Worcestershire Acute Hospitals NHS Trust

Electro Surgery Theatre Policy

Department / Service:	SCSD Theatres
Originator:	Countywide Theatre Matron
Accountable Director:	Clinical Director SCSD
Approved by:	Theatres Governance Meeting
Date of approval:	15th January 2025
First Revision Due: **This is the most current document and should be used until a revised version is in place**	15th January 2028
Target Organisation(s)	Worcestershire Acute Hospitals NHS Trust
Target Departments	Countywide Theatres
Target staff categories	All Theatre Staff

Policy Overview:
This policy sets out best practise, the safe use and potential risks associated with the use of diathermy across our countywide theatre departments.

Latest Amendments to this policy:

Date	Amendment	By
26th January 2022	**New document approved**	A.Fryer/ M.Trotman/ SCSD Governance
15th January 2025	**Policy reviewed.**	Theatres Governance Meeting

Contents:

Appendices:

Supporting Documents:

Supporting Document 1 - Equality Impact Assessment.
Supporting Document 2 - Financial Risk Assessment.

1. Introduction

The term ‘electro surgery’ is used in preference to ’diathermy’ in this policy, although the two terms are synonymous. Electro surgery is the cutting and coagulation of body tissue with a high frequency electrical current. It is important to note that the current itself heats the tissues, not the electrode. The high frequency current operates at 300,00Hz or over. At this frequency (radio frequency) the nervous system and muscles are not affected when the current is passed through the human body.

2. Scope of this document

This policy relates to any healthcare worker who is involved in applying the patient plate, checking and connecting the electrosurgical equipment, and the safe handling and storage of equipment during surgery. The healthcare worker should have received the relevant training and have been deemed competent by an appropriate assessor.

3. Definitions

Electro surgical equipment consists of a generator, the patient plate (also known as the return electrode), the lead, and an active electrode (forceps, ball or pencil). Bipolar diathermy does not require a patient plate.

There are two types of electro surgery as described below:

- Monopolar is the passage of a high frequency current through the patient from the electro surgery active electrode (forceps or pencil) to the return electrode (the patient plate, dispersive or indifferent electrode). The small tip of the active electrode produces ‘high current density’ which in turn results in the greatest heating effect. This is because the current is concentrated within that specific area.
- Bipolar electro surgery is when the active and return electrode are combined within the bipolar forceps. One tip of the forceps is the active electrode and the other is the return electrode. The heating effect is therefore spread equally between the 2 tips of the forceps which means the tissue grasped between the insulated tips of the forceps is affected.

4. Responsibilities and Duties

- The policy applies to all staff within the theatre environment who are involved in the application and use of electro surgical equipment.
- The registered theatre practitioner in each individual theatre is responsible for ensuring all equipment is checked, applied and handled correctly. It is also their responsibility to ensure that any faults with the equipment are reported efficiently, and the item is removed from use.
- It is the responsibility of the individual operating surgeon to ensure that they are adequately trained on the equipment and its uses.

5. Policy Detail

5.1 General Information

- Monopolar electro surgery requires an electrosurgical generator to produce the radio frequency current, as well as an active electrode, a cable and a return electrode.
- Monopolar electro surgery may be used to coagulate blood vessels, cut through muscles, skin and fat. Fulguration or spray may be used to provide superficial destruction of tissues.
- Bipolar electro surgery requires similar items except the large return electrode (patient plate) is not required as the return electrode is contained within the bipolar forceps.
- Bipolar is often used when either coagulation is required in peripheral areas of the body such as hands or feet, or if the patient has a pacemaker in situ. It may also be used during laparoscopic surgery, or where micro coagulation is required.

5.2 Hazards of Electro Surgery

- Several hazards can be identified in relation to the use of electro surgery. The practitioner must be aware of these to minimise the risk of adverse incidents occurring involving patients and staff.
- Accidental burns are the greatest risk to patients and have the potential to cause pain and disfigurement. The main cause of accidental burns is poor practice carried out by surgeons or practitioners with little or no knowledge or experience of the principles of electro surgery (MDA2002).
- It is important to be aware that accidental burns can occur in the following ways:
    - Using a faulty return electrode.
    - Through poor contact quality of the monitoring plates. This could be due to the patient plate becoming detached.
    - Attachment of the patient plate over scarred or damaged tissue. This should always be avoided.

