

# Heart failure and sudden cardiac death: key facts and why device longevity matters

## Key facts and figures on sudden cardiac death (SCD)

- More than 350,000 people in Europe die each year due to sudden cardiac death (SCD)<sup>1</sup>
- Sudden cardiac death has a **mortality rate of approximately 95%**<sup>2</sup>
- Approximately 75–80% of the **70,000** sudden cardiac deaths in England and Wales in 2010 could be attributed to **ventricular arrhythmias**<sup>3</sup> (abnormal heart rhythms caused by problems in the electrical conduction system of the heart).
- More than **1 million** people are affected by **cardiac arrhythmias** in the UK and with an ageing population the numbers are expected to rise.<sup>4</sup>
- With the right treatment, recent studies have reported a **5-year survival of 69–100%** in people who had survived a cardiac arrest.<sup>5</sup>

## Key facts and figures on heart failure (HF)

Despite its name, heart failure does not mean that the heart suddenly stops functioning. Heart failure is a **progressive condition** where the heart cannot pump enough blood to meet the body's needs efficiently. Heart failure begins when the heart is weakened due to damage (e.g. following a heart attack or persistent high blood pressure).

Over time, the failing heart no longer contracts as strongly or is as coordinated as before, further affecting its ability to pump. The heart needs to work harder to keep blood circulating around the body. This stresses the heart even more so the heart muscle becomes enlarged, further weakening it and progressing the heart failure.

- Heart failure has developed into a major burden in the Western world, which increasingly affects millions of people.<sup>6</sup>
- Heart Failure affects **14 million** people in Europe<sup>7</sup>, and is predicted to rise to 30 million by 2020<sup>8</sup>. Over 3.5 million people are newly diagnosed with heart failure every year in Europe alone.<sup>9</sup>
- Nearly **75,000** people develop **heart failure** each year in the UK<sup>10</sup>
- On average, about **50%** of heart failure patients die of **sudden cardiac death (SCD)**<sup>11</sup>
- Overall disease-related health care costs are €10.4 billion.<sup>12</sup> 74% of these costs are related to hospitalizations<sup>8</sup>
- Heart failure constitutes one of the biggest hospitalisation costs facing the National Health Service (NHS) in the UK with over **5% of emergency admissions** and **2% of all NHS inpatient bed days**<sup>13</sup>

The impact on society is also enormous. This burden is only set to increase because heart failure is the only cardiovascular disease on the rise. There are many treatments available to treat the symptoms and causes of heart failure but many patients have persistent and progressive symptoms and overall prognosis is poor. Implantable cardiac resynchronization therapy devices (CRT) have an established role in treatment of heart failure.<sup>14</sup>

## The role of ICDs and CRT devices

Implantable cardioverter defibrillators (ICDs) are proven to be the most effective therapy to protect against SCD.<sup>15</sup> They have transformed the lives of many people with life-threatening arrhythmia (abnormal heart rhythms caused by problems in the electrical conduction system of the heart). They work by administering an electrical shock to the heart (defibrillation) to reset the heart's rhythm and restore normal blood flow throughout the body.

Cardiac Resynchronisation Therapy (CRT) treats both heart arrhythmias and also the symptoms of heart failure. CRT devices stimulate both of the heart's lower chambers so that they are "synchronised" and become more efficient in pumping blood around the body. There are two types of CRT devices:

- CRT-Ps are specific pacemakers with the added capability to re-synchronise the heart
- CRT-Ds have a further facility to defibrillate the heart if a person is at risk from life-threatening arrhythmias

## The importance of device longevity

At the end of the battery life, implantable cardiac rhythm management devices must be replaced. With earlier clinical intervention and ageing populations, up to **70% of patients are now living longer than their new devices** and are subject to **device replacement** procedures<sup>16</sup>.

Given the impact of such replacements – including the clinical burden of higher risks of infections and complications as well as the financial consequences of carrying out unnecessary interventions and managing associated risks – device longevity and real world battery life for these devices is crucial.

**Moreover, the latest NICE guidance on ICD and CRT with its expanded indications has important implications for the NHS.**

**Extended longevity battery devices** are an important concern and **benefit for patients as well as hospitals and healthcare systems.**

- **73% of patients are concerned about the battery life<sup>a</sup>** of the device they are fitted with and the associated longevity of the device<sup>17</sup>
- Patients will have a lower risk of complications (including infections, lead malfunctions etc.) or re-interventions due to fewer required replacements
- **Complications are associated with device replacements and lead extractions** compared to new implants, with a 2-7% infection rate for replacements, compared to <1% for initial implantation.<sup>18</sup>
- **Infection** is a complication that has a huge impact on hospital related costs as it has a significant impact on the length of hospital days. **Intensive care** is the largest incremental cost factor, which accounts for more than **40%** of the difference to patients without infection.<sup>19</sup>
- Procedure admissions and **length of stay in hospital** is significantly greater with infection (>16 days) than without infection (>5 days).
- 30% of device related infections could be **avoided** if devices batteries lasted at least 9 years.<sup>20</sup> Overall, extending CRT-D and ICD longevity **can reduce costs by up to one third over a 15 year horizon**, as a result of fewer procedures and less complications.<sup>21</sup>

---

<sup>a</sup> Over 40% of patients who get a CRT-D device are < 65 years old (Sudden Cardiac Arrest Coalition, [www.stopcardiacarrest.org](http://www.stopcardiacarrest.org), European Society of Cardiology, [www.escardio.org](http://www.escardio.org))

Reduction in costs to health system due to fewer replacement procedures, as well as less complications and post-operative care, can be allocated to **treating more new patients** indicated for an ICD or CRT.

