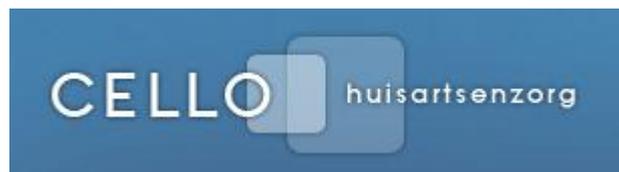


# **CARDIO-VASCULAR DISEASES PROTOCOL**



**CELLO**

**Leiden**

**August 2011**

## Introduction

This protocol includes the diagnostics, prevention and treatment of Cardiovascular diseases (CVD) and can be used as a tool for setting up and conducting consultations in the general medical practices of CELLO.

The CELLO way of working can be found on the website *www.cello-hazorg.nl* in the Cardiovascular diseases chapter. Here you can also find other protocols to read or download.

The objective of this protocol is to stimulate an optimal policy in identifying and treating patients with an increased risk of Cardiovascular diseases. The aim is to achieve similarity in the approach and treatment of patients by the practice nurse. This is conducted through:

- Protocolled diagnosis, treatment and check-ups of the risk factors in patients who have already been diagnosed.
- Identifying patients within the general medical practice with an elevated risk of Cardiovascular diseases

During the care programme, the practice nurse gives more insight into the disease by providing the patient with education and information, taking the following into account:

- General well-being;
- Modifying risk factors for CVD by optimising way of life, blood pressure and lipid values
- Prevention and postponement of complications
- On indication, referral to a specialist

The protocol and target values are based on the NHG (Dutch General Practitioners) Standard of Cardiovascular risk management which was published in 2006.

## CONDITIONS FOR SETTING UP A CONSULTATION

A consultation should be set up based on agreement between G.P. and practice nurse. Every general medical practice is different and depending on what is agreed, there may be differences in the execution. The different tasks of the general practitioner, practice nurse and assistant are therefore defined separately for each medical practice. However, there are still some general conditions which must be kept into account to set up an effective consultation.

### Defining the target group

Patients can be divided into two categories:

#### 1. Patients **with** CVD or Diabetes Mellitus type 2 (DM2)

For these patients, a risk profile is made to determine whether the treatment should be altered:

- Patients (marked) in the medical practice with a cardiovascular risk;
- Patients with Diabetes Mellitus (check-up takes place during the Diabetes consultation, see [www.cello-hazorg.nl](http://www.cello-hazorg.nl), Diabetes Mellitus);
- Patients who already have cardiac or vascular damage

#### 2. Patients **without** CVD or DM2

Patients with an increased risk of CVD are identified during the regular consultation. For the following patients, consider setting up a risk profile:

- Patients older than 60 years;
- Patients with a positive family anamnesis;
- Patients with obesity
- Patients who inquire about CVD themselves (if applicable, through a standardised questionnaire)
- Patients who are actively identified through an annual blood pressure measurement

For the following patients a risk profile should definitely be set up

- Systolic blood pressure (SBP)  $\geq$  140mmHG;
- Total cholesterol level (TC)  $\geq$  6,5 mmol/l;
- Males  $\geq$  50 years and females  $\geq$  55 years who smoke

### Principles of executing the consultation

Guidelines and protocols are discussed. For patients with a DM diagnosis the criteria are stricter. Agreements should be made regarding delegation of tasks to the practice nurse and practice assistant.

### **Invitation for the first consultation**

This can be done in the following ways:

- Send a letter with an appointment (Appendix 1), lab form (lipid spectrum and fasting plasma glucose), and questionnaire (Appendix 2)
- Practice nurse or assistant invites patient by phone;
- Referral by the general practitioner.

### **Possibility to review patients**

After the consultations, the practice nurse will report all patients to the general practitioner. During this review, diagnostic findings of the practice nurse, changes in medication and referrals to other disciplines can be discussed.

### **Evaluation**

Once a year, an evaluation must take place within the medical practice by the general practitioner and practice nurse. By regularly evaluating tasks within the practice, any developments can be discussed and if necessary tasks can be adapted accordingly.

