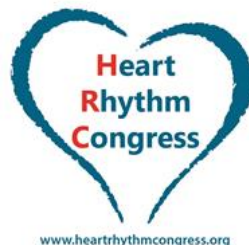


# All device patients should be on remote follow up only Against

Karen Lascelles  
Royal Brompton Hospital

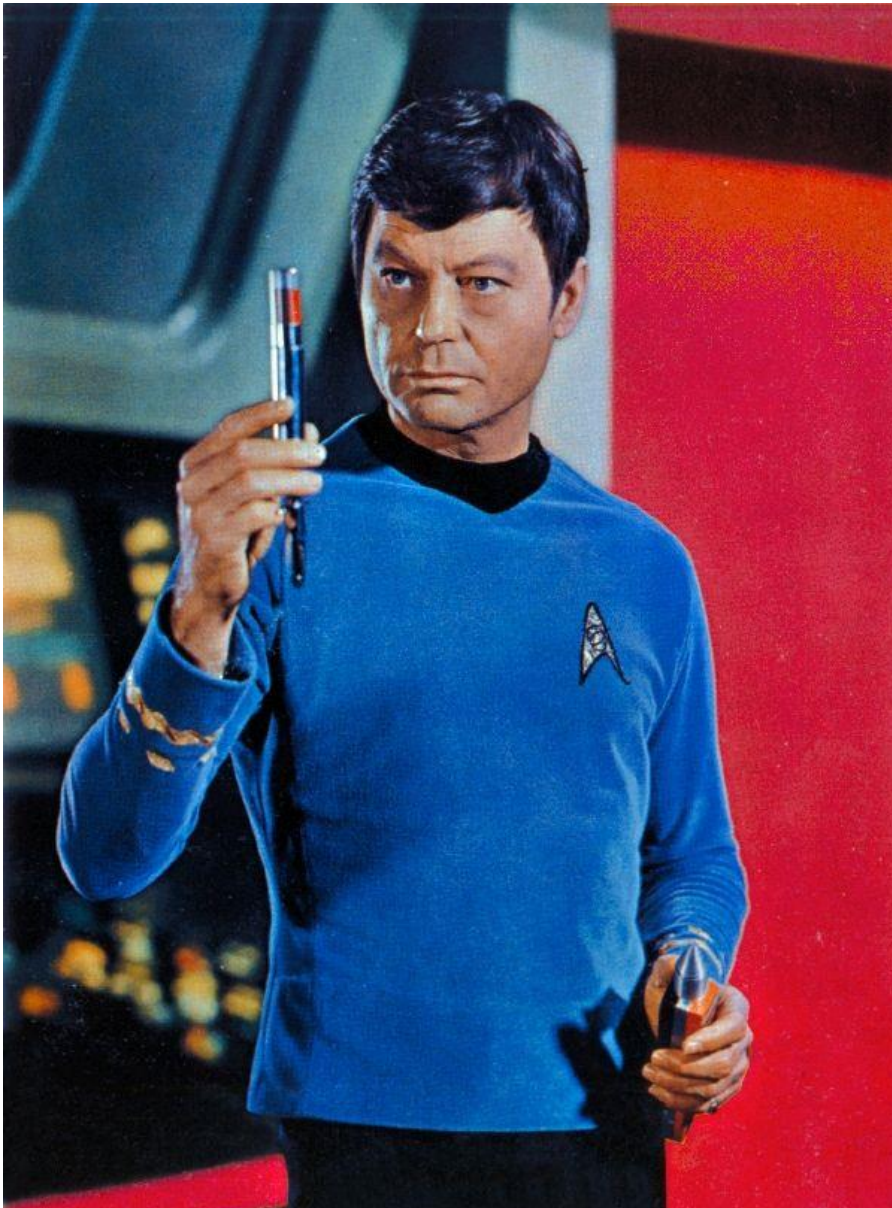




# It's a great thing

- Improving care quality for patients
  - Flagging up hardware issues early – before failure
  - Ease of review for advisories
- Improved patient safety
- Improved patient perception
- Cost saving for patient and NHS in transport
- Less hospital clinic visits

It's a great thing...



