

# **EP/Ablation Procedures Procedure Report**

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NICOR Report for Liverpool Heart & Chest Hospital  
2016-17

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*NICOR*

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# 1 Data Quality/Completeness

Number of records in 2016-17 = **1412**

Number of records after cleaning and removal of duplicates = **1406**

## 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  | 556     | 555     | -0.2              | {3.19 = 1} AND {3.12 = 17, 20, 12a-d, 5a}          |
| Complex ablation | 620     | 663     | 6.9               | {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           | 1200 (97.2%) | 43 (29.1%)  | 0       |
| Data incomplete/inconsistent       | 34 (2.8%)    | 105 (70.9%) | 24      |
| Total                              | 1234         | 148         | 24      |

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 | 100      | 100          | 100           | 100      | 100      | 96.4       |

Table 4: Data completeness of clinical information

|                  | 2.01                  | 2.02                    | 2.03                 | 2.04                | 2.05                  | 2.06                   | 2.07              |
|------------------|-----------------------|-------------------------|----------------------|---------------------|-----------------------|------------------------|-------------------|
|                  | Underlying heart dis. | Prev surg or interventn | Structural congen HD | Documented prior AF | Other doc. arrhythmia | Indication for proced. | Previous ablation |
| Clinical Details | 99.5                  | 100                     | 100                  | 99.8                | 100                   | 100                    | 99.8              |

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<br>Procedure<br>time        | 3.02<br>Procedure<br>urgency   | 3.04<br>1st Op.<br>GMC no.    | 3.10<br>Consultant<br>GMC No.    | 3.12<br>Ablation<br>procedure   | 3.13<br>Mapping<br>techniques | 3.16<br>Total fluoro<br>time (min) |
|-----------|----------------------------------|--------------------------------|-------------------------------|----------------------------------|---------------------------------|-------------------------------|------------------------------------|
| Procedure | 83.5                             | 99.9                           | 100                           | 100                              | 99.1                            | 100                           | 98.3                               |
|           | 3.18<br>Procedure<br>durat (min) | 3.19<br>Ablation<br>attempted? | 3.21<br>Abl. energy<br>source | 3.23<br>Transseptal<br>approach? | 3.24<br>Epicardial<br>approach? | 3.26<br>Success?              | 3.28<br>Acute<br>Complication      |
| Procedure | 100                              | 98.3                           | 98.5                          | 99.8                             | 100                             | 99.5                          | 99.6                               |

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 | 83.3             | 99.8               | 98.7           |

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)

|                                   | N   | <i>Acute outcome</i> |         |      |               |       |
|-----------------------------------|-----|----------------------|---------|------|---------------|-------|
|                                   |     | Success              | Partial | Fail | Indeterminate | Blank |
| No ablation/unknown               | 172 | -                    | -       | -    | -             | -     |
| <b><i>Simple targets</i></b>      |     |                      |         |      |               |       |
| AVNA                              | 141 | 138                  | 1       | 2    | 0             | 0     |
| AVNRT                             | 209 | 198                  | 6       | 5    | 0             | 0     |
| AP                                | 74  | 69                   | 1       | 4    | 0             | 0     |
| CTI                               | 212 | 196                  | 8       | 5    | 3             | 0     |
| <b>Total Simple Procedures</b>    | 555 | -                    | -       | -    | -             | -     |
| Simple Multi-Target               | 2   | -                    | -       | -    | -             | -     |
| <b><i>Complex Atrial</i></b>      |     |                      |         |      |               |       |
| AF total                          | 522 | 494                  | 21      | 5    | 1             | 1     |
| Cryo balloon                      | 218 | -                    | -       | -    | -             | -     |
| EAT/IART only                     | 57  | 42                   | 6       | 8    | 0             | 1     |
| <b>Total Complex Atrial</b>       | 579 | -                    | -       | -    | -             | -     |
| <b><i>Complex Ventricular</i></b> |     |                      |         |      |               |       |
| PVC/VT focal only                 | 63  | 48                   | 6       | 8    | 1             | 0     |
| VT scar etc.                      | 21  | 16                   | 2       | 2    | 1             | 0     |
| <b>Total Complex Ventricular</b>  | 84  | -                    | -       | -    | -             | -     |
| <b>Total Complex Cases</b>        | 663 | -                    | -       | -    | -             | -     |
| Other/Blank                       | 16  | -                    | -       | -    | -             | -     |
| Ablation in CHD                   | 10  | -                    | -       | -    | -             | -     |

*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  $\geq 50$  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                      |
|---------|------------------------|-------------|--------|---------|--|
| 4781875 | Archana Rao, Bhasker   | 0           | 1      | 0       | Cardiology                             |
| 7513594 | Bartoletti, Stefano    | 14          | 46     | 48      | Cardiology                             |
| 6103608 | Borbos, Zoltan         | 13          | 69     | 74      | General (internal) medicine<br>Trainee |
| 6145311 | Bowes, Michael         | 2           | 5      | 5       | Paediatric cardiology                  |
| 6115044 | Brough, Claire         | 2           | 0      | 0       | Cardiology                             |
| 6140540 | Chahal, Rajinder       | 0           | 2      | 0       | Trainee                                |
| 5198704 | Chaturvedi, Vivek      | 15          | 49     | 87      |  |
| 7042445 | Denham, Nathan         | 14          | 53     | 45      | Trainee                                |
| 5200272 | Elkadri, Moutaz        | 9           | 44     | 35      | Cardiology                             |
| 5205561 | Gupta, Dhiraj          | 12          | 45     | 168     | Cardiology                             |
| 4100131 | Hall, Mark             | 23          | 66     | 68      | Cardiology                             |
| 6061629 | Hussein, Ahmed         | 7           | 18     | 39      | Cardiology                             |
| 6057013 | Mahida, Saagar         | 29          | 72     | 74      | Cardiology                             |
| 7565217 | Maille, Baptiste       | 12          | 45     | 33      |  |
| 4216670 | Modi, Suneel           | 20          | 60     | 78      | Cardiology                             |
| 6114955 | Pearman, Charles       | 14          | 57     | 29      | Trainee                                |
| 7017308 | Pius, Charlene         | 0           | 1      | 8       | Trainee                                |
| 6066691 | Saeed, Yawer           | 6           | 14     | 18      | Cardiology                             |
| 4331782 | Snowdon, Richard       | 23          | 84     | 55      | Cardiology                             |
| 6078551 | Temple, Ian            | 5           | 64     | 47      | Cardiology                             |
| 3550443 | Todd, Derick           | 10          | 60     | 101     | Cardiology                             |
| 3410387 | Waktare, Johan         | 18          | 72     | 50      | Cardiology                             |
| 7472500 | Zeljko, Hrvojka Marija | 1           | 1      | 6       | Cardiology                             |

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 | 1218 |
| AF ablation procedures    | 522  |

## 5 Reintervention

As an index of effectiveness, we are reporting all-cause reintervention within 1 year of an ablation procedure - only in centres with  $\geq 90\%$  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 <sup>†</sup> |
|-------------------------------|------------------------------|--|
| Simple ablations              | 647                          | 21 (3.25%)                                 |
| Complex atrial ablations      | 556                          | 50 (8.99%)                                 |
| Complex ventricular ablations | 64                           | 8 (12.5%)                                  |

\* 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)

<sup>†</sup> 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, 0 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 reintervention 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.*