



Dr Franz Strydom

General Practitioner

Tauranga

Surgitron Demonstration - Concurrent Workshop Repeated

Saturday, 17 August 2013

Start 8:30am

Duration: 55mins

Kremlin

Start 9:35am

Duration: 55mins

Kremlin



South GP CME 2013

General Practice Conference & Medical Exhibition

15-18 August | Edgar Centre | Dunedin

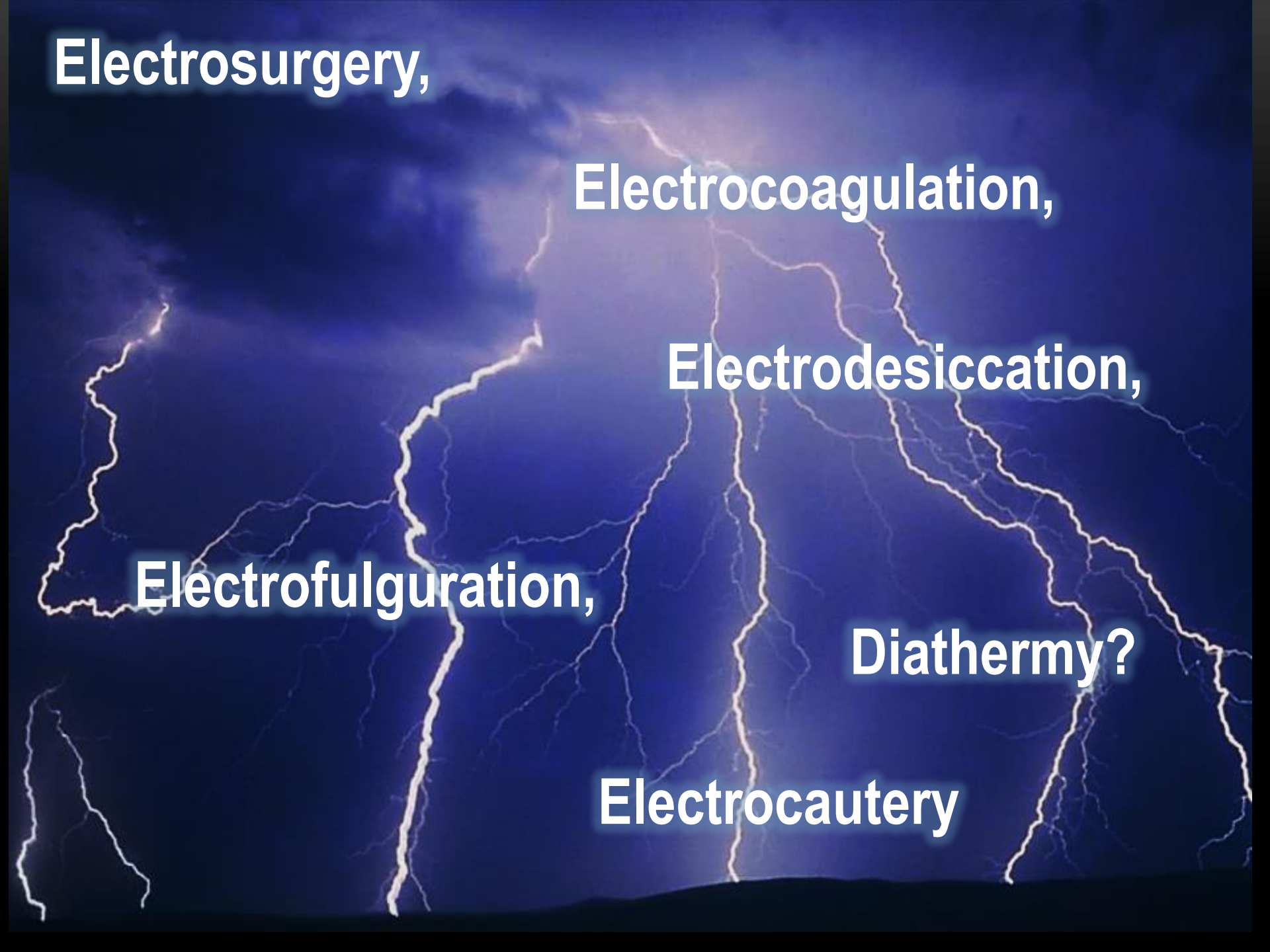
ELECTROSURGERY

Dr. Franz Strydom

Skinspots skin cancer clinic

Tauranga





Electrosurgery,

Electrocoagulation,

Electrodesiccation,

Electrofulguration,

Diathermy?

Electrocautery

ELECTROCONFUSION





HISTORY

- 1910, William Clark Under the micro- scope, he observed that tissues subjected to this current shrunk from dehydration. In 1914, he used the term dessication
- Bovie constructed a diathermy unit that produced high-frequency current delivered by a “cutting loop” to be used for cutting, coagulation, and dessication. The first use of his apparatus in an operating room in Boston



ELECTROSURGERY

ETYMOLOGY: GK, ELEKTRON + CHEIOURGOS, SURGEON

- The surgical division of tissues by high frequency electrical current applied locally with a metal instrument or needle i.e. Cutting
- The surgical use of high-frequency electric current for cutting or destroying tissue i.e. electrocauterization.
- This is accomplished by converting the electrical energy into heat through tissue resistance to the passage of the electrical current.



