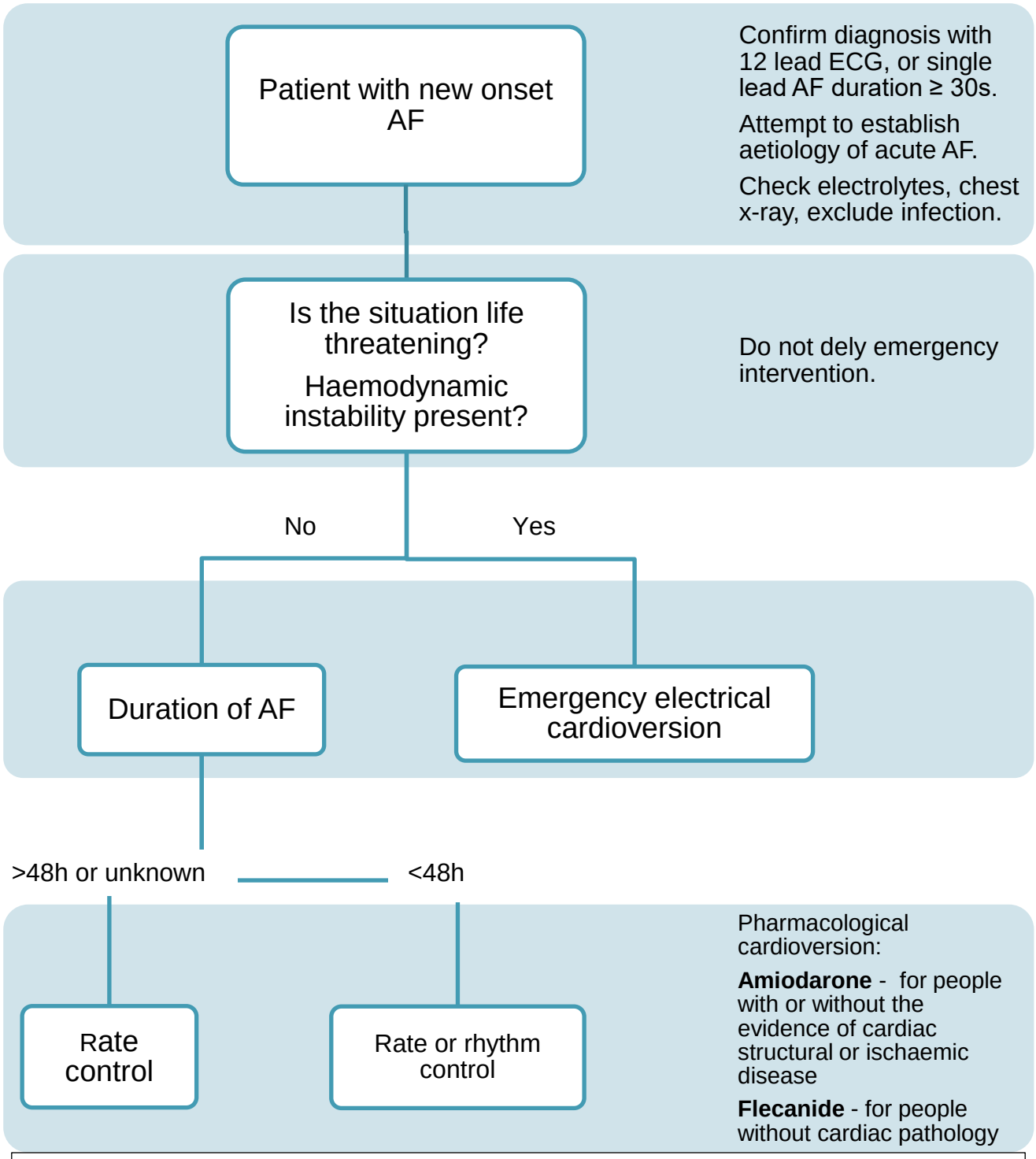
Royal Cornwall Hospitals
NHS Trust

Management of Postoperative Atrial Fibrillation Clinical Guideline

V4.0

December 2023

Summary: New onset AF in theatre/recovery treatment algorithm



Rate control therapeutic options:

