



Zorginstituut Nederland

Zinnige Zorg Verbetersignalement

Pijn op de borst

(Verdenking) Stabiele Angina Pectoris

ICD-10: IX 120



Zinnige Zorg

Room for improvement analysis: Chest pain
(Suspected) Stable Angina Pectoris

Cardiovascular Disease ICD-10: IX 120

Date	12 December 2017
Status	Final version

Zorginstituut Nederland and Zinnige Zorg

Zorginstituut Nederland's motto is "Taking care of good health care: no more and no less than necessary". Every citizen must be able to count on receiving good health care. No more and no less than is necessary, while also avoiding unnecessary costs.

As a public organisation, the *Zorginstituut* assesses health care systematically. We assess whether diagnostics and (therapeutic) interventions are being deployed in a patient-oriented, effective and cost-effective manner.

We discuss our findings with care professionals, patients, care institutions, health insurers and colleague governmental agencies. Together with them, we examine what is needed to improve patients' care and avoid unnecessary costs.

The parties in health care are responsible for improving that care. *Zorginstituut Nederland* provides an overview of points for improvement, promotes cooperation and monitors the results.

This is how we contribute to good and affordable health care for everyone.

More information about the activities of *Zorginstituut Nederland* and *Zinnige Zorg* can be found on www.zorginstituutnederland.nl.

Colophon

Series number	2016061623
Department	Care Sector <i>Zinnige Zorg</i> Programme
Contact	<i>Zinnige Zorg</i> Programme Secretary zinnigezorg@zinl.nl www.zorginstituutnederland.nl

Contents

TOC

Summary

What is this Room for Improvement Analysis about?

This Room for Improvement Analysis describes the research and the resulting actions and agreements that focus on further improvements in care for people with chest pain and a (suspected) problem with the coronary arteries (stable angina pectoris). We have analysed the care pathway together with the umbrella organisations of patients, care givers and health care insurers, within the framework of the 'Zinnige Zorg' [Appropriate Care] programme of *Zorginstituut Nederland*, and the conclusion is that improvement is desirable. This resulted in the improvement actions and agreements named in this analysis.

What is the care pathway for 'chest pain'?

Chest pain, the most frequent symptom of coronary artery disease, is also referred to as "angina pectoris". Patients feel a stifling, oppressive or constrictive feeling in the middle of the chest. When the obstruction occurs gradually, chest pain is mainly experienced during exertion or in an emotional state; it disappears during rest. This is known as the stable form of angina pectoris. A cardiac infarction is the acute form. This Room for Improvement Analysis is about the stable form.

In cases of (suspected) stable angina pectoris, further tests are carried out: *risk-stratification*, and if necessary, *diagnostics*. Once the diagnosis stable angina pectoris has been confirmed, specific *treatment* is initiated (medicines, and if necessary, surgery) and *cardiovascular risk management (CVRM)/follow-up*. Moreover, *cardiac rehabilitation* is needed after a coronary bypass operation. We looked at which treatment is given to people with chest pain in practice, and whether this is the care they should receive according to opinions on good care. In other words: we examined whether the care is patient-focussed, effective and appropriate. Not too much, nor too little.

Which improvement activities are necessary and have been concretely agreed with the parties?

The analysis revealed differences – often considerable ones – in how care is implemented. As a result, choices seem to depend mainly on the doctor involved and that doctor's working environment. For all aspects of the care pathway, greater alignment is needed between primary and secondary care and between the professionals working there. This applies both to medical recommendations, and to the transfer of data and referring patients (back). To this end, the parties will make agreements and amend or implement the guidelines.

Furthermore, more attention is needed for shared decision-making in guidelines and in consulting rooms. Essential to this is the development of decision aids and/or extensive patient information. This is primarily the responsibility of the patients' association.

A proper overview of the quality of this care is lacking, so outcome indicators (also known as patient-related outcomes) must become available. To this end, the parties will draw up a joint plan of approach.

The existing over-use of diagnostics in the *risk-stratification and diagnostics* component of the care pathway must be avoided. ECGs, ultrasound scans, chest X-rays and exercise stress tests, which are often currently used routinely, are only necessary and appropriate in exceptional cases. Coronary angiography is only useful if surgery is deemed necessary, but patients often undergo this invasive test without subsequently undergoing operation. Large differences exist between hospitals. Furthermore, the development of guidance on diagnostics in secondary care has been agreed to ensure that other diagnostic tests are put to better clinical use. According to the guidelines, the best *treatment* option is generally stepped care: medicines first and surgery only if this is inadequate. In practice, in many cases surgery takes place without medicines first having been given.

The rule for the *CVRM and follow-up* component of the care pathway is that cardiovascular risk management (CVRM) must be offered to people who are eligible for it. This is not currently the case, not for medication, nor in respect of lifestyle support. This is a case of under-treatment. Moreover, it should be clear to all persons involved, particularly patients, who is in charge of their treatment. This will be incorporated in the new multidisciplinary guidelines being developed by the parties.

Over-use of diagnostics (the exercise stress test, chest X-rays) is also a problem in follow-up in secondary care. Agreements on this are already available: the NVVC's 'Choosing Wisely'.

There is no evidence that the *cardiac rehabilitation* aspect of the care pathway is effective for stable angina pectoris patients who are being treated with medicines or a combination of medicines and cardiac angioplasty/stent (PCI). These patients should therefore only be eligible in exceptional cases. In practice, patients with medicines and a coronary bypass, though eligible, are not being offered cardiac rehabilitation. Revision of the guidelines has been agreed.

Budget Impact Analysis?

The health care costs for coronary heart diseases are high: in 2011 more than 2.1 billion euro per year. Almost 1.4 billion of this is for care provided by medical specialists (1.4 billion euro). This care expenditure is expected to double to 4.2 billion in 2030.

Based on the 2014 claim data, an estimated 375 million euro was claimed for the diagnostics and treatment of people with (suspected) stable angina pectoris. The Budget Impact Analysis (time path 2 years), [enclosed as an appendix to the original Room for Improvement analysis], estimates circa €177 million per year in avoidable costs for the health care budgetary framework (BKZ), in addition to favourable effects on the health of patients with chest pain if the improvement activities are carried out. This sum includes €119.3 million due to future avoidance of using cardiac rehabilitation on stable AP patients - included in the guidelines but the efficacy of which was not proven in this in-depth analysis - who are treated with medication alone or in combination with PCI.

The Budget Impact Analysis helps parties to substantiate accountable growth. After all, the demand for care is rising while at the same time we want the growth in care expenditure to be moderate. The avoidable costs we calculated are an estimate based on concrete improvement activities agreed. This does not include the avoidable costs of, e.g., improved collaboration between primary and secondary care (LTA) or the guidance for diagnostic tests in secondary care.

Why are the parties in health care doing this?

The concrete improvement activities agreed on the care pathway of people with (suspected) stable angina pectoris are based on a shared vision of what constitutes good care. One can expect that the majority of diagnostics and therapeutic interventions will be used in line with this; though clearly there will be room for exceptions in consulting rooms. Moreover, insofar as necessary, the parties will elaborate on this shared vision in transmural agreements, guidelines and guidance.

What happens next? Implementation, monitoring and evaluation

Implementation of these improvement activities is up to the parties in health care, based on their respective responsibilities. They have agreed to do this. If necessary, and when asked by the parties, the *Zorginstituut* can support implementation; e.g., by organising meetings to get the parties together or by supporting communication on the agreed improvement activities and the underlying analysis.

The *Zorginstituut* will monitor the improvement activities by discussing progress with the parties annually and by sending a progress report to the Minister van VWS. About three years after this Room for Improvement report has been published, the *Zorginstituut* will send an evaluation report of improvements achieved to the Minister van VWS.

The parties have contributed significantly to realising this Room for Improvement Report and have approved the outcomes. This generates confidence in an effective implementation.

Which parties are involved in this plan?

On behalf of the patients:

Hart&Vaatgroep.

On behalf of the care professionals:

NVvR (Royal Dutch Society for Radiology), KNGF (Royal Dutch Society for Physical Therapy)/VHVL (Association for Cardiovascular and Lung Physiotherapy), NVT (Dutch Association for Thorax Surgery), NVHV (Dutch Association for Cardiovascular Nurses), NVD (Dutch Association of Dieticians), NHG (Dutch Association of General Practitioners), NVVC (Netherlands Society of Cardiology).

On behalf of health institutions:

NFU (The Dutch Federation of University Medical Centres (NFU), NVZ (The Dutch Hospitals Association).

On behalf of health care insurers: ZN (Association of Dutch Healthcare Insurers).

Introduction

1.1 **Zinnige Zorg and systematic scans**

With this Room for Improvement report *Zorginstituut Nederland* indicates where possibilities exist for improving the care pathway for people with Chest Pain (that may be) caused by a cardiac problem. In medical terms, this is the care pathway for people with (suspected) stable angina pectoris: a non-acute coronary heart disease (ICD-10: IX 120). The *Zorginstituut* has published this report as part of the systematic analysis of the insured package.¹ It is an in-depth study within the ICD-10 sector Diseases of the Cardiovascular Diseases (IX I00-I99).

This Room for Improvement report is based on research into the potential for improvement within the care pathway for people with chest pain. The *Zorginstituut* indicates which improvements can be achieved and what consequences these can have for quality and costs. The research and the recommendations will be made in consultation with relevant parties in health care. The *Zorginstituut* will evaluate implementation.²

1.2 **Choice of the care pathway ‘chest pain’**

Within the ICD-10 Cardiovascular sector, it was partly at the request of the parties² that the care pathway for people with chest pain and suspected coronary heart disease was chosen for in-depth study. Care for people with peripheral arterial disorder (PAV) and the Implantable Cardioverter Defibrillator (ICD) will be analysed in more depth; see the separate reports for more information.³

Chest pain can be a symptom of acute or non-acute coronary heart disease. This Room for Improvement report focuses on the non-acute form of coronary heart disease: stable angina pectoris. Attention is given to acute infarction within the *Zorginstituut*'s dossier emergency care and within the top 30 K&D quality cycles.^{4,5} In carrying out this analysis, based on its package management and quality tasks, the *Zorginstituut* will focus on the perspective of patients and citizens. We have opted to examine the entire care pathway: not only diagnostics, but also treatment and the subsequent pathway. All parties involved support the choice of the entire care pathway.

1.3 **Research**

During the kick-off meeting for the in-depth phase on 8 September 2015, in consultation with all parties, research questions were formulated for all subsequent elements of the care pathway.⁶ Part of the study (including analysis of the claim

¹ The Ministry of Health, Welfare and Sport commissioned *Zorginstituut Nederland* to analyse the package. The ‘Accountability’ appendix describes the goal and working methods.

² Parties involved are: ZN, NFU, Hart&Vaatgroep, NVVC, NVT, NRA, NVvR, NHG, NVD, KNGF, NIP, V&VN, NVHV.

³ The choice of these 3 topics was described in the ‘Systematic Analysis of the Cardiovascular System’, 8 June 2015.

⁴ See www.zorginstituutnederland.nl/kwaliteit/kwaliteit+spoedzorg.

⁵ In 2013 VWS and the other K&D Partners signed the administrative outline agreement 2014-2017. A corollary of this agreement is the Quality and Effectiveness Agenda on Care provided by Medical Specialists (April 2014).

⁶ See ‘report kick-off meeting coronary heart disease and feedback on research questions’, available from www.zorginstituutnederland.nl.

data) was carried out by the *Zorginstituut*. Part was out-sourced and carried out by scientific institutes, under the guidance of the *Zorginstituut* and representatives of the parties involved.

The consecutive elements of the care pathway are: risk-stratification and diagnostics, treatment, follow-up/cardiovascular risk management (hereafter: CVRM) and heart rehabilitation.

Research questions were formulated about all these elements and the sections of this Room for Improvement report correspond with those elements.

The jointly formulated questions on which this Room for Improvement report is based were as follows (citation from report of the meeting):

A. Risk-stratification and diagnostics

1 Initial evaluation of a patient with chest pain:

How is risk-stratification recommended in the guidelines and in what way has this been

substantiated? Data analysis: How does risk-stratification take place in practice?

Which diagnostic tests are used?

2 Supplementary diagnostic evaluation:

Which diagnostics are recommended in the cardiological guidelines and in what way has this been substantiated?

Data analysis: How is this used in cardiology practice?

B. Treatment for stable angina pectoris

3 Medication

Which medication do the guidelines recommend prior to invasive treatment and in what way has this been substantiated?

Data analysis: Based on patients who have undergone a PCI or CABG: which medication do they use at the moment of the PCI or CABG?

C. Follow-up/CVRM (CardioVascular Risk Management)

4 Follow-up/CVRM:

Do all patients receive guidance as prescribed by the CVRM guidelines? For how long is professional guidance required and from whom?

Data analysis: Which medication do stable angina pectoris patients receive in the long term? Which diagnostic tests are requested for stable angina pectoris patients? And by which carers?

D. Heart rehabilitation

5 Rehabilitation:

What scientific substantiation exists for heart rehabilitation for stable angina pectoris patients? Does this differ per treatment modality (medicinal, PCI, CABG)?

6 Quality of life:

What is known about quality of life after the various treatment strategies?

(Quality of life was included in the systematic review of rehabilitation by designating 'quality of life' as an outcome measure. See 5.)

In addition to a substantive study, the parties also want to make joint transmurals agreements on organising care for patients with chest pain.

1.4

The 8 elements

We discuss our findings based on the elements of good care that are derived from the *Zorginstituut*'s tasks relating to quality and package management. This is about knowing what is good care, its use in practice, care outcomes, effectiveness, cost-effectiveness, necessity, feasibility and cohesion of quality circles. This report covers

these elements. Familiarity with good care, effectiveness, use in practice and care outcomes are discussed, per care pathway, in sections 3 to 6 inclusive. Cost-effectiveness, necessity, feasibility and cohesion of quality circles are discussed below, at care pathway level.

1.4.1 Cost-effectiveness

In this in-depth analysis we commissioned a systematic review of the effectiveness of a number of diagnostic tests and of the heart rehabilitation intervention. Based on the results obtained, we decided not to carry out a systematic review that focusses on cost-effectiveness.

1.4.2 Necessity and burden of disease

The burden of disease of people with coronary heart disease is high. All forms of coronary heart disease rank top among diseases that cause most burden of disease in the Netherlands, as expressed in DALYs. Of these, 62% are due to loss of quality of life and 38% due to premature death (life-years lost). This high burden of disease highlights the need of diagnostics and treatment of this disorder and their inclusion in the basic package of the Health Insurance Act (Zvw).

1.4.3 Feasibility

In this in-depth analysis, there was no reason to examine the feasibility of specific diagnostics or therapeutic interventions.

1.4.4 Cohesion in quality circles

The topic stable angina pectoris is not one of the top 30 topics on the K&D agenda, nor does any broad agreement exist in any other context regarding the quality of this care. In this Room for Improvement report we suggest where agreement is needed on guidelines and in communication between primary and secondary care in order to improve alignment between the quality circles.