...but it's not infallible



# Patient safety

- Improves survival rates
- Fewer inappropriate shocks
- Increased battery longevity
- Faster recognition of rhythm events
- Reduction in time to treatment

.....Provided it is connected.....

# Non-compliance

- Technical aspect - helplines
- Signal – what if the mobile signal is poor
- More worry about monitor
- Reminds people of their condition
- Holidays?
- Technophobic – ‘can’t use computers’
- Confusion , anxiety, reminds them of their condition
- Battery longevity
- ‘Rather see someone in clinic’
- No point in making people take a remote monitor
- Careful explanation – time consuming



# Superiority of automatic remote monitoring compared with in-person evaluation for scheduled ICD follow-up in the TRUST trial-testing execution of the recommendations

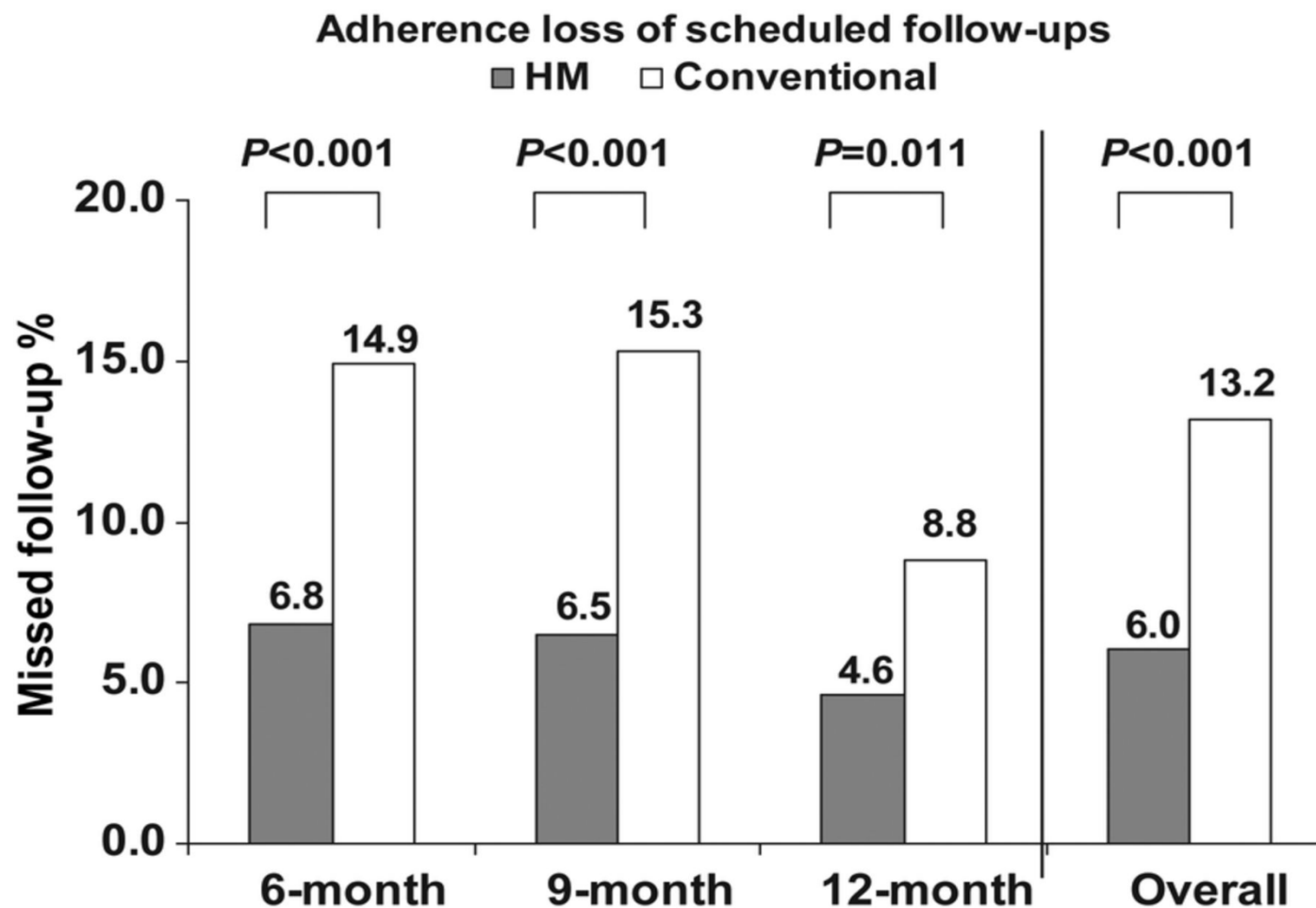
Niraj Varma et al

European Heart Journal ehu066 First published online: 3 March 2014

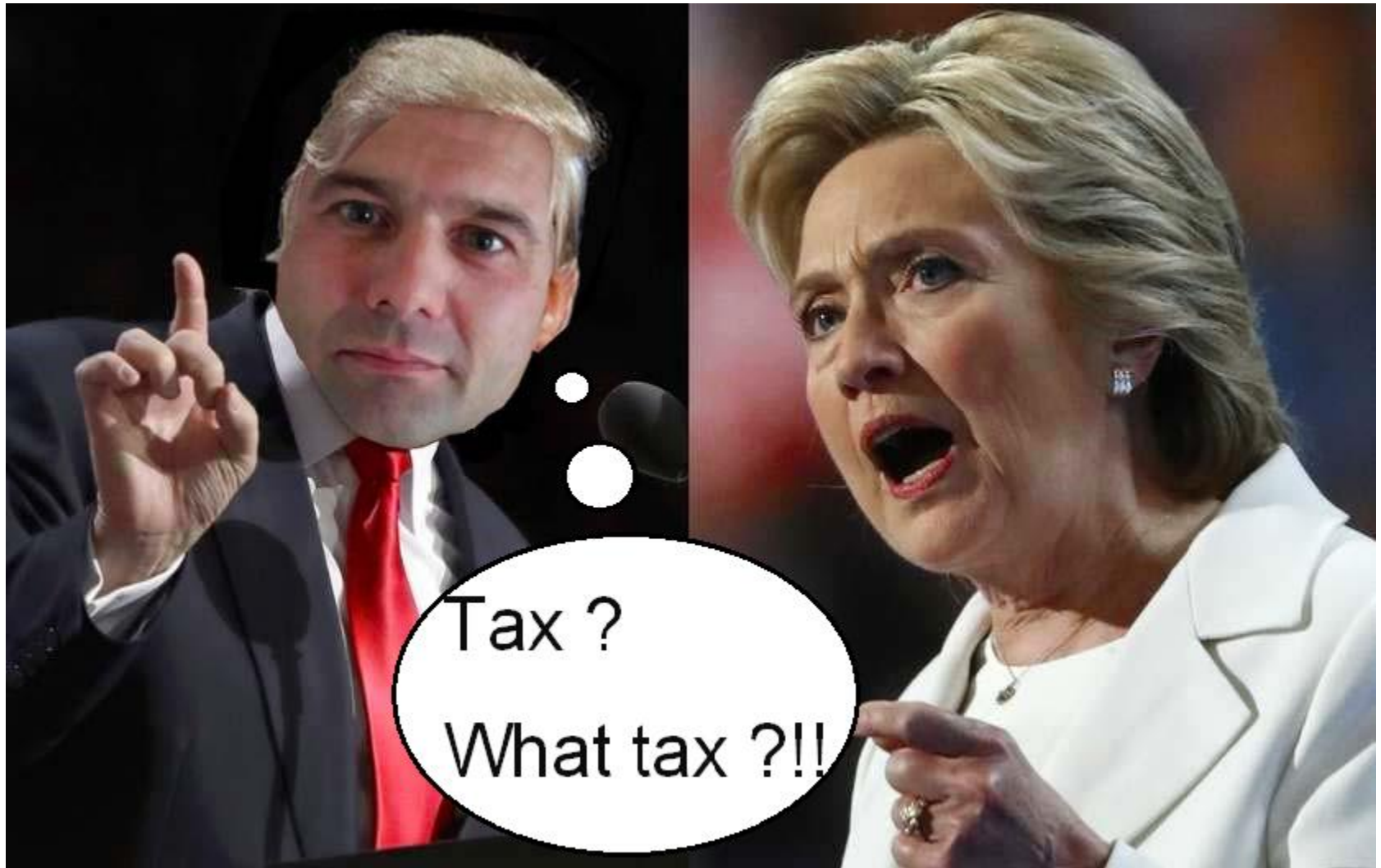
- $n = 1450$
- ‘....the initial 3 month evaluation during which HM patients were completely remotely managed, there was **100% adherence** to the four appointed checks (6, 9, 12, and 15 months) **in** 568 (**62.6%**) of HM vs. 212 (49.2%) in Conventional patients ( $P < 0.001$ )’