5.3 Other Risks

- Alcoholic skin preparations: Substances should not be allowed to ‘pool’ on or around the patient. After prepping the surgical site either allow the area to dry, or dry with a surgical swab (MDA 2000).
- Interference can occur with other medical devices such as pacemakers or the video equipment that may be in use during minimal access surgery (Mil-IRA 2006).
- Patients with pacemakers in situ are best treated with bipolar electro surgery. If monopolar surgery is used, the current pathway should be kept as short as possible. The return electrode should not be placed in a direct line with the active electrode and pacemaker. This is to avoid the current passing directly through the pacemaker. Electro surgery should be stopped immediately if an arrhythmia occurs.
- In minimal access surgery, the main hazards are direct coupling and capacitive coupling.

- Endoscopic surgery requires the use of metal instruments in confined spaces and therefore increases the risk that an active electrode will meet a metal endoscope resulting in a burn to the patient or surgeon. An additional danger is the explosion of methane from the patients' bowels that could cause electro surgical sparks. In this instance a low power/low voltage setting is therefore advisable, as well as good bowel preparation which will also reduce the risk of this happening.

5.4 Preparation and Use of Electro Surgical Equipment

- Equipment must be prepared prior to use and used following the manufacturer's instructions. The practitioner must also read and understand the relevant manuals for the equipment before it is used.
- All staff applying any type of return electrode (plate or REM) to patients must have received local competency and/or manufacturer training before undertaking this task.
- The selection of the diathermy plate should be appropriate to the patient's weight and according to the manufacturer's guidelines.

Procedure for the Preparation and Use of Electro Surgical Equipment:

- Switch on the generator to check the lights and alarms are functioning correctly.
- Open a new patient plate and attach this to the cable.
- Place this on an exposed arm or hand. Ensure generators Return Electrode Monitoring (REM) System lights are lit in green.
- Dispose of single use plate.
  The REM system is the most vital test to perform on any diathermy generator.
- Once this is checked ensure the foot pedals respond when they are pressed, these should beep even if no device is plugged in.
- All cables and electrodes must be checked prior to use to ensure there are no insulation problems or other defects.
- Cables must not be looped (for example around a towel clip) as this may increase the capacitive effect, leading to accidental burns by alternative return pathways.

Maintenance

- There must be a robust maintenance programme in place to prevent defects as far as possible. This must in accordance with the manufacturer's instructions.
- All maintenance undertaken on electro surgical products must be recorded.

5.5 Surgical Plume

- Surgical plume is the smoke, which is released when an electrosurgery, laser or ultrasonic device is used on body tissue.
- It contains toxins such as chemicals, carbonised tissue, blood particles, viral DNA particles and bacteria. Two specific components of concern are acrylonitrile and hydrogen cyanide. Acrylonitrile is a substance that is absorbed via the skin and lungs and is known to liberate hydrogen cyanide. Hydrogen cyanide can be absorbed through the skin, gastrointestinal system and the lungs, and can inhibit cellular oxygenation, thus inhibiting tissue oxygenation processes (Barret & Garber 2004). As a result of this it is recommended that specific smoke evacuators with ultra-low penetrating air filter(s) are used to remove this plume from the perioperative environment (AORN 2008).
- The filters for these machines must be checked and changed as per the manufacturer's recommendations.
- As a second, less efficient option, piped fluid suction units can be used to vent to the atmosphere outside the operating room. However, care should be taken that filters do not become blocked as this will reduce the suction power of the device.
- Free standing fluid suction units must not be used for smoke evacuation as they do not have particulate filters and will therefore only disperse the smoke throughout the operating room.
- High filtration face masks should be worn in all procedures that produce surgical plume to minimise the inhalation of carbonaceous particles (Hughes & Hughes 2001, Biggins & Renfree 2002).

5.6 Safe Practice

- It is the responsibility of the user to ensure that the equipment that is being used is suitable for the task.
- The electrosurgery values requested by the surgeon should be relayed verbally to the surgeon when set and acknowledged as correct verbally and visually before operation of the electro surgical equipment.
- Pre-gelled, self-adhesive, split-section patient plates using REM/CQM monitoring are recommended.
- Single use return electrodes should only be used once, per patient.
- All connections must be secure before the start of surgery.
- The activation of the active electrode is the responsibility of the surgeon, first assistant or a trained non-medical surgical practitioner.
- The active electrode should be housed in an insulated container and kept well away from the operative field except when in use.
- The user should be responsible for ensuring the electrode is returned to a place of safety, such as the quiver.
- The electrosurgical generator or unit should be switched off or set to standby before touching the live electrode terminal.
- Discussions on the use of electro surgery and the requirements of this equipment should be undertaken at the appropriate points during the WHO Surgical Safety

Checklist. This includes the discussion of any patient issues that affect the application and use of electro surgical equipment, such as pacemakers, electronic tags or procedure specific considerations.

