

4.3 ML in Cystic Fibrosis

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Model-based machine learning

<https://mbmlbook.com/>

Cystic Fibrosis pathophysiology

- allelic mutation at CFTR
- Multiple problem:
 - Lung: obstruction
 - Leading to chronic inflammation and infection
- Acute Pulmonary Exacerbations (APEs)
- Home monitoring data

Promises of AI-supported home monitoring in cystic fibrosis

- Benefits on patients and their families:
 - Patient-led demand for change
 - Predict deteriorations
 - Physiological feedback
 - Clinic only when needed
- Benefits on healthcare
 - Relief for overstretched CF centers
 - Safe withdrawal of treatments
 - Reduce cross-infection
 - Support virtual clinics

Novel sensors:

- Radar detection of respiratory rate/waveform
- Voice biopsies
- Wearable passive sensors