EP/Ablation Procedures
Procedure Report

NICOR Report for Barts And The London
2016-17

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NICOR

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1 Data Quality/Completeness

Number of records in 2016-17 = **9063**
Number of records after cleaning and removal of duplicates = **1645**

1.1 Year on year change in total reported activity

This calculation is intended to highlight major changes in reported centre activity for simple and complex ablations (derived from fields 3.19 and 3.12) – which may be due to under-reporting rather than actual changes in activity. In some cases, large changes may be due to the merger, closure, or opening of centres.

Table 1: Number of ablation procedures

Type	2015-16	2016-17	Percentage change	Definitions
Simple ablation	363	399	9.9	{3.19 = 1} AND {3.12 = 17, 20, 12a-d, 5a}
Complex ablation	716	814	13.7	{3.19 = 1} AND {3.12 = 15, 3a, 4a/b, 13a/b, 14a-e}

Definitions:

- *Simple ablations are defined as records for which 3.19 (Ablation attempted?) = Yes AND 3.12 (Ablation procedure) = 1 or more of the following targets, (but no complex targets):*
  - *complete AV nodal*
  - *AVNRT - slow or fast pathway*
  - *accessory pathway*
  - *cavotricuspid isthmus*
- *Complex atrial ablations are defined as records for which 3.19 (Ablation attempted?) = Yes AND 3.12 (Ablation procedure) = 1 or more of the following targets:*
  - *atrial fibrillation*
  - *atrial ectopy/focal atrial tachycardia*
  - *re-entrant atrial tachycardia right sided (not CTI)*
  - *re-entrant atrial tachycardia left sided*
- *Complex ventricular ablations are defined as records for which 3.19 (Ablation attempted?) = Yes AND 3.12 (Ablation procedure) = 1 or more of the following targets:*
  - *PVCs*
  - *VT*
- *If a record indicates both simple and complex targets, the procedure is counted as complex*

1.2 Ablation procedure validation

This calculation is intended to highlight missing or inconsistent entries in the fields relating to whether ablation was performed (field 3.19), and if so what target (field 3.12). These are obviously key fields, yet are sometimes completed incorrectly. We have examined fields 3.19 and 3.12 along with 3.21 "Ablation energy source" and 3.26 ("Ablation success?"), and tried to adjudicate whether ablation was actually performed (hence column headings: "Ablation", "No ablation" and "Unclear"), and whether the four fields are complete and consistent.

Table 2: Validation of ablation procedures

Data fields 3.12, 3.19, 3.21, 3.26	Ablation	No Ablation	Unclear
Data complete/consistent	1184 (80.7%)	9 (5.5%)	0
Data incomplete/inconsistent	283 (19.3%)	154 (94.5%)	15
Total	1467	163	15

The exact logic used to derive Table 2. is complex but can be forwarded on request. But, for example,

- *If in a record, 3.19 (Ablation performed) = "0. No" yet other fields state that there was an ablation energy source, a target, and a degree of success/failure, it will be counted in the table as "Ablation", but the data are clearly "incomplete/inconsistent".*
- *If in a record, 3.19 (Ablation performed) = "0. No", and there is no indication of ablation energy source or success, yet a target (3.12) is given, this will be counted in the table as "No Ablation", but "Data complete/consistent" on the basis that 3.12 was simply the intended target.*

1.3 Data completeness

The tables in this section show the percentages of records that are non-blank for a number of important fields. Please note that the red/amber/green boundaries defined below do not indicate that achieving >95% in each field (green) is considered adequate. For obviously important fields such as GMC, NHS No, Ablation type (where ablation performed), centres should aim for 100% completeness and the boundaries in future years will become more stringent to reflect this.

A "non-blank" entry does not imply that data are valid, let alone correct. For example, a GMC number that is not 7 digits will count in this analysis, but is not valid (and of course an incorrect 7-digit GMC number may have been entered). For this reason, the activity data for a centre or operator later in the report may be smaller than the expected figures in Tables 3-6 might suggest.

