Acoustic regulation in hospitals – Interior acoustics improving the recovery of patients

Georg SCHÖNER

1 Rockfon (ROCKWOOL International A/S), Denmark

ABSTRACT
Busy environments are bound to be noisy, and hospitals are no exception. The rampant noise found in modern hospitals are caused by a variety of sources; including patients, staff and medical alerts, making hospitals unable to meet the desired acoustic levels recommended for recovery. Evidence-Based Design can reduce treatment times, the consumption of medication by patients, as well as create an environment that supports better sleeping patterns and calmness. For example, a study of 416 patients has shown that quieter environments can reduce hospitalization periods. Major European countries, such as NL and IT, still miss acoustic regulations for the healthcare sector. Other countries, such as FR, DE, ES, PL, FI, UK and the Scandinavian countries, have specific regulation for hospitals in place. The presentation will analyze the particulars of the acoustic requirements in 9 European countries. In addition, the discussion will get initiated on what a meaningful “common denominator” looks like for countries with neither interior acoustic guidance nor regulations in place.

Keywords: Hospitals, Regulation, Room acoustics

INTRODUCTION
The requirements and guidance for room acoustics in hospitals in Europe vary by which technical parameter is used, by the stringency of a given parameter, and by the area of the hospital, which is governed depending on the use of the different room types.

When analyzing the technical parameters used, for example, in patient rooms a reverberation time is used in DK, FI, FR, NO, and SE. The reverberation times range from 0.5 seconds, for a class C patient room according to the Swedish standard, to 0.8 seconds in FI, FR and PL. ES and DE use the relation of an absorption area in a room, to the volume of the room, and the UK used the relation of absorption area to floor area.

The compartmentalization of hospitals also differs. For example, the French order from 2003, on the limitation of noise in healthcare facilities, differentiates between staff rooms, patient rooms, examination rooms, treatment rooms, offices, canteens, hallways, lobbies and any other room with a volume between 250 to 512 m³, as well as rooms with a larger volume than 512 m³.

An overview of sound absorption requirements and guidance specific for patient rooms in hospitals is given in table 1. The overview does not include other parameters that might be required in the given countries, such as a speech transmission index (STI), above 0.6 in Finland, and the various classes in certain countries. For example, in Norway and Sweden, the referred standards include sound quality classes A to D. A class A is equivalent to an especially good sound climate, where a class C rating is acceptable for the average person. The values in table 1 are the requirements to achieve a class C rating in a room.

In table 1, the “A” represents the absorption area of the room in m², the “FA” represents the floor area of the room in m², the “V” represents the room volume in m³ and “RT” the reverberation time.

1 georg.schoner@rockfon.com
**DISCUSSION**

The presentation will analyze the commonalities and differences of the acoustic requirements between these 9 European countries. Afterwards, a first conclusion is drawn what a meaningful “common denominator” could be for countries with neither interior acoustic guidance, nor an acoustic regulation in place. This serves as input for the discussion after the presentation.

For countries with requirements in place, a common reference can lead to more alignment over time. An example of a great first step in this area for residential building is ISO TS 19488 - Acoustic classification of dwellings, by ISO technical committee 43 working group 29.

**REFERENCES**

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