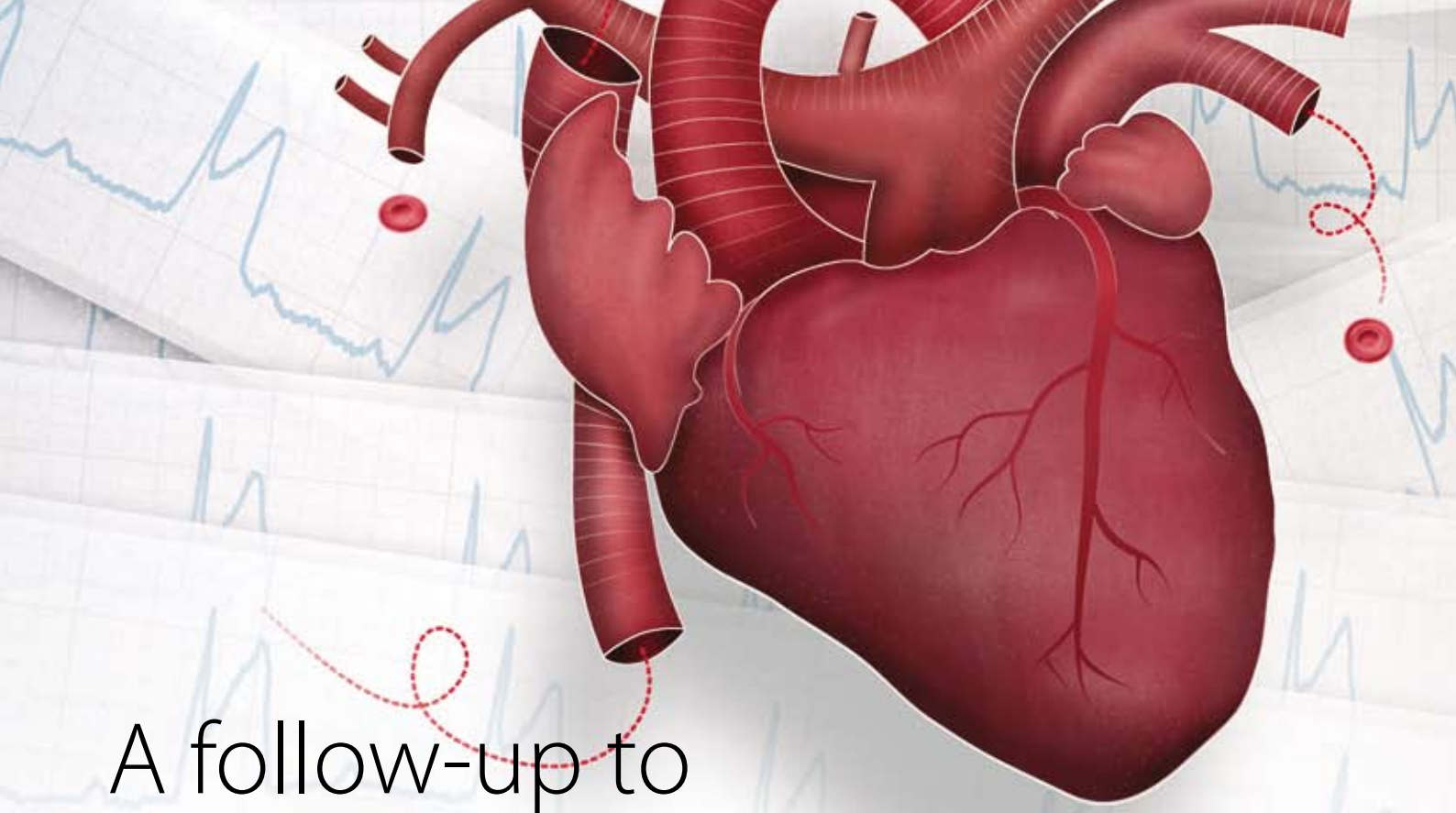

A follow-up to **acute coronary syndromes**

The article: "The immediate management of acute coronary syndromes in primary care" attracted some interest from emergency care clinicians around the country. In the interests of clarity we provide supplementary material on some of the more contentious issues.