Varma et al      European Heart Journal, 35(20), pp. 1345-1352  
'Superiority of automatic remote monitoring compared with in-person  
evaluation for scheduled ICD follow-up in the TRUST trial - testing  
execution of the recommendations.', *First published online: 3 March  
2014*



# Cost effectiveness



# Cost effectiveness

- Time taken for remote review ?
- Follow up of disconnected monitors
- If events are present – time taken to call them re symptoms
- Savings in clinic time for simple devices but additional costs are incurred as remote not part of system?
- Increased amount of telephone calls
  - Has it worked?
  - Have I had any events?
  - Am I in AF?
- Increased initial clinic visit time to explain and set up
- Increasing use of resources to keep up with transmissions

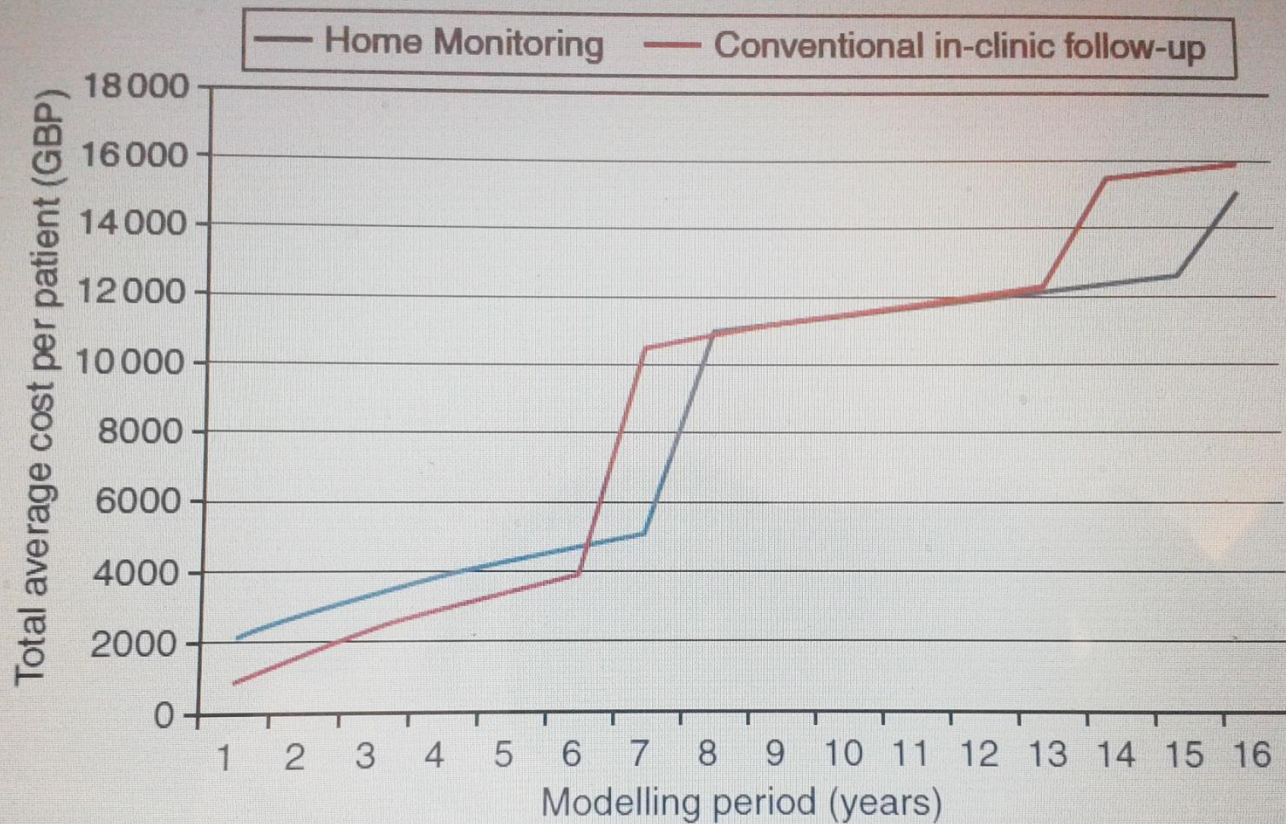
Cost–consequence analysis of daily continuous  
remote monitoring of implantable cardiac  
defibrillator and resynchronization devices in the UK  
Burri et al Europace (2013) 15, 1601–1608