1. Standard beta-blocker: Metoprolol, Esmolol, Propranolol, Bisoprolol.
2. Rate-limiting calcium-channel blocker: Verapamil, Diltiazem.
3. Amiodarone.
4. Combination therapy if monotherapy doesn't control the symptoms which are thought to be due to poor ventricular rate control. Consider combination therapy with any 2 of the following: beta-blocker, diltiazem, digoxin.
5. In suspected concomitant acute decompensated heart failure seek specialist input on the use of beta-blockers and do not use calcium-channel blockers.

1. Aim/Purpose of this Guideline

1.1 The purpose of this document is to provide guidance for management of new onset atrial fibrillation in postoperative period.

1.2 This guideline is not intended to cover management of atrial fibrillation with fast ventricular rate in patients with established diagnosis of atrial fibrillation.

1.3 This version supersedes any previous versions of this document.

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Data Protection Act 2018 and UK General Data Protection Regulations 2016/679 is applicable to all staff; this includes those working as contractors and providers of services.

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2. The Guidance

2.1. Background

AF is a common cardiac rhythm disturbance and increases in prevalence with advancing age. Approximately 1% of patients with AF are <60 years of age, whereas up to 12% of patients are 75 to 84 years of age [1]. More than one third of patients with AF are ≥80 years of age [2,3]. Frequent hospitalizations, haemodynamic abnormalities, and thromboembolic events related to AF result in significant morbidity and mortality. AF is associated with a 5-fold increased risk of stroke [4] and stroke risk increases with age [5]. AF-related stroke is likely to be more severe than non–AF-related stroke [6]. AF is also associated with a 3-fold risk of HF [7-9], and 2-fold increased risk of both dementia and mortality [4].

2.2. Definition and diagnosis

AF is a supraventricular tachyarrhythmia with uncoordinated atrial activation and consequently ineffective atrial contraction. Electrocardiogram characteristics include irregular R-R intervals (when atrioventricular [AV] conduction is present), absence of distinct repeating P waves, and irregular atrial activity. Rapid irregular wide QRS complex tachycardia suggests AF with conduction via an accessory pathway or associated with underlying bundle branch block. Extremely rapid rates suggest the presence of an accessory pathway.

ECG documentation is required to establish the diagnosis of AF [10]. A standard 12-lead ECG recording or a single lead ECG tracing of ≥ 30s showing heart rhythm with no discernible repeating P waves and irregular RR interval (when AV conduction is not impaired) is diagnostic of clinical AF [11].

2.3. Presentation

Hemodynamic consequences of AF can result from a variable combination of suboptimal ventricular rate control (either too rapid or too slow), loss of coordinated atrial contraction, beat-to-beat variability in ventricular filling, and sympathetic activation. Consequences for individual patients vary, ranging from no symptoms to fatigue, palpitations, dyspnea, hypotension, syncope, or heart failure.

2.4. Classification:

Classification	Information
First diagnosed	AF not diagnosed before, irrespective of its duration or the presence/severity of AF-related symptoms.
Paroxysmal AF	Terminates spontaneously or with intervention within 7 days (usually within 48 hours) of onset. Episodes may recur with variable frequency.
Persistent AF	Continuous AF that is sustained >7 days including episodes terminated by cardioversion (drugs or electrical cardioversion) after ≥7 days.
Longstanding persistent AF	Continuous AF >12 months in duration when decided to adopt a rhythm control strategy.
Permanent AF	The term is used when the patient and clinician make a joint decision to stop further attempts to restore and/or maintain sinus rhythm. Acceptance of AF represents a therapeutic attitude on the part of the patient and clinician rather than an inherent pathophysiological attribute of AF. Should a rhythm control strategy be adopted, the arrhythmia would be re-classified as ‘long-standing persistent AF’.

