

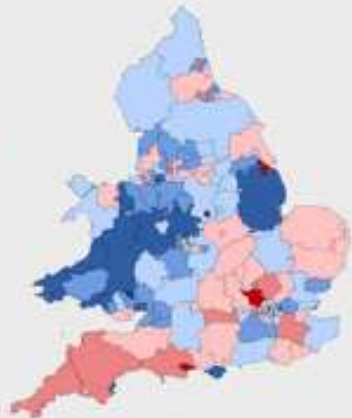
Setting up remote monitoring in device patients

**Jay Wright
HRC 2011**

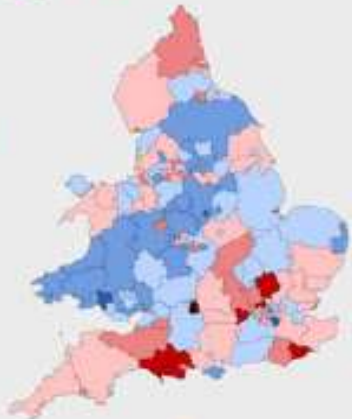
Heart Rhythm Service LHCH

- 7 consultants + 2 visitors
- 4 SpRs
- 14 device sessions
- 16 electrophysiology sessions
- 21 (4) technicians
- 10 sessions pacing FU
- 6 sessions ICD FU (2 remote)
- 4 specialist nurses
- Excellent industrial support
- Surgical and palliative care support

