



Killer of the Ages: Tuberculosis Killed Great-Uncle Charlie

We all have certificates where the cause of death was phthisis, consumption or tuberculosis (TB). It was a major cause of death from early times to the late 1900s and is still an issue in many parts of the world.

In the 1700s it is said that 1/7 deaths in London were due to TB, 1/5 by 1750 and ¼ in the 1800s. Lack of knowledge of germ theory and contagion contributed to the death toll as did the overcrowded cities, poor air quality and poor health of the population.

Many people were infected with TB but did not advance to active disease. Around 10-15% advance to the disease symptoms such as fever, night sweats, weight loss, chest pains, weakness, and coughing up blood.

Tuberculosis spreads when someone with an active lung infection coughs or sneezes, sings or spits. If they do this without covering their mouth other people can become infected by inhaling the droplets or by fomite transmission (touching a contaminated surface then touching their mouth). The longer the exposure the greater the risk and the overcrowded cities with many people living in close quarters contributed to longer exposure.

Tuberculosis has been known for around for thousands of years with Egyptian mummies remains showing the effect of infection on their skeletons. The writings from India documented cases 330 years ago and the Chinese writings documented cases 2300 years ago. Hippocrates described the disease defining the symptoms and the characteristic tubercular lung lesions. Aristotle suggested the contagious nature as did Clarissimus Galen, personal physician to Emperor Marcus Aurelius 174AD describing the symptoms and recommending treatment with fresh air, milk and a long sea voyage.

The terms consumption and phthisis for the disease came into use in the 17th and 18th centuries whereas tuberculosis was first used by Johann Lukas Schönlein in the 19th century.

The lungs are the most common site of infection, however tuberculosis can infect the skin, lymph nodes, kidneys, meninges and gastro-intestinal tract. TB of the cervical lymph nodes was recognised in mediaeval times and called Scrofula (also called struma, King's Evil, scrofulotuberculosis, tubercular lymphadenitis). It was believed that the Royal Touch would cure the disease. In England the last Royal to do this was Queen Anne. George 1 officially discontinued the practise in 1714. The French Royal court continued until 1825. (There is no evidence that any cures were ever achieved by the touch of Royalty).

Early medical definitions were often based on symptoms so Galloping Consumption, Quick Consumption, Slow Consumption were also used. Another side effect of TB is anaemia and the resultant white pallor contributed to another name "The White Plague". There was a romanticism of the young woman white and pale slowly dying of consumption in literature, poetry and paintings in the 1800s. Woman wanted the look and used whitening cosmetics which sadly contained lead, arsenic and other heavy metals to achieve the pallid look.

Robert Koch determined the causative agent was *Mycobacterium tuberculosis* for which he was given the Nobel Prize in 1905.

Emigrating for your Health

From the 1860s the Australian colonies were considered a good place to recover from tuberculosis as it was felt the warmer climate, fresh air and sea voyage was beneficial to health. Sanitoriums were built around the country, the majority in private hands. Generally, these emigrants were not part of the assisted programs as the colonies wanted healthy people who would not be a cost or burden to the colony.

There was a sanitorium opened in Dalby in 1900. The one opened in Stanthorpe in 1907 became a military sanitorium in 1916 (Kyoomba Sanitorium).

The Diamantina Hospital for Chronic Diseases opened 5 August 1901 as a charitable institution with 32 beds, increased to 72 beds in 1903 including two open air wards. This was on the site of the Diamantina orphanage and the current Princess Alexandra Hospital.

Bed rest and plenty of fresh air was recommended and patient's beds were often in the open air in open air wards or on verandas.

World War One

National Archives of Australia (<https://www.naa.gov.au/>) has the WW1 Attestation records and also the Repatriation files. These have been digitised and are freely available for download on that site as well as on the Discovering Anzacs site (<https://discoveringanzacs.naa.gov.au/>).

Many soldiers were sent home as unfit with TB. There was a sanatorium at Stanthorpe which opened in 1907 which was given to the military in 196 and became the Kyoomba Sanitorium (also known as the Stanthorpe Military Hospital, Kyoomba Repatriation Hospital) Deborah Wheeler has written a two volume history *Kyoomba Sanatorium 1916-1935*.

Exact number of Australian WW1 soldiers with TB is unknown ranges from 1827-5000. The Returned Soldiers Sailors Imperial League of Australia (the forerunner to the RSL said 5000, AG Butler the official historian said 1827. The Repatriation Department in December 1920 said there were 900 currently receiving a pension for TB and that 3000 had returned with TB.

Late 1915 the army directed that all suitable ie early stage TB cases should be sent to a sanitorium (but not to a charitable institution) and that medical staff could treat the advanced cases at their discretion.

The military did not want contagious disease in a military hospital. The army was not prepared for the numbers of medically unfit soldiers returning home. September 1917 the first *Australian Soldiers Repatriation Act* was passed and there were a number of amendments to it over the coming years. The military wanted the Repatriation Department to take charge of the TB cases (and other medically unfit) as the Army believed they should only be caring for the men who could return to the war. This did not occur until 1921 when the Repatriation Department took charge of the military hospitals.

The 1920 Act gave special pension for men with tuberculosis :provided they spent at least six months in a sanitorium and “*were not a menace to public health*” The pension was nearly double the usual repatriation pension.

However, there were many issues getting the pension. Soldiers had to prove that the TB was acquired as a result of their military service. The fact that each successful recruit on enlistment had a certificate stating

“recruit did not present with certain physical or medical conditions including scrofula, phthisis and contracted or deformed chest” was a help with this.

