

MINISTRY OF SOCIAL AFFAIRS AND HEALTH
WORKING GROUP MEMORANDUMS 1994:16eng

ASTHMA PROGRAMME IN FINLAND

1994 - 2004

MINISTRY OF SOCIAL AFFAIRS AND HEALTH
Helsinki 1994

PRESENTATION LEAF

Publisher	Date
Ministry of Social Affairs and Health/Finland	26.7.1994
Aurhors (in case of organs: name, chairman and secretary)	Art of the publication
Astma Working Group	Working Group Memorandum
Chairman	Principal
Secretary	Ministry of Social Affairs and Health
Kaj Koskela	
Tuulikki Nurmi	
Markku Turpeinen	
	Date of appointing the organ
	29.10.1993
The title of the publication	
Asthma Programme in Finland 1994 - 2004	
Parts of the publication	
Summary	
<p>The Asthma Working Group has designed a national programme in the form of recommendations for the prevention of asthma and treatment of asthma patients in 1994 to 2004. The goals of the programme are as follows: (a) as many patients as possible with incipient asthma recover, (b) asthma patients feel well, and their functional capacity corresponds to their age, (c) the percentage of patients with severe or moderate asthma falls from the current 40 % to 20 %, (d) the total number of annual bed-days decreases by 50 %, and (e) annual costs per patient fall by 50 %. The most important measures towards achieving the goals include: (a) early diagnosis and active treatment of individuals with asthma and asthma-like symptoms, (b) revision of the forms of treatment and hierarchy of referrals, (c) considerable reduction of environmental irritants such as tobacco smoke, (d) individually planned and correctly timed rehabilitation on an out-patient basis, (e) increase of knowledge about asthma in key groups, and (f) encouragement of research into asthma.</p>	
Key words	
Asthma	
Other data	
Title and number of the series	ISSN ISBN
Working Group Memorandum 1994:16eng	1237-0606 952-00-0009-7
Total number of pages	Language Price Confidentiality
62 pages	English 78 FIM
Distributor	Publisher
Ministry of Social Affairs and Health/Finland	Ministry of Social Affairs and Health/Finland

Ministry of Social Affairs and Health
Siltasaarekatu 18 C
00530 Helsinki

ISSN 1237-0606
ISBN 952-00-0009-7

Layout: AT-Julkaisutoimisto Oy

Painatuskeskus Oy, Helsinki 1995



To the Ministry of Social Affairs and Health

On 29 October 1993, the Ministry of Social Affairs and Health appointed a working group to design a national programme for the prevention and alleviation of problems caused by asthma and for reduction of the relevant costs paid by society. The working group was responsible for:

1. Investigating the social and health effects of and costs resulting from asthma;
2. Examining possibilities of preventing the development and activation of asthma and making relevant suggestions for measures to be taken;
3. Making suggestions concerning principles of treatment as regards self-care, immediate care, primary and specialized care, and suggestions concerning education, guidance and training required in the prevention of asthma;
4. Assessing the need for cooperation and distribution of work between different groups participating in the prevention and treatment of asthma and rehabilitation of asthma patients, and making relevant suggestions; and
5. Assessing the rehabilitation system intended for asthmatics and making the necessary suggestions for modifications.

The working group was chaired by Kaj Koskela, Special Advisor, Ministry of Social Affairs and Health. The Deputy Chairman was Tari Haahtela, Head Skin and Allergy Hospital, Allergy and Asthma Federation. The members were Eeva-Liisa Vakkilainen, Senior Supervising Officer, Ministry of Social Affairs and Health; Aarne Lahdensuo, Acting Professor, Finnish Association of Specialists in Pulmonary Medicine; Professor Lauri Laitinen, Helsinki University Central Hospital; Riitta Muotka, Organization Director, Federation of Finnish Lung Disease Associations; Timo Klaukka, Reader, Social Insurance Institution; Eeva Ahonen, Senior Medical Officer, Espoo Social Service and Health Centre; and Esko Kukkonen, Chief Engineer, Ministry of the Environment. The secretaries of the working group were Tuulikki Nurmi, Senior Planning Officer, Ministry of Social Affairs and Health, and Markku Turpeinen, D.Med., Helsinki University Central Hospital, Skin and Allergy Hospital.

The group named itself the Asthma Working Group, and met seven times in addition to separate divisional meetings. The term of the working group ended on 31 May 1994.

The working group consulted the following experts: Alf Backman, Reader,

Finnish Paediatric Association; Anja Helenius, Deputy Charge Nurse, Tampere University Hospital; Kaisu Juntunen-Backman, Reader, Helsinki University Central Hospital; Kari Kaukinen, Medical Director, Social Insurance Institution; Antti Koivikko, Head of Department, Turku University Central Hospital; Karl-Erik Kreis, Chief Physician, Kinkomaa Hospital; Henrik Nordman, Head of Department, Institute of Occupational Health; Timo Pitkälä, Medical Director, Tampere City Social Services and Health Department; Jouko Salminen, Specialist in Psychiatry, Social Insurance Institution; Professor Olli Seppänen, University of Technology; Associate Professor Brita Stenius-Aarniala, Helsinki University Central Hospital; Pirkko Syvänen, Specialist, Aurora Hospital; Professor Eero Tala, Paimio Hospital; Professor Erkki Terho, Turku University Central Hospital; Professor Hannu Tukiainen, Kuopio University Hospital; Timo Vanto, Specialist, Turku University Central Hospital; Ilpo Vilkkumaa, Executive Manager, Rehabilitation Foundation; and Ilkka Vohlonen, Research Director, Health Services Research Ltd. of Finland.

As commissioned, the working group designed a national programme in the form of recommendations for the prevention of asthma and treatment of asthma patients. The programme should be reviewed as necessary in line with rapid developments in medicine and, in particular, drug therapy. The group stresses that the patient, or parents if the patient is under age, and the attending health care professional and unit shall bear the primary responsibility for treatment. The presentation of the working group is based on numerous study results, investigations and practical experience. Detailed references are not given in the text.

On completion of its work, the working group hereby submits its memorandum to the Ministry of Social Affairs and Health.

Helsinki, 31 May 1994



Kaj Koskela



Tari Haahtela



Arne Lahdensuo



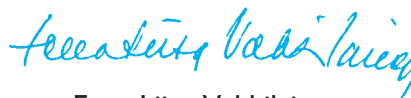
Riitta Muotka



Eva Ahonen



Tuulikki Nurmi



Eeva-Liisa Vakkilainen



Lauri Laitinen



Timo Klaukka



Esko Kukkonen



Markku Turpeinen



Contents

1.	Asthma from public health and financial perspectives _____	9
	1.1 Definition _____	9
	1.2 Prevalence _____	9
	1.3 Asthmatic population _____	15
	1.4 Costs _____	16
	1.5 Summary _____	18
2.	Goals of prevention and treatment _____	19
3.	Prevention of development and exacerbation of asthma _____	20
	3.1 Factors influencing development of and recuperation from asthma _____	20
	3.2 Prevention _____	21
	3.2.1 Individual health behaviour _____	23
	3.2.2 Environmental issues _____	24
	3.3 Summary _____	30
4.	Improving treatment _____	31
	4.1 Symptoms _____	31
	4.2 Treatment _____	33
	4.2.1 Diagnosis _____	33
	4.2.2 Treatment strategies _____	36
	4.2.3 Drug therapy _____	37
	4.2.4 Guided self-care _____	43
	4.2.5 Hierarchy of referrals _____	45
	4.3 Rehabilitation _____	47
	4.4 Social security _____	50
	4.5 Summary _____	52
5.	Information, training, research and follow-up _____	53
	5.1 Information and training _____	53
	5.2 Research and follow-up _____	54
	5.3 Summary _____	56
6.	Costs of the programme _____	57
7.	Summary _____	58

Asthma from public health and financial perspectives

— 1.1 —

Definition

In the 1992 international consensus statement, asthma was defined as an inflammatory disease of the bronchi, marked by increased numbers of inflammatory cells such as mast cells and eosinophilic white blood cells. In asthmatic individuals, inflammation causes symptoms including obstruction of the bronchi of varying degrees which subsides either spontaneously or in response to therapy. Inflammation increases the sensitivity of the bronchi to many irritants.

According to the Finnish legislation on occupational disease, occupational asthma refers to asthma resulting from exposure to biological, chemical or physical irritants. The causality between asthma and the exposure agent must be established with sufficient probability.

— 1.2 —

Prevalence

Asthma is one of the commonest public health problems in Finland. After hypertension and coronary heart disease, it is the third commonest chronic disorder requiring medication. It is also the commonest chronic disorder in children.

Extensive epidemiological population studies on the incidence and prevalence of asthma in Finland are few. Roughly 150,000 Finns, or three per cent of the population, have been diagnosed as asthmatics. A similar percentage of the population is on drug therapy or to social security because of asthma. Depending on the methodology, study material and definition of asthma, the prevalence rate may be up to five per cent or 250,000 individuals. The diagnosis of asthma is inaccurate as some individuals only have occasional asthma-like symptoms, such as prolonged cough and mild respiratory distress, without observable

impairment in pulmonary function tests. These symptoms may be associated with strain, respiratory infections or exposure to allergens and are usually of brief duration. Some individuals with these symptoms develop asthma (Fig. 1).

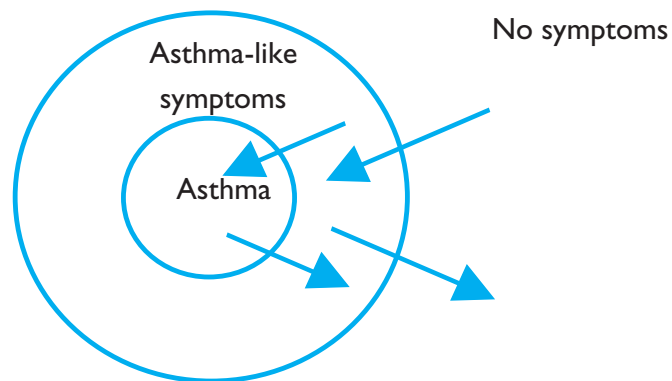


FIG. 1
Asthma and asthma-like symptoms

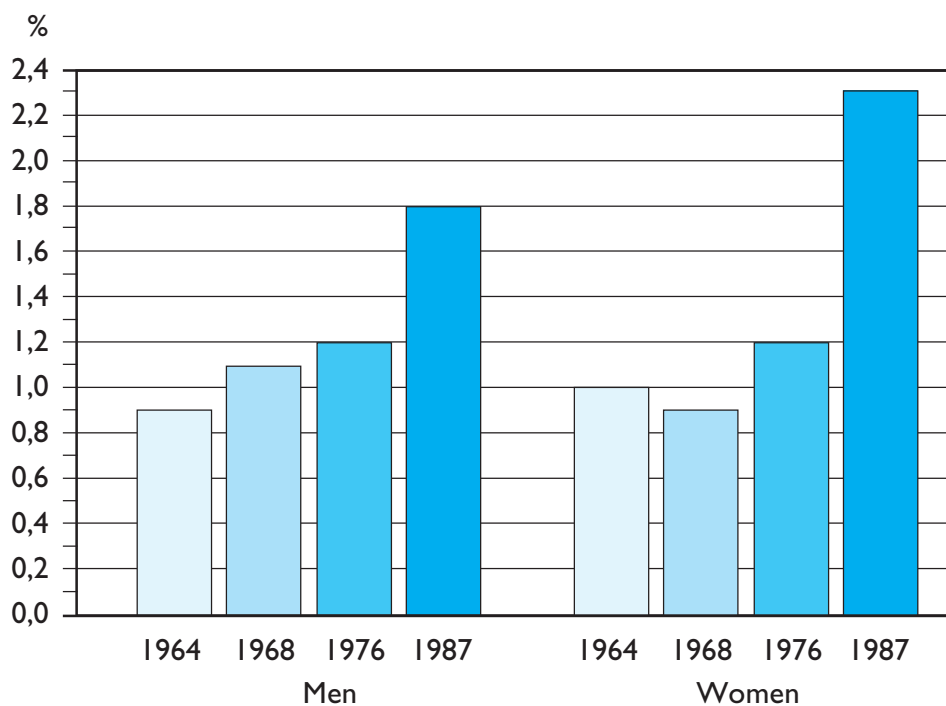


FIG. 2
Proportion of asthmatic individuals (%) in Social Insurance Institution population studies, 1964-1987

The percentage of asthmatic individuals in the population has increased especially over the past few decades (Fig. 2). The number of individuals entitled to special reimbursements for medicines prescribed for asthma has also increased by roughly 10% per year. At the end of 1993, 135,363 people were entitled to reimbursements, that is 11,000 more than the previous year. Increased rates

reflect in particular increases in subjective illness and its social consequences. There are also indications that, just as in other industrialized countries, asthma has also become more prevalent as a disease in Finland. Physical examinations carried out in the Finnish defence forces showed the prevalence of asthma in young men to be 0.3% in 1966 and 1.7% in 1991.