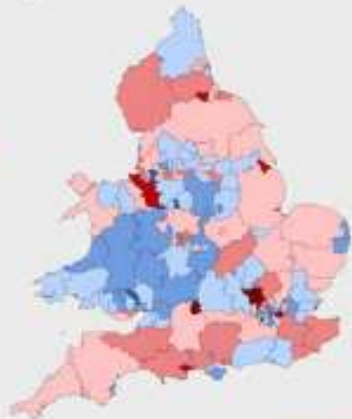
2007



2008

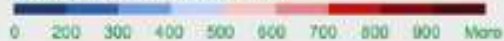


2009

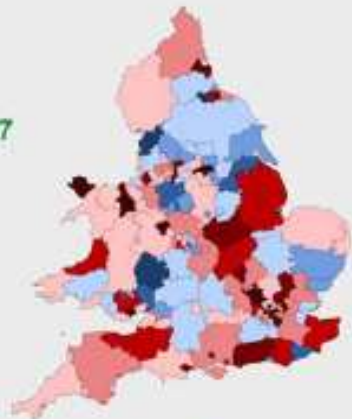


Realizador : SHT - 2010

New implants per million inhabitants



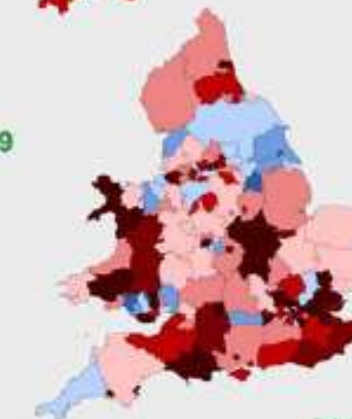
2007



2008



2009

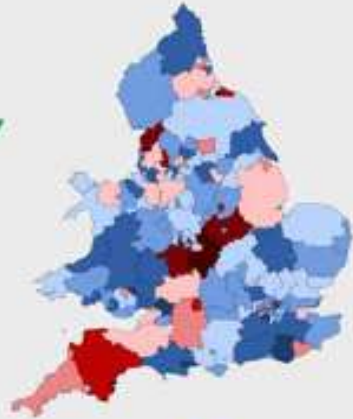


Realizador : SHT - 2010

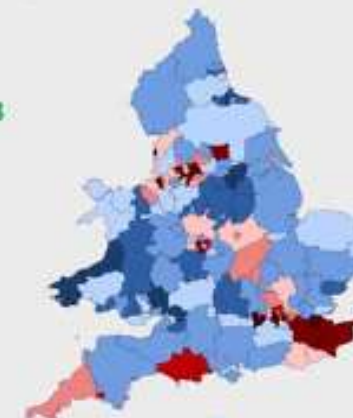
New implants per million inhabitants



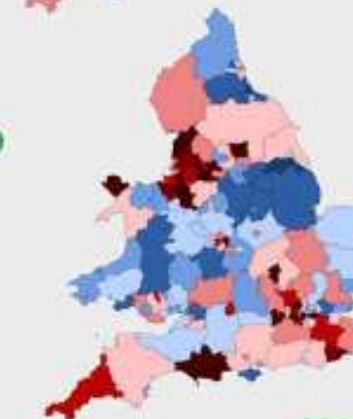
2007



2008

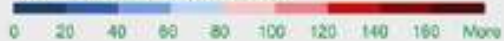


2009

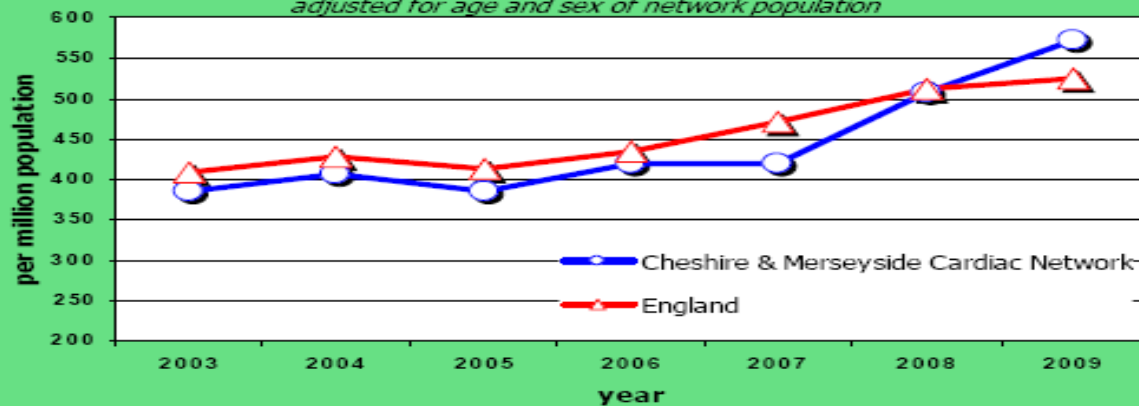


Realizador : SHT - 2010

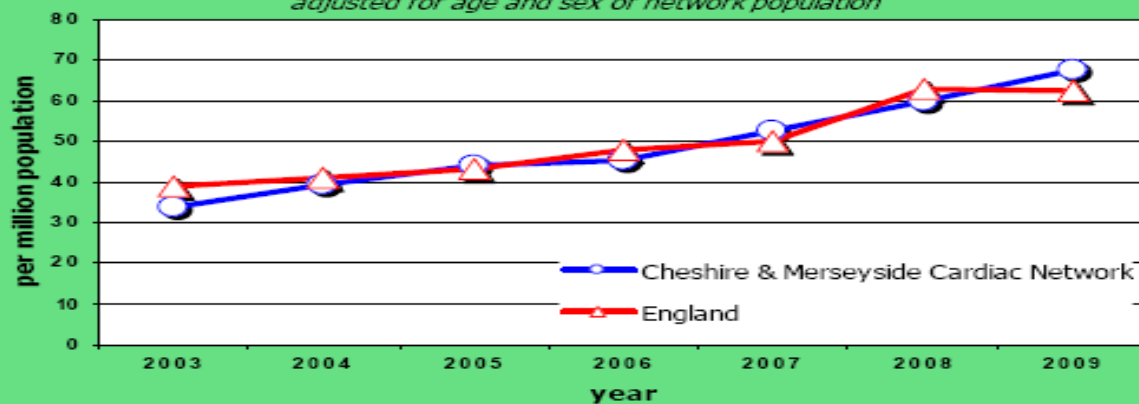
Total implants per million inhabitants



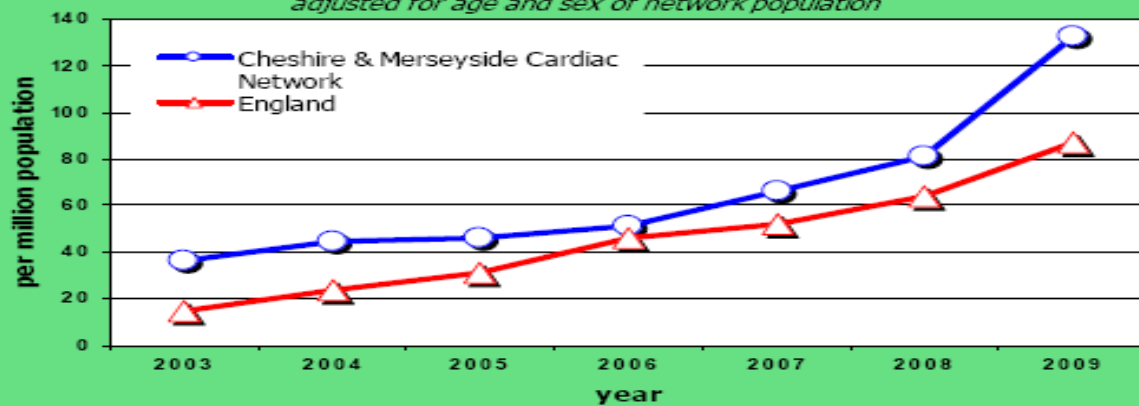
Pacemaker New Implant Rate
adjusted for age and sex of network population



ICD New Implant Rate
adjusted for age and sex of network population



CRT New Implant Rate
adjusted for age and sex of network population



Problems with device services

- Rapid expansion in implantation
- Increasing numbers in FU clinics
- Aging population with co-morbidities
- Increasingly complex devices
- Field alerts and recalls
- National lack of physiologists

Why should we do it ?

- Fewer patient visits
- More efficient patient visits
- More patient reassurance
- Cost efficacy
- Home management is a priority
- Patient preference

Why we don't want to do it

- Too much work to change system
- Need to see patients for wounds etc
- Patients like to see us
- No one will pay for it

ICD vs pacemaker

- ICD FU more frequent
- Patients potentially sicker and anxious
- More device issues (Sprint Fidelis)
- Small relative cost of FU

2007 LHCH at breaking point

- 1200 ICD patients in FU
- Numerous field alerts
- Dwindling physiologist population
- Huge geographic area to cover – Wales/IOM
- Technology becoming available to permit remote FU

Considerations for Remote FU

- Define the problem
- Understand technology
- Ensure compliance with IT regulations
- Negotiate with manufacturers
- Conduct pilot project
- Discuss cost with commissioners

Pilot Project

- Fliers for patients to attend evening meeting
- 43 attended, some with carers
- 43 signed up
- 6/12 use of Carelink
- Questionnaires at 3 and 6 months
- Vast majority found it easy to use and helpful
- All wanted to continue

