

In the hospital, the noisy hospital, the patient sleeps tonight?

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In the hospital it is not only direct patient care, but also the environment that contributes to recovery. A critical component of a healing environment is a peaceful space for a patient to get enough sleep.

However, according to a new study by researchers at Brigham and Women's Hospital (BWH), Massachusetts General Hospital and Cambridge Health Alliance, there are certain noises in a common hospital setting that can disrupt [sleep](#). Such disruption can negatively affect [brain activity](#) and [cardiovascular function](#).

The study will be published online in [Annals of Internal Medicine](#) on June 12, 2012.

"Hospitals and actually most urban sleep environments are increasingly noise-polluted," said Orfeu Buxton, PhD, BWH Division of [Sleep Medicine](#), co-lead study author. "This study highlights the importance of sleep for restoration and healing that is particularly important for hospitalized patients."

The researchers recruited 12 healthy volunteers to participate in the three-day study which took place in a sleep laboratory. On the first night, the participants slept without any disruption. On the following two nights, they were presented with 14 recorded sounds commonly heard in a hospital setting.

Among the 14 sounds were an intravenous alarm, telephone, ice

machine, voices in the hall, outside traffic and a helicopter. The sounds were presented at increasing decibel levels during specific sleep stages.

As expected, the louder the sound the more likely to disrupt sleep. However, there were unexpectedly large differences in sleep disruption based on sound type—independent of how loud the sound. The researchers found that of all sound types, electronic sounds were most arousing, even at a volume just above a whisper.

Also, a person's sleep stage affected whether sound would lead to arousal. During non-rapid eye movement (NREM) sleep, sound type influenced arousal; whereas, during rapid eye movement (REM) sleep, volume was more influential.

Sleep disruption due to hospital noises also affected cardiovascular function.

"Beyond disturbing sleep itself, we showed that noise-induced sleep disruptions—even subtle ones, beneath conscious awareness—lead to temporary elevations in heart rate," said Jeffrey Ellenbogen, MD, director of Sleep Medicine at MGH, co-lead study author. "While these effects were modest in size, our concern is that repeated disruptions, as might occur in a hospital room, may jeopardize the health of our most vulnerable populations."

The study systematically quantifies the disruptive capacity of [hospital](#) sounds on sleep, providing evidence that it is important to improve the acoustic environments of new and existing health care facilities to enable the highest quality of care.

"There are several strategies for protecting patient sleep in hospitals," said Jo Solet, PhD, Cambridge Health Alliance, senior study author. "These include acoustic performance guidelines for design and

construction, altered night-care routines, and enhanced technologies for clinician communication and medical alarms."

Provided by Brigham and Women's Hospital

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