

Infection control and quality management in dental medicine and maxillofacial surgery

Infektionsschutz und Aspekte des Qualitätsmanagements der Hygiene in der Zahnmedizin und Mund-Kiefer-Gesichtschirurgie

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Editorial

Infection control and the provision of quality management of hygiene both are important for the success of dental practices. The present issue deals with a number of topics related to quality management and primary prevention of infection in dental medicine and maxillofacial surgery. In order to monitor and measure the desired outcome quality, suitable indicators are required. Therefore, the emphasis of the first section of this issue is the discussion and highlighting considerations for selection of the most suitable quality indicators in dental medicine. Based on the HACCP (Hazard Assessment and Critical Control Points) concept, the quality concept according to Donabedian, and the quality indicators used by the German Healthcare system general requirements for quality management indicators are deduced. The proposed indicators, however, may need further fine-tuning, depending on the different requirements of subspecialized healthcare areas.

Furthermore, the impact of existing infection control and quality management recommendations on dental medicine is analyzed. Hygiene requirements in dental medicine have been published first in 1989 by the German Working Group for Hygiene in Dentistry (DAHZ) is regularly updated in the Germany Hygiene Guidelines of the DAHZ. Therein, continuously the statutory requirements and recommen-

dations are updated following the Robert Koch-Institute's KRINKO recommendations and modified accordingly based on latest scientific evidence. In 1998, the KRINKO firstly published recommendations for infection control in dental medicine; these recommendations were updated in 2006. However, for some aspects and areas in dentistry, there still is room for improvement and a demand for more suitable solutions [1]. Therefore, and based on other public criticism, it was raised that the KRINKO recommendations had not the expected impact on improving the current situation in Germany. In 2009, the status of infection control in dental medicine was investigated based on a questionnaire survey in a small rural region in Germany. Some 35 dental practices were included. This survey could not confirm such criticisms. Since 2002/2003, infection control and quality management standards in dental practice have improved not only subjectively, but based on measurable quality indicators also objectively [2], [3]. This positive trend is largely due to the recommendations of the KRINKO and the DAHZ and related activities of the dental associations to support their translation and practical implementation into dental practice.

Another aspect directly adjunct to quality in dental medicine is the quality of reprocessing devices. Current attention is focusing increasingly on the topic of reprocessing of dental instruments and taking the mandatory quality

management and the thorough infection control requirements for dental practices into consideration, it can be certainly prognosed that this issue will gain even more importance in the near future. The current recommendations for reprocessing semi-critical and critical dental instruments as stipulated by the Robert Koch-Institute in 2006 put particular emphasis on their pre-cleaning. Efficient cleansing of instruments contaminated with blood, secretion or tissue remnants is a critical pre-requisite for following disinfection or sterilization processes. The recommended standard for cleaning and disinfection is the use of machine-based processes. This recommendation, while logical and plausible, derived in general from experience and knowledge obtained from other medical areas, such as e.g. orthopedic or cardio-thoracic surgery. In dental medicine, however, a number of instruments are either not visibly soiled with blood or tissue remanent, but with difficult to remove composite bonding material. In a study conducted by Franz et al. [4] it was demonstrated that the usual test soils used for validation of surgical instruments are not suitable in dental medicine. Particularly bonding and composite materials may not be removed effectively by re-processing in washer disinfectors, but often may need a manual cleaning before further reprocessing. These results highlight the need for improved testing and reprocessing methods in dental medicine in the near future, but question also the current recommendations for sole machine-based reprocessing in this area.

The microbial contamination of waterlines in dental units with resulting biofilm formation is a frequent and not satisfactory solved problem in dental medicine. Not only that biofilm formation has a negative impact on the lifespan of expensive equipment, but because of augmenting and maintaining bacterial contamination due to biofilms, closure of a dental unit may be required if the thresholds of potential water borne pathogens such as *Legionella pneumonia* or *Pseudomonas aeruginosa* as defined in the drinking water directive are surpassed [5]. Furthermore, Bristella et al. [6] could show that in terms of preventive monitoring of dental units' water line quality, the sole bacteriological investigation of aerobic heterotroph bacteria is no predictor of contamination with potentially pathogenic microorganisms. In order to prevent initial biofilm formation, or to sanitize heavily contaminated water lines, various chemical compounds and technical solutions are present on the market. The current issue therefore includes research results on the performance and efficacy of some of these products and concepts, such as Purgen combined with periodic intensive decontamination, PotoClean, ActiDes-Blue, or other solutions including a cost effectivity analysis. The issue is closed by results of in-vitro testing of the microbicidal efficacy of four dental gels in comparison to gels based on amin fluoride or zinc fluoride, root cause analysis of stick injuries in dental practice and highlighting the importance of early training of dental students to prevent such incidences [7], [8], and the role of students as potential reservoir for multi-resistant bacteria.