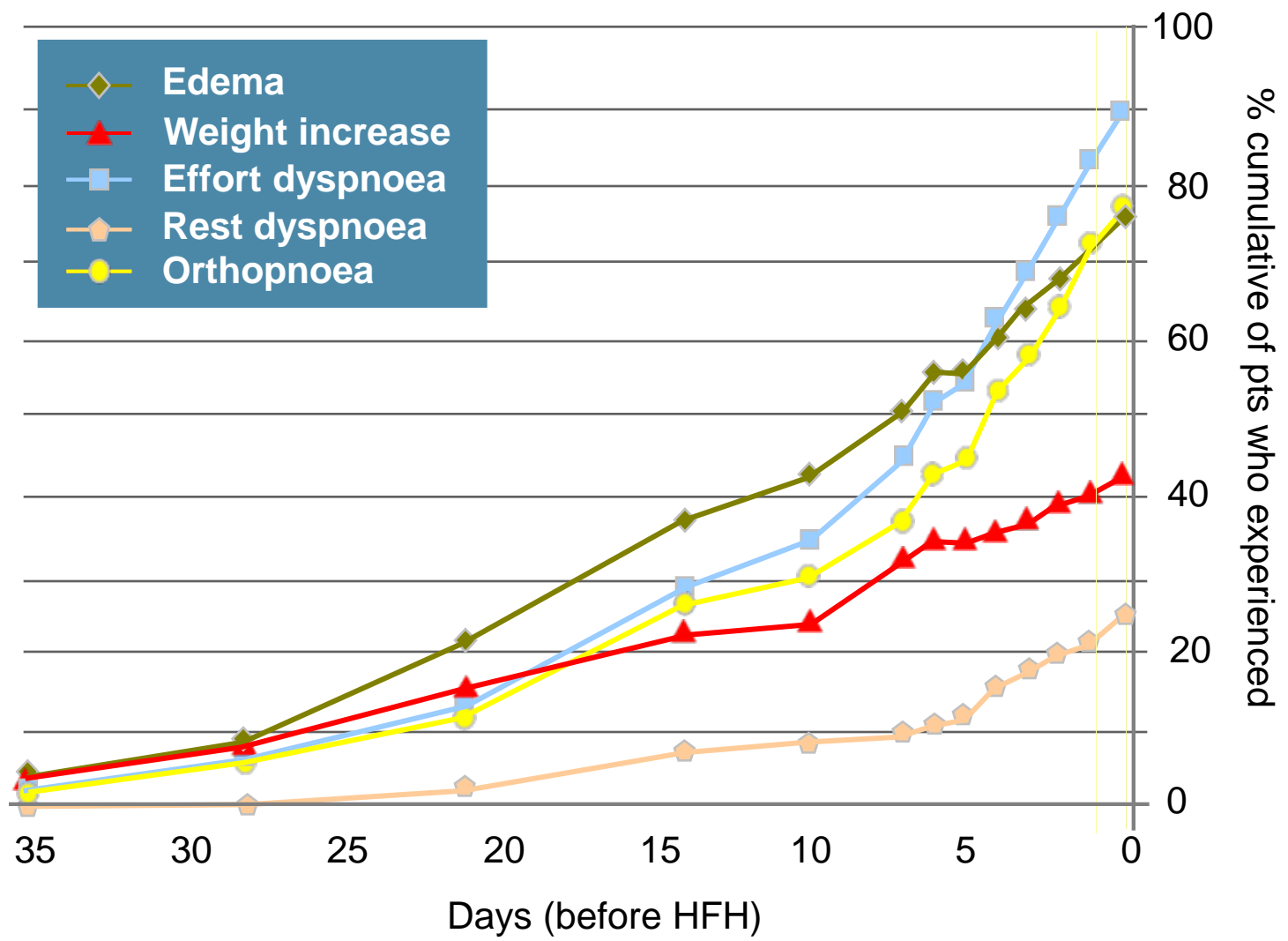
Next steps

- Discuss with commissioners
- Remote FU £75 vs £95 for visit
- Remote clinics of 30 patients vs 16 in a 4 hr clinic
- Regard remote clinic as mandatory physiologist attendance
- Recruit more patients to remote FU
- Program alarms for advisory patients

Currently

- >800 patients under remote FU
- Using Carelink and Lattitude
- Physiologist CRT optimisation clinic

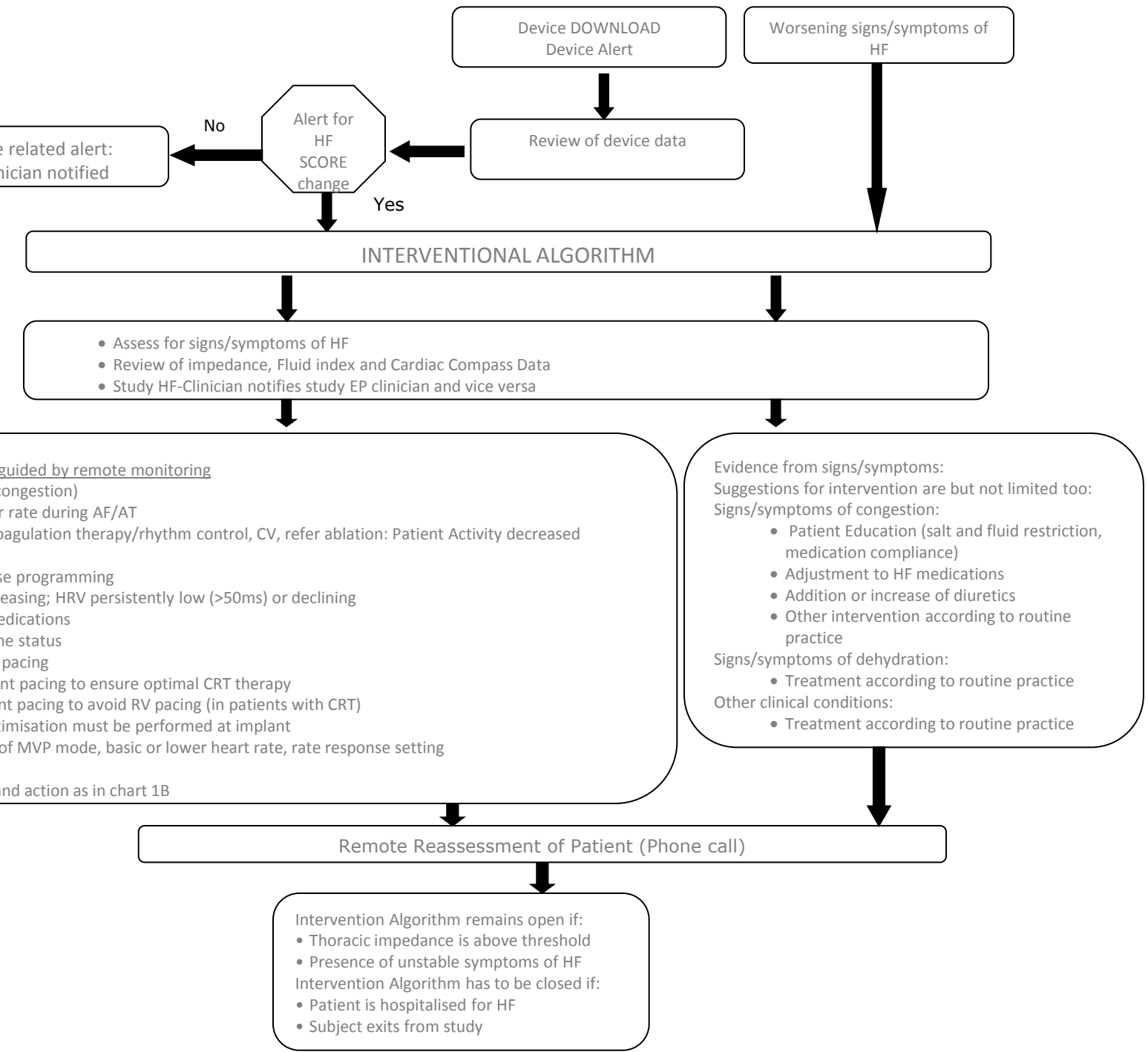
The way towards an acute HF event ...