Nearly 400 working individuals develop occupational asthma each year. The number of cases of occupational asthma reported to the occupational diseases register has increased steadily over the past 15 years. Cases of asthma caused by animal danders (mainly cow's epithelium) and grain dust reported to the register have increased since 1982 when farmers were included in the legislation on occupational diseases (Fig. 3).

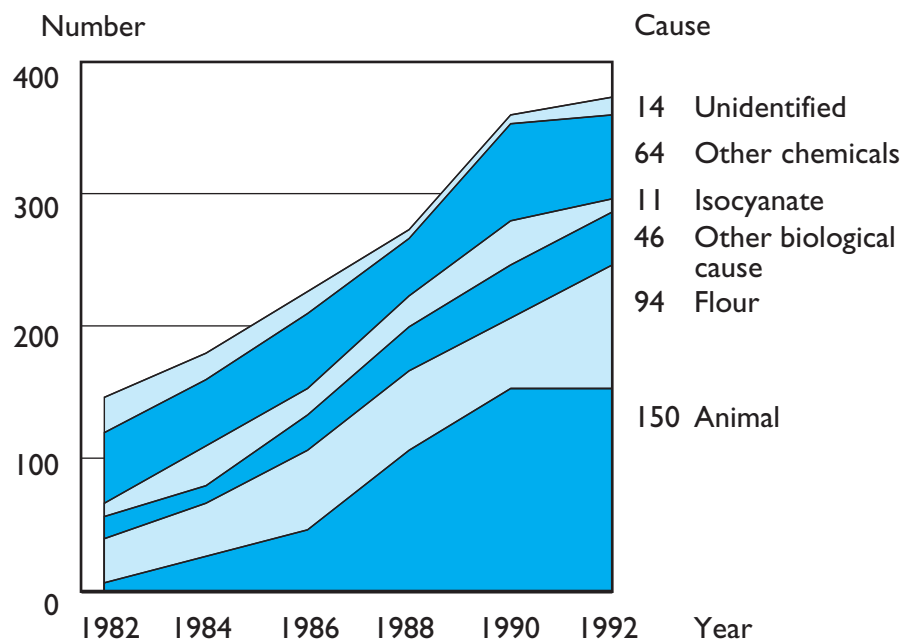


FIG. 3
Cases of occupational asthma entered into the Occupational Diseases Register in 1982-1992

Prevalence rates reported from several other western countries are higher than in Finland, ranging from 2 to 10% of the population. Differences in diagnostic criteria and study methods do not allow reliable comparison of prevalence rates between different countries. However, asthma is less common among Finnish emigrants in Canada than among other Canadians. In Finland, mortality from asthma is exceptionally low — just over 100 individuals a year — compared with Anglo-Saxon countries. In Finland, mortality rates from asthma have for long remained unchanged despite increased numbers of patients, compared with an increase in many other countries.

The register of patients entitled to special reimbursements for antiasthmatic agents shows a two-peaked prevalence curve especially for men (Fig. 4).

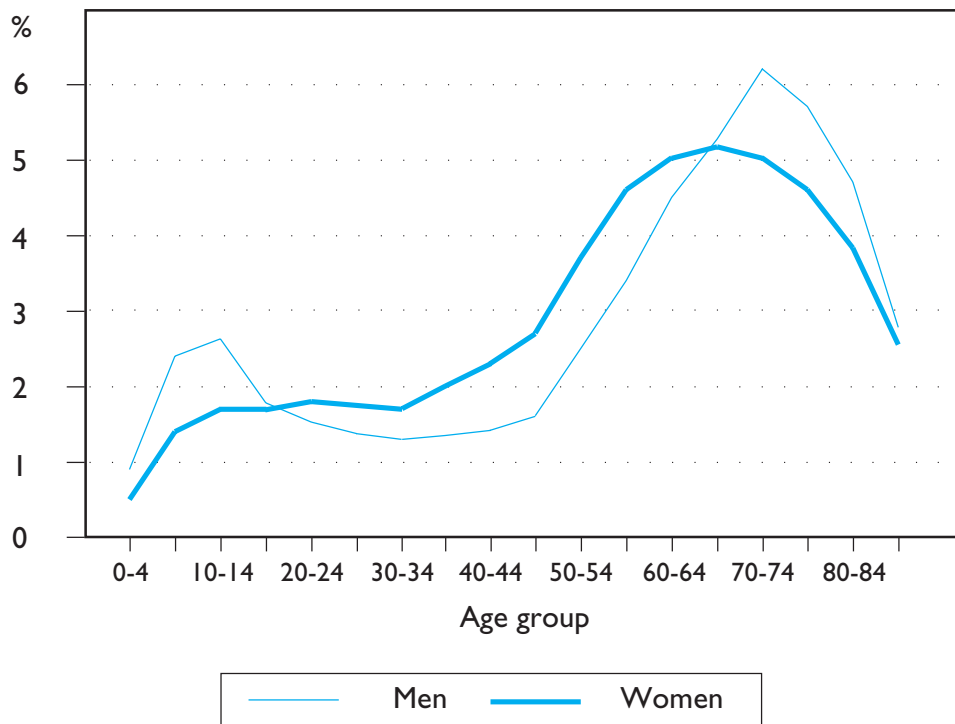


FIG. 4
Proportion of individuals (percentage of each age group) entitled to special reimbursement for prescriptions of antiasthmatic agents in 1992 according to age and sex

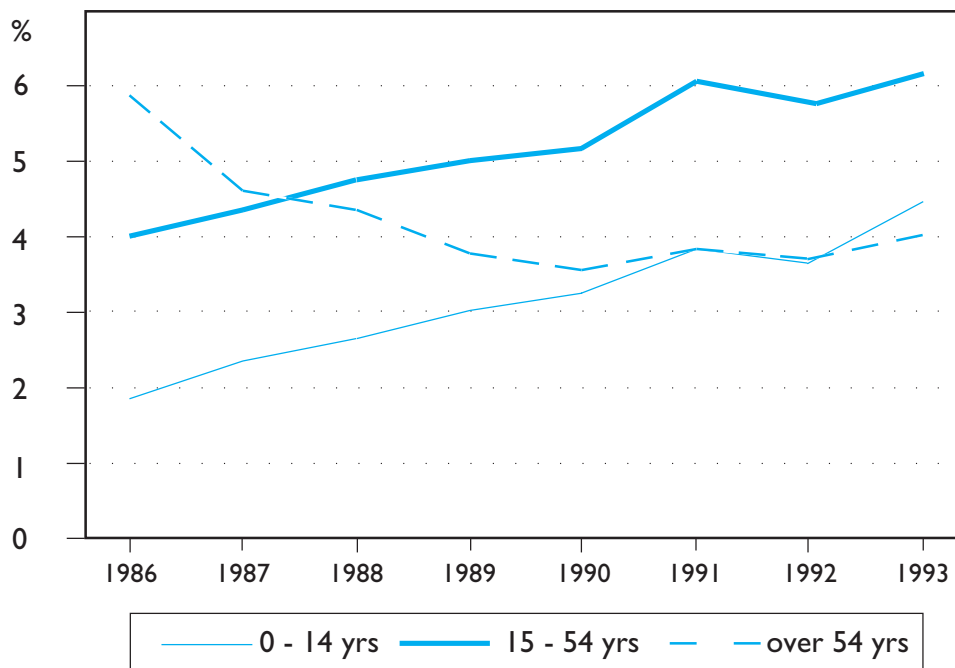


FIG. 5
Percentage of new cases of asthma according to age group in 1986-1993

The number of new cases of asthma, calculated from the number of patients entitled to special reimbursements for prescriptions of antiasthmatic drugs, increased between 1986 and 1993 fastest in the population below 15 years of age and, in particular, below 5 years despite the fact that the diagnosis of asthma is more difficult in small children than in older children (Fig. 5).

The incidence in the elderly decreased, primarily because the majority of patients in this age group are already entitled to special reimbursements and new cases are rare at this age.

The importance of asthma in terms of health care and social welfare expenditure has increased dramatically and continues to do so. Changes in the population age structure alone will increase the number of asthma patients by 7,000 by the year 2000. If the trend observed between 1986 and 1993 continues, the number of individuals suffering from asthma will be 60% higher in 2000 than it is now. Even this may not be the upper limit if the prevalence of asthma increases at a higher rate than before.

The population percentage of asthmatics shows regional variation (Fig. 6), due partly to differences in diagnostics, treatment practice and reimbursement policies.

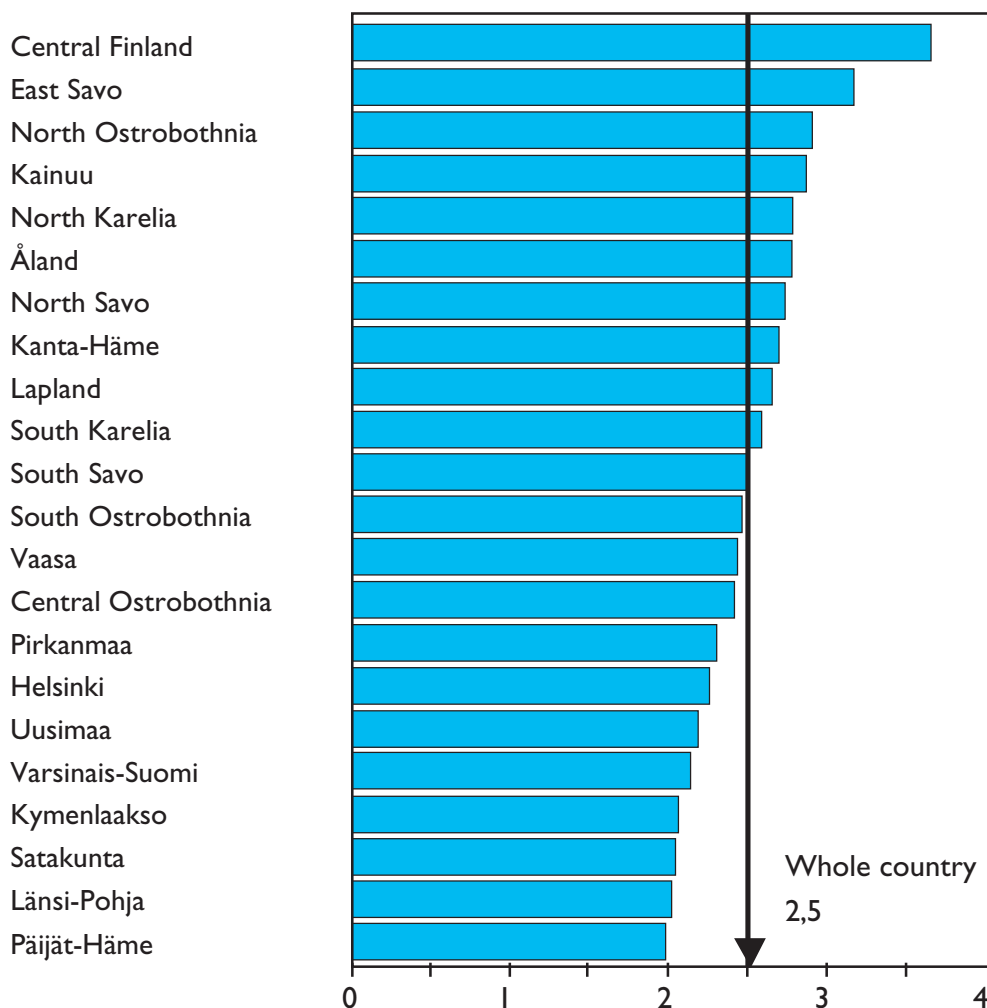


FIG. 6
Population percentage entitled to special reimbursement for prescriptions of antiasthmatic agents, according to hospital district, in 1992

The prevalence of asthma is highest in many municipalities in Central Finland (Fig. 7). In South-West Finland, asthma diagnoses are relatively few. The difference between the municipality with the highest prevalence and that with the lowest is over five-fold. The number of asthma patients is highest in Southern Finland where the number of inhabitants is also highest. Diagnostic variations are manifested in the fact that in one and the same region asthma may be relatively rare in adults but common in children or vice versa.

