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EXPERT INTERVIEW

The dynamic field of infection prevention

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The corona pandemic brought a new dimension of daily risk into hospitals around the world. And that's just one of the infection prevention challenges Pat Cattini and her colleagues in the field are handling every day.

Pat Cattini, Deputy Director and Lead Nurse for Infection Prevention and Control at the Royal Marsden NHS Foundation Trust in London, UK

New threats, new solutions: The dynamic field of infection prevention in the hospital

With 28 years of experience in infection prevention and control, Pat Cattini is currently Deputy Director and Lead Nurse for Infection Prevention and Control at the Royal Marsden NHS Foundation Trust, a cancer treatment facility in London, and has just finished a two-and-a-half year stint as the President of the Infection Prevention Society in Great Britain. It's a spectrum of professional activity that gives Cattini a broad overview of the field and also brings her face to face with the ongoing challenges of clinical practice and design improvements for hospitals in connection with infection prevention.

And these challenges are anything but static. Of course, the threat of infection is omnipresent in the hospital, and this is an unchanging circumstance as pathogens are always being brought into the hospital environment when patients are treated. But new technologies, new diseases and new standards of care are continually impacting infection prevention practice, which in turn impacts the demands that infection prevention specialists such as Cattini bring to hospital designers.

A case in point: Covid-19

The past year of healthcare crisis arising from the corona pandemic has impacted clinical practice across the board. With questions of possible contagion among patients, from patients to staff and vice versa, Covid-19 has been a particularly urgent issue in the field of infection prevention and control.

Speaking at the end of March 2021, Cattini was able to look back at the learning curve of the past year and identify some initial errors in the overall response and some still unresolved questions. There was an early period, she reports, when the flu-like characteristics of Covid-19 were judged to be its principal aspects and only with time did it become evident that it "not just about the respiratory disease. This was also about ongoing issues that this caused to the body, including clotting and those implications for clinical care."

This in turn gave rise to quite justified concern and anxiety among healthcare staff about whether they were being adequately protected with the personal protective equipment that was available. Directly related to the issue of personal protective equipment was also the gradual recognition of the importance of aerosols in the contagion process.

Looking back Cattini remarks, "I don't think that things like ventilation were really appreciated and things like the social distancing and the benefits of the use of face coverings. In the early days, I think we were very much more worried about them being used inappropriately rather than actually seeing that there might be an immediate benefit in their use, regardless of how well they were used."

The knowledge frontier

As knowledge was gained from month to month this resulted in an ongoing development and improvement in the infection prevention techniques used in clinical practice. "Over time, we've learned a lot and our approaches, I think, have been different in the second wave and I think we've been more organized and had a better understanding."

But Cattini is very open about the challenge of arriving at firm conclusions regarding infection prevention that can be used in clinical practice. She explains:

"I think there's a lot of areas that have been uncovered that need further work and research so that we get a better understanding, particularly of transmission of viruses in the environment. ... So, for example, one of the things that we've been doing in the U.K. is we've been putting screens in between patients in, say, in chairs or beds so that they're sort of screened from each other. But what implications does that have in terms of transmission of particles in the environment, because if they can't go sideways, they'll go forward, surely, but I don't think this has been looked at. So we don't have that real understanding."

And there are other basic questions that are still unresolved: "We don't understand what size of particles we need to worry about, because generally we talk about droplets being things that you can see and aerosols being things you can't see. But there are gradients in between. And I don't think we've got a real understanding of that. I don't think we've got a good understanding of what level of ventilation we need in our homes, in our clinical areas. So how many air changes an hour do we need to maintain the sort of good air flow? There is no minimum standard."

As Cattini points to these areas of uncertainty, one can see how progress is made in the field: It is precisely by clearly distinguishing between what is known and what is not yet clear that it becomes possible to make well-grounded decisions in the present and to identify areas for further inquiry so that additional improvements can be made going forward.

