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The diagnostic criteria for healthcare-associated infections in China should be urgently upgraded

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To the Editor—The prevention and control efforts for healthcare-associated infections (HAIs) have made remarkable progress in China over the past 20 years since the outbreak of SARS in China.[1] Laws, health standards, and hospital regulations related to HAIs control have been considerably improved and refined.[2–5] However, the current diagnostic criteria for HAIs are outdated and are no longer suitable for present circumstances. They were established in 2001[6] by the former Ministry of Health of China and were derived from the National Nosocomial Infections Surveillance System (NNISS). of the United States. Notably, the diagnostic criteria for HAIs in the United States have been upgraded >20 times; however, the diagnostic criteria in China have not been revised for 20 years. The current diagnostic criteria for HAIs in China have the following limitations:

(1) Most of the diagnostic criteria primarily focus on bacterial and fungal infections, making them unsuitable for addressing other pathogens, such as viruses. For example, the diagnostic criteria for lower respiratory tract infections emphasize leukocytosis. In recent years, most of the HAIs caused by emerging pathogens have been viral pneumonia. Furthermore, diagnostic criteria for pantropic virus infections should not involve a specific infection site, similar to criteria for bacteria and fungi.
(2) The present diagnostic criteria in China do not include the concept of a "repeat infection timeframe." When a patient is admitted to the hospital with an existing infection, it becomes challenging to determine HAIs in the same sites. Similarly, there is no clear guidance on how to determine the number of hospital infections when multiple repeated infections occur.
(3) Additionally, the logical relationship between certain diagnostic criteria items remains unclear. It is uncertain whether they need to be present simultaneously or if meeting some of them is sufficient. For example, in the case of respiratory tract infections, such as cough, expectoration, and pulmonary rales, it is not specified whether all these symptoms must co-occur or if the presence of any one of them would qualify.
(4) The current diagnostic criteria lack specific items for conditions such as central-catheter–related bloodstream infections, ventilator-associated pneumonia, and catheter-related urinary tract infections. Additionally, there are no established diagnostic criteria for infections in specific populations. For example, because of the unique physiological state of newborns, some clinical manifestations are highly atypical, making adult diagnostic criteria inappropriate. Furthermore, diagnostic criteria remain unclear for infectious diseases with a definite incubation period, in which patients have a history of exposure to the disease in the hospital but develop symptoms in the community, surpassing the average incubation period.
(5) How can the site of infection be determined in such cases? Moreover, for certain immunodeficient patients, such as those with leukemia, organ transplant, or agranulocytosis, who present with fever but no identifiable infection site, how should HAIs and their infection sites be determined?
(6) Furthermore, some concepts in the criteria appear outdated. For example, latent infections activated by diagnostic and therapeutic measures are no longer considered HAIs by the US CDC (eg, herpes simplex and latent tuberculosis) but are stilled considered HAIs in China.

Updated definitions for HAI surveillance in China are urgently needed. More accurate identification and reporting of HAIs would

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allow individual hospitals and the country to better understand the burden of these infections and to identify needs and opportunities for their prevention. Timely and accurate data are needed to identify problems and shortcomings, to make timely refinement and optimization, and to improve the quality of medical care.

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Why is there a discrepancy between laboratory test results and real-world efficacy of continuously active quaternary ammonium disinfectants?

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To the Editor—Continuously active quaternary ammonium disinfectants containing polymer coatings that bind to surfaces have been developed to provide persistent antimicrobial activity between episodes of cleaning.[1,2] Environmental protection agency (EPA) registration as a disinfectant with 24-hour residual antimicrobial activity requires demonstration of a 5-log reduction in bacteria and/or a 3-log reduction in viruses within 10 minutes after 12 cycles of alternating wet and dry abrasions intended to simulate routine contacts that might occur between cleaning episodes.[1,3,4] A product registered with the EPA as Firebird F130 (Microban Products, Huntersville, NC) and previously marketed by Professional Disposables International as Sani-24 has demonstrated residual activity against several bacterial pathogens and severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1,5] However, real-world assessments of these products have yielded mixed results.[1] In a recent randomized trial, a continuously active disinfectant significantly reduced total bioburden and recovery of clinically important pathogens,[6] whereas no significant reductions occurred in another randomized trial.[7]

Why might there be a discrepancy between laboratory results and real-world efficacy of continuously active quaternary ammonium disinfectants? It is possible that the coatings may sometimes be removed in real-world settings as the products are easily removed by disinfectant or nondisinfectant wipes.[1,8] The artificial methods used for laboratory testing may also exaggerate the potential for efficacy in real-world settings (ie, organisms deposited in a liquid inoculum during laboratory testing may be reduced more than organisms deposited without moisture in clinical settings).[1,9]

Another factor that could affect real-world efficacy is variation in the amount of continuously active quaternary ammonium disinfectant applied to surfaces. For Firebird F130/Sani-24, the EPA registration (no. 42182-9) for residual disinfection indicates that sufficient product must be applied to ensure thorough wetness with 1 minute of wet contact time. It is plausible that insufficient product might be applied in real-world settings. The product may dry quickly on surfaces because it contains 68.6% ethanol and might require reapplication to achieve 1 minute of wet contact time. Therefore, we compared the amount of product applied using Sani-24 Germicidal Spray and presaturated Sani-24 Germicidal Wipes with different wiping methods and tested for activity against methicillin-resistant *Staphylococcus aureus* (MRSA). Sani-24 was applied to overbed tables using 5 methods: (1) spraying with Sani-24 Germicidal Spray following the manufacturer's recommendation (ie, 3 sprays at 15 cm) providing ~120 seconds of wet contact time, (2) wiping with 1 Sani-24 Germicidal Wipe with 2 passes over the surface providing ~60 seconds of contact time, (3) wiping with 1

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