

Developing Treatments



Asthma

Asthma is currently the most common chronic illness in children. At least 1 in 5 children between the ages of 7 and 13 have been diagnosed as having asthma.

Historically *asthma* was a term used by the ancient Greeks to describe any condition which caused shortness of breath (from *Aazein* meaning panting). People have recognised the condition for centuries, and many treatments have been claimed to cure it. In truth, even today, medicines can only control asthma, not cure it.

Treatments, 3000BC – 500AD

People have reported many cures for asthma ever since it was first described by the ancient Greeks. The Chinese, Indian and Egyptian civilisations have all recorded cures for asthma. Some of these remedies are still used in some form, whilst others have found their way into the modern kitchen.

Ancient Greeks believed that asthma was derived from internal imbalances which were removed by healthy diet, natural remedies and lifestyle changes. The teachings of Greek scholars Hippocrates, Dioscorides and Galen influenced medical practice for the next 1000 years.

Chinese healers described asthma as 'xiao-chiran' or 'wheezy breathing'. They believed it was an imbalance in the life force they called Qi. They used treatments of herbs, acupuncture, massage, diet and exercise to correct these imbalances.

Indian philosophers believed that breathing was related to a person's soul in the connection of the mind, body and spirit. Yoga was used to improve both meditation and breathing technique.

Photograph shows:

Ma Huang (*Ephedra sinica*)

Ma huang is a Chinese remedy for asthma which dates back 5,000 years.

A tea, often called yellow river tea or warehouse tea, is made from the stems of the cone-bearing shrub. To this day an ephedra alkaloid, ephedrine, is used in cases of acute asthma.

Stramonium (*Datura stramonii*)

Stramonium has a long history of use in India as a remedy for asthma. It is known in Sanskrit as *Dhattura* and in Madras state as *Umatai*. The dried leaves and seeds were burnt and the patient inhaled the vapour. Stramonium has antispasmodic properties and relieves the symptoms of an asthma 'attack'.

Honey

Honey has been used widely as an asthma remedy. Patients inhaled the vapour or drank it with milk. It thins out the mucous and helps the patient breath more easily and deeper. In India, honey is known as *Shahad* and in China it is *Feng Mi*.

Mustard (*Sinapsis alba*)

Mustard was a common ingredient in traditional rubs. During an asthma attack, mustard oil would be mixed with a little camphor and massaged over the chest. This loosens up phlegm and eases breathing.



Turmeric (*Circuma longa*)

Turmeric was mixed with milk for a drink that was beneficial in cases of asthma.

Garlic (*Allium sativum*)

The ancient Egyptians prized garlic for its medicinal properties. Cloves of garlic have been found in royal tombs and temples. The Roman writer Pliny records that the Egyptians gave raw garlic to asthmatics because of its expectorant properties. Garlic was used into the twentieth century as a treatment for pulmonary diseases such as tuberculosis.

Treatments, 500-1600

Historians have described the early medieval period as the 'dark age of pharmacy'. Anglo-Saxon physicians used remedies which they could find in their local area. However, with the influence of Arabic physicians and the increase in exploration, more remedies included ingredients from around the world.

Bald, in his *Leechbooks* of 950AD, described asthma as '*a great oppression*' in which the patient '*wrythes as if troubled by a dwarf*'. In the 1500s, physicians believed that sputum of the lungs originated in the brain and that asthma was caused by a flow of humour into the lungs at certain phases of the moon. The knowledge gained by the ancient civilisations appears to have been forgotten.

The later medieval period, however, saw the first recognition that a person's lifestyle affected the symptoms of asthma. The physician treating Archbishop Hamilton, the Primate of Scotland during the late 1500s, recommended that he remained in warm heated rooms and did not sleep on feather pillows.

Photograph shows:

Wild pansy (Root) (*Viola tricolor*)

Otherwise known as heartsease, people used Wild Pansy for its soothing properties.

Butcher's Broom (Fruit) (*Ruscus aculeatus*)

Butcher's Broom is a low, shrubby evergreen plant which is closely related to asparagus and is found in Southern England. A decoction of Butcher's Broom, sweetened with honey, is said to clear the chest of phlegm and relieve difficult breathing.



Balsam of Peru (*Myroxylon pereirae*)

Balsam of Peru comes from a tree growing in San Salvador, Central America. People obtain the liquid by beating and then scorching the bark. Medicinally Balsam of Peru is an expectorant. As a pill, it was sometimes mixed with liquorice and treacle to provide a useful remedy for asthma.

Ipecacuanha (Root) (*Psychotria ipecacuanha*)

After the discovery of the Americas in the 1400s and the subsequent exploration by European nations, explorers brought back increasing numbers of medicinal plants. Ipecacuanha is one such plant. In small doses it was regarded as an expectorant with long lasting effects.

