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LIFE WITH ASTHMA

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A FAMILY DOCTOR BOOKLET

Life with Asthma

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Introduction

Many people suffer from asthma—a condition in which the patient gets sudden attacks of difficulty in breathing. Small children as well as adults are affected and it is a frightening experience that may lead to feelings of panic—in itself making the situation worse.

This booklet does not set out to tell you how to diagnose or treat asthma for every patient needs the individual attention of his own doctor. It does, however, tell you the basic things you need to understand about asthma, what can be done to help, and how to live life to the full in spite of it.

Help is at hand

There is no doubt that many asthma sufferers seek little or no medical advice: they tend to listen to unorthodox practitioners (whether genuine friends or quacks) using methods that are relatively useless and sometimes frankly dangerous. As asthma can itself be unpleasantly dangerous at times and as orthodox medical treatment can be extremely effective, this seems a bit hard on them.

Asthma is horrid. Normally our breathing is quite effortless and not even noticed, but with asthma it becomes an effort. Frightening, too, if the asthma is bad—not knowing if you are going to get enough breath to be all right: it can even be life threatening.

But I will have to start at the beginning and explain what asthma is. To do this I must first tell you about normal breathing, bronchial tubes and lung tissue; and something about germs, fumes, and allergies.

Normal breathing

When we breathe we suck air into our chests by making them expand. This we do by means of muscles so attached to the ribs that when they contract (ie shorten) they lever them both upwards and outwards and thereby expand the rib cage.

Another muscle doing this for us too is the diaphragm, which the floor of the rib cage is made of. This is so dome shaped that when it contracts it flattens out greatly and again enlarges the cage. In doing this it of course compresses the contents of the belly (abdomen) and so makes the abdominal wall bulge out a little – which is what we can see. Air is sucked in through mouth and nose. It does not really matter which, but the nose is in general better as it is equipped to notice any smells, humidifies the air so that the throat does not dry uncomfortably, and filters off much of the dust that we unfortunately breathe.

Breathing out

Breathing out takes less effort than breathing in as the rib cage tends to fall in again on its own, the abdominal wall flattens naturally, and the lungs themselves, having a lot of elastic in them, tend to deflate anyway. So you virtually breathe out just by stopping breathing in. But if you want to you can breathe out very powerfully indeed by forcibly contracting your abdominal muscles and another set of chest muscles which are attached to the ribs the opposite way round from the first group and bring the ribs down and closely together again. You can also if you need to increase the effort of breathing in call into play some muscles in the neck which help to lift the ribs up more. You can see these muscles working hard in anybody whose breathing is very difficult.

One way traffic

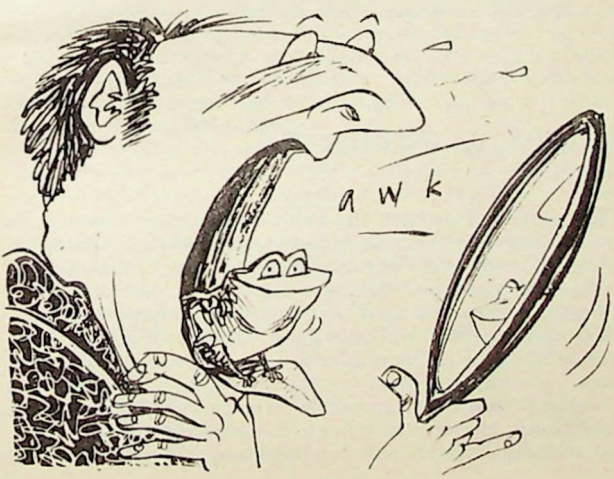
The air that is sucked in, whether through mouth or nose, gets to the back of the throat, and down, and then comes to an astonishing and dangerous crossroads where it negotiates the pathway for food and drink. It is vitally important that food should not get breathed into the lungs where it could cause tremendous trouble so there is a complicated mechanism at this collision area to prevent that happening. If by chance the mechanism lets us down and food "goes the wrong way" we know all about it immediately, and nothing can prevent us coughing until the last crumb has been safely salvaged. It is all part of the struggle to keep the lungs free of dirt, germs, flying insects, dust, and anything else that might harm them.

Air goes through the voice box (larynx) and on down through the windpipe (trachea). This is nearly an inch wide, kept permanently open by tough gristle (cartilage), but flexible and able to concertina in and out a bit because this cartilage is

arranged in rings. You can just feel them in the front of the lowest part of your neck. The trachea goes on down into the chest and then divides into two, one division (main bronchus) going to each side. These straightway enter the lungs and thereupon divide again and again (up to about 25 times in some parts) getting ever smaller but still retaining the stiffening of cartilage until they are right down to a millimetre or less in diameter. Even then the little tubes, now called bronchioles, have a lattice work of muscle fibres in them that probably help to keep them open all the time, allowing air to flow forwards and backwards with hardly any restriction at all. The angles at which the branches come off the main stems, and the relative sizes of the different tubes, are exactly what modern engineering science has worked out to be the ideal arrangement. Air flow is miraculously free and unimpeded.

Frog in the throat

These small air tubes also make themselves a lining of sticky slime (mucus) which traps any minute dust particles or germs that land on it. Furthermore they then send this slime back up to the super-sensitive larynx by wafting it along on countless millions of minute microscopic waving hairs (cilia). Here the mucus tickles us, so we "clear our throat", cough it up, and



either spit it out and get rid of it, or else swallow it and thereby immerse all unwelcome invaders in the sterilising bath of acid digestive juices in our stomachs. It all forms an excellent house cleaning service, a marvellous protection against lung disease. You can see why it is terribly important to keep those cilia good and healthy.