For the full article, see: "The immediate management of acute coronary syndromes in primary care", BPJ 67 (Apr, 2015).

Refer all patients with suspected coronary syndromes to hospital

A 12-lead ECG should be performed on all patients presenting to primary care with chest pain that may be due to a cardiac cause. The results of the ECG may confirm a ST segment elevation myocardial infarction, but more commonly a lack of acute ECG changes will be found which may be consistent with a non-ST segment elevation acute coronary syndrome. It is also possible that there will be delayed cardiac changes that may not be detectable on ECG when the patient is initially triaged. A fourth possibility, which is more likely in older patients or in patients with an underlying cardiac condition, is that the ECG is inconclusive. Immediate transfer to hospital is therefore recommended for all patients with symptoms suggestive of an acute coronary syndrome, where a cardiac cause cannot be reasonably excluded, regardless of the results of their ECG, i.e. a normal ECG does not exclude the possibility of a cardiac cause.

In the original article in BPJ 67 it was stated that: "If the patient's ECG is otherwise abnormal, and suspicion remains of a cardiac cause, then assume that the patient has an acute coronary syndrome and refer them to hospital." We did not intend to imply that, in a patient in whom a cardiac cause for their symptoms is suspected, the finding of a normal ECG would preclude referral to hospital.

Glyceryl trinitrate dosing during an acute coronary syndrome in a primary care setting

Glyceryl trinitrate (GTN) is an important medicine for patients with symptomatic angina. GTN exerts its therapeutic action by relaxing vascular smooth muscle, therefore producing both arterial and venous vasodilation. This results in an improvement in myocardial perfusion and a reduction in cardiac work load. However, GTN can also cause hypotension and it is important that patients with angina do not exceed the recommended dose. GTN should also be avoided by patients with significant pre-existing hypotension or hypovolaemia (both acutely and long-term), or by patients who are concurrently using PDE-5 inhibitors, e.g. sildenafil.[1]

The National Heart Foundation "Angina Action Plan" provides instructions for patients on how to administer GTN during an attack of angina. In summary, patients are advised to take one puff (or tablet) of GTN under their tongue, if symptoms remain the patient is advised to repeat the dose after five minutes, if

after another five minutes the patient's symptoms have not resolved then they are advised to assume they are having a heart attack, call an ambulance and chew an aspirin.

In contrast to the "Angina Action Plan" for patients, we have provided GTN dosing instructions that are appropriate when the patient is under the supervision of a primary care clinician. These include up to three doses of GTN, of one to two sprays, administered to the patient at five minute intervals. This is consistent with the Scottish Intercollegiate Guidelines Network (SIGN) for acute coronary syndromes (2013), the American Heart Association Guidelines for acute coronary syndromes (2010) and the New Zealand medicine datasheet for GTN.[2, 3, 4]

We believe that primary care clinicians will exercise clinical judgement when assessing the risk versus benefit of additional GTN doses when managing patients with suspected acute coronary syndromes. While the patient is awaiting ambulance transfer they may be given GTN and additional analgesia, and will be closely monitored for complications, e.g. cardiac arrest, and adverse effects of treatment, e.g. hypotension caused by GTN. If there is a delay in transfer, it is possible that three doses of GTN may be required in some situations.

Which is the best antiplatelet in combination with aspirin for patients with acute coronary syndromes?

The need to give aspirin to all patients with acute coronary syndromes is universally acknowledged. However, the issue of whether or not to provide an additional antiplatelet medicine, e.g. clopidogrel or ticagrelor, to these patients is more complex and depends on geographical location and clinical context. Given that general practitioners operate in very different situations across New Zealand it is difficult to provide one-size-fits-all guidance.