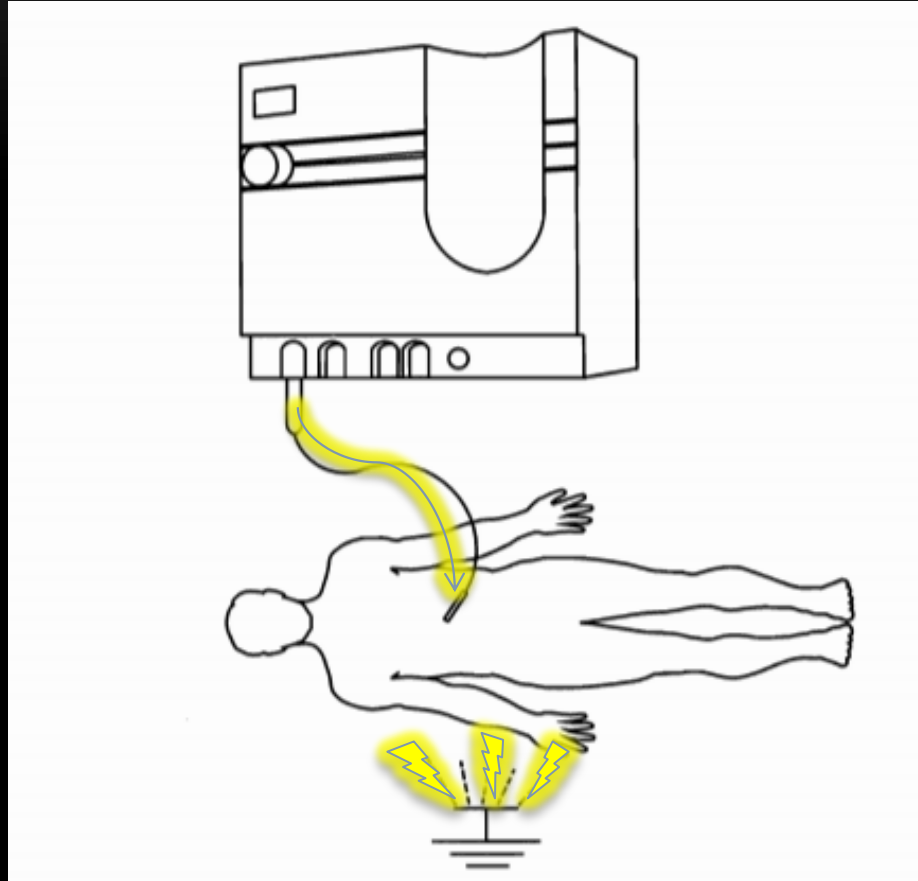
PROPERTIES OF ELECTRICITY

- CURRENT = Flow of electrons during a period of time, measured in amperes
- CIRCUIT = Pathway for the uninterrupted flow of electrons
- VOLTAGE = Force pushing current through the resistance, measured in volts
- RESISTANCE = Obstacle to the flow of current, measured in ohms
(impedance = resistance) **HEAT**

