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# Overview of Asthma Disease Management

Asthma can be one of the most daunting challenges within managed care.

Although managed care organizations have been successful in controlling the per capita expenditures in many areas of health care, asthma has remained a major cost problem, especially because of hospitalizations and emergency room visits. In addition, employers who purchase health care plans find that asthma has major indirect costs due to lost time on the job and reduced worker productivity.

The good news for managed care, employers and patients is that asthma can be controlled and its costs contained. Although there is yet no cure for asthma, the mechanisms of the disease are well known, and there are reliable diagnostics and safe and effective asthma therapies. The key for successful management of asthma is organizing treatment resources within a comprehensive plan that includes accurate and early diagnosis, expert professional care, an educated patient who participates in the treatment, and the support services necessary to help the patient achieve long-term control of the disease.

### Features of an Asthma Disease Management Program

As medical specialists who treat asthma, allergists-immunologists are highly knowledgeable about successful management of asthma. Allergists have developed comprehensive systems of care that (1) for the patient improve *outcomes* and *quality of life*, and (2) for the payer and insurer reduce *resource utilization* and *costs*. Much of that experience is presented in this disease management resource manual.

A comprehensive disease management program for asthma should have the following features:

1. The program's goals, concepts and key elements must be clearly defined.
2. The therapy must be based on a partnership between the patient and the health care team.
3. The professional care should be multidisciplinary.
4. There must be a strong education component.
5. Treatment protocol should be based on nationally accepted care standards such as the NHLBI guidelines.
6. Specific case management must be available for targeted individuals.
7. The program should largely depend on primary care for patients with intermittent disease.
8. Specialty consultation and management should be provided for patients with persistent disease.
9. Incremental intervention should be based on utilization patterns and disease severity.
10. There must be ongoing assessment with data-drive intervention.

The most up-to-date national standards of care are contained in the *Guidelines for the Diagnosis and Management of Asthma*, published by the National Heart, Lung and Blood Institute (NHLBI) in 1997 for the National Asthma Education and Prevention Program.

### Levels of Management

Disease management is the complete process that organizes, coordinates and monitors health care delivery and measures its outcomes. Disease management seeks to allocate health care resources in a logical, efficient and proportionate manner.

For asthma, the disease management process involves a hierarchy of functional levels of patient care:

- case management
- encounter management
- procedure management

*Case Management.* Individual patient cases must be identified and resources allocated based on need. For some diseases such as diabetes, case management of every patient is, for all intents and purposes, the standard of care. Diabetes cases are all complex, and failure to follow the necessary treatment regimen inevitably results in morbidity. For asthma, however, there is a broad range of severity, and it is not practical nor necessary to case manage every patient. Most asthma patients do not need extensive intervention because they simply are not very sick. Others, needing comprehensive case management, can be identified by their high utilization of health care resources.

Usually the moderate persistent and severe persistent asthmatics can be identified by counting hospitalizations and emergency room visits, or a combined weighted utilization scoring system. More specific clinical identification may involve pulmonary function studies. Once identified, these patients can be the recipients of case management as a component of an overall disease management program. Case management can decrease the fragmentation of care that often occurs when the patient has multiple encounters with the health care system.

*Encounter Management.* The next step is to monitor individual encounters within categories of asthma severity to identify patterns of utilization. The objective is to provide targeted intervention. If a particular patient is a high user of emergency room services, reduction in ER visits can be where the emphasis is placed. Steps should be taken that are specific to the patient, taking into consideration the factors that are causing the overutilization or inappropriate utilization of the emergency room.

Encounters may be of the kind that are scheduled, such as office visits, or unscheduled, as in emergency room visits. In general, the unscheduled visits are more expensive and less helpful in achieving the ultimate goals of disease management.

Clinical protocols and guidelines—which continue to be revised and improved—are available for decision making in each type of encounter. An excellent resource is the newly revised NHLBI *Guidelines for the Diagnosis and Management of Asthma*. Another important resource is the *Practice Parameters for the Diagnosis and Treatment of Asthma*, developed by a joint task force of the American Academy of Allergy, Asthma & Immunology, the American College of Allergy, Asthma & Immunology, and the Joint Council of Allergy, Asthma & Immunology, and endorsed by the Allergy-Immunology Subsection of the American Academy of Pediatrics.