Working non-stop

The bronchioles, after further division, eventually open out into the minute little air sacs (alveoli) that are the true gas exchange organs and are what the lungs are all about. They are about a fifth of a millimetre in diameter (less than a hundredth of an inch), and there are about 300 000 000 of them, so their total surface area is somewhere about 80 square yards—say the size of a tennis court. Their microscopically thin walls allow atmospheric oxygen from the breathed-in air to seep across, within about half a second, into the network of superfine (capillary) blood vessels that are there and thus get into the general blood stream. At the same time the unwanted carbon dioxide present in the blood stream, derived from the general chemical workings of the body and equivalent to the flue gases coming from a fire, seep across from the capillary network into the alveoli (going in the reverse direction, that is) and hence into the bronchioles, bronchi, trachea, throat, mouth or nose, and finally into the room.

What is asthma?

The trouble in asthma lies with those little bronchi and bronchioles. They become extremely irritable and during an attack they suddenly behave as if they were at action stations to repel all invaders. To achieve this they narrow right down, the muscle fibres in their walls contracting hard to do so. This hard contraction of millions upon millions of minute little muscle fibres in the bronchial and bronchiolar walls is as it were the enemy in asthma, for if only they can be made to relax out of their cramp like spasm ("bronchospasm") the attack will be relieved. In addition, though, the very substance of their walls swells, and this narrows the internal diameter further

still. Finally, presumably in order to sweep out any invaders that get in after all, the manufacture of sticky mucus accelerates, so that thick goo now comes to line what little remains of the air passageways.

Out of breath

All this of course disastrously cuts down on the free flow of air. Greater efforts of breathing are now required to get it flowing at all and as a result the sufferer feels all out of the blue, and for no apparent reason at all, very nastily short of breath. Definite efforts have to be made to squeeze air out of the chest—it is no longer just a matter of relaxing things—and these very efforts inevitably squeeze the air tubes narrower still. It therefore becomes even harder to breathe out than in and the chest can be felt to get ever tighter and more blown up with air.

Scary situation

If it is the first attack the sufferer may well feel a bit desperate, start to panic, and try different positions for breathing in. This restless movement only makes him worse, for the extra muscular effort means that more air is needed and this is just what he cannot manage to provide. If he can calm himself he will be much better, but it is a terrifying situation to be in and this is a difficult thing to do. Slowly he gets more used to it and realises he can stick it out, but hours may go by before he has much spare breath for moving around, or even for eating and drinking. Talking itself has to be rationed. Slowly the asthma eases off, and as it does so an attack of coughing may occur, bringing up some of that sticky mucus.

An attack like this will happen to anybody if he breathes into his lungs enough of a really irritant gas—like sulphur dioxide for instance. In the patient with asthma it is allergy that basically does it instead. What happens in allergy is that some tiny harmless little scrap of animal or vegetable matter, that has never previously caused any trouble at all, becomes capable of producing an intense irritable inflammatory reaction in a particular person. The fault lies not with the substance itself but with the person: ie he has become allergic to it.

Family connection

Some people and families can be allergic in various different ways to many different things. Allergic inflammation can then

occur in the skin as eczema, in the nose as hay fever, or in the bronchi as asthma. Infantile eczema may even be followed by asthma in childhood and later by hay fever in adolescence. The word "atopy" is applied to allergic people: they are said to be "atopic".

So the asthmatic is a person whose small bronchi are liable to get congested and constricted should he breathe in even only minute amounts of whatever he has become allergic to. This might be grass pollen, cat fur, mould spores, or minute fragments from the tiny little mites that live in ordinary house dust; or it could be one or several of many other things. Occasionally odd foods can do it, like strawberries or shellfish.

The attack that is brought on usually lasts a few hours and then slowly clears away completely as the allergic inflammation in the tubes disappears. It could be days, weeks, or months before another attack occurs, during which time most asthmatic people are quite all right. There are some people, however, the extra unlucky ones, in whom some of the inflammation persists, the bronchial tubes remain narrowed down, stay congested and "juicy", and symptoms only subside and do not disappear completely.

Develops gradually

Asthma often starts in the 2 or 3 year old child and may take a few years to show itself in its true colours. At first it may just be a matter of recurrent wheezy colds in the chest ("wheezy bronchitis") from virus infections. The allergy to house dust, or whatever, only becomes obvious later on.

It is an odd thing that once a person is asthmatic he is likely to find that the particular offending material to which he is allergic is by no means the only thing that will bring on attacks: sudden changes in temperature or humidity, the inhalation of cigarette smoke, the development of an ordinary chest cold, and many emotional stresses will do it too. Exercise is particularly likely to do this—a five minute run perhaps or a game of football—though strangely enough swimming is usually all right.

Asthma and the mind

The effect of emotions in triggering off an asthma attack is often very striking indeed, but this should not really be surprising for most bodily functions are after all greatly influenced by them, as every blushing bride, queasy examination candidate, and palpitating horror film viewer can testify.

In some cases of allergic asthma their effect is so powerful that the majority of attacks may seem to result purely from emotional stress. This is why asthma is commonly held to be a psychosomatic disorder, this being a term indicating that it is the mind ("psyche") that is the root cause of trouble in the body ("soma"). Usually it is unpleasant stress that does it like apprehension at going back to school but it may be quite the opposite – the keen bridge player for instance being incapacitated by an attack before the game even starts.

A rose by any other name

Some people show an astonishing degree of suggestibility, like the person allergic to certain flowers who develops a genuinely severe asthma attack when exposed to a plastic imitation. Such experiences are commonplace in asthma clinics but they do not alter the fact that the disease is basically allergic. Emotions, among many other things, may trigger off an attack but it was allergy that loaded the gun in the first place.

Searching for clues

Working out what the sufferer is allergic to is sometimes easy but often not. One does it by methodical detective work, noting what occasions bring attacks on. For instance, if the attacks occur mainly in early summer a likely culprit is allergy to grass pollen. Attacks mainly during the working week suggest an occupational exposure – some particular sawdust for instance. If during the weekend, it may be horses, dogs, or garden moulds. If when out visiting it could well be dry rot or other moulds in the house. If it happens exclusively at night it points towards house dust in the bedroom or mattress, feathers in the pillows, or cats on the bedclothes. The general rule, also, is that the offending substance will not be anything new but will be something to which exposure has taken place in the past without trouble. After all, it takes time and more than one exposure for allergy to develop.