2.5. Management

2.5.1. The management of atrial fibrillation aims to prevent complications, particularly stroke, and alleviate symptoms.

2.5.2. Pharmacological treatments include:

- Anticoagulants to reduce the risk of stroke.
- Antiarrhythmics to restore or maintain normal heart rhythm.
- Drugs to slow the heart rate in adults who remain in atrial fibrillation.

2.5.3. Non-pharmacological management in postoperative period includes electrical cardioversion.

2.6. NICE guidelines published in 2021 recommendations:

2.6.1. Unless contraindicated, manage postoperative atrial fibrillation following non-cardiothoracic surgery as for new-onset atrial fibrillation with any other precipitant.

2.6.2. In the management of postoperative atrial fibrillation, use appropriate antithrombotic therapy and correct identifiable precipitants (such as electrolyte imbalance, hypovolemia, and hypoxia).

2.6.3. Carry out emergency electrical cardioversion, without delay to achieve anticoagulation, in people with life-threatening haemodynamic instability caused by new onset atrial fibrillation.

2.6.4. In people with atrial fibrillation presenting acutely without life threatening haemodynamic instability, offer rate or rhythm control if the onset of the arrhythmia is less than 48 hours, and start rate control if it is more than 48 hours or is uncertain.

2.6.5. Consider either pharmacological or electrical cardioversion depending on clinical circumstances and resources in people with new onset atrial fibrillation who will be treated with a rhythm control strategy.

2.6.6. If pharmacological cardioversion has been agreed on clinical and resource grounds for new-onset atrial fibrillation, offer:

- Flecainide or amiodarone to people with no evidence of structural or ischaemic heart disease
- Amiodarone to people with evidence of structural heart disease.

2.6.7. In people with atrial fibrillation in whom the duration of the arrhythmia is greater than 48 hours or uncertain and considered for long-term rhythm control, delay cardioversion until they have been maintained on therapeutic anticoagulation for a minimum of 3 weeks. During this period offer rate control as appropriate.

2.6.8. In suspected concomitant acute decompensated heart failure seek specialist input on the use of beta-blockers and do not use calcium-channel blockers.

2.7. Management in theatre/recovery

2.7.1. Confirm atrial fibrillation with ECG tracing [10]. A standard 12-lead ECG recording or a single lead ECG tracing of ≥ 30s showing heart rhythm with no discernible repeating P waves and irregular RR interval (when AV conduction is not impaired) is diagnostic of clinical AF [11].

2.7.2. Carry out emergency electrical cardioversion, without delaying to achieve anticoagulation, in people with life-threatening haemodynamic instability caused by new-onset atrial fibrillation [10].

2.7.3. Following the cardioversion or if there's no immediate life-threatening cardiovascular instability, the priority in the management of acute AF is the identification and treatment of potential triggers because rate and rhythm control may be less likely to succeed until the acute illness improves. Potential acute triggers and sources of acute triggers: electrolyte imbalance, volume loss/overload, bleeding, hypoxia, sepsis/infection, post-procedural pulmonary complications [12].

2.7.4. Offer rate control as the first-line strategy to people with atrial fibrillation, except in people:

- With life-threatening haemodynamic instability.
- Whose atrial fibrillation has a reversible cause.
- Who have heart failure thought to be primarily caused by atrial fibrillation.
- With new-onset atrial fibrillation.
- For whom a rhythm control strategy would be more suitable based on clinical judgement [10].

2.8. Rate control therapeutic options:

Aim for heart rate ≤ 110/min.

2.8.1. **Standard beta-blocker** (that is, a beta-blocker other than sotalol).

2.8.2. **Metoprolol** up to 5mg, dose to be given at a rate of 1-2mg/minute, then up to 5mg after 5 minutes if required (A total dose 10-15mg).

2.8.3. **Esmolol** 500 mcg/kg IV bolus over 1 min, then 50–200 mcg/kg/min IV.