Algorithm Driven Management

Using: CARELINK, MERLIN.NET and
LATITUDE



Device DOWNLOAD
Device Alert

Worsening signs/symptoms of
HF

HF related alert:
EP clinician notified

No

Alert for HF
SCORE
change

Yes

Review of device data

INTERVENTIONAL ALGORITHM

- Assess for signs/symptoms of HF
- Review of impedance, Fluid index and Cardiac Compass Data
- Study HF-Clinician notifies study EP clinician and vice versa

- minimal interventions guided by remote monitoring
- HF related (congestion)
 - AT/AF, high ventricular rate during AF/AT
 - Adjust anticoagulation therapy/rhythm control, CV, refer ablation: Patient Activity decreased
 - Exercise
 - Rate response programming
 - HR at night high or increasing; HRV persistently low (>50ms) or declining
 - Adjust HF medications
 - Assess volume status
 - Percentage ventricular pacing
 - Maximise vent pacing to ensure optimal CRT therapy
 - Minimise vent pacing to avoid RV pacing (in patients with CRT)
 - AV delay optimisation must be performed at implant
 - Adjustment of MVP mode, basic or lower heart rate, rate response setting
 - VT/VF, ICD shock
 - Refer to EP and action as in chart 1B

- Evidence from signs/symptoms:
Suggestions for intervention are but not limited too:
- Signs/symptoms of congestion:
- Patient Education (salt and fluid restriction, medication compliance)
 - Adjustment to HF medications
 - Addition or increase of diuretics
 - Other intervention according to routine practice
- Signs/symptoms of dehydration:
- Treatment according to routine practice
- Other clinical conditions:
- Treatment according to routine practice

Remote Reassessment of Patient (Phone call)