Skin tests may be helpful. A drop of water containing a tiny trace of the suspected material is pricked or actually injected into the skin of the forearm, on the inner side where the skin is soft and hairless, and with luck if the patient is allergic to it he will develop a red blotch there, looking somewhat like a single spot of nettle rash.

Many of these tests can be done at one sitting, testing for house dust, pollens, animal dander, and so on. The results can be useful, but many experts claim that they are only a little

more accurate than our present day weather forecasting, and perhaps this is about right. No doubt much depends on the care with which they are carried out.

Treatment for asthma

Nowadays there are several different ways of treating asthma, which are much more effective than a generation ago, and treatment can to some extent be tailored to fit the individual patient and the individual attack.

Bronchodilators

The tiny muscle elements that are in the walls of the small bronchi and bronchioles are in a cramp-like state of contraction ("bronchospasm") during attacks of asthma and there are many drugs ("bronchodilators") that will make them relax, stop contracting, and thereby allow the tiny tubes to open out again. These may be given as tablets or medicines by mouth, by injection, or perhaps preferably by inhalation.

Bronchodilators are constantly being improved in the continual and highly competitive search for the ideal thing—something that works quickly and effectively on the bronchial muscles alone, not affecting the very similar muscle elements that are present in all the other organs of the body. It would have to be absolutely safe and cause no unpleasant side effects, even in very young children and even if it had to be taken daily for a very long time.

New drugs to the rescue

Fortunately, there has already been a good deal of success in this search, so that the older drugs like adrenaline, ephedrine, and isoprenaline have been supplanted by newcomers, like salbutamol, orciprenaline, and terbutaline. (All these drugs have separate trade names given to them by the individual drug firms. They will be referred to here collectively as "salbutamol etc" but this is purely for convenience and does not in any way mean that salbutamol is the best of them.) Ephedrine, though very helpful against asthma, makes the heart thump uncomfortably strongly, the patient nervy and wakeful, makes

his hands shake, and hinders the action of his bladder somewhat. Salbutamol etc, equally effective against asthma, have much less effect on these other organs and are usually preferable, even though they are nowhere near perfect yet.

If the drug is taken by mouth as a tablet or medicine it gets absorbed by the stomach and sent in the blood stream all over the body, so most goes to parts that do not want it and in them it may cause adverse reactions. Only a minute fraction gets to those muscle elements in the bronchioles and bronchi where it is needed. If on the other hand it can be inhaled so that it carries on down into the lungs into the small bronchioles, far less is wasted and therefore a much smaller dose is needed. This means that far less is absorbed into the general body system and therefore less trouble is going to arise from the effects it produces on the other organs of the body.

Much research has resulted in very ingenious ways of achieving this. The problem is to produce a fine enough mist containing a standard dose of the drug dissolved in it for the tiny droplets to escape being trapped in the mouth, throat, larynx, trachea, major bronchi, and their bigger branches and to reach far enough down to the really small ones to be trapped and held. This must not be too haphazard as it is important that the patient should be able to rely on getting a reasonably standard quantity of drug down there.

Special inhalers

Various inhalers have been devised and if used properly achieve this result. They differ with each drug but basically the procedure is the same for all. The patient first breathes out as far as he can, taking plenty of time to do so. He then puts the appropriate part of the inhaler into his mouth and closes his lips around it firmly. He next has to make the inhaler squirt out its fine medicated mist, usually by pressing down on the container vessel that is in it, and at the very same moment he must take a really big deep breath right in.

Learning how

Taking this deep breath is the difficult part, the part that most people get wrong for the simple reason that it is a very unnatural thing to do. Remember that we have all sorts of reflexes and automatic reactions to stop the wrong stuff getting into our lungs, so the natural thing to do if you notice anything funny in your mouth is to stop breathing in immediately and to breathe the stuff out again without delay.

You have to learn to overcome this if you are going to get any benefit at all from your inhaler. And then, having at length learned how to breathe the mist in deeply, you have to learn to hold your breath in for several seconds in order to give it time to settle in your tiny bronchial tubes before you breathe out again. You will lose too much of it if you do not do this. The whole procedure, quick though it is to perform, is trickier than you might think and hence the advice in this booklet (so often repeated) that you should get somebody else to check that you are carrying it out correctly.

Your friend in need

Used well, inhalers are excellent, effective, and safe. It seemed likely a few years ago that they were dangerous, for deaths were reported after their use and dire warnings were given that on no account should they be used more often than was advised on the prescription. These warnings no longer apply. Modern drugs are better and safer and it is unquestionably more dangerous to use them too little than to use them too much. It is now realised that many of those tragedies attributed to the aerosols of isoprenaline then in use were due not to the inhalers at all but to the asthma attack itself.

The message is quite clear now: look on the inhaler as a good friend and use it as much as you need to. Use it quickly and use it plenty. The only real snag is an entirely different one: it is that if the attack of asthma gets really bad it becomes quite impossible to take a deep breath to breathe the mist down far enough into the lungs to be effective and give the relief needed.

In an emergency

In urgent circumstances like this tougher measures are needed. An excellent and very effective bronchodilator drug is aminophylline, and this can be given by injection into a vein ("intravenous"). It is a tricky job, definitely not one for home use by the family, for the injection has to be given unbelievably slowly and carefully. It is one for the doctor only, whether in general practice or in hospital. It works immediately and is standard emergency treatment nowadays.

The same drug in different guises can be given by mouth as a tablet or medicine and its effect is comparable with salbutamol etc. It can be used with them or instead of them but sometimes there is a case for reserving its use for emergencies. The reason is that a doctor would not like to give aminophylline by emergency intravenous injection if the patient had already been taking it by mouth. To do so might be a bit dangerous.