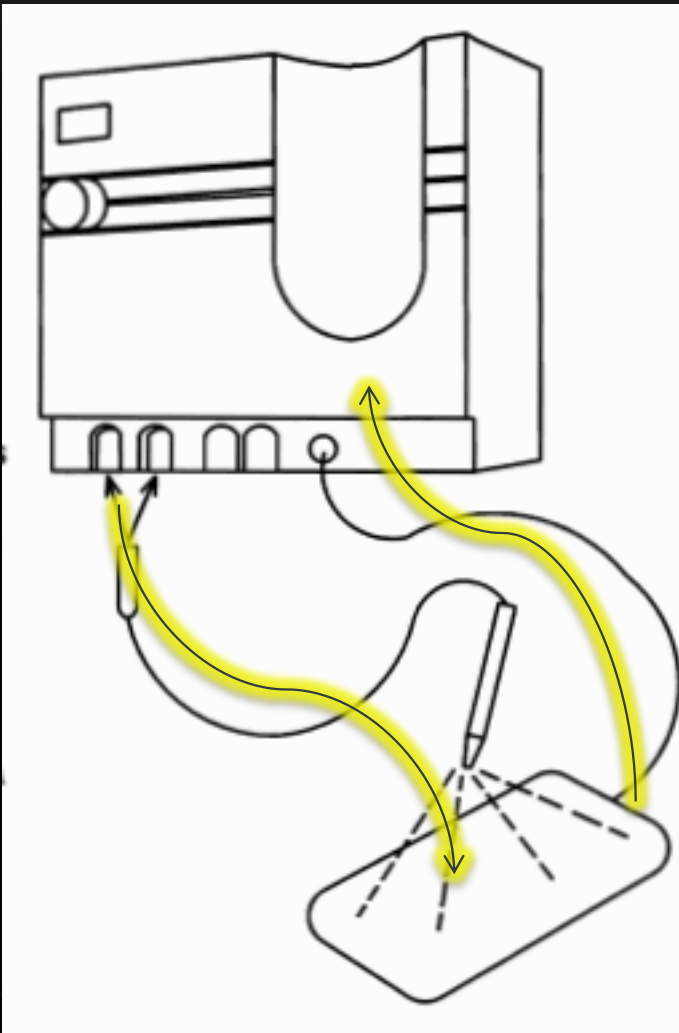
HEAT



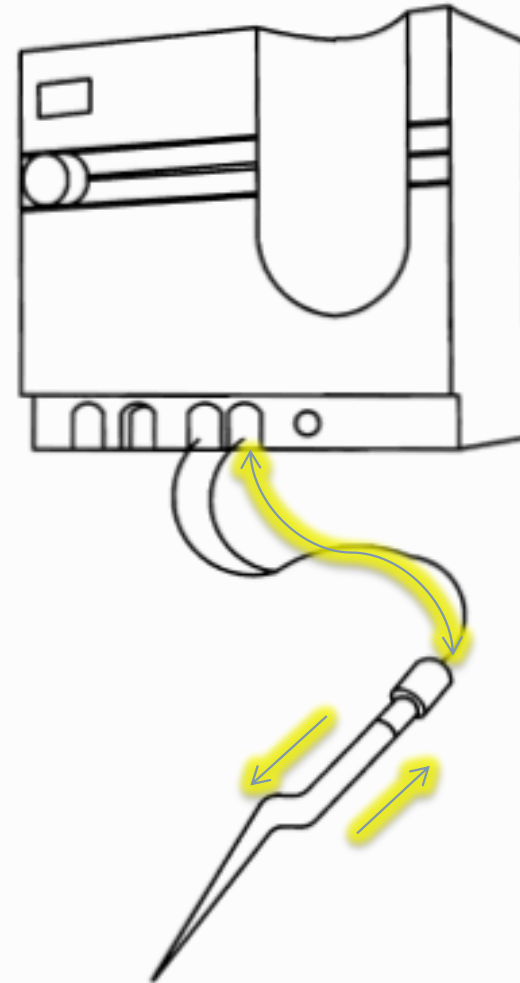
Hyfrecator



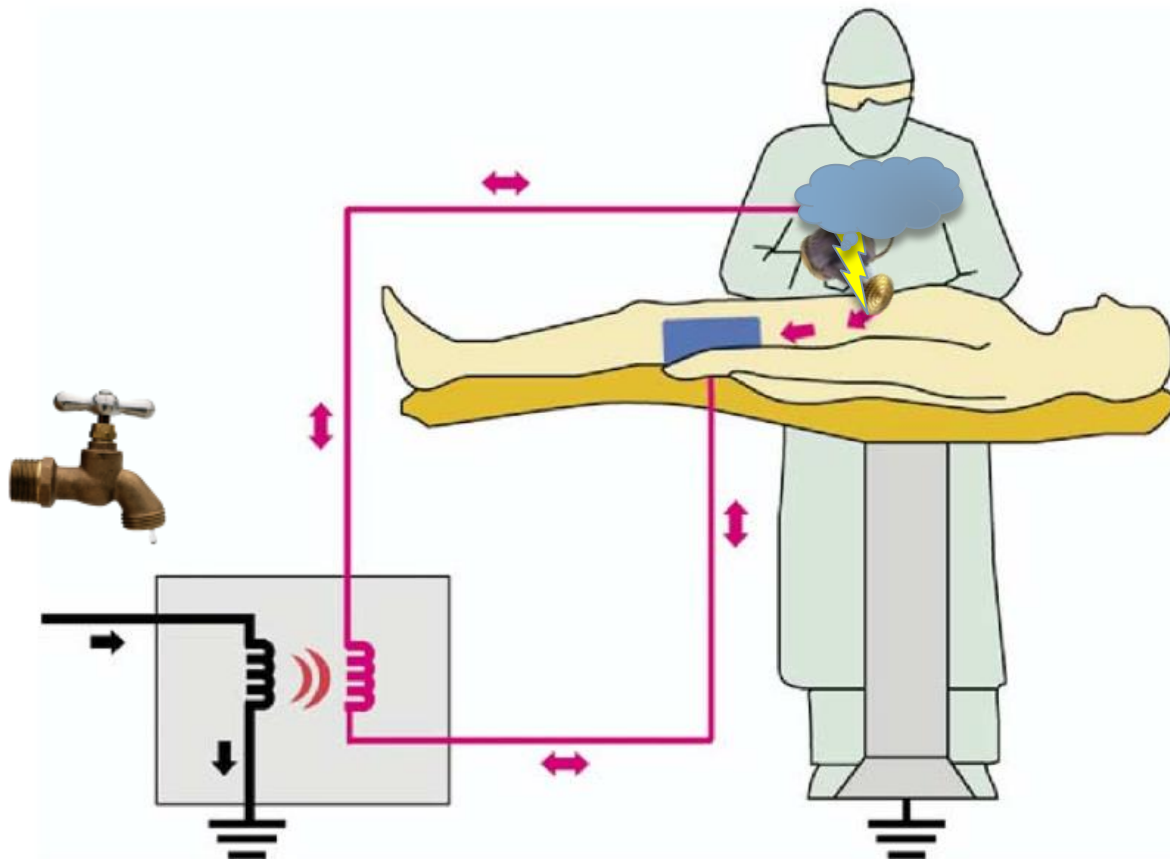
Monopolar



Bipolar



ELECTROSURGERY

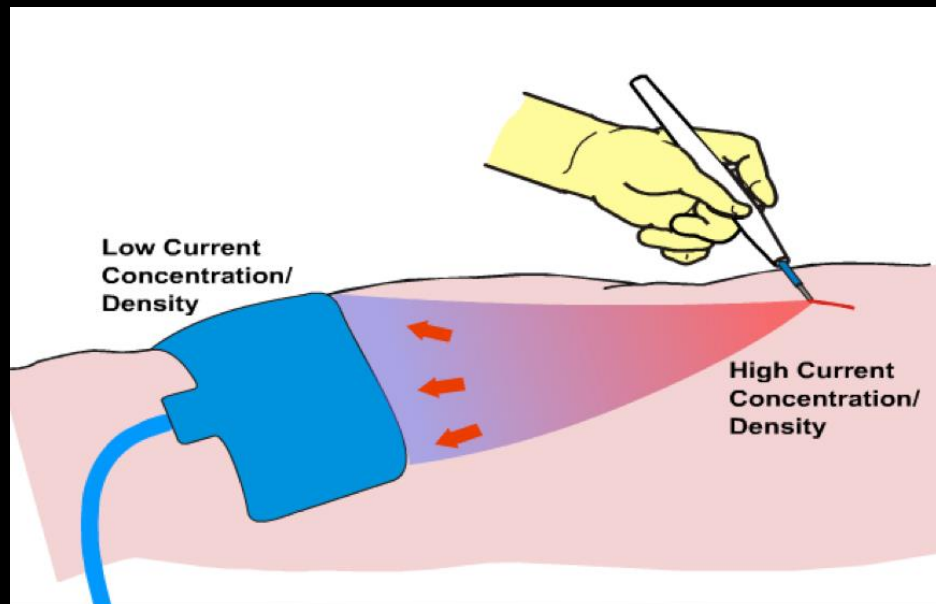


Isolated generator circuit.

