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Dr. Keith A. Robinson, D.D.S., C.C.C., D.A.A.E.T.S.

Maxillofacial Prosthodontist/Health Editor

Breaking the Re-Aerosolization Vector in MRI Environments: A Preventable Threat Neutralized by MWABS™

Executive Summary

Hospital imaging suites—particularly MRI and CT bores—are unrecognized reservoirs for infectious pathogens. Evidence demonstrates that viruses and bacteria expelled by one patient can layer onto internal surfaces, then become re-aerosolized and remain infectious for subsequent patients. The **MWABS™ (MRI Wall-Adhering Barrier Sheath** PPE) creates a single-use physical and aerosol barrier that prevents pathogen deposition and eliminates re-aerosolization risk, protecting both patients and staff while reducing hospital liability.

1. The Problem: Hidden Disease Vector in MRI Environments

Each MRI bore functions as a closed, non-sterilizable chamber. Exhaled aerosols, droplets, and shed skin cells deposit on inner surfaces, forming microbial layers invisible to standard cleaning. Immunocompromised and high-risk patients are repeatedly placed into the same contaminated airspace. Conventional surface cleaning cannot reach the bore's internal micro-crevices or remove submicron viral particles adhered by static charge.

2. The Scientific Basis: Layered Pathogens Can Re-Aerosolize and Infect

Summary of scientific evidence supporting re-aerosolization:

Mechanism	Evidence	Key Finding
Aerosolized fomites	Asadi et al., Nature Communications (2020, 2021, 2023)	Influenza A transmitted via aerosolized dust/fomites—no direct cough/sneeze needed.
Surface & floor resuspension	Rawat et al., Buildings (2023); Boone et al. (2024)	Live influenza A and MS2 virus re-aerosolized from settled dust/floors during walking.
Textile re-aerosolization	Shiomori et al., J Hosp Infect (2002); Warnke et al. (2023)	MRSA released into air during hospital bedmaking, forming respirable particles.
Contaminated PPE	Fisher et al., CDC (2012)	N95 masks can release viable virus back into airflow under normal breathing.
Clothing & human motion	Kvasnicka et al., Environ Sci Technol (2022); Ren et al. (2021)	Clothing re-aerosolizes deposited particles during movement.
Integrative review	Ijaz et al., PeerJ (2023)	Defines re-aerosolization from surfaces as a dynamic infection pathway.

3. The Preventable Solution: MWABS™ (MRI Wall-Adhering Barrier Sheath PPE)

The MWABS™ system is a single-use polymer sheath adhering to the MRI bore surface before each scan. It prevents deposition of exhaled droplets/aerosols onto bore walls and eliminates the potential for re-aerosolization from prior patients. It integrates seamlessly with infection-control workflows and is compatible with CloudEvac™ aerosol evacuation

systems. By demonstrating due diligence in environmental infection control, MWABS™ reduces hospital liability and improves patient safety.

4. Implications for Public Health and Hospital Liability

With 46 million MRI scans annually in the U.S., millions of potential re-exposure events occur each year. Immunocompromised patients face the greatest risk. MWABS™ provides a cost-effective, immediate intervention versus post-exposure treatment costs. Adoption aligns with CMS infection-control standards and supports preferential liability-rate reductions through insurer programs.

5. Summary

Layered pathogens are not inert—they can and do return to the air, capable of infecting subsequent occupants. By applying MWABS™ technology, hospitals can eliminate this hidden vector entirely, transforming an unrecognized contamination source into a controlled, non-infective healthcare environment.

With ***therapeutics,*** medicine heals one patient at a time... with ***prevention***, the numbers could be in the millions!

Appendix A – Key Scientific Citations

Full-text versions or summaries of the following key references should be attached as an appendix:

- Asadi et al., Nature Communications (2020, 2021, 2023)
- Rawat et al., Buildings (2023)
- Boone et al. (2024)
- Shiomori et al., Journal of Hospital Infection (2002)
- Warnke et al. (2023)
- Fisher et al., CDC Report (2012)
- Kvasnicka et al., Environmental Science & Technology (2022)
- Ren et al. (2021)
- Ijaz et al., PeerJ (2023)