Steroids

A totally different and much more basic approach to the treatment of asthma is to try to settle down the allergic inflammation itself rather than just attack one of the results of it, which is all that the bronchodilator drugs that we have just been considering do. The drugs that settle the allergic inflammation are the steroids like prednisone and prednisolone, derived originally from cortisone. They are mysterious and wonderful things, a basic part of life itself, and they have effects on every cell, tissue, and organ of the body. They can save lives in asthma, and are used regularly for severe attacks in hospital. Unfortunately they take a few hours to work even if given by intravenous injection. Clearly therefore there is no point in taking them if attacks only last for an hour or two every now and then but they are excellent if there is any reason to think that an attack may go on for many hours and be severe.

Side effects with steroids are not a problem in the shorter term; it is only their prolonged use in high dosage over months and years that leads to the moon face, hairy cheeks, fat trunk,

bruising legs, ulcerated shins, weakened bones, shortened height, and all the rest of the well known troubles. Despite all this they are still of great benefit to many who suffer from persistent asthma for whom bronchodilators are simply not good enough and who would otherwise be condemned to a life of perpetual wheeze and disabling shortness of breath.

Careful control of dosage minimises risks but it becomes a bit of a "tight rope act"—on the one hand taking enough of the drug to prevent the asthma getting out of control while on the other not taking so much of it that one's future health is threatened by irreversible side effects. Sadly, this means that for many sufferers there can be no question of taking a big enough dose to suppress the symptoms completely or even anywhere near completely. The build up of side effects as the years go by would become too great.

Fortunately inhalers again come to the rescue. Ingenious ones are available, this time delivering a very fine dust of powdered steroid. Only minute doses are needed if the drug is taken this way and side effects are avoided but once again technique is everything and any errors mean that no benefit is obtained. Read and reread the instructions therefore if you have been advised to take this form of treatment and get your doctor to check on your method, just to make sure.

Cromoglycate

Another drug given by special inhaler is disodium cromoglycate. It too attacks the basic allergy but in a very different way and it takes several weeks to work. Taken correctly it virtually cures most young asthmatics by preventing attacks but it has to be taken several times a day, every day without fail, attacks or no. It may have to be taken for years and it is fortunate that it is quite safe to do this.

Many people misunderstand the drug and do not take it long enough or regularly enough for it to work, abandoning it after only a week or two or after only somewhat irregular use. This is nowhere near a long enough trial. It should be given at least a month, and preferably three, before being abandoned.

Many others expect it to work during an attack but this it cannot do at all. It is quite useless then and should not even be tried. Its action is purely preventative but what a marvellous preventative it is! Many bad asthmatics have had their lives literally transformed by it, turning from one of dangerous invalidism aggravated by the misery of steroid side effects to one of literally normal health.

Often it is wise for them to take extra doses ("puffs") from their inhalers if extra dangers loom up—a sudden plague of cats or in anticipation of a bout of violent exercise. There are several international athletes who would be incapacitated by their asthma but for this drug; they take it regularly together with an extra puff or two before the game or race starts.

Nothing is perfect, however, and nor is this drug. Many of the cases of asthma that start later in life, in middle age or so, gain no benefit from it at all even after months of patient trial. Some of the younger ones are unlucky too, particularly those unfortunates who suffer from the more unrelenting and persistent form of the disease and who are sadly the very ones who most need its help.

Antibiotics

What of antibiotics? In the older patient it often seems that allergy plays much less of a part in provoking attacks of asthma, infection being more important. As in chronic bronchitis, it is mostly the ordinary germs that do this, and perhaps in these people those hair-like cilia in the bronchial tubes are not doing their cleaning up job properly (sometimes because they are being paralysed by cigarette smoke, which they hate). When this happens the patient finds himself coughing up a lot of yellowish or greenish phlegm and this is the time when antibiotics are often needed. As they clear the phlegm the tightness in the chest begins to lessen.

Keep clear of colds

In very young children attacks often seem to be caused by ordinary household coughs and colds, the child who is developing into an asthmatic getting wheezy whereas the other children do not. It would be nice to be able to stop these infections promptly too but unfortunately they are nearly always due to viruses, against which antibiotics are useless. They are best avoided therefore as even the best of them can give trouble.

Antihistamine

Antihistamine drugs are very effective against some forms of allergy like hay fever but they are not usually any good against asthma. There is no harm in trying them sometimes but do not waste time with them in a severe attack. Remember that they all cause drowsiness and so must never be taken when driving or operating machinery and especially not with alcohol.

Sleeping tablets

During a bad attack of asthma the patient's very life depends on continuing the fight to get breath in and out of his lungs. All sleeping tablets take some of this fight out of him and are therefore dangerous at such times. They are even risky to take during mild attacks as nobody can predict with certainty that the condition will stay mild.

Even experienced patients and experienced doctors have been taken rudely by surprise at times. Do not take them therefore unless specifically advised to do so by your doctor: do not even ask him to supply them.

Oxygen

If you really need oxygen you probably ought to be in hospital. There are just a few special occasions in which it is wise to have a supply at home and this will be decided by your doctor. But remember that it is dangerous stuff, more dangerous than petrol, and on no account let any enterprising child fiddle with it as if it were part of a chemistry set. Oxygen fires spread with unimaginable speed and ferocity.

Desensitisation

If a patient's asthma is clearly due to an allergy to something definite, it is sometimes possible to lessen this allergy by giving frequent injections of minute but increasing quantities of the offending substance. This works well in hay fever but is disappointing in asthma and not many doctors advise it nowadays. It is not entirely without danger either for each injection naturally carries a risk of promoting an attack instead of preventing it and even of bringing on an extra severe and complicated attack too.

If the patient is allergic to many different things—and skin testing may clearly show that he is—there is not much point either for he would be all too likely to develop allergy to something else in due course and all the effort would be wasted. It is usually better to rely on regular use of the cromoglycate inhaler. Until the next invention comes along.

