakes and short-term bias elevate cardiovascular risk

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During the last 10 years, thousands of New Zealanders have had a cardiovascular risk assessment completed in primary care using simple risk algorithms such as "PREDICT". When completing this risk score, the most important 'box' is 'prior cardiovascular disease' (CVD). This identifies patients who usually have a much higher risk compared to people with risk factors alone, and who almost always have a clear indication for preventive medication.[1]
In this issue of the *NZMJ*, Sue Wells and colleagues report on what initially seems a mundane question; "Is general practice identification of prior cardiovascular disease at the time of CVD risk assessment accurate and does it matter?"[2]

The answer is staggering and the consequences substantial. Wells found that ~40% of patients who had a previous hospitalisation for a major cardiovascular event had 'no' indicated for prior CVD in the PREDICT risk algorithm. The mistake was most common for patients with an admission for peripheral arterial disease, whose risk for recurrent CV events is particularly high.[3] This apparently simple error translated to more than double the failure to dispense appropriate evidence-based treatment during the next six months. For CVD, incorrectly compared to correctly recorded lipid-lowering therapy was not dispensed for 40% vs 15% of patients respectively, an antiplatelet or anticoagulant in 40% vs 17%, blood pressure lowering medication for 30% vs 14%, and for all three or 'triple therapy' in 57% vs 31% of patients.

From many randomised clinical trials we know that lowering LDL cholesterol, decreasing blood pressure, and anti-platelet therapy reduce the risk of myocardial infarction, stroke and cardiovascular death. The 'triple therapy' target evaluated by Wells is easy to audit, but for patients at high cardiovascular risk even 'triple therapy' may not be optimal therapy. During the first year after an acute coronary event, dual antiplatelet therapy with ticagrelor and aspirin lowers the risk of ischaemic events and death more than clopidogrel and aspirin,[4] and both are better than aspirin alone. The reduction in risk is greater for treatment regimens which lower LDL cholesterol more.[5] Blood pressure lowering medication to achieve a target systolic blood pressure of 120mmHg decreases cardiovascular events more than when the target is 140mmHg.[6] The benefits of combining medications and optimising dose regimens are cumulative, so that optimal therapy compared to no therapy can reduce relative risk by more than 70%.

A healthy diet, regular physical activity and not smoking are also important. For sedentary people even modest increases in regular physical activity are associated with lower cardiovascular and all-cause mortality.[7] As for preventive therapy, the benefits of favorable lifestyle risk factors accumulate over time, and have been associated with many additional years of life.[8] However, in patients with CVD, encouraging a healthy lifestyle is not a substitute for preventive medication—both are important.

Despite strong evidence and clear guidelines, a third of New Zealanders are not taking a statin one year after acute myocardial infarction,[9] and adherence to all recommended therapies is even less. Several factors may explain why patients and doctors often decide that persisting with secondary preventive medication is not worth the effort. These medications do not directly improve wellbeing or quality of life. Some people think taking medication makes them less healthy and

want to reduce the number of tablets they take, even though for many an increase in treatment could lower risk further. The same medications are widely prescribed for primary prevention where the absolute benefits are often, although not always lower,[10] and this may bias perceptions of benefit. Statistical concepts of 'risk' are hard to understand, and people respond differently depending on how it is framed. Most people have a short-term bias, and in the short term, benefits of medication seem small. For example, a 50-year-old man with coronary artery disease taking no medication may have a ~5% risk per year of death, myocardial infarction or stroke, and this can be decreased to ~1.5% by optimal medical therapy. Taking the medication would reduce the risk of a major cardiovascular event in the next week by less than 1 in 1,000. But risks, as well as benefits of treatment, accumulate over time. Over 20 years adhering to optimal preventive medication may increase the chance of being alive without a major heart attack or disabling stroke from less than one in three to more than 70%. It is important to remember that short-term risks of non-adherence to medication are much higher during the first three months after an acute coronary syndrome or arterial stenting.

Side effects, either real or perceived, are a common reason for patients to stop medication. Some, such as cough with angiotensin converting enzyme inhibitors, and ankle edema with calcium antagonists, are easy to ascribe to medication and an alternative or dose reduction can be considered. However, often the link between a medication and suspected side effect is less certain. Is the beta-blocker the reason for fatigue, or a statin for muscle ache? Temporarily stopping medication to see if the problem improves seems reasonable, but symptoms often improve either way. Reluctance to restart a possible offending medication is understandable, but the consequence over the longer term can be a substantial increase in CV risk.