2.8.4. **Propranolol** 1 mg IV over 1 min, dose can be repeated at 2 min intervals (Max total dose 5mg).

2.8.5. **Bisoprolol** orally start with 1.25mg (max dose 10mg once daily).

2.8.6. **Rate-limiting calcium-channel blocker** (nondihydropyridine calcium channel antagonist).

2.8.7. **Verapamil** 5-10mg (0.075-0.15 mg/kg) slow IV bolus over 3 min, followed by 5mg after 5-10 minutes if required (over 3 min).

2.8.8. **Diltiazem** oral (off-label use).

2.8.9. **Consider digoxin monotherapy** for people with non-paroxysmal atrial fibrillation only if they are sedentary (do no or very little physical exercise) or other rate limiting drug options are ruled out because of comorbidities or the person's preferences. [10].

2.8.10. **Digoxin** 0.75-1mg loading dose over at least 2 hours, then (by mouth) maintenance, loading dose is rarely necessary, maintenance dose to be started on the day following the loading dose, reduce dose in the elderly.

2.8.11. **Amiodarone** Initially 5 mg/kg, to be given over 20–120 minutes with ECG monitoring, subsequent infusions given if necessary, according to response; maximum 1.2 g per day.

2.8.12. If monotherapy does not control symptoms, and if continuing symptoms are thought to be due to poor ventricular rate control, contact medical registrar or cardiologist on-call for advice.

2.8.13. In suspected concomitant acute decompensated heart failure seek specialist input on the use of beta-blockers and do not use calcium-channel blockers [10].

2.8. Pharmacological Cardioversion of AF

Consider pharmacological and/or electrical rhythm control for people with atrial fibrillation whose symptoms continue after heart rate has been controlled or for whom a rate-control strategy has not been successful.

2.9. Recommended Drug Doses for Pharmacological Cardioversion

2.8.14. **Amiodarone** 5mg/kg (max 300mg) over 20 minutes with ECG monitoring followed by a further 900mg over 23 hours via a central line (people with or without evidence of structural or ischaemic heart disease).

2.8.15. **Flecanide** 2mg/kg (max 150mg) over 10-30 minutes with ECG monitoring (people with no evidence of structural or ischaemic heart disease).

2.10. Electrical Cardioversion

Perform under general anaesthetic using a synchronized DC electrical shock. Indicated in haemodynamic instability but in cases where haemodynamic compromise is not apparent, no evidence has been found to favour electrical cardioversion over pharmacological cardioversion.

3. Monitoring compliance and effectiveness

Information Category	Detail of process and methodology for monitoring compliance
Element to be monitored	Adherence to RCHT guidelines
Lead	Lead anaesthesia consultant for each case.
Tool	Audit and review of suspected cases of inappropriate care would take place in monthly anaesthesia governance meetings.
Frequency	Will be determined by the incidence of cases.
Reporting arrangements	The committee reviewing the cases will be the anaesthesia directorate. Cases will be discussed at audit meetings and the details will be recorded in the minutes.
Acting on recommendations and Lead(s)	See above.
Change in practice and lessons to be shared	A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders.

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the Equality Diversity And Inclusion Policy or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.

Appendix 1. Governance Information

Information Category	Detailed Information
Document Title:	Management of Postoperative Atrial Fibrillation Clinical Guideline V4.0
This document replaces (exact title of previous version):	Management of Postoperative Atrial Fibrillation Clinical Guideline V3.0
Date Issued/Approved:	7 November 2023
Date Valid From:	December 2023
Date Valid To:	December 2026
Directorate / Department responsible (author/owner):	Dr Anna Malik, Consultant Anaesthetist Anaesthetics, Critical Care and Theatres
Contact details:	01872 258195
Brief summary of contents:	The purpose of this document is to provide guidance for management of new onset atrial fibrillation in postoperative period. This guideline is not intended to cover management of atrial fibrillation with fast ventricular rate in patients with established diagnosis of atrial fibrillation.
Suggested Keywords:	Atrial fibrillation, Anaesthesia.
Target Audience:	**RCHT:** Yes **CFT:** No **CIOS ICB:** No
Executive Director responsible for Policy:	Chief Medical Officer
Approval route for consultation and ratification:	Anaesthetic and Theatres Business Group. Governance Lead Anaesthetics. MPC not required (confirmed by pharmacist reviewing and approving).
Manager confirming approval processes:	Doug Riley
Name of Governance Lead confirming consultation and ratification:	James Masters