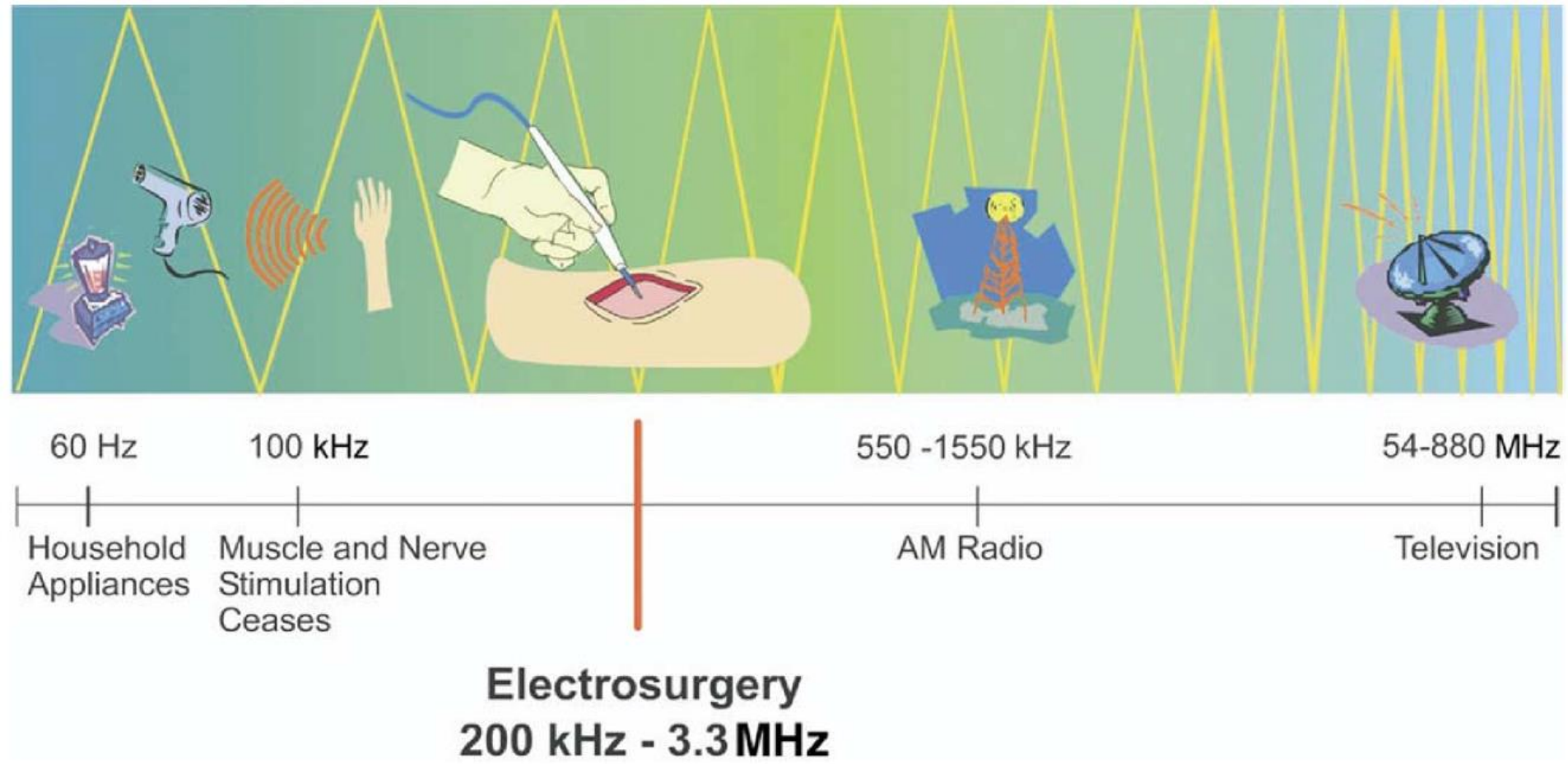
The transformation of electrical energy into heat occurs in accordance with Joules Law and can be expressed by the following formula:

HEAT
HEAT

Energy = (current/cross-sectional area)² x resistance x time



AC CURRENT

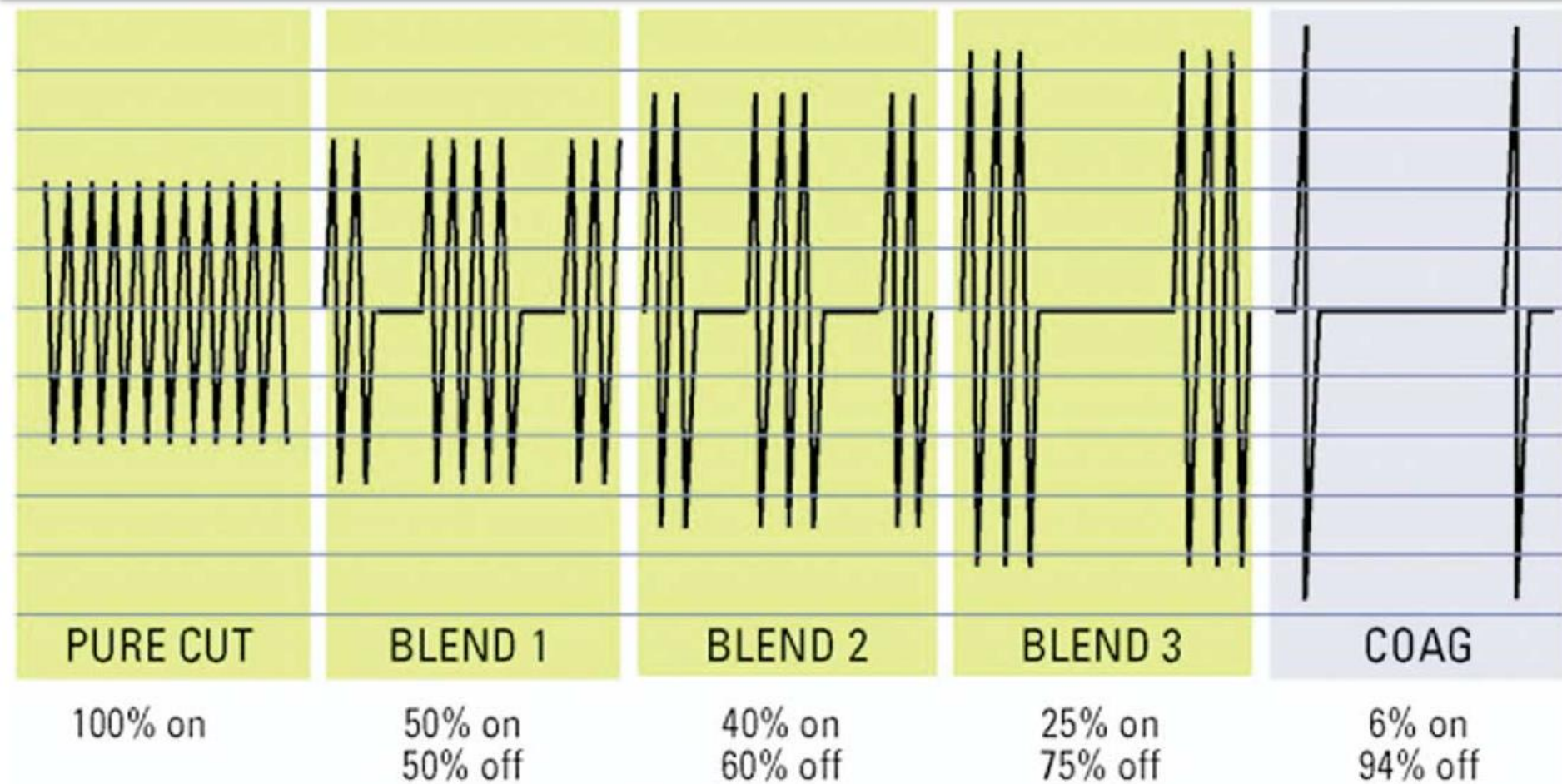


CUTTING VERSUS COAGULATION

- Different waveforms create different tissue effects
- Cutting current
 - Constant waveform
 - Heat produced quickly – vaporisation of tissue
 - Lower voltage
- Coagulation current
 - Intermittent waveform allows dispersion of heat
 - Less heat produced – coagulum rather than vaporisation
 - Higher voltage