1.5 Structure of this report

For each section, a summary of the main findings can be found, in italics, at the start of each section. **Section 2** describes the disorder stable angina pectoris, the clinical picture, burden of disease, care pathway, epidemiology and development in volume and costs. In **sections 3, 4, 5 and 6** we discuss in more detail the various elements of the care pathway for stable angina pectoris patients, namely, risk-stratification and diagnostics, treatment, CVRM/follow-up and heart rehabilitation. In **section 7** we discuss possibilities for improvement, agreements that have been made and what patients will notice of these improvements. **Section 8** discusses implementation, monitoring en evaluation.

Accountability, and a discussion of the elements, the study set-up, the background to knowledge of good care, the analysis of data from daily practice and the BIA are included in the appendices.

2 What is stable angina pectoris?

Problems that occur in the blood circulation of the cardiac muscle, due to atherosclerosis or coronary heart disease, can lead to chest pain. Stable angina pectoris is caused by chronic circulatory problems. Acute problems lead to a cardiac infarction. All coronary heart disease has a high burden of disease, and the number of people with this disease is rising, as are the costs. Life-style factors such as smoking and diet play a crucial role here.

Though attention is increasingly being paid to differences between men and women (gender specificity) in cases of coronary heart disease, there are still lacunas in our knowledge and more scientific research is needed into risk-factors, diagnostics and treatment.

2.1 The clinical picture

Chest pain, the most frequent symptom of coronary artery disease, is also referred to as "angina pectoris". Patients feel a stifling, oppressive or constrictive feeling in the middle of the chest. The pain can radiate into an arm, the jaw, or the stomach region and can be accompanied by sweating, nausea and shortness of breath. The pain is caused by lack of oxygen in the cardiac muscle. The lack of oxygen occurs due to dilation of the coronary arteries, or smaller blood vessels (micro-circulation) to which they are connected, as a result of arteriosclerosis (hardening of the arteries). When the obstruction occurs gradually, chest pain is mainly experienced during exertion or in an emotional state; it disappears during rest. This is known as the stable form of angina pectoris. A cardiac infarction is the acute form.

2.2 What happens to such patients?

The care pathway is not the same for all stable angina pectoris patients. Patients can enter care in a variety of ways and their treatment can differ.

Patients generally present with stable angina pectoris, with the symptom 'chest pain'. Patients may think that the pain is a sign of a heart attack, which can cause a lot of concern and anxiety. As a result, these patients seek an urgent appointment with a doctor. This may be their GP, the GP-emergency post or the Casualty department. The doctor concerned will first want to rule out a possible acute infarction by determining precisely what the symptoms are and whether any risk factors exist. If a heart attack is suspected or another urgent problem, a cardiologist will provide treatment immediately. If speed is not of the essence, the GP or cardiology out-patients' clinic will have time to organise supplementary diagnostics. It is difficult to say which examination will take place. This is because the primary and secondary care guidelines for people with suspected stable angina pectoris are not in line with one another and on some counts even contradict one another. Differences may exist between the tests doctors use for similar patients. Advice on a healthy life-style and medicines (thrombocyte inhibitors, cholesterol-inhibitors and antihypertensive drugs) are part of treatment for people with stable angina pectoris, in conformity with the Cardiovascular Risk Management guidelines (CVRM). Additional medicines are needed for treating the actual symptom of chest pain (treatment of symptoms). These medicines improve the balance between oxygen requirement and oxygen supply via the cardiac muscle. If medicinal

treatment does not reduce the symptoms, or insufficiently, the cardiologist can consider invasive (operative) treatment: a Percutaneous Coronary Intervention (PCI) (Dotter/stent) or a Coronary Artery By-pass Graft (CABG) (by-pass operation). Part of secondary care treatment may be Heart Rehabilitation. Many patients are supervised in GP practices after they have been referred back by cardiologists, with or without treatment. CVRM is part of this care.

The following table provides a summary of possible diagnostic tests and forms of treatment for stable angina pectoris.

Table 1: Summary of supplementary tests and treatment

Diagnostische tests	Operatieve Behandelingen	Medicamenteuze behandelingen	Leefstijl
<ul style="list-style-type: none"> - fietstest (ook wel stress echocardiografie ergometrie genoemd) - (stress-) MRI perfusie - (stress-)SPECT scan - PET scan - CT angiografie - CT calciumscore - CAG (eventueel i.c.m. FFR en IVUS) 	<ul style="list-style-type: none"> - PCI - CABG 	<p>Behandeling voor de klacht 'pijn op de borst'</p> <ul style="list-style-type: none"> - nitraten - bètablokkers - calciumantagonisten <p>Behandeling in het kader van CVRM</p> <ul style="list-style-type: none"> - trombocytenuitremmers - statines - antihypertensiva 	<p>Leefstijl in het kader van hart-revalidatie</p> <p>Leefstijl in het kader van CVRM</p>

* For a detailed explanation of the terms used above, see the Glossary.

2.3 Epidemiology

Stable angina pectoris is one form of coronary heart disease. The total number of patients (prevalence) with coronary heart disease is large and – based on demographic data – is expected to increase even further. Stable angina pectoris has a high prevalence, but recent incidence and prevalence data are limited, because the acute and stable forms of coronary heart disease are generally recorded jointly.⁷

Primary care

We do not currently know how many stable angina pectoris patients are being treated in primary care. The *Zorginstituut* commissioned a study of statistics on incidence in primary care. Before 2015, the research group arrived at an incidence of non-acute chest pain among the GP population of 1.5 per 1000 adult patients. Half of these patients are 50-70 years old, with women visiting their GP slightly more often than men. Two comments are important in calculating these incidence statistics. First, incidence in the primary care data studies increased from 0.6/1000 in 2010 to 1.5/1000 patients in 2015. According to the research group, this increase was mainly caused by improved registration in this period, which means the 2015 incidence is most reliable. Second, the statistics on incidence may have been underestimated because the research group chose a conservative method for selecting consultations. They selected based on ICPC codes that were actually linked to a GP consultation. As a result, consultations via the telephone or by post were not included in the incidence statistics. In the second national study of diseases in GP practices, a combined incidence of 2.8/1000 was found for ICPC codes K01 and K02.⁸ However, this incidence statistic also includes persons <18 years and patients

⁷ Gijzen R, Poos MJJC. Backgrounds and details in statistics from GP registries. In: Public Health, Exploring the Future, National Public Health Compass, Bilthoven: RIVM, www.nationaalkompas.nl (June 2003)

⁸ van der Linden MW, Westert GP, de Bakker DH, Schellevis FG. Second National Study of diseases and interventions in GP practices. Symptoms and disorders in the population and in GP practices. 85. 2004.

with acute chest pain.

Secondary care

From claim data we know that in 2013 more than 180,000 new patients with non-acute chest pain were seen by cardiologists in secondary care. In 2013, in total 240,000 patients with chest pain were being treated by a cardiologist.⁹

Based solely on demographic developments (size and composition of the population according to age and gender), expectations are that in 2030 the number of patients with coronary artery disease in the Netherlands will be 34% higher than in 2012. In view of the large number of people with stable AP and the estimated increase in the next few years, improvements in care resulting from this in-depth analysis can potentially be expected to have a substantial effect.

2.4 Gender-specificity

At the start of this in-depth phase, we decided to pay attention to disease-specific differences between men and women with 'chest pain'.

This topic is receiving increasing attention from clinics, studies, guidelines and the media. Nevertheless, knowledge lacunas still exist in the field of risk factors, diagnostics and treatment. It is important that study results are published and included in guidelines so that professionals and patients are aware of the findings and can apply them in practice.

In the Netherlands epidemiological differences exist between men and woman that could in part correlate with gender-specific lacunas regarding diagnostics and treatment. For instance, per 1000 person-years, for every age category, the percentage of men with a diagnosed cardiovascular disorder is larger, and per 100,000 residents, for every age category, mortality due to coronary heart disease is also higher for men.

This paragraph discusses the systematic review of gender and cardiac disorders that was recently published by the European Society of Cardiology (ESC).¹⁰

The four heart diseases with the highest incidence are discussed here, including ischaemic heart diseases. Stable angina pectoris is one of the ischaemic heart diseases, though it is not distinguished as a separate category in the review. Women in Western European countries develop ischaemic heart diseases between 7 to 10 years later than men. However, due to unfavourable changes in women's lifestyle, this difference is getting smaller with the passage of time. Hypertension and unfavourable lipid levels (dyslipidaemia) are risk factors for ischaemic heart disease for both men and women. However, diabetes types 1 and 2 (as well as gestational diabetes) have a bigger negative effect on women than on men. Cases of pre-diabetes (present in 40% of older Europeans and more frequently among women) are also associated with a bigger risk of ischaemic heart disease. In particular, pre-diabetes should be treated in the earliest possible stage in women with coronary heart disease. Depression and perpetual 'stress' are causative factors that determine the prognosis of coronary heart disease. This applies equally to men and women, but the incidence of these disorders is higher among women.

The small arteries (microvascular disease) of women are more likely to be affected than those of men, irrespective of abnormalities in the large epicardial blood vessels. Women are also more likely to have a form of abnormal vascular responses, such as spasms and dysfunctional vascular walls (endothelium), which reduces the circulation in the cardiac muscle and causes symptoms.

Diagnosing women, particularly those younger than 60 years, is more difficult. For example, a Swedish CAG study found that 80% of the women with stable Angina Pectoris showed no signs of obstruction in the coronary vessels, while 40% of the men did. The conclusion was that the known diagnostic paths are sub-optimal for women if one is looking for the classic male patterns of obstruction on coronary arteries. More study is therefore required into optimal diagnostic pathways for women with symptoms that could indicate coronary heart disease.

Outcomes of treatment for coronary heart disease with PCI are comparable for women and men. However, during procedures, women do run a bigger risk than men of an infarction or haemorrhage. Furthermore, after treatment, women are more likely to still have chest pain. This is probably linked to the higher incidence of microvascular coronary disorders among women.

After an elective CABG too, women have a bigger chance than men of mortality, long-term admission and a lower quality of life. The presence of microvascular dysfunction and abnormal peripheral blood circulation lead to a poorer prognosis for women and men, but the incidence among women is higher. Coronary angiography (CAG) can lead to under-diagnosis of coronary heart disease in cases involving microvascular disease. This has a higher incidence in women.

The researchers recommend more gender-specific research on diagnostics and treatment in an international setting, the publication of study results and their inclusion in guidelines.

Epidemiological differences exist between men and women with coronary heart disease in the Netherlands. It is not possible to obtain insight into people with stable AP as a separate group, because the statistics include people with a heart infarction and these are in the majority. The epidemiological differences between men and women are largely determined by differences in life-style (particularly smoking) and hormone levels. For the moment, the role played by gender-specific knowledge lacunas is not clear. We know that, per 1000 person-years, more men than women have coronary heart disease and also that, per 100,000 residents, more men die of coronary heart disease. Source for figures 1 and 2: the RIVM.¹¹

¹¹ <https://www.volksgezondheidenzorg.info/onderwerp/coronaire-hartziekten> 2014

Figure 1: Number of persons with coronary heart disease (2014)

Aantal personen met een coronaire hartziekte

Jaarprevalentie

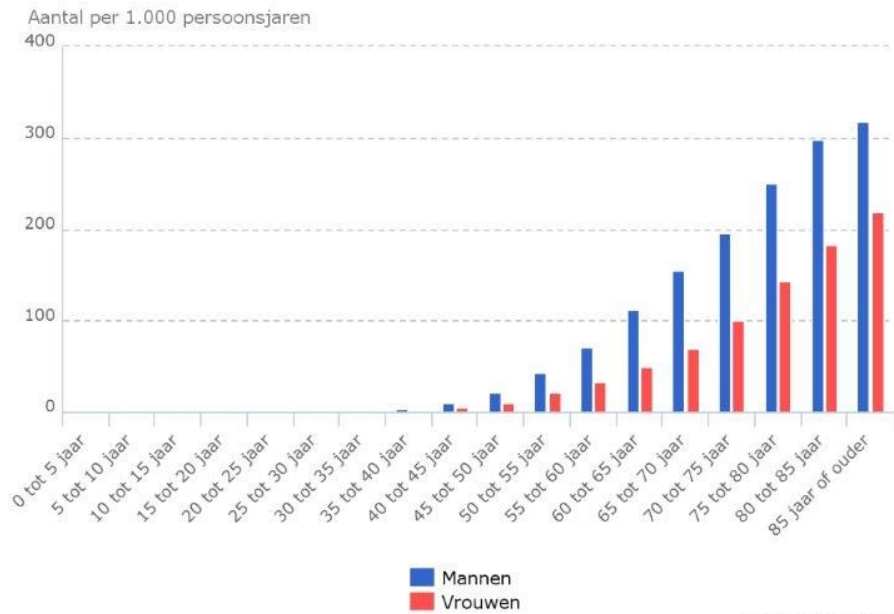
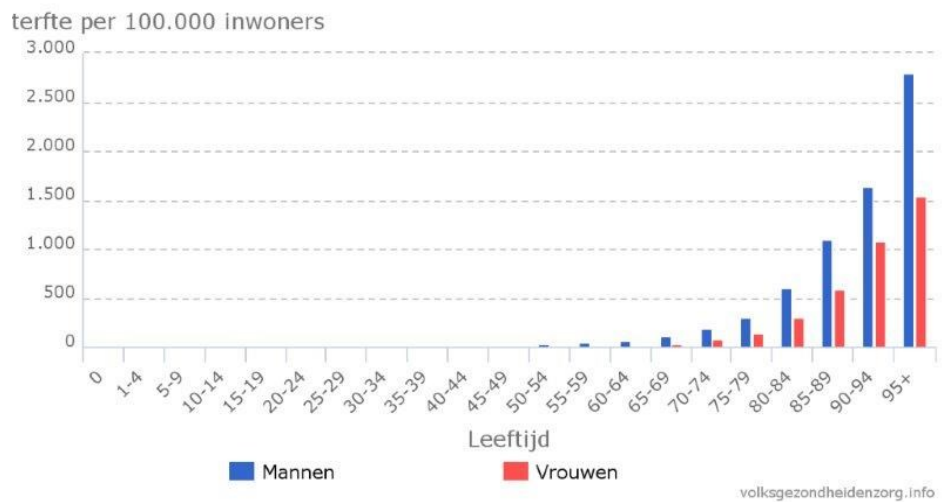


Figure 2: Mortality due to heart disease (2014)

Sterfte aan coronaire hartziekten in 2014



2.5 Development in volume and costs

Care expenditure on coronary heart diseases, including stable AP, is expected to double from 2.1 billion in 2011 to 4.2 billion in 2030.