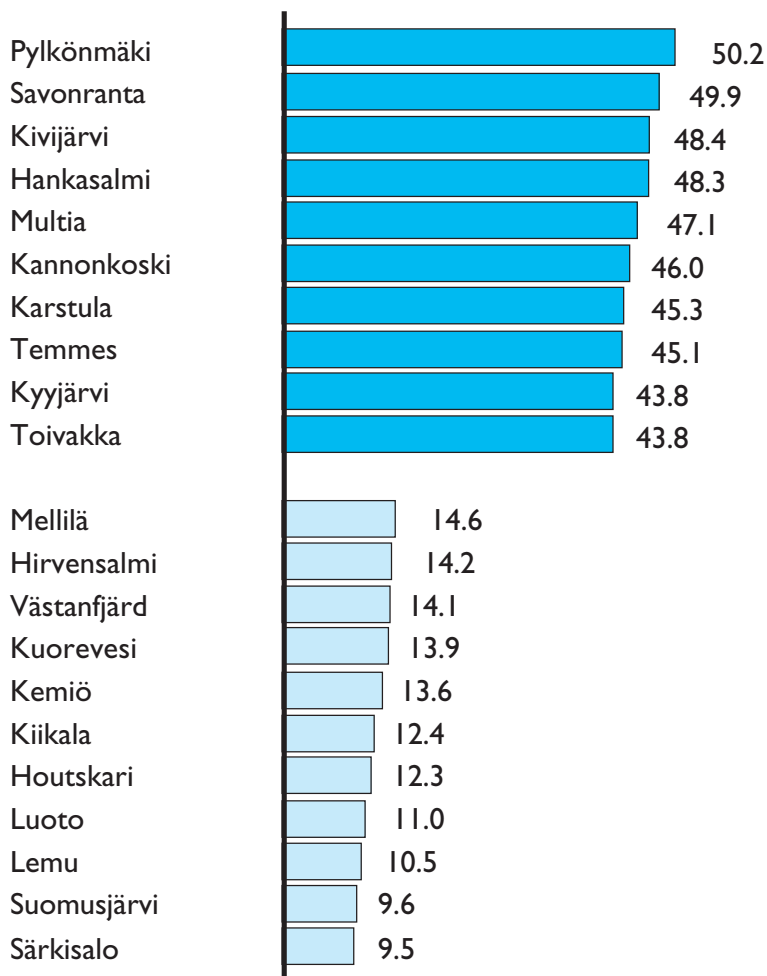


FIG.

7

Proportion (‰) of individuals entitled to special reimbursement for prescriptions of antiasthmatic agents of the population in certain municipalities in 1992

The annual number of bed-days of asthma patients fell from roughly from 186,000 in 1985 to 113,000 in 1990. The number of hospitalized patients fell far less, from 12,600 to 11,000. The mean age of hospitalized patients decreased from 49 years to 47 years, and the average length of hospital treatment from 8.9 to 6.7 days.

1.3 Asthmatic population

Twelve per cent of the asthmatic population are below 15 years of age, 29% are 15-44-year olds, 32% are 45-64-year olds and 27% are over 65. In childhood, asthma is markedly more common in boys than in girls, but in adults the reverse is true. The reason for this is not known.

Staging of asthma according to the degree of the disorder is problematic as there are no commonly agreed criteria. In a report published in the late 1980s, asthma patients were divided into five groups based on given criteria. Most (60%) of the patients were considered to suffer from mild asthma and one-fifth from severe or very severe asthma (Table 1). This distribution involved only adults and is probably different in children.

TABLE

1

Distribution of asthma patients according to severity of disease (%)

Severity	Percentage	Description
● Very severe	2%	Disabling disease, numerous bed-days. Life-threatening attacks.
● Severe	18%	Wheezing daily, poor general condition, disease restricts life, severe nocturnal symptoms. Absence from work for several weeks a year. One in two patients needs hospital treatment.
● Moderate	20%	Symptoms daily but no significant diurnal variations. Patient avoids exercise, occasional nocturnal symptoms.
● Mild	20%	Periodic symptoms. Patient reacts to e.g. pollen or intense cold. Symptoms restrict activity 2-3 times a week.
● Very mild	40%	Occasional cough and wheezing that do not cause major impairment. Respiratory tract sensitive to intense cold and infections. Allergens cause symptoms of varying degree depending on exposure.

In a Finnish study, physical strain was reported to be the commonest factor causing exacerbation of symptoms in adult asthma patients. Other common factors were weather, psychological factors, odours, tobacco smoke, dusts, respiratory infections, allergic factors and acetylsalicylic acid.

Asthmatic children and adolescents manage at school relatively well. Most problems occur in physical education sessions and technical and textile work, and on the way to school especially in below-freezing conditions and during the pollen season. Although adolescents have a fairly good self-esteem many fear what the illness may bring in the future. Parents of children under school age are sometimes overprotective and restrict the child's activities unnecessarily.

According to surveys, asthma patients are surprisingly often smokers, particularly pregnant women and young people.

According to a population study, asthma patients perceive their health status as markedly poorer than the average population. Psychological symptoms are significantly more common in young asthma patients than among their peers of the same age group. Adult asthma patients suffer from dependencies and anxiety more than the normal population. Depression is the commonest disorder in individuals suffering from chronic asthma. Together with asthma, the patients often suffer from other chronic disorders: more than one-third suffer from cardiovascular disease and one patient in six is hypertensive and on antihypertensive medication. Roughly one-third of asthmatics suffer from disorders of the musculoskeletal system, usually back problems or arthrosis.

— 1.4 — Costs

The overall annual cost of asthma was estimated at FIM 2.5 billion at the start of the 1990s. This included direct costs resulting from medical care and changes in working and living conditions, indirect costs relating to loss of production, and costs resulting from disabilities. Some of these costs are calculatory, and it should be borne in mind that asthma also gives employment to people and contributes to the growth of the national product. The costs of severe asthma account for roughly 60% of the total costs (Fig. 8).

If the number of asthma patients is estimated at 150,000, annual costs of the disease average FIM 17,000 per patient. The annual costs of severe asthma average FIM 52,000 per patient, those of moderate asthma roughly FIM 20,000, and those of mild asthma roughly FIM 4,000.

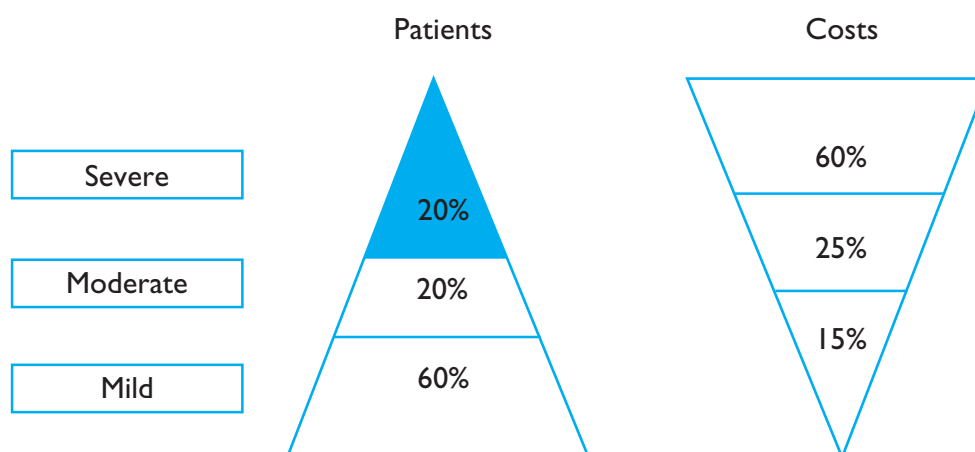


FIG. 8
Distribution (%) of asthma patients and costs resulting from asthma according to severity of the disease

A 50% decrease in the number of patients developing severe asthma would save roughly FIM 500 million a year. A nearly equal sum may be spent if the prevalence of asthma continues to rise at the present rate. Most of the costs are incurred by adult patients due to their large number. According to Swedish calculations, the percentage incurred by child patients of the total cost is roughly equal to their percentage of all asthma patients. However, the costs of medical care are higher for children than for adult asthma patients.

Should the above mentioned 60% increase in the number of asthma patients occur, the number of patients in 2004 would be 280,000 compared with the present 150,000. In addition, patients suffering from asthma-like symptoms account for roughly 10% of the population. Although it may not be possible to influence the number of patients significantly, the severity of the disease can be reduced considerably.

If the **number** of patients suffering from severe asthma could be reduced from the current 30,000 to half that number by 2004 and the number of patients with moderate asthma remained at the current level, the costs of asthma would fall from FIM 2.5 billion at present to FIM 2.2 billion, even if the number of patients with mild asthma were to more than double. If the **percentage** of patients with severe asthma decreased from the current 20% to 10% and the other presumptions were as above, the costs in 2004 would be similar to what they are at present.

More than half the costs of severe asthma result from loss of production due to impaired capacity for work. Most actual treatment costs result from hospital treatment, not drug therapy. Patients with severe asthma should be treated so that their capacity for work and functional capacity is maximized and the need for hospitalizations minimized.

— 1.5 — Summary

The importance of asthma in terms of public health and economy is outlined in Table 2.

TABLE

2

Asthma as a public health problem

1. Asthma is one of commonest public health problems in Finland. Although estimates of the increase of its biological prevalence are still reserved, the number of patients seeking medical care and social security is rising sharply.
2. Patients with severe or moderate asthma are a minority but account for a great majority of the costs.
3. The most effective way to control the increase in costs resulting from asthma is to reduce the number of severe asthma cases.
4. New demands have been made on the diagnosis of asthma since the definition of the disease changed. The line between asthma and asthma-like symptoms is flexible. Therefore the population at which preventive measures and treatment should be targeted becomes larger. There are no generally accepted criteria for use in determining the severity of the disease.
5. By comparison with other public health problems, studies on the epidemiology and clinical features of asthma are relatively few.

Goals of prevention and treatment

The goals of prevention and treatment of asthma and rehabilitation of asthma patients for the next 10 years are presented in Table 3. The most important measures for achievement of these goals are given in Table 4 and discussed in greater detail in Sections 3, 4 and 5.

TABLE

3

Goals of prevention, treatment and rehabilitation

- As many patients as possible with early asthma recover.
- Asthma patients feel well, and their capacity for work and functional capacity correspond to their age.
- The percentage of patients with severe and moderate asthma falls from the current 40% to 20%.
- The number of bed-days of asthma patients decreases by 50% by the year 2000, that is to 50,000 a year.
- The annual costs per patient fall by 50% as a result of more effective prevention and treatment.

TABLE

4

Measures towards achieving the goals of the Asthma Programme

1. Early diagnosis and active treatment of individuals with asthma and asthma-like symptoms.
2. Guided self-care is the primary form of treatment. The patient and the primary health care system, supported by specialized medical care, bear the responsibility for treatment. Parents of asthmatic children share the responsibility for treatment with specialized medical care and, as agreed, with primary health care.
3. Irritants such as smoking and tobacco smoke that cause asthma and asthma-like symptoms are decreased.
4. Rehabilitation is implemented on an out-patient basis, planned individually and timed appropriately.
5. Knowledge about asthma and its prevention and treatment are increased in key groups.
6. Scientific research into asthma is promoted.

Prevention of development and exacerbation of asthma

3.1

Factors influencing the development of and recuperation from asthma

Many asthma patients, 80-90% of children and 50-60% of adults, are predisposed to atopy, which is strongly hereditary. If one of the parents has atopic allergy the risk of the child developing an atopic disease is roughly two-fold, and roughly four-fold if both parents are affected, compared with a child whose parents have no such tendency. Atopy is associated not only with asthma but also with allergic rhinitis and atopic eczema.

Genetic factors also underly the tendency to bronchoconstriction typical of asthma. At least some differ from those regulating the heredity of atopy. If both parents are susceptible to bronchoconstriction, 35% of the children are hyper-reactive. If one of the parents is hyper-reactive, 20% of the children have the same quality.

Together with genetic factors, environmental factors regulate hypersensitivity, and onset of an allergic disorder is always preceded by exposure to allergens. Allergens enter the body through the skin and mucous membranes. Inflammation of the mucosa may develop once the immune system is sensitized to particles in the environment, such as animal danders and pollen. This is called **extrinsic asthma**. If atopic allergy is not detected the term used is **intrinsic asthma**. Aetiological factors of the latter are unknown, but apparently viruses can trigger a chronic mucosal inflammation in individuals with a predisposition to asthma.

The course of asthma is very varied. Some people experience symptoms of brief duration once in their lifetime, in others the disease may recur after a long symptom-free period, or it may quickly become chronic. Data concerning recovery from asthma either spontaneously or as a result of treatment are incomplete.

— 3.2 — Prevention

The risk of developing asthma and of exacerbation of symptoms can be reduced through measures aimed at changing the individual's health behaviour, avoiding environmental exposure (primary prevention) and stepping up early diagnosis and initial treatment (secondary prevention). Correct timing and reasonable targeting of rehabilitation can help reduce the handicap caused to the individual by the disease (tertiary prevention) and diminish the costs incurred by society.

The prevention strategies are aimed at the **risk group** in particular and at the **population** in general. The former strategy helps to target preventive measures at individuals with a high risk of developing asthma, such as those with atopic disease. The aim of the population strategy is to reduce irritants and exposure to allergens in general — both in the entire population and in the environment. One example is reduction of tobacco smoke in many places.

It is essential in the prevention of asthma to affect the start of the chain, that is to prevent atopy. This is not easy. Wholly preventing the development of atopy may not be possible, but preventive measures may help postpone the onset of symptoms and reduce their severity.

As the role of prevention in the development of atopy in children is disputed, instructions and guidance relating to modifications at home due to allergy should be well thought out, individual and family-specific. If specific hypersensitivity occurs, the allergen should be reduced or eliminated from the environment of diet. Pet animals should be acquired with reserve. An essential aim in the prevention is that the mother or other care provider does not smoke and that the home is smoke-free (Table 5).