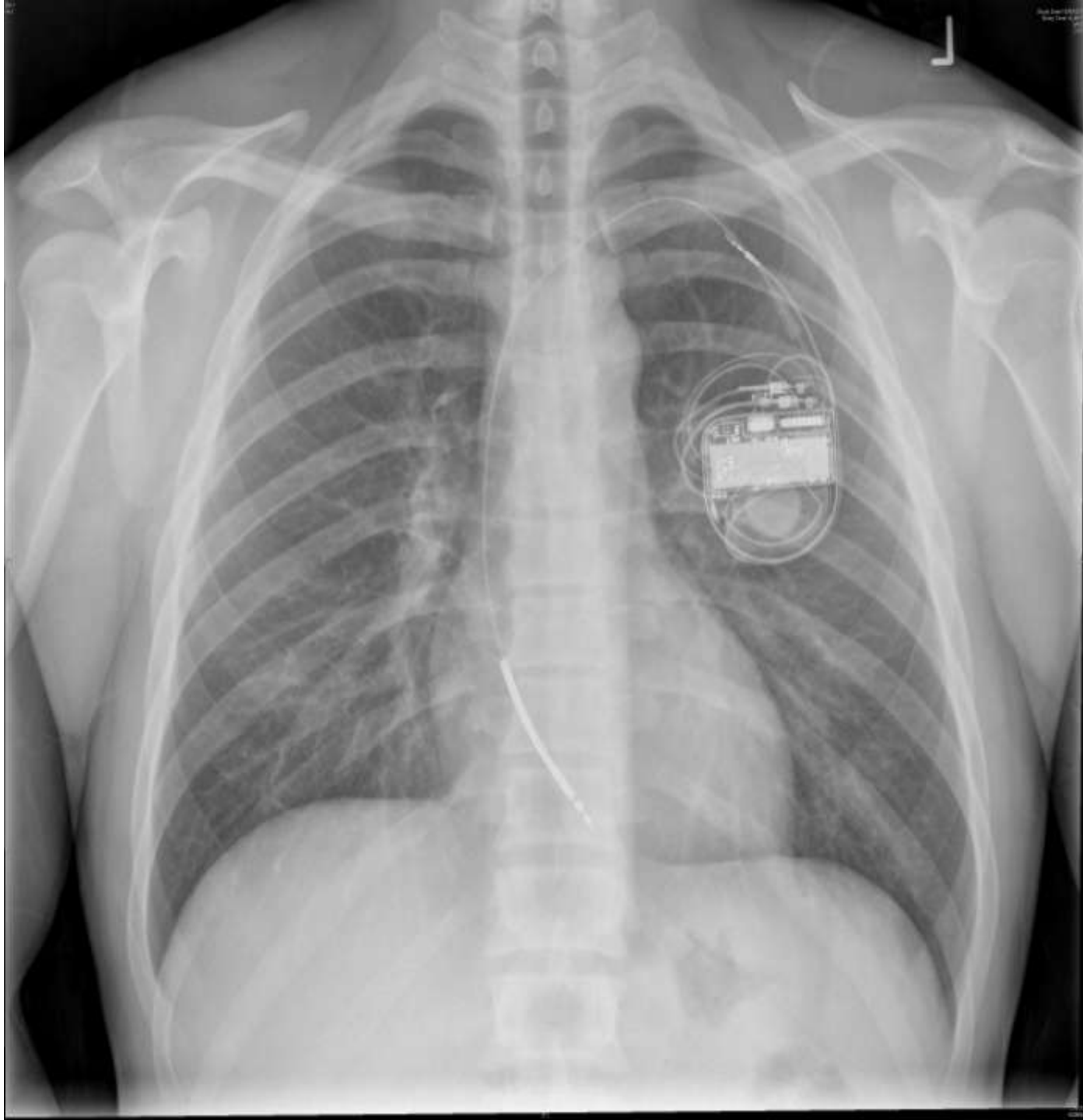
- Intervention Algorithm remains open if:
- Thoracic impedance is above threshold
 - Presence of unstable symptoms of HF
- Intervention Algorithm has to be closed if:
- Patient is hospitalised for HF
 - Subject exits from study

Patient story

- 45yr old male from Wales, anxious disposition
- Brother died suddenly late 30`s
- Multiple syncopal episodes
- Admitted with BCT requiring cardioversion
- Troponin, echo and angiogram normal
- MRI appearances of ARVC
- PR interval $>250\text{ms}$
- DR ICD

Patient story

- Well at 6/52 visit but anxious
- Fearful of appropriate and inappropriate treatment and many other things
- Remote FU with alerts programmed on
- After few weeks device alerts exceeded
- Both leads demonstrating changes in parameters, lots of NSVT
- Asked to attend



Summary

- Remote FU is better for patients and carers
- Remote FU is better for us
- Remote FU is developing rapidly with extensive use in ICD population
- More unscheduled visits treating AF etc faster
- Mortality studies to report in future
- To implement get patient data and discuss early with commissioners