Avoidance of contact

Give a great deal of thought to this, but remember that the asthmatic patient may need only microscopic quantities of the offending substance to bring on even a severe attack so it is not likely that even extremely strict measures will eliminate trouble altogether.

Remember also that an asthmatic can be allergic to several different things at once (both now and in the future) so do not needlessly expose him to possible trouble. Feather pillows, for instance, would be asking for it, invisibly fine organic dust being pumped out of them every time he fidgets in bed and going straight into his nose or mouth at the very next breath. Remember also that emotions and nervous tension are great at triggering off an attack, so you will only make matters worse if you get too steamed up over all this. Calmness, sympathy, and efficiency are required: any rousing of antagonism can undo it all.

What then about the family cat, the horse next door, or the incurable mould in the basement? Before deciding upon drastic measures with all their disadvantages, make sure in your own mind how much of the trouble is due to these things and how sure you are that they really bring on attacks. Do not be too influenced by skin tests for unfortunately they are nowhere near 100% reliable. Do not try to prove things either by getting the patient to bury his nose in the cat's fur and take a deep breath: even if done in hospital, tests like this are far too dangerous. If patient observations convince you beyond all doubt that it is the mould in the basement that is the sole

culprit, then the inconvenience and expense of a house move will be immeasurably outweighed by the great benefit gained by the asthma sufferer. But do not go shooting innocent cats!

Difficult decisions come also with regard to allergies at work and very often it proves remarkably difficult to pin point the offending substance. It might be sawdust, welding fumes, or moulds from hay and it is often something to which the patient has been exposed for many years without trouble, his allergy to it only developing slowly. In some of these cases the attacks only start several hours later, in bed at night perhaps, but cease during long weekends and holidays. This can put you off the track for a long time. Medical scientists are steadily finding out more and more about all this and in general it would be best to discuss this sort of problem with doctors who have specialised in the work.

Microscopic house mite

A very common offender indeed is the little mite one hundredth of an inch long that lives in our houses, in the dust of bedrooms, in mattresses, carpets, and the like. Apparently it is its excrement that does it, microscopic though it must be. It is only sensible therefore to keep the bedroom as dust free as possible. This means using a vacuum cleaner daily, wet-sponging the furniture, and using man made materials rather than wool (animal) or cotton (plant) for sheets, blankets, curtains, and pillows. All bedclothes should be frequently changed, and you might encase the mattress and pillows in plastic covers too.

To a lesser degree, the same principles apply to the rest of the house and it is important also to try to eliminate moulds and fungi of all sorts as their spores are common offenders. The dry rot fungus, arch-enemy of joists and timbers, is one such.

Offending foods

Food allergies definitely occur. No doubt many people assert they are allergic to various foods merely because they dislike them and want a respectable reason to avoid eating them but equally there is no doubt that some attacks of asthma are caused by them. In this case, once identified, they can very simply be avoided and it would be folly not to do so. A food allergy will sometimes cause an itchy rash looking like a nettle sting, and in fact goes by the name of nettlerash. Things that are known to do this should be strictly avoided too, just in case one day they provoke an asthmatic reaction.

Caution with drugs

Drugs can do the same and aspirin is such a common offender that it is often considered wise for asthmatics to avoid its use and lessen the pain of toothache, headache, or painful periods with paracetamol. Very many headache and backache remedies contain aspirin and are therefore best avoided. A careful scrutiny of the small print on the box will tell whether or not they do; remembering that "acetyl salicylic acid" is the same thing, being merely the chemist's name for aspirin. Many other drugs are occasional offenders, penicillin for instance, so it is just as well to remain somewhat on the alert when they are prescribed for you.

Remember that it is not the first contact that provokes an attack, for allergy to a substance takes time to develop, so the fact that aspirin or strawberries could safely be taken last year does not necessarily mean that it is not the cause of trouble now.

Smoking

Many people with asthma continue to smoke even when the condition is quite bad, feeling that it helps them to cough up their phlegm. This it undoubtedly does, for the simple reason that the smoke itself speeds up the manufacture of mucus in

the bronchial tubes, and it is this extra mucus that then comes up in the form of phlegm.

At the same time the smoke by irritating the bronchi makes them narrow down and their walls thicken just as happens in asthma anyway. It therefore in fact worsens the situation. But, worse still, it paralyses and then destroys those marvellous little ciliary hairs that are so useful in wafting the mucus up out of the depths of the lungs and up to the larynx. Much of the extra mucus, caused by smoking, is therefore unable to get away and stays put in the bronchi. Lying there, inert and stagnant, it soon gets colonised by all sorts of invading germs, brought to it by every breath. In it these germs multiply happily, and the bad ones amongst them quickly set up infections which the body has lost the ability to eliminate. These infections slowly damage the walls of the bronchial tubes, spread into the real lung tissues itself where the gas-exchanging alveoli are and damage them too. Damage of this sort cannot be repaired by the body and therefore stays there for ever.

The next step is that the damaged lung in turn cannot defend itself against germ infections either, nor when they develop can it get rid of them, so the damage worsens, permanent

again. Stepwise in this way the lungs deteriorate ever more and more, particularly in the winter when chest colds are rife.

Many different germs can make trouble like this once the lungs are damaged, some of them normally fairly harmless and resistant to the action of antibiotics. It is dreadful then to watch the progressive downhill slide of these people, with their breathing difficulties relentlessly increasing, their phlegm copious and dirty, and their weight, strength, and general vitality steadily sapped. Medical treatment at this stage is powerless to do any more than prolong an increasingly miserable existence for them.

