

# The Changing Trends in New ICD and CRT-D Implants Over the Last 20 Years at a Single Large Tertiary Cardiology Centre

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## Introduction

Since their introduction to standard clinical practice, implantable cardioverter defibrillators (ICD) have been shown in a number of clinical trials to improve survival.

We review the changes seen in the numbers and demographics of patients receiving ICD or CRT-D implants at one large tertiary cardiology centre (Glenfield Hospital) with a catchment population of approximately 2 million.

## Methods

We reviewed data recorded in our local registry database. All patients who had a de novo ICD or CRT-D implanted between 1994 and March 2017 were identified. Only new implants were included.

Patients were grouped by implant date into 10 consecutive groups (1994 to 1999, then 2-yearly to 2017), and further differentiated according to indication (primary or secondary). Further subgroup analysis was made according to aetiology.

## Findings

The total number of de novo ICD and CRT-D implants has increased from a total of 92 implants in the period between 1994-1999, to 584 new implants in 2015-2017.

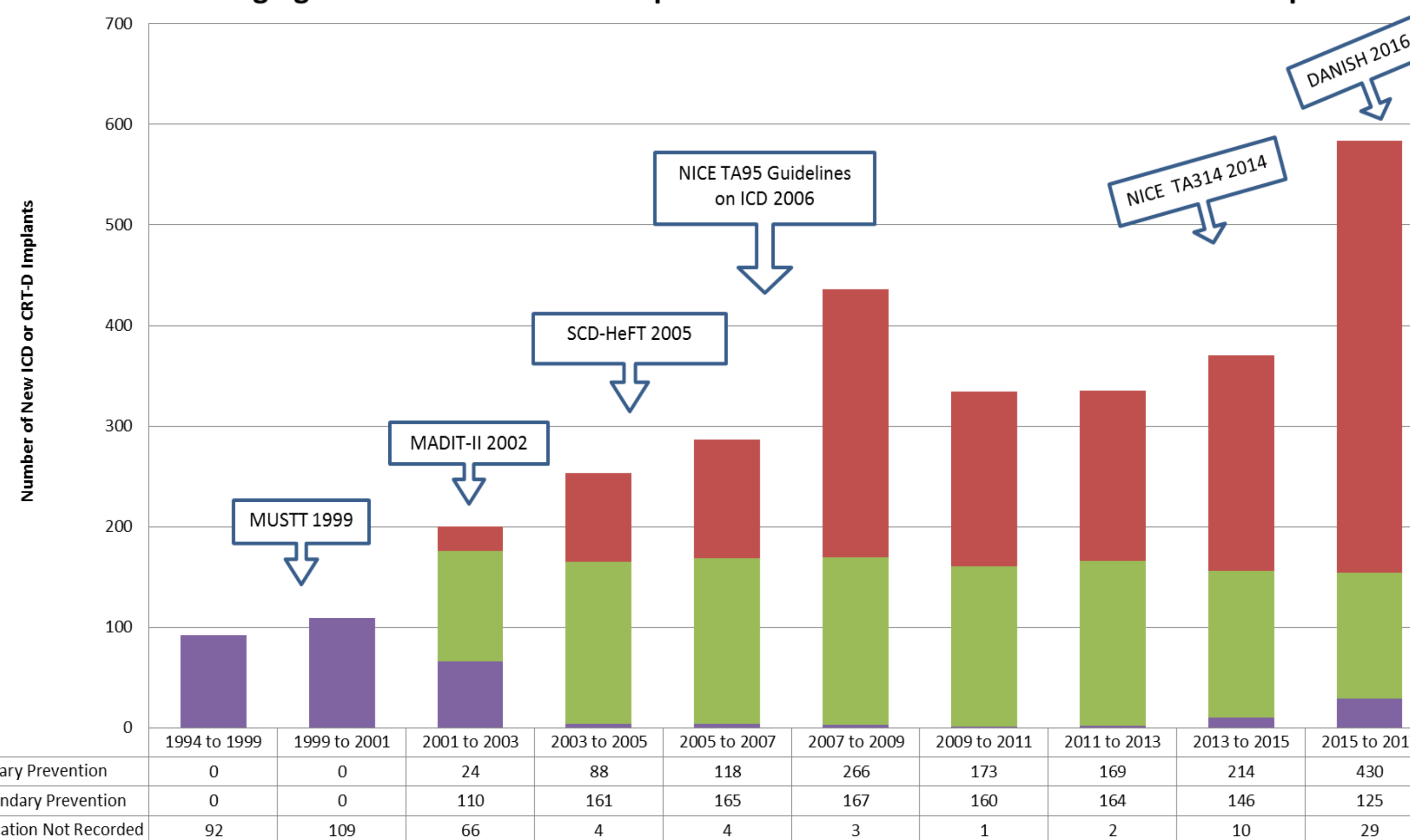
The number of primary prevention implants saw an increase from 2005 with an upsurge from 2015 onwards.