## DIAGNOSTICS

### Setting up a risk profile

The Cardiovascular risk profile is an overview of risk factors which are relevant for CVD:

- Age;
- Sex;
- Smoking;
- Systolic blood pressure (SBP);
- Fasting plasma glucose;
- Lipid spectrum (TC, HDL, TC/HDL-ratio, LDL, TG)<sup>1</sup>;
- Family anamnesis (father, mother, brother or sister with CVD before the age of 60);
- Diet (saturated fat, fish, vegetables, fruit and salt intake);
- Alcohol consumption;
- Physical activity;
- Body mass index (BMI) and abdominal circumference.

### Determining the blood pressure

Blood pressure should be measured according to the protocol (see appendix 4).

Other ways of measuring the blood pressure are a 24-hour measurement or measurement at home in case of increased 'white coat' blood pressure, i.e. if the patient is anxious to have the blood pressure measured by a doctor.

Measure the blood pressure twice during a consultation and calculate the average; repeat the measurements after at least 24 hours if  $SBP \geq 140$  mmHG; use the average of the two measurements from the last consultation.

### Laboratory measurements

- Fasting lipid spectrum: TC, HDL, LDL, TG:  
If  $TC > 8$  mmol/l or TC/HDL ratio  $> 8$  mmol/l rule out family hypercholesterolaemia.  
The TC/ HDL ratio is used to estimate the risk. The LDL value is used to monitor the treatment.
- Fasting plasma glucose:  
If  $> 6.9$  mmol/l (venous), repeat measurement (if value stays too high, start Diabetes protocol)
- Before starting treatment, determine serum creatinine and serum potassium values  
Also for ACE-inhibitor and/ or use of diuretics. Also kidney test for microalbuminuria (renal damage).

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<sup>1</sup> TC= Total cholesterol, HDL= High density lipoprotein cholesterol, LDL= Low density lipoprotein cholesterol, TG= Triglycerids

Increased blood pressure can be caused by underlying diseases. Consider further investigation in case of the following:

- Clinical disorders, e.g. symptoms of Cushing syndrome
- SBP > 180 mmHG;
- Hypokalaemia (<3.5 mmol/l);
- Renal function disorder (elevated serum creatinine and glomerular filtration rate < 60 ml/min);
- Therapy resistance

### **Anamnesis and investigation by practice nurse**

<b>History</b>	Diabetes Mellitus 2 Fat metabolism disorders Angina pectoris Myo-cardial infarction Cardiac failure CVA TIA (transient ischemic attack) Peripheral vascular disease Aortic aneurysm Coronary heart disease in parents, brothers or sisters < 60 years
<b>Anamnesis of cardiovascular pathology</b>	Anginous symptoms Claudication symptoms Symptoms indicating cardiac failure
<b>Anamnesis of lifestyle</b>	Diet Smoking Physical exercise and sports activities Work / hobbies Medication use (e.g. oral contraception, corticosteroids, NSAID's) Alcohol consumption
<b>Measurements</b>	Blood pressure; twice in 1 consultation Length Weight Abdominal circumference Optional: ankle / arm index Quetelet-index (calculated automatically in the measurement module)
<b>Lab</b>	Plasma glucose level Cholesterol, HDL-Cholesterol TC/HDL-ratio Triglycerids Creatinine Potassium if applicable ALAT Homocysteine Urine

When all data has been collected, an appointment is made with the general practitioner if necessary. The decision whether to conduct an ECG should be made by the G.P during the next consultation.

Annual check-up on indication.

### **Anamnesis by the general practitioner**

Depending on what has been agreed, a consultation with the general practitioner may follow. The general practitioner adds details to the anamnesis to determine the Cardiovascular risk profile.

