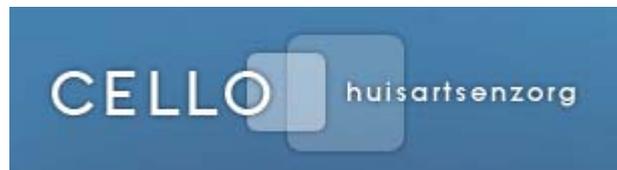


# ASTHMA PROTOCOL



**CELLO**

**Leiden**

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## Introduction

This protocol includes an explanation of the clinical picture, diagnosis, objectives, non-medical and medical therapy and a scheme for inhaler dosage. The Cello way of working can be viewed on the website [www.cello-hazorg.nl](http://www.cello-hazorg.nl) in the chapter WAY OF WORKING LUNG PATIENTS CELLO.

You can also read or download other protocols here.

## Asthma (summary of clinical picture)

Asthma is a chronic disease in which the airways show a hypersensitive reaction to certain triggers. This causes (temporary) narrowing of the air passages in reaction to a specific allergen that is perceived as harmful. This is followed by a contraction of the airway muscles (smooth muscle tissue), swelling of the airway wall (inflammatory reaction) and increased sputum production (usually thick mucus). In this way, a chronic inflammatory process in the airways develops.

The **triggers** that can cause asthma symptoms can be divided into two groups:

- Specific allergens. These are allergic triggers;
- Non-specific stimuli. These are non-allergic triggers.

The most common specific allergens are:

- House dust mite;
- Grass and tree pollen, many kinds of weeds;
- Animal dander (dead skin flakes) e.g. from cats, dogs, horses and rabbits;
- Fungus

The most common non-specific stimuli are:

- (Smoke) fumes or other air pollution;
- Fog and cold (and/or sudden temperature transitions);
- Physical exercise;
- (Perfume) fumes;
- Irritating products such as domestic detergents;
- Paint and diesel fumes, or other irritating fumes

These are airway allergens.

There are also allergens that enter the body in a different way, such as through the gastro-intestinal tract (e.g. peanuts) or through the skin (insect poison through bites, metals or preservatives in cosmetics, etc)

(Viral) infections can also be an important trigger for asthma, and for this reason a preventive annual flu vaccination is important.

## **Symptoms:**

Symptoms of asthma are: shortness of breath, usually with coughing and sputum production and audible wheezing. Symptoms can vary in presence and severity.

## **Causes:**

As far as we know, the most important cause of asthma is genetic disposition. Even though the cause can not be tackled, generally the symptoms are well treatable.

## **Types of asthma:**

There are several forms of asthma, such as exercise induced asthma (during sports) or occupational asthma (work environments such as bakeries and hairdressers). Some diseases are related to asthma, such as eczema and hay fever.

## **DIAGNOSIS**

The signs and symptoms in asthma are more important than the outcome of the spirometry test, and therefore anamnesis (prior history) is very important. The doctor makes the diagnosis. The diagnosis can be supported by spirometry and allergy tests.

According to the NHG (Dutch General Practitioners Association), the diagnosis of asthma can be given when:

- Patients show periodic signs of dyspnea (shortness of breath), wheezing in the chest and/or (productive) coughing.
- The diagnosis is confirmed with a spirometry test with demonstrated reversibility (=measuring additional air after giving a bronchodilator ( $\geq 12\%$  after bronchdilation or  $\geq 200\text{ml}$  in case of a smaller lung volume)).

In patients with (suspicion) of asthma it is advisory to conduct a spirometry test during a period of symptoms.

In the following situations the patients should be referred to a lung specialist<sup>1</sup>:

- Doubts about the diagnosis or persistent symptoms;
- Insufficient response to step 3 medication;
- Persistent severe obstructive lung function;
- (suspicion of) restrictive lung disorder;
- (suspicion of) lung carcinoma;
- (suspicion of) occupational asthma/ food allergy;

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<sup>1</sup> See also the NHG Standard on Asthma in adults M27 (2007)

- 2 or more exacerbations per year, for which corticosteroids or hospitalisation was necessary;
- If during a severe exacerbation no improvement is shown within 30 minutes, despite acute treatment.

## **TARGET GROUP AND OBJECTIVES**

The target group consists of all patients with asthma that are part of the final medical responsibility of the general practitioner.

### **General objectives**

- Identifying patients with asthma within the general practice by a validated method of diagnosis
- Improving the care for asthma patients, by offering modular supervision by the practice nurse, adapted to the individual patient.

The objective of asthma treatment is for the patient to experience the least possible inconvenience of the asthma.

The most important factors on which asthma treatment focuses is avoiding (as much as possible) the triggers of asthmatic reactions and (good) inhalation of medication.

