Device management and generator changes at end of life: what do we want to avoid?

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Device management towards end of life

Outline of Presentation

- Avoid missing the fact that 'end-of-life' is approaching
  - Look for simple markers of poor prognosis; trust 'clinical instinct'
  - Use objective scoring systems in specific situations
- Avoid multiple painful/futile ICD shocks at end-of-life
  - Program painless ATP and extend detection in all zones
  - Think about ICD deactivation but expect discussions to be challenging; patient/carer views may not meet your expectations
- Avoid unnecessary ICD generator changes at end-of-life
  - Think about appropriateness of generator replacement
  - Consider CRT-D to CRT-P or ICD withdrawal in selected patients

Avoid missing the fact that 'end-of-life' is approaching

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Triggers for thinking about end of life

Predictors of poor prognosis

- Advanced age
- Refractory symptoms despite optimal treatment
- High level of dependence
- Repeated hospital admissions with heart failure
- Multiple shocks from defibrillator
- Comorbidity with poor prognosis such as cancer or end-stage renal failure

Gold Standards Framework (>2 of…)

- NYHA class III or IV symptoms (breathless at rest or minimal exertion)
- Repeated hospital admissions with heart failure
- Difficult physical or psychological symptoms despite optimal tolerated treatment
- Thought to be in last year of life by care team – the surprise question.

"Would you be surprised if this patient died in the next six to twelve months"

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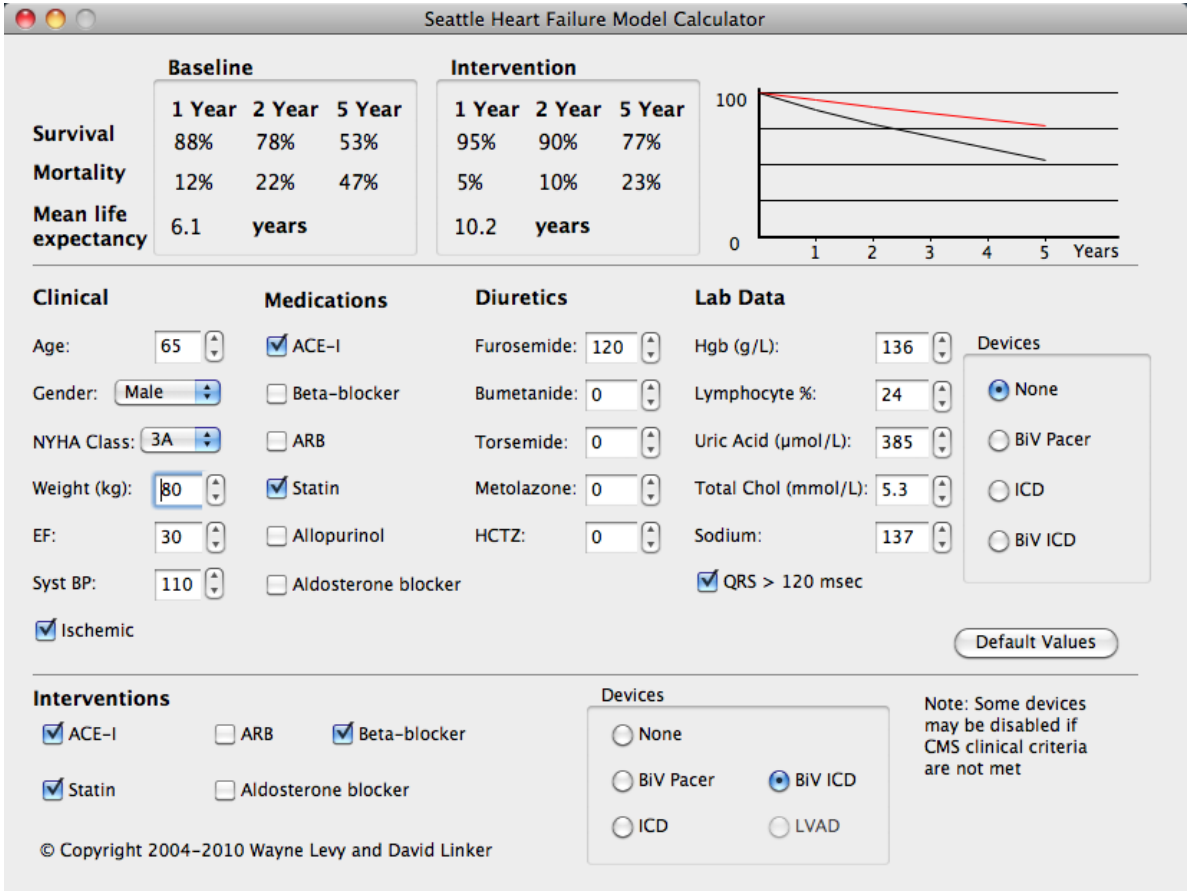
Scoring systems may help identify sick patients



