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Internal affairs

Cleaning the bloody mess!

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About the author

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Everyone

talks about optimising washer disinfector cycles and I have presented my holistic approach to the subject before in the Volume 19, No. 2 issue of this journal. Since that time, however, there was a significant development on the statutory side of things – we now have an official goal to achieve – put it simply, 5µg per side per instrument. So "alles klar", as our German friends say! ...well not quite.

And, to be absolutely clear about my take on this, the problem I see here isn't really about the fact that an arbitrary numerical value was assigned, nor that it refers to the "side" of the instrument, nor even that it refers to a universal unit of physical size known as an "instrument". These are the obvious shortcomings, but I am sure that – in time – and with more quantitative data, we will be able to make it more precise and relevant. I am actually really glad that at last we have got a benchmark value and a goal to achieve as it finally puts all the laggards on the spot as there is no longer an argument for ignorance.

My concern is rather more profound and relates to complex and hollow instruments.

The problem with internal cleaning is that we cannot simply assume that an instrument sufficiently cleaned outside is automatically cleaned inside to a similar standard. It is because the physics or, more precisely, the mechanics of the cleaning process are so much different. Even when we consider ultrasonication that by design unifies cleaning conditions in the washing chamber, its effect differ when it comes to internal and external surfaces. To go further, the result will depend on an entire array of variables from internal diameter of the lumen through wall thickness, surface finish to materials and cleaning chemistry not to mention further challenges with internal mechanisms, pulleys, hinges etc. that are found in most minimally invasive instruments. What it simply means, is that at the same time as we evaluate external surfaces, we need to independently evaluate internal cleaning capability.

The problem becomes more serious when we realise that fluorescence protein detection system used by the ProReveal system (in my personal opinion a tool that without a doubt has got the ability to take us further on the quest to improve cleaning efficiency) reaches its limit here. Fluorescence based protein detection is not the only method of sufficient accuracy that allows to quantify the results. For internal cleaning we could use OPA/modified OPA method or even better Radionuclide method, however they require access to laboratories and qualified personnel, and are usually too expensive for routine testing and larger scale process optimisation.

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>
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Solution to the problem could perhaps be provided by realistic Process Challenge Devices (PCDs) that can be used in combination with any of the above methods for quantification of results and establishing a benchmark. Such PCDs could be effectively used for periodic testing and exploratory research into alterations in the cleaning process design (chemistry, temperatures, duration of stages). I use them regularly for testing of new washer and washer disinfector prototypes and independently for benchmarking of different types and brands of cleaning chemicals. I went as far as developing my own range of PCDs to test for different conditions, in both internal and external cleaning (simulations of different diameters and lengths of lumens as well as effects like shadowing or alternative orientation of surfaces in the chamber). The importance here is to simulate comparable cleaning conditions/challenges and being able to understand the limitations of the Process Challenge Devices and further evaluation methods. The good thing is that it gets easier with experience.

In conclusion, I wanted to stress out that whenever we are evaluating complex instruments the internal surfaces of lumens and surfaces contained within need to be independently tested. Internal surfaces are equally, if not more (cannot be visually assessed in the theatre as a last resort) important than the external surfaces. There is nothing worse than a sense of false assurance justified by the limitations of currently available evaluation methods or lack of specific statutory limits.

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