In adult asthmatics, underlying atopy is more rare than in children, and the asthma is often intrinsic. Secondary and tertiary prevention are therefore more important than prevention of atopy. This means individual health care in addition to good medical care, in order to eliminate symptoms and maintain good quality of life of asthmatics (Table 6).

Maternity and child health centres, school health care and occupational health care providing services for asthmatics and individuals suffering from asthma-like symptoms are responsible for guidance and, as necessary, referrals to further examinations. Guidance and support are particularly important for the family of an asthmatic child and for adolescents on their way to independence.

TABLE

5

Prevention of asthma and allergies in children with strong inherited propensity

- The mother should avoid smoking during pregnancy.
- Breast-feeding should be supported.
- The child should not be exposed to tobacco smoke or unnecessary animal danders.

If the child has symptoms of allergy, the following instructions should be followed **after deliberation** in addition to those given above:

- The mother should avoid food allergens that cause symptoms in the child during breast-feeding.
- The child should not be given eggs, fish or citrus fruits during his first year of life.
- Day care of the child should be arranged at home or in a family if the child has respiratory symptoms.

TABLE

6

Prevention of exacerbation of asthma in adolescents and adults

Health behaviour

- Non-smoking, avoidance of tobacco smoke
- Maintenance of good general condition, physical exercise
- Adequate treatment of infections
- Avoidance of food allergens and airborne allergens that cause symptoms
- Avoidance of pet animals as necessary
- Use of respiratory protective device in situations where there is special exposure to dusts and chemicals

Training and working life

- Consideration of allergy in choice of career and vocational training
- Avoidance of tasks involving risk of exposure

Environment

- Measures relating to quality of air at home, schools, work places, facilities open to the public and public transport (see 3.2.2 Environment)

— 3.2.1 —

Health behaviour

Smoking is the most important factor relating to health behaviour that contributes to sensitization and morbidity. Smoking, including passive smoking, increases susceptibility to infections, and some infections (e.g. chlamydia pneumoniae) may increase the risk of asthma. Smoking also increases the permeability of mucous membranes, facilitating entry of airborne allergens into the immune system from the respiratory tract. Passive smoking also increases IgE-mediated sensitization. Particular attention should be paid to smoking in asthmatic pregnant women and the young, as smoking is common in these groups.

Physical activity is important for the maintenance of good general condition in asthmatics. Together with drug therapy and an irritant-free environment, physical activity is one of the cornerstones of treatment and rehabilitation. Advances in drug therapy, early diagnosis and monitoring methods have increased the opportunities of asthmatics to engage in physical activity. The physical and psychological effects of exercise improve both physical condition and self-esteem. Asthmatics should be motivated to engage in physical exercise and given information about suitable forms of, and facilities for, physical exercise. Young people especially should be offered varied and interesting forms of exercise to promote a healthy lifestyle.

Food allergies are rarely an important cause of asthmatic symptoms in children or adults. Hypersensitivity to food additives is rare, but some patients develop symptoms after exposure to food colourings, sulphites and benzoic acid. Examination of food allergies and hypersensitivity to additives should be carried out at a special clinic. Controlled challenge tests are often necessary. Intake of **sodium chloride** has been suggested to increase inflammatory reactions of the mucosa, and low-salt food may reduce symptoms of asthma and improve pulmonary function. Reduction of salt intake may be important for public health not only because of its effects on cardiovascular disease but also in terms of asthma and allergies.

Roughly 5 to 10% of asthmatics are hypersensitive to acetylsalicylic acid and other analgesics, which give them severe asthmatic attacks. Patients hypersensitive to analgesics should be given thorough instructions. Avoidance of natural salicylates in food is not useful. A challenge test should be carried out at a specialized clinic as necessary.

Psychological factors and stress may exacerbate asthma, trigger symptoms or contribute to onset of the disease. A chronic disease involving periods of exacerbating symptoms, insomnia and impaired capacity for work and functional capacity causes fear, anxiety and depression, which in turn may increase symptoms. Good cooperation between health care personnel and patient and family to establish appropriate treatment and rehabilitation helps the patient achieve a balanced state and facilitates his or her daily life.

Active and motivated **self-help and guided self-care** are an essential factor in preventing the exacerbation of asthma.

— 3.2.2 — Environmental issues

Development of asthma and exacerbation of symptoms are affected by many environmental factors. Common allergens include pollen, animal danders, house-dust mites, mould dust and various chemicals. Many microbes cause infections in some individuals and allergy in others.

Exposure to allergens and microbes occurs especially indoors, where people spend 80 to 90% of their time. Exposure at home and school, and in day care centres, work places and public places is particularly important. Community air pollutants are also found indoors to some extent. Smoking is a problem indoors. Attention should be paid to the immediate environment, primarily the home. Schools, day care centres, public facilities and places of work may cause special problems for asthmatics. The main problems and suggestions for their solution are presented in Tables 7 to 11. Most of the suggested measures are related primarily to education of the population and are fairly easy to implement. However, some problems require official measures and revision of the relevant rules and regulations.

TABLE

7

Commonest problems in the home and measures to prevent them

Problems	Measures
● Smoking	Health education, information. Smoke-free home (non-smoking child care provider particularly important).
● Animal danders	Health education, information. Cat and dog allergens are commonest.
● Cleaning neglected	Education, consumer guidance, correct cleaning methods. Appropriate house construction. Reasonable choice of materials. Central vacuum cleaner recommended.
● House-dust mites	Education, consumer guidance. Cleaning bed and bedroom, checking condition of bedclothes. Improved ventilation, reduction of relative humidity. Bedclothes impermeable to house-dust mites as necessary. Wash at over 60°C.
● Chemicals	Education, consumer guidance. Research and testing. Obligatory notification of allergy-causing agents. Voluntary approval mark to products.
● Humidifiers, filters	Education, consumer guidance. Improvement of type approval.
● Building and interior decoration materials	Education, consumer guidance. Training of designers and builders. Research and testing. Obligatory notification of allergy-causing agents. Voluntary approval mark to products.
● Ventilation, impurities in indoor air	Monitoring of implementation of regulations. Improvement of type approval for equipment and materials. Operator training and organization of maintenance. Periodic inspections.
● Outdoor air pollutants, pollen	Stepping up distribution of information about air pollutants and pollen. Technical solutions for filtering incoming air.
● Moisture damage, moulding of structures	Training of designers and builders. Recommended relative humidity indoors 30-40%. Improvement of methods for detection of moisture damage and immediate correction. Research into mechanisms of symptoms caused by moulds.
● Temperature	Avoidance of excessive temperature (> 22°C). Improvement of room-specific temperature control.

TABLE 8

Problems at day care centres and schools and measures to prevent them

Problems	Measures
● Inadequate ventilation	Education, training of designers and builders. Operator training and organization of maintenance. Periodic inspections, monitoring of implementation of regulations.
● Indoor air impurities	Careful choice of building and decoration materials, trial of approaches designed for allergic individuals. Cleaning before or after school hours. Appropriate location of facilities that are impure or emit odours and use of pressure ratios to prevent spread of impurities. Allergy testing of chemicals used in cleaning. Consumer guidance. Avoidance of unnecessary soft surfaces. Improvement of storage of outdoor clothing.
● Animal danders, pollen	Avoidance of animal exhibitions. Avoidance of plants producing pollen (esp. catkin, birch, composites).
● Moisture damage, moulding of structures	Training of designers and builders. Improvement of methods for detection and correction of moisture damage.
● Temperature	Recommended room temperature 21-22°C. Improvement of temperature control. In day care centres, technical solutions to avoid cold floors and draughts. Information, guidance, training of designers and builders.

Problems in the working environment and measures to prevent them

Problems	Measures
<ul style="list-style-type: none"> ● Exposure to respiratory irritants and allergens 	<p>Technical and hygiene-related approaches to reduce exposure (effective ventilation, local ventilation, respiratory protective devices, automation, robots, etc.). Increased knowledge of hazardous effects of exposure substances. Improvement of working methods and hygiene at work places. Monitoring of symptoms and careful registration of occupational diseases.</p>
<ul style="list-style-type: none"> ● New chemical exposure substances 	<p>Improvement of analysis of new substances. User safety instructions. Improvement of assessment of allergenic qualities.</p>
<ul style="list-style-type: none"> ● Smoking at work places 	<p>Enforcement of the new Tobacco Act 1995. Separate rooms for smoking. Health education.</p>
<ul style="list-style-type: none"> ● Vocational selection and restrictions of work in asthmatics and allergic individuals 	<p>Increased training relating to asthma and allergies among training authorities and in occupational health care. Application of results of "Work and allergy" project of the Institute of Occupational Health at work places. Elimination of unnecessary restrictions.</p>
<ul style="list-style-type: none"> ● Symptoms at work 	<p>According to occupational health legislation, measures should be directed primarily at working conditions if work involves health hazards. Investigations and renovations to reduce symptoms.</p>
<ul style="list-style-type: none"> ● Assessment of capacity for work 	<p>Improvement of collaboration between occupational physician and attending specialist.</p>

TABLE 10

Problems in public facilities and public transportation and measures to prevent them

Problems	Measures
<ul style="list-style-type: none"> ● Smoking indoors 	<p>Health education, information, restrictions. Separate rooms for smoking. Prohibition of smoking during air flights. Reduction of smoking compartments in trains and installation of air lock between smoking and non-smoking compartments. Non-smoking sections in restaurants.</p>
<ul style="list-style-type: none"> ● Inadequate ventilation 	<p>Information. Training of designers and builders. Operator training and organization of maintenance. Avoidance of excessive use of recycled air and other energy sparing measures.</p>
<ul style="list-style-type: none"> ● Avoidance of unnecessary allergens 	<p>Avoidance of wall-to-wall carpeting. Prohibition of dogs and other domestic animals entering public facilities. Avoidance of perfumes. Information, guidance, restrictions. Filtering of incoming air in cars.</p>
<ul style="list-style-type: none"> ● Accumulation of impurities in indoor air 	<p>Correct design of buildings. Appropriate choice of materials. Correct timing of cleaning and use of appropriate cleaning methods and harmless chemicals. Information, guidance and training. Hotel rooms and other accommodation and boat cabins for allergic individuals.</p>

Problems in community, traffic and energy supply and measures to prevent them

Problems	Measures
<ul style="list-style-type: none"> ● Reduction of emissions from traffic 	Reduction of unnecessary private transportation through community planning. Promotion of public transportation. Reduction of emissions from individual cars: catalyzers, electric cars. Information, guidance and restrictions.
<ul style="list-style-type: none"> ● Community sanitation 	Effective cleaning of streets without dusting. Information.
<ul style="list-style-type: none"> ● Reduction of emissions from energy supply 	Promotion of combined electricity and heating supply and municipal heating. Use of less polluting fuels. Inspections of heating devices and their appropriate use and maintenance. Information and guidance.
<ul style="list-style-type: none"> ● Strict control of emissions and outdoor air concentrations 	Approval of suggestions for new guidelines for quality of air by Ministry of the Environment. Improved monitoring of guidelines and control of emissions.

3.3

Summary

Important aspects in the prevention of asthma and exacerbation of symptoms are listed in Table 12.

TABLE 12

Important aspects in the prevention of asthma and exacerbation of symptoms

1. There is usually a genetic predisposition underlying asthma, and onset of the disease is significantly dependent on exposure to environmental agents.
2. Exacerbation of asthma can be prevented by choices relating to lifestyle, such as not smoking, maintaining good general condition and adequate treatment of asthma.
3. In the home, day care centres, schools, work places and public facilities, exacerbation of asthma can be prevented and cost savings achieved by many different means.
4. Preventive measures should be individualized and based on careful deliberation. The aim is to impose as few restrictions as possible on the life of asthma patients and their families.

Improving treatment

— 4.1 — Symptoms

Onset of asthma is usually preceded by exposure to an allergen or prolonged respiratory infection. There are usually several contributing factors. Inflammation of the mucosa is a defence reaction against diverse respiratory irritants, and if the inflammation persists it may provoke an asthmatic response in the bronchi. Initial symptoms such as production of mucus and cough are followed by wheezing and dyspnoea. An essential feature of asthma is increased bronchoconstriction or hyper-reactivity of the bronchi. Both mucosal inflammation and bronchoconstriction are defensive reactions of the body, which in asthma are triggered too easily and are exaggerated (Table 13).

TABLE

13

Pathophysiology of asthma

1. Triggering factors
 - allergens, viruses, bacteria, unknown
2. Activation of the immune system (genetic factors)
3. Activation of primary and secondary inflammatory cells, activation of neurogenic inflammation
4. Release of mediators of inflammation from cells and nerve endings
5. Mucosal inflammation and damage
6. Increased bronchoconstriction and obstruction of the bronchi (genetic factors)
7. Clinical symptoms of asthma
 - mucous secretion, cough, wheezing, dyspnoea

Roughly 80% of asthma patients have allergic rhinitis. Usually, the entire respiratory mucosa is affected. If the patient has atopy, children and adolescents in particular often also have skin symptoms (infantile atopic dermatitis, Bersnier's prurigo, atopic eczema). Such additional symptoms should be taken into consideration in examination and treatment of patients. For example, severe atopic eczema and chronic polytopic rhinitis may cause the patient more inconvenience than asthma itself.