The costs of care for coronary heart diseases are among the top ten diseases with the highest expenditure. In 2011 these costs amounted to 2.1 billion euro. Almost two-thirds of the costs of coronary heart diseases are incurred for care provided by medical specialists (1.4 billion euro). The RIVM has published a trend scenario of developments in the costs of coronary heart diseases, based on both demographical and epidemiological developments. This care expenditure is expected to double to 4.2 billion in 2030.¹² This doubling in costs will probably apply to all forms of coronary heart disease and thus also to stable angina pectoris.

Costs of stable angina pectoris in secondary care; without costs for medication, CVRM and GP care

Using claim data, the Zorginstituut estimates below expenditure for stable angina pectoris patients in the form of care provided by medical specialists. It is not possible to obtain insight into costs for medication, CVRM and forms of treatment given by GPs specifically in relation to stable AP.

Based on the claim data, it is estimated that in 2014 approximately 375 million euro was claimed for diagnostics and treatment of people with (suspected) stable AP in secondary care.

Table 2: Known secondary care costs of stable angina pectoris

Onderwerp		2010	2011	2012	2013
DBC pijn op de borst	aantal patiënten	250.727	263.692	270.853	269.214
	totale kosten	€ 369.055.843	€ 361.373.187	€ 326.974.849	€ 337.116.679
CABG	aantal patiënten	1.923	2.190	2.460	2.122
	totale kosten	€ 26.827.871	€ 26.298.663	€ 28.977.447	€ 22.924.537
Hartrevalldatie	aantal patiënten	3.263	4.595	5.953	6.238
	totale kosten	€ 3.302.663	€ 4.840.719	€ 9.778.276	€ 15.276.564

Per year, all cardiological DBCs (specialism code 0320) and care products with diagnosis codes thoracic complaints eci (201) and stable angina pectoris (202) are collected. These DBCs and care products also include all PCIs received by these patients with chest pain.

¹² Mapping cardiovascular diseases. Epidemiology, care consumption and care costs. Contribution RIVM, January 2015.

3 Risk-stratification and diagnostics

Findings on the current situation:

A patient who goes to the doctor with chest pain and suspected stable angina pectoris does not know in advance what examination for risk-stratification and supplementary diagnostics he can expect. This is partly because the recommendations in the guidelines applicable in the Netherlands for GPs and cardiologists differ and lack consistency. And partly because, in practice, there seem to be large differences in the tests used. There is little evidence of guideline recommendations being implemented. The choice of tests seems largely to depend on the doctor being consulted and on the setting in which the doctor works (primary or secondary care and which hospital). This multiplicity is mainly a problem because the professionals themselves are not even clear about what test strategy is most useful and effective for risk-estimation and diagnostics of people with chest pain. In other words: there is a general lack of scientific knowledge about which diagnostic strategy will potentially have the greatest health gain for patients.

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Bij alle patiënten wordt het risico op coronair vaatlijden vastgesteld alvorens diagnostiek te verrichten of te verwijzen. Ingeschat wordt daarmee hoe groot het risico op een aandoening van de kranslagaderen voor deze individuele patiënt is. Huisartsen en cardiologen gebruiken eenzelfde model om dit risico te bepalen. Huisartsen en cardiologen gaan uit van dezelfde afkappunten in de risicoscore voor afzien of inzetten van diagnostiek of verwijzing.
- Bij verdenking op stabiele angina pectoris wordt niet standaard een rust echo, een fietstest of een longfoto gedaan.
- Bij een intermediair risico op een coronaire hartaandoening wordt slechts 1 niet-invasieve test gedaan.
- Bij een hoog risico wordt direct een Coronaire angiografie gedaan als gezondheidswinst verwacht wordt van een PCI of CABG.
- Patiënten kunnen er op vertrouwen dat hun huisarts op de hoogte is. Huisartsen ontvangen na verwijzing bericht van cardiologen over de diagnose en nemen dit op in het dossier.
- Er komt informatie voor patiënten om uit te leggen wat het nut van risicostatificatie is en wat het vervolgtraject is bij een bepaald risico.

3.1 Knowledge about good care

When a patient with chest pain reports to a doctor, the latter determines, based on risk-stratification, the risk of coronary heart disease. Estimating this risk correctly is important because it helps to determine which diagnostics to use, treatment and any possible referral, and thus the patient's care pathway. Investigation revealed, however, that primary and secondary care guidelines on risk-stratification and diagnostics differ, are not always unequivocal and have little scientific substantiation.

No client versions of the guidelines, decision aids or measuring instruments are available. Insight is lacking into the quality of this part of the care pathway. Nor do the guidelines describe shared decision-making, though this could be a good option in view of existing uncertainties surrounding the optimum diagnostic pathway. At the moment, a patient with chest pain and suspected coronary disease does not really know what to expect during the diagnostic pathway.

Quality Standards

The standard available in primary care for risk-stratification and diagnostics is "Stable angina pectoris" (Dutch College of General Practitioners, Rutten (2004);

under revision)) (hereafter: NHG standard) and in secondary care it is the European Guidelines "European Society of Cardiology (ESC) on the management of stable coronary artery disease" (Montalescot 2013) (hereafter: ESC guidelines). The Netherlands Society of Cardiology (NVVC) has accepted the ESC guidelines.

Table 3: Current quality standards for risk-stratification and diagnostics in the Netherlands

Kwaliteitsstandaard	Organisatie	Jaartal	Clientversie	Meetinstrumenten	Keuzehulp
Standaard Stabiele angina pectoris	NHG	2004, in herziening	X	X	X
Guidelines on the management of stable coronary artery disease	ESC/NVVC	2013	X	X	X

For this part of the pathway, these guidelines, which currently apply in the Netherlands, do not yet include the elements mentioned in the Assessment Framework: clients' version, measuring instruments, decision aids and/or extensive information that supports joint decisions in the consulting room and an information standard. The NHG standard (under revision) contains information standards; information for patients can be found on TGP.nl. Nor is shared decision-making described, which could be a good option in view of the existing variation and uncertainties about the optimum diagnostic pathway.¹³

Analysis of the recommendations on risk-stratification and diagnostics

The *Zorginstituut* commissioned Cochrane Netherlands/UMCU to carry out a substantive analysis of the said guidelines and compare the recommendations with one another and with the NICE guidelines.¹⁴ The Nice guidelines, as non-Dutch guidelines, were chosen for comparison due to the high score in the AGREE assessment.¹⁵

Differences between guidelines currently applicable in the Netherlands

The NHG standard and the ESC guidelines do not distinguish between populations of patients in primary and secondary care for risk-stratification and corresponding recommendations on diagnostics. This means they can be used for the purpose of comparison. Four important differences can be found in the recommendations. First, the ESC guidelines advise a resting echocardiogram for all patients with chest pain. This is not recommended in the NHG standard.

Second, the background risk of coronary artery disease is estimated based on various cohorts. The NHG uses the original prevalences from the study by Diamond and Forrester (1979). The ESC uses more recent prevalences from the study by Genders (2011), which claims that the original prevalences probably overestimated the risk. This study dates from after the publication in 2004 of the NHG standard, which is currently being revised. Specifically selected patient groups were used to develop both models. Differences exist in the degree to which these cohorts are representative of primary or secondary care populations – thus also in the degree to which the risk estimations can be generalised. Neither the NHG standard nor the ESC guidelines address this specific population difference.

Third, differences exist between the cut-off values below and above which supplementary examination should (/can) be dispensed with. Both sets of guidelines are based on the chance of erroneous test outcomes in the event of a very low – or a very high – background risk of coronary artery disease. The NHG does not state

¹³ Appendix 3: Background to knowledge about good care

¹⁴ Cochrane Netherlands/University Medical Centre Utrecht (UMC Utrecht). Risk-stratification and Diagnostics for patients with chest pain and suspected coronary heart disease. Part 1 Analysis of the guidelines.

¹⁵ An update of the NICE guidelines was published at the end of 2016, too late to be included in this study.

its reason for choosing <30% and >70%. The ESC accounts for its choice of <15% and >85% by assuming an average sensitivity and specificity of 85%.

Fourth, differences exist in the diagnostic tests recommended for patients with an intermediate risk of coronary artery disease. The NHG standard limits this to supplementary examination in the form of a cardiac stress test. If this isn't possible, referral to a cardiologist for stress diagnostics can be considered. The ESC prefers stress diagnostics to the cardiac stress test, referring to 2 systematic reviews and 4 cohort studies, 2 of which were published later than the NHG standard. How this evidence was obtained, and how it was weighted to arrive at a recommendation, lacks transparency.

Differences between the NHG standard, the ESC guidelines and the NICE guidelines

The analysis revealed that the NHG standard and the ESC guidelines do not shed light on how specific recommendations were arrived at, and that the NICE guidelines do report on their search strategy and considerations. We illustrate here how the guidelines differ in recommendations on risk estimation and diagnostics despite being based on the same scientific data. The scientific data are, for the rest, arguably limited (3.2).

Most noticeable in comparing the 3 sets of guidelines is the difference between ESC and NICE in categorising patients with an intermediary risk of coronary artery disease and the corresponding recommendations on diagnostic tests. The ESC advises CT-coronary angiography for patients with a low calcium score and a background risk of 15 to 50%. In the NICE guidelines the calcium score is formally first-choice for patients with a background risk of 10 to 29%, followed, depending on the outcome, by CT-coronary angiography. If the calcium score is zero, NICE advises against further examination, while ESC offers no relevant concrete recommendation.

Based on extensive cost-effectiveness analyses, NICE – unlike ESC – sees no ground for an exercise ECG. Lastly, ESC advises stress imaging at a background risk up to 85% and above in specific cases of invasive coronary angiography; for NICE this is 60%. Thus, the indication for invasive coronary angiography in the NICE guidelines is broader than the ESC guidelines. NICE bases its guidelines on several cost-effectiveness analyses.

3.2 Effectiveness

The Zorginstituut commissioned Cochrane Netherlands/UMCU to carry out research into published studies about the effects on health (clinical value) of the various medical tests used for diagnosing chest pain. This study shows that research into the clinical value of tests for people complaining of chest pain is very limited. More can be found on the diagnostic accuracy of tests (clinical validity), but this too is limited due to changing insights regarding the golden standard (invasive coronary angiography or invasive coronary angiography with FFR) over the course of time. Noticeable is that the knowledge lacuna on the clinical value and accuracy of diagnostic tests (clinical validity) applies not only to new tests or tests that are used less frequently. For instance, little is known either about the clinical value of the exercise ECG, even though this test has been used frequently for quite some time in both primary and secondary care.

Clinical value of tests

The Zorginstituut commissioned Cochrane Netherlands/UMCU (based on agreed research questions) to carry out a systematic review of the clinical value (effectiveness) of diagnostic tests on patients with chest pain and suspected

coronary heart disease.¹⁶

The tests studied were: Exercise stress test, Calcium score, CT coronary angiography, Stress MRI, Stress echocardiogram, SPECT, PET-CT. The outcomes studied were major adverse cardiac events (MACE: combination of death, myocardial infarction, unstable angina pectoris or necessary coronary revascularisation), anxiety, myocardial infarction, death irrespective of cause, angina pectoris frequency/chest pain, quality of life and adverse events resulting from radiation exposure, intravenous contrast agents, etc. The systematic review did not include costs as endpoint.

The systematic review found only eight randomised controlled trials (RCTs) to use in assessing the clinical value of all tests.

Summarising, in the RCTs no significant differences in clinical value were found between diagnostic strategies using on the one hand CT coronary angiography and on the other hand functional tests. Evidence suggests that a strategy with CT coronary angiography does more to reduce the frequency of angina pectoris symptoms, but also causes a higher radiation burden and more secondary adverse effects.

No significant differences were found between using the exercise ECG and the stress SPECT.

No significant differences were found relating to clinical value between the stress SPECT, the stress MRI and stress echocardiography on patients with a deviating exercise ECG.

In general, scientific confidence in the outcomes of the above-mentioned RCTs is moderate to (very) limited.

Diagnostic test accuracy of functional stress tests

Due to the limited number of publications on clinical value, studies into diagnostic test accuracy (DTA, also sensitivity and specificity) of various stress tests on patients with stable chest pain were examined as reference standard in comparison with fractional flow reserve (FFR). FFR added to invasive coronary angiography (ICA) is regarded as a more relevant reference standard than the customary CAG, because FFR also looks at the functional consequences of a coronary stenosis. Additionally, a systematic review was updated in which the diagnostic test accuracy of the exercise ECG and that of CT coronary angiography were examined, with invasive coronary angiography (without FFR) as golden standard (reference was coronary stenosis of 50% or more).

Summarising, the stress MRI has the most favourable sensitivity and specificity for demonstrating haemodynamically relevant coronary disease (based on a functional reference standard) and, in comparison with CT coronary angiography, no significant differences were found in relation to clinical value. The sensitivity of stress echocardiography is low, while that of stress CT is high. The stress SPECT is insufficiently accurate and its clinical value did not differ from that of exercise ECG. The accuracy of PET CT has still not been studied sufficiently.

Exercise ECG shows little sensitivity and specificity for revealing coronary stenosis of 50% or more (with a great many false positives and false negatives) and the exercise ECG test seems to have little discerning ability. The same applies to revealing a coronary stenosis of 75% or more. The reference standard in the last-mentioned DTA studies was not a functional test, and this may have disadvantaged the exercise ECG. However, no studies were found in which exercise ECG was compared with a functional reference standard (such as FFR). Furthermore,

¹⁶ Cochrane Netherlands/University Medical Centre Utrecht (UMC Utrecht). Risk-stratification and Diagnostics for patients with chest pain and suspected coronary heart disease. Part 2 Systematic reviews.

selection bias seems to exist in most studies on the accuracy of the exercise ECG.

3.3 Application in practice

A patient with chest pain and suspected stable angina pectoris may be advised to undergo various tests for risk-stratification and supplementary diagnostics. Our research shows that, in practice, large differences and variations exist in the tests used. There is little evidence that guideline recommendations are being implemented. The choice of tests seems largely to depend on the doctor who is consulted and on the specific practice or region in which the doctor works. This applies to both GPs and cardiologists. Variations also exist in the percentage of patients that GPs refer to a cardiologist (25-45%). In practice, it seems that the referral recommendations from the NHG standard are not followed. Noticeably, GPs did not receive a letter from the cardiologist for 1 in every 3 referred patients. GPs who did receive a letter often (58%) did not record the diagnosis in the dossier.

This in-depth analysis studied the use of risk-stratification and diagnostics in practice separately for primary and secondary care. The *Zorginstituut* commissioned a research group from the LUMC to analyse the primary care data. Below is a summary of '**Primary Care**'.¹⁷ The *Zorginstituut* analysed the claim data of medical specialists for the use of supplementary diagnostics ('**Secondary care**').

Primary care

GPs registered a risk-assessment in the medical dossier of only 11% of patients complaining of chest pain. This is a low percentage in view of the NHG standard's recommendation that this should be done and may relate to lack of clarity for GPs about the effect of a risk-assessment on policy, alongside other risk factors used. The NHG standard advises GPs to carry out an exercise ECG, particularly for patients with an intermediate risk, in order to examine the risk of coronary heart disease in more depth. This advice is only followed for 13% of patients.

