Name of Policy: Surgical Smoke **Policy Number**: 3364-124-77 **Approving Officer**: Chief Executive Officer **Responsible Agent**: Chief Nursing Officer **Scope**: University of Toledo Medical Center, Operating Room/Perioperative Services	UTOLEDO HEALTH **Effective date:** 10/2025 **Original effective date**: November 30, 2018
Key words: surgical smoke, safety, operating room, evacuator, air quality	

☐	New policy proposal	☐	Minor/technical revision of existing policy
☐	Major revision of existing policy	☒	Reaffirmation of existing policy

(A) Policy statement

The University of Toledo Medical Center (UTMC) Operating Room (OR) will employ methods and equipment to ensure the highest level of air quality possible in the surgical environment.

(B) Purpose of policy

A smoke evacuation system will be used in the UTMC OR during surgical and laser procedures to reduce worker (employees, anesthetists, physicians) and patient exposure to surgical smoke plume.

(C) Information

1. Surgical smoke plume is a dangerous by-product generated from the use of electro-surgical pencils, lasers, electro-surgical pencils, ultrasonic devices, and other surgical energy-based devices. As these instruments cauterize vessels and destroy (vaporize) tissue, fluid, and blood, a gaseous material known as surgical smoke plume is created. It is estimated that approximately 95% of all surgical procedures produce some degree of surgical plume.

2. The chemical component of surgical smoke contains over eighty (80) different toxic chemicals and by-products: some which have documented harmful health effects. Some of the chemicals identified are:

    a. Hydrogen cyanide: neurotoxin used in chemical warfare
    b. Toluene, Formaldehyde & Benzene: known carcinogens
    c. Ethylbenzene: used in the manufacture of Styrofoam
    d. Perchloroethylene: main component in dry cleaning fluid

3. Carbon monoxide generated can cause headaches and nausea. Surgical smoke and aerosols irritate the lungs and have similar mutagenicity of cigarette smoke. One study done to quantify exposure found that on average the surgical plume produced daily in the operating room was equivalent to 27-30 cigarettes.

4. The biological matter in the plume contains blood, and potentially infections, viruses, and bacteria. The water vapor created is a viable carrier for those viruses and bacteria to transfer infectious diseases, including the documented case of HPV and potentially HIV-1.

5. The physical components consist of particulate that range from <0.01 microns to >200 microns. These ultrafine particles are significantly elevated in the operating room and particles smaller than .3 microns can bypass the normal filtration system in the lungs and deposit in the alveoli. Surgical plume is consistent with cigarette smoke in that it can paralyze cilia. It has been shown that surgical smoke can induce acute and chronic inflammatory changes including congestion, pneumonia, bronchiolitis, and emphysematous changes in the respiratory tract.

(D) Procedure

1. A smoke evacuation electrocautery pen, smoke evacuator, or portable smoke evacuator must be used in the OR room whenever surgical smoke is anticipated.

2. High filtration masks with minimum 0.1 micron filtration (i.e., N95) or Controlled Air Purifying Respirator (CAPR) hood are recommended for any procedure where surgical smoke is anticipated from =laser usage.

3. For known HPV cases, a N95 mask or CAPR hood should be worn.

4. Check integrity of filters and operation of system.

5. When using evacuation tubing (if appropriate for case) as part of the sterile field, the individual that hands off the evacuation tubing identifies it to the circulating nurse, and evacuation tubing is connected to the smoke evacuator.

6. Evacuation tubing or suction tip should be held as close to the source of surgical smoke as possible.

7. Run evacuator suction at a level that maximizes surgical smoke reduction.

8. All filters and suction canisters should be disposed of using standard precautions and disposed of as biohazardous waste at appropriate intervals per manufacturer’s instructions for use.

Approved by: /s/ _____ Daniel Barbee Chief Executive Officer 10/29/2025 _____ Date /s/ _____ Kurt Kless Chief Nursing Officer 10/29/2025 _____ Date *Review/Revision Completed by:* *Operating Room*	**Policies Superseded by This Policy:** • None Initial effective date: November 30, 2018 Review/Revision Date: 11/2018 6/2022 10/2025 Next review date: 10/2028