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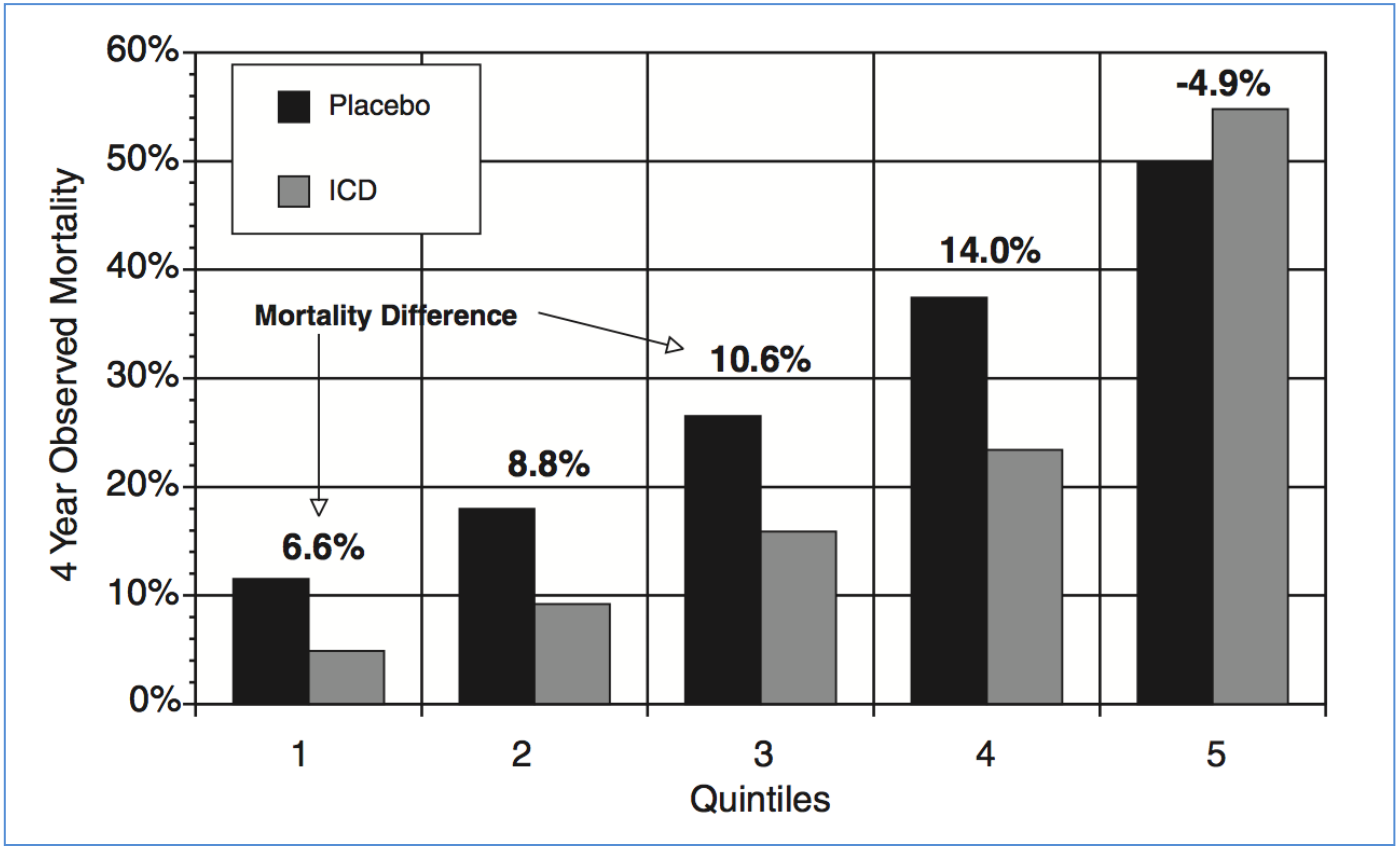
Sickest patients don't survive longer with ICDs