*Procedure Management.* The specific procedures to be performed have traditionally been audited retrospectively through utilization review. A far superior method of management, however, is prospectively through the use of critical pathways. A critical pathway provides a detailed “road map” for the health care provider to follow when managing an encounter. Critical pathways, although similar to practice parameters and guidelines, are often more specific and detailed.

A word of caution, though, about critical pathways. There is a tendency to use them only when an encounter occurs. The consequence is lost opportunities for preventing undesirable encounters that may affect the ultimate outcome of the case. Effective case management should reduce the number of encounters and treatment procedures and that, ultimately, will make the critical pathways less “critical.”

### Illustration A

## Types of Management

Level	Definition	Intervention	Goals
Disease (ICD-9)	A particular diagnosis	Disease management	Improved outcomes and reduced costs
Case (Unit number)	An individual patient	Case management	Improved satisfaction and quality of life
Encounter (Account)	An interaction with the patient	Clinical protocols and guidelines	The patient feels better
Procedures (CPT code)	What is done during an encounter	Critical pathways	Cost-effective, high-quality care

### Focus on Outcome Goals

For asthma patients, *outcome goals* include decreased hospitalizations, decreased emergency room visits, increased clinic visits and, ultimately, decreased utilization. On the other hand, *quality-of-life goals* include enhanced wellness and an ability to participate in activities that are routine for the patient, decreased absences from work or school, increased compliance with treatment plans, and increased satisfaction by the patient and family.

The goals can be outlined as follows:

- I. Patient's individual goals
- II. Population management goals
  - A. Clinical
    1. Increased PEF/FEV<sub>1</sub>
    2. Reduced reliance on beta-agonists
    3. Increased daily use of controller medications
  - B. Humanistic
    1. Improved patient quality of life
    2. Improved patient satisfaction
  - C. Economic
    1. Reduced hospital admissions
    2. Reduced emergency room events

### Asthma Disease Management Process Model

An asthma disease management program encompasses all levels of patient care. At the level of the managed care organization, it requires a disease manager and a disease management advisory committee that includes the kinds of health care professionals who are involved in asthma care. At the level of individual patient encounters, primary care providers and educational programs must be provided for all asthma patients.

The disease manager should monitor utilization patterns of all patients and assign case managers where utilization patterns suggest more intensive management. To manage a disease as common as asthma, a stratified approach is necessary. The steps include:

1. identify the patients and assign them to intervention groups
2. intervene
3. monitor the results using objective measurements

The third step must feed back to the intervention program so that improvements are continuous.

