

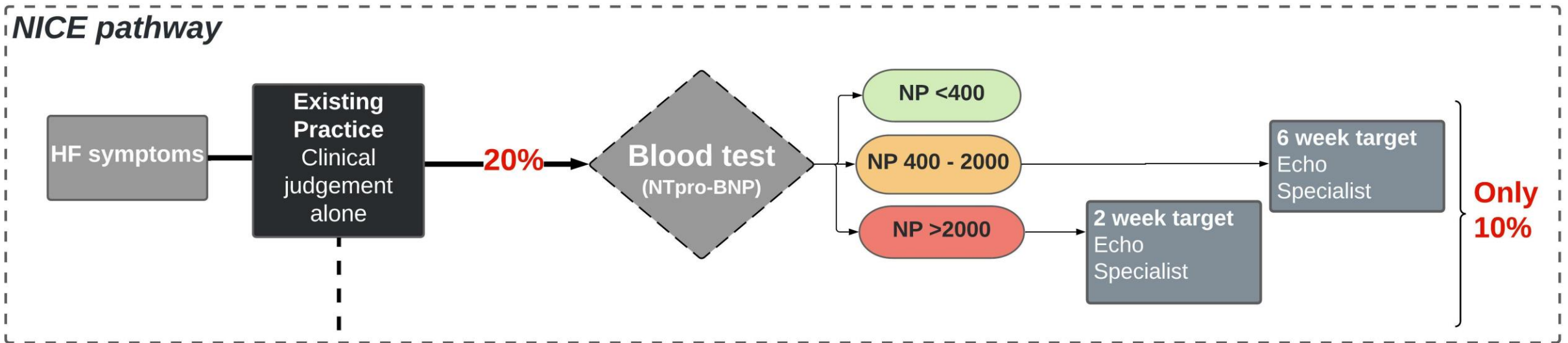
Artificial Intelligence for Point-of-Care Heart Failure Screening

