Patient referrals cause differences in hospital infection rates

March 18 2010

Patient referrals between hospitals influence the rates of hospital-acquired infections such as MRSA, according to a study by researchers based in the Netherlands. The findings, published March 19 in the open-access journal *PLoS Computational Biology*, explain that referred patients, who have the potential to carry a hospital-acquired infection with them, are more likely to be admitted to University Medical Centers than to teaching or general hospitals.

The prevalence of hospital-acquired infection is widely believed to reflect the quality of hygiene and health care in individual hospitals, and is therefore often used as a benchmark for hospital quality. However, this assumes that the rate at which patients introduce infections is equal for all hospitals. The authors, from the National Institute for Public Health and the Environment, the University Medical Center Groningen, and the University Medical Center Utrecht, show that this assumption is unlikely to be correct.

The authors used patient admissions data, gathered from the National Medical Registry, to reconstruct the entire hospital network of the Netherlands. The University Medical Centers were shown to be central to this network as they admit more patients who have recently stayed in other hospitals. Therefore, the authors conclude, the University Medical Centers are more likely to admit patients that still carry pathogens acquired during previous hospital visits, thus raising their rates of hospital-acquired infections.

The authors show that this difference in connectedness within the network results in differences in prevalence of hospital-acquired infections by using an individual-based model. As a consequence the authors suggest that interventions should therefore focus on hospitals that are central in the network of patient referrals.

The authors note that their methods do not account for transmission outside the hospitals. If community transmission of hospital-acquired infections becomes a significant factor, the observed effect will be diluted.

More information: Donker T, Wallinga J, Grundmann H (2010) Patient Referral Patterns and the Spread of Hospital-Acquired Infections through National Health Care Networks. PLoS Comput Biol 6(3): e1000715. doi:10.1371/journal.pcbi.1000715