Levy WC *et al. Circulation* 2009;**120**:835-842

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But scoring systems are not perfect

	Sensitivity (%)	Specificity (%)
Gold Standards Framework	83	22
Seattle Heart Failure Model	12	99

Haga K *et al*. *Heart* 2012;**98**:579–583.

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Trust your instincts

Doing well

Not doing so well

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Avoid multiple painful/futile ICD shocks at end-of-life

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Sensible steps for all ICD patients

- Program painless ATP therapy
- Extend detection to reduce amount of ICD therapy
  - Medtronic – 30/40 Intervals (VF zone)
  - Boston Scientific – Detection Delay 6 seconds
  - St Jude – 24 Intervals
- Let patients and care-givers know that ICD deactivation can be appropriate when the end of life is approaching
- Ensure care-givers are aware that shocks can be suspended with use of a magnet

25 July 2014 Last updated at 15:05

Dying man at Tameside hospital 'shocked to life' 31 times

Brian Williams' defibrillator implant was left in, shocking him dozens of times after his life support was switched off

The family of a man who was "shocked back to life" 31 times after his life-support was turned off, said he had been denied a dignified death.

Brian Williams, from Manchester, who had a terminal brain tumour, was being treated at Tameside Hospital in 2012.

Doctors failed to turn off the 77-year-old's defibrillator implant after his family decided to allow him to die.

The hospital said it "unreservedly apologised" to the family and had agreed an out of court settlement.

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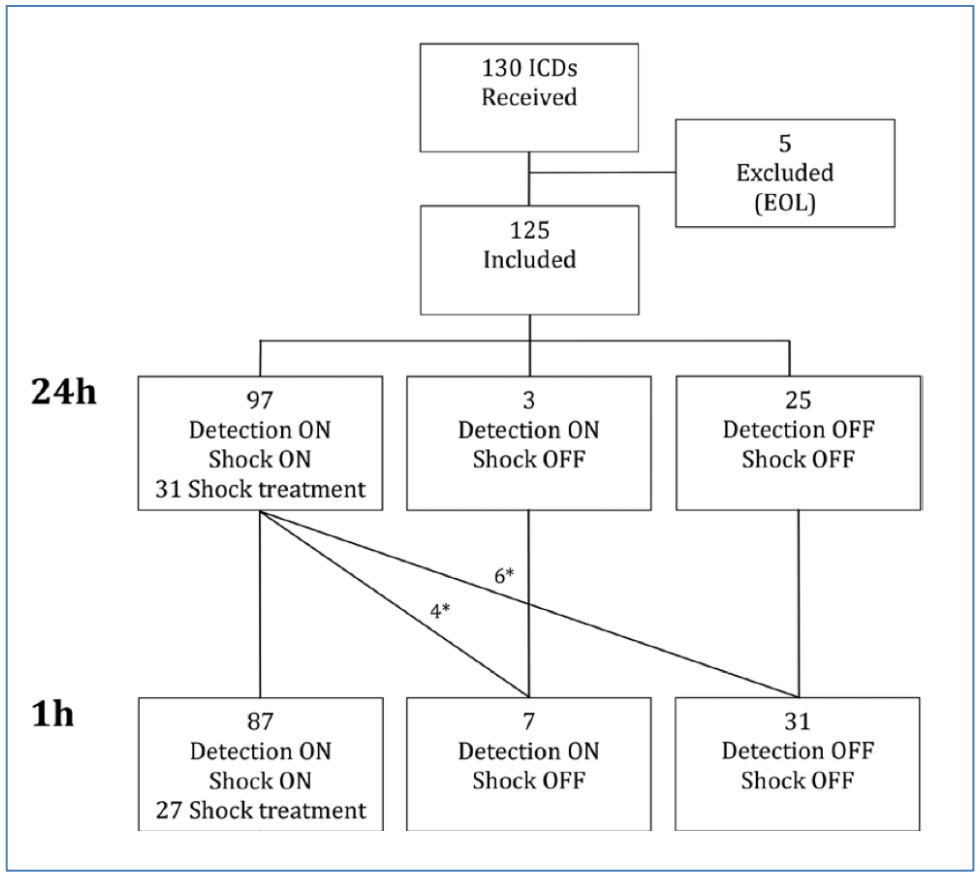
1/3 patients get ICD shocks in last hour of life