Treatments, 1600-1800

Medical men made great advances in the understanding of the causes of asthma in this period. In 1618 the College of Physicians published the first *London Pharmacopoeia*. In this book the convulsive nature of asthma was recognised and it recommended the use of anticonvulsants such as opiates. By the end of the 1600s, scientists recognised that asthma was hereditary and associated with nervous conditions. In 1797, Brie recognised that asthma was caused by an irritation specifically to the bronchial tree. Despite these advances some remedies still appeared fanciful. The *London Pharmacopoeia* still listed prepared millipedes and fox lungs as cures. As well as common herbal remedies, many apothecaries and physicians concocted their own medicines, some with rather unusual ingredients.

Photograph shows:

Pectoral Ointment (UNG PECTORALE)

This ointment was described in John Quincy's *A Compleat English Dispensatory* 1718 as "commended to anoint the Breast with, in all Diseases of that Part...it is judg'd of service in Pleurisies, Asthma's, and such-like Ailments". It was made of sweet almond oil, camomile oil, violets, fresh butter washed with violet-water, hen's and duck's-fat, orris-root, saffron and wax.

Lohoch of Fox Lungs (L E.PVLM.VVLP)

This English delFTWARE jar would have contained a lohoch (a type of linctus) made from fox lungs, liquorice, sweet fennel and aniseed, boiled to a syrup in coltsfoot water. These ingredients were known to aid chest problems such as asthma and bronchitis. Culpeper wrote in his *Complete Herbal* of 1653 "It cleanseth and uniteth Ulcers in the Lungs and Breast".



Syrup of Garlic (S:EX:ALLIO)

Garlic has long been recognised as a remedy for asthma. In 1653 Nicholas Culpeper listed garlic as being used to “cut and void tough phlegm” and as such recommended it to treat asthma, bronchitis and pneumonia, as well as “other nervous afflictions”.

Oxymel of Squill (*Oxymel Scillae*)

Sir John Floyer, author of *Treatise of Asthma* (1698), believed that squill was the most effective remedy he had tried for his own asthma. Squill is the bulb of *Urginea scilla* otherwise known as sea onion. Oxymel of squill is a mixture of squill and acetic acid, sweetened with honey. In small doses it produces reflex secretion from the bronchioles and was used mainly as an expectorant in the treatment of coughs, asthma and bronchitis.

Spirit of Hartshorn

Hartshorn is calcium phosphate extracted from stag horns. It was used in cases of asthma due to its anticonvulsive properties. This bottled example comes from an early 1800s medicine chest.

Coltsfoot (*Tussilago farfara*)

Coltsfoot is recommended in Nicholas Culpeper’s *Complete Herbal* of 1653. “the fresh leaves or juice, or a syrup thereof is good for a hot dry cough, or wheezing, and shortness of breath. The dry leaves are best for those that have thin rheums and distillations upon their lungs causing a cough” Coltsfoot could also be smoked like tobacco.

Opium Poppy (Head) (*Papaver somniferum*)

Apothecaries made medicines from poppies, or opiates, which were recognised throughout the period as useful asthma remedies due to their ability to stop spasms in the bronchial tract.

Treatments, 1800-1900

In the 1800s, scientists significantly developed their understanding both of asthma and of the actions of the drugs used. A particularly important development was Henry Hyde Slater’s paper, *On Asthma*, in 1860 which showed that both a medical condition and environmental factors combined to cause asthma.

In 1812 stramonium was introduced from Asia and used in asthma remedies. In 1888 the alkaloids of coffee, theobromine and theophylline and, in 1908, aminophylline were isolated and used to treat asthma.

During this period, many proprietary medicines, developed by pharmacists to their own recipes, were also sold. These remedies may or may not have had any therapeutic effect.

Photograph shows:

Stramonium

The plant *Datura stramonium* has been used in the Far East as an asthma remedy since ancient times. After its introduction to the West in 1812, it was produced in many forms and products such as cigarettes, powders and infusions for inhaling. Its use stops the spasmodic contraction of the airways which causes asthma.

Coffee

Coffee was first recommended by Slater in his essay of 1860. More recent analysis has shown that it contains the alkaloids caffeine, theophylline and aminophylline all of which are useful in the management of asthma. Caffeine stimulates muscle, theophylline and theobromine relax muscles in the chest, while aminophylline opens the airways.



Asthma and Bronchitis Pills, circa 1900

Many pharmacists prepared asthma remedies to their own specifications. Often these recipes were lost over time. These pills were made by a Mrs Lingard of Halifax.