Dr Patrik Bachtiger

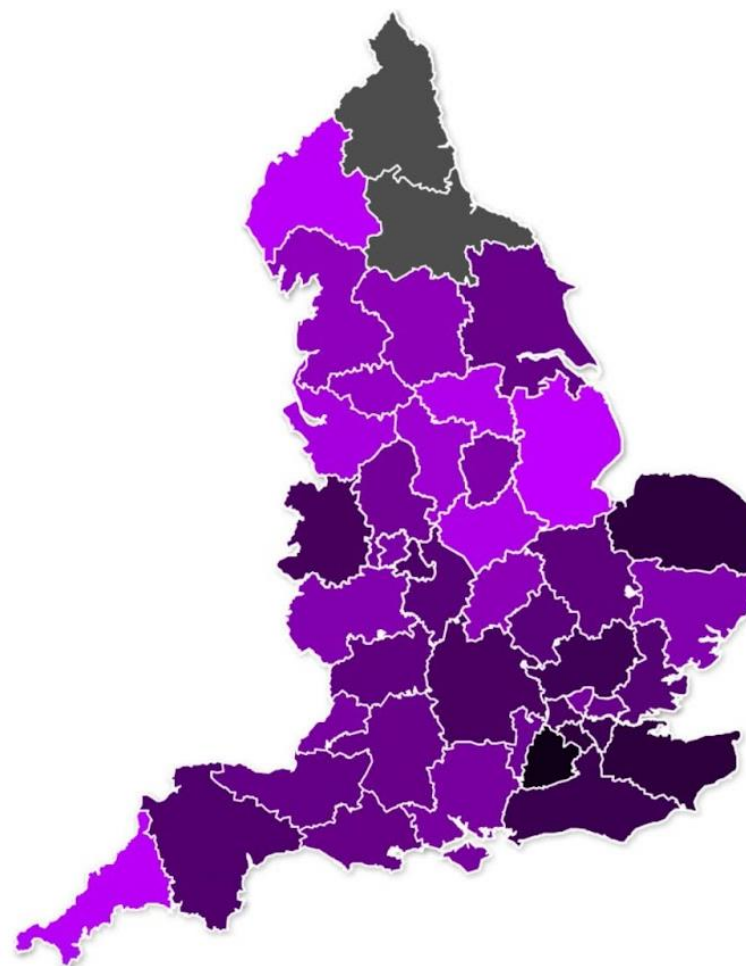
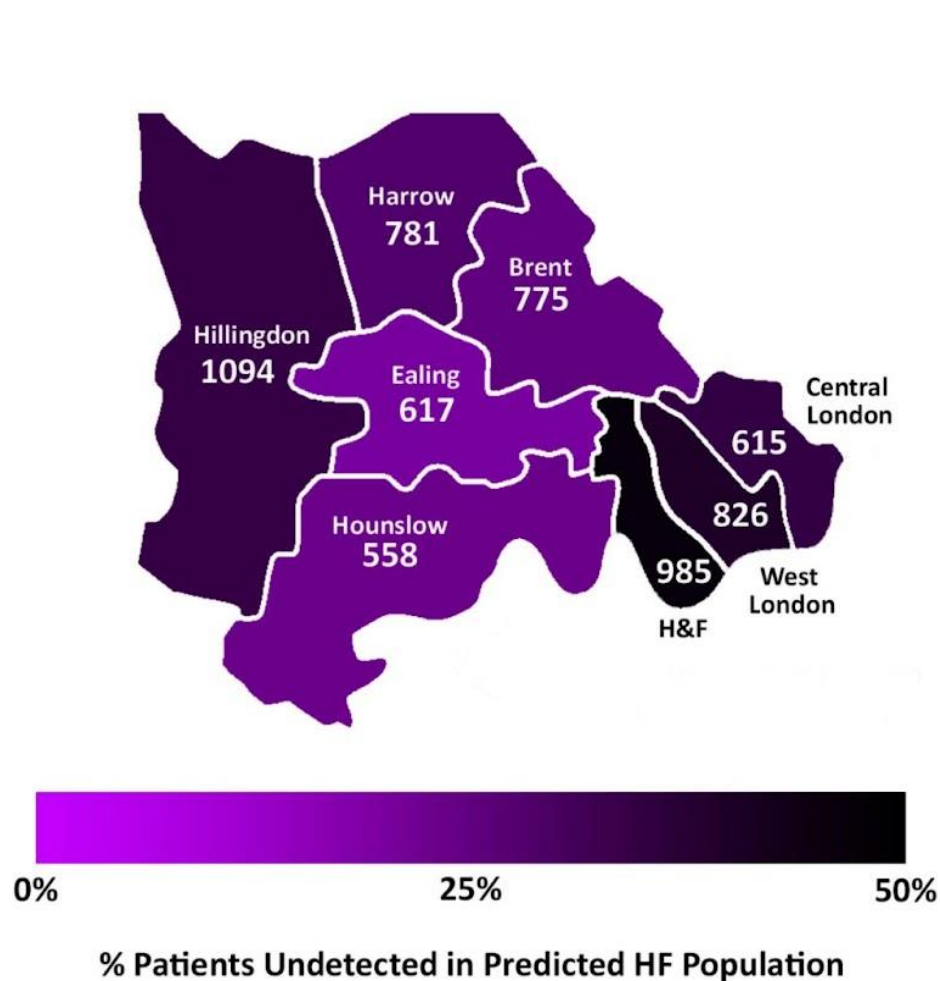
Clinical Research Fellow in Digital Health | Imperial College London