32% received shocks in final 24 hours of life

31% received shocks in final hour of life

Kinch Westerdahl A et *al*. *Circulation* 2014;**124**;422-429

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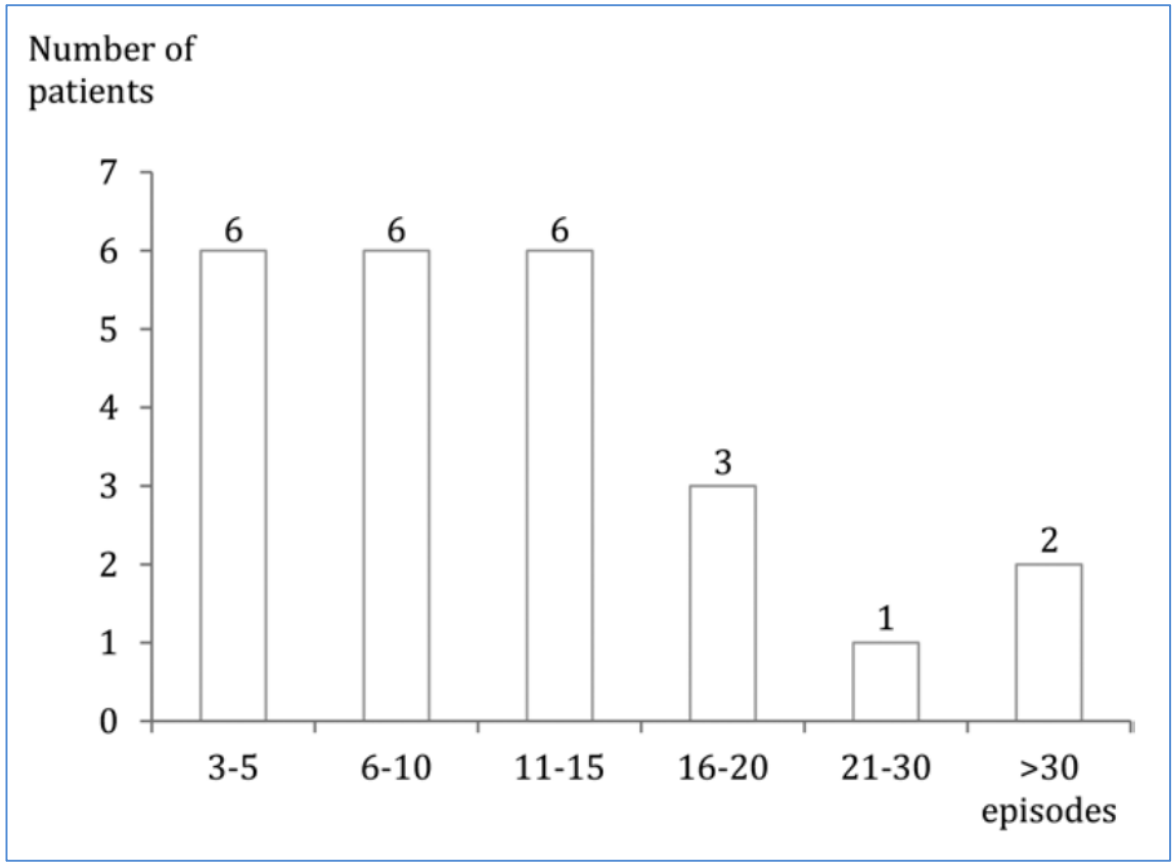
Most of these patients get multiple shocks



