

Hazards of diathermy

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Burns These are the most common type of diathermy accidents and occur when the current flows in some way other than that which the surgeon intended; they are far more common in (b) monopolar than bipolar diathermy. Diathermy can also cause thermal injury to the surgeon and theatre staff. These may occur as a result of: /uni25CF Faulty application of the indifferent electrode (footplate) with an inadequate contact area. /uni25CF The patient being earthed by touching any metal object, e.g. the Mayo table, the bar of an anaesthetic screen or - a leg touching the metal stirrups used in maintaining the lithotomy position. /uni25CF Faulty insulation of the diathermy leads. /uni25CF Inadvertent activity such as the accidental activation of the diathermy or accidental contact of the active electrode with other metal instruments, such as retractors or towel clips. A hole in the glove can also result in burns to the fingers, double gloving may help prevent this.

Diathermy unit Active cable Two small active electrodes (b) Bipolar diathermy /uni00A0 Bipolar diathermy.

Figure 7.19 (a) (b) Electrocution Today, diathermy machines are manufactured to very high safety standards, which minimise the risk. However, as with any electrical instrument, there must be regular and expert servicing. **Explosion** Sparks from the diathermy unit can ignite volatile or inflammable gas or fluid within the theatre. Alcohol-based skin preparation can catch fire if allowed to pool on or around the patient. It may be difficult to detect these flames early on as they may be invisible under the bright operating theatre lights. **Channelling** Channelling of current happens when current is applied to tissues that have a narrow stalk, resulting in a 'bottleneck' causing current to concentrate and thereby damage or char tissue. Channelling is also used to describe a phenomenon wherein distant tissues may be affected if current contacts and then travels through tissue, resulting in unintentional coagulation of distant tissue. For example: /uni25CF coagulation of the penis in a child undergoing circumcision; /uni25CF coagulation of the spermatic cord when the electrode is applied to the testis. In such situations, diathermy should not be used; if it is necessary, then bipolar diathermy should be employed. **Interference with implantable electronic devices** Diathermy currents can interfere with the working of a gastric or cardiac pacemaker, implantable cardioverter defibrillator, cochlear implants, etc. The use of an ultrasonic scalpel and bipolar diathermy are relatively safer; it may be prudent to liaise with the cardiology team and the anaesthetist pre-emptively in /uni00A0 such circumstances. **Occupational hazard from surgical smoke** - Viral particles, bacteria, respiratory and ophthalmic irritants and carcinogens have been identified in surgical smoke from diathermy devices. Universal precautions, smoke evacuation systems or simple suction devices can be used to minimise the risk to theatre personnel.

(b) Cutting and coagulation of tissue using monopolar diathermy (courtesy of Dr Vinay Timothy Kuruvilla).

Diathermy burns are a particular hazard in laparoscopic surgery owing to a relative lack of visibility of the entire instrument. Such burns may occur by: /uni25CF faulty insulation of any of the laparoscopic instruments or equipment; /uni25CF intraperitoneal contact of the diathermy with another metal instrument while activating the pedal (direct coupling); /uni25CF inadvertent activation of the pedal while the diathermy tip is out of the vision of the camera; /uni25CF retained heat in the diathermy tip touching susceptible structures, such as the bowel. Hazards of diathermy

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Revision #1

Created 2025-12-31 15:25:58 UTC by Omar Ayman

Updated 2025-12-31 15:25:58 UTC by Omar Ayman