The NHG standard advises only using a resting ECG for patients with a high risk of cardiovascular disease, but in practice it is often also done for patients without a high risk. It seems that a resting ECG in primary care is also of limited value for high-risk patients, because almost 80% of these people are referred to the cardiologist who generally repeats this ECG.

The standard advises referral for patients with an intermediary risk, but in practice not all these patients are referred (69% are referred). Furthermore, 63% and 28% respectively of high-risk and low-risk patients are referred, while the standard recommends against this. In general practice, the largest group is the low-risk group, which is thus the group with the biggest potential to benefit from more appropriate referrals.

GPs receive no correspondence from cardiologists regarding 32% of patients they refer. GPs who do receive a letter from the cardiologist do not register a diagnosis for 58% of these patients. If the cardiologist does send a letter after a referral, and the GP does register the diagnosis, 32% of patients have coronary heart disease, 19% have a different heart disease and 50% have no cardiac disorder.

Risk-assessment by GPs

GPs currently only record a risk-assessment for 11% of patients with non-acute chest pain, even though correct risk-assessment is very important for determining

¹⁷ Leiden University Medical Centre. The care pathway of patients with non-acute chest pain and suspected coronary heart disease.

adequate diagnostics, treatment and referrals. One explanation for the fairly low percentage could be that the main text of the NHG standard does not clearly mention risk-assessment, nor does it explain properly how it affects policy. Furthermore, the advised risk-assessment is based only on gender, age and type of pain, while GPs are used to taking other cardiovascular factors into account (smoking, blood pressure, cholesterol) when making a risk-assessment for cardiovascular disease. According to the research group, the (new) NHG standard needs to update risk-assessment for the current primary care population.

Diagnostics by GPs

In addition to anamnesis and physical examination, other tests requested in primary care for patients with chest pain are lab blood examination (for 30%), a resting ECG (for 30%) and an exercise ECG (13%). No supplementary diagnostics are requested for 46% of patients.

Table 4: Use of diagnostic tests by GPs

Diagnostiek	Percentage patiënten
geen diagnostiek	46%
laboratorium onderzoek in bloed	30%
rust-ecg	30%
inspannings-ecg	13%

The NHG standard for Stable Angina Pectoris states that a resting ECG is only useful for the prognosis of patients with a major risk of significant coronary artery disease. The study found that only 11% of patients with non-acute chest pain have a major risk (>70%) of coronary artery disease, yet a resting ECG is carried out on 30% of all patients. Thus, a proportion of these resting ECGs constitute inappropriate care. Furthermore, there is a large risk of repeating this resting ECG (unnecessarily) because a large proportion of these high-risk patients (83%) will be referred to a cardiologist, who also often makes a resting ECG. The standard states that a GP can request an exercise ECG (stress test) to further investigate the risk of coronary artery disease and that this is particularly useful for patients with an intermediate risk (30%-70%, atypical angina pectoris) of significant coronary sclerosis. Our study suggests that few GPs follow this advice. An exercise ECG was noted in GP dossiers for only 13% of patients. The NHG states that a resting ECG is often made together with a stress test and that this could explain some of the resting ECGs registered.

GP referrals to a cardiologist

25%-45% of patients with chest pain are referred to a cardiologist due to suspected coronary heart disease. Patients who undergo a resting ECG are referred more frequently, while patients who undergo an exercise ECG are not referred as frequently. For the rest, the latter finding could be an overestimation, as the registered exercise ECG was carried out by the cardiologist.

28% of patients with a minor risk of coronary disease, 69% of those with an intermediate risk and 83% of those with a high risk, are referred to a cardiologist. This does not agree with the current NHG standard, which recommends referral only when the risk is intermediate (30-70%). However, these results show that in current practice high-risk patients (>70%) are referred most frequently and that only 69% of patients with an intermediate risk are referred. The research group feels that both intermediate-risk and high-risk patients should be referred to a cardiologist (in accordance with the ESC guidelines). The largest group of patients (66%) in primary care with non-acute chest pain in primary care has a low risk, yet 28% of them are referred to a cardiologist. According to the research group this may be due to the lack of a good decision-making rule for safely precluding coronary disease in low-risk patients with non-acute chest pain, as this is the largest group of patients. Such a decision-making rule, based on a patient's symptoms, has already been developed but has not yet been validated for use in Dutch general medical practice. Studying and implementing this could support the referral decision and may limit the number of inappropriate referrals.

Table 5: Percentage of patients with a certain risk score and the percentage of these who are referred to a cardiologist by the GP

Kans op coronairlijden	Percentage patiënten	Percentage verwijzing
kleine kans (<30%)	66%	28%
intermediaire kans (30-70%)	24%	69%
hoge kans (>70%)	11%	83%

Communication between cardiologists and GPs after a referral

GPs receive no correspondence from the cardiologist for 32% of their referred patients. GPs have no registered diagnosis for 58% of their referred patients after the cardiologist has sent a reply letter. If the diagnosis is registered, for 32% it is coronary heart disease, for 19% other heart disease and for 50% non-cardiac. The research group feels that 32% non-receipt of correspondence is accurate, as post received is automatically registered in GPs dossiers. Beyond all doubt, and recorded in several sets of guidelines and agreements, is the fact that after a referral, the cardiologist should (soon) inform the GP about his findings and any treatment. In turn, GPs must register the correspondence received in the dossier, in accordance with the NHG guidelines on adequate dossier creation.

Secondary care

The claim data revealed that many differences exist between the tests cardiologists use for patients with chest pain. Large differences exist between the diagnostic pathways of hospitals. In the secondary care data, we found no signs that the guideline recommendations on risk-stratification and diagnostics were being used consistently. In view of the variation found, the choice of a patient's diagnostic pathway seems to be determined mainly by the doctor and the care institution. It would be interesting to know the line of argumentation behind this and to identify an optimal pathway with the potential for maximum health gains for patients.

Use of supplementary diagnostics by cardiologists

The Netherlands Society of Cardiology (NVVC) endorses the European (ESC) Guidelines. However, general practice data do not indicate compliance with the guideline recommendations on diagnostics.⁹

Analysis of the cardiology claim data reveals differences between clinics in the use of diagnostic tests for patients with suspected stable angina pectoris.

The following table shows the tests carried out on the group selected for our analysis, totalling 105,358 new patients (2012) with chest pain. An echocardiogram was carried out on 48% and a stress test on 61% of patients. This table reflects the percentage of people from this population that underwent the said test. Many people underwent several tests.

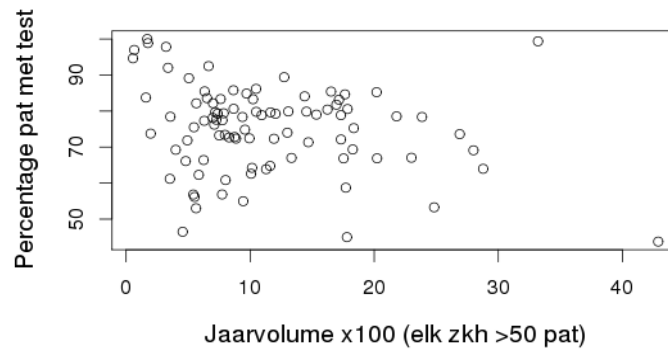
Table 6: Diagnostics during 12 months as a percentage of the entire group of patients with chest pain seeking care in 2012

N = 105.358	
Transthoracaal echocardiografie (TTE)	48%
Fietstest	61%
X thorax	38%
Troponine of CK-MB	37%
Aanvullende diagnostiek	19%
CT calciumscore	5%
CT coronairangiografie	8%
Ischemie detectie	11%
- SPECT	10%
- Stress MRI	<1%
- Stress echocardiografie	<1%
Coronairangiografie	10%

A stress test was carried out on most (61%) of the patients with chest pain. An echocardiogram was registered for almost half of the patients (48%). Noticeably, some hospitals use these diagnostics relatively often, while other hospitals use them infrequently or not at all. This percentage is not related to the number of patients per hospital.

Fig. 3 below illustrates that the use of a stress test and/or echocardiogram (without a stress test) varies from 45 to 100% (Y-axis). This is independent of the total volume of these patients in the hospital concerned (X-axis).

Figure 3: Percentage of patients tested with a stress test and/or echo (no stress test)



Variations exist between hospitals for all tests.

For instance, Fig. 4 shows that the variation between hospitals for coronary angiography (CAG) was 2-46% (Y-axis). This was independent of the volume of these patients in the hospital concerned (X-axis).

Figure 4: Percentage of patients with CAG, set off against volume

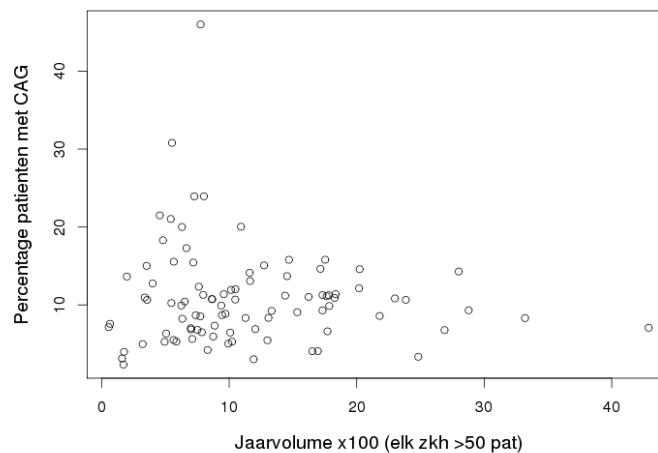
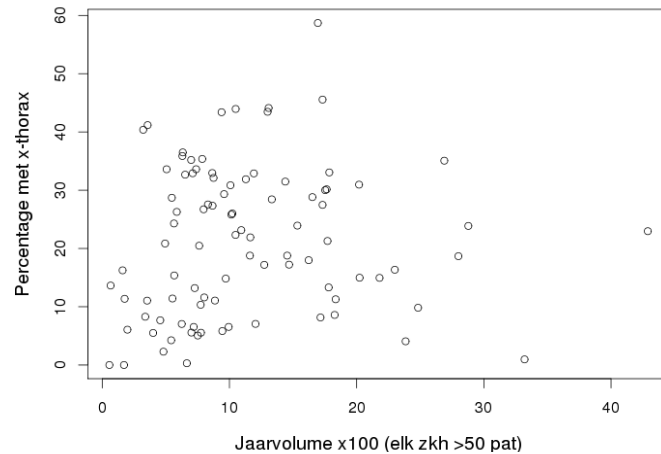


Figure 5 illustrates that a chest (thorax) X-ray was carried out for 38% of patients. Variations existed between the hospitals: from 0% to 59% independent of volume. The guidelines do not recommend the chest (thorax) X-ray as a test for patients with chest pain. Obviously, reasons may exist for carrying out this test for certain patients, but in view of the variations in use of the thorax X-ray between hospitals, this seems mainly to be about doctors' preferences.

Figure 5: Percentage of patients with at least one chest X-ray, set off against volume (cohort – D&B)*



* range = 0%-59%

Table 7 shows the breakdown of the various test strategies (sequence of tests) for patients with chest pain. This relates to the total group of people with chest pain: both those diagnosed with the code 'thoracic symptoms eci' (77,999 patients), and those coded as having 'stable angina pectoris' (27,359 patients).

Table 7: Diagnostic pathways of patients with chest pain.*

Diagnostische workshop	Aantal patiënten	Procent
Geen enkel cardiologisch onderzoek	23.558	22%
Alleen fietstest	23.138	22%
Alleen hartecho (zonder stress)	8.355	8%
Alleen fietstest en hartecho (zonder stress)	22.500	21%
Minstens anatomisch of functioneel onderzoek	20.071	19%
Andere combinaties van cardiologische onderzoeken	7.736	7%
Totaal	105.358	100%

*This did not include chest X-ray, troponine and CK MB.

No supplementary cardiological tests were carried out on 22%. Only a stress test was carried out for 22%. Only a non-stress echocardiogram was carried out on 8% and a stress test and an echocardiogram on 21%.

One or more forms of supplementary non-invasive diagnostics were carried out on 19% of all patients (excluding the stress test or cardiac ultrasound without stress). This involved a calcium score on 5%, a CT coronary angiography on 8% and an ischaemic detection on 11%. Ischaemia detection comprised mainly of nuclear imaging tests. A stress MRI or a stress echocardiography was claimed for <1% of patients. In this analysis, patients may have undergone more than 1 test.

The diagnostic pathway did not differ between patients with the diagnosis code 'Thoracic symptoms eci' and those with 'stable angina pectoris'. Table 8 illustrates this.

Table 8 Diagnostic tests after segregation according to the two diagnoses

	Thoracale klachten eci (N = 77999)	Stabilele angina pectoris (N = 27359)
X thorax	39%	35%
Troponine of CK-MB	37%	20%
Echocardiografie (geen stress)	44%	50%
Fietstest	62%	59%
Ca score	4%	5%
CT coronairen (geen calcium)	7%	9%
Ischemie detectie	9%	18%
- SPECT	8%	17%
- Stress MRI	0,6%	0,9%
- Stress echo	0,3%	0,5%
MRI (geen stress)	0,6%	0,3%
Coronairangiografie, al dan niet als onderdeel van FFR/ IVUS/ PCI	5%	26%
Niet gehad: fietstest, echo (stress), mri (stress), spect (stress), CT, CT calciumscore, angiografie	23%	20%

3.4

Care outcomes

No outcome indicators were established and included in the transparency calendar for risk-stratification and diagnostics. No publicly accessible outcomes specifically for stable angina pectoris patients on the quality of this diagnostic pathway are available elsewhere.

4 Treatment for stable angina pectoris

Findings on the current situation:

According to the guidelines, the treatment of stable angina pectoris starts with lifestyle advice and medication. Medicinal therapy has two aims; both improving the prognosis and reducing the chest pain. If medicines do not reduce the symptoms sufficiently, invasive treatment can be considered: Dotter treatment (PCI) or a bypass operation (CABG). This requires scientific substantiation. Nevertheless, pharmacy data show that in practice 73% of stable angina pectoris patients did not receive optimum medicinal treatment prior to invasive treatment, as these patients did not collect the necessary medicines from their pharmacies. This does not mean to say that these medicines were not prescribed. It is also possible that the medicines were collected, but not used.

Noticeable is that invasive surgery was only carried out on 31% of patients who received coronary angiography (CAG), while professionals agree that CAG should only be carried out if invasive treatment (PCI or CABG) is being considered.

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Elke patiënt met stabiele angina pectoris gebruikt een bloedplaatjes aggregatieremmer en een lipiden verlagend middel.
- De betrokken arts bespreekt met de patiënt de voor- en nadelen van het gebruik van deze medicatie; zowel vanuit het wetenschappelijk perspectief als ook vanuit dat van de betrokken patiënt (gedeelde besluitvorming).
- De arts ondersteunt de patiënt vervolgens in het gebruik door aandacht voor eventuele belemmeringen voor therapietrouw.
- Voordat een invasieve behandeling wordt overwogen gebruikt iedere patiënt minimaal 1 anti-ischemisch medicament.
- Patiënten ondergaan alleen een CAG wanneer de cardioloog verwacht dat een invasieve behandeling nodig is en gedeelde besluitvorming heeft plaatsgevonden.
- Er komt een keuzehulp om dit gesprek in de spreekkamer te ondersteunen.