Biotronik

Using randomised controlled trials to estimate  
future events and subsequent costs appropriate  
for UK

(Economic Markov model)

cost neutral at 10 years



**Figure 3** Univariate sensitivity analysis for modelling period: Discounted total costs per patient on HM vs. conventional in-clinic FU.

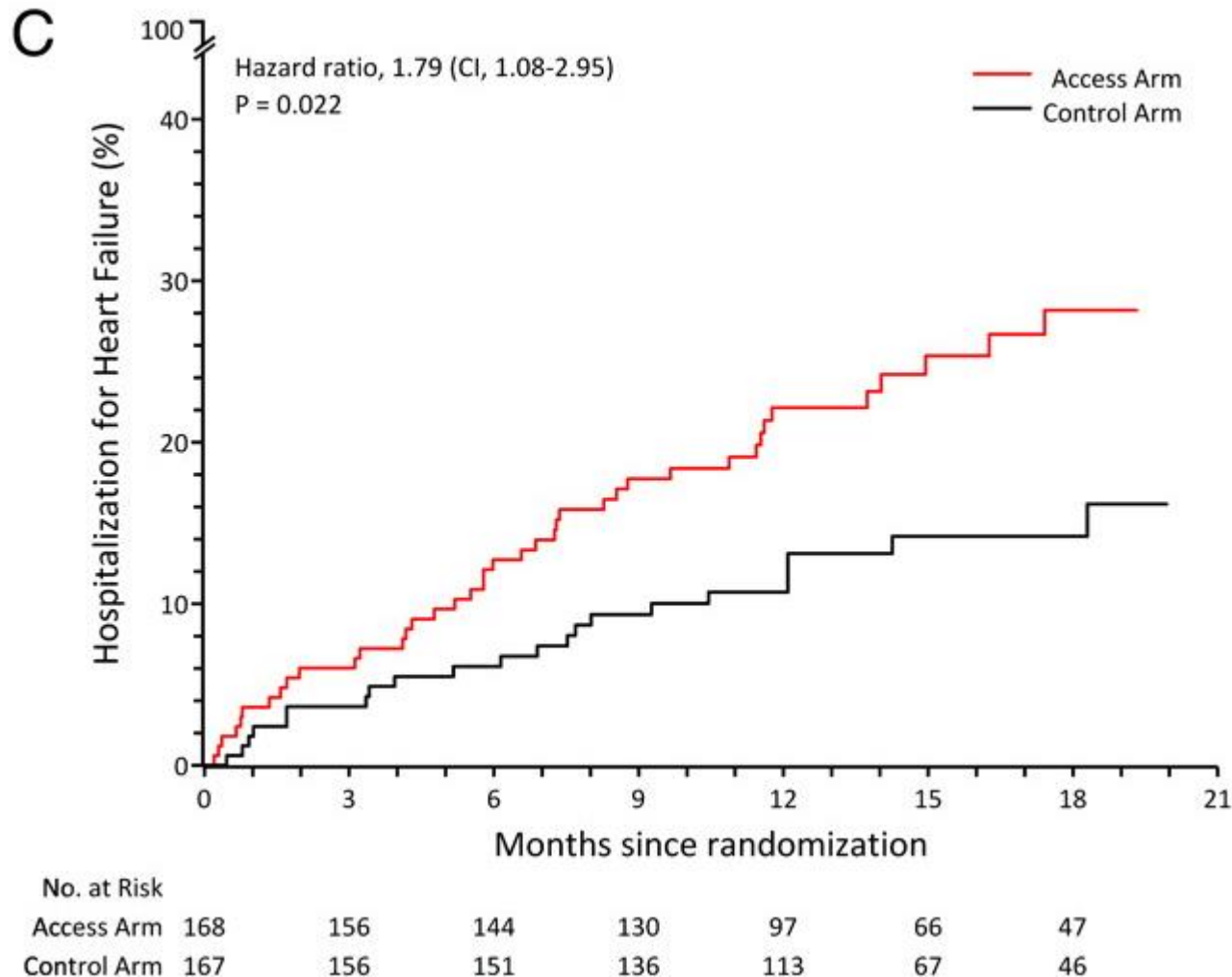
# Heart failure – can you see it remotely?