CUTTING VERSUS COAGULATION

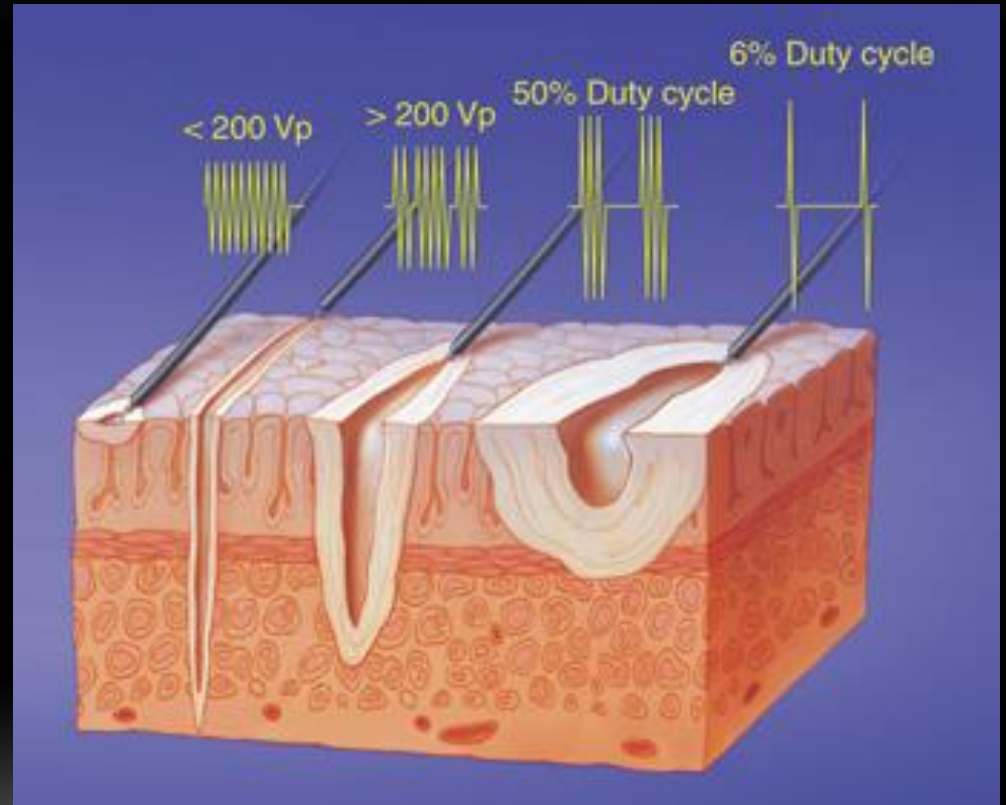
- Different waveforms create different tissue effects
 - Cutting/fulguration/dessication
 - Cutting –producing maximal current density vaporising tissue
 - Fulguration – sparking with coagulation waveform, char and coagulum over wide area
 - Dessication – contact with tissue. Current density reduced – cell drying
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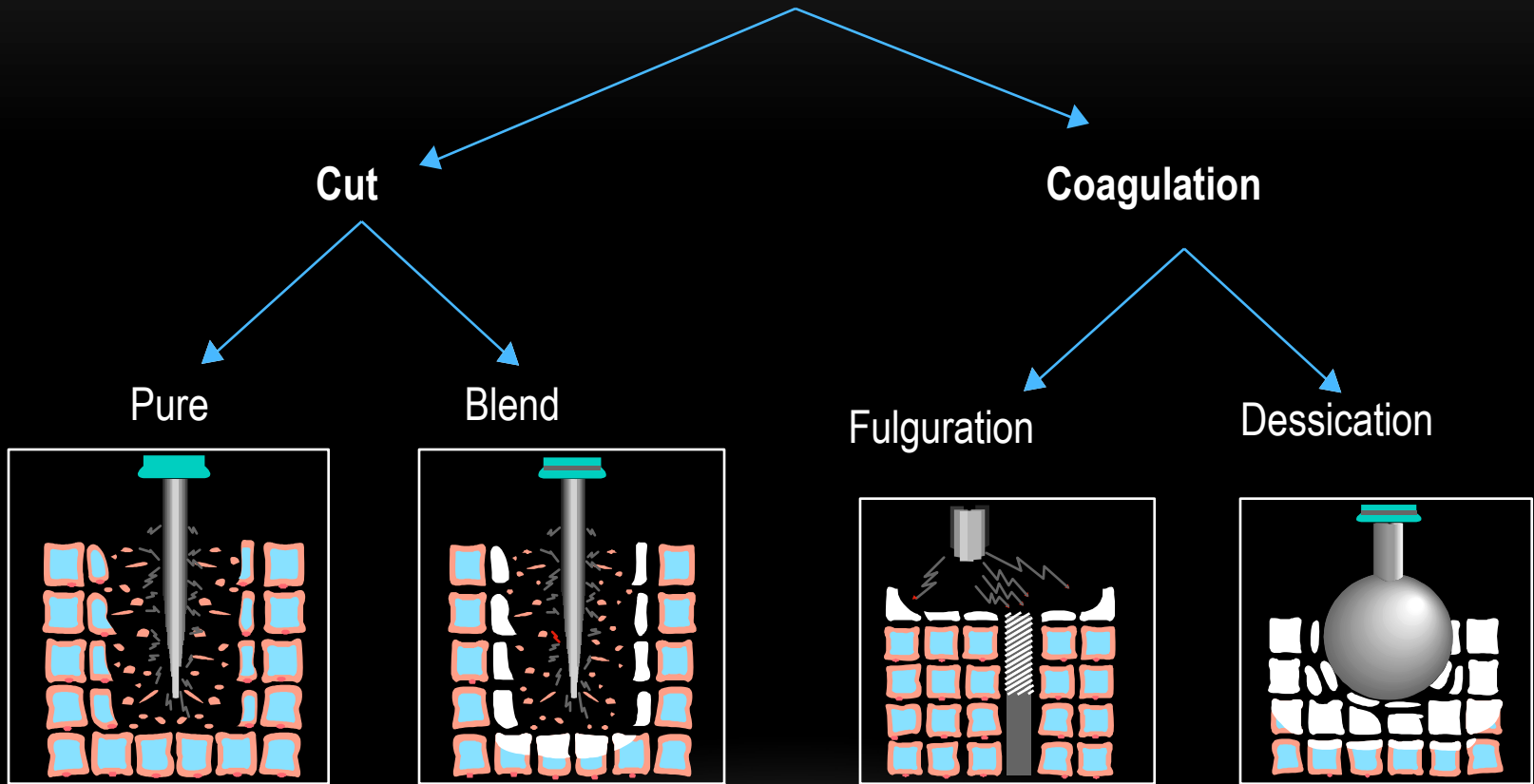