### **Specific objectives for asthma patients**

Increasing self-management plays a part in all objectives. The objectives are:

- Reduce or eliminate symptoms so that everyday activities are possible;
- Avoid exacerbations;
- Achieve or maintain a stable lung function with as little as possible maintenance treatment

According to the NHG Standard this means:

- (Almost) symptom free during the day (< twice a week);
- No functional constraints
- No nocturnal symptoms
- (Almost) no usage of short-acting bronchodilators (< twice a week)
- Normal FEV1 or peak expiratory flow rate (PEF)
- Asthma exacerbation (almost) absent (< once a year)

In general, asthma is well treatable. Therapy can be divided in non-medical and medical therapy.

## NON MEDICAL THERAPY

Three components of non-medical therapies are:

- Smoking cessation
- Exercise
- Clean home environment

### *Smoking cessation*

On top of the general disadvantages of smoking, with asthma smoking will worsen the course of the disease. The effectiveness of corticosteroid inhalers will decrease.

### *Exercise*

A healthy exercise scheme is necessary for maintaining and training the physical condition (e.g. strengthening of the heart, lungs (respiratory) muscles).

### *Clean home environment*

This means making the (home) environment allergen free as much as possible. Especially in case of a proven allergy for house dust mite or pets home cleaning can help, although proof of effectiveness of common measures, such as allergy mattress covers, is limited.

### *Other disciplines*

Referral to a *physiotherapist* in case of breathing problems and/or the need to improve (breathing) techniques.

The *lung nurse* can be applied as an expert in advice on creating an allergen-free home environment.

A *dietician* can tackle overweight, if applicable. Weight loss can reduce breathing problems. If BMI > 30 health insurance covers the costs of a dietician.

## MEDICAL THERAPY

Bronchodilators and corticosteroid inhalers are at the basis of medical therapy for asthma. However, they focus only on the symptoms; they counteract symptoms and avoid the disease getting worse.

Asthma medication<sup>2</sup> consists mainly of inhalers, with a choice between dose aerosols (usually with holding chamber) and powder inhalers.

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<sup>2</sup> Please see the (more) extensive NHG Standard and pharmacological compass

The NHG standard contains 3 schemes for medication guidelines:

- Short-acting bronchodilators
- Long-acting bronchodilators
- Corticosteroid inhalers (CSI)

### **Medical build-up scheme for asthma (NHG)**

The build-up scheme only contains inhalers in increasing order by severity of the disease. Oral medication prescribed by the G.P., such as leukotriene receptor antagonists (LTRAs) are not incorporated in the NHG build-up scheme.

**Step 1 Intermittent asthma** with short-acting bronchodilator 'as necessary' (ICPC code R96.1 without allergies, ICPC code R96.2 with allergies)

*Symptoms:*

- $\leq$  twice a week: short acting  $\beta_2$ -sympathomimetic drug during symptoms;
- If age  $>$  60 years or in patients with heart disease there is a slight preference for ipratropium bromide;
- If a patient has symptoms more than twice a week, and uses 2 or more 'puffs' of short-acting  $\beta_2$ -sympathomimetic drugs per week, the patient should move to corticosteroid inhalers. Also if this is related to exercise induced asthma.

*Exercise induced asthma* occurs before or after physical exercise (ICPC code R96.3). Advise 1 or 2 'puffs' of short-acting  $\beta_2$  sympathomimetic drug 10-15 minutes before exercise. This protects for about 2 hours. For more lengthy exercise, a long-acting bronchodilator can be given. (The only exception for prescribing long-acting bronchodilator without giving CSI!).

**Step 2 Mild persistent asthma with or without allergy** with maintenance treatment of low or moderate dosage of CSI (ICPC code R96.6).

*Symptoms:*

- Symptoms  $>$  twice a week. Treatment consists of low to moderate dosage of corticosteroid inhalers, possibly (temporarily) together with a short-acting  $\beta_2$ -sympathomimetic drug.

After the patient has started with CSI, check every two to four weeks whether the treatment objectives are met. Subsequently, if necessary check once or several times until the treatment objectives are met/continue to be met and continue the CSI dosage for three months.

If asthma symptoms worsen, a short-acting  $\beta_2$ -sympathomimetic drug can be added until a maximum of eight inhalations.

**Step 3 Moderate/ severe persistent asthma with or without allergy (ICPC code R96.6).**

*Symptoms:*

- Not achieving targets, in spite of step 2, reconsider diagnosis and current policy;
- If there is no doubt about diagnosis of asthma, consider adding a long-acting  $\beta_2$ -sympathomimetic drug and moderate dosage of CSI; or doubling CSI. (long-acting  $\beta_2$ -sympathomimetic drug can only be used as maintenance treatment *next to* CSI<sup>3</sup>).