4.1 Knowledge about good care

Quality Standards

It can be concluded, based on an analysis of the quality standards, that the recommendations they contain on medicinal treatment for stable angina pectoris patients are well-aligned with one another. The primary and secondary care guidelines are unequivocal in recommending the stepped care approach to care. The advice is to treat stable angina pectoris first with lifestyle advice and medicines, though exclusions do exist. If symptoms are not reduced sufficiently, invasive treatment can be considered such as Dotter treatment (PCI) or a bypass operation (CABG).

Table 8: Overview of the quality standards and protocols used in the Netherlands for treating stable angina pectoris

Kwaliteitsstandaard	Organisatie	Jaartal	Clientversie	Meetinstrumenten	Keuzehulp
Standaard Stabiele angina pectoris	NHG	2004, in herziening	X	X	X
Guidelines on the management of stable coronary artery disease	ESC	2013	X	X	X
Dutch guidelines for interventional cardiology. Institutional and operator competence and requirements for training working groups	NVVC	2004	X	X	X
Guidelines for percutaneous coronary interventions	ESC/NVVC	2005	X	X	X
Richtlijn indicaties CABG en PCI	NVT	2007	X	X	X
Richtlijnen voor percutane coronaire interventie	NVVC	2005	X	X	X
Praktijkdocument voor interventiecardiologie	NVCC	2016	X	X	X
Guidelines on myocardial revascularization	ESC/EACTS	2014	X	X	X
A Dutch perspective on the guidelines on myocardial revascularisation	ESC/EACTS	2015	X	X	X

The said quality standards do not include a client's version, measuring instruments or information standard mentioned in the assessment framework. A decision aid, including an option grid, is being developed. Patient information about various forms of treatment is available via various websites and brochures.¹³

Analysis of the guideline recommendations on medicinal treatment

Medicinal treatment for stable angina pectoris patients is described in the NHG standard on stable angina pectoris (2004) and the ESC guidelines on the management of stable coronary artery disease (2013). For the invasive forms of treatment PCI and CABG, cardiologists and thorax surgeons can consult the ESC/EACTS myocardial revascularisation guidelines (2014).

The NHG and ESC recommendations on medicinal treatment for stable angina pectoris patients are highly compatible with one another. Both sets of guidelines refer to the dual objectives: improving the prognosis and reducing the symptoms of chest pain. The prognosis is improved by preventing cardiovascular events (based on CVRM). To this end, patients are given lipid-lowering products, blood pressure-lowering medicines and thrombocyte inhibitors.

To reduce the symptoms of chest pain (halting and preventing attacks of pain), patients are prescribed short-acting nitrates that temporarily dilate the blood vessels. Patients who experience frequent attacks receive maintenance treatment with medicines such as beta-blockers, calcium antagonists and/or long-working nitrates. This is also known as optimum anti-ischaemic therapy, which, according to the guidelines, includes at least one medication. If symptoms persist, a combination treatment or a different medication is advised.

The ESC guidelines state that if patients are objectified low-risk stable patients, it is safe to start them on optimum medicinal therapy and that this should be the standard treatment. However, for high-risk patients (post-infarction angina pectoris, left ventricular dysfunction, main stem stenosis, multiple vascular disease and/or a myocardial ischaemia in a large area) the guidelines advise revascularisation (PCI or CABG).

Table 9: Medicinal treatment for stable angina pectoris

Doel	Pathofysiologie	Medicatie
Preventie van cardiovasculaire events (myocardinfarct, cerebrovasculair event of sterfte ten gevolge van een hartvaataandoening)	Reduceren van plaque progressie, stabiliseren van reeds gevormde atherosclerotische plaques en het voorkomen van coronair trombose	Lipiden verlagend middel en bloedplaatjes aggregatiemremmer
Reductie van symptomen van pijn op de borst	Vaatverwijding en vermindering hartinspanning	- Onderhoudsbehandeling (profylactische behandeling) Bèta blokker/ - Calciumantagonist/ Langwerkend nitraat - Aanvalsbehandeling - Kortwerkende nitraat

4.2 Effectiveness

In order to determine the effectiveness of medicinal treatment for stable angina pectoris, we looked at scientific substantiation for the guidelines and concluded that the recommendations are in keeping with the stepped-care approach to the treatment of stable angina pectoris and are sufficiently scientifically substantiated. The advice is to start with lifestyle changes and medication. If insufficient effect is booked, invasive treatment (PCI or CABG) can be considered. Dutch professionals confirm this recommendation in 'Choosing wisely for patients with cardiac disorders'.

The ESC guidelines advise medicine only as first treatment of stable angina pectoris patients without a high risk of an acute cardiac event. Only if symptoms improve insufficiently in response to optimum medicinal therapy does invasive treatment become an option, assuming it is technically possible, with an acceptable risk, and on patients with a good life expectancy. This advice is based on three landmark studies, the characteristics of which are listed in the following table. The BARI-2D trial (Frye et al., NEJM 2009), FAME-2 (De Bruyne et al., NEJM 2012), COURAGE trial (Boden et al., NEJM 2007) and the recently published long-term follow-up of the COURAGE trial (Sedlis, NEJM 2015).

Characteristics of studies on treatment

Studie	Patient aantallen en kenmerken	Vergelijkende behandelingen	Uitkomsten
BARI-2D trial (Frye et al, NEJM 2009) RCT	2368 patiënten met type 2 diabetes mellitus en coronairvaatliden (stenose >70%)	- PCI of CABG, (keuze aan de behandelend arts) met medicamenteuze behandeling - of alleen medicamenteuze behandeling	Na 5 jaar follow-up werd geen verschil aangetroffen in de primaire eindpunten sterfte en combinatie van sterfte, myocardinfarct of CVA.
FAME-2 (De Bruyne et al, NEJM 2012) RCT	888 patiënten met stabiel coronairvaatliden en een functioneel significante stenose (gemeten met FFR)	- FFR-geleide PCI met optimale medicamenteuze therapie - of alleen optimale medicamenteuze therapie	Studie voortijdig beëindigd ivm minder spoedinterventies bij PCI-groep. Er was echter geen verschil in sterfte of myocardinfarct.
COURAGE trial (Boden et al, NEJM 2007) RCT	2287 patiënten met geobjectiveerde myocardische en significant coronairvaatliden	- PCI en optimale medicamenteuze behandeling - of alleen optimale medicamenteuze behandeling	Na een mediane follow-up van 6,2 jaar was de sterfte in beide groepen vergelijkbaar: 25% in de PCI groep en 24% in de medicamenteus behandelde groep.

The ESC guidelines conclude, based on the above-mentioned studies (in combination with supplementary studies comparing revascularisation with optimum medicinal therapy), that invasive treatment of stable angina pectoris patients does

not reduce mortality. The ESC emphasises that optimum medicinal treatment is important for all stable angina pectoris patients, including those who have undergone invasive treatment.¹⁸

A recently published (2 November 2017) study in the Lancet: 'Percutaneous coronary intervention in stable angina (ORBITA): a double-blind, randomised controlled trial', found as follows: In patients with medically treated angina and severe coronary stenosis, PCI did not increase exercise time by more than the effect of a placebo procedure. In this recent trial, the researchers concluded that PCI is no better than placebo in this group of patients.

Dutch scientific literature

The importance of medicinal therapy in the treatment of stable angina pectoris is also emphasised in Dutch scientific literature. In May 2016 Ottervanger and Zijlstra wrote that "In view of the newest results of the COURAGE-study, the lack of clarity about indications that prompt Dotter-centres to carry out a PCI, and in view of the possibility of realising greater benefit with medicines and training, a degree of caution is advised in carrying out PCIs on stable angina pectoris patients".

Choosing wisely

The joint publication 'Choosing wisely for patients with heart diseases' of the NVVC and the Dutch Patients and Consumers Federation (NPCF) also emphasises the importance of medicinal therapy in cases of stable angina pectoris. One of these evidence-based recommendations is: "Patients with stable angina pectoris without indications of extensive abnormalities of the coronary arteries should first be given optimum medicinal treatment before Dotter treatment or surgery". The supplementary explanation states: stable patients with angina pectoris without high-risk characteristics should only undergo Dotter treatment or a bypass operation if their symptoms persist despite taking adequate medication.

4.3 Application in practice

Data from DIS and GIP are used to examine how stable angina pectoris patients are treated with medicines in practice. The analysis seems to indicate that not all patients receive optimum medicinal treatment before undergoing invasive treatment with a PCI or CABG. Based on the required optimum anti-ischaemic treatment, we see that only 27% of these patients receive optimum medicinal treatment before invasive treatment.

Furthermore, it seems that a CAG is carried out more frequently than one might expect. After all, professionals agree that coronary angiography should only be done if invasive treatment (PCI or CABG) is being considered, but in practice it seems that only 31% of CAGs are followed by an invasive intervention. This varied between hospitals.

¹⁸ Dutch Journal of Medicine 2016;160: D3. Dotter-therapy should not always be given in cases of stable angina pectoris

Use of medicines for treatment prior to PCI/CABG

Claim data from DIS and GIPA were analysed to form a picture of the medicinal treatment of stable angina pectoris patients.⁹ In order to obtain optimum insight into stepped care, an inventory was made of the medication collected from pharmacies by patients who underwent a PCI or CABG in the four months prior to this intervention.

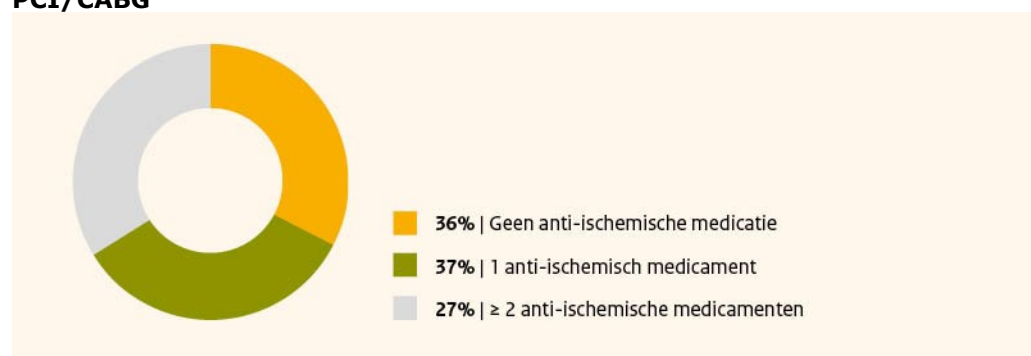
For this we checked the 10,190 patients who underwent a PCI and/or CABG in 2012 due to stable angina pectoris, and determined (for at least 30 days) which medication they collected from the pharmacy in the 4 months prior to the intervention. See table 10.

In 81% of patients who were not taking a vitamin K antagonist collected a thrombocyte aggregation inhibitor from their pharmacy. 71% of these patients who underwent surgery collected a lipid-lowering product. Anti-ischaemic maintenance treatment comprised of a beta-blocker for 47%, a calcium antagonist for 28% and a long-acting nitrate for 22% of them. One type of anti-ischaemic medication was claimed for 64% of patients. Optimum anti-ischaemic treatment is comprised of at least two products, while only 27% of patients collected this medication from their pharmacy in the 4 months prior to PCI or CABG. See Figure 5.

Table 10: Medicines prior to PCI or CABG in stable angina pectoris patients

PCI / CABG N= 10.190	
Trombocytenaggregatieremmer (N=9.155 (exclusief patiënten met vitamine K antagonist))	81%
Antilipidicum	71%
Anti-ischemische medicatie	
Betablokker	47%
Calciumantagonist	28%
Langwerkend nitraat	22%
Kortwerkend nitraat	22%

Figure 5: Use of anti-ischaemic medication in the 4 months prior to PCI/CABG



Invasive treatment

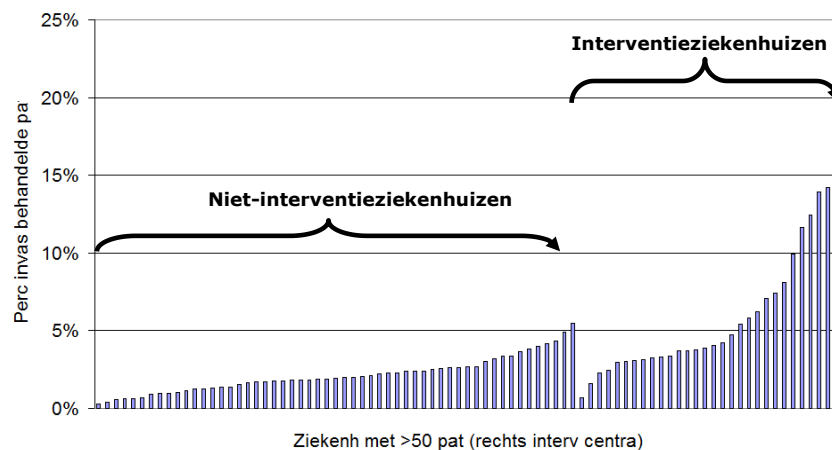
In 2012, 3,393 (3%) of the total number of 105,358 new patients underwent invasive treatment.⁹ A PCI was carried out on 2,112 patients, a CABG on 1,185 patients and a PCI and CABG on 96 patients. Men undergo invasive treatment more frequently than women: 5% vs. 2%. See table 11.

Table 11: Treatment of stable angina pectoris according to type and gender

	Mannen N = 50.670		Vrouwen N = 54.688	
Geen PCI of CABG	48.124	95%	53.841	98%
PCI	1515	3%	597	1%
CABG	953	2%	232	<0.1%
PCI en CABG	78	<0.1 %	18	<0.1%

Variations existed between hospitals in the percentage of patients who underwent invasive treatment: 0% to 5% in non-intervention centres and 1% to 19% in intervention centres. We found no explanation for these variations based on the data. For this analysis (and subsequent analyses) of invasive forms of treatment, patients who underwent diagnostics and/or treatment in several hospitals were allocated to the first hospital where a regular DBC was started. This is always about the number of patients treated, not the number of forms of treatment. See Figure 6.