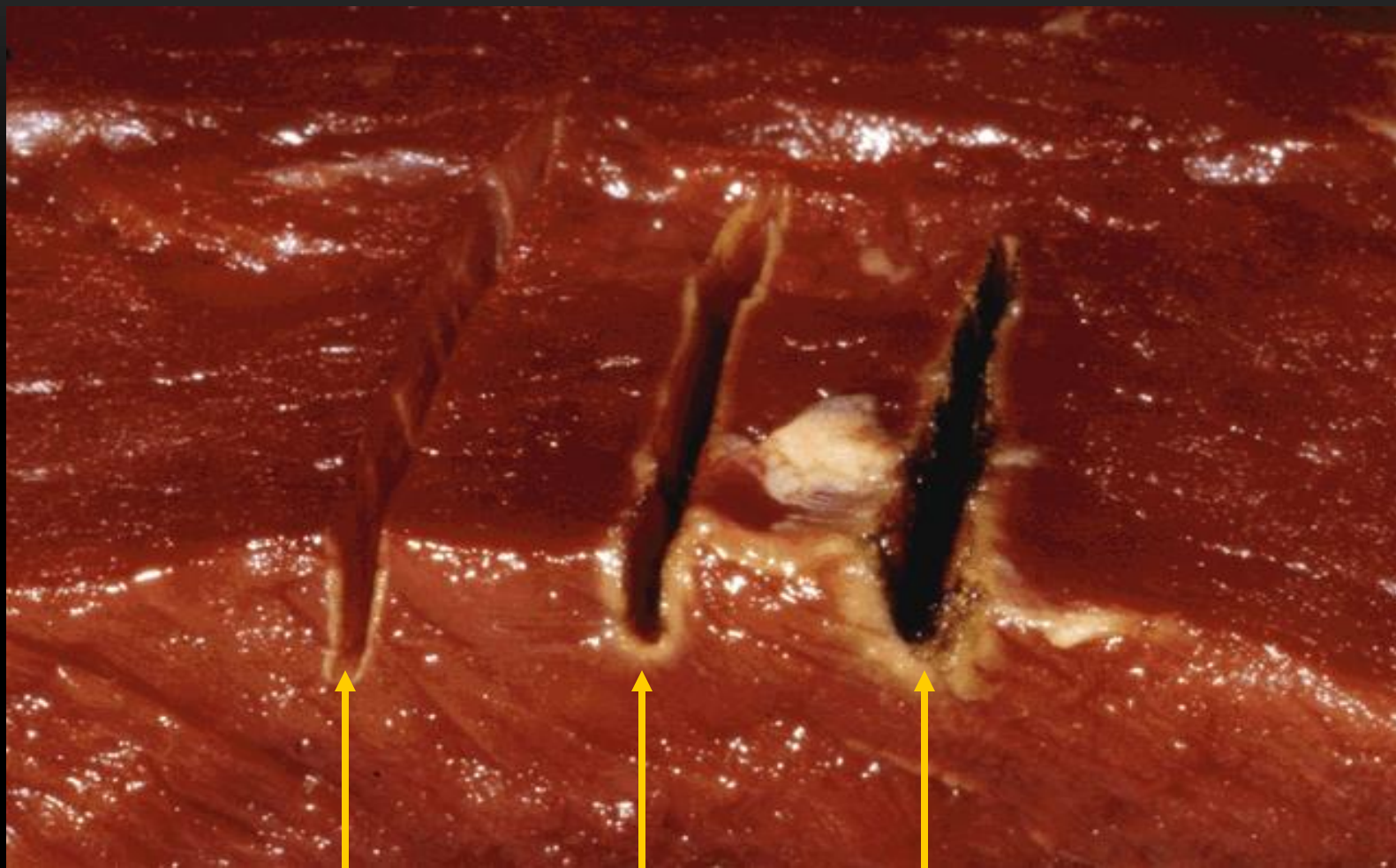
CUTTING VERSUS COAGULATION

- Different waveforms create different tissue effects
- Blends
 - Modification of on/off time
 - Blend 1 50/50 (on/off)
 - Blend 2 40/60
 - Blend 3 25/75
 - Coagulation 6/94



ELECTROSURGERY





Pure cut

Blend

Fulguration/non contact coag

ELECTROSURGERY COMPLICATIONS

- Relatively common, occurring in 2 to 5 per 1000 procedures.
- Severe burns can occur if the dispersive electrode pad becomes partially detached from the patient. increased current density on the smaller surface area of the skin. (return electrode monitoring system)
- Patients with electrical implants require special precautions, especially when using monopolar devices.
- Cautery Smoke – irritating and dangerous

PATIENTS & ELECTRODES

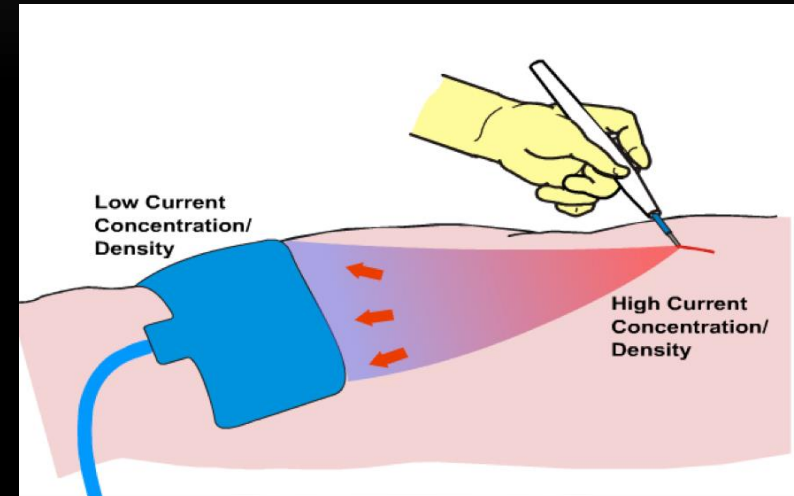


SMOKE PLUME

- The smoke plume contains potentially toxic substances.
 - In high concentrations, these substances can irritate the eyes and respiratory tract
 - Can transmit viruses.
-
- For this reason, smoke should be captured and evacuated using suction and smoke evacuation devices.

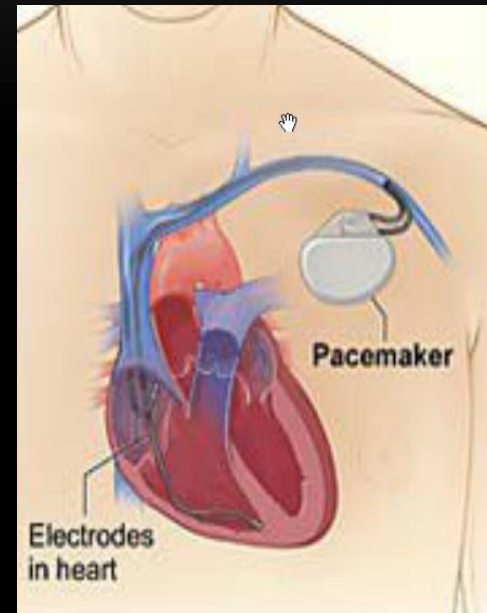
PATIENT RETURN ELECTRODES

- Position plate as close to surgical site as possible
- Prevent poor patient plate contact
 - bony prominences.
 - fluid invasion,
 - adhesive failure.
 - scar tissue
 - Excessive Hair at return electrode plate
- Break in the return cable
- Detached return cable
- Ignition of flammable material on pt's skin
- Abnormally high power setting



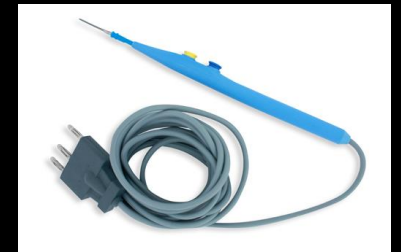
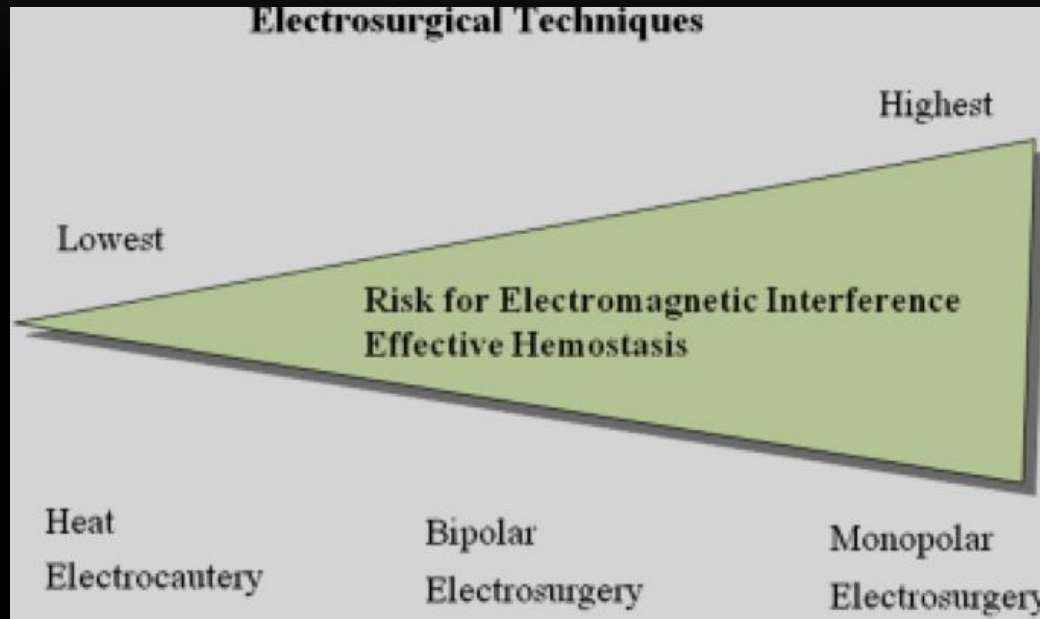
Electrosurgery and Implantable Electronic Devices