Mild symptoms of asthma may be present for years before the patient seeks help. Sometimes asthma starts with sudden dyspnoea, and the patient quickly seeks medical attention (Table 14).

TABLE 14

Symptoms of asthma and aggravating factors

Symptoms	Aggravating factors
<p>Adults</p> <ul style="list-style-type: none"> ● Cough (nocturnal) ● Mucous secretion ● Wheezing ● Dyspnoea ● Repeated bronchitis <p>Children in addition to the above</p> <ul style="list-style-type: none"> ● Fatigue ● Poor general condition ● Delayed growth ● Avoidance of physical effort 	<p>Adults and children</p> <ul style="list-style-type: none"> ● Respiratory infections ● Inhaled allergens ● Physical stress ● Cold weather ● Tobacco smoke, dusts, odours, chemicals ● Foods ● Acetylsalicylic acid and its derivatives ● Stress

— 4.2 —

Treatment

Illness changes the lives of the patient, his or her family and other close persons. Asthma may seem frightening and cause anxiety. The young, in particular, often deny their illness, which may result in irregular intake of medicines, psychological symptoms, unhealthy life habits (smoking) and other risk behaviour. Psychological factors also affect the course of asthma and need to be taken into consideration at an early stage.

If treatment is to be successful, it is essential that the patient is aware of and understands the causes of asthma and the possibilities and results of treatment and has confidence in both him- or herself and in the treatment organization. A good patient-provider relationship, individual total care and adequate guidance are cornerstones of treatment. In the treatment of asthmatic children, it is important to give support to all family members.

— 4.2.1 —

Diagnosis

With early diagnosis and medication to treat inflammation of the mucosa, it is possible to improve the prognosis of asthma in both adults and children. Careful clinical examination and accurate anamnestic information are fundamental in diagnosis. In incipient asthma, pulmonary auscultatory findings are normal most of the time. Results of pulmonary function tests and allergological examination may also be normal. Other illnesses should be excluded with the help of routine tests (ESR, CRP, blood count, chest X-ray and ECG). In asthma, only eosinophilic white blood cell counts in blood, sputum and nasal mucus are important.

Allergological tests should be carried out on every patient at an early stage of symptoms. Allergenic factors at home and in the working environment and exacerbations of symptoms associated with food and consumer habits should be investigated in a thorough interview. Skin prick tests, measurement of IgE antibodies from the serum and the challenge testing required are usually carried out at specialized medical care units.

Inflammation of the mucosa is not visible on chest X-rays and cannot be detected in the usual blood tests. At an early stage of asthma the inflammation is often difficult to detect. The only way to gain direct information as to the status of the bronchial mucosa is fiberoptic bronchoscopy and collection of specimens. This examination has become more common in specialized clinics. Activated inflammatory cells release inflammatory factors (e.g., cationic protein of eosinophilic white blood cells, ECP) that can be measured from the sputum and the

serum. Determination of inflammatory factors especially from the sputum may provide a key to improved early diagnosis in the near future.

The diagnosis should be confirmed by repeated monitoring of respiratory function: measurement of peak expiratory flow (PEF) or forced expiratory volume in one second (FEV₁) in a bronchial dilation test, PEF monitoring or different challenge tests. The peak flow meter is an important tool in diagnostics and monitoring of treatment (Tables 15 and 16).

TABLE 15

Examinations in primary health care

- Anamnestic information, mapping of allergy-causing factors.
- Repeated auscultation of the lungs, including forced expiration.
- Bronchial dilation test. PEF measurement at the clinic before and 15 minutes after inhalation of beta₂ sympathomimetic (2-4 inhalations).
- Determination of eosinophilic white blood cells in blood and sputum and, possibly, determination of ECP in sputum.
- PEF home measurement for 2 weeks. One week without medication and one with beta₂ sympathomimetic with measurements morning and night before and after medication.
- Possibly, measurement of specific IgE antibodies in serum in accordance with anamnestic information. Skin testing only if tests are supervised by a specialist and if testing is otherwise comprehensive.
- After diagnosis has been established, trial with anti-inflammatory medication as appropriate and monitoring of results (e.g. PEF).

In **occupational asthma**, an aetiological diagnosis should be made. Exact information about the cause is necessary for possible out-placement and training. The diagnosis is based on detailed anamnestic information about work and symptoms and on demonstration of a connection between asthma and work. The latter can be shown with the help of two to four weeks of carefully planned PEF monitoring including at least two weeks at work and three weekends or similar free days. A specific challenge test breathing the suspected allergen is the most reliable method of proving occupational asthma. This test can only be carried out at a specialized clinic.

Interpretation of the results of PEF monitoring

Significant changes during PEF monitoring

- The PEF value increases by over 15% (over 50 l/min in adults) upon the patient inhaling a bronchodilating beta₂ sympathomimetic two to four times.
- The PEF value falls by over 15% roughly 10 minutes after strain (wheezes are usually audible at the same time).
- The PEF values vary by over 20% during the day (morning-night) or from day to day.
- The PEF value rises by over 20% during 2 weeks of treatment with an inhaled corticosteroid.

In **differential diagnosis**, sinusitis, chronic bronchitis, pulmonary emphysema, cardiac insufficiency and hyperventilation **in particular** should be considered. In children, pharyngeal tonsillitis, bronchiolitis, sinusitis, upper respiratory tract obstruction and foreign bodies must be excluded. More detailed diagnosis should include measurement of bronchial reactivity, other challenge tests and pulmonary physiological and bronchological tests. If there are problems with differential diagnosis, the patient should be referred to specialized medical care.

In the diagnosis and treatment of asthma, the **special features** of a **growing child** should be considered. Asthma and its treatment can affect the child's growth, development, behaviour, success at school and choice of career. The diagnosis should be made and treatment started as early as possible. Asthma in children is still underdiagnosed. Information about symptoms is often incomplete because the child adapts to them and learns to avoid situations causing them. Diagnosis is particularly difficult in small children because pulmonary function tests are not reliable. In some small children diagnosis can be established only at the age of five or six, when they learn the technique required in pulmonary function tests. In small children, diagnosis is based on information about symptoms and on auscultatory findings. Diagnosis of asthma can be made if a small child manifests repeated respiratory distress and **two** auscultatory findings of wheezing on expiration, and other causes have been excluded. Regular antiasthmatic medication should be considered in children with frequent respiratory distress or who also have symptoms during periods between infections.

4.2.2

Treatment strategies

At the initial presentation of asthma, the goal of treatment is elimination of symptoms and recovery. Symptoms can seldom be eliminated in chronic asthma that has lasted for years (Table 17). In addition to asthma, the patient often needs treatment for allergic rhinitis. Good treatment of rhinitis may also alleviate symptoms of asthma.

TABLE

17

Goals of treatment

- Recovery of patients with initial asthma.
- The patient feels well and the functional capacity is consistent with age. Symptoms are as few as possible and do not occur at night.
- Exacerbations are as rare as possible.
- Pulmonary function is as close to normal as possible.
- Diurnal variation in PEF values is less than 20%.
- Treatment does not cause excessive side effects.

Treatment according to the cause aims at elimination of the allergens involved and exposure to infections at home and, as far as possible, at work, school, day care centre and public facilities. Symptoms may be eliminated through effective steps to remove allergens.

Desensitization to inhaled allergens improves the patient's tolerance to allergy and may reduce symptoms of asthma. The treatment is suitable for patients with mild asthma who are hypersensitive to pollen — sometimes also to house-dust mite and animal danders. The treatment should be started at a specialized medical care unit.

Physiotherapy concentrates on guidance concerning physical activity, finding a suitable form of exercise and relaxation and breathing exercises. Good functional capacity can be maintained and exercise-induced asthma may be alleviated with the help of regular and appropriate physical exercise.

There is no reliable evidence as to the significance of **alternative therapies** in the treatment of asthma. The patient's subjective health status may improve as a result of such therapies, upon which he or she may discontinue medication without confirmation from PEF measurements. This may result in exacerbation of asthma. Some natural products contain herbal remedies and parts of plants that may cause symptoms in patients with atopic asthma.

The basis of present-day treatment of asthma is **drug therapy** implemented as **guided self-medication**. **Rehabilitation** at an appropriate time is part of total treatment.

— 4.2.3 —

Drug therapy

Recent changes in drug therapy for asthma have been adopted in health care, but not sufficiently. Essential changes include the following:

- Anti-inflammatory medication to treat inflammation of the mucosa is primary therapy and should be started at an early stage.
- Any remaining symptoms should be treated with bronchodilators as necessary.
- The patient, or the parents if the patient is a child, play a key role in the implementation of drug therapy.

Agents intended for the prevention and treatment of inflammation of the mucosa are listed in Table 18. Inhaled corticosteroids are the most effective, but chromoglycate and nedocromil also have anti-inflammatory effects.

TABLE 18

Anti-inflammatory agents

- Inhaled corticosteroids: beclomethasone, budesonide, fluticasone
- Sodium chromoglycate and nedocromil
- Systemic corticosteroids: hydrocortisone, prednisone, prednisolone, methylprednisolone
- Other anti-inflammatory agents: gold preparations, methotrexate, cyclosporine (in specialized medical care)

When prescribing inhaled drugs attention should be paid to **inspiratory technique** introducing the drug into the bronchi. In many patients, particularly in children and in the elderly, poor treatment results arise from poor inspiratory

technique. With pressurized aerosol inhalers, release of the drug at an appropriate phase of inspiration presents the most difficulties. Many patients also find it difficult to hold their breath after inhalation. Inspiration should be as calm as possible. Inhalation of powder-form drugs requires powerful inspiration.

Most children above 6 years can use the same inhalers as adults. In younger children, devices that function at normal respiration are more appropriate. Nebulizers are suitable for patients of all ages. Pressurized aerosol inhalers combined with a spacer are also suitable for small children, particularly if the spacer is connected to a silicone mask. Because of low lung deposition and difficult inhalation technique, pressurized aerosols should not be used without a spacer. Dry-powder inhalers require fairly powerful inspiration and can usually be used in children above six years. As necessary, the use of a dry-powder inhaler can be tested in specialized medical care by measuring inspiratory flow with special equipment.

There are many kinds of inhalers, and the patient may have to learn to use several of them. A common problem with these devices is poor delivery of the drug. They should be standardized and made simpler to use, and the delivery of the drug to the lungs should be improved. In Finland, delivery systems have been developed and courses for respiratory therapists have been organized by the South Häme Lung Disease Association and its Respiratory Care Centre. Improvement of the devices should be continued and promoted. It should be investigated whether the opportunities and willingness exist to establish a delivery system register and to organize distribution, counselling and maintenance services on a national or regional basis. Such activities could increase the availability of delivery systems, facilitate their use, and lower costs.

Initial treatment: Once a firm diagnosis has been established, treatment should be started with an inhaled corticosteroid, chromoglycate or nedocromil. In corticosteroid therapy, treatment should be started with a dose that controls symptoms, after which the lowest dose that keeps the patient in good condition should be sought (Table 19). Inhaled steroids can also be used alternately with chromoglycate or nedocromil. Concomitant use is seldom necessary but can be considered in children who receive high doses of steroids, or if steroids have caused side effects, and only temporarily when changing from steroids to chromoglycate or nedocromil. The length of regular therapy depends on the patient's condition and the results of pulmonary function tests. If bronchial reactivity has increased and there are marked variations in PEF values, regular drug therapy should be continued until pulmonary function is normal. This may take one to two years in adults. In children, the situation may normalize sooner.

**Example of use of inhaled corticosteroids
in initial asthma**

Drug/Use	Dosage
<ul style="list-style-type: none"> ● Beclomethasone, budesonide, fluticasone 	
<ul style="list-style-type: none"> ● Alleviate symptoms ● Maintain result ● Confirm result ● Find lowest dose that controls symptoms ● Try periodic therapy ● Raise dose as necessary 	<ul style="list-style-type: none"> ● Fairly high initial dose ● Halve the dose ● Reduce dose if possible ● Lowest possible dose

In **chronic asthma**, regular treatment with inhaled steroids is often necessary. When budesonide or beclomethasone is used, the daily dose varies from 0.4 to 2 mg, but some patients need considerably higher doses, up to 3 to 4 mg a day. In children, the daily dose is 0.2 to 1.0 mg.

Inhaled steroids have proven safe to use. Nevertheless, they cause side effects either locally (mouth and pharynx) or systemically depending on the dose and individual sensitivity (Table 20). In children, growth and relative weight should be carefully monitored. The risk of systemic adverse effects increases if the daily dose of budesonide or beclomethasone is chronically over 1.2 to 2.0 mg in adults and over 0.4 to 1.0 mg in children, depending on the size of the child. After intensive initial treatment the lowest possible maintenance dose should be sought. The usual maintenance dose in adults is 0.4 to 1.0 mg a day and in children 0.2 to 0.5 mg a day. If the patient is free from symptoms for a long time, the possibility of an even lower dose or managing without a steroid should always be considered.

