

Improvements of hygiene in radiology

First experiences with the new CT Table Cover (Pearl Technology) in clinical practice

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Background

It is not only since the Covid-19 outbreak that the topic of "hygiene" has taken on central importance in the medical care of patients and for the protection of patients.

To prevent nosocomial diseases, intensive hygienic measures are carried out in hospitals today. In addition to wearing gloves and protective clothing, hand disinfection is an important component to prevent nosocomial infections. Cleaning of contact surfaces must also be carried out after each patient.

Due to the high patient throughput, radiology cannot be compared with any other department in the hospital. In addition to inpatients, outpatients are also examined frequently in many hospitals.

Due to this fact, special challenges arise for the work processes and the tools used to always ensure hygienic standards. Routine cleaning of the equipment especially of the contact surfaces is essential to prevent patients from being infected during a radiological examination.

Challenge

Foam patient mattresses and the frequently used foam positioning aids with washable coatings present a special challenge here. These must be disinfected after each patient and fresh "paper barriers" must be applied additionally.

The use of disinfectants and the high mechanical force frequently cause damage to the surfaces of

the foams. We also observed that the wings of the patient mattress on the CT were particularly worn out on the side where patient are transferred onto the table.

To protect the mattress, many clinics use at least a plastic mat in the foot area (Figure 1), but this does not provide complete protection of the mattress. In addition, these plastic mats can cause image artifacts, so that they can only be used in areas which are not relevant for the image.



Figure 1: Illustration of mechanical damage (arrow) of the patient mattress on the CT with severe wear of the flaps on the right side due to frequent patient transfer.

Therefore, the mattresses must be replaced once the surface is harmed to meet the requirements for hygienic work. Often times, the mattresses are used for a longer period of time due to cost reasons and lack of clarity as to when replacements are necessary.

In the course of routine hygiene examinations, smear tests were carried out on various contact surfaces to determine the germ load in the radiology department. In this context, germ colonization even with mold, were particularly found in the area of the CT patient mattress.

The very high level of contamination on the CT couch was very surprising, as clear cleaning and disinfection guidelines are provided for all areas with patient contact and these are lived very conscientiously by the entire team despite the "tight schedule". Thus, after each examination, all surfaces with direct patient contact are wipe-disinfected with Oxy-Wipes S (Ecolab).

Accordingly, possible causes for the contamination of the CT mattress were analyzed and discussed with the responsible hygiene experts from the hospital. It was determined that the damaged surfaces in particular represent a potential hazard. These areas are predestined for the development of germs, even with regular disinfection.

“ The damaged surfaces allowed the foam to be soaked with any kind of liquid, so that the foam could become an «incubator» for germs and even mold. ”

Further clarifications by means of a comparative measurement of a new patient mattresses have shown that completely new, undamaged mats can be kept hygienic and clean by means of surface disinfection. However, due to the heavy workload at the CT with over 50 patients per day and a large proportion of inpatients, the surfaces of the conventional table mats quickly wear out again.

Solution

To sustainably improve the hygiene situation on the CT couch, a collaboration was initiated with Pearl Technology AG, Schlieren, Switzerland, a company specialized in positioning solutions for radiology. The company manufactured a hard-wearing mat protection perfectly fitting the CT table mat, which ensures reliable hygiene even under heavy use and regular disinfection. For this purpose, the standard table mat of the Somatom Definition AS was inserted into a CT Table Cover. Recesses on the underside allow the mat to be attached to the tabletop using the existing Velcro points (Figure 2). The CT Table Cover is made of a biocompatible polyurethane (PU) film.

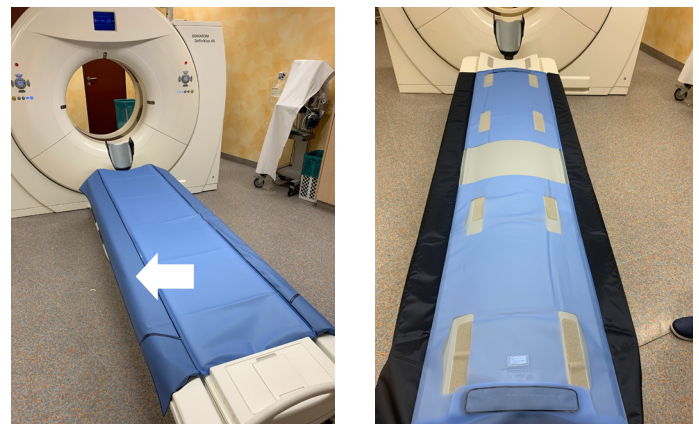


Figure 2: Illustration of the CT Table cover for the patient mattress with lateral flaps (arrow) and cutouts that expose the hook and loop to connect to the table.

Particularly with heavily bleeding injuries, liquids may cause downtimes of the CT table. The contaminations then have to be cleaned at great expense by the service technicians. The wings on both sides can effectively prevent liquids from running in between the tabletop and the bottom of the table. These flaps are reinforced on the bottom with a slippery film so that the risk of pinching is reduced.

“ Using the CT table cover, the hygiene requirements in a radiology department could be improved in an economical way. ”

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Any influences on image quality and ECG-triggered examinations were evaluated. No influence on image quality was observed in all body regions and there was also no negative influence on the ECG leads during ECG examinations, so that ECG-triggered examinations could be performed without any problems.

A re-evaluation of the germ load after 3 months showed that the contact surfaces can be effectively wipe-disinfected using OxyWipes S.

Likewise, there was no mechanical damage due to rearrangements on the CT table cover.

Only one defect caused by a pin of an external fixator was found in the cover. By padding the pins, such defects can be avoided in the future.

Conclusion

Within the framework of the systematic evaluation of the germ load, unexpected hygiene challenges were identified in a radiology department, which occurred despite conscientious cleaning and disinfection processes.