

Episode: *Ethics Talk: Environmental Services Techs Are Key to Fighting Antimicrobial Resistance*

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[mellow theme music]

[00:00:04] TIM HOFF: Welcome to *Ethics Talk*, the *American Medical Association Journal of Ethics* podcast on ethics in health and health care. I'm your host, Tim Hoff. Threats of superbugs have been common in news media for decades now. Many clinicians have been warning of the risks of microbes adapting to become resistant to common medicines. In fact, as far back as 1954, British physician Lindsay Batten warned that "We may come to the end of antibiotics." Their warning signals our need to be cautious stewards of antimicrobials' capacity to effectively treat serious infections, but even the best prescribing practices among individual clinicians won't halt adaptation and growth of resistant microbes.

Managing antimicrobial resistance threats requires clinicians, risk managers, policy makers, public health officials, and even patients to collaborate and cooperate. Health care organizations also need to evaluate and respond to antimicrobial resistance threats with special attention to employees with high risk of exposure to microbial pathogens, like those cleaning hospital rooms, surgical suites, and other clinical care sites. Lloyd Duplechan is here today to discuss how high reliability can help health care organizations respond to the growing threat of antimicrobial resistance within their own walls and in the communities they serve. Lloyd, thank you so much for being back on the podcast.

LLOYD DUPLECHAN: And thank you for having me on, Tim. [music fades]

[00:01:37] HOFF: So, antimicrobial resistance poses obvious threats to individual patients and the clinicians who might come in contact with resistant microbes, but obviously, the threats don't stop there. Organizations also face challenges as they attempt to manage the effects of AMR. So, to begin with, can you orient our listeners to these organizational-level threats from AMR?

DUPLECHAN: Yeah. Thanks so much for having me and for asking my opinion and thoughts on this. Antimicrobial resistance, AMR, is the development of an organism's ability to survive exposure to previously effective antimicrobial agents by either mutation or adaptation. I'm not sure if it was Nietzsche or Kelly Clarkson who said, "what doesn't kill me makes me stronger." Well, I think it was both, but in essence, that's AMR. Anyway, current literature highlights concern with resistance rates among prevalent bacterial pathogens, resulting in diminished efficacy of common antibiotics against bacterial infections, right? In fact, the World Health Organization, WHO, ranks AMR

among the top three major public health threats. They estimated that bacterial AMR was directly responsible for 1.27 million global deaths in 2019 and contributed to almost 5 million deaths. These data are beyond sobering. In addition to significant global health concerns, AMR brings about economic impact. The World Bank estimates that AMR could result in \$1 trillion of additional health care costs by 2050. Now, that's a real mind boggler. AMR is indiscriminate, insidious, and can penetrate and impact all socioeconomic swaths. That said, it's disconcerting, but not surprising, that AMR tends to be more prevalent in marginalized communities where income is low and access to quality health care, treatment, and medications could be fettered.

[00:03:33] DUPLECHAN: So, turning our attention to local organization-level threats relative to combating AMR in the health care setting. CDC estimates that hospital-acquired infections, HAIs, like VRE and MRSA are typically caused by pathogens that are resistant to antibiotics. So, in the hospital, AMR can forestall the progress of an organization's care plan, hinder the provision of quality, safe, and effective treatments, and the like. For example, when AMR infection countermeasures require the use of second-line and third-line treatments, it can cause serious side effects like organ failure, prolonged care, or protracted recovery. And thinking collaterally, in addition to making the treatment of infections more complex and more challenging, AMR can put critical medical and surgical procedures and therapies that could compromise a weakened immune status at even greater risk. Many medical procedures, including joint replacements and organ transplants, cancer therapy, and the treatment of chronic diseases, they rely on the body's ability to fight infections using antibiotics.

[00:04:41] HOFF: You've written in the past, as recently as our February 2024 issue on *Health Ecology and Disease Transmission*, how high reliability can help organizations anticipate, identify, and respond to threats. So, how does high reliability specifically help health organizations respond to AMR?