Chromoglycate and nedocromil may give good results in the treatment of seasonal asthma in children and in initial asthma in children of school age. Introduction of inhaled chromoglycate (10 mg 2 to 3 times a day) or nedocromil (4 mg twice a day) may be considered after steroid therapy in children in particular. On exacerbation of symptoms, medication can be potentiated by an inhaled steroid, in which case chromoglycate or nedocromil is usually discontinued for a short time.

Problems and side effects associated with inhaled corticosteroids

Local side effects

- Oral and pharyngeal candidiasis
- Hoarseness and vocal problems
- Contact allergy caused by steroids

Systemic side effects

- Suppression of pituitary and adrenal function
- Growth failure
- Effects on calcium balance in the bones and the body, osteoporosis
- Thinning of the skin and purpura
- Steroid allergy
- Other

Poor effect of corticosteroids

- Patients who respond poorly to steroids

Treatment of exacerbation of symptoms: If symptoms of asthma occur or become aggravated during a common cold, inhaled steroid should be resumed or its dosage doubled on the first day of illness. Thus, a common cold is not a contraindication for steroid therapy but rather its indication. The same applies to exposure to allergens during, for example, the pollen season. After intensive initial treatment, many patients need anti-inflammatory medication only during such periods.

On exacerbation of symptoms, **systemic corticosteroids** should be given as necessary. Prednisolone or methylprednisolone 25 to 40 mg a day is given for 7 to 10 days. Side effects are few even if the course were repeated every two months. However, systemic steroid therapy continuing for months or years has serious side effects that may occur after long-term (months and years) administration of doses exceeding 10 mg a day. In children, repeated systemic steroid therapy is seldom necessary.

Gold preparations, methotrexate and cyclosporine may be used in the treatment of severe cases of asthma in specialized hospitals.

With bronchodilators, inhaled beta₂ sympathomimetics (e.g., short-acting salbutamol and long-acting salmeterol) have a direct effect on the respiratory smooth muscle and produce marked bronchodilation. The effect of salbutamol, for example, is poorer when taken orally. Short-acting beta₂ sympathomimetics

are used for occasional symptoms, as first aid in exacerbation of symptoms or for the prevention of symptoms before physical stress or going outdoors. They should not be used regularly unless necessary. Single doses should be reduced, as low doses produce similar bronchodilation to much higher doses if basic treatment is in order (Table 21). Low doses also cause less tremor and cardiac symptoms.

New long-acting (up to 12 hours) beta₂ sympathomimetics are not intended for primary treatment of asthma. They are useful in chronic asthma when appropriate anti-inflammatory medication fails to control the disease adequately. They also reduce early-morning symptoms.

TABLE

21

Use of inhaled beta₂ sympathomimetics

- For occasional symptoms
- First aid in exacerbation of symptoms
- Prevention of symptoms, e.g. before strain
- In long-term treatment, for mild and moderate symptoms of asthma as necessary
- In long-term treatment, for regular treatment of severe asthma (primarily long-acting sympathomimetics)
- Low doses are preferred in long-term treatment

Anticholinergic agents (e.g., ipratropium bromide) may be used instead of beta₂ sympathomimetics if the latter cause side effects. They can also be combined with sympathomimetics. Anticholinergics produce bronchodilation more slowly and to a lesser extent than beta₂ sympathomimetics. Their most important indication together with asthma is chronic bronchitis. They have practically no side effects.

Theophylline tablets are used when basic anti-inflammatory medication fails to control symptoms. Theophylline apparently has mild anti-inflammatory effects, and the long-acting form taken at night reduces early-morning symptoms. Primary side effects include abdominal problems and headache and, particularly in children, restlessness. In long-term treatment, a suitable dose is determined by measuring the blood theophylline concentration.

Asthma patients are still prescribed antibiotics far too often. Aggravation of dyspnoea and cough and increased mucous secretion should be treated primarily by increasing the dose of anti-inflammatory agents. Antibiotic therapy should be started if there are indications of bacterial infection. Cough suppressants and

expectorants are seldom necessary in asthma. Antihistamines are not effective in asthma.

Severe asthmatic attack is life-threatening, and rapid and appropriate medication is essential (Table 22). Fatal asthmatic attacks are usually a result of inadequate basic treatment, underestimation of the degree of the disease or attack, avoidance of corticosteroids or the patient's unknown hypersensitivity to analgesics.

TABLE

22

Example of treatment of severe asthmatic attack

1. Rapid assessment of the situation; reassurance of patient and family
2. Oxygen, 35% mask or nasal cannulae, flow 4-5 l/min
3. Pulmonary auscultation, PEF, respiratory and heart rates
4. Inhalation of beta₂ sympathomimetic, e.g., salbutamol 5 mg diluted in 2 ml physiological saline; *in children, 50-150 µg/kg*
5. Intravenous fluid infusion, 5% glucose or 0.9% NaCl
6. Methylprednisolone 40-80 mg i.v.; *in children, 2 mg/kg*. Dosage can be repeated every 4-6 hours.
7. Arterial blood gas studies; measurement of oxygen saturation
8. If the attack persists:
 - salbutamol inhalation every 20 minutes, 5 mg during the first hour, and then at 1 to 2 hour intervals; *in children, 50-150 µg/kg or rasemic adrenaline 0.5-1.0 mg/kg*
 - ipratropium bromide inhalation 0.5 mg (2 ml) six times a day, possibly together with beta₂ sympathomimetic; *single dose in children, 0.3 ml/10 kg*
9. As necessary:
 - theophylline 3-5 mg/kg in a 100 ml infusion given over 10-20 minutes; *in children, 5 mg/kg diluted into 20 ml*
 - continuation with theophylline infusion 0.2-0.6 mg/kg per hour; *in children, 0.8-1.2 mg/kg per hour*
10. Prednisolone 40-60 mg a day orally; *in children, 1-2 mg/kg*

4.2.4 Guided self-care

In a Finnish study, guided self-care decreased the number of visits by asthma patients to health centres and specialized medical care units, absence from work because of the disease and use of antibiotics by 50%. Exacerbations of symptoms were also significantly less frequent in the self-care group (Fig. 9).

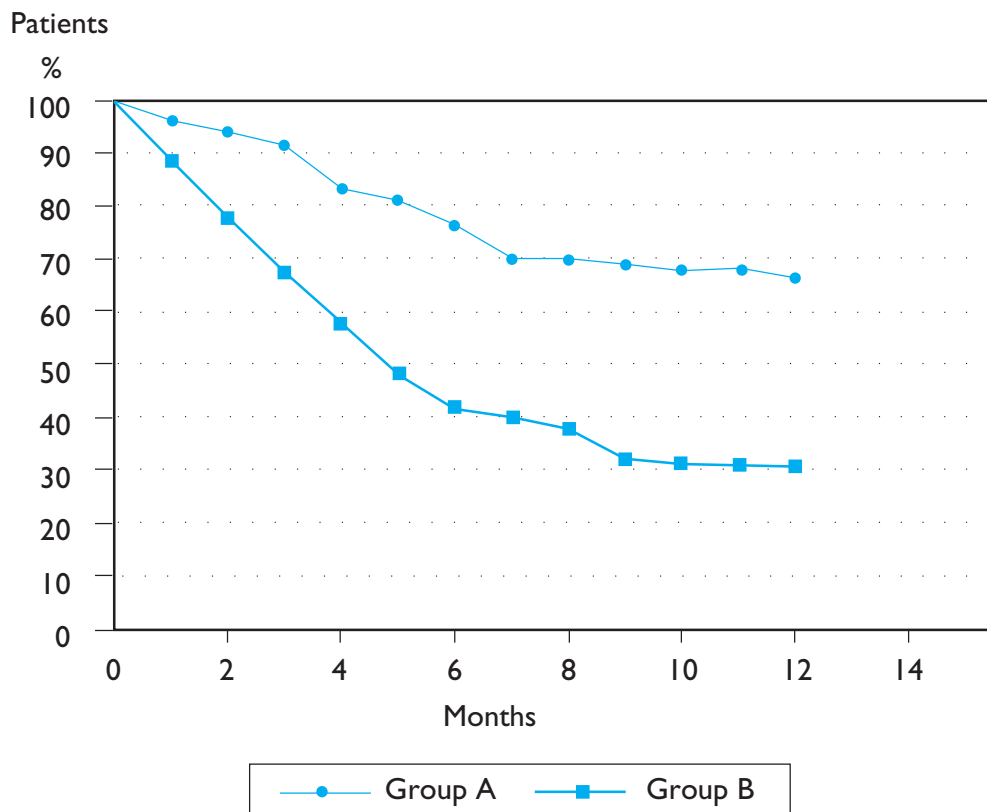


FIG.

9

Accumulated percentage of patients who exhibited no exacerbations of symptoms during one year in a guided self-care group (A) and a control group that received conventional treatment (B)

The patient's responsibility for treatment is crucial. Guided self-care where the patient is motivated and monitors his or her condition on the basis of symptoms and preferably with PEF measurements and adjusts medication in accordance with specific instructions ensures the best results in long-term treatment and reduces exacerbations of symptoms (Table 23).

Signs of exacerbation of asthma

- Increased cough and/or dyspnoea and/or mucous secretion
- Disturbed sleep at night
- Increased exercise-induced asthma
- Inhaled sympathomimetic does not seem to help
- Cortisone inhaler causes irritation and cough
- Morning PEF values decrease
- Medication does not bring PEF values to the usual level

Patient education should include basic information about asthma and instructions concerning allergies and hypersensitivity to medicines. The purpose and side effects of medication, and self-administration and its restrictions should also be explained. Appropriate use of medicines (including inspiration technique) must be taught, and a written crisis plan including instructions as to when to seek medical attention should be drawn up. Written material, such as an asthma passport or medication card, should also be used.

Attention should be paid to psychosocial stress factors, as these may impair control of the disease or patient compliance. Patients usually benefit from discussions with their doctor or primary nurse.

At **follow-up** the patient's subjective condition (at night, in the morning, upon exercise, common colds) is examined, medication (doses, technique) and other treatment instructions are checked, the patient is given the necessary prescriptions, and the date for the next appointment is fixed. The patient should monitor his PEF values for two weeks prior to the appointment morning and night and record actual medication.

Like other patients with chronic illness, the patient may have other health problems in addition to or associated with asthma (physical symptoms, problems in human relationships, sexual problems, fears, etc.) that may affect his or her well-being and control of the disease. It is important to reserve enough time for discussion with the patient and for investigating his current concerns.

In long-term treatment, guided self-care should be introduced if possible. Successful self-care requires (Table 24) a good patient-provider relationship and treatment organization. Flexible access to assessment by a nurse or a doctor as necessary is fundamental. Self-care must not be implemented in such a way that the patient is left on his or her own after initiation of care.

Conditions of successful self-care

- Personal doctor, personal nurse
- Individual, thorough and repeated education
- Clear, documented self-care material
(PEF chart, instructions for action in different situations, teaching material about asthma)
- The patient has a PEF meter
(at least in cases of severe/moderate asthma)
- A flexible treatment organization also responsible for follow-up

4.2.5

Hierarchy of referrals

Appropriate hierarchy of referrals aims at early detection of the disease and careful mapping of the external causes of asthma. The patient should be given adequate information about asthma and its treatment and instructions to help lead as normal a life as possible.

The primary health care system is responsible for the treatment of adult patients, unless their treatment has not been temporarily shifted to specialized medical care. Paediatricians in specialized care are primarily responsible for the treatment of children and are supported as agreed by the primary care system.

The patient should be transferred to specialized care as necessary and returned to primary care when specialized care is no longer needed (Table 25). Situations in which the patient falls between the two systems and does not know where to seek help should be avoided. Successful scaling of treatment requires rapid and flexible flow of information into both directions (e.g. epicrisis).

Hospital districts should ensure that the primary health care system is capable of diagnosing and treating asthma patients appropriately. They are responsible for organizing training and consultation. Treatment of asthma involves regional cooperation.

A hospital district should appoint one of its **specialists** to be **in charge of asthma treatment**. This person is responsible for regional know-how and the quality of treatment of asthma patients. In primary care, **local contact persons for asthma treatment** should be appointed to distribute information and coordinate training. Each health centre should appoint one doctor and one nurse as contact persons in asthma treatment. Regional persons in charge are responsible for the organization of regional training and should monitor treatment results together with local contact persons.

