

Policy Number: BD-00-11-40013
CA_6100

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Surgical Plume Evacuation Policy

Policy: A formal, clear, concise, and non-negotiable statement directing staff decision-making

1. Introduction

1.1. Description

Vancouver Coastal Health (VCH) and Providence Health Care (PHC) are smoke-free environments. This pertains to tobacco smoke and all harmful smoke, such as Surgical Plume, that put the health of its employees at risk.

Research confirms that Surgical Plume contains carcinogenic gases and vapours that can cause nausea, coughing, and irritation of the eyes and upper respiratory tract. In the operating room, Surgical Plume is created by the destruction of human tissues. Electrosurgical Units (ESUs) and lasers most frequently generate Surgical Plume, in addition to radio frequency devices, ultrasonic devices, power tools and other surgical tools.

This policy is intended to ensure that appropriate measures are taken to mitigate the risk of Surgical Plume exposure for VCH and PHC Clients and Staff, and to ensure that both organizations conform to all occupational health and safety regulations.

1.2. Scope

This is a joint policy between Vancouver Coastal Health (VCH) and Providence Health Care (PHC). This policy applies to all surgical procedures performed at VCH and PHC, as well as VCH and PHC medical clinics and offices using ESUs or lasers that produce Surgical Plume.

1.3. Exceptions

Smoke evacuation is not required where there is little to no Surgical Plume created. When the smoke evacuator unit impedes the safe conduct of surgery due to visualization or ergonomic issues, options for an alternative product need to be evaluated. In the event there is no alternative product available, surgical plume will be evacuated using wall suction with an in-line Ultra-Low Penetration Air (ULPA) filter.

ALL efforts should be made to provide smoke evacuation, including investigating alternate products for this purpose.

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2. Policy

VCH and PHC must comply with Section 5.55 of British Columbia's [Occupational Health and Safety Regulation](#), which requires that an employer eliminate or otherwise control an employee's exposure to hazardous substances, including Surgical Plume.

The Canadian Standards Association (CSA) requires that, if a facility employs techniques that involve the creation of Surgical Plume, the Surgical Plume shall be evacuated according to standard Z305.13-13 in order to protect Clients and Staff from exposure to Surgical Plume.

2.1. Use of Smoke Evacuators

In order to control exposure to Surgical Plume, a Smoke Evacuator must be used during any surgical procedure that produces Surgical Plume.

A Smoke Evacuator is meant for removal of Surgical Plume only, and must not be used for any other purpose (e.g. the purpose of fluid collection). The Smoke Evacuator must be positioned in close proximity to the site where the Surgical Plume is being generated, usually within 5 cm of the plume source.

Use of wall suction with an in-line Ultra-Low Penetration Air (ULPA) Filter can be used only where a Smoke Evacuator system is unavailable or authorized by a Workplace Health risk assessment.

Surgical masks are not protective against Surgical Plume and N95 respirators are not acceptable as the primary method of protection against occupational exposure for Surgical Plume.

Smoke Evacuators must be operated and maintained according to the manufacturer's written instructions, including filter replacement and disposal using bio-hazardous precautions. Smoke Evacuator units, pencils, and accessories shall be used as per manufacturer's recommendations. Alterations or disfigurement of Smoke Evacuator units, pencils, and accessories in whole, or in part, are not permitted.

2.2. Laparoscopic Surgery Procedure

A specialized laparoscopic Smoke Evacuator must be used during laparoscopic surgery in order to limit Client exposure to Surgical Plume.

The laparoscopic Smoke Evacuator device must have a 0.1 micron filtration capability.

2.3. Responsibilities

2.3.1. Perioperative Staff

It is the responsibility of all Perioperative Staff to ensure that Surgical Plume is minimized in the operating room in accordance with this policy.

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2.3.2. Surgeon

The surgeon is responsible for ensuring that a Smoke Evacuator is used during any of the surgeon's procedures where Surgical Plume may be produced. The surgeon must also ensure manufacturer's instructions for the Smoke Evacuator being used are followed.