Figure 6: Percentage of patients who underwent invasive treatment, per hospital

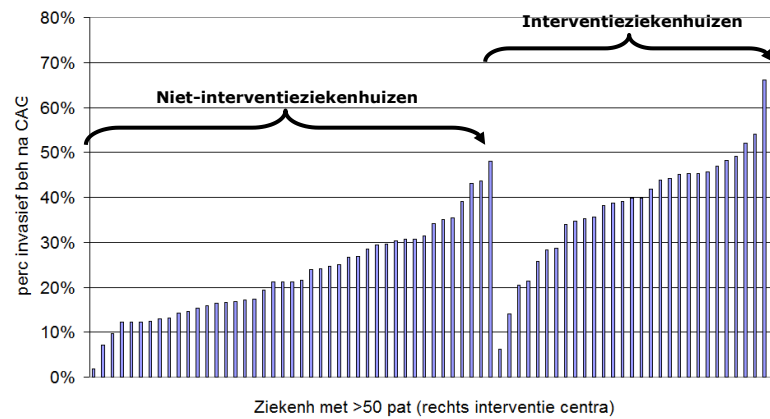


Coronary angiography, whether or not followed by invasive treatment

In 2012, 11,046 of the new patients underwent a coronary angiography. Of this group, 3,393 patients received invasive treatment within a year of the regular DBC being started. Thus, 31% of patients underwent coronary angiography and subsequent invasive treatment. This percentage varies per hospital: 2% to 48% in non-intervention centres and 6% to 68% in intervention centres. The patients and the corresponding CAG were classified according to hospital where they first presented.

The professional group agree that a CAG should only be done if invasive treatment (PCI or CABG) is also being considered. Based on the data, however, in only a minority of the cases (31%) was an invasive intervention actually carried out after a CAG. This varied between hospitals (see Figure 7). Furthermore, coronary angiography is a form of invasive diagnostics that is not entirely risk-free and is burdensome for patients.

Figure 7: Percentage of patients who underwent CAG and received invasive treatment



4.4

Care outcomes

No outcome indicators are available specifically for the patient group with stable angina pectoris.

However, the Dutch Heart Intervention Monitoring Committee (BHN), *Meetbaar Beter* [Measurably Better] and the NCDR (National Cardiovascular Data Registry) have registered various indicators on the invasive forms of treatment PCI and CABG. Their reports are public. However, the group of patients with stable AP, which forms only a small proportion of patients who underwent invasive treatment, cannot be identified separately, which greatly limits the value of these indicators for stable AP. In addition to information on patients who received invasive treatment, *Meetbaar Beter* also provides information on patients with coronary arterial disease who received conservative treatment. Once again, the group of patients with stable angina pectoris cannot be identified separately.

5 CVRM

5 CVRM

Cardiovascular risk management (CVRM) is care intended for people with an increased risk of (an exacerbation in) cardiovascular diseases, including patients with stable angina pectoris. The aim is to reduce this risk and improve the prognosis. The interventions used are lifestyle guidance and medicines. The guidelines on CVRM are generally in agreement, though relevant details do differ. This can compromise quality and cooperation between professionals. The individual interventions for CVRM are demonstrably effective. It is not clear whether the protocol-based CVRM approach in the Netherlands also demonstrably leads to health gains for patients.

In any case, our study seems to suggest a number of implementation problems. For instance, the specialist in charge of treatment is unknown for 28% of patients. 16% of patients in primary care do not receive all necessary medication. And, based on GPs' documentation, patients are hardly ever referred for specialised lifestyle guidance. We have no data on the implementation and quality of CVRM monitoring of patients being treated by a cardiologist, while more than half of the patients who undergo invasive treatment for stable angina pectoris are still being treated – or again being treated – by the cardiologist after three years. There are no health-related outcome indicators for CVRM, irrespective of whether monitoring takes place in primary or secondary care. Data are available on markers, e.g. blood pressure, LDL-cholesterol, BMI and smoking in the CVRM care programme in primary care. However, it is not possible to identify patients with stable angina pectoris.

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Elke patiënt met stabiele angina pectoris krijgt CVRM; zowel in eerste als tweede lijn.
- Patiënten weten wie voor hen hoofdbehandelaar CVRM is.
- Patiënten krijgen meer zicht op de voor- en nadelen van CVRM.
- Professionals in eerste en tweede lijn geven adviezen over medicatie en leefstijl die op elkaar aansluiten en met elkaar in overeenstemming zijn. Ook voor wat betreft de te bereiken targets..
- Zelfmanagement wordt makkelijker gemaakt.

5.1 Knowledge about good care

CVRM guidelines currently applicable in the Netherlands generally correspond with one another, but relevant aspects of their recommendations differ on the use of statins and antihypertensives. This can be particularly problematic for patients being treated by both a cardiologist and a GP.

The guidelines are not clear about the content and frequency of check-ups for CVRM, nor about their total duration.

We have no data on the implementation and quality of CVRM guidance for patients being treated by a cardiologist. Also lacking are health-related outcomes about CVRM in primary care. Data are available on markers e.g., blood pressure, LDL-cholesterol, BMI and smoking. However, patients with stable angina pectoris cannot be specifically identified.

Quality Standards

Professionals can consult various quality standards for recommendations on CVRM for stable angina pectoris patients: the CVRM Multidisciplinary Guidelines (2011), the CVRM Care Standard (2013), which is being revised by the NHG, and the CVRM National Transmural Agreement (2012). The NHG CVRM standard and the NHG 'Stable Angina Pectoris' standard (2004; under revision) are specifically for primary care. Four NHG care modules on a healthy lifestyle (alcohol, smoking, activity and diet) are available for GPs for giving lifestyle advice. Two ESC sets of guidelines: the 'European Guidelines on cardiovascular disease prevention in clinical practice' (2016) and the '2013 ESC guidelines on the management of stable coronary artery disease' (Montalescot 2013) are specifically for secondary care. The following table provides an overview.

Table 12: Overview of CRVM guidelines currently applicable in the Netherlands

Kwaliteitsstandaard	Organisatie	Jaartal	Clëntversie	Meetinstrumenten	Keuzehulp
NHG-standaard Stabilele Angina Pectoris	NHG	2004 in revisie	X	X	X
NHG-Standaard CVRM	NHG	2012	✓	✓	✓
Zorgstandaard vasculair risicomangement	Platvorm vitale vaten/ Ned Hartstichting	2013	✓	✓	X
Multidisciplinaire richtlijn cardiovasculair risicomangement	NHG	2011	X	X	X
Landelijke transmurale afspraken (LTA) Cardiovasculair risicomangement	NHG, NVVC, NIV, NVvN, NVvV	2012	X	X	X

The guidelines do not include elements mentioned in the Assessment Framework: clients' versions, measuring instruments and information standards. The Care Standard does discuss the perspective of the patient and the possibility of self-management. The Care Standard also discusses the role of the various (paramedics and) physicians.

Analysis of CVRM recommendations in the guidelines

The recommendations in the quality standards generally agree on influencing lifestyle and medicines. Within the framework of CVRM, in addition to thrombocyte aggregation inhibitors to prevent blood clots, patients are also prescribed statins to reduce their cholesterol and blood fat levels, and antihypertensives to regulate their blood pressure. The guideline recommendations differ on precise indications for prescribing statins. The prescription of statins is recommended either for every patient with symptomatic coronary artery disease, or only for patients with Low-Density-Lipoproteins (LDL) above a certain level. Moreover, this upper level is lower in the ESC guidelines than in the NHG standard. Nor do the recommendations agree about the indication for antihypertensives and the medicinal product used.

Measuring instruments

Both GPs and cardiologists lack health-related outcome measures on CVRM care for people with stable angina pectoris. Data are available on markers such as blood pressure, LDL-cholesterol, BMI and smoking in the primary care CVRM care programme, but the group of patients with stable angina pectoris cannot be

specifically identified.¹⁹

Duration of CVRM treatment

The guidelines have not arrived at an unequivocal recommendation on the duration of CVRM treatment. The NHG CVRM standard and the CVRM Multidisciplinary Guidelines say nothing on the matter. Recommendations are given on monitoring that focusses on medicinal treatment, but not on its frequency nor on its duration. Nor are any recommendations given on the duration and assessment of influencing and monitoring lifestyle. For follow-up, the CVRM Care Standard refers to the CVRM Multidisciplinary Guidelines 2011, but elsewhere the standard advises arranging a follow-up moment at least once a year (Individual Care Plan (IZP)).

5.2 Effectiveness

CVRM is comprised of various (non-) medicinal interventions that can be tailored for use. For individual interventions, the guidelines provide scientific substantiation for preventing new disease and mortality due to cardiovascular disease. Little is known about the effectiveness of CVRM as a form of chain care as implemented in the Netherlands. In fact, it is not yet clear whether (implementing) this protocol-based approach results in health gains for the patient.²⁰

5.3 Application in practice

Contrary to recommendations in the standard, GPs do not prescribe a blood aggregation inhibitor or a blood-thinning agent to 16% of patients with stable AP. Due to ambiguity in the NHG standard about the indication for prescribing statins, no conclusion can be drawn about possible room for improvement. The guidelines advise prescribing medicines that help improve blood circulation in the heart muscle and for the chest pain. However, GPs did not prescribe these medicines to 12% of patients. Another important factor is that about 10% of medicines prescribed are not collected. GPs do not refer more than 90% of patients with stable AP for lifestyle guidance, even though this is the cornerstone of treatment. This raises questions about the level of quality of this care. All the more because it is not clear who is in charge of the CVRM of 28% of patients: the GP or the cardiologist. After invasive treatment for stable AP (PCI or CABG), 59% of patients are still being treated by the cardiologist after 3 years. Data are lacking on the quality of CVRM guidance when a cardiologist is in charge of treatment, as patients can only be included in the CVRM care programme if a GP is in charge of their treatment. Indicators are lacking on the health outcomes of patients on a CVRM guidance pathway. Data are available on markers e.g., blood pressure, LDL-cholesterol, BMI and smoking.

Medicinal treatment of stable AP patients in primary care

Research was commissioned by the Zorginstituut into the treatment of angina pectoris patients by GPs.

Blood aggregation inhibitors were prescribed to 75% of patients diagnosed with stable angina pectoris. 13% of patients used oral anticoagulants (blood thinners). Ultimately, GPs prescribed no form of anticoagulant whatsoever (blood aggregation inhibitors or oral anticoagulants) to 16% of patients within 3 months after the diagnosis, despite the fact that this is recommended in the Stable Angina Pectoris NHG Standard.

¹⁹ Dutch Heart Foundation: Cardiovascular risk management in the Netherlands from 2009 to 2013: state of the art

²⁰ *Medisch Contact* dated 11-02-2016. Hollander et al.; Preventing cardiovascular disease is like shifting sand.

Lipid-reducing medicinal products (statins) are prescribed frequently (72%) for stable angina pectoris patients. The NHG CVRM standard is not clear about the indication for statin treatment for stable angina pectoris patients, so it is impossible to determine whether room for improvement exists here.

According to the NHG stable angina pectoris standard, patients with stable AP are eligible for pain treatment as part of treating attacks, maintenance treatment or combination treatment with medicines. However, these prescriptions were not issued for 12% of patients. Room for improvement exists here.

The study looked at prescribed medication in a primary care database. It is possible that medication was prescribed, but not collected from the pharmacy by patients. This statistic is about 10% for cardiovascular diseases.

Lifestyle guidance by GPs

In 94% of cases, GPs did not prescribe angina pectoris patients any form of lifestyle guidance (physiotherapist, dietician or psychologist) within 3 months after the diagnosis. This is the same whether patients were or were not referred to a cardiologist. The CVRM NHG standard recommends lifestyle advice for all patients with cardiovascular diseases. In general practice, this can be given by the GP or the primary care assistant, or the patient can be referred to a specialised physiotherapist, dietician or behavioural therapist. Thus, GPs can opt not to refer for lifestyle guidance. The research group feels that, based on these data, the quality of lifestyle guidance GPs provide for stable angina pectoris patients is currently not clear, despite the fact that lifestyle is the cornerstone of cardiovascular disease prevention. According to the research group, for patients with cardiovascular diseases, future research is needed into effective forms of lifestyle guidance in primary care.

Physician in charge of CVRM treatment

GPs are in charge of CVRM treatment for 34% of angina pectoris patients, while specialists have this role for 38%. GPs neglected to register this for 28% of patients with angina pectoris. This can result in pressure on continuity of care. Only patients whose GP is in charge of their treatment can be accepted into a CVRM care programme.

5.4 Follow-up after PCI or CABG

Follow-up after invasive treatment

We looked at the follow-up of stable AP patients who received invasive treatment (PCI or CABG) in 2010. We included all care products registered during 36 months after the operation. The study shows that more than half of the patients are still being treated – or again being treated – by the cardiologist three years after the operation. Of these, 37% have developed another cardiac disorder, and 22% of the cases involve stable AP or thoracic symptoms. The question is whether patients were referred back to their GP in the interim period. No data whatsoever are available on CVRM treatment when cardiologists are in charge of treatment. Patients who are treated by a cardiologist probably do not receive CVRM treatment.

Table 14: Follow-up by the cardiologist after PCI/CABG

Jaar	Patiënten met cardiologische DBC	Patiënten met cardiologische DBC, waaronder één voor thoracale klachten of stabiele angina pectoris	Patiënten met een cardiologische DBC, maar geen DBC voor thoracale klachten of stabiele angina pectoris
2010	100%	100%	0%
2011	76%	28%	48%
2012	67%	25%	42%
2013	59%	22%	37%

5.5 Care outcomes

Indicators for CVRM care in primary care are measured annually by *InEen*. The indicators studied measure the quality of (chain) care provided for chronic patients (including cardiovascular patients) based on process indicators and also on surrogate outcome indicators. The group of patients known to have cardiovascular diseases is a mixed group; no specific data are available on angina pectoris patients. Due to the lack of such outcome measures, it is not clear whether these patients book any health gains.

InEen provides the following data on lifestyle guidance as a component of CVRM. According to *InEen*, for 2016 the physical exercise of 73% (spread 11 to 100%) of patients is registered in the HVZ programme. The enormous spread is noticeable. Not known is how often motivational interviewing was used in an attempt to improve people's level of activity and how many of these patients participated in high quality programmes – of sufficient duration – for boosting their exercise and physical condition.

6 Heart rehabilitation

In this report the concept of 'heart rehabilitation' describes the multidisciplinary care offered to patients by cardiologists with a view to reducing the number of cardiovascular incidents and increasing the quality of life. The multidisciplinary Heart Rehabilitation guidelines, which use this definition, claim that people with stable angina pectoris have an absolute indication for heart revalidation. The ESC guidelines, which also apply in the Netherlands, does nothing more than suggest considering heart rehabilitation, and the NHG standard argues in favour of cardiovascular risk management. None of the guidelines provide (unambiguous) stop-criteria for heart rehabilitation or discuss the transition to CVRM guidance. No publicly accessible health-related outcome indicators are available. Nor are client's versions of the guidelines available. The systematic review that the Zorginstituut commissioned revealed that the effectiveness of heart rehabilitation for stable angina pectoris patients has not been scientifically proven. The randomised studies found barely allow any conclusions on the matter. The additional cohort studies analysed report only one outcome measure and state that heart rehabilitation may reduce the long-term mortality risk of stable angina pectoris patients who have undergone a CABG or PCI, though this estimated effect is uncertain. No studies whatsoever were found that allow any conclusion about the effectiveness of heart rehabilitation on stable angina pectoris patients who receive only medicinal treatment. The number of people receiving heart rehabilitation has risen sharply over recent years due to the recommendation in the guidelines.