Information Category	Detailed Information
Links to key external standards:	https://www.nice.org.uk/guidance/ng196/chapter/recommendations#management-for-people-presenting-acutely-with-atrial-fibrillation https://academic.oup.com/eurheartj/article https://www.ahajournals.org
Related Documents:	**Reference:** 1. Wolf PA, Benjamin EJ, Belanger AJ, et al. Secular trends in the prevalence of atrial fibrillation: The Framingham Study. Am Heart J. 1996; 131:790–5. [PubMed: 8721656]. 2. Camm AJ, Kirchhof P, Lip GY, et al. Guidelines for the management of atrial fibrillation: the Task Force for the Management of Atrial Fibrillation of the European Society of Cardiology (ESC). Eur Heart J. 2010; 31:2369–429. [PubMed: 20802247]. 3. Go AS, Hylek EM, Phillips KA, et al. Prevalence of diagnosed atrial fibrillation in adults: national implications for rhythm management and stroke prevention: the AnTicoagulation and Risk Factors in Atrial Fibrillation (ATRIA) Study. JAMA. 2001; 285:2370–5. [PubMed: 11343485]. 4. Kannel WB, Wolf PA, Benjamin EJ, et al. Prevalence, incidence, prognosis, and predisposing conditions for atrial fibrillation: population-based estimates. Am J Cardiol. 1998; 82:2N–9N. 5. Wolf PA, Abbott RD, Kannel WB. Atrial fibrillation: a major contributor to stroke in the elderly. The Framingham Study. Arch Intern Med. 1987; 147:1561–4. [PubMed: 3632164]. 6. Miller PS, Andersson FL, Kalra L. Are cost benefits of anticoagulation for stroke prevention in atrial fibrillation underestimated? Stroke. 2005; 36:360–6. [PubMed: 15637326]. 7. Wang TJ, Larson MG, Levy D, et al. Temporal relations of atrial fibrillation and congestive heart failure and their joint influence on mortality: the Framingham Heart Study. Circulation. 2003; 107:2920–5. [PubMed: 12771006]. 8. Krahn AD, Manfreda J, Tate RB, et al. The natural history of atrial fibrillation: incidence, risk factors, and prognosis in the Manitoba Follow-Up Study. Am J Med. 1995; 98:476–84. [PubMed: 7733127].

Information Category	Detailed Information
	9. Stewart S, Hart CL, Hole DJ, et al. A population-based study of the long-term risks associated with atrial fibrillation: 20-year follow-up of the Renfrew/Paisley study. Am J Med. 2002; 113:359–64. [PubMed: 12401529]. 10. Atrial fibrillation: diagnosis and management. NICE Clinical guideline. [NG196] Published: 27 April 2021. 11. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS): The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC. 12. Atrial Fibrillation Occurring During Acute Hospitalization: A Scientific Statement from the American Heart Association, 13 March 2023. 13. https://doi.org/10.1161/CIR.0000000000001133 13. bnf.nice.org.uk.
Training Need Identified?	No
Publication Location (refer to Policy on Policies – Approvals and Ratification):	Internet and Intranet
Document Library Folder/Sub Folder:	Clinical / Anaesthetics

Version Control Table

Date	Version Number	Summary of Changes	Changes Made by
25 January 2012	V1.0	Initial Issue	Dr Ann Harvey, Consultant Anaesthetist.
January 2015	V2.0	No changes required. Current guideline in line with recent publications and reviewed by Cardiology Dept	Dr Thomas Cope. Dr Ann Harvey.