- Signs and symptoms
- Increased breathlessness ?
- Peripheral oedema ?
- Nocturnal tachycardia?



# Intrathoracic Impedance Monitoring, Audible Patient Alerts, and Outcome in Patients With Heart Failure for the DOT-HF Investigators

Circulation October 2011





- DOT-HF 2011 – ‘In the present study, the use of an implantable diagnostic tool to measure intrathoracic impedance with a patient alert did not improve outcome in the outpatient management of patients with heart failure.’
- Alerts increased number of visits to clinic compared to control group.

# Comment

- Requires more contact and clinical markers to properly assess heart failure in an individual
- Heart failure diagnostics work in individual patients.
- Improving heart failure markers in diagnostics
- Heart failure diagnostics work to predict HF if they have been shown to be correlate with HF signs and symptoms in THAT individual patient.

# Reprogramming

- How many times do you change the programming?
- Provocative manoeuvres
- Configuration testing
- Morphology template
- Rate response assessment

# Use of Remote Monitoring of Newly Implanted Cardioverter-Defibrillators Clinical Perspective

## Insights From the Patient Related Determinants of ICD Remote Monitoring (PREDICT RM) Study

Joseph G. Akar et al , Circulation, 128(22), pp. 2372-2383  
[Online] 2013

- n=24113 all <89yrs
- 76% of patients sent transmissions within 6/12 of implant
- ‘Finally, **patients with comorbidities**, severe left ventricular dysfunction, and in-hospital procedure-related complications and those not admitted specifically for device implantation were **less likely to use RPM**.
- Thus, **sicker patients** who may be more likely to benefit from RPM were **less likely to use this technology**, which is an example of a risk-treatment paradox.
- The underlying reasons for this paradox are unknown, but **it is possible that sicker patients prefer** or are deemed by clinicians to **need in-office encounters**.’

# Symptom review

- Can you review symptoms remotely?
- Relating symptoms to events
- Importance of relating symptoms to events? (DVLA)
- Clinic time for telephone calls to patients
- If there are remote events nocturnally is it useful or helpful to inform the patient?

# Elderly and infirm

- Don't need to come - difficulty travelling
- Bed bound / immobile / EOL
- Only if device is RF - less likely to be able to send manual transmissions
- Less likely to tell you about symptoms
- Less likely to notice wound issues / oedema

# Wound care





# Individual care

- **NICE 2012** Quality statement
  - ‘ Patients experience care that is tailored to their needs and **personal preferences.....**’
- **Lord d’Arzi NHS review 2008**
  - ‘They want care that is **personal to them**, and to be shown compassion, dignity and respect by those caring for them. ‘
- ***Systematic review of evidence on the links between patient experience and clinical safety and effectiveness*** Doyle et al ***BMJ Open* 2013 3**
  - ‘The data presented display that **patient experience** is positively associated with **clinical effectiveness and patient safety**’
- **NHS constitution – 2015**
  - NHS values ‘ We put the needs of patients and communities before **organisational boundaries.**’
  - Patient rights ‘You have the right to receive care and treatment that is appropriate to you, meets your needs and **reflects your preferences.** ’