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Patiënten met stabiele AP die een CABG ondergaan krijgen allen (een verwijzing voor) multidisciplinaire hartrevalidatie.
- Patiënten met stabiele AP die alleen medicamenteus of met PCI worden behandeld krijgen slechts bij uitzondering op individuele gronden (een verwijzing voor multidisciplinaire hartrevalidatie)
- Alle patiënten krijgen CVRM, ongeacht of multidisciplinaire hartrevalidatie plaatsvindt.

6.1 Knowledge about good care

The multidisciplinary Heart Rehabilitation guidelines state that people with stable angina pectoris have an absolute indication for heart rehabilitation. Scientific substantiation for this is however limited and of a low quality. The ESC guidelines currently applicable in the Netherlands suggest considering heart rehabilitation, while the NHG standard argues in favour of CVRM and does not mention heart rehabilitation. None of the guidelines provide (unambiguous) stop-criteria for heart rehabilitation or discuss the transition to CVRM guidance. No national instruments exist for measuring the quality of heart rehabilitation. Nor are clients' versions of the guidelines available, as requested in the assessment framework.

Quality Standards

Various guidelines are used in the Netherlands within the framework of heart rehabilitation. The most important are the multidisciplinary Heart Rehabilitation guidelines (2011) (hereafter: MDR). The NVVC heart rehabilitation guidelines in General Practice (2011) are linked to these and cover general practice requirements in implementing heart rehabilitation. The NVVC endorses the ESC guidelines as well as the MDR. The KNGF Heart Rehabilitation guidelines (2011) can be regarded as a

specific elaboration of the MDR for physiotherapy.

The MDR defines heart rehabilitation as follows: "Heart rehabilitation is comprised of offering multidisciplinary rehabilitation programmes that enable patients to adjust their lifestyle and maintain this new lifestyle over a longer period of time. Heart rehabilitation focusses on improving functional capacity and physical recovery as well as improving mental welfare and social functioning, thereby reducing cardiovascular incidents and increasing the patient's quality of life."

Table 15: Overview of heart rehabilitation guidelines

Kwaliteitsstandaard	Organisatie	Jaartal	Clientversie	Meetinstrumenten	Keuzehulp
Hartrevalidatie	KNGF	2011	X	X	X
Multidisciplinaire Richtlijn Hartrevalidatie	NVVC	2011	X	X	X
Model hartrevalidatie	NVVC	2011	X	X	X
Praktijkrichtlijn Hartrevalidatie	NVVC	2011	X	X	X
Beslisboom Poliklinische Indicatiestelling Hartrevalidatie	NVVC	2010	X	X	X
Standaard Stabiele Angina Pectoris	NHG	2004	X	X	X
Guidelines on the management of stable coronary artery disease	ESC/NVCC	2013	X	X	X

A client's version of the guidelines and an information standard are still lacking. No national indicators exist on the quality of heart rehabilitation, despite proposals described in the multidisciplinary heart rehabilitation guidelines (2011). The Hart&Vaatgroup formulated disorder-specific quality criteria for heart rehabilitation (in 2012).

Analysis of recommendations on indications for heart rehabilitation

The *Zorginstituut* commissioned an analysis of the recommendations in the heart rehabilitation guidelines.²¹

According to the Dutch multidisciplinary guidelines, an absolute heart rehabilitation indication exists for stable angina pectoris patients. However, little scientific substantiation exists for this recommendation and it is based on research involving a much larger heterogeneous group of patients. The ESC guidelines do not regard stable angina pectoris as an absolute indication, but as a recommendation for heart rehabilitation. Again, however, with little substantiation. The NICE Guidelines on 'Stable angina' conclude that there is (still) insufficient evidence of the effectiveness of multidisciplinary heart rehabilitation on stable angina pectoris patients and recommends offering these patients only cardiovascular risk management. The NHG Stable Angina Pectoris standard (2004) offers no advice on heart rehabilitation, though it does advise exercise and gives specific lifestyle advice, thereby referring to the NHG CVRM standard (2012).

None of the guidelines distinguish between medicinal and invasive treatment of stable AP patients.

Analysis of the recommended duration of heart rehabilitation

The MDR, the KNGF guidelines and the ESC guidelines provide no description of how long heart rehabilitation should last, claiming that it depends on the objectives set and customising the programme. These stop-criteria lack specificity. Furthermore, the guidelines do not discuss the transition to CVRM guidance.

6.2 Effectiveness

A research question was jointly formulated on the effectiveness of heart

²¹ Radboud UMC. Heart rehabilitation for stable angina pectoris patients

rehabilitation in stable angina pectoris patients who received conservative or invasive treatment. Randomised studies found in a systematic study of the literature on scientific substantiation of the effectiveness of heart rehabilitation on these patients barely allow any conclusions on the matter. The cohort studies reported one outcome measure and state that heart rehabilitation may reduce the long-term mortality risk of stable angina pectoris patients who have undergone a CABG or PCI, though the estimated effect is uncertain. No studies whatsoever were found that allow a conclusion on the effectiveness of heart rehabilitation on stable angina pectoris patients who receive only medicinal treatment.

Based on the joint study question, a new systematic search of the literature (systematic review: SR) examined what evidence exists for heart rehabilitation in stable angina pectoris patients.²¹ To avoid missing any publications, we opted to include a wide assortment of concepts in the search string, and not just limit it to the term 'heart rehabilitation'. The PICO outcome measures for the SR were mortality, myocardial infarction, revascularisation (CABG or PCI), hospitalisation, health-related quality of life, symptom reduction, fear of exercise/exertion, and physical activity. Existing SRs, Randomized Controlled Trials (RCTs) and cohort studies with propensity score-weighting were included and the quality of their methodology assessed. In order to focus as far as possible on stable AP patients, RCTs and cohort studies with more than 30% myocardial infarction patients were not included. Due to this criterion, only 14 RCTs were found. Moreover, these were heterogeneous in respect of interventions, comparisons and outcome measures. The quality of the evidence found is low to very low and – based on the RCTs – no conclusion can be drawn regarding the effectiveness of heart rehabilitation on stable angina pectoris. This applies to all outcome measures. The 6 identified cohort studies compared heart rehabilitation with no heart rehabilitation, and they were of good methodological quality. Five of the six cohort studies involve patients who underwent a CABG or PCI. We limited ourselves to studies that included heart patients without acute coronary syndrome or less than 30% of patients with a myocardial infarction, or studies that reported analyses for sub-groups of stable AP patients. The cohort studies also involved heterogeneous groups of patients. Only the sixth study contained a small sub-group of coronary patients treated exclusively with medicines, though no separate sub-group analysis was carried out. Based on these cohort studies, we concluded that low-quality evidence exists that heart rehabilitation reduces the long-term mortality risk, in comparison with no heart rehabilitation in patients who have undergone a CABG or PCI. Based on the cohort studies, nothing can be said about effectiveness in relation to the other outcome measures.

Summarising, we conclude that the RCTs allow almost no conclusions on the effectiveness of heart rehabilitation on the group studied. The cohort studies show that long-term mortality may be reduced in stable angina pectoris patients who underwent a CABG or PCI, though the estimated effect remains uncertain. No studies whatsoever were found that permit a conclusion on the effectiveness of heart rehabilitation on stable angina pectoris patients treated only with medication.

6.3 Application in practice

Stable AP patients who also receive invasive treatment are more likely to receive heart rehabilitation than those treated only with medication: patients with a CABG (38%) more than twice as often as patients with a PCI (15%). Overall, the number of stable AP patients who receive heart rehabilitation is rising, as are the costs. In view of the guideline recommendations, this number is expected to rise further.

Using DIS data, we have formed a picture of heart rehabilitation that is given to stable angina pectoris patients.⁹ Based on the entire study population of new patients with chest pain (105,358), a DBC for heart rehabilitation was claimed for 1,271 patients (1.2%). A total of 24% of patients had received invasive treatment (15% of patients treated by means of PCI, 39% of patients treated by means of CABG resp., 43% of patients treated with PCI and CABG). Participation in heart rehabilitation was fairly identical for men and women (PCI: 15% men vs. 14% women; CABG: 39% men vs. 34% women; PCI and CABG 44% men vs. 39% women). For patients who did not receive invasive treatment, a DBC for heart rehabilitation was claimed for 0.3% of women and 0.7% of men.

Table 16: Heart rehabilitation for the study population in 2012 (n=105,358)

Type behandeling die de patiënt kreeg	Totaal	Hartrevalidatie	
Conservatief	101.965	460	0,5%
PCI	2.112	312	15%
CABG	1.185	458	39%
PCI en CABG	96	41	43%

The number of people with stable angina pectoris who receive heart rehabilitation is rising over the years, as are the costs. This is illustrated in the following table. In view of the recommendations in the 2011 heart rehabilitation guidelines, a further increase can be expected.

Table 17: Trends in heart rehabilitation

Hartrevalidatie	2010	2011	2012	2013
Hartrevalidatie	3.263	4.595	5.953	6.238
Totale kosten	€ 3.302.663	€ 4.840.719	€ 9.778.276	€ 15.276.564

6.4 Care outcomes

No publicly accessible outcome indicators are available for heart rehabilitation.

7 Room for Improvement report

The parties jointly chose care for people with chest pain and (suspected) stable angina pectoris for in-depth research based on the expectation that room for improvement would be found. After extensive research, the Zorginstituut confirms that such room exists and in this section indicates which improvement activities are desirable. The management boards and stakeholders we consulted agree on the whole with the conclusions and improvement activities. In addition to the effects described below of improvement activities on patients, unnecessary costs can also be avoided. The Budget Impact Analysis (time horizon 2 years), [originally an appendix to this Room for Improvement report (only in Dutch)], the estimated avoidable costs to the Budgetary Framework for Care (BKZ) amount to a sum of approx. €177 million per year. The Budget Impact Analysis can also help the parties to substantiate accountable growth.

7.1 Improvements along the entire care pathway

For all aspects of the care pathway, improvements are needed in the following points:

- advice that is consistent right across the board for GPs and cardiologists
- improved communication between professionals
- availability of client's/patients' versions of guidelines
- paying attention to shared decision-making in guidelines and in consulting rooms
- availability of decision aids and/or extensive information to support joint decisions in consulting room
- availability of outcome indicators, including patient-based outcomes

Agreements:

The parties will make a National Transmural Agreement (LTA) for patients with (suspected) stable angina pectoris. This is the joint responsibility of NHG and NVVC. The multidisciplinary Cardiovascular Risk Management guidelines will be updated. NHG is responsible for this.

The NVVC will draw up guidance on diagnostics in collaboration with the NVvR. The outcomes of this Room for Improvement report will be incorporated in both quality standards and guidance.

A draft version of the NHG Stable Angina Pectoris standard became available in 2014, though it has not yet been published. Publication of the standard can be expected at the latest by the end of 2018, partly as a result of agreements in the LTA, and it should also include the recommendations of this Room for Improvement report. NHG is responsible for this.

The drafts of the LTA and the NHG standard will be ready by the end of 2018; the CVRM Guidelines in June 2019. The secondary care diagnostics guidance will be ready by the end of 2018.

There will also be a plan of approach for developing clients' versions, decision aids and/or extensive information to support joint decision-making in consulting rooms, and outcome indicators that have not yet been realised. The NHG will publish patients' versions of Standards on TGP.nl.

The NVVC, *Hart&Vaatgroep* and the NHG will come up with a joint plan of approach before April 2018 for realising outcome indicators.

Care pathway agreements

For some products, the specified deadline is for the draft product.*

Actie	Verantwoordelijke	Gereed	Indicator
LTA	NHG en NVVC	Eind 2018*	Product
Richtlijn CVRM	NHG	Juni 2019*	Product
NHG standaard	NHG	Eind 2018*	Product
Leidraad diagnostiek 2de lijn	NVVC, NvVR	Eind 2018	Product
PVA indicatoren	NVVC, HV-groep, NHG	April 2018	Product

* In de consultatie werd aangegeven dat de producten op de genoemde termijnen in concept gereed zijn, maar mogelijk nog niet officieel zijn geautoriseerd.

7.2 Improvements, per aspect of the care pathway

7.2.1 Risk-stratification and diagnostics

Possibilities for improving risk-stratification and diagnostics

- The risk of coronary vascular disease will be explicitly determined for all patients, before they are referred or diagnostics are carried out, based on a risk assessment model (including nature of the symptoms, age and gender).
- This risk will be recorded in the medical dossier.
- GPs and cardiologists will use the same model for risk-stratification.
- The cut-off points for waiving the use of diagnostics will be the same in primary and secondary care.
- Cut-off points will be agreed for referring to a cardiologist.
- Information on risk-stratification will be available for patients, providing them with a clear explanation of risk-stratification. It will explain that, though it is about tracing as many potential sufferers of a heart disorder as possible, it is also about not causing people unnecessary anxiety or exposing them to unnecessary tests, unnecessary medicines or unnecessary interventions (and the potential dangers this involves).
- A resting echocardiogram will be made based only on an indication
- A thoracic X-ray will be made based only on an indication
- An exercise ECG will not be carried out as a matter of course
- No supplementary diagnostics will be carried out on low-risk patients.
- Only 1 non-invasive test will be carried out on patients with an intermediate risk of coronary vascular disease.
- The NVVC will develop guidance for (a) preferred test(s) for patients with an intermediate risk, which will take into account the findings of this Room for Improvement report.
- A CAG will be carried out, without other prior non-invasive diagnostics, for patients with a high risk of an acute cardiac event and potential health gains.
- Upon completion of the diagnostics, the cardiologist will inform the GP about the diagnosis and follow-up.
- The GP will include the diagnosis and other data received from the cardiologist in the dossier.
- Agreements will be made in the LTA on cardiologists referring patients back

to their GP.