Because of its importance in all areas of medicine, including in dental medicine, a hitherto little noticed aspect of hand hygiene is highlighted as well: the design and requirements of hand rub and liquid soap dispensers in healthcare settings as recommended by the German Society for Hospital Hygiene (DGKH) and the Austrian Society for Hygiene, Microbiology and Preventive Medicine (ÖGHMP) [9].

Finally, the present issue contains two articles on efficacy of tissue tolerable plasma in relation to its perspectives for dental medicine and is closed with an article discussing bio-physical aspects of viral cell infection using thermodynamic modeling.

Notes

Competing interests

The authors declare that they have no competing interests.

References

1. Kramer A, Ryll S. Schwerpunkte der Infektionsprävention in der Zahnarztpraxis. Quintessenz. 2010;61(9):1123-30.
2. Kramer A, Meyer G, Ertzinger S, Kietz K, Schrader O, Martiny H. Multicenterstudie zur Durchführung ausgewählter Hygienemaßnahmen in 331 Zahnarztpraxen. Hyg Med. 2008;33(3):64-73.
3. Meyer VP, Jatzwauk L. Hygienemanagement in Zahnarztpraxen – Ergebnisse einer bundesweiten Online-Befragung in Deutschland. IDZ-Information. 2010;2. Available from: [http://www3.idz-koeln.de/idzpubl3.nsf/30c7ccae1fb54ce8c12573380037acd9/6ecb2fa788e18304c1257743002fad7e/\\$FILE/IDZ-0210.pdf](http://www3.idz-koeln.de/idzpubl3.nsf/30c7ccae1fb54ce8c12573380037acd9/6ecb2fa788e18304c1257743002fad7e/$FILE/IDZ-0210.pdf)
4. Franz A, Bristella M, Stauffer F. Reprocessing of dental instruments in washer-disinfectors: does a representative test soil exist in dentistry? GMS Krankenhhyg Interdiszip. 2012;7(1):Doc13. DOI: 10.3205/dgkh000197
5. Erste Verordnung zur Änderung der Trinkwasserverordnung vom 03.05.2011 (1. TrinkwVÄndV). Geltung ab 01.11.2011. Bundesgesetzblatt. 2011;l (21):748-74. Available from: http://www.bgbl.de/Xaver/text.xav?bk=Bundesanzeiger_BGBI&start=%2F%2F*%5B%40attr_id%3D%2Fbgbl111s0748.pdf%5D&wc=1&skin=WC
6. Bristella M, Skolka A, Schmid-Schwab M, Piehslinger E, Indra A, Wewalka G, Stauffer F. Testing for aerobic heterotrophic bacteria allows no prediction of contamination with potentially pathogenic bacteria in the output water of dental chair units. GMS Krankenhhyg Interdiszip. 2012;7(1):Doc12. DOI: 10.3205/dgkh000196
7. U.S. Public Health Service. Updated U.S. Public Health Service Guidelines for the Management of Occupational Exposures to HBV, HCV, and HIV and Recommendations for Postexposure Prophylaxis. MMWR Recomm Rep. 2001 Jun 29;50(RR-11):1-52.
8. Postexpositionelle Prophylaxe der HIV-Infektion. Deutsch-Österreichische Empfehlungen. Aktualisierung 2008. Available from: <http://www.aidshilfe.de/sites/default/files/2008%2001%20Leitlinie%20PEP.pdf>

9. Assadian O, Kramer A, Christiansen B, Exner M, Martiny H, Sorger A, Suchomel M; Section Clinical Antisepsis of the German Society for Hospital Hygiene (DGKH); Disinfection Assessment Board of the Austrian Society for Hygiene, Microbiology and Preventive Medicine (ÖGHMP). Recommendations and requirements for soap and hand rub dispensers in healthcare facilities. *GMS Krankenhhyg Interdiszip.* 2012;7(1):Doc03. DOI: 10.3205/dgkh000187

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