

## Purpose:

All surgical smoke is appropriately evacuated from the theatre environment to ensure a safe working environment for Theatre personnel.

To ensure that theatre personnel are competent to use approved smoke evacuation systems employed when smoke is generated.

## Policy Applies to:

All Theatre personnel working in Mercy Hospital theatres.

## Related Standard:

- New South Wales Ministry of Health Guidelines *“Work Health and Safety- Controlling Exposure to Surgical Plume,”* 2015
- AORN. (2017) *Guidelines for Perioperative Practice*
- Health & Safety at Work Act 2015
- NZS8134:2021 Nga Paerewa: Health and Disability Services; Standard 2.2.4 Risk identification and management

## Rationale:

Surgical smoke generated during surgical cases is potentially hazardous and must be captured and filtered through the use of smoke evacuators or in-line filters positioned on suction lines.

Surgical smoke (plume) can contain toxic gases and vapours such as benzene, hydrogen cyanide, and formaldehyde along with bio aerosols, dead and live cellular material (including blood fragments), and viruses. At high concentrations, surgical smoke can cause ocular and upper respiratory tract irritation in healthcare workers and can create obstructive visual problems for the surgeon.

Surgical smoke has unpleasant odours and has been shown to have mutagenic potential.

## Cultural Considerations

No cultural considerations identified.

## Definitions:

Surgical smoke is created as a result of the destruction of tissue by electro-surgical units (ESUs).

## Objectives:

- To ensure all smoke is appropriately evacuated by using approved evacuation systems when surgical smoke is generated.
- To ensure that staff are trained in the use of smoke plume evacuation including diathermy.

### Implementation:

All theatres are equipped with smoke evacuation systems and perioperative teams must select the smoke evacuation method that is appropriate for each surgical procedure.

All Credentialed Specialists, Perioperative Nurses, Anaesthetic Technician and Surgical Assistants (Theatre Personnel) will be informed of the hazards of surgical smoke and the smoke evacuation methods via new staff orientation, hazard register, talking wall notices, electro-surgical smoke evacuation policy and resource folder.

Perioperative Nurses/Anaesthetic Technicians will complete an electro-surgical smoke evacuation competency every two years. This includes diathermy.

### Surgical procedures which generate small amounts of plume

- e.g.
- Tonsillectomy
  - Nasal procedures
  - Ear surgery
  - Carpal Tunnel
  - Discectomy
  - Skin Lesion
  - Breast Biopsy

A handheld suction device must be positioned no further than 5.00cm from the site of plume production and shall be used in conjunction with an in-line filter (0.1 micron filtration capability) positioned between the wall suction and the suction canister. Close proximity of the smoke evacuation wand maximises particulate matter and odour capture and enhances visibility at the surgical site.

A suction tubing of no longer than 2 metres in length will be used with a handheld suction device

The Nursing team are responsible for changing inline filters in accordance with manufacturer's recommendations. This is part of their routine maintenance checklist.

### Note:

Wall suction devices have a low suction power which can limit the efficiency of smoke plume evacuation but are suitable for minimal plume evacuation

### Surgical procedures which generate large amount of plume

Where surgical procedures generate a large amount of plume, a smoke evacuator will be used: e.g.:

- Abdominal surgery
- Breast reduction surgery
- Large extremity surgery
- Cardiothoracic surgery
- Neck surgery

- Spinal fusions
- Joint replacement surgery
  
- A handheld smoke evacuation pencil will be connected directly to the smoke evacuation filter and unit
  
- Standard suction tubing with a handheld suction device will only be used to evacuate fluid
  
- The smoke evacuator filter will be changed in accordance with manufactures recommendations

### **Laparoscopic surgery**

Laparoscopic surgery must be performed in a manner that minimises the Theatre personnel's exposure to blood, fluids, droplets, noxious fumes, gases, or surgical smoke. The release of gas and ESU smoke during endoscopic surgery exposes the surgical team to the hazards of surgical smoke

- Surgical smoke must be evacuated throughout the laparoscopic procedure by using a laparoscopic smoke evacuation device and by following the manufactures recommendations
  
- The smoke evacuation device should have a 0.1-micron filtration capacity
  
- A closed system must be used when releasing insufflated gases. The release of the pneumoperitoneum should be performed using a closed system which may involve a 0.1 micron in-line filter on the suction line, a smoke evacuation system that employs suction/irrigation probe or a smoke evacuator equipped to manually release insufflated gases

### **Equipment disposal**

Single use smoke evacuation equipment that is contaminated will be disposed of in the hazardous waste stream.

### **Personal Protective Equipment**

A high filtration mask (0.1micron filtration) must be worn to protect against any residual smoke particulate matter that has not been evacuated. Wearing a high filtration mask must not replace the need to use a smoke evacuation system to remove the surgical smoke from the environment. The high filtration mask must fit snugly around the face.

### **Electrosurgical smoke evaluation competency**

Theatre staff will complete the following biannually –

1. Read the Electrosurgical Plume Evacuation guidelines (SharePoint)
2. Complete the Clinical Competency: Electrical Safety Course on Tautoko within 3 months of starting in theatre

## Evaluation

- Compliance with smoke plume and diathermy policy in each theatre will be monitored by the Theatre Clinical Lead and Senior Nursing staff on a daily basis. Failure to comply will prompt a professional conversation
- Training records will reflect every two years competency update.
- Hazard register
- Credentialing process records
- Incident forms
- Equipment service maintenance

## Associated Documents

### *External*

- Health and Safety at Work Act, 2015
- New South Wales Ministry of Health Guidelines “*Work Health and Safety- Controlling Exposure to Surgical Plume*” January, 2015  
[http://www.health.nsw.gov.au/policies/gl/2015/pdf/GL2015\\_002.pdf](http://www.health.nsw.gov.au/policies/gl/2015/pdf/GL2015_002.pdf).
- International Council on Surgical Smoke Plume <http://www.plumecouncil.com/>

### *Internal*

- Theatre Hazard register
- Hazard Management policy
- Waste Management policy
- Personal Protective Equipment Apparel
- Credentialed Specialists Health & Safety and IPC Orientation Checklist