5.7 Safeguards for Patients

- The return electrode (patient plate) should be cited as close as possible to the operative site and should not be placed on sites that contain implants or prosthesis.
- The return electrode site should be free from hair, skin blemishes, lesions or scars. It should also be sited over a vascular, muscular area such as the buttocks, upper or lower legs, stomach, back or arms.
- The return electrode must remain in direct and complete contact with the patient's skin to ensure a safe return pathway for the current. If the REM or CQM alarm sounds or the patient is moved during surgery, it is necessary to recheck the return electrode site.
- The return electrode should also remain dry during surgery and precautions should be taken to prevent pooling of inflammable liquids in any cavity under the patient's body, or under the return electrode itself.
- The patient's body should not meet with earthed metal objects such as the operating table base, trolleys, drip stands and mayo tables.
- The audible activation sound must be maintained at an appropriate level for the environment so it can be heard by the surgeon and the peri-operative team.
- Skin condition should be checked immediately before and after surgery as well as prior to leaving the peri-operative setting, and this should be documented appropriately.
- The site of the return electrode should be recorded in the patient's peri-operative record, along with any other comments relating to the electro surgery.
- All necessary precautions should be taken for patients with medical devices such as pacemakers and internal cardiac defibrillators.

5.8 Handling Electronically Tagged Patients

- The AfPP guidelines recommend that contact is made with the electrosurgical equipment manufacturer to ascertain their advice with regards to the use of their equipment in this group of patients.
- At the same time contact the prison or offenders' institution to find out the name of the electronic tag supplier so that if necessary both groups can have a dialogue and provide advice on this.

6. Implementation and Dissemination

6.1 Plan for implementation

This policy will be implemented and disseminated through the theatre communication routes to include staff meetings and the 8am huddles.

6.2 Dissemination

All theatre policies will be located and stored on the electronic document library and there will be links to them from the theatre intranet homepage.

6.3 Training & Awareness

Training will also be given on the use of all diathermy machines across theatres countywide.

7. Monitoring and compliance

- Any diathermy related incidents will be recorded through the Datix system.
- All training will be refreshed every three years, through face-to-face training or self-declaration of competence and will be recorded in the theatre medical devices passport.
- Theatres should conduct their own audit to monitor compliance with this policy and ensure strict adherence where appropriate.

8.0 Policy Review

This Policy will be reviewed every three years, or when deemed necessary.

9.0 References

	Code:
Association of Peri Operative Registered Nurses 2008 Perioperative Standards and Recommended Practices Denver, AORN Inc	
Barrett W, Garber S M 2004 Surgical smoke - a review of the literature Business Briefing: Global Surgery 1-7	
AfPP Principles of Safe Practice in the Perioperative Environment (2015)	

10 Background

10.1 Equality requirements

No impact

10.2 Financial risk assessment

No impact

10.3 Consultation

The countywide theatres management team will have the opportunity to comment and make alterations to the policy.

Contribution List

This key document has been circulated to the following individuals for a review and any updates.

Countywide Theatre Matrons (WRH/AGH/KTC).
WRH Theatre Managers.
AGH Theatre Managers.
KTC Theatre Managers.

Countywide Theatres Quality & Governance Team Leader.
Clinical Lead for Governance in Theatres & Anaesthetics.

This policy has been circulated to the chair(s) of the following committee's / groups for comments.

Committee
SCS Division Quality Governance
Theatre User Safety Committee
Trust Infection Prevention Control Committee
Health & Safety Committee

9.4 Approval Process

This policy has been sent to the countywide theatre management team for review and discussion, as well as the divisional governance meeting for approval and ratification.

Supporting Document 1 - Equality Impact Assessment Tool

To be completed by the key document author and included as an appendix to key document when submitted to the appropriate committee for consideration and approval.

Please complete assessment form on next page;

Worcestershire Acute Hospitals NHS Trust

Worcestershire Acute Hospitals NHS Trust

Herefordshire & Worcestershire STP - Equality Impact Assessment (EIA) Form
Please read EIA guidelines when completing this form

Section 1 - Name of Organisation (please tick)

Herefordshire & Worcestershire STP		Herefordshire Council		Herefordshire CCG	
Worcestershire Acute Hospitals NHS Trust	x	Worcestershire County Council		Worcestershire CCGs	
Worcestershire Health and Care NHS Trust		Wye Valley NHS Trust		Other (please state)	