Date	Version Number	Summary of Changes	Changes Made by
September 2019	V3.0	Updated with recent evidence.	Dr Anna Malik, Consultant Anaesthetist
November 2023	V4.0	Full review and updated to latest Trust template.	Dr Anna Malik, Consultant Anaesthetist

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All Policies, Strategies and Operating Procedures, including Business Plans, are to be kept for the lifetime of the organisation plus 6 years.

This document is only valid on the day of printing.

Controlled Document.

This document has been created following the Royal Cornwall Hospitals NHS Trust The Policy on Policies (Development and Management of Knowledge Procedural and Web Documents Policy). It should not be altered in any way without the express permission of the author or their Line Manager.

Appendix 2. Equality Impact Assessment

Section 1: Equality Impact Assessment (EIA) Form

The EIA process allows the Trust to identify where a policy or service may have a negative impact on an individual or particular group of people.

For guidance please refer to the Equality Impact Assessment Policy (available from the document library) or contact the Equality, Diversity, and Inclusion Team rcht.inclusion@nhs.net

Information Category	Detailed Information
Name of the strategy / policy / proposal / service function to be assessed:	Management of Postoperative Atrial Fibrillation Clinical Guideline V4.0
Directorate and service area:	Theatres and Anaesthesia
Is this a new or existing Policy?	Existing
Name of individual completing EIA (Should be completed by an individual with a good understanding of the Service/Policy):	Dr Anna Malik, Consultant Anaesthetist
Contact details:	01872 258195

Information Category	Detailed Information
1. Policy Aim - Who is the Policy aimed at? (The Policy is the Strategy, Policy, Proposal or Service Change to be assessed)	To inform all anaesthesia staff of the appropriate course of action when treating with perioperative atrial fibrillation.
2. Policy Objectives	Ensure anaesthesia team are adequately prepared to treat atrial fibrillation
3. Policy Intended Outcomes	Patients who develop perioperative atrial fibrillation will receive optimal care.
4. How will you measure each outcome?	Audit and monitoring through incident reporting and case discussion at governance meetings.
5. Who is intended to benefit from the policy?	Patients

Information Category	Detailed Information
6a. Who did you consult with? (Please select Yes or No for each category)	• Workforce: Yes • Patients/ visitors: No • Local groups/ system partners: No • External organisations: No • Other: No
6b. Please list the individuals/groups who have been consulted about this policy.	**Please record specific names of individuals/ groups:** Anaesthetic and Theatres Business Group. Governance Lead Anaesthetics.
6c. What was the outcome of the consultation?	Approved.
6d. Have you used any of the following to assist your assessment?	**National or local statistics, audits, activity reports, process maps, complaints, staff, or patient surveys:** No.

7. The Impact

Following consultation with key groups, has a negative impact been identified for any protected characteristic? Please note that a rationale is required for each one.

Where a negative impact is identified without rationale, the key groups will need to be consulted again.

Protected Characteristic	(Yes or No)	Rationale
Age	No	
Sex (male or female)	No	
Gender reassignment (Transgender, non-binary, gender fluid etc.)	No	
Race	No	
Disability (e.g. physical or cognitive impairment, mental health, long term conditions etc.)	No	
Religion or belief	No	
Marriage and civil partnership	No	

Protected Characteristic	(Yes or No)	Rationale
Pregnancy and maternity	No	
Sexual orientation (e.g. gay, straight, bisexual, lesbian etc.)	No	

A robust rationale must be in place for all protected characteristics. If a negative impact has been identified, please complete section 2. If no negative impact has been identified and if this is not a major service change, you can end the assessment here.

I am confident that section 2 of this EIA does not need completing as there are no highlighted risks of negative impact occurring because of this policy.

Name of person confirming result of initial impact assessment: Dr Anna Malik, Consultant Anaesthetist.

If a negative impact has been identified above OR this is a major service change, you will need to complete section 2 of the EIA form available here:
Section 2. Full Equality Analysis