Each state had a TB Soldiers Association who did a lot of work fighting the various government departments on the soldier's behalf. (Fryer Library University of Queensland has some information on the Queensland TB Soldiers Association).

In 1923 the Queensland War Council agreed that some of the Anzac Cottages fund could be used to build homes for returned servicemen with TB. Initially the Anzac Cottages fund was meant to build cottages to rent at low cost only for homeless widows and descendants of deceased servicemen. The funds to buy the land and the building materials were raised via the Government lottery (The Golden Casket). The Queensland State Archives have digitised documents relating to this TB Homes scheme and you can download the 108 applications from their website.

World War Two

All recruits for WW2 were given chest x-rays looking for TB and TB accounted for ~3% of the men rejected for service. The men were then sent for further testing and treatment. While fewer in percentages men did return with TB as did a number of prisoners of war. Again, the military did not want TB cases long term in military hospitals although there were special wards and also the 106th General Hospital in Albury as a dedicated hospital. In 1944 the new sanatorium opened at Kenmore, with 32 patients in one two and four bed wards. It was converted to a Repatriation Hospital after the war and closed in 1994. It is now the site of the Fairview War Veterans Home.

Treatments

Before the advent of antibiotics treatments consisted of bed rest, lots of fresh air and good food. Some medical interventions were used with the purpose of “resting” the lungs. It was thought that of the lung was not active and would then be in a low oxygen state this would help to reduce the bacterial load and thus cure the patient. As the patient still needed to breathe only one lung could be collapsed at a time. The lung was deliberately collapsed by injecting oxygen or nitrogen into the chest cavity. This needed to be repeated every couple of weeks. Patients who have undergone this this say, “it is not at all pleasant!”

Another way of collapsing the lung was crushing the phrenic nerve that causes the diaphragm to inflate /deflate the lung. This paralyses the diaphragm on the side operated upon, which is then pushed upwards by the abdominal contents, thus pressing on the lung and partially collapsing it. Nitrogen/oxygen would also be introduced into the peritoneal cavity to aid the lung compression. It took time but in the majority of cases the nerve slowly healed.

Thoracosplasty was a non-reversible surgical procedure where ribs were removed, several at a time to cause deflation of part of the lung. Often needed multiple surgeries as average patient needed around eight ribs removed to achieve the required deflation. This was non-reversible and usually only considered after long periods of bed rest and other treatments had failed to give improvements. It caused restrictions to arm movement on that side and also caused scoliosis of the spine long term.

Antibiotics

Streptomycin was the first antibiotic found to be useful against tuberculosis. It was not discovered until 1943. It did kill TB but had nasty side-effects including dizziness, fever, headaches, nausea, loss of balance and in some cases deafness. In 1947 it was found to be effective against TB in skin, bones lungs, meninges, joints and the genito-urinary tract.

In modern times TB is usually treated with a six to twelve month course three antibiotics: isoniazid, rifampin and pyrazinamide. Sadly, multi-drug resistant cases of TB are seen (>485, 000 cases in 2018 where there is no real treatment available).

Post WW2 TB Eradication in Australia

Tuberculosis was still a concern in the general community so with the advent of streptomycin and the success of x-rays in WW2, Australia started an eradication campaign. Commonwealth gave funding and between 1949-1953 six states enacted legislation for TB eradication.

Community chest x-rays was a major component of the campaign: Queensland, Western Australia South Australia and Tasmania made it compulsory to have a chest x-ray while New South Wales did not make it compulsory until 1956. Victoria made it compulsory for specific groups but not overall until 1963.

This is also the time of mass migration to Australia and all immigrants were x-rayed and this continues to be a requirement today though the x-ray is now usually done prior to immigration with a clear x-ray as part of the application.

The Brisbane Chest Clinic was on the corner of George and Mary Street with other screening points around town. There were also mobile x-ray vans that went around the state,

The Brisbane Chest Hospital opened in 1954 with 3 wards 75 patients and a planned expansion to 186 patients within three months. It was originally housed in four prefabricated WW2 huts. In 1961 the new building opened with TB patients on the ground, 1st, 3rd, 4th and 5th floors and cardiac and thoracic patients on the 2nd floor. This became the Prince Charles Hospital in 1974.

As well as the chest x-rays and treatments of patients another major measure was to introduce the pasteurisation of milk. This killed the brucellosis and *Mycobacterium bovis* bacteria (as well as Salmonella and campylobacter) which was prevalent. It was not until 1989 Australian cattle were free of brucellosis and 1997 that Australia was free of bovine TB. Both were intensive eradication programs.

The other part of the campaign was vaccination with the BCG vaccine (Bacille Calmette-Guérin) which was used in Australia until the 1980s. Now it is not part of the routine vaccination schedule but is used in specific circumstances ie children under five going to a TB endemic area.

The Mantoux is still used as a screening test to determine exposure. A small amount (0.1mL) tuberculin is injected intradermally and left for 48-72 hours. The resulting red raised welt is then read and treatment done as required. Current treatment is 6-12 months of a multi antibiotic schedule.

With better housing, living conditions and the major public health campaign Australia has eradicated tuberculosis except sadly in some First Nations communities who are at a 14 times higher risk.

Sadly this is not the case worldwide. in 2018 there were 10 million plus new cases with 1.5 million deaths and about one quarter of the world's population has latent TB. Between 2000 and 2018 with the public health interventions around the world it is estimated that more than 50 million lives have been saved.

Unfortunately there is a worldwide increase in multi-resistant tuberculosis and this is hampering the work to make the world tuberculosis free.

