

Wood (And Other Natural Materials) in the Healthcare Facilities

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All the previously mentioned characteristics of wood, except its maintenance stereotypes, predestine wood for its use in the healthcare and wellness facilities where is high interest to create anti-stress environmental settings. Environment built with natural materials and especially wood has a regenerative effect on the nervous system, helping to create a supportive environment for stress reduction and shortening the treating process by patients, as demonstrated by several global studies.

The inclination to natural materials and nature evoking solutions, which is currently in the scientific community called biophilia, is based on socio- cultural and animal level of human as well. Our nervous system knows the materials and solutions well, as they are instinctively close and somehow also related. It is not necessary to scan the environment so much, thus it reminds survival and thus whole body can release. On the socio-cultural level this inclination works through the sharing of cultural archetypes, because natural materials are part of our traditional culture. Even if they temporarily displaced by a variety of news from material engineering, but the culture always gets back to them in the material and building culture, because they represent timelessness. To change the stereotypes and related hygienic directives associated with maintenance of surfaces, we need to create opportunities for the use of wood in hygienically high exposed facilities. Therefore, since 2015 we are looking for cooperation projects for revitalization of healthcare premises where we could participate with design thinking and evidence based design. In this way we can prove that the wood and other natural materials in its authentic form have a place at least in the less exposed areas such as waiting rooms, rest rooms. We can certainly recommend wood also for more exposed areas of health facilities on the wall and ceilings panelling that do not come into direct contact with contaminated and colourful fluids. We think it is a way to change stereotypes common by building and furnishing of health care facilities.

The pilot intervention study was the revitalization of lobby and waiting room of the National Oncological Institute in Bratislava on Klenová street. We have designed project for the whole lobby and within the research project there was built its first part - the waiting room in October and November 2016. There was installed wall and ceiling panelling made solid pine wood and sitting area made of larch timber. It has also been used first time the secondary veneering with raw pine veneer splice and installed new warm white lighting. First three months are the surfaces left without chemical finishing. This proposal is part of the PhD-thesis of Martin Boleš with supervisor Veronika Kotradyová. Nowadays there was installed a wooden art relief on the wall above sitting area. Authors are Veronika Kotradyová, Martin Mjartan in cooperation with Martin Boleš and Wanda Borysko.

Regarding microbiological quality of air and surfaces, we measured its original state and the current one 3 weeks after the installation that have shown up in much better state in comparison to the original one, after implementation of wood elements surfaces and indoor air have appeared like uncontaminated and hence very good hygiene standard. Next microbial testing on the site is planned after 4 months - in March 2017.

There is a hypothesis that the surfaces without chemical treatment and in the intensive

contact with human body will make dirty and their antimicrobial effect will be reduced, but that the less contacted surfaces will have the same antimicrobial effect like before and they will continue to improve microbial quality of air. Goal of this study is to optimize the process of maintenance and to find a recommendation for surface treatment and for combining the treated and untreated surfaces by maintaining the hygienic standards or to try to change them.

In cooperation with Kompetenzzentrum WOOD K plus Vienna there is running measuring and evaluation of VOC- emissions in the same premises of lobby, in original state and after 3 weeks and 3 and 7 months after the installation of the solid wood elements. Its aim is to declare that wood without chemical surface finishing can absorb other toxic VOC- emissions and to desorb into the indoor air less and to provide so called „sink-effect“.

For the further progress in this field we need to prepare new studies in the healthcare facilities and nowadays there is developed project at neonatology Department of Faculty hospital in Košice.



Original state in the part of vestibule



State after reconstruction in December 2016



Contemporary revitalization of lobby and waiting room of the National Oncological Institute in Bratislava on Klenová street, after installation of piece of art- Story of the tree.

Assessment of Microbial Contamination in National Institute for Oncology in Bratislava

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Assessment of microbial contamination in the health-care facilities can be carried out using different ways: active air sampling by aero-scope, passive air sampling with settle plates, surface sampling by swabbing technique and contact plates, while the presence of viable cells is monitored.

The index of microbial air contamination (IMA) is based on the count of the microbial fallout on to Petri dishes left open to the air according to the 1/1/1 scheme (for 1 h, 1 m from floor, at least 1 m away from walls or any obstacle). Petri dishes 9 cm in diameter contained solid nutrient medium Tryptic Soy agar or Sabouraud agar with chloramphenicol. Microbes carried by inert particles fall onto the surface of the nutrient and after incubation at 25°C for 2-5 days they grow colonies (colony forming units, CFU) in a number proportional to the level of microbial contamination of the air. There were determined 30-56 CFU/dm² in the waiting room air, which corresponds to fair to poor class of IMA. After the reconstruction and implementation of wooden elements in this area, the air total microbial count decreased to half corresponding good to fair quality of air.

The conventional swabbing procedure uses a sterile cotton swab with an applicator for releasing microbes from surfaces. The cotton swab bud applied on the surface (10 x 10 cm²) recovered cells and released them into the extracting solution during a vortexing step, followed by dilution plating. After incubation, CFU were calculated.

The standard recommends a quantitative aerobic colony count of < 5 CFU per cm² on frequent hand touch surfaces in hospital. More than 15 CFU per cm² were present on the

surfaces of seats, table with magazines and floor in the waiting room, which means low level of microbial contamination. After the reconstruction, there was 1 to maximum of 4 CFU per cm² on the wooden surfaces (bench, table, and wall) in the waiting room. This state is equal to very low or no contamination and therefore very good hygiene standard. These tests were repeated after 4 and 7 months.