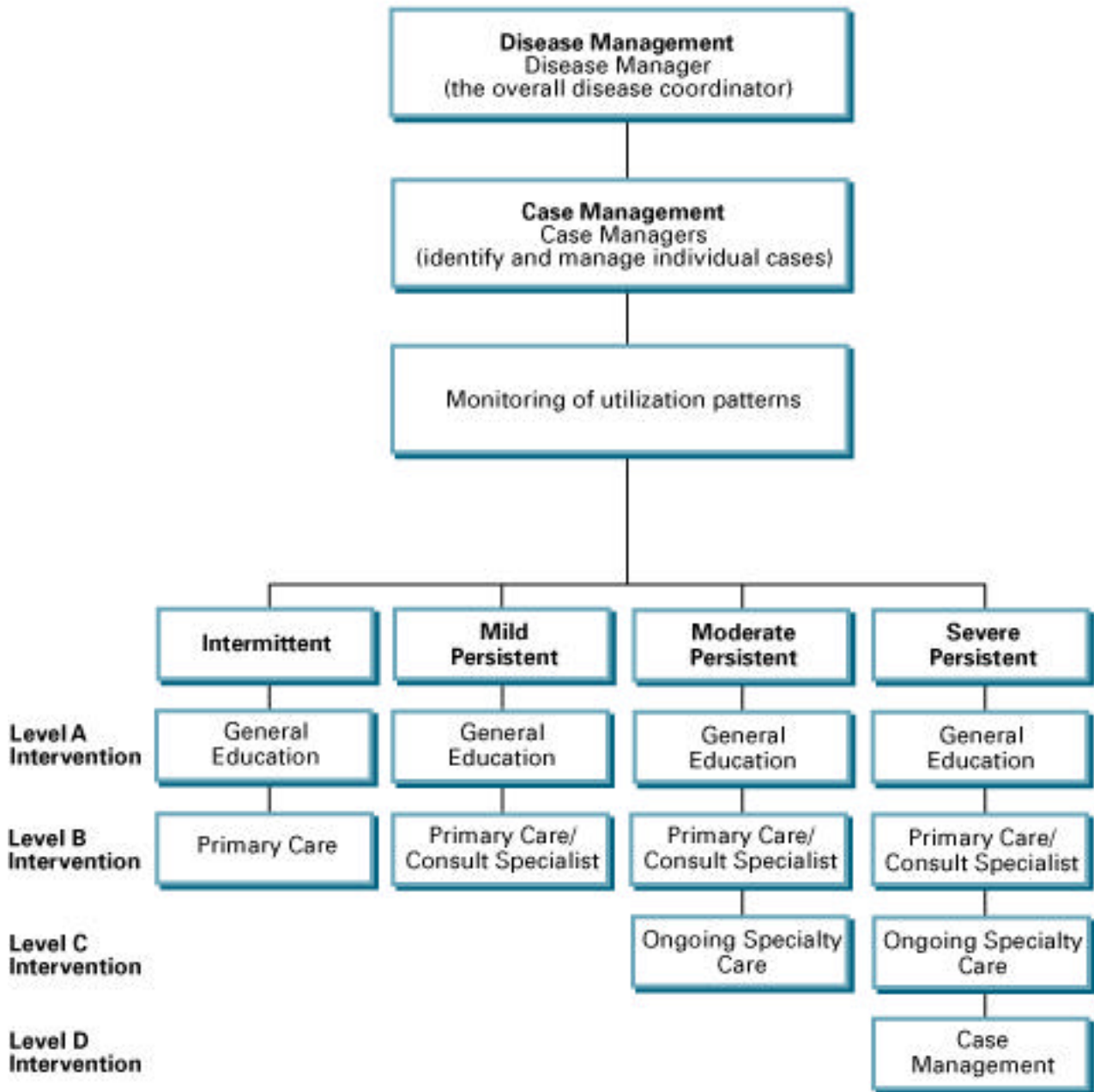
Primary care physicians must be provided continuing education that enables them to keep abreast of scientific advances, the diagnosis and treatment of asthma, and the indications for referral for specialist care.

An example of an allocation algorithm that has four levels of disease severity and intervention is shown in Illustration B. Either disease severity or utilization patterns—or a more complex combination of the two—can be used to categorize patients, and the number of levels of intervention can be greater than four.

Illustration B

**Resource Allocation Algorithm**

(Based on Disease Severity)



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### Identification of Asthma Patients

Asthma patients can be identified by self-reported surveys or by claims data analysis.

Claims data bases are readily accessible in most health plans, however the data usually are not in a form that is easily used for identifying asthmatics. Part of the problem is there are no universal criteria for labeling a patient as having asthma. Although many definitions have been published, primary care and specialty providers have been reluctant to label patients as having asthma because of concern about their insurability. The result is under-reporting of the disease.

### Stratification of Asthma Patients into Risk/Need Categories

Also, there are no universally accepted criteria for stratifying asthma patients into risk/need categories.

Possible criteria for stratification include:

#### *Retrospective Data Collection and Analysis*

- Claims encounters—provided by health plan data bases. These include information about hospitalizations and visits to an emergency room. Since the data are based on claims, there will generally be a three- to six-month delay before the information can be used by the case manager or disease management committee, which may be too long to prevent morbidity in a rapidly deteriorating patient.
- Pharmacy data—when available. This can include beta-agonist or anti-inflammatory drug ratios, or the number of beta-agonist canisters prescribed per month. Such data only works in closed health care networks where all pharmacy data are available. There are a limited number of studies demonstrating the utility of this type of pharmacy data.
- Clinical information—generally supplied by the health care providers themselves. The results of a pulmonary function test would be an example. Physicians should always be able to refer patients for case management when they deem it appropriate.

#### *Prospective Data Collection and Analysis*

- Patient-reported surveys—quality-of-life (QOL) studies that are valuable for measuring an asthma patient's overall well being. These surveys, usually conducted on an ad hoc basis in the past, are just now coming into general use in some managed care programs. The tools for administering the surveys, collecting and storing the data, and viewing the results in the context of each patient's overall status are becoming more widely available.
- Pulmonary function data, including FEV<sub>1</sub> and serial peak flow measurements.
- Medication types and refills.