Maw and Sons inhaler, 1860-1870

This ceramic, double-valved inhaler was designed by Dr Nelson and made by S Maw and Son. It could be used to inhale plain steam or other medicinal ingredients such as Friar's Balsam.

Balsam of Horehound and Coltsfoot, early 20th century

As well as pills and products for inhalation, sufferers also used liquids to relieve asthma symptoms. This balsam of horehound and coltsfoot would have used the expectorant properties of the horehound and the soothing properties of the coltsfoot.

Tincture of Belladonna, circa 1900

Belladonna has anti-inflammatory, antispasmodic and expectorant properties. It was a popular remedy for asthma during the 1800s as it was well tolerated by children. Treatment with belladonna was a forerunner of atropine therapy.

Tincture of Lobelia, circa 1900

Also known as Indian tobacco, lobelia has similar effects to nicotine; it opens the airways and helps remove phlegm. Lobelia was a common asthma remedy throughout the 1800s. It could either be administered in the form of a tincture or more commonly inhaled from burning powder. Some modern products contain lobelia, though mainly to help people to stop smoking.

Treatments, 1900-1950

Adrenaline was one of the first modern medications used for asthma. It is useful because it dilates the airways rapidly, so that a patient having an asthma attack can breathe more easily. Scientists isolated ephedrine from the plant ephedra in 1887. It was subsequently prescribed for asthma in the 1920s.

The use of these drugs marked a move away from natural remedies. Although these drugs are both derivatives of natural products, they have been scientifically extracted and later on were synthetically produced. More traditional remedies were still in use though, as many companies offered burning or smoking powders derived from plants such as stramonium and lobelia.

Pharmacists continued to develop and sell proprietary medicines, often containing traditional herbal remedies. Some, like Potter's Powders, became household names.



Photograph shows:

Ephedrine compound, circa 1950s

From the 1920s, ephedrine became widely prescribed by doctors for its bronchodilating and decongestant properties. This elixir of ephedrine compound contains ephedrine sulphate, caffeine, and tincture of belladonna. All have beneficial properties in the treatment of asthma.

Adrenaline and Atropine spray (Nebulae Adrenalinae et Atropinae), circa 1950s

This preparation would have been placed into an atomiser, sprayed and then inhaled. Although adrenaline is still used today, it has many cardiac side effects and is only used in emergencies rather than as a regular treatment. Atropine is the active ingredient in the belladonna plant which was used earlier to treat asthma.

Potter's inhalation products, late 1800s – 1980s

Potter's inhalation products were well-known asthma and bronchitis remedies for many decades during the early to mid 20th century. These powders, which contained stramonium, lobelia and coltsfoot, would be burnt and the smoke inhaled. This could have been on a plate, in a pipe or in cigarettes. Potter's continued to be made until 1988 when the UK Health Department refused to renew the product licence.

Dr Nelson's inhaler, early 20th century

Dr Nelson's Inhaler was a familiar household device for helping with asthma and other chest complaints. Patients would inhale hot water vapour or Friar's Balsam to aid breathing.

Trisan Anti-Asthmaticum liquid, circa 1920s

Many different remedies were introduced during the early 20th century which use barbiturates and/or hypnotics to relieve the symptoms of asthma. They are especially useful at night. Trisan contains chloral hydrate (hypnotic), barbitone soluble (barbiturate) and potassium iodide (expectorant).

Neo-Epinine (Isoprenaline sulphate) tablets, mid 1950s

The drug isoprenaline is a bronchodilator. It was first introduced in 1948 for use with asthma. Its over-prescription in aerosol form in the 1950s and early 1960s contributed to a rise in asthma-related mortality. These *Neo-Epinine* tablets are believed to date from the mid 1950s.

Dr Singha's Asthma tablets, circa 1920-1950

These tablets were claimed to “*ensure ease by day and restful sleep by night*”. Dr Singha's Asthma tablets, which were made in Caernarfon, Wales, included caffeine (muscle stimulant), powdered grindelia, emetine and euphorbia (expectorants), lobelia and ephedrine (bronchodilators).

Treatments, 1950-1980

The period 1950-1980 marked a shift in asthma treatment. By the 1980s asthma remedies had moved away from a policy of treating symptoms. The focus was now on asthma control and long term management. Corticosteroid anti-inflammatory medicines (a type of steroid hormone) and bronchodilators were the mainstay for prescribed medication during this period. Steroids allowed the inflammation of the airways to be controlled and sometimes reversed. Bronchodilators were still used to aid a patient's breathing if they were having an attack.

