

key points

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Cystic fibrosis (CF) is the most common fatal inherited disease in Caucasian people. Inheritance follows an autosomal recessive pattern. At a cellular level there is an abnormal CF transmembrane conductance regulator (CFTR), a protein essential for chloride and sodium homoeostasis, caused by a mutation in the CF gene. The consequence of this abnormal protein is thick, viscous secretions in the lungs and GI tract, which lead to recurrent lung infections and pancreatic insufficiency with intestinal malabsorption.

Most patients present in early childhood with classic or typical CF. They demonstrate one or more of the typical CF phenotypic characteristics (chronic pulmonary disease, GI symptoms and malabsorption, nutritional abnormalities and sinus disease). A minority of patients have non-classic or atypical CF. They tend to present at an older age, often in adulthood, are mainly pancreatic sufficient, have milder disease and a better prognosis.

Survival is closely related to lung function and great efforts are therefore made to minimise loss of FEV₁. Colonisation of the lower airways with certain bacteria can confer a worse prognosis, in particular, *Pseudomonas aeruginosa* and *Burkholderia cepacia*. Consequently, attempts are made to eradicate *Pseudomonas* when it is first isolated. Other factors associated with a worse prognosis are diabetes and poor nutritional status.

In the past few decades, with continual advances in management, the prognosis for CF patients has improved significantly. The current median survival for CF patients in the UK is 38.8 years and a patient born today with CF can expect to live to the age of 50 or beyond.

When CF is suspected the diagnosis can be confirmed by measuring the sweat chloride concentration and by looking for CFTR mutations. Immunoreactive trypsinogen is measured in blood taken from a heel prick in all neonates, and is a marker of pancreatic injury consistent with (but not specific for) CF.

CF is characterised by chronic bacterial infection of the lower airways with intermittent pulmonary exacerbations, when patients have increased respiratory symptoms, particularly cough and increased volume and purulence of sputum. Clinical outcomes are better for patients managed in dedicated paediatric and adult CF centres.

Courses of antibiotics are typically longer and at higher doses in CF. Oral antibiotics can be used for minor exacerbations, but IV antibiotics are more often required. Chronic *Pseudomonas* infection is associated with a more rapid decline in lung function and a reduction in long-term survival. Prevention or delay of the onset of chronic infection is a priority. Nebulised antibiotics are prescribed for patients chronically colonised with *Pseudomonas*, leading to less frequent use of IV antibiotics, fewer admissions and better preservation of lung function.