Neither clopidogrel nor ticagrelor are available on Practitioner's Supply Orders (PSO), therefore it is unlikely that many general practices will have ready access to either of these medicines at short notice. Furthermore, in most urban areas there should not be significant delays in transporting patients by ambulance to hospital and therefore the decision regarding administration of an additional antiplatelet medicine will be left to secondary care. Administering an additional antiplatelet medicine in primary care in this situation is also unlikely to improve the patient's outcome. The "Administration of Ticagrelor in the Cath Lab or in the Ambulance for New ST Elevation Myocardial Infarction to Open the Coronary Artery" (ATLANTIC) study found that earlier treatment with ticagrelor did not improve coronary reperfusion prior to percutaneous coronary intervention (PCI).[5] Patients receiving ticagrelor in the ambulance received the medicine at a median time of 31 minutes earlier than patients in hospital.[5] However, in remote communities where there are often significant delays in transporting patients to secondary care, it may be necessary for general practitioners to initiate dual antiplatelet treatment and to thrombolyse patients with acute coronary syndromes.

In the original article in BPJ 67 it was recommended that clopidogrel be given to patients with an acute coronary syndrome if there was evidence of ischaemia on ECG or elevated troponin levels. This was based on SIGN guidelines recommending that all such patients should be treated immediately with both 300 mg of aspirin and 300 mg of clopidogrel.[2] However, in New Zealand, the trend among cardiologists now appears to be a preference for ticagrelor in combination with aspirin over clopidogrel in combination with aspirin.

A meta-analysis of four trials with over 31 000 patients with non ST segment elevation acute coronary syndrome compared the efficacy of ticagrelor or prasugrel with clopidogrel in preventing major cardiovascular events. It was found that ticagrelor or prasugrel, in combination with aspirin, significantly reduced major cardiovascular events in patients with non ST segment elevation acute coronary syndrome, compared with clopidogrel and aspirin.[6] However, there was also an increased risk of major bleeding associated with both ticagrelor and prasugrel, compared with clopidogrel for some patients.[6] For every 1000 patients treated with ticagrelor and aspirin there would be 16 fewer major cardiovascular events and six more major bleeds, compared to patients treated with clopidogrel and aspirin.[6] The issue of antiplatelet treatment in patients with acute coronary syndromes is therefore further complicated by the risk of bleeding associated with subsequent surgical interventions, e.g. stenting, and primary care clinicians will not always be certain of which interventions the patient will undergo later.

The bottom line is that if a patient with recent chest pain has a positive troponin test and/or new ECG changes, and there will be a significant delay in delivering them to secondary or tertiary care, then it is reasonable that either ticagrelor or clopidogrel be administered; in this situation giving either of these medicines is preferable to withholding treatment due to clinical uncertainty.

Administering fibrinolysis in primary care

If a patient has a ST segment elevation myocardial infarction they are likely to gain the greatest benefit from fibrinolytic treatment in the early phase of their condition.[2] Fibrinolytic treatment is recommended for all patients with a ST segment elevation myocardial infarction, who do not have

contraindications, if a percutaneous coronary intervention cannot be performed within two hours of first medical contact.[7] Primary care clinicians working in urban centres are unlikely to need to administer fibrinolytic treatment to patients with ST segment elevation myocardial infarction as transport to hospital can be expected to be relatively rapid. However, in rural settings this practice is more common.

When deciding whether or not to initiate fibrinolytic treatment to a patient with a ST segment elevation myocardial infarction, assuming that intravenous tenecteplase and enoxaparin are available, clinicians should consider the total time that passes from first contact with the patient until the time that a specialist coronary care unit can be expected to perform an intervention. This includes not only the transportation time, as highlighted in our article, but also the time taken to triage the patient and the time the patient must wait until the ambulance arrives. If this total time is estimated to be more than two hours then fibrinolytic treatment should be initiated in primary care, where possible.

N.B. In the printed version of the article there was a "typo" in the sentence discussing enoxaparin, which read: "Patients aged over 75 years are recommended not to receive the IV bolus of tenecteplase, due to the increased risk of bleeding." It should instead read: "Patients aged over 75 years are recommended not to receive the IV bolus of **enoxaparin**, due to the increased risk of bleeding." This has been corrected in the online version of the article.

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