No smoking and no smoke

This is the reason why asthmatics are told not to smoke at all. In contrast with the position with respect to lung cancer, it takes very little tobacco smoke indeed to harm an asthmatic, for the very fact of being asthmatic means that their bronchial tubes are far more sensitive to any form of irritation than are those of healthy people. So much so that there is no point in their just cutting down on the smoking a bit and feeling virtuous about it: **it has to be cut out altogether and for ever**. Even their companions have to stop smoking in their presence—or else put up with a healthy cross draught of fresh air in the room. Give the poor fellow's bronchial tubes a chance!

Asthma in children

It is common for asthma to start about the age of 3, perhaps after a warning period of infantile eczema or after the general warning of asthma, hay fever, and eczema being in the family. At first all that is noticed is that the child catches coughs very easily, coughing especially at night and being rather distressed by it.

A doctor's stethoscope would pick up the wheezes in the chest at such times—"wheezy bronchitis"—but one attack of that would not necessarily mean that the child (usually a boy and therefore referred to henceforth as "him") is doomed to become an asthmatic. Nor even would two attacks. It has to

keep on recurring for such a diagnosis to be made. If it does so, however, it will be found that bronchodilator drugs—salbutamol etc—are very helpful and take away not only the wheeze but the cough. Children with asthma cough much more than adults do.

Most of them will grow out of the condition before their teens but a few may have trouble again many years later. Perhaps it is their increasing immunity to the viruses of ordinary coughs and colds that help them to shake it off, for it would appear that the allergic basis to the trouble usually only becomes important several years later. Nevertheless it is obviously wise to be closely on the watch for allergies straight away and to institute anti-dust, anti-wool, anti-cotton, and to some extent anti-pollen and anti-animal measures too.

All this is a great test of wise parenthood for though the child needs this special care and needs special support when asthma strikes he must not be overprotected or turned into too much of a special case or his emotional development will be at risk, and among all the problems that this can bring even the asthma itself can be worsened.

It is most important that nobody be allowed to smoke in the child's bedroom and it would be more than shameful if any member of the family continued to smoke in the same house anyway. It takes very little tobacco smoke in the atmosphere to harm an asthmatic child.

Aim for normality

The aim of management of the child will be to try to achieve a normal upbringing, both at home and at school. What alterations have to be made depend on the nature and severity of his condition. Far more often than not it is all very mild and remains so; a nasty fright for the parents perhaps, and that is all. There may be a dozen wheezy attacks altogether during which the child will need companionship at night and a long sleep-in in the morning, losing perhaps a day at school. Naturally the parents will not leave his side when the attack is on: crying and coughing worsen things so their presence is much needed. Furthermore, any unexpected worsening of the condition demands a doctor's help immediately, so the child needs watching all the time. On the other hand he must not be alarmed, so you must appear casual (but don't be!).

Children of 5 years and older might well be able to manage the salbutamol inhaler and as this works quicker than tablets it is clearly preferable. Make sure he is using it properly, so

check yourself from the instruction sheet and check again with your doctor. If there is any trouble with the inhaler or for any reason you suspect the attack might become a bad one use the salbutamol tablets as well, and use them immediately. Do not be frightened of using them unnecessarily.

Perseverance pays off

If attacks come at all frequently, whether throughout the year or not, a cromoglycate inhaler may well be prescribed. If so be sure to give it a really good try as it takes time to do its work in preventing attacks.

Don't underestimate the problem

Attacks are made worse by fear, tension, and anxiety. If the attack is bad even your approach to the bedside can worsen it so you could easily be misled into thinking that the child is putting it on. NEVER THINK THIS. Such worsening is commonly a sign of danger. It can mean that he has not got much reserve left. He is, as it were, labouring uphill and is in bottom gear already. He maybe ought to be in hospital by now.

It is more dangerous still if the child finds it difficult to talk. This is a reliable sign of a severe attack, with all its fearsome possibilities, and it means that immediate emergency action is absolutely essential.

Avoid emotional upsets

Emotional tensions at home make an asthmatic worse but do not be deceived into thinking it is at heart a psychological illness. Modern research indicates ever more clearly that it is not. Because tension is bad for it, anything that relieves this will do good. Yoga, faith healing, acupuncture, hypnosis, will all do it for some people. No doubt the best of all though is a happy household, with the right mixture of the three basic ingredients of affection, security, and discipline and thus the avoidance of tension in the first place. This is at once the best and the cheapest method. Tranquillisers are usually no good and indeed are nearly always harmful before long. Their use is very much a doctor's decision, reached only after careful professional assessment of the individual case.

Keep cool and calm

Asthma itself is of course a cause of emotional tension, not only in the child who is suffering the attacks but in his parents and household too. It is all too easy therefore for a vicious

circle to develop, nervous tension worsening the asthma and asthma worsening the nervous tension. It is not surprising that it is all too easy to take fright and imagine an attack to be much worse than it is. This makes life unnecessarily difficult for everybody and the best way to avoid making the mistake is to take actual measurements of how bad the attack is by using a peak flow meter, described later.

On the other hand – and the value of measurement comes in again here – it is far worse, and much more dangerous, to overlook the severity of an attack and to think things are better than they really are. The child bravely puts up with grave and worsening distress, danger signs are ignored, and fatalities result.

Peak flow meters

The difficulty is that it is not at all as easy as you might think to be sure whether an attack is getting worse or how it compares with previous ones. Simple tests like blowing out a match with your mouth wide open give a fairly good idea but it is far better to have more precise measurements and for this purpose a gadget has been developed, called a mini flow meter. You blow into it as hard as you can and it measures how fast you do so, giving the answer in litres per minute. Ordinarily

you might manage a flow of 500 or 600 litres per minute, just for a fraction of a second; a mild attack of asthma might bring this down to 250 and a severe one to as low as 100 or less. With it you can watch how things are going and can tell for sure whether improvement has started or not, whether your inhaler is still giving you benefit, or whether you might need an injection. Instruments of this sort are much relied upon in hospitals and they can be very helpful in the home too. Most asthma clinics and many family doctors will supply patients with these meters. They are not all that expensive and it might be well worth buying one.