- Cardiovascular pathology: myocardial infarct, heart failure, peripheral vascular disease CVA, TIA or symptoms indicating angina pectoris, decompensation cordis or kidney disorders;
- Coronary heart diseases of parents, brother or sister before the age of 60;
- Starting or adjusting medication

### **Physical examination by the general practitioner**

- Cardiac auscultation (souffle's, 3rd / 4th heart sound);
- Palpation of apex beat (ictus cordis);
- Central venous pressure (CVP);
- Pulmonary auscultation;
- Pitting edema of ankles
- Peripheral circulation: pulsations, cyanosis, body temperature;
- Hepatomegaly;
- Palpation of abdominal aorta

### **Risk estimation**

For patients **without** CVD and **without** DM2 a risk estimation is made (see appendix 5). In the SCORE risk function measure, the mortality risk due to CVD within ten years is estimated base on the following factors in the risk profile:

- Age
- Sex
- Smoking
- SBP
- TC/HDL-ratio

## TREATMENT

After making the diagnosis, the general practitioner initiates the treatment. The choice of interventions and the set-up of a treatment programme is done in collaboration with the practice nurse and consists of:

- Non-medical treatment
- Medical treatment

### Non-medical treatment

#### *Lifestyle advice*

- Stop smoking;
- Sufficient exercise;
  - 30 minutes of cycling, brisk walking or gardening 5 days/ week
- Healthy diet;
  - less saturated fat, fish 1-2 times a week, 200 gram vegetables and 2 pieces of fruit a day, minimise salt intake
- Limit alcohol consumption;
  - men maximum 3 glasses a day, women maximum 2 glasses a day
- Aim for optimal body weight
  - BMI < 25, abdominal circumference men <80 cm, women <94 cm

### Medical treatment

The initiation of medication is done by the general practitioner. To determine the indication for medical treatment a distinction is made between:

- Patients **with** CVD or DM2
- Patients **without** CVD or DM2

#### Patients with CVD

Start acetylsalicylic acid

- Unless indication for anticoagulant (atrial fibrillation, structural cardiac malformation)
- In case of hypersensitivity start clopidogrel

Start ACE- inhibitor

- After coronary revascularisation, myocardial infarction or heart failure based on coronary heart disease

Start  $\beta$ -blocker

- If SBP  $\geq$ 140 mmHg
- For angina pectoris, previous myocardial infarction, heart failure

Start statin

- If LDL >2,5 mmol/l
- If LDL <2,5 mmol/l and high increased risk (recidivating myocardial infarction, positive family anamnesis, clustering risk factors)

For patients with a previous cerebral infarct or TIA, consider starting blood pressure reducing medication, even if blood pressure is normal.

### **Patients with DM2**

Treatment of glucose regulation according to the NHG (Dutch General Practitioners Association) Standard for DM2.

In case of increased blood pressure (SBP  $\geq$ 140 mmHg) start antihypertensive drugs to prevent CVD and neuropathy.

Start statin

- If LDL >2,5 mmol/l or TC > 4,5 mmol/l
- If SBP  $\geq$ 140 mmHg and high increased risk (bad metabolism control, renal function disorder, positive family anamnesis, clustering of risk factors)

### **Patients without CVD and without DM2**

Medical treatment depends on the estimated risk of CVD and on the SBP and TC/ HDL-ratio (see appendix 5). Both the advantages and disadvantages of treatment should be taken into account.

10-year risk of death by CVD of  $\geq$ 10%

- Start antihypertensive drugs, unless SBP <140 mmHg
- Start statin, unless LDL <2,5 mmol/l

10-year risk of death by CVD of <10%

- Consider medical treatment if:
  - Positive family anamnesis ( CVD < age of 60)
  - Obesity (BMI >30) or abdominal circumference >88 cm for women, >102 cm for men
  - Indication of end-stage organ damage (albuminuria, renal function disorder, left ventricular hypertrophy)

If SBD  $\geq$ 180 mmHg, start antihypertensive drugs regardless of the CVD risk.

### **CHECK-UPS**

The check-ups are conducted by the practice nurse. The check-up scheme is set up individually, based on the risk profile, (co)morbidity and personal preferences. For all patients with an elevated risk, one annual check-up forms the basis. Schemes for 3-monthly and annual check-ups can be found in Appendix 6 and 7.