Again, if asthma symptoms worsen, a short-acting  $\beta_2$ -sympathomimetic drug can be added for several days.

**Step 4 Severe persistent asthma with or without allergy (ICPC code R96.6)**

*Symptoms:*

- Insufficient reaction to step 3;
- Treatment with high dosis of CSI with long-acting  $\beta_2$ -sympathomimetic drug or ipratropiumbromide, or both, or maintenance treatment with oral CSI;
- Treatment together with or referral to lung specialist.

The NHG Standard states that the pharmacotherapy compass should be consulted. Some dosage aerosols/ powder inhalers have lower (maximum) dosages. For more information on side effects the pharmacotherapy compass can also be consulted.

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<sup>3</sup> The only exception is exercise-induced asthma during sports activities for more than two hours. For physical exercise shorter than two hours, a short-acting bronchodilator can already have sufficient effect.

## INHALER DRUG DOSAGE SCHEME

Please find below the dosage of all inhaler drugs that the NHG includes:

### Dosage short-acting bronchodilators

<i>Indication</i>	<i>Drug</i>	<i>Powder inhaler 'where necessary'</i>	<i>Dosis aerosol 'where necessary'</i>
incidentally/ temporarily in case of: - intermittent asthma (step 1) - exacerbations (also during maintenance treatment with long-acting $\beta_2$ -mimetics) - exercise-induced asthma	Salbutamol	4 daily 100-400 mcg  <i>Max daily 1600 mcg</i>	4 daily 100-200mcg  <i>Max daily 1600 mcg</i>
	Terbutaline	4 daily 250-500mcg  <i>Max daily 4000 mcg</i>	
- incidentally for intermittent asthma >60 years (step 1) - maintenance treatment for severe asthma (step 4)	Ipratropium bromide	4 daily 40 mcg  <i>Max daily 320 mcg</i>	4 daily 20 mcg  <i>Max daily 320 mcg</i>

### Dosage long-acting bronchodilators

<i>Indication</i>	<i>Drug</i>	<i>Powder inhaler</i>	<i>Dosis aerosol</i>
Maintenance treatment next to CSI for (mildly) severe asthma (step 3 and 4)	Formoterol	2 x daily 6 - 12 mcg <i>Max daily 48 mcg</i>	2 x daily 12 mcg <i>Max daily 48 mcg</i>
Maintenance treatment next to CSI for (moderately) severe asthma (step 3 and 4)	Salmeterol	2 x daily 50 mcg <i>Max daily 100 mcg</i>	2 x daily 25 mcg <i>Max daily 100 mcg</i>

### Dosage corticosteroid inhalers

<i>Indication</i>	<i>Drug</i>	<i>Low dosage (per day)</i>	<i>Moderate dosage (per day)</i>	<i>High dosage (per day)</i>
Maintenance treatment for mild, moderately severe and severe asthma (step 2-4)	Beclomethasone	200 – 400 mcg	>400 -800 mcg	>800 -1600 mcg
	Budesonide	200 – 400 mcg	>400 -800 mcg	>800 -1600 mcg
	Fluticasone	100 -250 mcg	>250-500 mcg	>500 -1000 mcg

### Dosage combined preparations

<i>Indication</i>	<i>Drug</i>	<i>Powder inhaler</i>	<i>Dosage aerosol</i>
	Budesonide/ Formoterol	2 x daily 100/6-400/12 mcg  <i>Max daily 1600/48 mcg</i>	2 x daily 25/50 - 25/500 25/500  <i>Max daily 100/1000 mcg</i>
	Salmeterol/ Fluticasone	2 x daily 50/100- 50/500  <i>Max daily 100/1000 mcg</i>	

*Drugs not mentioned in the 2007 NHG Standard:*

The Standard is updated every five years. In the mean time new drugs have come to the market.

New drugs that can be administered for asthma:

The new corticosteroid inhaler Ciclesonide (Alvesco) is not in the standard, but is mentioned in the GINA guidelines, the international guideline for asthma. Here it is considered as a test treatment (CAHAG presentation of the new standard in 2007) for patients that suffer from side effects, such as hoarseness and fungus infections, from other CSI's that have been on the market for longer.

The combined preparation Beclomethasone/Formoterol metered aerosol dose (Foster) is also new, but is a combination of existing medicines that are mentioned in the standard.

## **Literature and websites**

NHG Standards 2007: Asthma / COPD in adults

NHG Practice guideline Asthma/ COPD, diagnostics and treatment.

Consulted websites:

[www.cello-hazorg.nl](http://www.cello-hazorg.nl)

[www.nhg.artsennet.nl](http://www.nhg.artsennet.nl)

[www.ersnet.org](http://www.ersnet.org)

[www.ginasthma.org](http://www.ginasthma.org)

[www.astmafonds.nl](http://www.astmafonds.nl)