The severe attack

Relatively few asthmatic people ever get a really severe attack; for most the condition remains very mild. Asthma is so common, however, that most doctors have to deal with bad attacks at times and in hospital emergency departments these are quite common. Asthma causes about 1700 deaths in Britain each year, mostly in young people. This is in fact as much as a quarter of the number of people killed on the roads and like car accidents these fatal attacks do not have to happen.

Undoubtedly many would have been prevented if the patient had been given and had heeded advice about the danger signs and what to do about them. What often happens is that he courageously tries to stick the bad attack out, just as he has stuck quite nasty ones out in the past, and by the time he realises that he cannot do so after all he is so short of breath that he can no longer do anything about it. He can hardly get downstairs and into a car. By now insufficient oxygen is getting into his system, and the whole situation puts so much strain on his heart that it may suddenly fail and he is dead—beyond recall by the "kiss of life" as even the best rescuers cannot blow any air into his asthmatic lungs for him.

To hospital—with all speed

If he had got to hospital in time, continuous intravenous injections of drugs like aminophylline and steroids would have had a good chance of saving his life; and if they should fail other methods are nevertheless available there such as oxygen

forced under pressure into the lungs. Unfortunately the setting up of all this takes quite a time and there is very little time available if the condition is worsening badly. The remedy therefore is that patients developing a bad attack need early and urgent hospital admission.

How to achieve this varies from district to district but your general practitioner is the one to advise you. Many hospitals nowadays actively encourage their asthmatic patients to feel free to demand emergency admission whenever they think it necessary: they can soon be discharged again if it all turns out to have been a false alarm.

Warning signs

It is often impossible to tell why a severe attack occurs but sometimes the reason is a nasty chest cold or perhaps pneumonia, so be on guard if such things start up. Use of the flow meter will tell you how things are going, but if you have not got one or have left it at home, seek medical help or get to hospital if talking becomes difficult, you become pale, sweat, or your pulse rate rises above 100 beats per minute. Signs of desperate urgency are mental confusion, total inability to talk, a definite blue tinge to lips and tongue (a much better guide than the cheeks), and a pulse rate above 120.

Such patients must do nothing at all for themselves or they may drop down dead. The standard emergency treatment is the drug aminophylline, given by desperately slow intravenous injection, but first aid with oxygen, giving it as pure as possible, right close up to the face, and with the tap turned well on can save lives. (DANGEROUS STUFF! A smouldering cigarette will burst into flames, BE CAREFUL!)

Asthma that goes on and on . . .

Asthma can take on rather a different form, when instead of just consisting of sudden attacks (mild or severe) with long periods of complete freedom in between it is present all the time. It still varies a good deal, being much worse at some times than at others but it never goes away completely. This is

obviously much nastier for the patient than the usual sort. It is very similar to chronic bronchitis except that it is more wheezy, there is less phlegm, and though smoking undoubtedly makes it ten times worse you do not have to be a smoker to develop it. The same thing is going on in the small bronchi and bronchioles as goes on in the ordinary attack of asthma described earlier.

Scientists believe that this sort of asthma is again the result of an allergic process but of a different sort and they do not know what it is all about. It is called "intrinsic" asthma as it seems to be due more to something wrong with the patient himself and much less to the effects of animal and vegetable matter in his environment. The patient is not atopic like the eczema-asthma-hay fever sufferer, has nothing that he is clearly allergic to, and may derive little or no benefit from the usual anti-allergic measures like the avoidance of cats, or from desensitising injections, or even from cromoglycate. Bronchodilators still work, though not usually all that well and regular steroids are often necessary.

In this form of asthma steroids may have to be taken for months or years on end, in which case the only way to avoid a steady build up of ever worsening side effects is to keep their dose as low as possible. The best way of achieving this is by taking them by inhaler, the only side effect of which is a tendency to get mild thrush infections in the throat, easily cured by appropriate treatment from your doctor. If tablets have to be taken in addition, their dosage can be kept down by concentrating greatly on the other treatment measures and in particular on the complete avoidance of all irritant fumes or gases and of tobacco smoke of any sort at all. If this is not done and tablets of steroid drugs like prednisone or prednisolone have to be taken several times every day, after a year or so the side effects from the treatment become a good deal more dangerous, disabling, and even more painful than the disease itself.

The future

What comes next? Something for the "intrinsic" asthma sufferer perhaps: something that is greatly needed. Research continues in several centres, aimed at unravelling the mysteries that surround the dreadful obstinacy of the bronchial irritation in this condition. It might well be that it is something rather fundamental that has gone wrong with the patient's immunity and defence mechanism, something that

might be tremendously important to know about in connection with all sorts of other diseases quite apart from asthma. This often happens in medical research.

Maybe there will be a solution soon, but if I could persuade a modern Nuffield to sponsor medical research in any chosen subject, this would be the one I should choose. Perhaps you know someone? Or perhaps you might like to make a contribution yourself, big or small? It would be lovely if you did. The organisation concerned with research is The Asthma Research Council, St Thomas' Hospital, Lambeth Palace Road, London, SE1 (01-928 3099).

Your questions answered

Q Is asthma an hereditary condition?
A Yes, but not in a straightforward way as is the case with red hair or blue eyes. It is a constitutional sort of illness, and the sort of constitution that is prone to it is carried down in families by inheritance rather than by environment.

Q When my asthmatic child starts at school, should he be excused PE and games?
A Almost certainly not, as it would be much to his disadvantage. If exemption proves necessary, then it must be accepted, but the aim of treatment of a school age asthmatic is to secure him a completely normal upbringing in all respects.

If his asthma is brought on by exercise, a puff of cromoglycate or other treatment may prevent it completely. But, if not, then it would be foolish to risk bad attacks developing this way, and sadly PE and games would have to be restricted. Fight hard to make him safe for them!

