

5 infectious disease topics to watch

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Experts at the AMMI Canada conference in Vancouver shared hot topics in infection control, from the changing role of infectious disease (ID) physicians to striking research on masks and air filters. They also highlighted growing concern about drug-resistant infections and new data on the dangers of sinks.

Redefining the ID doc

The COVID-19 pandemic sparked an explosion of interest in infection control — and cast ID doctors in new roles, said Lynora Saxinger, an ID specialist and associate professor at the University of Alberta.

According to Saxinger, ID physicians have spent a “tremendous amount of uncompensated time” over the past two years acting as a bridge between lab colleagues and public health, and pharmacists and clinicians. She said the specialty should consider integrating science communication, media literacy, social media, and knowledge translation into its core competencies.

Looking to the future, Saxinger said the official role and training of ID physicians could expand to include communicating with the medical community, the public, and the media to help “interpret the science, triangulate on recommendations and leverage trust.”

Making the most of masks

The pandemic has also had a “huge impact” on infection control research, particularly around the use of masks, says Yves Longtin, chair of the Infection Prevention and Control Unit at Jewish General Hospital in Montreal and an associate professor at McGill University.

More papers were published about N95 masks in the last two years than in the previous 20 years, Longtin said.

Meanwhile, there was a 25% increase in publications on surface disinfection, a 60% increase in research on hand hygiene, and a 10-fold increase in papers on airborne transmission.

One notable American study found that wearing a cloth mask on top of a medical mask captured at least 85% of particles the wearer exhaled or coughed, while wearing an elastic brace over a medical mask blocked at least 95% of particles. By contrast, wearing a surgical mask alone captured roughly half as many particles.

Researchers also found that wearing an N95 mask captured nearly 100% of particles. Longtin called the finding a “game-changer” because it challenges the common wisdom that N95s are not “source control devices” — in other words, it was thought they weren’t ideal for capturing infectious particles exhaled by the wearer.

“This is why when you have a patient with suspected tuberculosis, we [have been asking] them to wear a procedure mask, not an N95,” Longtin explained.

“At the beginning of the pandemic, I was dismissing the capacity of the N95 to be a source control device,” he said. “But perhaps it is the best one. Of course, more studies will be needed on that topic, but it is thought-provoking.”

Can air purifiers filter SARS-CoV-2?

Many infectious disease experts were also unsure about the usefulness of portable air filtration devices in reducing airborne SARS-CoV-2. However, research from the United Kingdom suggests the devices hold promise for removing the virus and other pathogens from the air in certain settings.

Researchers installed portable HEPA air filtration systems with UV sterilization capabilities in a COVID ward and intensive

care unit and tested for airborne SARS-CoV-2 on the days when the devices were on versus off.

While the research team did not detect airborne SARS-CoV-2 in the COVID ward while the air filters were on, they did detect the virus in the air on days before the filter was running and after it was turned off. Meanwhile, they detected SARS-CoV-2 in the air of the intensive care unit only once when the machine was active, and in both wards, the air filters also reduced levels of other viruses, bacteria, and fungi.

According to first author Andrew Conway Morris of the University of Cambridge, “We were really surprised by quite how effective the air filters were at removing airborne SARS-CoV-2.”

The study was conducted in only two rooms, and there are no data on the optimal air changes required to remove detectable pathogens, nor on the impact of air filters in better-ventilated facilities. However, the authors noted that “the broad range of pathogens removed in this study suggests potential for benefit beyond SARS-CoV2.”

Longtin said the study indicates that air filters may “actually have a role to play” in reducing airborne infections. “Think of an outbreak in a long-term care facility that is not ventilated enough,” he said. “Perhaps these are the tools [and] the way to go to make the air safer.”

Concern over drug-resistant infections

Looking beyond SARS-CoV-2, a standout paper published in *The Lancet* provided one of the most comprehensive pictures of the global burden of antimicrobial resistance (AMR).

Researchers analyzed 471 million patient records from 204 countries and

found an estimated 4.95 million deaths to be associated with AMR in 2019. This makes AMR one of the leading infectious disease killers, alongside malaria, HIV, and tuberculosis, Longtin said. “It is up there.”

The death toll was highest in western sub-Saharan Africa at 27.3 deaths per 100 000, and lowest in Australasia at 6.5 deaths per 100 000.

Six pathogens accounted for most of the deaths associated with drug resistance: *Escherichia coli*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Streptococcus pneumoniae*, *Acinetobacter baumannii*, and *Pseudomonas aeruginosa*.

Longtin also noted increasing publications on *Candida auris*, an emerging fungus that is resistant to all three major classes of antifungals.

“You feel that people are getting worried,” said Longtin. “It’s spreading more and more,” including beyond intensive care units and hospitals.

C. auris can be difficult to identify with standard lab methods and can be misidentified in labs without specific technology.

In a study of an outbreak in southern Californian long-term care and nursing facilities, researchers found they could identify infections more quickly by assessing the prevalence of *C. auris* in urine cultures they received from affected facilities rather than by swabbing people. Faster detection of infections meant they were able to contain outbreaks more quickly, too.

Dealing with dirty sinks

Many bugs associated with drug resistance like *K. pneumoniae* tend to proliferate in moist environments and are often pervasive in hospital sinks and drains.

A French prospective study involving 73 intensive care units found “frequent and multifactorial infectious risks” linked with dirty sinks. Across the participating sites, half the sinks were contaminated with multidrug-resistant bacteria, while more than one-third were producing “visible splashes.” Nearly a third were close to beds with no barrier around the sink — “which is a big no-no in infection control,” Longtin said.

Intensive care units that disinfected the sinks with bleach every day were much less likely to be contaminated. However, regular treatment with quaternary ammonium wasn’t as effective.

The study also showed that the risk of bloodstream infections was lower in hospitals with better sink hygiene than in facilities where there were multiple problems with the sinks — for example, where more sinks were contaminated, causing splashes and close to beds.

According to Longtin, the study makes a strong case to pay more attention to the cleanliness of sinks. “Your patients will have less bacteremia if you take care of your sinks.”

Diana Duong, CMAJ

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