Kinch Westerdahl A et *al*. *Circulation* 2014;**124**;422-429

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Lots of guidance about ICD deactivation

Europace (2010) **12**, 1480–1489
doi:10.1093/europace/euq275

CONSENSUS STATEMENT

EHRA Expert Consensus Statement on the management of cardiovascular implantable electronic devices in patients nearing end of life or requesting withdrawal of therapy

Luigi Padeletti[1]*, David O. Arnar[2], Lorenzo Boncinelli[3], Johannes Brachman[4], John A. Camm[5], Jean Claude Daubert[6], Sarah Kassam[6], Luc Deliens[7], Michael Glikson[8], David Hayes[9], Carsten Israel[10], Rachel Lampert[11], Trudie Lobban[12], Pekka Raatikainen[13], Gil Siegal[14], and Panos Vardas[15]

Reviewers: Paulus Kirchhof[16], Rüdiger Becker[17], Francisco Cosio[18], Peter Loh[19], Stuart Cobbe[20], Andrew Grace[21], and John Morgan[22]

HRS Expert Consensus Statement on the Management of Cardiovascular Implantable Electronic Devices (CIEDs) in patients nearing end of life or requesting withdrawal of therapy

This document was developed in collaboration and endorsed by the American College of Cardiology (ACC), the American Geriatrics Society (AGS), the American Academy of Hospice and Palliative Medicine (AAHPM); the American Heart Association (AHA), the European Heart Rhythm Association (EHRA), and the Hospice and Palliative Nurses Association (HPNA).

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European Journal of Heart Failure (2009) **11**, 433–443
doi:10.1093/eurjhf/hfp041

Palliative care in heart failure: a position statement from the palliative care workshop of the Heart Failure Association of the European Society of Cardiology

Tiny Jaarsma*, James M. Beattie, Mary Ryder, Frans H. Rutten, Theresa McDonagh, Paul Mohacsi, Scott A. Murray, Thomas Grodzicki, Ingrid Bergh, Marco Metra, Inger Ekman, Christiane Angermann, Marcia Leventhal, Antonis Pitsis, Stefan D. Anker, Antonello Gavazzi, Piotr Ponikowski, Kenneth Dickstein, Etienne Delacretaz, Lynda Blue, Florian Strasser, and John McMurray on behalf of the Advanced Heart Failure Study Group of the HFA of the ESC

A discussion document for health professionals

British Heart Foundation

Implantable cardioverter defibrillators in patients who are reaching the end of life

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But very few people actually deactivate ICDs

- EHRA survey of ICD-implanting centres
  - 4% Cardiologists discuss ICD deactivation before implantation
  - 11% Cardiologists are involved in ICD deactivation
- Rate of ICD deactivation in trials/registries is around 1%
  - Deactivation tends to occur late, often in the final hours of life
- Barriers to ICD deactivation
  - Cardiologist and/or patient doesn't want to engage with issue
  - Family members or care-givers not available
  - Misconceptions about ICD deactivation
  - Lack of time

Magazine

The woman who wanted her pacemaker turned off

By Jennifer Tracey
BBC News

24 September 2016 | Magazine

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Avoid unnecessary generator changes

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Box change may not be right for everyone

Time for a Change — A New Approach to ICD Replacement

Daniel B. Kramer, M.D., Alfred E. Buxton, M.D., and Peter J. Zimetbaum, M.D.

Clinical trials of implantable cardioverter–defibrillators (ICDs) continue to drive expanding indications for these devices.[1] More than 100,000 ICDs are implanted in the United States annually. Of these procedures, at least 25% are generator replacements required as a result of depleted battery life.[2] Because of the high cost and concern about patient selection, the appropriateness of initial device placement has been closely scrutinized. But there has been little consideration as to what happens in the years after implantation, when ICD batteries drain sufficiently to require replacement, device leads become defective, or systems become infected. Should all these patients receive replacement ICDs?