Nocebo effects, or adverse events which result from expectations of harm, are a major contributor to treatment non-adherence. They may be driven by warnings about adverse effects from clinicians, or misleading information in the media. The high rate of muscle aches, memory impairment and other symptoms attributed to statins in clinical practice may largely reflect nocebo effects. In controlled trials, when neither patients nor their doctors know they are taking an active medication, suspected side effects are reported in up to 10% of patients, but the rate is almost the same on placebo and statin.[5] When patients know they are taking a statin, discontinuation because of side effects increases even more.[11]

The importance of access to healthcare and trust is demonstrated by a recent US study where monitoring blood pressure in barbershops with pharmacist support dramatically improved blood pressure control in middle aged black men.[12] In New Zealand, primary care practitioners have the central role in achieving optimal long-term secondary prevention. Trusted advice from their GP is important if patients with cardiovascular disease are to believe that taking four or five medications every day is one of the most important things they can do to live a longer life. However, effective implementation is not as simple as it looks. The study by Wells shows how easy it is to make simple mistakes during busy consultations, and doctors and patients can both 'forget' important medical events. Improved systems which automatically link electronic records and lab results to decision support tools and then check and guide decisions may reduce these types of mistakes. Also important is effective communication of the long-term benefits of preventive medications, and considered evaluation of possible side effects. During a 15-minute consultation with more immediate concerns, this can be difficult.

Better implementation of treatment guidelines for secondary prevention would substantially decrease cardiovascular morbidity and mortality. Recognising that choices made by both patients and doctors are influenced by human error and bias could suggest novel approaches to achieve this goal.

Competing interests:
Nil.

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REFERENCES:

1. Kerr AJ, Broad J, Wells S, Riddell T, Jackson R. Should the first priority in cardiovascular risk management be those with prior cardiovascular disease? Heart. 2009; 95(2):125–9.
2. Wells S, Poppe KK, Selak V, Kerr A, Pylypchuk R, Wu B, Chan WC, Grey C, Mehta S, Gentles DGR, Jackson R. Is general practice identification of prior cardiovascular disease at the time of CVD risk assessment accurate and does it matter? N Z Med J 2018; 131(1475):10–20.
3. Steg PG, Bhatt DL, Wilson PW, et al. One-year cardiovascular event rates in outpatients with atherothrombosis. JAMA. 2007; 297(11):1197–206.
4. Wallentin L, Becker RC, Budaj A, et al. Ticagrelor versus clopidogrel in patients with acute coronary syndromes. N Engl J Med. 2009; 361(11):1045–57.
5. Baigent C, Blackwell L, Emberson J, et al. Efficacy and safety of more intensive lowering of LDL cholesterol: a meta-analysis of data from 170,000 participants in 26 randomised trials. Lancet. 2010; 376(9753):1670–81.
6. Wright JT, Jr., Williamson JD, Whelton PK, et al. A Randomized Trial of Intensive versus Standard Blood-Pressure Control. N Engl J Med. 2015; 373(22):2103–16.
7. Stewart RAH, Held C, Hadziosmanovic N, et al. Physical Activity and Mortality in Patients With Stable Coronary Heart Disease. J Am Coll Cardiol. 2017; 70(14):1689–700.
8. Li Y, Pan A, Wang DD, et al. Impact of Healthy Lifestyle Factors on Life Expectancies in the US Population. Circulation. 2018.
9. Grey C, Jackson R, Wells S, et al. Maintenance of statin use over 3 years following acute coronary syndromes: a national data linkage study (ANZACS-QI-2). Heart. 2014; 100(10):770–4.
10. Yusuf S, Lonn E, Pais P, et al. Blood-Pressure and Cholesterol Lowering in Persons without Cardiovascular Disease. N Engl J Med. 2016; 374(21):2032–43.
11. Gupta A, Thompson D, Whitehouse A, et al. Adverse events associated with unblinded, but not with blinded, statin therapy in the Anglo-Scandinavian Cardiac Outcomes Trial-Lipid-Lowering Arm (ASCOT-LLA): a randomised double-blind placebo-controlled trial and its non-randomised non-blind extension phase. Lancet. 2017; 389(10088):2473–81.
12. Victor RG, Lynch K, Li N, et al. A Cluster-Randomized Trial of Blood-Pressure Reduction in Black Barbershops. N Engl J Med. 2018; 378(14):1291–301.