DUPLECHAN: Well, high reliability is a practical framework to help bring about consistent excellence in quality and safety maintained over long periods of time. Several years ago, the Joint Commission actually highly recommended that health care organizations transform into high reliability organizations where zero harm should be the norm. So, to that end, the organization actually instituted a not-for-profit subsidiary branch called the Joint Commission Center for Transforming Healthcare. So, high reliability is not an 11th hour deus ex machina dropped in during the final act, as we hopelessly are surrounded by demons of chaos. But rather, it's both a concept and a resolve based on a set of carefully studied principles, leadership structures, tools, ideas, borrowed from military, aviation, and industrial settings where system failure can result in dire consequences. These principles help fashion a mindset, carefully examine components of complex systems that could fail, assess and manage risk, foster a culture of safety. These principles are the taproots through which a culture of patient safety is nourished. The effective application of high reliability ideas start with an understanding and appreciation of the full gestalt, the way complex system components are assembled, and the way they work as they pertain to fighting disease through antibiotics.

[00:06:21] The widely accepted high-reliability organization, HRO, model presented in the publication *Managing the Unexpected*, penned by Weick and Sutcliffe, if memory serves, follows five core principles. One, preoccupation with failure or, better still, the prevention of failure. Two, reluctance to simplify, or accepting that processes and systems are complex and fraught with unknowns. Three, sensitivity to operations. In context, this principle could refer to a heightened awareness of the state and complexities of processes and acknowledge the interconnection of humans, medications, animals, plants, and the environment in the spread of AMR. Number four is resilience, or anticipating failures or emergency situations, and how we bounce back and recover. And five, deference to expertise. A high-reliability approach to AMR, I think, requires tapping into expertise in all aspects and all levels of an organization: clinical, pharmacological, environmental, science, research and development, statistical analysis, even the regulatory community.

I think one way leaders can demonstrate deference to expertise is by designing and implementing AMR initiatives through the collective wisdom of multidisciplinary infection control committees and pharmacy and therapeutics P&T committees. The rock band America once sang, "Oz never did give nothing to the Tin Man that he didn't already have." I don't think you're old enough to even remember that song.

HOFF: [chuckles]

DUPLECHAN: But double negatives notwithstanding, I would suggest that many organizations already have a lot of these building blocks of a high-reliability organization, but there's some assembly required. It becomes a matter of setting things into order and applying the principles accordingly in the context of AMR.

HOFF: Hmm. That's interesting. I always appreciate your cultural references. And as a matter of fact, I do know the song that you're referring to.

DUPLECHAN: [laughs]

HOFF: It was a little bit before my time, but I do know it.

DUPLECHAN: I feel so old anyway. [laughs]

[00:08:24] HOFF: [laughs] Nice. You brought it back with the Kelly Clarkson reference. That was right in my wheelhouse. That was good. So, as a matter of industrial hygiene, the workers who are charged with cleaning hospital rooms and surgical suites are some of the most vulnerable in a health care system. So, what's your view on how well we value health care workers in charge of health care industrial hygiene and how well we can control AMR?

DUPLECHAN: Thanks, Tim. Needless to say, environmental services, EVS, is a mission critical function of any health care organization. EVS contributes a great deal to public patients' health, well-being, and the overall care experience, as I've often said. The gleam of their hygiene serves to illuminate the institution's creed. In fact, if one were to list the true heroes of, say, the COVID pandemic, right, EVS workers would

have to be included at the top of this list. I'm talking about early on, during the onset of the pandemic, when the world was at sixes and sevens, before the scientific and regulatory communities really got a good handle on the modes of transmission and effective treatments, proper cleaning, and ventilation, and before the promise of COVID vaccines. And when the government issued a veritable gallimaufry of ever-changing information, direction, and interpretation, these EVS professionals literally faced life and death situations, remained steadfast, remained courageous, heeded the call, if you will, even as co-workers were exposed, and some got sick.