Disclosures: none

Heart failure: a broken clinical pathway



Heart failure: underdiagnosis, inconsistent care



£500 million opportunity ... but need effective PoC screening

Evolution of a universal tool

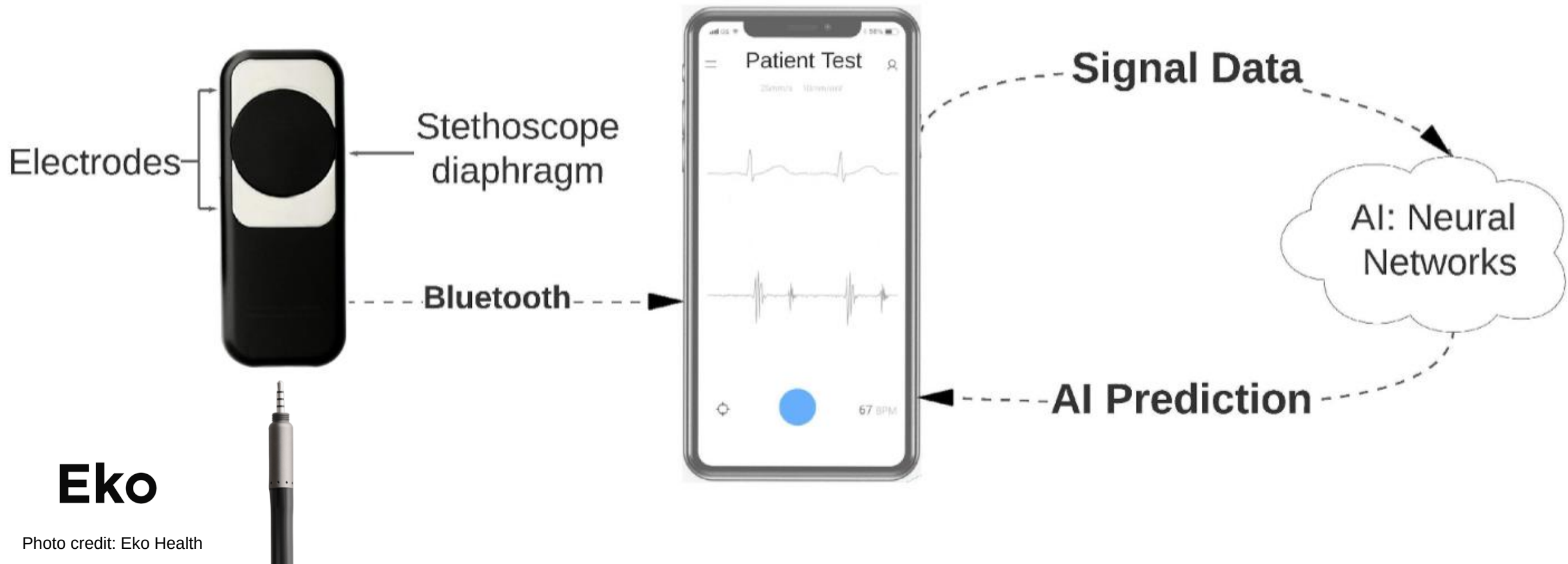


Photo credit: Wikimedia Commons



Photo credit: Eko Health

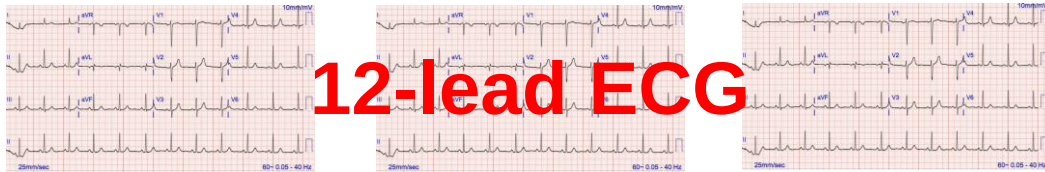
Hardware + connectivity + AI



Eko

Photo credit: Eko Health

Super-human AI-ECG for heart failure



nature medicine

Letter | [Published: 07 January 2019](#)

Screening for cardiac contractile dysfunction using an artificial intelligence-enabled electrocardiogram

nature medicine

Article | [Published: 06 May 2021](#)

Artificial intelligence-enabled electrocardiograms for identification of patients with low ejection fraction: a pragmatic, randomized clinical trial

THE LANCET

Digital Health *P Bachtiger ... NS Peters, 2022*

Point-of-care screening for heart failure with reduced ejection fraction using artificial intelligence during ECG-enabled stethoscope examination in London, UK: a prospective, observational, multicentre study

Proving it works

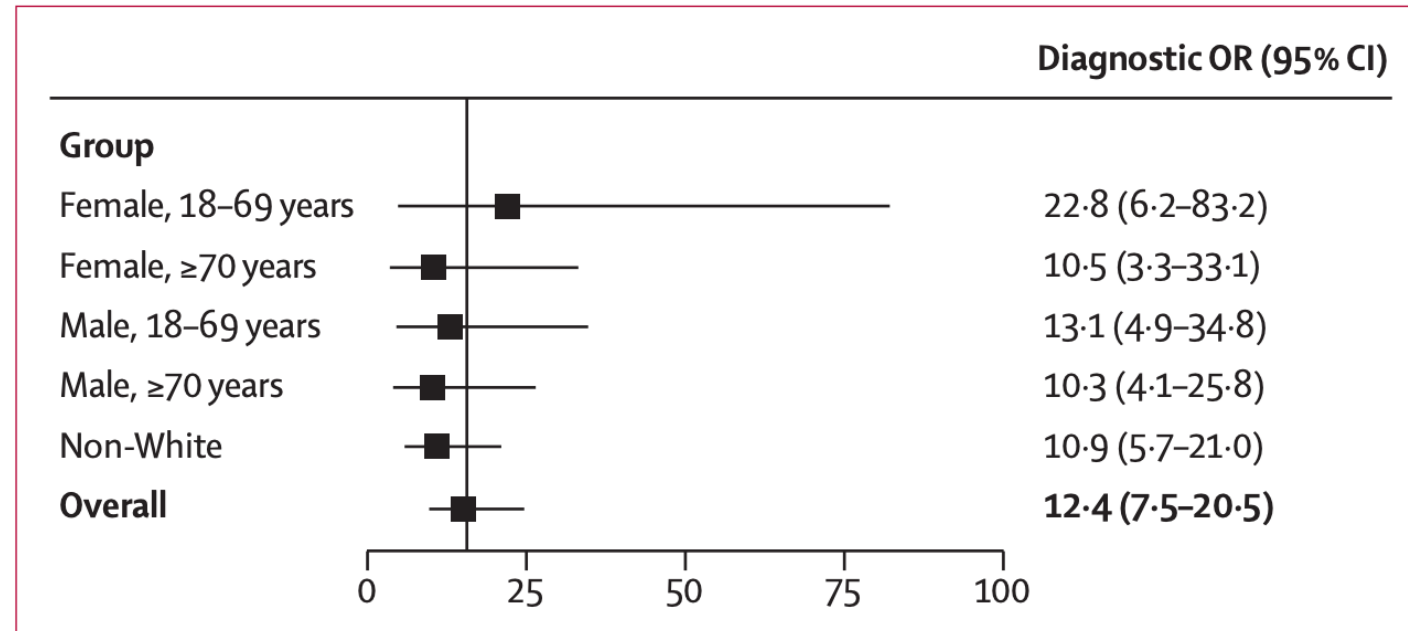
- 1,050 patients in NW London
- Gold standard = echo
- Area Under Curve = 0.91
 - **Sensitivity = 92%**
 - **Specificity = 80%**