# Extent of responsibility

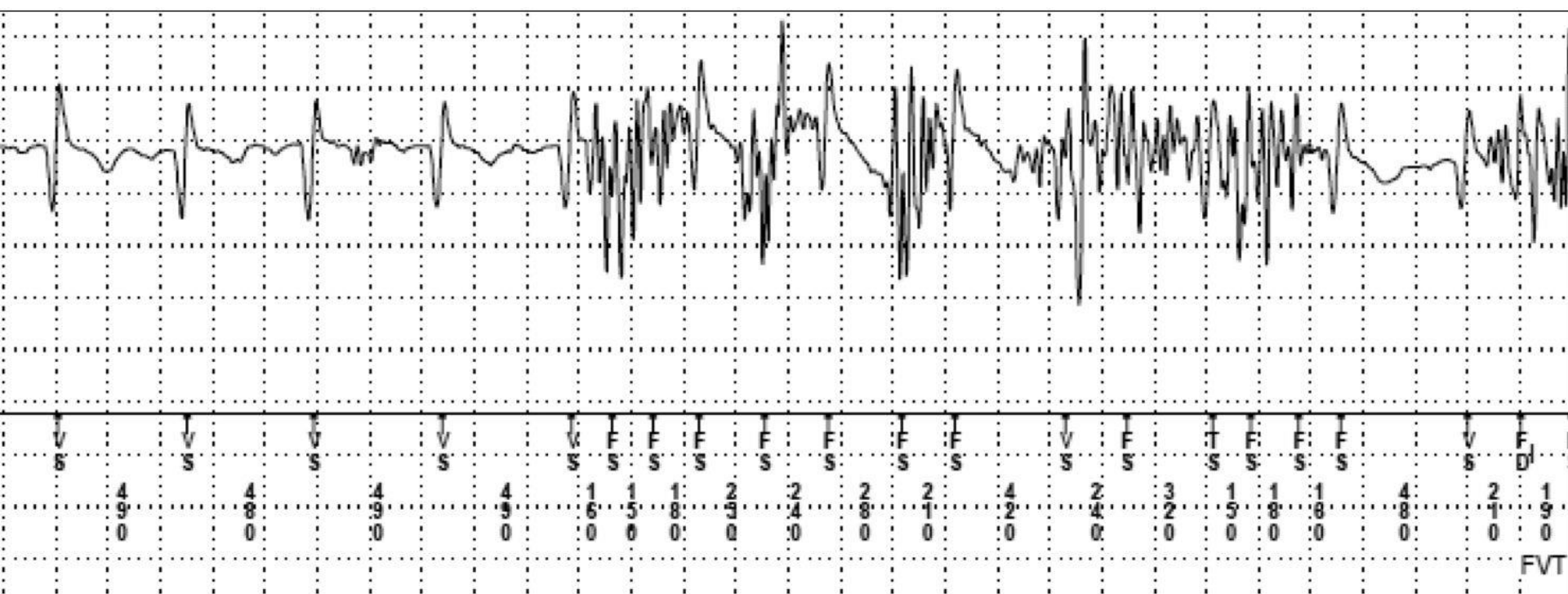
- What is pacing clinic for?
- What are the minimum standards of care for pacing clinic?
- Management of patient or management of device?
- All pacing patients seen by clinicians?
- Holistic care for complex patients, multiple comorbidities, long term, who and where ?

# Paediatrics and complex congenital patients

- Epicardial pacing thresholds – less stable
- Use of automatic output features
- Need to come to clinic for X rays and review
- Questions from parents

# ILR monitoring

- Definitely requires remote follow up
- Increases clinic workload dramatically
  - 10% of implants produces about 75% of automatic transmissions coming in
- Reasons for monitoring - symptomatic or not
  - Time to call patients to investigate symptoms
- Amount of information available automatically
- More recent indications for monitoring – review for atrial fibrillation in the context of cryptogenic stroke
  - Capacity issues
  - False positives
  - How often do you schedule in asymptomatic patients?



# Summary

- Safer than just in clinic f/u, very effective as a diagnostic tool, probably cost effective, one size fits all approach.

## **Ideal world**

All patients accept remote follow up

All patients are connected remotely and don't call clinic

All alerts represent real events



# Summary

- Real world
  - Some patients don't want remote monitors
  - Remote monitoring still takes a lot of clinical resources
  - There is a lot of telephone contact involved
  - Should be used as an adjunct to in clinic follow up
  - Individual care plans for individual patients which includes cardiology



The monitor says no.....



# Thank you

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