### **Initiation of medication**

- Check SBP every 2-4 weeks during first 3 months;
- Target SBP <140 mmHg;
  - If SBP < 140 mmHg, check-up after 3 months
  - If SBP > 140 mmHg, check-up after 1 month
- In case of non-potassium sparing diuretics:
  - 3-monthly potassium check-ups per year
  - If potassium < 3,5 mmol/l, a thiazide/potassium sparing diuretic should be prescribed
- Check statin therapy after 6 weeks and after 3 months (LDL);
  - With CVD/DM2: target value LDL <2,5 mmol/l
  - Without CVD/DM2: target LDL decrease of at least 1,0mmol/l

### **Annual check-up**

After the initiation period, an annual check-up for potassium and creatinine values is needed when diuretics and ACE-inhibitors are used. During every check-up, the blood pressure should be measured twice. If the blood pressure is stable, the blood pressure can be checked annually. See scheme for annual check up (Appendix 7).

In case of an elevated glucose value, the patient can be forwarded to the Diabetes consultation of CELLO.



# **CARDIOVASCULAR DISEASES PROTOCOL APPENDIX**

**Appendix 1**

Invitation letter

**Appendix 2**

Questionnaire to prepare for a check-up consultation concerning cardiovascular risk management for patients *with* CVD and/or DM2.

**Appendix 3**

Reminder letter

**Appendix 4**

Protocol blood pressure measurement

**Appendix 5**

Table: Mortality risk for patients *without* CVD and DM2

**Appendix 6**

Scheme for 3-monthly check-up by assistant

**Appendix 7**

Scheme for annual check-up

[G.P. name and address]

[Place, date]

[Patient name and address]

Dear Sir/Madam,

Until now, your blood pressure and cholesterol value have been checked during the regular consultation. In this general medical practice a special consultation has now been initiated for patients with these problems. During this consultation, we would like to put more focus on the prevention of cardiovascular diseases. We offer to set up a risk profile and to investigate which cardiovascular risk factors are present for you. We will also pay attention to your lifestyle. If there are any possibilities to reduce the risk by adapting your lifestyle, we can help you.

The consultation for cardiovascular risk management will take place on [...]. Our practice nurse [...] will lead this consultation. The practice nurse and general practitioner [...] work together closely. The practice nurse has completed a special education for this task.

To prepare for this consultation, we ask you to fill in the attached questionnaire in advance. We request you to take the completed questionnaire to your next check-up.

If your symptoms get worse before the next special cardiovascular consultation on the date indicated above, you can make a regular appointment with your general practitioner.

Hopefully this information is clear and sufficient. If you have any questions, please do not hesitate to contact the practice nurse.

Kind regards,

[G.P. name]

You have been invited to the cardiovascular risk management consultation. To prepare for this consultation, we ask you to answer several questions in advance. In this way, the practice nurse will know which questions are important to discuss further.

**General**

What do you definitely want to discuss during your visit?.....

**Symptoms**

Do you have symptoms you want to discuss?  yes  no

If yes, which? .....

In the past few years, have you suffered from heart or coronary diseases?  yes  no

Do you suffer from:

- pain in the chest?  yes  no

- palpitations?  yes  no

- shortness of breath during exercise?  yes  no

- fatigue during exercise?  yes  no

- bloated ankles?  yes  no

- painful legs when you walk?  yes  no

If yes, does the pain go away after rest?  yes  no

**Medication**

Do you experience problems with your medication?  yes  no

**Lifestyle**

Do you smoke?  yes  no

If yes, have you ever considered stopping?  yes  no

Have you tried to stop smoking during the past year?  yes  no

Have you been on a diet during the past year?  yes  no

Would you like to change something about your eating habits?  yes  no

Do you have questions about nutrition?  yes  no

If yes, which? .....

During the past year, did you exercise less than before?  yes  no

Would you like to exercise more frequently?  yes  no

Do you have questions about physical exercise?  yes  no

If yes, which? .....

[G.P. name and address]

[Place, date]

[Patient name and address]

Dear Sir/Madam,

Some time ago, you received some information about a special cardiovascular diseases consultation. You have been invited to this consultation because one or more risk factors are present in your situation. This means you may have an increased risk of developing problems with your heart or arteries.

Currently you probably experience little to no symptoms, possibly due to any medication you are taking. For this reason, a check-up may seem unnecessary. However, because of the identified risk factors, it is important that you are checked regularly.

In this general medical practice a special consultation has now been initiated for patients with these problems. During this consultation, we would like to put more focus on the prevention of cardiovascular diseases. The consultation for cardiovascular risk management will take place on [...].

