

**HRUK**

Heart Rhythm UK



CERTIFICATE OF ACCREDITATION

(PHYSIOLOGIST -  
ELECTROPHYSIOLOGY)

**PRACTICAL LOGBOOK**

**BY**

## KNOWLEDGE BASE FOR EP PROCEDURES

To gain a certificate of accreditation in electrophysiology it is expected that the practitioner has a knowledge and understanding of the following:

- Normal ECG and electrogram interpretation and recognition including baseline intervals:
  - P-A (ms)
  - A-H (ms)
  - H-V (ms)
  - Coronary sinus activation patterns
  - AV relationship
  - VA conduction
  - Decremental conduction
- ECG and EGM interpretation of the following:
  - Atrial fibrillation
  - Atrial flutter (typical and atypical)
  - Atrial tachycardia
  - AVNRT
  - AVRT (orthodromic and antidromic)
  - Pre-excitation
  - VT
  - VF
  - Enlargement and hypertrophy
  - Electrolyte imbalance
  - Bundle branch block and hemiblock
  - Myocardial ischaemia and infarction
  - Pericarditis and myocarditis
  - Drug effects e.g. flecainide
- Anatomical abnormality recognition
  - ARVD
  - HCM
- Care and routine maintenance of all equipment.
- Correct application and positioning of all consumables including ECG, defibrillation pads, ground pads, surface kits for navigational mapping systems.
- Preparation of all equipment including navigational mapping systems and irrigated catheter systems.
- Patient approach and reassurance especially during high risk cases.
- Recording technique including recognition and reduction of artefact.
- Recording system settings, use and adjustments.
- Archiving and data protection
- Pacing system settings, use and adjustments.
- Pacing protocols for induction and termination of arrhythmias.
- Recognition and rectification of patient deterioration.
- Resuscitation and defibrillation as appropriate.
- Diagnostic and therapeutic electrode selection and rationale.
- Ablation therapy modalities and selection rationale.
- Peri-operative application of anti-arrhythmic medication for diagnostic and therapeutic purposes.
- Compatibility of navigation mapping systems, RF generators, irrigated catheter systems and diagnostic and therapeutic electrodes.
- Interrogation and programming of pacemakers and ICDs.

## RECORD OF COMPLETED ELECTROPHYSIOLOGY PROCEDURES

No.	Procedure	Patient Hospital Number	Procedure Date	Pre Procedure Evidence/Diagnosis	Post Procedure Outcome	Diagnostic electrodes	Ablation Electrode	Pre procedure ECG	Post procedure ECG	Ablation Target	Comments
1	SVT study <sup>1</sup>										
2	SVT study <sup>1</sup>										
3	SVT study <sup>1</sup>										
4	VT study										
5	VT study										
6	VT study										
7	AVNRT ablation <sup>2</sup>										
8	AVNRT ablation <sup>2</sup>										
9	AVNRT ablation <sup>2</sup>										
10	AVNRT ablation <sup>2</sup>										
11	AVNRT ablation <sup>2</sup>										

No.	Procedure	Patient Hospital Number	Procedure Date	Pre Procedure Evidence/Diagnosis	Post Procedure Outcome	Diagnostic electrodes	Ablation Electrode	Pre procedure ECG	Post procedure ECG	Ablation Target	Comments
12	AVRT ablation <sup>3</sup>										
13	AVRT ablation <sup>3</sup>										
14	AVRT ablation <sup>3</sup>										
15	AVRT ablation <sup>3</sup>										
16	Atrial flutter ablation <sup>4</sup>										
17	Atrial flutter ablation <sup>4</sup>										
18	Atrial flutter ablation <sup>4</sup>										
19	Atrial flutter ablation <sup>4</sup>										
20	Atrial tachycardia ablation										
21	Atrial tachycardia ablation										
22	AF ablation										
23	AF ablation										

No.	Procedure	Patient Hospital Number	Procedure Date	Pre Procedure Evidence/Diagnosis	Post Procedure Outcome	Diagnostic electrodes	Ablation Electrode	Pre procedure ECG	Post procedure ECG	Ablation Target	Comments
24	AF ablation										
25	AF ablation										
26	AF ablation										
27	VT ablation										
28	VT ablation										

Supervisor Signature:

1. You can include the diagnostic section of an ablation procedure included in this section
2. Ideally one AVNRT case should be "atypical"
3. At least one AVRT case must have WPW syndrome
4. At least one atrial flutter case should be atypical

## CASE STUDY 1 – SVT STUDY

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
Rhythm and rate		

Number of sheaths inserted	Approach		French		Number			
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles		Curve		Spacing		Name	

Baseline intervals (ms)	P-A		A-H		H-V		
Retrograde curve performed?							
V-A conduction?							
Anterograde curve performed?							
Decremental conduction evident?							
Tachycardia induced?							
Induction method							
Diagnostic manoeuvres performed (pacing or pharmacological)							
Tachycardia diagnosis							
Treatment plan including risks, rationale etc							