>=95%
90-95%
<90%

Table 3: Data completeness of demographics

	1.03 NHS	1.04 Surname	1.05 Forename	1.06 DOB	1.07 Sex	1.09 Pcode
Demographic details	94.7	100	100	100	100	98.5

Table 4: Data completeness of clinical information

	2.01 Underlying heart dis.	2.02 Prev surg or interventn	2.03 Structural congen HD	2.04 Documented prior AF	2.05 Other doc. arrhythmia	2.06 Indication for proced.	2.07 Previous ablation
Clinical Details	38.4	92.7	93.3	92.5	90.5	94.1	84.9

The most common reason for low scores in some fields is that they have been left blank. For patients with structurally normal hearts, field 2.01 ("Underlying heart disease") should be ("0. None"). Field 3.19 ("Ablation attempted?") should never be blank. Unfortunately, the current dataset does not have the option

("0. None") for fields 2.07 ("Previous ablation") and 4.04 ("Previous anti-arrhythmic drugs"), so a low score in these fields does not necessarily indicate poor data quality. This oversight has been amended in the latest dataset revision and we encourage centres to enter ("0. None") where appropriate.

Table 5: Completeness of procedural fields

	3.01 Procedure time	3.02 Procedure urgency	3.04 1st Op. GMC no.	3.10 Consultant GMC No.	3.12 Ablation procedure	3.13 Mapping techniques	3.16 Total fluoro time (min)
Procedure	98.1	94.6	97	99	83.2	97.4	93.7
	3.18 Procedure durat (min)	3.19 Ablation attempted?	3.21 Abl. energy source	3.23 Transseptal approach?	3.24 Epicardial approach?	3.26 Success?	3.28 Acute Complication
Procedure	100	99.1	96.7	93.6	92.4	97.5	97

3.12, 3.13, 3.21, 3.26 are only required if 3.19 = "1. Yes"

In field "3.01 Procedure date/time", date is a pre-requisite for a record to be saved, and is therefore 100% complete by definition. However, the time component is also necessary (and cannot be "00:00" or "00:01") in order to identify the rare instances of two procedures on the same day, and avoid one being deleted as a duplicate. Thus, Table 5. only reports the completeness of the time component of field "3.01 Procedure date/time".

Table 6: Data completeness of atrial fibrillation ablation details

	4.01 LA size/vol	4.03 Rhyt at start	4.04 Prev AADS
AF ablation details	49.9	84.6	59.7

AF ablation details is only applicable if field "3.12 ablation procedures" = 15 (AF ablation)

2 Centre Activity

The table shows the reported procedures for the centre, based solely on field 3.19 ("Ablation attempted?"- rather than the adjudicated column headings in Table 2) and 3.12 ("Ablation procedure"). Acute outcomes are based on field 3.26 ("Success?").

Table 7: Type of ablation by procedure outcome (n)

		Acute outcome				
	N	Success	Partial	Fail	Indeterminate	Blank
No ablation/unknown	178	-	-	-	-	-
Simple targets						
AVNA	58	55	2	0	0	1
AVNRT	160	152	2	3	2	1
AP	23	21	1	1	0	0
CTI	215	198	9	1	4	3
Total Simple Procedures	399	-	-	-	-	-
Simple Multi-Target	3	-	-	-	-	-
Complex Atrial						
AF total	689	649	17	8	2	13
Cryo balloon	348	-	-	-	-	-
EAT/IART only	65	57	5	2	0	1
Total Complex Atrial	754	-	-	-	-	-
Complex Ventricular						
PVC/VT focal only	35	30	2	2	1	0
VT scar etc.	25	21	3	0	1	0
Total Complex Ventricular	60	-	-	-	-	-
Total Complex Cases	814	-	-	-	-	-
Other/Blank	254	-	-	-	-	-
Ablation in CHD	46	-	-	-	-	-

Definitions:

- *No ablation/unknown A procedure is only counted as an ablation if field 3.19 = "1. Yes". Some procedures do not result in ablation because: it was not intended; no substrate or arrhythmia was found; because of a complication or risk thereof.*
- *Simple targets For combined procedures, each "target" is counted separately (e.g. CTI + AP will count once for each target). However, a procedure is counted as "simple" if there is one or more simple targets, but no complex targets). Thus, the combination AF + CTI will count towards the CTI count but not the simple procedure count. AVNA = AV node ablation, AVNRT = AV nodal re-entrant tachycardia (slow or fast pathway), AP = one or more accessory pathways and CTI = cavotricuspid isthmus ablation for typical or clockwise flutter.*
- *Complex Atrial "AF total" = left atrial ablation for AF, using any energy type. Cases with AF and additional targets (simple procedures and AT/IART) are included within "AF total". "Cryo balloon" is a subset of "AF total". "EAT/IART only" = atrial ectopics/ectopic atrial tachycardia/intraatrial re-entrant tachycardia (not typical flutter) without concomitant AF ablation.*
- *Complex Ventricular "PVC/VT focal only" = target includes PVCs and VT (outflow or other focal) but not VT-scar, fascicular, or bundle branch re-entry. "VT Scar etc" = target includes VT-scar, fascicular or bundle branch reentry.*
- *Ablation in CHD If field 2.03 indicates presence of complex structural congenital heart disease.*

3 Operator Activity

BHRS standards recommend that doctors out of training that undertake catheter ablation perform a minimum volume of 50 cases per year in total; if complex ablations are undertaken, a minimum volume of 25 complex cases is recommended and $\geqslant$ 50 complex cases is desirable.

The table below shows annual activity (as either first/second scrubbed operator, or responsible consultant) for each doctor uniquely identified by GMC registration No. Note that this table include trainees, for whom

the above minimum volumes do not apply. Note that name, specialty and training status are taken from the GMC List of Registered Medical Practitioners in September 2018, some time after the period covered by the report, so the status of some doctors may have changed.

Table 8: Number of ablation procedures undertaken by doctors

GMC No.	Name	No ablation	Simple	Complex	Primary Specialty
4743161	Ahsan, Syed	12	20	38	Cardiology
6052025	Ang, Richard	16	21	39	Cardiology
7475210	Baca, Marco	11	30	32	Cardiology
6149085	Behar, Jonathan	2	4	2	Trainee
7044392	Bhuva, Anish	0	0	2	Trainee
4420866	Boullin, Julian	1	2	23	Cardiology
3477757	Chow, Wai	12	41	43	General (internal) medicine
7021027	Christophides, Theodoros	16	22	60	Cardiology
6103946	Chubb, Mark	0	1	0	Paediatric cardiology
7476797	Creta, Antonio	7	12	13	Cardiology
4206941	Dhinoja, Mehul	13	30	84	Cardiology
4009089	Earley, Mark	22	44	63	Cardiology
4544829	Ezzat, Vivienne	8	39	25	Cardiology
6030169	Finlay, Malcolm	12	23	65	Cardiology
7140493	Gill, Harminder	1	2	5	Trainee
7016357	Graham, Adam	1	17	19	Trainee
7049603	Honarbakhsh, Shohreh	2	12	9	Trainee
6031316	Hunter, Ross	10	17	148	Cardiology
6159437	Karim, Nabeela	6	9	10	Trainee
4635235	Khan, Fakhar	4	16	32	Cardiology
3581218	Lambiase, David	14	12	36	Cardiology
6078279	Lane, Jem Daniel	13	30	80	Cardiology
7548733	Lim, Paul Chun Yih	2	8	33	
7036823	Lim, Wei-Yao	4	9	18	Trainee
3442476	Lowe, Martin	10	23	31	Cardiology
6110131	Martin, Claire	3	10	39	Cardiology
7507866	McLellan, Alexander	8	31	60	
6029007	Opel, Aaisha	13	23	57	Cardiology
7475782	Quadros Bebiano Da Providencia E Costa, Rui Andre	3	21	32	Cardiology
6048344	Rosengarten, James	3	8	44	Cardiology
1707236	Rowland, Edward	1	12	7	Cardiology
7090151	Saberwal, Bunny	4	9	10	Trainee
6132519	Sawhney, Vinit	4	14	103	Trainee
3338881	Schilling, Richard	2	15	89	Cardiology
4209250	Segal, Oliver	23	21	22	Cardiology
3549634	Simon, Ron	12	39	1	Cardiology
3549854	Sporton, Simon	2	15	30	General (internal) medicine
6146796	Srinivasan, Neil	11	18	20	Trainee
6076617	Ullah, Waqas	3	5	16	Cardiology
7090260	Waddingham, Peter	3	8	12	Trainee