Agreements on risk-stratification and diagnostics

Action	Party responsible	Ready	Indicator
LTA for agreements on risk-stratification/cut-off points for diagnostics/referrals (back)	NHG and NVVC	Draft end of 2018	Product
Risk-stratification will be registered in dossier	NHG and NVVC	As of publication of the Room for Improvement report	EPD primary and secondary care
Explanation of risk-stratification for patients	<i>Hart&Vaatgroep.</i>	End of 2018	Product
No supplementary diagnostics for low-risk patients	NHG, NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	EPD claim data primary and secondary care
Only 1 non-invasive test for intermediate risk patients	NHG, NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
CAG for high risk patients (without other prior test)	NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
Rest-echocardiogram not standard	NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
Dutch addendum to the European Guidelines: rest echocardiogram on indication	NVVC	April 2018	Product
Thoracic X-ray not standard	NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
Exercise test not standard	NHG, NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
CT angiogram OR ischaemia test, not both	NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
Guidance on diagnostics in secondary care	NVVC (working group)	End of 2018	Product; addendum to the guidelines
Referral based on NHG standard/LTA	NHG	From the publication date of the LTA and NHG Standard	EPD primary care
Cardiologist's letter after referral	NVVC	As of publication of the Room for Improvement report	EPD primary and secondary care
Entering cardiologist's data in the GP's dossier	NHG	As of publication of the Room for Improvement report	EPD primary care

Referring back to the GP (based on NHG standard/LTA)	NVVC	As of publication of the Room for Improvement report	Claim data, EPD primary and secondary care
--	------	--	--

7.2.2

Treatment

Possibilities for improving treatment

- To reduce the risk of cardiovascular incidents, all stable angina pectoris patients will be given a thrombocyte aggregation inhibitor and a lipid-lowering product. See CVRM.
- Patients for whom invasive treatment is being considered will take not only a thrombocyte aggregation inhibitor and a lipid-lowering product but also at least 1 anti-ischaemic medicinal product.
- Invasive treatment will only be carried out after optimum medicinal treatment has failed.
- A CAG will only be carried out if the chance of invasive treatment is very high.
- Patients will be informed about the advantages of optimum medicinal therapy which will often result in an operation not being necessary. Furthermore, they must know that medicinal treatment is still necessary after an operation.
- A decision aid and/or extensive information to support joint decision-making on treatment in the consulting room.
- Cardiologists and GPs will develop interventions to improve the motivation and guidance of patients in therapy compliance.

Agreements on treatment

Action	Party responsible	Ready	Indicator
Decision aid and/or extensive information to support joint decision-making in the consulting room	Hart&Vaatgroep	End of 2018–mid-2019	Product
Shared decision-making on the intervention	NVVC	As of publication of the Room for Improvement report	Study of patients and doctors
Use of preventive medicine	NVVC, NHG	As of publication of the Room for Improvement report	Claim data
Develop interventions for therapy compliance	NVVC, NHG, Hart&Vaatgroep	June 2019	Product
Optimum medicinal treatment prior to CAG	NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
Optimum medicinal treatment prior to CABG/PCI	NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data
CAG only if CABG/PCI is likely	NVVC, ZN, NVZ, NFU	As of publication of the Room for Improvement report	Claim data

7.2.3

CVRM and follow-up

Possibilities for improving CVRM and follow-up

- (Superfluous) tests will not routinely be carried out in the follow-up of patients after CABG/PCI. In accordance with the NVVC's 'Choosing wisely'.
- Patients who are stable after a PCI or CABG will be referred back to their GP.
- Patients who are stable on medicinal treatment will be referred back to their GP.
- The LTA will make agreements on cardiologists referring patients back to the GP.
- In the LTA and the CVRM guidelines, GPs and cardiologists will make joint agreements about the physician in charge of CVRM.
- In the LTA and the CVRM guidelines, GPs and cardiologists will make joint agreements about target values for blood pressure and lipid levels.
- In the LTA and the CVRM guidelines, GPs and cardiologists will make joint agreements about types of medicines – and possible exceptions – based on indications.

Agreements on CVRM and follow-up

Action	Party responsible	Ready	Indicator
No tests will be carried out routinely in the follow-up after CABG/PCI	NVVC	From the publication of 'Choosing wisely'	Claim data
Referring stable patients back after medicinal treatment or after CABG/PCI	NVVC	As of publication of the Room for Improvement report	Claim data
Agreements on referring back in the LTA	NHG and NVVC	End of 2018	Product
Agreement on the physician in charge of CVRM in the LTA	NHG and NVVC	End of 2018	Product
Record the physician in charge of CVRM in the EPD	NHG and NVVC	As of publication of the Room for Improvement report	EPD
Every patient with stable AP will be given (/offered) CVRM	NHG, NVVC, Hart&Vaatgroep	As of publication of the Room for Improvement report	Claim data
Therapy compliance and self-management are part of CVRM guidance	NHG, NVVC, Hart&Vaatgroep	As of publication of the Room for Improvement report	Claim data
Primary and secondary care give advice on medication, targets to be achieved and	NHG, NVVC, Hart&Vaatgroep	As of publication of the Room for Improvement report and CVRM guidelines	CVRM guidelines, Claim data

lifestyle that are consistent with one another			
--	--	--	--

7.2.4 *Heart rehabilitation*

Possibilities for improving heart rehabilitation

Care for stable angina pectoris patients can improve by more selective use of multidisciplinary heart rehabilitation. In view of the parties' broad consensus at the meeting in February 2017 about the added value of heart rehabilitation after CABG, it is very important that heart rehabilitation – despite the lack of sufficient pertinent scientific data – is offered to all stable AP patients who have undergone a CABG. However, because the added value of heart rehabilitation has not been demonstrated for stable angina pectoris patients who received only medicinal treatment or treatment with a PCI, it should be advised to them only in exceptional cases. CVRM will be offered to all stable AP patients, irrespective of the nature of their treatment.

Agreements on heart rehabilitation.

Action	Party responsible	Ready	Indicator
Offer heart rehabilitation after CABG	NVVC, ZN	As of publication of the Room for Improvement report	Claim data
Only offer heart rehabilitation in exceptional cases after PCI or medication alone	NVVC, ZN	As of publication of the Room for Improvement report	Claim data
Update scientific substantiation of recommendations in the guidelines (SR)	NVVC, KNGF	End of 2018	Product

7.3 **Knowledge lacunas**

While carrying out this in-depth research, some evidence of knowledge lacunas was found.

Risk-stratification; which variables are important, in view of their clinical value?
Diagnostic tests; which test or test strategy is clinically useful? KE?
What health gains are realised by CVRM, as currently implemented in the Netherlands?
How can a professional assess and promote compliance with medicinal therapy that needs to be taken chronically?
How can a professional assess and promote lifestyle therapy compliance?
How effective is heart rehabilitation in stable AP patients treated only with medication or in combination with PCI? What form should this HR take?
Should life-long CVRM be offered? Stop-criteria? Customised care? Self-management?

7.4

What will patients notice as a result of improvement activities?

Per aspect of the care pathway, patients will notice specific improvements. More generally, patients will start to notice that primary and secondary care professionals make agreements with one another about organising the care pathway and about recommendations for diagnostics and treatment. As a result, the accessibility and quality of this care will improve. Information will become available to citizens and patients about the meaning of risk-stratification and about guideline recommendations. In consulting rooms more attention will be paid to shared decision-making and supporting it by developing decision aids and/or extensive information. The parties will also develop outcome indicators (including PROMs), resulting in greater insight into the quality of this care and ensuring that the quality cycle runs (more) smoothly.

Risk-stratification and diagnostics

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Bij alle patiënten wordt het risico op coronair vaatlijden vastgesteld alvorens diagnostiek te verrichten of te verwijzen. Ingeschat wordt daarmee hoe groot het risico op een aandoening van de kranslagaderen voor deze individuele patiënt is. Huisartsen en cardiologen gebruiken eenzelfde model om dit risico te bepalen. Huisartsen en cardiologen gaan uit van dezelfde afkappunten in de risicoscore voor afzien of inzetten van diagnostiek of verwijzing.
- Bij verdenking op stabiele angina pectoris wordt niet standaard een rust echo, een fietstest of een longfoto gedaan.
- Bij een intermediair risico op een coronaire hartaandoening wordt slechts 1 niet-invasieve test gedaan.
- Bij een hoog risico wordt direct een Coronaire angiografie gedaan als gezondheidswinst verwacht wordt van een PCI of CABG.
- Patiënten kunnen er op vertrouwen dat hun huisarts op de hoogte is. Huisartsen ontvangen na verwijzing bericht van cardiologen over de diagnose en nemen dit op in het dossier.
- Er komt informatie voor patiënten om uit te leggen wat het nut van risicostratificatie is en wat het vervolgtraject is bij een bepaald risico.

Treatment

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Elke patiënt met stabiele angina pectoris gebruikt een bloedplaatjes aggregatiemiddel en een lipiden verlagend middel.
- De betrokken arts bespreekt met de patiënt de voor- en nadelen van het gebruik van deze medicatie; zowel vanuit het wetenschappelijk perspectief als ook vanuit dat van de betrokken patiënt (gedeelde besluitvorming).
- De arts ondersteunt de patiënt vervolgens in het gebruik door aandacht voor eventuele belemmeringen voor therapietrouw.
- Voordat een invasieve behandeling wordt overwogen gebruikt iedere patiënt minimaal 1 anti-ischemisch medicament.
- Patiënten ondergaan alleen een CAG wanneer de cardioloog verwacht dat een invasieve behandeling nodig is en gedeelde besluitvorming heeft plaatsgevonden.
- Er komt een keuzehulp om dit gesprek in de spreekkamer te ondersteunen.

CVRM and follow-up

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Elke patiënt met stabiele angina pectoris krijgt CVRM; zowel in eerste als tweede lijn.
- Patiënten weten wie voor hen hoofdbehandelaar CVRM is.
- Patiënten krijgen meer zicht op de voor- en nadelen van CVRM.
- Professionals in eerste en tweede lijn geven adviezen over medicatie en leefstijl die op elkaar aansluiten en met elkaar in overeenstemming zijn. Ook voor wat betreft de te bereiken targets..
- Zelfmanagement wordt makkelijker gemaakt.

Heart rehabilitation

Wat gaan patiënten merken van de afgesproken verbeteringen:

- Patiënten met stabiele AP die een CABG ondergaan krijgen allen (een verwijzing voor) multidisciplinaire hartrevalidatie.
- Patiënten met stabiele AP die alleen medicamenteus of met PCI worden behandeld krijgen slechts bij uitzondering op individuele gronden (een verwijzing voor multidisciplinaire hartrevalidatie)
- Alle patiënten krijgen CVRM, ongeacht of multidisciplinaire hartrevalidatie plaatsvindt.

7.5 Budget Impact Analysis

The health care costs for coronary heart diseases are high: in 2011 more than 2.1 billion euro per year. Almost 1.4 billion of this is for care provided by medical specialists (1.4 billion euro). Expectations are that this care expenditure will double to 4.2 billion in 2030.

Based on claim data, an estimated 375 million euro was claimed in 2014 for the diagnostics and treatment of people with (suspected) stable angina pectoris. The Budget Impact Analysis (time path 2 years), [which is enclosed as an appendix with the original Room for Improvement Analysis], estimates avoidable costs to the health care budgetary framework (BKZ) amounting to circa €177 million per year, in addition to favourable effects on the health of patients with chest pain, upon implementation of the improvement activities. This sum includes €119.3 million due to future avoidance of using cardiac rehabilitation on stable AP patients - included in the guidelines but the efficacy of which was not proven in this in-depth analysis - who are treated with medication alone or in combination with PCI.

The Budget Impact Analysis helps parties to substantiate accountable growth. After all, the demand for care is rising while at the same time we want the growth in care expenditure to be moderate. The avoidable costs we calculated are an estimate based on concrete improvement activities agreed. This does not include the avoidable costs of, e.g., improved collaboration between primary and secondary care (LTA) or the guidance for diagnostic tests in secondary care.

7.6 Reactions following administrative consultation

The management boards consulted agree on the whole with the conclusions and improvement activities in this Room for Improvement report. Some matters, such as the LTA, have already been initiated.

The *Zorginstituut* made a few alterations in the Room for Improvement report in response to reactions. For instance, the planning for the LTA and NHG standard was altered and the term 'decision aid' was replaced by 'decision aid and/or extensive

information to support joint decisions in the consulting room'. In addition, at the request of the NHG and the NVvR, the agreement on arriving at guidance for secondary care was moved to the main agreements, due to the urgent need that was emphasised.

A number of parties expressed their objection to specific improvement activities. Within this framework, the NVVC stated that they felt that the stress test should remain available for use in secondary care, despite the acknowledged knowledge lacuna due to a lack of studies on its clinical use and its very limited clinical validity (a lot of false negatives and false positive test results). However, the *Zorginstituut* persists in its conclusion that the stress test should no longer be used routinely, but only in exceptional cases. After all, it is uncertain whether the stress test has any health benefit for patients and using the stress test as a diagnostic test may actually lead to health loss.

The KNGF/VHVL are largely in favour of the proposed improvements of recommending heart rehabilitation for stable angina pectoris patients with CABG and 'very occasionally' for patients treated with PCI and medicines, despite their reservations about how the systematic review is implemented. The NVVC, though it acknowledges the knowledge lacuna relating to the effectiveness of heart rehabilitation for people with stable angina pectoris, nevertheless argues that heart rehabilitation should be accessible for all stable angina pectoris patients. It is specifically due to this knowledge lacuna that the *Zorginstituut* concludes that heart rehabilitation should be used only very occasionally for patients receiving medicinal or PCI treatment. After all, it is uncertain whether heart rehabilitation does bring health gains for these patients. All parties support the analysis that not everyone should receive (/be offered) CVRM and agree to this improvement activity.

The BIA (Budget Impact Analysis) statistics are estimates of costs that could potentially be avoided. The *Zorginstituut* agrees with the viewpoint that the BIA statistics are an estimate. Some parties see reason to advise against including the BIA in the report. However, the *Zorginstituut* wants to offer the BIA as a tool to help the parties to substantiate accountable growth in care costs. After all, the demand for care is rising while at the same time we want the growth in care expenditure to be moderate. For the rest, the avoidable costs estimated in the BIA may actually be too low, as they were calculated based only on the concretely agreed improvement activities. Not included are avoidable costs that might result from, e.g., improved collaboration between primary and secondary care (LTA) or guidance on diagnostic tests in secondary care. The NVVC argues that exceptions always exist when advising based on patient characteristics. This is indeed the case. The concretely formulated improvement activities for diagnostic, preventive or therapeutic interventions were determined based on a shared vision of what constitutes good care. The majority of diagnostics and therapeutic interventions can be expected to take this course; though clearly exceptions can still be made in consulting rooms. The NVVC argued that the improvement activities can only be implemented after completion of the cooperation agreements, guidelines and research for the knowledge lacunas. The *Zorginstituut* is aware of the importance of the cooperation agreements, guidelines and research, but would like to emphasise that many improvement activities are independent of these. The tables on agreements in section 7 elaborate on which improvement activities can already be started.

8 Implementation, monitoring and evaluation

Implementation

Parties have already introduced some good initiatives. The *Zinnige Zorg* Room for Improvement report wants to add to these initiatives and intensify cooperation between the parties, the objective being to improve care for patients with chest pain even further.

Implementation of these improvement activities is up to the parties in health care, based on their respective accountabilities within the health care system. If necessary, and when asked by the parties, the *Zorginstituut* can support implementation; e.g., by organising meetings to get the parties together or by facilitating dissemination of the analysis and the improvement activities.

Monitoring

The *Zorginstituut* will monitor the improvement activities by discussing progress annually and sending a progress report to the Minister of VWS. Before publishing a report, the *Zorginstituut* will organise a meeting with all parties to discuss and align matters.

Evaluation

The *Zorginstituut* will evaluate the improvements realised about three years after publishing this Room for Improvement Report and send a report to the Minister van VWS.