### Weighted Utilization Scores

Utilization has been the most common method for stratifying patients with asthma. Asthma utilization studies invariably find that a few patients are responsible for a disproportionate number of hospitalizations and ER visits. For example, at Children's Mercy Hospital (CMH) in Kansas City where emergency room patients were tracked for one year, a single patient was seen 13 times, accounting for 0.55% of the total visits—a multiple of almost 18 times the average.

A similar pattern is seen for hospital admissions. At CMH, a single asthma patient was admitted nine times and accounted for 1.28% of the inpatient utilization. Since the asthma patients who frequently visit emergency rooms are not necessarily the same patients who are admitted, it is desirable to combine the two measures into a weighted utilization score.

A weighted utilization system might, for example, assigned 3 points for a hospitalization, 2 points for an ER visit,

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## Illustration C

## ER Visits at Children's Mercy Hospital

ER Visits per Patient	Number of Patients	Cumulative Number of Patients	Cumulative Percent of Patients	Total Number of ER Visits	Cumulative Total of ER Visits	Cumulative Percent of ER Visits
13	1	1	0.03 %	13	13	0.55 %
11	1	2	0.06 %	11	24	1.02 %
8	3	5	0.14 %	24	48	2.05 %
7	4	9	0.25 %	28	76	3.24 %
6	12	21	0.58 %	72	148	6.31 %
5	16	37	1.03 %	80	228	9.71 %
4	37	74	2.06 %	148	376	16.02 %
3	115	189	5.25 %	345	721	30.72 %
2	368	557	15.48 %	736	1457	62.08 %
1	890	1447	40.21 %	890	2347	100.00 %
0	2152	3599	100.00 %	0	2347	100.00 %
	<b>3599</b>			<b>2347</b>		

The table demonstrates that 2% of asthma patients accounted for 16% of ER visits, and that 15% of asthma patients accounted for 62% of ER visits.

1 point for an urgent care visit, and 0 for a clinic visit since it is a desirable encounter. The result of this system of weighted utilization is a numerical ranking of patients from highest to lowest. It is then a simple matter to stratify patients according to their utilization. Similarly, patients can be ranked and stratified according to costs for a particular period of time.

### Procedure Management for Asthma Patients

Once patients are stratified, interventions can be assigned. Here are five suggested levels of intervention:

*Level A—General Education.* All asthmatics and their families require education about their disease. This can be in the form of educational brochures, videos, electronic information via the internet and support groups. Daily pollen and mold counts that are provided by many allergy offices can be a vehicle for taking information about asthma to the public through media in the local community. The outreach program should be based on behavioral goals.

Continuing medical education is important to improve the knowledge and communications skills of health providers who counsel asthma patients. Health care providers should participate in lectures, and specialists should be willing to participate in medical conferences.

*Level B—Primary Care.* Every patient—in or out of managed care—should have a primary care provider (PCP), and this is particularly true for asthma patients. At the very least, an appointment should be made with a primary care provider after any ER visit or hospitalization for asthma, and preferably an asthma specialist should be consulted.

An extra effort should be made to have a PCP relationship for patients who are in the top 50% of the asthma

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service utilization curve .

*Level C—Specialty Consultation or Referral.* It is not practical, nor even necessary, for every asthma patient to be under the direct care of an asthma specialist. Patients with the greatest need for specialist consultation or referral are those with moderate persistent and severe persistent asthma, as defined by the 1997 NHLBI *Guidelines for the Diagnosis and Management of Asthma*. In the managed care setting, a case manager should monitor these patients to be sure that they actually are seen by the specialist.

Asthma specialists provide the most effective and economical care for patients with moderate persistent and severe persistent asthma, because they have specialized training and experience in handling these particular problems, and they more often follow accepted principles and protocols for the diagnosis and treatment of asthma—precepts that have been frequently revised and improved in recent years.

Patients also are likely to receive a more comprehensive evaluation and treatment plan from the specialist. This includes a complete history—past medical history, social history, family history and environmental history. The latter focuses on environmental and other triggers of asthma with the intent of appropriate remediation. Allergy testing should be performed to identify sensitivities, and spirometry should be routinely provided for patients who are old enough to be tested. Peak flow tests should be performed when indicated.