In this and future reports, doctors will be solely identified by their seven-digit GMC number; their name will be derived from the GMC List of Registered Medical Practitioners (this is because the use of multiple different spellings of names is common). For records in which the GMC number is absent or invalid, the

operator will not be identified. A procedure is ascribed to a doctor if his/her GMC number appears as first or second (scrubbed) operator, or as responsible consultant (fields 3.04, 3.07 or 3.10). It follows that each procedure may count toward the activity of up to three doctors, but if GMC numbers are missing, it may not count to any.

4 Centre compliance with national guidance

Centres' reported activity is evaluated against contemporary national guidance for simple and complex ablations. BHRS standards (2016) recommend that centres performing catheter ablation undertake a minimum volume of 100 cases/year, and that those undertaking AF ablation undertake a minimum volume of 50 such cases/year. In the table below, amber indicates a number 10% below or above the recommended minima.

Table 9: Total number of ablation procedures

	Procedures
Total ablation procedures	1213
AF ablation procedures	689

5 Reintervention

As an index of effectiveness, we are reporting all-cause reintervention within 1 year of an ablation procedure - only in centres with $\geqslant$ 90% completeness of NHS No. in both of the two years used for analysis. The definitions of "reintervention" are detailed below the table. Every ablation has been tracked for up to 1 year to see whether it is followed by a re-ablation at any centre (where the reintervention was at a different centre, it has been assigned to the centre performing the index procedure). The table estimates the proportion of patients with one or more re-ablations.

In this analysis, patients have been identified solely by a pseudonymised version of field 1.03 ("NHS No."). Records in which this is missing or incorrect could result in a reintervention being missed. It follows that the reintervention rates in the table below are minimum estimates, and are likely to be significant underestimates in centres with poor NHS No. completion.

Table 10: Re-interventions within a year

	No. of ablations in 2015/16*	Reinterventions within 1 year†
Simple ablations	407	11 (2.7%)
Complex atrial ablations	602	77 (12.79%)
Complex ventricular ablations	108	10 (9.26%)

* All ablations performed between 1/4/15 and 31/3/16 are included as index cases (whether or not they were the patient's first ablation)

† Of these, the number of patients with 1+ reinterventions within 1-365 days.

Of the ablations performed in 2015-16, 0 patient(s) with simple ablation, 2 patient(s) with complex atrial ablation and 0 patient(s) with complex ventricular ablation had a reintervention within one year in a different hospital.

Notes & definitions:

- *For simple ablations, a further procedure with the same target (e.g. CTI followed by CTI, or any AP followed by any AP) is considered a reintervention, but a further procedure with a different target (e.g. CTI followed by AP) is not. The "simple targets" count in Table 10. refers to procedures that included any simple target – including those combined with complex targets (which count as complex procedures elsewhere in this report). Thus the number of simple targets in Table 10. may exceed the number of simple ablation procedures elsewhere.*
- *For complex atrial ablations, any further complex atrial procedure (e.g AF followed by AF or AF followed by IART) is considered a reintervention. However, AF followed by CTI ablation or vice-versa is not.*
- *For complex ventricular ablations, any further complex ventricular procedure is considered a reintervention.*
- *A second ablation performed in the index year (for the 2016-17 report, the index year is 2015-16) will still count as an index case, and will be tracked for a further 365 days. Thus, for example, a patient undergoing two complex atrial ablations and three complex ventricular ablations within a year will count once as having complex atrial reintervention and once as having complex ventricular reintervention. Essentially, in each category the number of patients with re-intervention and NOT number of reintervention procedures is counted.*
- *No attempt has been made to identify whether each index procedure was a "first ablation" as this is likely to be unreliable. In future we hope to address this and identify true first-time procedures.*