**Distribution of work in the treatment of asthma patients
between primary health care and specialized medical care****Primary health care**

- Prevention
- Diagnosis
- Preliminary allergological examinations
- PEF home monitoring
- Long-term treatment of asthma
- Guided self-care
- Acute care
- Treatment of infections
- Treatment of children under school age as agreed
- Health education, training
- Environmental measures
- Clinical research

Specialized medical care

- Prevention
- Diagnosis
- Thorough allergological examinations
- Thorough pulmonary function tests
- Acute care
- Guided self-care, patient education
- Long-term treatment of severe asthma
- Occupational asthma
- Primary treatment of children under school age
- Treatment of children receiving regular steroid therapy
- Desensitization to allergens
- Consultations
- Training, teaching
- Regional direction and coordination of treatment
- Basic and clinical research

Indications for specialized medical care consultations

- Diagnostic problems
- Suspected unknown external causes of asthma
- Suspected occupational asthma
- Poor control of symptoms (numerous steroid courses, severe nocturnal and exercise-induced asthma, excessive use of bronchodilators)
- Assessment of capacity for work

In its 1983 report, the Allergy Committee suggested the foundation of a joint allergy laboratory for various specialties in central hospitals, and more intensive cooperation between the representatives of different specialties. This suggestion has been partly realized. Joint **allergological units** have been established in some hospital districts for allergy testing in dermatology, pulmonary diseases, otorhinolaryngology, paediatric diseases and internal medicine, with good results. These activities should be extended to cover the whole country as allowed by regional resources.

— 4.3 — Rehabilitation

Rehabilitation of asthma patients includes all forms: medical, occupational and social. Treatment procedures with rehabilitative aims and rehabilitation based on special regulations cannot be clearly differentiated.

The Finnish Social Insurance Institution organizes rehabilitation for roughly 3,000 asthma patients annually. The number of patients in medical rehabilitation has increased slightly during the past few years, while that of patients in occupational rehabilitation has decreased. In 1991-1993, the number of asthma patients in occupational rehabilitation fell by over 25% (from 2,352 to 1,715). The costs of occupational rehabilitation are not reimbursed by the Social Insurance Institution to the same extent as before, as according to current regulations reimbursement requires that the patient's capacity for work and means of earning a living have decreased considerably because of the illness.

Most rehabilitation services are targeted at the age group that uses the least hospital services. Elderly patients who use the most hospital services receive the least rehabilitation (Fig. 10). In 1990, rehabilitation of asthma patients cost roughly FIM 38 million, which is some 8% of the total costs.

The health care system bears the primary responsibility for medical rehabilitation. The Social Insurance Institution shares the responsibility for organization of institutional and out-patient rehabilitation of severely disabled individuals. Patient associations and public health organizations organize several rehabilitation courses annually, partly in their own rehabilitation centres, financed by the Social Insurance Institution as discretionary rehabilitation in accordance with the Rehabilitation Act. Forms of medical rehabilitation and the hierarchy of referrals are presented in Table 26.

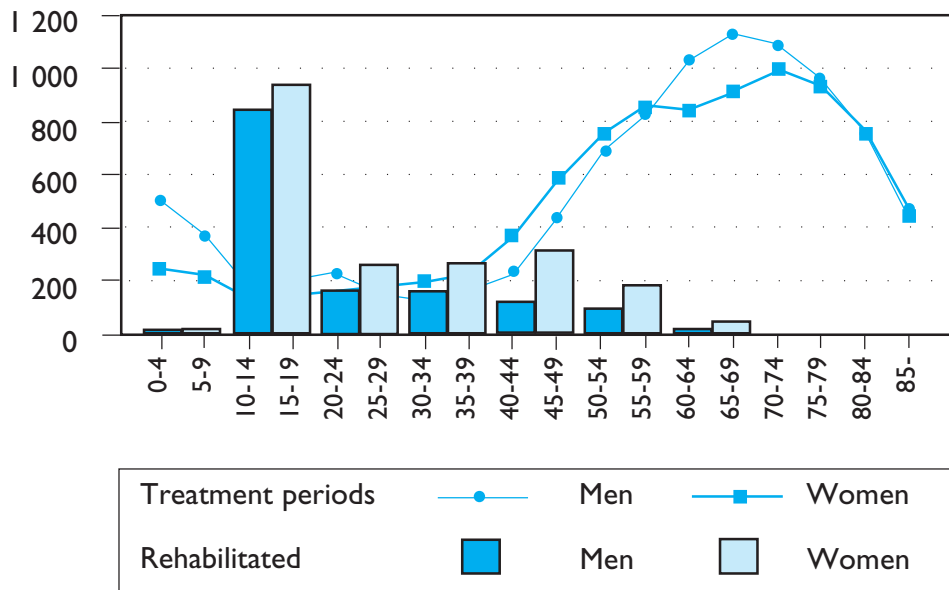


FIG. 10

Patients hospitalized because of asthma and rehabilitated by the Social Insurance Institution, according to age group

TABLE 26

Forms of medical rehabilitation of asthma patients

1. Instructions and guidance relating to immediate treatment of asthma provided by the health care system. This includes instructions on the use of drug delivery systems, provision of such systems and their maintenance.
2. Out-patient adaptation training courses organized or purchased by hospitals and health centres.
3. Rehabilitation instruction for asthmatic children and adults suffering from respiratory disorders implemented in most hospital districts and organized or purchased by the health care system.
4. Adaptation training and rehabilitation courses organized by the Social Insurance Institution on an out-patient or institutional basis.
5. Rehabilitation courses for farmers with occupational asthma organized by the Farmers' Social Insurance Institution.
6. Respiratory rehabilitation provided at occupationally oriented medical rehabilitation courses (ASLAK) organized by the Social Insurance Institution.
7. Out-patient and institutional medical rehabilitation of severely disabled individuals.

The responsibility for occupational rehabilitation is shared by many sectors. According to the legislation on occupational diseases, rehabilitation of patients with occupational asthma is the responsibility of insurance companies and should be coordinated by the Insurance Rehabilitation Agency. Occupational rehabilitation of other asthma patients is within the compass of labour administration, based on the legislation relating to labour services passed on 1 January 1994. According to the Rehabilitation Act, the Social Insurance Institution is responsible for organizing training for asthma patients whose capacity for work and means of earning a living have markedly diminished because of their illness. According to the employment pension legislation, employment pension agencies can organize occupational rehabilitation and medical rehabilitation to support it. Early rehabilitation services are also provided.

According to the Institute of Occupational Health, in their experience 75% of patients suffering from occupational asthma can be rehabilitated sufficiently to continue in working life. The primary measure is to transfer the patient to a new task in his or her current work place. If this is not possible, the Insurance Rehabilitation Agency should be contacted as early as possible. Rehabilitation is more successful if the individual is referred to examinations as soon as possible without long sick leaves.

Rehabilitation is regulated by many laws and has as such become, at least partly, an automated mechanism fuelled by various systems whose examination of actual needs has been inadequate. Rehabilitation centres excessively on institutions, and cost-benefit ratios have received too little attention when planning different ways of implementing rehabilitation.

Out-patient rehabilitation should as far as possible replace institutional form; some rehabilitation services currently provided in institutions could be realized at lower costs on an out-patient basis. Primary health care and specialized care systems should provide rehabilitation services as an integral part of treatment. Provision of preliminary information, instructions and guidance, and support for both patient and family are one of the basic tasks of the health care system. Decisions concerning referral to rehabilitation should be made case by case and timed correctly, patients being referred at a time when maximum benefit can be expected. The need for, and appropriate timing of, rehabilitation can best be assessed by the attending doctor and the patient.

Where children are concerned, rehabilitation should be targeted at those whose asthma is difficult to treat or whose parents are unable to manage even the treatment of mild asthma. The whole family should understand what the child's illness is about, their attitudes should be realistic, and they should provide appropriate treatment and create an environment that promotes the growth and development of the child. Patients of working age may need intensive rehabilitation or vocational retraining to maintain capacity for work. In the treatment of elderly asthma patients, rehabilitation is important in supporting self-care, increasing the patient's resources and improving the quality of life, which reduces the need for hospitalizations. A general observation is that while the need for

“heavy” rehabilitation of asthma patients has decreased, that for guidance and instruction has increased. Needs for improvement of rehabilitation are listed in Table 27.

TABLE 27

Improvement of rehabilitation of asthma patients

- Rehabilitation should make it possible for children and young people to lead as normal a life as possible, improve capacity for work in individuals of working age, and reduce the need for hospitalization of elderly patients.
- Rehabilitation should be timed correctly and planned individually. It should be implemented primarily in connection with normal treatment.
- Rehabilitation services should be implemented primarily on an out-patient basis, organized or purchased by the health care system. Rehabilitation in institutions should be reduced.
- In occupational asthma, the basic condition of successful rehabilitation is that employees are referred to examinations as soon as possible without long sick leaves.

4.4 Social security

The purpose of social political support measures is to ensure effective treatment of asthma patients and their management in daily life.

The social security of patients with occupational asthma is better than that of other asthma patients. The costs of examinations to diagnose occupational disease are reimbursed. Other reimbursements prescribed by law include costs of medical care, daily allowances, employment accident pension, handicap indemnity, survivor’s pension, welfare for the disabled, funeral grant and compensation for breakage of aids. In addition, if illnesses other than the occupational disease are aggravated because of work-related factors, treatment or sick leave can be reimbursed in the same way as those resulting from the occupational disease.

The number of child care allowances tripled between 1987 and 1993. In 1993, ordinary child care allowance was granted to 8,493 children, increased allowance to 2,140 children, and special allowance to 11 children, totalling 10,644. In 1992,

the grounds for granting child care allowance were changed to fit developments in the treatability of asthma, bringing a drop in the number of persons on increased allowance and a rise in those receiving ordinary allowance. This decision may reflect in medical rehabilitation of the severely disabled, implemented in accordance with the rehabilitation legislation passed on 1 October 1991, because only children receiving increased or special child care allowance are entitled to these services.

The number of persons receiving actual disability pension because of asthma has fallen slightly over the past few years, from 5,858 in 1989 to 5,228 in 1993. Conversely, the number of persons receiving early disability pension has risen from 965 in 1989 to 1,984 in 1993. The number of persons entitled to special reimbursements for prescriptions of antiasthmatic medicines has soared from 98,103 in 1989 to 135,363 in 1993.

In 1993, roughly FIM 280 million were spent on antiasthmatic medicines. Costs of medication for severe and chronic asthma are reimbursed under the lower special reimbursement category, which since April 1994 is 75%. The patient's fixed excess per purchase is FIM 25, and reimbursement is calculated for the amount exceeding this. Most (roughly 70%) prescriptions for antiasthmatic medicines fall into the special reimbursement category. Both adults and children also need medicines for alleviation of asthma-like symptoms. The reimbursement for such prescriptions is 50% of the sum exceeding the patient's fixed excess (FIM 50 per purchase). All of the most important antiasthmatic medicines are in the special reimbursement category.

Since 1992 the state of the economy has warranted a greater contribution from the patient to the costs of medication. Prior to the changes, special reimbursement was 90% with no fixed excess. The so-called basic reimbursement for prescriptions was 40% for some time but was raised back to 50% in April 1994. Prior to the changes, the patient's fixed excess in this category was FIM 35 compared with the current FIM 50. The net result of all this is an increase in the proportion paid by asthma patients entitled to special reimbursement from 10% to 24%. Annual costs of medication average FIM 1,900. Roughly FIM 1,400 is paid by the social insurance and FIM 500 by the patient.

The grounds for granting special reimbursement changed for asthma at the beginning of April 1994 in that, for example, the patient must first be on regular medication for at least 6 months, and the need for medication must continue beyond that period. Until special reimbursement (75%) is granted the patient receives the basic reimbursement (50%) for the costs of medicines. The purpose of such reforms in the reimbursement scheme is to determine the severity of the disease and whether it is chronic. Persons with initial asthma may recover after effective initial medication, and the need for medication must therefore be reassessed from time to time. In some cases, changes in the grounds for granting reimbursement has delayed the start of medication.

— 4.5 —

Summary

Essential aspects in the treatment of asthma patients are listed in Table 28.

TABLE 28

Essential aspects in the treatment of asthma

1. As many patients as possible with initial asthma recover.
2. The patient feels well and the functional capacity is consistent with age.
3. Asthma is diagnosed early and treatment started without delay.
4. Medication for inflammation of the bronchial mucosa is of primary importance and is started at an early stage.
5. Guided self-care is an essential form of treatment.
6. The patient and the primary health care system bear the main responsibility for treatment, supported by specialized medical care. The treatment of children is the responsibility of parents and the specialized medical care system and, as agreed, the primary health care system.
7. Rehabilitation is implemented on an out-patient basis. Actual needs for rehabilitation are considered, rehabilitation is planned individually and timed correctly, and implemented so that it is economically effective.
8. When changing the grounds for reimbursement of costs of medicines, and in other social security issues, it is important not to introduce shortterm savings that later result in increased costs.

Information, training, research and follow-up

5.1

Information and training

Implementation of the Asthma Programme at local level, and achievement of the goals, require training and dissemination of information to key groups. These include individuals at high risk of asthma (those with atopy), who suffer from asthma or whose children have asthma, who participate directly in treatment and rehabilitation (doctors, nurses, rehabilitation personnel), who can influence the nature and extent of exposure (designers, decision-makers, day care centre personnel and teachers), or who distribute information about matters relating to health and illness (reporters, representatives of various organizations, the pharmaceutical industry).

