

Nosocomial Infections: The Definition Criteria

In 1988, the Centers for Disease Control and Prevention (CDC) published two articles on nosocomial infections (NIs) and certain types of NIs' criteria for surveillance purposes. Nosocomial infections refer to any systemic or localized conditions that result from the reaction by an infectious agent or toxin.¹

The infection is developing in all high, middle and low income countries. The CDC estimated that the cost of events related to NIs was an average of \$2,100, and varied from \$680 for urinary tract infections to \$5,683 for respiratory tract infections in the United States of America.²

An intensive care unit (ICU) is one of the hospital wards critical in the treatment of many serious diseases, which needs particular cares. Despite having a prominent role in the care of patients with infections, ICUs cause some complications and death, and increases the costs imposed on patients and society.³ The incidence of NIs related to mechanical ventilation, catheter insertion and some invasive procedures are more than that in other hospital wards, which do not carry such procedures.⁴

Classification of NIs is critical for any surveillance program. Traditionally, a time cut-off of 48 hours after admission is used to differentiate between hospital and community acquired infections. However such a cut-off point does not present the patients' carrier status that can cause the infection. In an attempt to solve the problem, a classification based on pathogenesis of infection and the criteria for carrier status were offered.⁵ Three types of infections in ICUs including primary and secondary endogenous, and exogenous infections are defined by carrier status. Only, secondary endogenous and exogenous infections are real infections acquired in ICUs.⁶

The overall incidence of NIs is 6.1% to 29.6% in pediatric ICUs. Using the CDC definition of NIs, which is defined as infection occurring 48 hours after admission, it was shown that in a sample of 1239 pediatric patients in 2009 the incidence of NIs was 24.5 per 1000 person days, and that the length of stay of patients with NI in ICU was higher than that without the infection.⁷

Overall, many studies have focused on the epidemiology, risk factors, and prevention methods in adults patients. However, there have been limited studies on NI in pediatric patients.²

The current issue of Iranian Journal of Medical Sciences publishes a paper by Jiří Žurek, and Michal Fedora titled "classification of infections in intensive care units: A comparison of current definition of hospital-acquired infections and carrier state criterion." The paper compares the classification of NI based the CDC definition of the infection and carrier state criterion. The article is highly important in showing the two definitions of NIs. However, the use of each of the definitions in surveillance programs can cause confusion.

Lacking a widely-accepted standard definition for infections, such as nosocomial infections, can lead physicians to incorrect diagnosis and treatment of infections. The first study about hospital infection in ICUs in Iran showed that for correct comparison and control of hospital infections, we need to use international standards in population of study,⁸ to be able to have correct comparisons and plans to control infections.

In addition, it is better that the cut-off time and carrier status of admitted patients are compared in several aspects including diagnosis, burdens of diseases in the community, health care workers' concern about the origin of infection, various precautions and use of various diagnostic techniques. Nosocomial infections is over estimated in the cut-off time definition and underestimated in carrier state definition protocol.

If comparison of different classification methods could be accompanied with a strong research design and analysis, additional financial and psychological costs could be reduced.

Please cite this article as: Kouchak F, Askarian M. Nosocomial Infections: The Definition Criteria. *Iran J Med Sci.* 2012;37(2):72-73.

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References

- 1 Horan TC, Andrus M, Dudeck MA. CDC/NHSN surveillance definition of health care-associated infection and criteria for specific types of infections in the acute care setting. *Am J Infect Control.* 2008;36:309-32. doi: 10.1016/j.ajic.2008.03.002. PubMed PMID: 18538699.
- 2 Abramczyk ML, Carvalho WB, Carvalho ES, Medeiros EA. Nosocomial infection in a pediatric intensive care unit in a developing country. *Braz J Infect Dis.* 2003;7:375-80. doi: 10.1590/S1413-86702003000600004. PubMed PMID: 14636476.
- 3 Hassanzadeh P, Motamedifar M, Hadi N. Prevalent bacterial infections in intensive care units of Shiraz University of medical sciences teaching hospitals, Shiraz, Iran. *Jpn J Infect Dis.* 2009;62:249-53. PubMed PMID: 19628899.
- 4 Masoumi Asl H, Nateghian AR. Epidemiology of nosocomial infections in a pediatric intensive care unit (PICU). *Iranian Journal of Clinical Infectious Diseases.* 2009;4:83-6.
- 5 Shankar KR, Brown D, Hughes J, Lamont GL, Losty PD, Lloyd DA, et al. Classification and risk-factor analysis of infections in a surgical neonatal unit. *J Pediatr Surg.* 2001;36:276-81. doi: 10.1053/jpsu.2001.20688. PubMed PMID: 11172415.
- 6 Silvestri L, Monti Bragadin C, Milanese M, Gregori D, Consales C, Gullo A, et al. Are most ICU infections really nosocomial? A prospective observational cohort study in mechanically ventilated patients. *J Hosp Infect.* 1999;42:125-33. doi: 10.1053/jhin.1998.0550. PubMed PMID: 10389062.
- 7 Asembergiene J, Gurskis V, Kevalas R, Valinteliene R. Nosocomial infections in the pediatric intensive care units in Lithuania. *Medicina (Kaunas).* 2009;45:29-36. PubMed PMID: 19223703.
- 8 Askarian M, Williams C, Assadian O. Nosocomial infection rates following cardiothoracic surgery in Iran. *Int J Infect Dis.* 2006;10:185-7. doi: 10.1016/j.ijid.2005.04.004. PubMed PMID: 16298538.