National Audit of Cardiac Rhythm Management (NACRM)

Overview of Quality Improvement (QI) metrics

1 Overview of QI metric: Data completeness and validity

QI Metric Description/Name	**Data Completeness and Validity**
Why is this important?	A key indicator of an effective service with good governance is compliance with audit. This means complete, accurate and valid data entry. It also ensures accurate recording of the clinical activity for the centre and the doctors working there.
QI theme	Effectiveness.
What is the standard to be met?	**Quality Standard 1** Hospitals should achieve ≥90% completeness in each of 6 data domains for device and ablation procedures (completeness). **Quality Standard 2** Hospitals should achieve ≥90% validity in key data domains for device and ablation procedures.
Key references to support the metric	N/A.
Numerator	**Data Completeness** For each domain, the average of fields completed. **Data Validity** Devices: records in which the stated system type matches capability of the generator model. Ablation: records in which 'ablation attempted' matches other related entries.
Denominator	Number of records.

2 Overview of QI metric: Hospital activity volumes

QI Metric Description/Name	**Hospital Activity Volumes**

Why is this important?	International studies have demonstrated that outcomes tend to be poorer in hospitals undertaking low volumes of device and ablation procedures. The British Heart Rhythm Society publishes standards documents for hospitals and clinicians undertaking these procedures in adults. These include minimum recommended procedure volumes, which are stringent by international standards. The standards documents are regularly reviewed.
QI theme	Safety.
What is the standard to be met?	**Quality Standard 3 (Device Implantation)** BHRS Standards (2024) recommend that pacing centres undertake a minimum of 80 pacemaker implants per year. Training centres should perform more than 100 device implants per year.[1] **Quality Standard 4 (Complex Device Implantation)** BHRS Standards (2024) recommend that complex device centres undertake a minimum of 60 such procedures (ICD and CRT implant/upgrades) per year (80 is desirable).[1] **Quality Standard 5 (Catheter Ablation)** BHRS Standards (2020) recommend that ablation centres undertake a minimum of 100 ablation procedures per year in total.[2] **Quality Standard 6 (AF Ablation)** BHRS Standards (2020) recommend that centres undertaking AF ablation should perform a minimum of 50 such cases per year.[2]
Key references to support the metric	See above
Numerator	Pacemaker implants and complex device (ICD, CRTP, CRTD) implants/upgrades, simple and complex ablations.
Denominator	N/A.

3 Overview of QI metric: Operator activity volumes

QI Metric Description/Name	**Operator volumes for device and ablation procedures**

Why is this important?	Studies have demonstrated that device and ablation procedure outcomes tend to be poorer when undertaken by low-volume operators. The British Heart Rhythm Society has made recommendations for individual specialists undertaking device (2024) and ablation (2020) procedures in adults. The standards documents are regularly reviewed.
QI theme	Safety.
What is the standard to be met?	**Quality Standard 7 (Pacemaker Implantation)** The minimum volume for an implanting specialist is 35 total new/upgrade devices per year.[1] **Quality Standard 8 (Defibrillator/Cardiac Resynchronisation Therapy)** For those who are non-CRT implanters, it is recommended that operators implant 60 devices per year, of which 30 must be new ICD implants or upgrades.[1] If the operator implants CRT devices, again, 60 device implants per annum is recommended, of which 20 should be new CRT-P/D implants or upgrades. If the consultant is training an SpR they should perform a minimum of 30 ICD or CRT implants or upgrades per year, and 40 is desirable. **Quality Standard 9 (All Ablation)** An operator undertaking catheter ablation should perform at least 50 ablation procedures per year.[2] **Quality Standard 10 (Simple Ablation)** An operator performing simple ablations should perform at least 25 simple ablations per year.[2] **Quality Standard 11 (Complex Ablation)** For those undertaking complex procedures (generally AF ablation), the recommendation is at least 25 such procedures from a total of at least 50 procedures per year. Fifty or more complex procedures is desirable.[2] Operators performing single-shot atrial fibrillation ablation should be performing a minimum of 25 ablations using that technique each year.
Key references to support the metric	See above

Numerator	Pacemaker implants and complex device (ICD, CRTP, CRTD) implants/upgrades; simple and complex ablations.
Denominator	N/A.