Your last check-up took place on [date]. Another check-up is advisable. Therefore, please contact the practice nurse promptly to confirm your presence at the cardiovascular consultation for your check-up.

Kind regards,

[G.P. name]

## Appendix 4

### Blood pressure measurement protocol

1. Blood pressure (BP) is measured:
  - In patients who have previously been diagnosed with high BP and/or increased cardiovascular risk profile
  - At least annually in patients without previously diagnosed hypertension
  
2. The measurement is conducted in the following way:
  - The patient has been seated and calm for at least 10 minutes;
  - No talking during the measurement;
  - Place the centre of the inflatable cuff at the same height as the centre of the breastbone / heart level;
  - Pump upto 200 mmHg, if necessary upto 240mmHg if arterial 'whooshing' (pounding) is still heard;
  - Let the mercury column drop at a speed of 2mm/sec;
  - Determine the systolic blood pressure (SBP) when the tones become audible. Determine the diastolic blood pressure (DBP) when the tones disappear. Only when the tones stay audible at (or close to) 0 mmHg, use the value indicated when the tones cease to be clearly ticking (pumping). In this case, note down the value followed by /0;
  - Determine the BP value with an accuracy of 2mmHg;
  - During the first consultation, measure the BP in both arms. If the difference in DBP or SBP is 10mmHg or higher, measure the BP again in the arm with the highest value. During the next consultations, measure the BP in the arm with the highest value. In other cases, the BP is usually measured in the right arm (or left arm, if the medical practice prefers this);
  - Measure BP twice during the consultation and calculate the average
  
3. If the BP of a diabetes patient without diagnosed hypertension is  $>140/95$  mmHg, follow-up measurements are necessary.

If DBP is between 85-104 mmHg or SBP  $\geq 140$ mmHg, at least 5 follow-up measurements in the next 3-6 months are necessary to make the diagnosis of hypertension.

If DBP  $\geq 105$ mmHg, at least 3 follow-up measurements in the next 1-3 months are necessary to make the diagnosis of hypertension.

If during these 3 follow-up measurements DBP  $< 85$ mmHg and SBP  $< 140$ mmHg, further measurements are not necessary.

Determine the DBP and SBP based on the number of measurements that are advised. Don't take the first (entry) measurement into account.

If a diabetes patient with hypertension has BP  $> 140/95$  mmHg, consult the G.P. Request the patient to come back after 2 weeks for another check-up. If continued BP  $>140/95$  mmHg, consult the G.P. again.

Appendix 5. Mortality risk for patients without CVD and without DM2

		Female					Male														
		<i>Non-smoker</i>					<i>smoker</i>														
SBD	Age																				
		4	5	6	7	8	4	5	6	7	8										
180	65	8	10	11	13	14	15	18	20	23	26	13	15	17	20	22	23	27	31	35	38
160		6	7	8	9	10	11	13	15	17	19	9	11	13	14	16	17	20	23	26	29
140		4	5	6	7	7	8	9	11	12	14	6	8	9	10	12	12	15	17	19	21
120		3	3	4	5	5	5	7	8	9	10	5	6	7	7	8	9	11	12	14	16
180	60	4	5	6	7	8	8	10	11	13	14	7	9	10	12	13	14	16	19	21	24
160		3	4	4	5	5	6	7	8	9	10	5	6	7	8	9	10	12	14	16	17
140		2	3	3	3	4	4	5	6	7	7	4	5	5	6	7	7	9	10	11	13
120		1	2	2	2	3	3	3	4	5	5	3	3	4	4	5	5	6	7	8	9
180	55	2	3	3	4	4	4	5	6	7	8	4	5	6	7	8	8	10	11	13	15
160		2	2	2	3	3	3	4	4	5	5	3	4	4	5	6	6	7	8	9	11
140		1	1	2	2	2	2	3	3	3	4	2	3	3	4	4	4	5	6	7	8
120		1	1	1	1	1	1	2	2	2	3	2	2	2	3	3	3	4	4	5	5
180	50	1	1	2	2	2	2	3	3	4	4	3	3	4	4	5	5	6	7	8	9
160		1	1	1	1	2	2	2	2	3	3	2	2	3	3	3	4	4	5	6	6
140		1	1	1	1	1	1	2	2	2	2	1	2	2	2	2	3	3	4	4	5
120		0	1	1	1	1	1	1	1	1	2	1	1	1	2	2	2	2	3	3	3
180	40	1	1	1	1	1	1	1	2	2	2	1	1	1	1	2	2	2	2	3	3
160		0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2
140		0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2
120		0	0	0	0	0	0	0	1	1	1	0	0	0	1	1	1	1	1	1	1