- Cardiac Pacemakers
- Implantable Cardioverter Defibrillators
- Cochlear Implants
- Deep Brain Stimulators
- Vagal Nerve Stimulators
- Sacral Nerve Stimulators
- Phrenic Nerve Stimulators
- Spinal Cord Stimulators
- Gastric Pacemaker

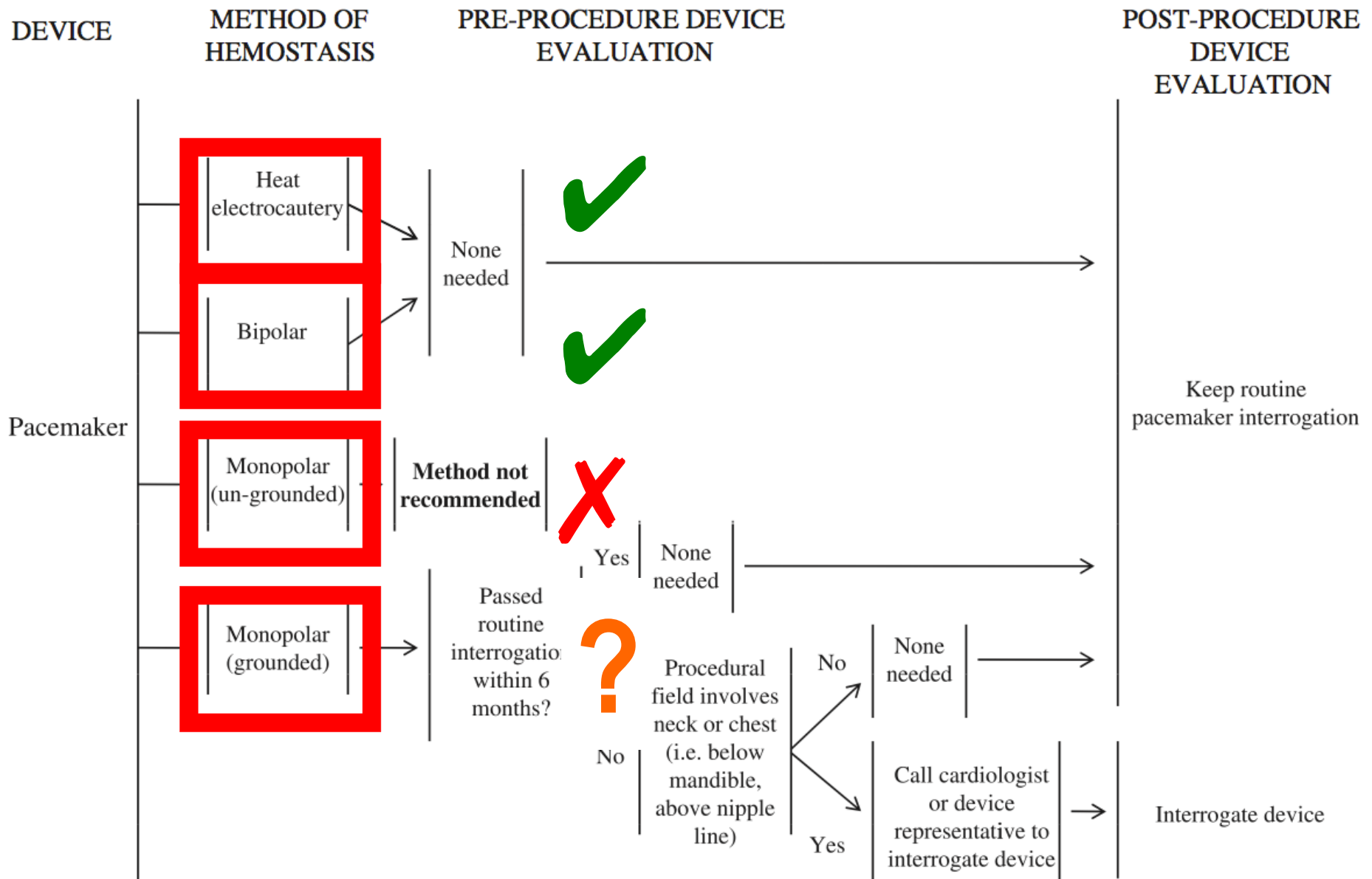


- Electrosurgery and Implantable Electronic Devices: Review and Implications for Office-Based Procedures
Dermatol Surg 2011;37:889–899

ELECTROSURGERY AND IMPLANTABLE ELECTRONIC DEVICES



Consultation with a cardiology or pacemaker service



GENERAL ADVICE

- Use lowest effective possible power setting
- Use a low voltage waveform (cut)
- Use brief, intermittent activation
- Do not activate in close proximity or direct contact with another instrument
- Use bipolar electrosurgery where appropriate
- Use a return electrode monitoring system
- The disappearance of water vapor is a good guide for deciding when to stop the application of bipolar electrosurgical energy