Q Why should my asthmatic attacks be specially bad just before I start my period?
A I would love to know. One can speculate that it might have something to do with premenstrual tension – itself a vague and difficult subject when one comes to try to investigate it. One can also generalise: sex hormones affect the personality and the personality affects asthma; sex hormones are chemical

relations of steroid drugs and steroid drugs affect asthma; sex hormones affect the body's power to retain fluid and it might well be that fluid retention could have some effect on ordinary asthma, though I rather doubt it. Ask again in 10 years' time.

Q Will a child with asthma continue to have it as an adult?
A Probably not. Most of them stop having attacks when they reach about 12 but if I had an asthmatic child I would work hard to try and ensure that he belonged to that lucky majority group. This would mean doing everything sensible to help him avoid contact with whatever he is allergic to and at the same time getting him going on cromoglycate and keeping him at it regularly. There is no proof but the hope would be that if attacks can be totally prevented for a few years his bronchi would get out of the habit of having them and would then stay that way for ever after.

Q Is it true that asthma "burns itself out" as you get older?
A Yes it usually does, by about the age of 12 but unfortunately not always. And the nasty persistent sort of asthma, the intrinsic variety that commonly starts in middle-age, is far less likely to do so. If you are going to have it at all, have it young and get over it: if you start it later on, you might well get saddled with it for the rest of your life.

Q What is the difference between asthma and bronchitis?
A Asthma is wheeze and bronchitis is cough and spit, but many asthmatics cough and bronchitics wheeze so it is not always easy to tell. The basic difference is that asthma is due to allergy, and bronchitis is due to atmospheric pollution. The conditions are closely linked, however, for an asthmatic person is extra susceptible to atmospheric pollution and if exposed to it is very likely indeed to develop genuine bronchitis and then come to have both conditions at once. And on the other hand the wheezing that most bronchitics are subject to is the result of bronchospasm, very similar indeed to that of asthma but differing by being irreversible, and not improved, or hardly at all, by the bronchodilator drugs.

Q Why is eczema often linked with asthma?
A Eczema and asthma are basically very similar conditions, differing mainly in the parts of the body they affect. They are both due to allergy, the one in the skin and the other in the

bronchi, as a result of which inflammatory reactions are liable to occur when there is exposure to whatever the child is allergic to. If it is the skin that is allergic, eczema develops; if the bronchi, asthma. In both conditions the affected part will thereafter be very susceptible to minor irritants, so the skin of a child with eczema will for instance be made much worse if scrubbed with soap, just as the asthmatic's bronchi will go into a fury if exposed to atmospheric pollution like cigarette smoke.

Both conditions may co-exist in the same child, poor thing, but eczema commonly starts younger and may have cleared away before the asthma starts. In some families both conditions are quite common, with an obvious hereditary element, and the word "atopy" is then applied—atopic eczema and atopic asthma.

Q Must I always carry my inhaler around with me? What should I do if I have an attack and I have left it at home?
A It is a good idea to have it with you if attacks are at all frequent or you have any reason to suspect one might come on while you are away. But if the condition is mild and attacks are rare you hardly need bother.

If an attack starts and you need your inhaler but have left it at home, get hold of one from a chemist's shop—even at weekends there will be one open somewhere—but you will of course first see a doctor and he will be able to advise you.

Q Are you born with a tendency to asthma—or is it something that is acquired?
A Mostly you are born with the tendency, though it may not show itself for a long while. But if you are born with just a bit of a tendency to it it is likely that you could make things much worse for yourself by being unkind to your bronchi and exposing them to unnecessary atmospheric pollution. Cigarettes, for instance!

Q Is it dangerous to fly with asthma?
A If you have severe persistent "intrinsic" asthma, flying may well be quite out of the question: your doctor will advise you. Otherwise it should present no problems. Oxygen is available of course, but it should not be needed and all I should do would be to make sure I had tablets and inhalers with me.

Q Is asthma affected by diet or alcohol?
A Not usually, though alcohol has a strange ability to find out one's weak spots, and certainly affects some people adversely.

It is fairly obvious if it, or if any article of food, does affect one in an undesirable way. If it does not do so then there is no need to restrict oneself in any way (good news!).

Q Is smoking harmful to an asthmatic?
A Yes, unbelievably and disastrously so. It is the irritant effect of the smoke itself that matters, nothing to do with whatever ingredients there are that promote heart disease, arterial disease and lung cancers. Even very small quantities are harmful, and most asthmatics are detectably harmed if they just breathe the air of a smoke laden room, without ever doing the actual smoking themselves.

Q My asthma has been diagnosed as being due to house dust. Can you tell me whether one of the air purifiers now on the market is likely to be beneficial?
A I should not put much faith, or money, into air purifiers. What one needs is regular and frequent room cleaning, paying particular attention to carpets, bedclothes, curtains, and any other fabrics that might hold the dust.

Q Are inhalers dangerous if they are used too often?
A Not in themselves, but if you are needing to use them every half hour or so they cannot be working. If you are using them correctly, the container is not empty, and your asthma is genuinely getting worse you may well be in urgent need of some different treatment and therefore you need your doctor's help without delay.

Q Does a severe attack of asthma need immediate attention from a doctor?
A Yes, it may and do not be timid about calling him out or about getting yourself quickly to a hospital accident and emergency department, it is what they are there for. That is not to suggest you should do this with every single nasty attack but it is certainly recommended that you should do so if the attack is in any way at all worse than the usual nasty ones.

Normally our breathing is quite effortless and not even noticed. On a crisp bright morning it is even a delight. But with asthma it becomes an effort to breathe in and out again. Frightening too, if the asthma is bad, not knowing if you are going to get enough breath to recover. The author of this booklet, Dr H. Wykenham Balme, outlines the risks, warning signs, and what action to take. Most major attacks of asthma are preventable. The aim of this booklet is to improve the quality of life of the asthmatic which need not be nearly as restrictive as many people imagine. Some of our top athletes and sportsmen and women suffer from, but cope with, asthma.

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