Infection prevention and hospital design

In addition to ongoing clinical practice, Cattini is also active as an infection prevention consultant for new building works. In this capacity, her role is to make sure that the physical and technical design of clinical areas being built or renovated for a new facility will support good infection prevention practice in the future.

As she is quick to point out: “The environment is hugely important in terms of infection prevention.” She notes basic factors such as ensuring that there is enough space for hospital staff to work effectively. “Looking at flows and layouts and spacing is all really important...that there’s enough space around beds, chairs or whatever” and also that storage facilities are adequately dimensioned, since “people tend to compromise on space for things like that and then you end up having things pushed into different areas.”

In addition to focusing on spatial layouts, Cattini will want to talk to hospital designers about water and ventilation systems: “I’m primarily interested in the ventilation aspects of the building, making sure that it’s adequately ventilated. I’m very interested in the water systems that they’re going to be putting in so that I know how we’re going to manage potential water pathogens like Legionella and Pseudomonas. So I would be looking for additional support from what we call authorized engineers to support the schematics that are presented for both ventilation and for water. I’m looking at the flows.”

Expert sources

Cattini’s own specialised knowledge is also supplemented by so-called health building notes, Great Britain’s official guidelines for best practice guidance on the design and planning of new healthcare buildings and on the adaptation or extension of existing facilities. While Cattini cites these notes as an essential resource, she also points out that they “have not been updated in quite some time” – for some areas as long as 10 or 15 years. This makes ongoing knowledge exchange and sharing of expertise within the field all the more important. For this, Cattini often relies on the network of contacts provided by Great Britain’s Infection Prevention Society, a UK charity made up of some two thousand infection prevention experts acting in various roles. “I use things like my annual conference or other specialist conferences to tap into new information... Being able to interact with other clinical people and being able to have those discussions is really helpful. So quite often it’s ‘phone a friend’. You know, you bring in someone else who you know has got a specific interest or a specific expertise.”


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Timing

Another crucial aspect with new design projects is making sure that this expert input for infection prevention questions comes at the right stage of project development. Cattini explains: “The important thing for an infection prevention person is to get in there at the design stage before they start to complete plans that then can’t be changed. So looking at flows and layouts and spacing is all really important, making sure all the correct facilities have been accounted for and that they haven’t left things out.”

How is this done? It seems to be a matter of classic organizational politics. “I think, you know, that’s about being plugged in and using one’s influence to make sure that you are included in discussions at an early stage and keeping an ear to the ground, making sure that you know if they’re going to be thinking about a new project and making sure that the infection prevention is represented. It’s not always easy. I’ll definitely say that. And I think people have varying luck with whether they get that seat at the table to make that difference.”

Working with medical manufacturers

One gains a sense that Cattini is always looking to optimise infection prevention results. As she puts it: “Infection prevention should be the art of what is possible.” This also applies for interactions with medical manufacturers.

Cattini tells about new devices being offered that should hopefully improve ventilation in the hospital: “There are lots of bits of kit that you can put in the ceiling and it will pull your air in and maybe ultraviolet it or somehow filter it But does that... actually make a difference? Are you cleaning pockets of air or are you cleaning the whole building? We just don’t understand.”

What Cattini seeks are companies that will support research to demonstrate the usefulness of the equipment that they have developed. Her aim at the front lines of infection prevention is clear: To work with companies “to make sure that products have got clinical efficacy and that they actually make a difference to patient care.”

Her question is always this: “Does it make any clinical difference to my patients?” As better, more precise answers are gathered also with the help of manufacturers, the wish behind that question can be satisfied bit by bit: “So going forward, we’ll be better prepared with better ventilated buildings and where we haven’t got actual, if you like, fresh air coming in, we’ve got solutions that can improve the environmental air quality.”

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- Draft of medical workplaces in our 3D-Tool
- Customer-individual workplace set-up and optimization
- Hands-on workshops with physical mock-ups in the Dräger Design Center
- Virtual mock-ups (additionally, or if a physical workshop is not possible)
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