Median age of implant has gone up from 60 years before 1999 to 67 years in 2015-2017.

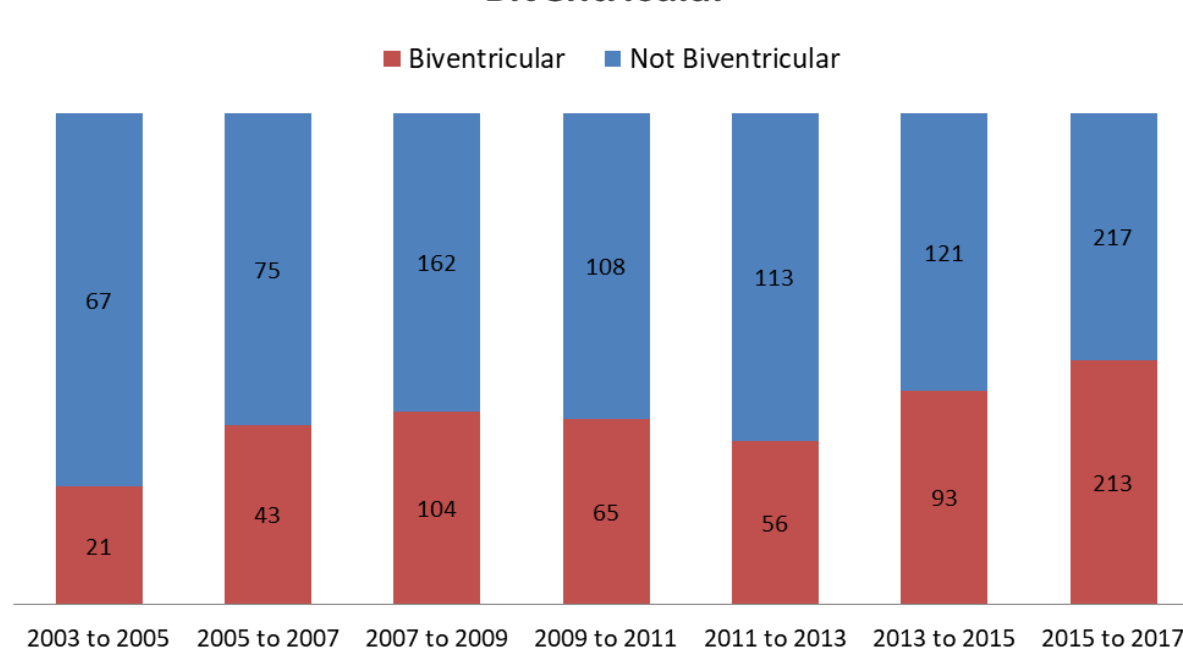
Median length of hospital stay for primary prevention implants has decreased from 6 days in 2005-2007, to 1 day in 2015-2017.

In 2003-2005 88% of those receiving both primary and secondary prevention implants were male. In 2015-2017 there was an increase in the number of women implanted with primary prevention device, however the proportion of men was still much higher at 78%. Men made up 84% of all secondary prevention implants in 2003-2005, and 85% of implants in 2015-2017.