Photograph shows:

Dr Hair's Asthma Remedy liquid, around first half of 20th century

Dr Hair's Asthma Remedy was a liquid medicine developed by Dr Benjamin Hair of Pennsylvania, USA in the late 1870s. Its ingredients are unknown. This example was made in the 1950s by Dr Hair's British subsidiary company based in Staines, Middlesex.



Strix Asthma tablets, 1965-1972

Tablets were another means of administering medication for asthma. Strix Asthma tablets were a proprietary medication that contained theophylline, and methylephedrine, both common ingredients in asthma remedies at the time.

Pib Plus inhaler, 1965-1970

Isoprenaline inhalers, such as Pib Plus, were introduced in the 1950s. They were some of the first devices to provide a measured dose with each inhalation. Isoprenaline is no longer used in self-administered asthma medication. It is now given intravenously in hospital.

Pre Cortisyl (Prednisolone) 1958-1960

Prednisolone is an orally administered corticosteroid. It was one of the first such treatments to be introduced in the 1950s. As a corticosteroid, prednisolone has anti-inflammatory properties thus helping asthma sufferers by decreasing the inflammation of the airways.

Betnelan (Betamethasone)

Betamethasone was another corticosteroid released in the early 1960s. Betamethasone was traditionally a skin medication applied externally. The idea to use it to control inflammation in the lungs was suggested by scientists in the late 1950s. This brochure for *Betnelan* was published by Glaxo Laboratories in about 1962.

Noradran Bitabs Nocte tablets

This medication system uses two tablets taken together to provide night-time relief from the symptoms of asthma. One tablet contains ephedrine, theophylline, papaverine, and phenobarbitone and is absorbed into the system quickly. The other, containing ephedrine, theophylline and papaverine is 'enteric coated' and is designed to bypass the stomach and be absorbed via the intestines, thereby delaying its action.

Ventolin (Salbutamol) inhaler

Salbutamol was probably the most widely used asthma drug in the world during the late 20th century. It was one of the first drugs which had the bronchodilating action of adrenaline without many of the side effects. It was a significant therapeutic advance. Salbutamol is used to treat symptoms when they appear. Once inhaled the drug works rapidly and lasts for approximately four hours. This Salbutamol inhaler is part of the *Ventolin* brand.

Inhalation Therapy

The benefit of inhaling medicines became widely known during the first half of the 20th century. As a result numerous companies devised new ways to aid this inhalation. Inhalers, nebulisers and face masks were all developed.

Treatments, 1980-2006



The latter part of the twentieth century saw the consolidation of knowledge from the middle part of the century. The use of corticosteroids as an anti-inflammatory asthma medication was continued and new variants were introduced, although their long term use is being questioned. Today scientists are developing new medications that target one of the principle causes of asthma, namely the body's response to an allergen.

The inhaler became the most important device for patients to take their medication. Earlier burning powders had shown that inhalation therapy was more effective at a lower dose and with fewer side effects than swallowing a tablet or liquid. Many different designs of inhaler were introduced.

Photograph above shows:

Seretide (Salmeterol) inhaler

Salmeterol was introduced in the 1980s as an improvement on the short lasting action of Salbutamol. Salbutamol's active duration of 4 hours would not prevent night-time asthma attacks. Salmeterol has similar actions to Salbutamol but has been developed to last for up to 12 hours. This inhaler is part of the *Seretide* brand.

Dexamethasone, liquid for injection

Dexamethasone is a corticosteroid that is similar in use to the earlier Prednisolone but more effective in smaller doses. This recent example would be injected intravenously.

Becotide (Beclometasone) inhaler, Rotahaler and nose spray

Becotide is a very common brand of Beclometasone, a corticosteroid used during the late 20th century and early 21st century. Patients inhale this drug via an inhaler, inhalation capsules and a rotahaler or a nasal spray.

Methods of Administration

There are currently many devices used to administer drugs for asthma. Although injection, tablets and liquid are all still used, inhalation is by far the most effective way. There are a large number of different patented devices used by sufferers to inhale medication.

Singular Paediatric chewable tablets (Montelukast Sodium)

Montelukast sodium tablets are used in cases of chronic asthma, but not for asthma attacks. When a person with asthma inhales an allergen which causes irritation their airways constrict. Montelukast prevents this constriction from occurring. This is different to bronchodilators which help to relieve already constricted airways. These chewable tablets are specially formulated for children who cannot use an inhaler.

Xolair (Omalizumab)

Xolair is a brand new type of asthma medication, known as an anti-immunoglobulin E (IgE) antibody. It is administered by injection in cases of severe allergic asthma. When a person with asthma is exposed to an allergen, IgE causes a chain reaction of responses which results in the symptoms of an asthma attack. Xolair targets IgE and prevents it from triggering this reaction. This drug has only recently been released to be prescribed in Europe.