[00:09:52] While things are improving, I believe these workers are still far too often undervalued. Overall lack of recognition, infrequent and disingenuous gestures of appreciation, safety issues, feelings of exclusion, equitable compensation, and attrition, they can all contribute to the EVS workers' feelings of discontent and disenfranchisement. Recognition and respect can actually start with something as simple as the position's title. The correct moniker, in my opinion, can be very important. As recent as a month ago, a national health care trade organization post stated that her facility, and I'm quoting, "has finally moved to the industry standard and EVS staff will be called Environmental Services Techs, not housekeeper, custodian. Now I just need to get the rest of the hospital to call us EVS Tech and not housekeeping." Controlling AMR is truly a team sport, and EVS is an integral team member. Leadership has to encourage inclusion, collaboration, and appreciation and recognize the importance of interdependence, or relying on one another.

[00:10:59] So, anyway, we're all familiar with nursing's eight rights of medication administration. But from an EVS perspective, here are seven principles, key principles, seven rights of AMR as I see it. And I've got it right here. Hang on.

HOFF: Mmhmm.

DUPLECHAN: Applying the right chemical product for the right job against the right germ. For example, recent science publications say that there are certain C. diff disinfectant ingredients such as quaternary ammonium compounds and chlorhexidine that can actually promote the spread of AMR through mutation or horizontal gene transfer.

HOFF: Hmm.

DUPLECHAN: The right dilution ratios. The right duration of application following the manufacturer's IFU dwell time or contact time. This is imperative. The right compliant management of waste chemical products and wastewater discharge are critical. Also critical is the right personal protective equipment: gloves, eye protection, respiratory protection, and the like. And speaking of PPE, personal protective equipment, industrial hygiene does include worker protection. Those who have been designated by organizational leadership to coordinate initiatives that manage the risk of harmful exposure from work activity or working conditions typically manage industrial hygiene programs. In contexts of AMR, these individuals must be competent, fully supported,

duly compensated, given a seat at the decision and policy development table, and trust and recognition must be commensurate with accountability.

[00:12:34] HOFF: Hmm. The *National Action Plan for Combating Antibiotic-Resistant Bacteria Progress Report* in 2022, which documents the progress of the National Action Plan for Combating Antibiotic-Resistant Bacteria, showed that while modest success has been made in some areas, such as a 36 percent reduction of health care-associated C. diff infections, there's much progress to be made in response to resistant infections generally. So, in your view, in what ways are health care organizations responding well to the threats of AMR, and in what ways have they been responding poorly?

DUPLECHAN: Very interesting question. As data from the *National Action Plan Progress Report* suggests, there have been notable efforts at the health care organization level yielding some measurable gains. CDC actually implements activities outlined within the U.S. National Action Plan for Combating Antibiotic-Resistant Bacteria. That's a mouthful. The agency states that hospital AMR programs have seen successes in the form of decreases in the number of AMR infections seen in hospitals, as well as the number of deaths from AMR infections. But they warn without continued action and vigilance, these gains will only be temporary. This is straight from CDC. In light of CDC's caveat, in my opinion, health care organization plans need to place even more emphasis on prevention of resistant infections in addition to response to resistant infections. Several years before penicillin—before penicillin—was administered as a therapeutic agent in 1940 or thereabouts, I believe, the first penicillin-resistant Staphylococcus strain was discovered. This was before it was even on the market. This serves to underscore the fact that while ushering in a veritable paradigm shift in medicine, administering antibiotics in and of itself is not a silver bullet. According to WHO, the AMR crisis is punctuated by inadequate research and development, coupled with an urgent need for equitable access to new and existing vaccines, diagnostics, and medicines. NIH publications suggest that AMR has been accelerated by the misuse of antibiotics, and EPI studies reveal a direct cause-and-effect relationship between antibiotic overuse and the development of AMR.

[00:14:56] So, given this, I've noted that organizations tend to quickly tether AMR drivers and causes directly to the caregivers and the providers, like inappropriate prescription dose issues and the like and so forth. I would suggest that what's particularly insidious about AMR is that it's a road to perdition paved with the best intentions. Providers, by and large, are doing their level best to thwart disease and make lives better, using what's accessible and available and what's known. The chief medical officer of the Healthcare Environment Institute reminded me that while medicine is scientific, no care plan is 100 percent. I think where he was going with this is that providers must constantly steer a good line between risk and benefit. And many organizations, in my opinion, could benefit from careful and meticulous identification and review of risk factors that could be conducive to failure, including drug-related factors, imitation meds, substandard medication, substandard drugs, the availability of the wrong over-the-counter drugs, even improper doses. Patient-related factors can include poor compliance, not always asking the patient are there any leftovers, poverty, lack of

communication, awareness, education, self-medication, and a lot of misconception about antibiotics. The environment, population and overcrowding, weak or ineffective infection control programs, rapid spread through mass travel, poor sanitation, widespread agricultural use of antibiotics all factor in, and monitoring or failure to consistently and proactively track and analyze results and clinical outcomes.