Responsibility for information and training could be shared between organizations such as the Allergy and Asthma Federation, Folkhälsan (non-governmental health and social organization for the Swedish-speaking population in Finland), the Finnish Lung Health Association, the Federation of Finnish Lung Disease Associations, and the Finnish Indoor Air Association. These could distribute information to their members and, to some extent, to the general public. They also produce appropriate material for patient education, and health education material relating to asthma for schools in cooperation with the health, education and environmental authorities. However, these activities require financial support from the society, such as grants from the Finnish Slot Machine Association.

The Social Insurance Institution plays a key role in disseminating information relating to reimbursement of costs of medicines, rehabilitation and social security. The authorities, in turn, are responsible for dissemination of information to professionals and for their training in cooperation with different organizations and associations, such as the Association of Finnish Pulmonary Physicians, the Finnish Paediatric Association, the Finnish Society of Allergologists and Immunologists, the Finnish Association of Municipal Doctors, the Finnish Society of Internists, the National Union of Public Health Nurses, and the Union of Health Professionals in Finland. Regional direction and training is the responsibility of hospital districts and provincial governments. Health centres are in charge of local direction and training. The pharmaceutical industry plays a significant role in supporting

information and training. The Ministry of Social Affairs and Health is responsible for implementation and follow-up of the programme.

The media as a whole and medical reporters and editors in particular, as well as editors of professional journals, are in a key position to stimulate discussion on the general principles of the programme and to promote achievement of the goals.

Examples of areas of information and training important for implementation of the programme are given in Table 29.

TABLE 29

Information and training necessary for implementation of the Asthma Programme		
Information and training	Time	Agent
● Preliminary information and information to key groups	1994	Ministry, organizations
● National discussions and training	1994-95	Ministry, Asthma Working Group
● National Asthma Days	1995, 1997 etc.	Ministry and organizations
● Regional training	1994-95	Hospital districts, provincial governments
● Local training	1995-96	Health centres
● Articles in organisation publications	1994-	Organizations
● Articles in professional journals	1994-	Asthma Working Group
● Provision of material	1995-98	Organizations and authorities
● Supplementary information	-2004	Authorities and organizations

— 5.2 — Research and follow-up

In Finland, asthma research has been carried out by the universities, the Social Insurance Institution, health care institutions, different organizations, the pharmaceutical industry, individual researchers and groups of researchers and, as commissioned, undertaken or sponsored by the Academy of Finland.

Few extensive population studies exist on the prevalence of asthma. Those that do exist have helped to correct estimates about the prevalence and causes

of asthma and to improve treatment, but data about the natural course of the disease, the incidence, risk factors, changes in the severity of the disease and effects of long-term treatment are insufficient. Epidemiological studies on the risk factors of asthma and on the effects of asthma on public health, and intervention studies to improve prevention of asthma and guided self-care, should be increased and financial support for such studies secured. Studies on preventive measures should be an integral part of asthma research. Multidisciplinary research projects should be promoted. Areas of research central to the Asthma Programme are listed in Table 30.

Northern Finland is at a disadvantage, as there is no chair of pulmonary diseases at Oulu University Medical Faculty. Such a chair would promote scientific research and the prevention, treatment and training relating to asthma at a regional level. Teaching and training in allergology should be improved. A chair in allergology at Helsinki University would promote such activities.

The Finnish pharmaceutical industry accounts for only 15% of the market of antiasthmatic medicines in the special reimbursement category. This is a significant challenge for research and development by the domestic pharmaceutical industry.

TABLE

30

Needs for research and follow-up relating to the Asthma Programme

Central areas of research and development

- Genetics of asthma
- Prevalence and incidence of asthma
- Aetiology of "intrinsic" asthma
- Early diagnosis and treatment of asthma
- Indicators of mucosal inflammation, sputum and blood tests in asthma
- Diagnosis of asthma in small children, particularly pulmonary function tests and treatment
- Self-care of asthma patients
- Living and working conditions of asthma patients
- Environmental factors causing asthma: description and evaluation of risk
- Non-pharmacological treatment of asthma (e.g., elimination of allergens at home and in the working environment)
- Creation of extensive data systems for follow-up

5.3

Summary

Important information and training issues relating to the Asthma Programme and to improvement of research and follow-up are presented in Table 31.

TABLE 31

Needs for improvement in information, training, research and follow-up relating to the Asthma Programme

1. Information and training should be targeted at key groups, such as patients and their families, health care personnel, day care centre and school personnel and individuals in charge of environmental issues.
2. Organisations should disseminate information to their members, and produce material needed in health and patient education and in training, in cooperation with the authorities. The Social Insurance Institution should disseminate information about reimbursements and social security. The pharmaceutical industry plays an important role in supporting information and training.
3. The authorities should bear the primary responsibility for training professionals. Regional direction and training are mainly the sphere of hospital districts and provincial governments and local health centres. The Ministry of Social Affairs and Health is responsible for implementation, follow-up and, as necessary, revision of the programme.
4. The media play a key role in the dissemination of information about prevention and treatment of asthma.
5. Research into asthma should focus on population studies on the prevalence of the disease, risk groups and risk factors, on studies aiming at the promotion of prevention and guided self-care, and on studies on the significance of long-term treatment and reduction of harmful exposure.
6. Criteria for the staging of asthma should be established.
7. The Academy of Finland should prepare and sponsor a programme for asthma research.

Costs of the programme

The costs of implementation of the Asthma Programme will arise mainly from information and training. However, these will not be additional costs but costs relating to normal activities of the health care system and organizations, as health care workers, for example, undergo training continuously to maintain their professional skills. Implementation of the programme will therefore not incur extra costs.

According to the Working Group, implementation of the programme would make it possible to treat increasing numbers of asthma patients at current costs. Total expenditure by society would remain at the current level. If the programme is not implemented, the costs paid by society are bound to rise quickly as asthma becomes increasingly prevalent.

Summary

1. The Working Group has given its recommendations for promotion of the prevention and treatment of asthma and rehabilitation of asthma patients for the period 1994-2004. The programme should be revised as necessary because of rapid developments in medical knowledge and drug therapy in particular.
2. Asthma is an inflammatory disease of the bronchi affecting 3-5% of the population. Roughly 150,000 individuals are on drug therapy or social security because of asthma. In addition, roughly 10% of the population experience asthma-like symptoms occasionally. Nearly 400 cases of occupational asthma are detected annually. The number of asthma patients may increase by up to 60% by the year 2000. Thanks to early diagnosis and treatment, recovery from initial asthma is possible and severe asthma can be alleviated. The majority (60%) of asthma patients suffer from a mild form of the disease.
3. In the early 1990s, the annual costs of asthma were estimated at FIM 2.5 billion. Without effective prevention and treatment these costs will increase considerably. The costs arising from severe asthma (20% of the patients) account for roughly 60% of total costs, most of which are caused by hospitalizations and loss of production.
4. The goals of the Asthma Programme are as follows: (a) as many patients as possible with initial asthma will recover; (b) the patient feels well, and the capacity for work and functional capacity are consistent with age; (c) the proportion of patients suffering from severe and moderate asthma will fall from the current 40% to 20%; (d) the annual number of bed days will decrease by 50% by the year 2000, i.e. will be 50,000; and (e) the annual costs per patient will decrease by 50% as a result of more effective prevention and treatment.
5. The following means are suggested to achieve the goals: (a) organization of early diagnosis and active treatment for patients suffering from asthma and asthma-like symptoms; (b) treatment focusing on guided self-care. Treatment is the responsibility of the patient and the primary health care system and is supported by the specialized medical care system. Parents and the specialized medical care system and, as agreed, the primary care system, are responsible for the treatment of child patients; (c) exposure to factors

causing asthma and asthma-like symptoms, such as smoking and tobacco smoke, should be reduced considerably; (d) rehabilitation should be integrated in treatment and carried out on an out-patient basis, it should be individualized, based on actual needs and timed correctly; (e) knowledge about asthma and its prevention and treatment should be increased among key groups; and (f) research into asthma should be stepped up.

6. Asthma and exacerbation of its symptoms can be prevented through (a) choices relating to lifestyle, such as not smoking, maintenance of good general condition, avoidance of allergens and appropriate treatment, and (b) measures to reduce the exposure of sensitive individuals to allergens and irritants at home, in day care centres, schools, work places and public facilities. The Asthma Programme gives several examples of such measures and appeals to various authorities and voluntary organizations to increase cooperation. Preventive measures should be individualized and based on actual needs. The aim is to minimize restrictions in the life of the patient and his or her family.
7. Asthma should be treated actively right from the start. In drug therapy, treatment of inflammation of the bronchial mucosa is of primary importance and should be started at an early stage. The role of the patient or parents in the implementation of drug therapy is fundamental.
8. The hierarchy of referrals in the treatment of asthma should be revised to increase the role of primary health care. A good flow of information and cooperation between primary health care and specialized medical care are necessary if this hierarchy is to work properly.
9. Hospital districts should ensure that the primary health care system is capable of diagnosing asthma and providing proper treatment to the patients. It is their responsibility to organize training and specialist consultation. One of the specialists in the hospital district should be appointed in charge of know-how and quality relating to treatment at regional level. In primary health care, local contact persons should be appointed to disseminate information and coordinate training. The treatment of asthma should be a matter for regional cooperation.
10. It is recommended in the programme that joint allergological laboratories be established in central hospitals and cooperation between different specialties increased. Some hospital districts have already gained good experience from such units.
11. Rehabilitation of asthma patients should cover all forms of rehabilitation: medical, occupational and social. In children, rehabilitation is targeted especially at children with severe asthma or whose parents are not able to

manage even the treatment of mild asthma. In individuals of working age, intensive rehabilitation or training for a new occupation may be necessary to maintain capacity for work. In elderly patients, rehabilitation should support self-care, increase the patient's resources and improve the quality of life, reducing the need for hospital care. When changing the grounds for reimbursement of costs of medicines, and in other social security issues, it is important not to introduce short-term savings that later result in increased costs.

12. Rehabilitation should be implemented on an out-patient basis as far as possible. Guidance and instruction should be an integral part of treatment. This includes instructions about the use of drug delivery systems, provision of such systems and their maintenance. Hospitals and health centres should provide or purchase various forms of rehabilitation services on an out-patient basis. Patients should be referred to rehabilitation on the basis of their individual needs. The attending doctor and the patient can together best assess the situation in which rehabilitation is the most beneficial.
13. Information and training should be directed primarily at key groups, such as patients and their families, health care personnel and individuals responsible for environmental issues. Organizations should disseminate information to their members and produce general material needed in health and patient education relating to asthma and training material in cooperation with the authorities. The Social Insurance Institution should disseminate information about reimbursements and social security. The pharmaceutical industry plays a key role in supporting information and training. Regional direction and training are the area of hospital districts, provincial governments and local health centres. The Ministry of Social Affairs and Health is responsible for implementation, follow-up and, as necessary, revision of the programme. The media play an important role in the dissemination of extensive and in-depth information about prevention and treatment of asthma.
14. Research into asthma should focus on population studies on the prevalence of the disease, risk groups and risk factors, on studies aiming at the promotion of prevention and guided self-care, and on studies on the effects of long-term treatment and environmental measures. Criteria for the staging of asthma should be established. The Academy of Finland should prepare and sponsor a programme for asthma research. Development of antiasthmatic agents, inhalation devices and delivery systems is an important challenge for the Finnish pharmaceutical industry.
15. If the Asthma Programme 1994-2004 is implemented, the increasing number of asthma patients can be treated at current costs. If it is not, the costs paid

by society will increase rapidly with the prevalence of asthma. The programme can be implemented by reallocation of current resources; there will be no extra costs.

MINISTRY OF SOCIAL AFFAIRS AND HEALTH
WORKING GROUP MEMORANDUMS ISSN 1237-0606

- 1994:
- 1 Pienten lasten hoitojärjestelmän kehittämistyöryhmän väliraportti
 - 2 Sosiaali- ja terveysministeriön tietohallintostrategia
 - 3 Sosiaali- ja terveysministeriön tietotekniset arkkitehtuurit
 - 4 Sosiaali- ja terveysministeriön tietohallinnon kehittämisohjelma vuosille 1994-1996
 - 5 Reumatyöryhmän muistio
 - 6 Vakuutusyhtiölainsäädännön ETA-työryhmä: Kotimaisia vakuutusyhtiöitä koskevat säännökset
 - 7 Vakuutusyhtiölainsäädännön ETA-työryhmä: Ulkomaisia vakuutusyhtiöitä koskevat säännökset
 - 8 Vakuutusyhtiöiden vakavaraisuussäännösten ETA-työryhmänmuistio
 - 9 Kansanterveyden monitorointityöryhmän muistio
 - 10 Yrittäjien ansioturvatyöryhmän muistio
 - 11 Pienten lasten hoitojärjestelmien kehittämistyöryhmän loppuraportti
 - 12 Lomituspalvelujen hallinto- ja rahoitustyöryhmän muistio
 - 13 Asuntovelkatyöryhmän muistio
 - 14 Vähimmäisturvatyöryhmän välimuistio
 - 15 Työvuorottelutyöryhmän väliraportti
 - 16 Astmaohjelma 1994-2004