Name of Lead for Activity	Rebecca Price

Details of individuals completing this assessment	**Name**	**Job title**	**e-mail contact**
	Rebecca Price	Countywide Theatres Quality & Governance Team Leader	rebecca.price9@nhs.net
Date assessment completed	24/01/2025		

Section 2

Activity being assessed (e.g. policy/procedure, document, service redesign, policy, strategy etc.)	**Title:** Electro Surgery Theatre Policy			
What is the aim, purpose and/or intended outcomes of this Activity?	To outline the best practise, safe use and potential risks associated with the use of diathermy across our countywide theatre departments.			
Who will be affected by the development & implementation of this activity?	❑	Service User	x	Staff
	x	Patient	❑	Communities
	❑	Carers	❑	Other _____
	❑	Visitors	❑	

Is this:	x Review of an existing activity ❑ New activity ❑ Planning to withdraw or reduce a service, activity or presence?
What information and evidence have you reviewed to help inform this assessment? (Please name sources, eg demographic information for patients / services / staff groups affected, complaints etc.	This policy is in line with national guidelines.
Summary of engagement or consultation undertaken (e.g. who and how have you engaged with, or why do you believe this is not required)	This policy is in line with national guidelines. Input was requested from the Theatre Managers countywide, and the Theatre Matrons countywide.
Summary of relevant findings	No adverse impact identified.

Section 3

Please consider the potential impact of this activity (during development & implementation) on each of the equality groups outlined below. **Please tick one or more impact box below for each Equality Group and explain your rationale**. Please note it is possible for the potential impact to be both positive and negative within the same equality group and this should be recorded. Remember to consider the impact on e.g. staff, public, patients, carers etc. in these equality groups.

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Age		x		
Disability		x		
Gender Reassignment		x		
Marriage & Civil Partnerships		x		
Pregnancy & Maternity		x		
Race including Traveling Communities		x		
Religion & Belief		x		
Sex		x		

Equality Group	Potential positive impact	Potential neutral impact	Potential negative impact	Please explain your reasons for any potential positive, neutral or negative impact identified
Sexual Orientation		X		
Other Vulnerable and Disadvantaged Groups (e.g. carers; care leavers; homeless; Social/Economic deprivation, travelling communities etc.)		X		
Health Inequalities (any preventable, unfair & unjust differences in health status between groups, populations or individuals that arise from the unequal distribution of social, environmental & economic conditions within societies)		X		

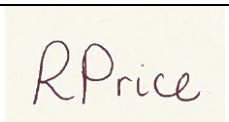
Section 4

What actions will you take to mitigate any potential negative impacts?	Risk identified	Actions required to reduce / eliminate negative impact	Who will lead on the action?	Timeframe
	n/a	**n/a**	**n/a**	**n/a**
How will you monitor these actions?	**n/a**			
When will you review this EIA? (e.g in a service redesign, this EIA should be revisited regularly throughout the design & implementation)	**At each policy review.**			

Section 5 - Please read and agree to the following Equality Statement

1. Equality Statement

1.1. All public bodies have a statutory duty under the Equality Act 2010 to set out arrangements to assess and consult on how their policies and functions impact on the 9 protected characteristics: Age; Disability; Gender Reassignment; Marriage & Civil Partnership; Pregnancy & Maternity; Race; Religion & Belief; Sex; Sexual Orientation
1.2. Our Organisations will challenge discrimination, promote equality, respect human rights, and aims to design and implement services, policies and measures that meet the diverse needs of our service, and population, ensuring that none are placed at a disadvantage over others.
1.3. All staff are expected to deliver services and provide services and care in a manner which respects the individuality of service users, patients, carer's etc, and as such treat them and members of the workforce respectfully, paying due regard to the 9 protected characteristics.

Signature of person completing EIA	
Date signed	24/01/2025
Comments:	n/a
Signature of person the Leader Person for this activity	
Date signed	24/01/2025
Comments:	n/a

Supporting Document 2 – Financial Impact Assessment

To be completed by the key document author and attached to key document when submitted to the appropriate committee for consideration and approval.

	Title of document:	**Yes/No**
1.	Does the implementation of this document require any additional Capital resources	No
2.	Does the implementation of this document require additional revenue	No
3.	Does the implementation of this document require additional manpower	No
4.	Does the implementation of this document release any manpower costs through a change in practice	No
5.	Are there additional staff training costs associated with implementing this document which cannot be delivered through current training programmes or allocated training times for staff	No
	Other comments:	

If the response to any of the above is yes, please complete a business case and which is signed by your Finance Manager and Directorate Manager for consideration by the Accountable Director before progressing to the relevant committee for approval.