### Total cholesterol/HDL-cholesterol ratio



The values represent an estimation of the 10-year mortality risk (%) caused by CVD in The Netherlands for non-smoking and smoking males and females of 65, 60, 55, 50 and 40 years old, based on the SCORE risk function test.

The colour-coding can be used as a global indication of the proposed treatment (see 1.2 and 4.2.1.3 in the NHG Standard CVRM):

-  = no treatment
-  = lifestyle advice: consider medication in case of additional risk factors or for young patients who have a 10-year risk of  $\geq 10\%$  at the age of 60 with the same risk profile (see 4.2.1.3. in the NHG Standard CVRM).
-  = Lifestyle advice: consider medical treatment
-  = Lifestyle advice and medical treatment

## **Appendix 6**

### **3-monthly check-up by practice nurse / assistant**

#### **Anamnesis and physical examination**

- ❑ Discuss general well-being
- ❑ Discuss reason for this education
- ❑ Evaluation of non-medical treatment advice
- ❑ Side-effects of medication
- ❑ Therapy compliance
- ❑ Advice about lifestyle improvements
- ❑ Smoking habits and advice how to stop
- ❑ Alcohol consumption
- ❑ Physical exercise
- ❑ Diet
- ❑ Check weight (take shoes and coat off)
- ❑ Check for symptoms of ankle edema
- ❑ Measure BP twice (see protocol BP measurement)
- ❑ Pulse

#### **Registration**

- ❑ Register data in computer and on BP passport
- ❑ Register new patients in evaluation file for G.P.
- ❑ Make new appointment with patient
  - If SBD < 140mmHg → check-up after 3 months
  - If SBD > 140mmHg → check-up after 1 month
  - After starting ACE-inhibitor and/or statin, control creatinine and LDL via lab
- ❑ If necessary, provide patient with brochures

#### **Evaluation with G.P.**

- ❑ Evaluation takes place on a fixed day and time
- ❑ Side-effects of medication
- ❑ Tension which does not drop
- ❑ Irregular pulse
- ❑ On patient's request
- ❑ On assistant's request

## **Appendix 7**

### **Annual check-up by practice nurse / assistant**

After previous consultation, patient has been invited with a letter to make an appointment for a new consultation and a lab visit. If applicable, a questionnaire is attached (see Appendix 2).

#### **Anamnesis**

- General well-being
- Explanation of consultation objective
- Explanation of BP passport
- Discuss symptoms or side-effects of medication; therapy compliance
- Liquorice, alcohol and NSAID consumption
- Smoking
- Physical exercise
- Any changes in family anamnesis

#### **Physical examination**

- Measure BP 2x and take average of measurements
- Pulse rhythm and frequency
- Abdominal circumference
- Weight (take shoes and coat off)
- BMI

#### **Lab study (fasting):**

- Creatinine
- Lipid spectrum
- ALAT
- Plasma glucose
- Sodium and potassium (if using diuretics)
- Proteins in urine

#### **Information and advice (orally and written)**

- Discuss lab outcomes
- Explain therapy proposal
- Brief summary of previously supplied information
- Brief recap of importance of balance between nutrition, medication and exercise
- Importance therapy compliance
- Explain complications
- Written information: NHG Patient letters

#### **Referral to other disciplines:**

If necessary refer to

- Stop smoking programme
- Dietician

**Discuss with G.P:**

- ❑ Side-effects of medication
- ❑ On patient's request
- ❑ On assistant's request

In case of insufficient results (i.e. target values are not met), the practice nurse discusses this further with the G.P.

**Registration**

- ❑ Adapt risk profile
- ❑ Register data in computer and BP passport
- ❑ Make new appointment with patient