



Threats from Health Technology

As breakthroughs continue to be made in the fields of science and health care that help us live longer, better lives, it's important to remember the potential risks to workers in these fields that come with these new innovations. Two areas that merit closer examination are nanotechnology and surgical procedures using lasers and electricity.

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Smoke Plumes from Laser/Electric Surgical Procedures

During surgical procedures where a laser or electrosurgical unit is used, the thermal destruction of tissue creates a byproduct. NIOSH says that studies have confirmed that this smoke plume can contain toxic gases and vapors, such as benzene, hydrogen cyanide and formaldehyde, bioaerosols, dead and live cellular material (including blood fragments) and viruses. At high concentrations, the smoke causes ocular and upper respiratory tract irritation in health care personnel and creates visual problems for the surgeon.

To effectively control the removal of contaminants created by these surgical devices, NIOSH recommends a combination of two methods:

- Portable smoke evacuators
- Room suction systems

The following resources provide more detailed information about this topic and steps to reduce exposure:

- “Control of Smoke from Laser/Electric Surgical Procedures” from NIOSH: <http://www.cdc.gov/niosh/docs/hazardcontrol/hc11.html>
- “Laser/Electrosurgery Plume” from OSHA: <http://www.osha.gov/SLTC/laserelectrosurgeryplume/>

Nanotechnology

Nanotechnology is defined as the manipulation of matter on an atomic or molecular scale and is used across a variety of business sectors, including medicine, consumer products, energy, materials and manufacturing. Nanotechnology has helped to improve existing technologies and enhance the effectiveness of new ones. By the end of this decade, nanotechnology is estimated to have a \$1 trillion impact on the global economy and employ nearly 1 million workers in the United States alone.

In the health care sector, nanomaterials can be used to circulate through the blood vessels and interact with blood cells to help detect disease, deliver treatment and assist in disease prevention. Because of their utility, they’ve aided medical professionals in diagnosing, monitoring, treating and preventing diseases such as cancer, cardiovascular diseases, musculoskeletal and inflammatory conditions, diabetes and infectious diseases.

While this technology promises endless possibilities, it also brings with it challenges to understanding and managing potential health and safety risks to workers. Because of their nature, nanoparticles can be inhaled, absorbed through the skin or ingested, particularly if the materials are aerosolized or sprayed during application.

The National Institute for Occupational Safety and Health (NIOSH) has identified nanotechnology as an area of focus as they strive to protect workers from the technology’s growing applications. Because of the relative newness of the technology, knowledge remains limited so far on the risks of nanomaterials to health care workers and the most effective techniques and practices to ensure any potential exposure is limited.

The following resources provide more information about the occupational risks of nanomaterials:

- “Nanomaterials in the Healthcare Sector: Occupational Risks and Prevention” from the European Agency for Safety and Health at Work: <https://osha.europa.eu/en/publications/e-facts/e-fact-73-nanomaterials-in-the-healthcare-sector-occupational-risks-and-prevention>
- “Approaches to Safe Nanotechnology” from the Centers for Disease Control and Prevention: <http://www.cdc.gov/niosh/docs/2009-125/pdfs/2009-125.pdf>

How to Learn More

United Heartland is committed to providing and directing our customers to helpful resources regarding exposures to hazardous drugs and chemicals. Contact our team of specialists for more information at 800-258-2667 or visit UnitedHeartland.com.