Comments:

Supervisor comments:

Include the following:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- Tachycardia 12 Lead ECG
- Tachycardia IEGMs with measurements
- Tachycardia initiation
- Diagnostic manoeuvres
- Tachycardia termination

Supervisor Signature:

## CASE STUDY 2 - VT STUDY

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
Rhythm and rate		

Number of sheaths inserted	Approach		French		Number			
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles		Curve		Spacing		Name	

Baseline intervals (ms)	P-A		A-H		H-V		
Retrograde curve performed?							
V-A conduction?							
Anterograde curve performed?							
Decremental conduction evident?							
Tachycardia induced?							
Induction method							

Diagnostic manoeuvres performed (pacing or pharmacological)	
Tachycardia diagnosis	
Termination (ATP, CV etc)	
Treatment plan including risks, rationale etc	

Comments:

Supervisor comments:

Include the following:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- Tachycardia 12 Lead ECG
- Tachycardia IEGMs with measurements
- Tachycardia initiation
- Diagnostic manoeuvres
- Tachycardia termination

Supervisor Signature:

### Case STUDY 3 – AVNRT

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
Rhythm and rate		

Number of sheaths inserted	Approach	French	Number	
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles	Curve	Spacing	Name

Baseline intervals (ms)	P-A		A-H		H-V		
Retrograde curve performed?							
V-A conduction?							
Anterograde curve performed?							
Wenckebach rate (pre and post RF)							
Decremental conduction evident?							
Evidence of dual AV nodal physiology?							

Tachycardia induced?	
Induction method	
Diagnostic manoeuvres performed (pacing or pharmacological)	
Tachycardia diagnosis	
Termination (ATP, CV etc)	
Treatment plan including risks, rationale etc	

Mapping technique	Conventional	Ensite NavX	EnSite Array	Carto
Ablation performed?				
Ablation target				
Ablation type	RF	Cooled RF	Cryo	
Ablation electrode				
Number of ablations				
Ablation settings	Temperature (°C)	Power (W)	Time (s)	
How was endpoint determined?				
Outcome				
Complications				

Comments:

Supervisor comments:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- Tachycardia 12 Lead ECG
- Tachycardia IEGMs with measurements
- AH jump if present
- WB pacing – is PR > RR?
- Tachycardia initiation
- RF recordings if appropriate
- (e.g. ablation signal, junctional tachycardia during RF etc)
- Tachycardia termination

Supervisor signature:

## Case STUDY 4 - AVRT

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
Evidence of pre-excitation?		
Rhythm and rate		

Number of sheaths inserted	Approach		French		Number	
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles	Curve	Spacing	Name		

Baseline intervals (ms)	P-A		A-H		H-V		
Retrograde curve performed?							
V-A conduction?							
Retrograde atrial activation pattern?							
Anterograde curve performed?							
Pathway ERP							
AV node ERP							
Decremental conduction evident?							
Tachycardia induced?							
Induction method							
Diagnostic manoeuvres performed (pacing or pharmacological)							
Tachycardia diagnosis							

Termination (ATP, CV etc)	
Treatment plan including risks, rationale etc	

Mapping technique	Conventional	Ensite NavX	EnSite Array	Carto
Ablation performed?				
Ablation target				
How was pathway activation mapped?				
Ablation type	RF	Cooled RF	Cryo	
Ablation electrode				
Number of ablations				
Ablation settings	Temperature (°C)	Power (W)	Time (s)	
How was endpoint determined?				
Outcome				
Complications				

Comments:

Supervisor comments:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- Tachycardia 12 Lead ECG
- Tachycardia IEGMs with measurements
- Tachycardia initiation
- RF recordings if appropriate   
(e.g. RF signal, VA block during RF or loss of delta)
- Tachycardia termination

Supervisor signature:

## CASE STUDY 5 – ATRIAL TACHYCARDIA

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
AV ratio (if applicable)		
Rhythm and rate		

Number of sheaths inserted	Approach	French	Number	
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles	Curve	Spacing	Name

Baseline intervals (ms)	P-A		A-H		H-V		
Retrograde curve performed?							
V-A conduction?							
Anterograde curve performed?							
Decremental conduction evident?							
Tachycardia induced?							
Induction method							
Diagnostic manoeuvres performed (pacing or pharmacological)							
Tachycardia diagnosis							
Termination (ATP, CV etc)							
Treatment plan including risks, rationale etc							

Mapping technique	Conventional	Ensite NavX	EnSite Array	Carto
Ablation performed?				
Ablation target				
Ablation type	RF	Cooled RF	Cryo	
Ablation electrode				
Number of ablations				
Ablation settings	Temperature (°C)	Power (W)	Time (s)	
How was endpoint determined?				
Outcome				
Complications				

Comments:

Supervisor comments:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- Tachycardia 12 Lead ECG
- Tachycardia IEGMs with measurements
- Tachycardia initiation
- RF recordings if appropriate
- Tachycardia termination

Supervisor signature:

## CASE STUDY 6 – ATRIAL FLUTTER

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
AV ratio (if applicable)		
Rhythm and rate		

Number of sheaths inserted	Approach		French		Number			
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles		Curve		Spacing		Name	

Baseline intervals (ms)	P-A		A-H		H-V		
Retrograde curve performed?							
V-A conduction?							
Anterograde curve performed?							
Decremental conduction evident?							
Tachycardia induced?							
Induction method							
Diagnostic manoeuvres performed (pacing or pharmacological)							
Tachycardia diagnosis							
Termination (ATP, CV etc)							
Treatment plan including risks, rationale etc							

Mapping technique	Conventional	Ensite NavX	EnSite Array	Carto
Ablation performed?				
Ablation target				
Ablation type	RF	Cooled RF	Cryo	
Ablation electrode				
Number of ablations				
Ablation settings	Temperature (°C)	Power (W)	Time (s)	
How was endpoint determined?				
Outcome				
Complications				

Comments:

Supervisor comments:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- Tachycardia 12 Lead ECG
- Tachycardia IEGMs with measurements
- Tachycardia initiation
- RF recordings if appropriate
- Tachycardia termination
- Evidence of bidirectional block

Supervisor signature:

## CASE STUDY 7 – ATRIAL FIBRILLATION

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
AV ratio (if applicable)		
Rhythm and rate		

Number of sheaths inserted	Approach	French	Number	
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles	Curve	Spacing	Name

Mapping technique	Conventional	Ensite NavX	EnSite Array	Carto
Ablation performed?				
Ablation target				
Ablation type	RF	Cooled RF	Cryo	
Ablation electrode(s)				
Number of ablations				
Ablation settings	Temperature (°C)	Power (W)	Time (s)	
How was endpoint determined?				
Outcome				
Pulmonary veins isolated				
Complications				

Comments:

Supervisor comments:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- IEGM from each vein pre isolation
- Evidence of pulmonary vein isolation

Supervisor signature:

## CASE STUDY 8 - VT ABLATION

Patient ID/DOB		
Date of procedure		
Clinical history		
Pre procedure diagnosis		
Patient symptoms		
Structural heart disease?		
On anti-arrhythmic drugs?		
Baseline ECG description	PR interval (ms)	
	QRS duration(ms)	
	QT interval (ms)	
	Axis of Deviation	
Rhythm and rate		

Number of sheaths inserted	Approach		French		Number			
Diagnostic electrodes inserted (include any specific rationale for selection)	Poles		Curve		Spacing		Name	

Baseline intervals (ms)	P-A		A-H		H-V		
Retrograde curve performed?							
V-A conduction?							
Anterograde curve performed?							
Decremental conduction evident?							
Tachycardia induced?							
Induction method							
Diagnostic manoeuvres performed (pacing or pharmacological)							
Tachycardia diagnosis							
Termination (ATP, CV etc)							
Treatment plan including risks, rationale etc							

Mapping technique	Conventional	Ensite NavX	EnSite Array	Carto
Ablation performed?				
Ablation target				
Ablation type	RF	Cooled RF	Cryo	
Ablation electrode				
Number of ablations				
Ablation settings	Temperature (°C)	Power (W)	Time (s)	
How was endpoint determined?				
Outcome				
Complications				

Comments:

Supervisor comments:

- Baseline 12 Lead ECG
- Baseline IEGM measurements
- Tachycardia 12 Lead ECG
- Tachycardia IEGMs with measurements
- Tachycardia initiation
- Response during RF
- Any pace mapping
- RF signals with diastolic potential
- RF signals for focal VT
- Tachycardia termination

Supervisor signature:

## ELECTROPHYSIOLOGY SKILLS ASSESSMENT

<b>ASSESSMENT DATE:</b>								
<b>SKILL</b>	<b>SVT Study</b>	<b>VT Study</b>	<b>AVNRT</b>	<b>AVRT</b>	<b>Atrial Tachycardia</b>	<b>Atrial Flutter</b>	<b>Atrial Fibrillation</b>	<b>VT Ablation</b>
Check environment, including location of all emergency equipment								
Select a study protocol appropriate to the procedure on the haemodynamic monitoring system and EP system								
Input correct patient demographics into all systems								
Prepare all consumables and select EP electrodes appropriate to the procedure								
Ensure compatibility between electrodes, RF generators, cool flow pumps and navigational mapping systems								
Prepare the patients chest, stomach and legs as appropriate to the procedure including shaving and skin abrasion								
Correctly apply all monitoring to the patient inc. ECG, surface kits for mapping systems, BP, O <sub>2</sub> saturation monitoring etc.								
Set up navigational mapping systems i.e. NavX, Carto etc according to the procedure type								
Connect all EP electrodes to the EP systems via the junction boxes								
Identify, record and measure the baseline rhythm i.e. AH, HV intervals and cycle length								
Record and identify any subsequent rhythms and diagnostic manoeuvres								
Safely perform basic pacing protocols and threshold checks								