2.3.3. Scrub Nurse

The scrub nurse is responsible for ensuring proper set up of the Smoke Evacuator in the surgical field, in accordance with the manufacturer's instructions.

2.3.4. Circulating Nurse

The circulating nurse is responsible for inspecting the Smoke Evacuator for electrical safety, filter patency and proper functioning before each use.

For VCH only, the circulating nurse is responsible for documenting the serial number or the identifying number of the Smoke Evacuation Unit on the intraoperative record for each procedure. If the Smoke Evacuator was not used, the circulating nurse must list a reason for not using the system on the intraoperative record.

2.3.5. Perioperative Manager

The perioperative manager is responsible for ensuring the documentation that provides evidence of employee training and competency in the use of Smoke Evacuators.

Perioperative managers will also establish and maintain a preventative maintenance schedule for Smoke Evacuators.

2.3.6. Staff not directly associated with the operating room

In VCH and PHC medical clinics or offices using ESUs or lasers which generate Surgical Plume, but are not directly associated with the operating room, the individual operating the Smoke Evacuator or the Most Responsible Provider (MRP) would be responsible for all of the responsibilities listed above for Perioperative Staff, surgeons, scrub nurses, circulating nurses and perioperative managers.

2.4 **Compliance**

The surgeon is responsible for ensuring that this policy is followed in operating rooms.

In VCH medical clinics or offices using ESUs or lasers, the Smoke Evacuator operator or MRP is responsible for ensuring compliance with this policy. Non-compliance will be reported to operating room leadership or management at medical clinics or offices, and Staff will not be provided in an operating room or other VCH facility where a Smoke

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Evacuator is not used. If a surgeon stops the use of the Smoke Evacuator halfway through a procedure in the operating room, then the Perioperative Staff will not be available for the next case.

PHC sites will determine their own escalation processes for non-compliance with this policy.

3. Supporting Documents and References

3.1. Related Policies

- [VCH Smoke-Free Premises](#)

3.2. Standards/Guidelines/Forms

- CSA Standard Z305.13-13: Plume scavenging in surgical, diagnostic, therapeutic, and aesthetic settings
- CSA Standard Z386-14: Safe use of lasers in health care

3.3. Definitions

“Client” means all people receiving care or services from VCH and includes patients and residents.

“Electrosurgical Unit (ESU)” refers to the machine used to delivery high frequency current to cut and coagulate human tissue.

“Most Responsible Provider (MRP)” means the physicians, nurse practitioner, or other health care provider on record as responsible for the individual patient’s care.

“Perioperative Staff” includes nurses, surgeons, anesthesiologists, students, contractors, allied health care professionals and other service providers engaged by VCH who may enter the operating room and be exposed to Surgical Plume.

“Smoke Evacuator” (also “Smoke Plume Evacuation Unit”, “Plume Scavenging System”, “Laser Plume Scavenger”, “Local Exhaust Ventilation (LEV)” is a product designed to remove the Surgical Plume via suction at the site of its origin. The Smoke Evacuator contains both charcoal to remove hazardous vapours and an ultra-low penetration air filter to eliminate particulate matter such as viruses from the air.

“Staff” refers to all employees, Medical Staff Members (including physicians, midwives, dentists and Nurse Practitioners), residents, fellows and trainees, students, volunteers, contractors and other service providers engaged by VCH.

“Surgical Plume” (also “Surgical Smoke”, “Surgical Smoke Plume”, “Laser Plume”) is smoke created from the destruction of human tissue. During surgical procedures, an ESU uses thermal energy to cut and cauterize human tissue. Lasers and other devices such as

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radio frequency ablation devices can also create Surgical Plume, which contains numerous toxic gases and vapours, as well as the potential to transmit infections.

“Ultra-Low Penetration or Particulate Air (ULPA) Filter” is a filter that removes particles as small as 0.12 µm with a filtration efficiency of not less than 99.999%.

3.4. **Keywords**

electrosurgical unit, ESU, operating room, operation, OR, nursing, perioperative, smoke evacuation, smoke plume, surgeon

3.5. **Questions**

Contact: Regional Surgical Program