4 Overview of QI metric: Adherence to NICE and other guidelines

QI Metric Description/Name	**Adherence to NICE and Other Guidelines**
Why is this important?	To reduce morbidity and mortality, NICE and other relevant guidelines should be followed.
QI theme	Effectiveness.
What is the standard to be met?	**Quality Standard 12 (Pacing for Sinus Node Disease in the Absence of Atrial Fibrillation)** Fewer than 10% of devices should be VVI(R) devices. **Quality Standard 13 (Pacing for Atrioventricular Block in the Absence of Atrial Fibrillation)** Fewer than 10% of devices should be VVI(R) devices. **Quality Standard 14 (ICDs for Primary Prevention)** 80% of ICD implants for primary prevention should be documented to meet at least one of the NICE criteria: • Left ventricular dysfunction ≤35% despite optimum medical therapy and who are not in NYHA functional class IV. • A familial cardiac condition with a high risk of sudden death. • Prior surgical repair of congenital heart disease. **Quality standard 15 (ICDs for Secondary Prevention)** 80% of ICD implants for secondary prevention should be documented to meet at least one of the NICE criteria: • Prior cardiac arrest caused by ventricular tachycardia (VT) or fibrillation. • Sustained VT causing syncope or significant haemodynamic compromise.

	• Sustained VT and left ventricular ejection fraction ≤35%.
Key references to support the metric	Dual-chamber pacemakers for symptomatic bradycardia due to sick sinus syndrome and/or atrioventricular block. NICE Technology Appraisal TA88[3] Implantable cardioverter defibrillators and cardiac resynchronisation therapy for arrhythmias and heart failure. NICE Technology Appraisal TA314[4]
Numerator	Patients documented to meet the above criteria.
Denominator	Patients undergoing first pacemaker and ICD implants.

5 Overview of QI metric: Re-intervention rates after device implantation and ablation procedures

QI Metric Description/Name	**Procedural Success and Complication Rates**
Why is this important?	Patients and clinicians want a successful procedure without complications. A re-intervention suggests that there has been a complication, or a procedure has failed to achieve what was intended. There are no absolute standards that have been set nationally or internationally. Therefore relative standards have been adopted.
QI theme	Outcomes.
What is the standard to be met?	**Quality Standard 16 (Pacemakers)** The rate of re-interventions within a year of a first pacemaker implant should be below the 95% upper control limit (national mean + 2 standard errors). **Quality Standard 17 (Complex Devices)** The rate of re-interventions within a year of a first complex device (ICD or CRT) implant should be within the 95% control limit (national mean + 2 standard errors).

	Quality Standard 18 (Catheter Ablation) The frequency with which patients undergo a repeat procedure (i.e. to the same or related target) within a year of catheter ablation should be within the 95% control limit (national mean + 2 standard errors).
Key references to support the metric	N/A.
Numerator	All device re-interventions in the year following an index procedure, at the implanting hospital or elsewhere. All repeat ablations in the year or two years following an index procedure, at the ablating hospital or elsewhere.
Denominator	All first pacemaker and complex (ICD±CRT) implants. All catheter ablations, divided into simple, complex atrial, and ventricular targets.

References

[1] Microsoft Word - BHRS-standards-January-2024-Implantation-and-Follow-Up-of-CRM-Devices-in-Adults.docx
[2] British-Heart-Rhythm-Society-Standards-Ablation-2020-1.pdf (bhrs.com)
[3] Overview | Dual-chamber pacemakers for symptomatic bradycardia due to sick sinus syndrome and/or atrioventricular block | Guidance | NICE
[4] Overview | Implantable cardioverter defibrillators and cardiac resynchronisation therapy for arrhythmias and heart failure | Guidance | NICE