AI-ECG Heart Failure Screen

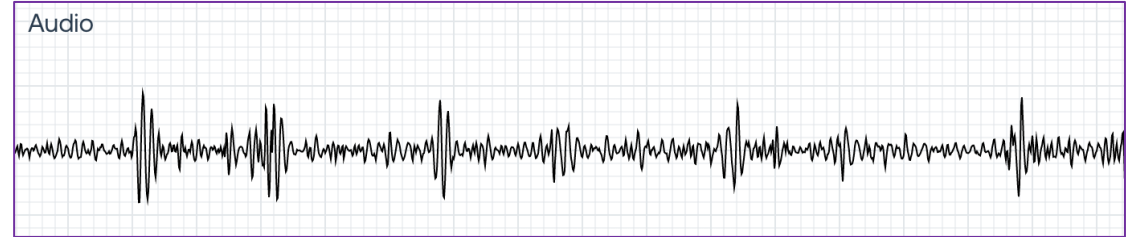
Avoiding limitations of AI research – by design

- Independent
- Prospective
- External validation
- Multi-site/operator
- 40% minority ethnic*



No bias by age, sex, or ethnicity

Towards comprehensive PoC AI screening



Heart failure

Atrial fibrillation

Valvular heart disease

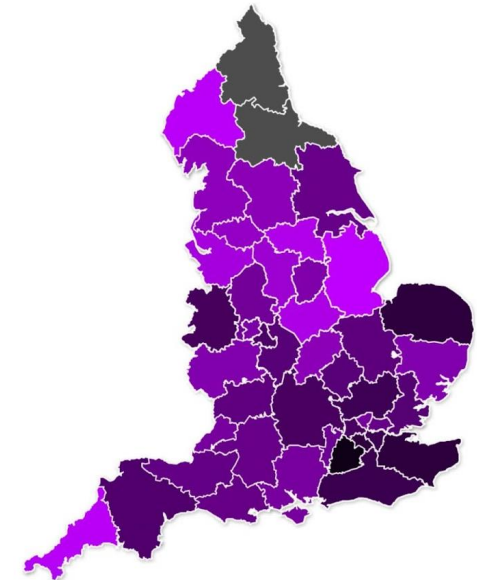
Coronary artery disease

Inherited heart conditions

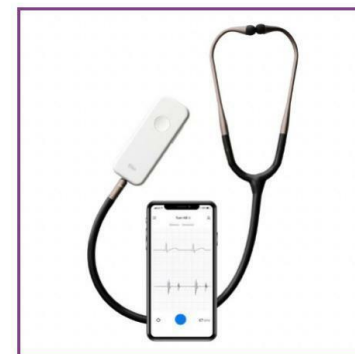


TRICORDER 2022

- **Triple** AI CV disease screening in 15s
- New, improved AI algorithms (HF+)
- Real-world evidence generation



300 GP practices
NWL & Wales
1:1 cluster RCT



Clinical outcomes
Health economics
Usability/acceptability
Equitable access
DTAC, MedTech Funding

Thank you

Imperial Hearts & Minds Lab | NHS Connected Care Hub



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Funders

NIHR
NHSX
AAC
British Heart Foundation
Imperial Health Charity
Rosetrees Foundation
Pfizer Scientific Awards
Imperial AI4Health CDT

Imperial/ICHNT Partnership
ICHNT DPO & IP, C&I Team,
Transformation Team.

... and >1,000 NHS patients.