

## ASBESTOS; THE MIRACLE FIBRE FROM PANDORA'S BOX

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22.05.09

Asbestos is a Greek word meaning “unquenchable” and has been known by ancient civilisations for thousands of years before Christ. It was woven into fabric which was used in shrouds, and in some regions of Greece and Turkey it was common practice for villagers to grind up a soft white local rock and use this white stucco for the walls of their houses and in their fireplaces. They were unaware that this was a type of asbestos called tremolite. Around 800 A.D. the Holy Roman Emperor, Charlemagne is reputed to have had a table-cloth made of woven asbestos which he used to throw in the fire after dinner to amaze of his guests as it did not burn.

It was not until asbestos started to become more widely used in industry in the early 19<sup>th</sup> century in Europe and in particular, the United Kingdom, that the deleterious affects of this amazing fibrous mineral started to become apparent. It had soon become recognised that asbestos was incredibly resistant to heat and as heat loss was costly to industry, asbestos soon became widely used in steam engines, ships, and in building construction as a fire retardant. Indeed its application became so numerous that soon it was found in nearly every aspect of modern life from the hot water pipes in the bathroom to the walls of our houses.

However by 1931 the British Government had enacted legislation to compensate workers with asbestosis, a form of insidious scarring of the lungs or pulmonary fibrosis which often led to an early death. It was the German government in 1943 which first compensated asbestos workers for lung cancer as this condition was also linked with asbestos exposure. In Western Australia during the war, Lang Hancock developed the now infamous blue asbestos mine in the Wittenoom Gorge and despite warnings from health officers at the time, the mine went ahead and led to one of the largest man-made disasters in our history. In 1950 the Western Australian Commissioner for Public Health reported to the minister that “Asbestos dust if inhaled constitutes a very grave risk and is, if anything, worse than silicosis.” By the early 1960's, doctors in South Africa were starting to report cases of a hitherto rare tumour, mesothelioma, in asbestos workers in the North Western Cape Province and it was not long before cases were appearing in Australia. However it was not until 1977 that the first mesothelioma sued the CSR Company who owned the mine. Unfortunately he died before the case went to court. Since then there has been a steady increase in the numbers of asbestos victims who have sought legal redress and I personally estimate I have seen over 10,000 patients with asbestos in the last twenty years.

As an Expert Witness to the courts I have been involved in numerous court cases, with the majority being for benign asbestos pleural diseases as mesothelioma is only the tip of the iceberg. Indeed Australia has the second highest incidence of mesothelioma in the world, second only to Belgium. Between 1986 and 2000, there were 5,176 cases here and with a peak projected to 2014 and a projected cost of 5 billion dollars for mesothelioma alone. I estimate that over the same period, there would be somewhere in the order of several hundred thousand people developing benign asbestos pleural diseases.

Asbestos fibres which like tiny needles when inhaled migrate through the lung to the surface of the lung where there is a thin membrane called the pleura. Asbestos fibres are so thin and tiny that an amount which would cover a pin if lined up end to end would reach from the earth to the sun. There are also a range of different types such as blue, brown and white with the white ones being spiral-shaped and the blue, fine thin straight needles which tend to be harder to clear from the lung by coughing or by the lung's defence mechanisms.

The thin membranous lining on the inside of the chest cavity and on the lung itself is called the pleura. It is thinner than a sheet of paper but surprisingly tough and also well supplied by nerve fibres. When this becomes inflamed we have pleurisy and sometimes asbestos can cause a transient pleurisy often with a collection of fluid in the chest cavity called a pleural effusion. The pleural surfaces become irritated by the fibres and as result, a dense plaque forms which is a bit like a callosity on an old tree. They never become malignant but they can grow larger and also become more numerous and if there are enough of them, they can cause shortness of breath and sometimes, chest pain. It can also cause a more diffuse pleural thickening which occurs at the back of the chest wall.

Folded atelectasis is a less common condition caused by asbestos where the lung becomes entrapped by scar tissue from the pleura which rolls the lung up a bit like a jam roll, reducing lung function and often resulting in pain. This condition may be confused with lung cancer as it can look like a mass or a tumour. If this is not diagnosed corrected it may result in unnecessary procedures such as needle biopsies and even surgery.

Many doctors and even radiologists incorrectly call asbestos pleural diseases as "asbestosis" which is a term used for the fibrosis or scarring which occurs in the lung. This is a very important as asbestosis usually is a much more serious condition than asbestos pleural disease.

I am currently writing up a study on chest pain in benign asbestos pleural disease after doing a chart review of several hundred patients who have been seen by me for asbestos-related diseases either as medicolegal assessments or referred by their family doctor. We found that about 40% of patients had chest pain which could be reasonably attributed to asbestos diseases and that it was more common in those with diffuse pleural thickening and folded atelectasis. The pain usually has a gnawing or neuropathic quality but also may be sharp and severe although often of only short duration. As the pain is caused by irritation of the intercostal nerves that run around the inside of the chest wall, it is usually poorly responsive to simple analgesics although drugs such as Panadol Osteo are usually indicated in less severe pain. Some patients end up being treated in specialised multi-disciplinary pain clinics.

There are many other effects of asbestos such as lung cancer and mesothelioma but fortunately these are much less common. One big problem is the need to educate general practitioners more into asbestos diseases so that patients can be treated more appropriately, and even such things as the best type of CT chest to order. I shall discuss more on the results of my current study at a later date.

One other project of which I am the principal investigator here is the GUARD study which is investigating the genetic make-up of people to see who is more likely to develop mesothelioma. We are conducting this in conjunction with a group in Western Australia, indicating that we are doing research in a collaborative fashion so that all Australians can benefit.

As one of the foundation members of the Asbestos Research Group, Wesley Research Institute, we appreciate the financial assistance of asbestos victims and also their willingness to participate in the research we are conducting. We may not be able to cure all these conditions at present but with perseverance and determination, a lot more can be done to help patients and their families. When Pandora opened the box given by the gods, out flew all things good and bad, never to return. They had been released into the world. The only thing which remained in her box was "Hope". Like asbestos itself, my determination to help make life better for those with these diseases is unquenchable. We also have "Hope".