Specialists also tend to provide more extensive patient education, based on the results of the diagnostic tests. The education includes information about environmental control, use of medications, general and specific treatment of asthma, and crisis management. There are a number of action plan examples in this manual and in the NHLBI *Guidelines for the Diagnosis and Management of Asthma*.

Patients with mild intermittent asthma can be returned to the PCP with a treatment plan. Patients who have mild persistent asthma also may be returned to the PCP, but usually should have scheduled follow-up appointments with the asthma specialist.

*Level D—Specialty Care.* Patients with moderate persistent and severe persistent asthma should be co-managed by the PCP and the asthma specialist. These patients are the top utilizers of asthma care services—especially hospital and emergency room services—and aggressive intervention can achieve the most dramatic treatment outcomes and cost savings.

*Level E—Case Management.* Patients with the most severe persistent asthma are eligible for detailed case management. This means the assignment of a case manager who initiates contact with the family, probably arranges for a home visit and facilitates the patient's interactions with the health care system. Frequent telephone contact also should be an integral part of case management. These patients should be reviewed by the disease management team at least every six months.

The purpose of the home visit is to establish or improve contact with the patient and the patient's family and to evaluate environmental exposures. Asthma is a multifactorial disease, but the most important factor is environmental exposures, including tobacco smoke, allergens or poor ventilation. If a quick visual inspection of the home suggests allergen exposure, a full environmental analysis can be done. This may include assays for a number of antigens, including dust mite, dog, cat, cockroach, mouse and rat feces, and molds. Air sampling may be conducted to identify bioparticulates. An engineering survey may detect faulty plumbing or foundation walls.

Once identified, the environmental triggers must be eliminated or modified. Case management may include insect extermination, carpet cleaning or removal, mite-proof covering for mattresses, dehumidification or HEPA air filtration, cleaning of heating and air conditioning ducts, and plumbing repairs. The cost of the remediation may be far less than the costs of repeated hospitalization and emergency room visits.

Finally, some asthma patients are among the top utilizers of health care services because they do not keep clinic appointments—a primary reason for their uncontrolled asthma. The case manager may have to arrange to bring the patient to the clinic for medical appointments.

## An Overview

### Outcomes Measurement

In disease management, an “outcome” is a change in health resource utilization caused by an intervention. Measurable outcomes include frequency of hospitalization and emergency room visits, or changes in more-sophisticated utilization scores. The scores of groups of patients can be compared—e.g., case managed vs. other patients, specialist co-managed vs. primary care. Single groups also can be tracked over time to evaluate consistency and duration of effects.

In addition to the outcomes, the process itself can be measured:

- physiologic status such as FEV<sub>1</sub>
- functional status, such as number of work or school days missed
- number of unscheduled care episodes
- number and type of prescribed medications
- duration of inhaled anti-inflammatory therapy
- number and type of behavior problems
- level of family conflict or support
- quality of life, as measured by validated instruments such as the modified SF-36

Patient satisfaction also is a measurable outcome. The perceptions of the patient or the patient’s family, recorded on a questionnaire, can be summarized, compared and reported.

### A Final Word about Disease Management

Too often in the past, the managed care approach to asthma has been primarily reactive, based on utilization review.

Today’s asthma disease management is proactive and data-driven. It relies on evidence-based guidelines and promotes critical pathways. It takes into account the overall care—and cost—of the patient with asthma. It is a system that evolves and is never quite finished. It manages the entire relationship between the patient, the doctor, the patient’s environment and the health care system.

The purpose of this *Asthma Disease Management Resource Manual* is to provide many of the tools needed to create and maintain an asthma disease management program.

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Betty B. Wray, M.D., Augusta, Georgia (Chair)  
William E. Berger, M.D., Mission Viejo, California  
Terence L. Carey, M.D., Tulsa, Oklahoma  
Jean A. Chapman, M.D., Cape Girardeau, Missouri  
Ira Finegold, M.D., New York, New York

Stanley M. Fineman, M.D., Marietta, Georgia  
Phillip E. Korenblat, M.D., St. Louis, Missouri  
Jay M. Portnoy, M.D., Kansas City, Missouri  
Mark C. Wilson, M.D., Omaha, Nebraska

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