[00:16:39] HOFF: So, this report that we're discussing suggests that the gains seen in combating AMR largely come from management within health care facilities, but that community-based infections remain difficult to manage for a number of reasons that you just elucidated for us. So, how do health care organization-based risk managers consider the ongoing community-based challenges of AMR, and what are some ways that individual health care facility policy, as well as national policy, can be leveraged to address these challenges?

DUPLECHAN: Well, as I said before, I think better leveraging of existing policy can begin with carefully examining the processes and conditions that the provisions of the policy are designed to address, like using an Ishikawa cause-and-effect diagram or an FMEA, failure modes and effects analysis. These exercises can help illustrate and highlight the complex nature of the processes, specifically where things can break down, where things can drift, detection, mitigation, and a proactive, pragmatic approach to policy, language, and implementation. From there, I think that sound health care facility policy should be built on a ballast of materials assembled through an assessment of risk with operational procedural language that supports community-based outreach, access, education, and other responsible initiatives to follow.

An approach to setting and leveraging local policy should be circumspect, substantive, and above all, in my opinion, back to basics with a particular focus on, number one, the prevention of infections, which may reduce the use of antibiotics in the first place. "Reduce the use." I use air quotes because that's a bumper sticker, isn't it? It's just a catchy campaign. Proper hand hygiene is still an effective bulwark against the harmful bacteria that can ultimately call for the administration of antibiotics. There's a lot about prevention. Community-based education and infection prevention guidance and effective communication that challenges the misconceptions of antibiotic treatments and preventive care. This could take the form of outreach to where patients are, or something as simple as policies to make certain that we carefully review the after-visit summary instructions or the plan of care with every patient at every encounter. An effective monitoring and statistical analysis to give rise to useful strategic information, innovation, and initiatives.

[00:19:07] With respect to public policy, organizations should first avail themselves, in my opinion, of existing directives like CMS regulations requiring hospital antibiotic stewardship programs, as well as CDC guidelines fashioned after the U.S. National Plan. And while it could be argued that advancements in emerging scientific discovery within the realm of antibiotics have been shrouded in the doldrums since the '50s, health care leaders must not operate under a rather naive assumption that science will eventually catch up, and public policy will then follow suit. I believe health care leadership must have the conviction and courage to advocate for, encourage, support,

and seek out scientific research, development, and discovery, and remain passionately curious, like Einstein said, and tirelessly petition the current apparatus of governance for the proper prioritization of AMR prevention in the dockets of emerging and amended public policy and legislation, including provisions that better ensure universal access to quality diagnosis and appropriate treatment of infections. Leverage, to that end, I think can be intensified through the synergy of public health agencies and health organizations, the regulated community speaking with one voice. So, as an example of keeping one's finger on the pulse of scientific advancement, this is rather encouraging. A few days ago, the *Los Angeles Times* reported this: "A potent antibiotic has emerged in the battle against deadly drug-resistant superbugs. For the first time in half a century, researchers have identified a new antibiotic that appears to effectively kill a specific, nightmarish, transmogrified, drug-resistant superbug." Another one bites the dust.
[theme music returns]

[00:20:53] HOFF: Lloyd, thank you so much for being back on the podcast. Always a pleasure to have you here.

DUPLECHAN: Thank you so much.

HOFF: That's all for this month's episode. Thanks to Lloyd Duplechan for joining us. Music, as always, was by the Blue Dot Sessions. To read the full issue on Antimicrobial Resistance for free, visit journalofethics.org. Follow us on social media @journalofethics for all of our latest news and updates. And we'll be back next month with a companion episode on Antimicrobial Stewardship. Talk to you then.