## Changing Trends in Defibrillator Implant Rates From 1994 to 2017 at Glenfield Hospital

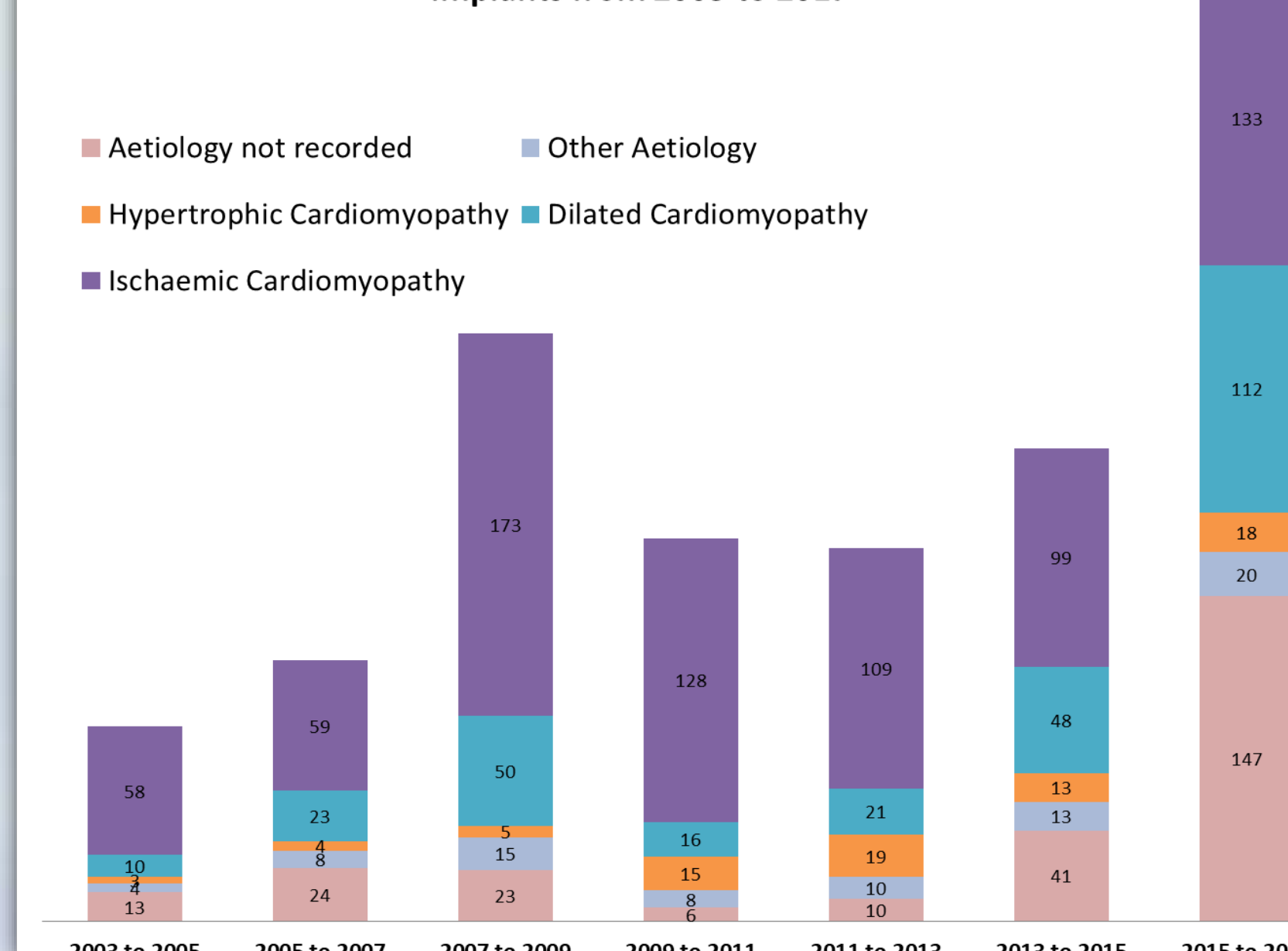


## Proportion of Primary Prevention ICDs that are Biventricular

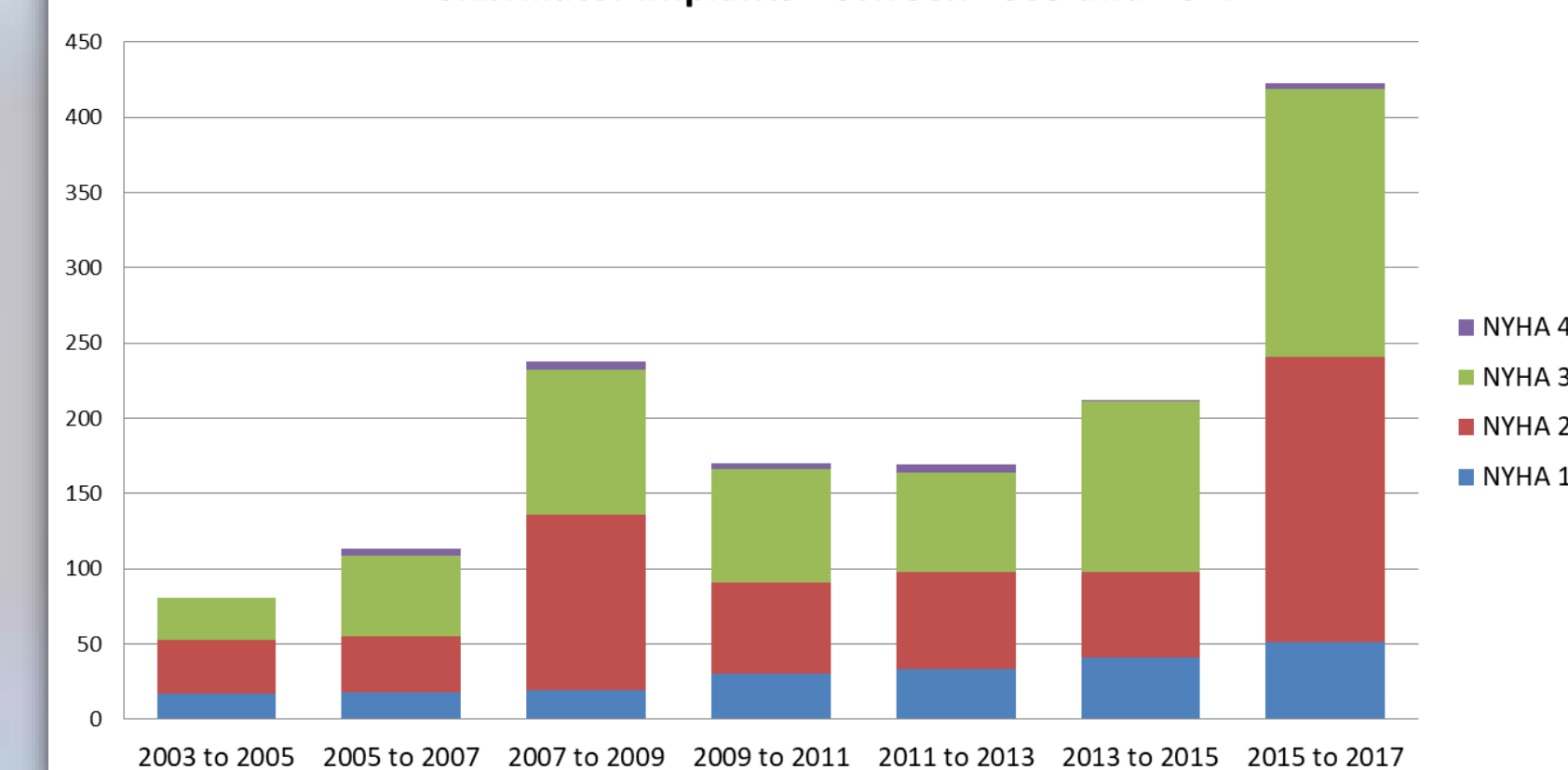


Following 2007 there was a big increase in patients with an ischaemic aetiology, and following 2015 there was a sharp increase in patients with DCM receiving primary prevention ICDs. The proportion of patient receiving a biventricular ICD has more than doubled between 2003–2005 (24%) and 2015–2017 (50%). This figure is even higher amongst patients with DCM (57%).

## Changing Aetiology of Patients With New Primary Prevention ICD Implants from 2003 to 2017



## NYHA Functional Class of Patients with New Primary Prevention Defibrillator Implants Between 2003 and 2017



There has been a small rise in patients with NYHA functional class 1 receiving primary prevention ICDs, but nevertheless the bulk of implants is evenly split between the NYHA 2 and NYHA 3 groups. Median procedure time has reduced from 90 minutes in 1999-2001 to 70 minutes in 2015-2017 (despite not correcting for the increase in biventricular implants).

## Discussion

The findings of this study show how major clinical trials have influenced clinical practice. The most striking change was seen in primary prevention implants after the 2014 NICE (TA314) guidelines.<sup>1</sup>

There has been a recent increase in patients with DCM receiving primary prevention implants. The average age for these patients was 64 years, hence we believe the result from the recent DANISH trial are unlikely to have much impact on referrals. Secondary prevention implants have remained stable over the years.

The drop in all implants after 2009 with a steady rise after this may reflect a rise in complex device implants at district hospitals and reduction in referrals to tertiary centres.

In our cohort, there were approximately 110 per million population de novo ICD implants in 2015/16. This compares to a national average of 94 per million<sup>2</sup>, however remains considerably lower than the European average of 141 per million.

## References

1. NICE technology appraisals [TA314]. (Accessed 12/06/2017, at <http://www.nice.org.uk/guidance/ta314>)
2. National Audit of Cardiac Rhythm Management Devices April 2015 – March 2016 (Accessed 12/06/2017, at [www.bhrs.com/audit](http://www.bhrs.com/audit))