Kramer DB *et al. New Engl J Med* 2012;**366**:291-293

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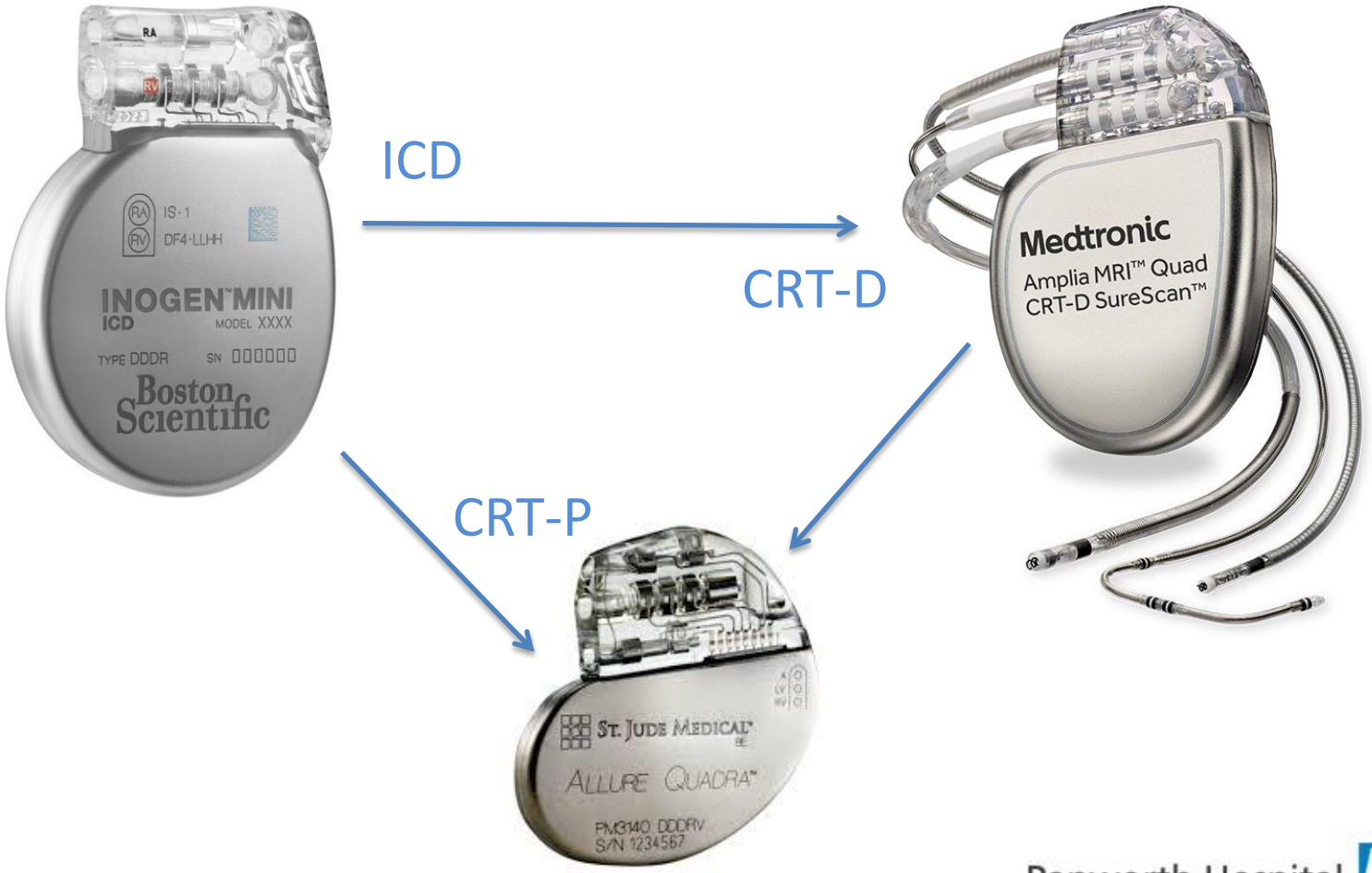
May be appropriate to change type of device



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Is ICD generator replacement required?

Probably	**Maybe not**
Pacing-dependant	No pacing requirement
Doing well	Not doing well
Secondary prevention ICD	Primary prevention ICD
Appropriate ICD therapy	No appropriate ICD therapy

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Summary

- Avoid missing the fact that 'end-of-life' is approaching
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Any questions?