## Media contacts

Nathalie Verin +44 (0) 7785 510 429 (mobile) Health Economics & Government Affairs Boston Scientific <a href="mailto:VerinN@bsci.com">VerinN@bsci.com</a>	Simonetta Balbi + 39 338 793 6422 (mobile) + 39 010 6060 281 (direct) PR and Corporate Communication Europe Boston Scientific Corporation <a href="mailto:Balbis@bsci.com">Balbis@bsci.com</a>	Lisa Henry – Weber Shandwick +44 (0) 20 7067 0808 (direct) +44 (0) 7785 458 203 (mobile) <a href="mailto:lhenry@webershandwick.com">lhenry@webershandwick.com</a>
--	--	--

## References

- <sup>1</sup> ACC/AHA/ESC 2006 guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death *Europace* 2006; 8:746-837.
- <sup>2</sup> American Heart Association. Available at: [http://www.heart.org/HEARTORG/Conditions/More/CardiacArrest/Long-Term-Treatment-for-Cardiac-Arrest\\_UCM\\_307916\\_Article.jsp](http://www.heart.org/HEARTORG/Conditions/More/CardiacArrest/Long-Term-Treatment-for-Cardiac-Arrest_UCM_307916_Article.jsp) Accessed June 12, 2013.
- <sup>3</sup> NICE Technology Appraisal - Implantable cardioverter defibrillators and cardiac resynchronisation therapy for arrhythmias and heart failure, 2014
- <sup>4</sup> <http://www.bhf.org.uk/healthcare-professionals/best-practice-1/arrhythmia-care-coordinators.aspx>
- <sup>5</sup> <http://www.escardio.org/about/press/press-releases/esc12-munich/Pages/arrhythmia-treatment-gaps-eastern-western-europe.aspx>
- <sup>6</sup> <http://www.profelsadigkazzam.com/WHFS/about-us/>
- <sup>7</sup> SHAPE: Study Group on Heart Failure Perception and Awareness in Europe, [www.heartfailure-europe.com](http://www.heartfailure-europe.com)
- <sup>8</sup> Biermann et al. Resource use and costs in systolic heart failure according to disease severity: a pooled analysis from the German Competence Network Heart Failure, *Journal of Public Health* February 2012, Volume 20, Issue 1, pp 23-30.
- <sup>9</sup> <http://www.medicographia.com/2012/02/the-heart-failure-epidemic/>
- <sup>10</sup> [http://www.aral.org.uk/Documents/Booklets/HeartRhythm\\_Booklet.pdf](http://www.aral.org.uk/Documents/Booklets/HeartRhythm_Booklet.pdf)
- <sup>11</sup> Teresa E et al Profiling risk from arrhythmic or hemodynamic death. *Am J Cardiol* 2000;86(Suppl):126K-132K.
- <sup>12</sup> SHAPE: Study Group on Heart Failure Perception and Awareness in Europe, [www.heartfailure-europe.com](http://www.heartfailure-europe.com)
- <sup>13</sup> <http://www.nhs.uk/Livewell/Healthyhearts/Pages/Arrhythmias.aspx>
- <sup>14</sup> ESC Guidelines for Pacing, CRT and ICDs <http://www.egmedicals.com/CA2010%20Presentations/Day%203/065005.pdf>
- <sup>15</sup> European utilization of the implantable defibrillator: has 10 years changed the 'enigma'? *Europace* 2010;12:1063-1069.
- <sup>16</sup> Hauser. Implantable cardioverter-defibrillators: The growing mismatch between patient longevity and the service life of implantable cardioverter-defibrillators. *JACC* 2005; 45: 2022-5
- <sup>17</sup> High Voltage Patient Survey, January 2011. Double-blind online survey administered by 3rd party vendor; conducted among 189 high voltage device patients
- <sup>18</sup> Borleffs et al.: Pacing *Clin Electrophysiol*. 2010 Aug;33(8):1013-9. Recurrent implantable cardioverter-defibrillator replacement is associated with an increasing risk of pocket-related complications.
- <sup>19</sup> M. Rizwan Sohail, Mortality and Cost of Infection Associated with Cardiovascular Implantable Electronic Device Procedures, presented at ISDA, 2011
- <sup>20</sup> Ramachandra I. *PACE* 33: 314-310, March 2010. Impact of ICD Battery Longevity on Need for Device Replacements—Insights from a Veterans Affairs Database.
- <sup>21</sup> Boriani et al.: Impact of extending device longevity on the long terms costs of implantable cardioverter-defibrillator therapy: a modelling study with a 15-year horizon *Europace*, 2013