**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