

Conventional healthcare design is no longer fit for purpose. The pandemic exposed critical cracks in its foundations, exposing the need for deeper research, connected care and community integration. The question is, how do you build resilient healthcare that benefits patients, health carers and communities? This future hospital blueprint must go beyond concrete steel and material decisions. The social factors and architectural design are as crucial for healing and wellbeing as medicine. This complex challenge requires a new approach, one that introduces evidence-based design, tech-led innovation, cross-sector collaboration and hybrid skillsets.

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My name is Arthur Jones and I'm joined by our guests who are pioneers in these fields. Matthew Holmes, Global Director of Health Infrastructure at Jacobs, and Dr. Diana Anderson, dochitect and Healthcare Principal at Jacobs. Diana and Matthew, thank you for joining us on the podcast. Before we get started, could you both please share more about your careers and areas of expertise? I'd like to start with you, Diana, and could you also please explain what a dochitect does?

Yeah, sure. No, thanks for having me on the podcast, Arthur. Glad to be here. So doc26(Dr.)10(D)] TJETQq0Q re

recently been based in Singapore. I'm also the Jacobs Global Director of Healthcare Infrastructure. And so I work with a very diverse team around the planet leading our health infrastructure line of business.

Can I add something, Arthur? I was actually going to say that while Matthew and I work together currently at Jacobs, we actually met and began working with each other in Australia - must have been over a decade

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And so I think there's this whole trend of thinking about spaces that we live and work in. That's definitely

Also, maybe some of the lessons of pandemic preparedness and the likes. How do we deal with surge,

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I think also having worked in hospitals and I see patients on a regular basis, who actually give me a lot of the ideas for my research projects and design feedback. It's what patients and their families say, and my fellow clinicians. But a lot of ideas there in terms of how to change what we do in design to make it more user-friendly and to increase the care delivery and the health outcomes.

(15:04):

Some more examples maybe. Call room locations. As a clinician, I've worked in units where the call room

often be 12, 14 years from the start of maybe a business case and the likes. And as Diana said, some of those care models could change. So actually, how do we deliver infrastructure that may respond to technology, care models in the future, that we don't actually know what they are or how they will be at the moment.

(18:14):

The reflection I see is actually is how do we speed up that process hugely when we're talking about big infrastructure that might take four, five, six years to deliver, commissioning, pre-planning, design. A big emphasis at the moment on looking at every facet or every stage of that program about how do we streamline it or speed it up. And I see that across multiple client groups around the planet. The timeline is a really big consideration. That's probably one of the big things.

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So how do you do that? An element of are we reinventing everything from scratch every single time, or can we actually bring those lessons learned and those examples and just continue to augment and deliver those to the benefit? I would say going back to what's the evidence on that, is it the right answer, the right thing, the right component and the likes. But actually look at some of those standardization elements across the whole paradigm of a project, such that we're not actually starting everything from scratch. And we're doing that already. Many of our colleagues globally around the planet have got that approach, but how do we look at the whole program of work to the delivery of a big hospital, infrastructure project, to speed the process up? And there's obviously many benefits to doing that.

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In Singapore, we've been working with the Ministry of Health here for some time. They have a very major program of building, and that element of standardization is really ingrained in the approach to how things are delivered. Whether that's components or the likes, bringing those in and repeating them over multiple projects and programs to speed up is really very apparent across the work we're doing.

And I suppose, aligned to that that you've explained there, and you're learning from these past lessons, can we get any insights from other sectors or other industries or do you use them when applying it to the

baggage handling, how the automation of logistics and delivery is becoming more apparent. But only choose on aviation as one example.

to get from the initial idea, schematic design, all the way to ribbon cutting and inhabiting the building. It can be up to towards a decade and medicine changes so quickly, so does technology.

(24:13):

So I think it's a real challenge. I like to think about spaces and architecture that flexes and is able to adapt over time, even though we don't exactly know what's coming down the pipeline. Maybe doctors will be robots in 50 years, I don't know, and can the building accommodate that? Certainly there's going to have to be changes. And that's why it's so important to do these performance evaluations and critically look at how the building's performing on a regular basis to understand how we might adapt it with current technologies.

(24:44):

I was thinking a little about your question, Arthur, about parallels to other fields, and I really appreciate that Matthew mentioned aviation. That's a very common one that's mentioned in clinical practice. It seems to be very efficient. I think my own opinion is that medicine is a field that changes quite slowly. And certainly, when I go into high-tech office buildings, I'm surprised, and then I walk next door to the hospital and it seems like you're stepping back in time by 50 to 75 years. I'm sure others have had that sort of experience. But I certainly take a lot of lessons from clinical medicine and the research fields into my design practice.

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I think architecture and healthcare architecture specifically is also a very slow-changing field. I say that again to harp on this emphasis on evidence-based design and data. This shift towards empiricism, many fields have done it. In medicine, evidence-based medicine is standard practice. You couldn't be a clinician that looks at a patient and their disease process and says, "I'm going to treat it this way," without looking at what the data says. We have to do that. That's part of our code of ethics, that's part of how we professionally deliver care.

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We are really here to practice shared decision making, whereby what we essentially do is think about the range of options that we have, and this is in parallel with what we do as architects, what we should be thinking about the range of options with this particular individual. Then we should look at the evidence and we should use that to narrow down that range of options. But that's not enough, we have to go one step further to value preferences by multiple stakeholders. We have to think about who's in front of us, what are their values, what are their goals of care? How do they want to live with this disease process? What's important to them, what's important to their families? And then you essentially end up with your choice.

(27:28):

And I like to see design in that way. There are infinite possibilities. Certainly codes and guidelines and minimum standards will whittle that down initially. We can do a deeper dive into the data and get a few options, but then we have a real responsibility to think about stakeholder involvement and to make that very inclusive. I think we're doing a better job of that in clinical care to involve patients, understand who they are, understand who their caregivers are, and how they live.

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But I think in architecture, it's still challenging for us to involve stakeholders in an inclusive way. We tend to hold user group sessions during design processes where we involve key clinicians and non-clinicians and hospital leadership. But I think we still have some work to do in terms of how we capture that information and apply that to our designs, and how we make sure we capture an inclusive set of opinions, how do we make sure we have a good patient representation.

(28:30):

And, Matthew, maybe in your projects you've had more experience with this, but I would like to see a framework or methodology for gathering feedback as we design buildings and make sure we have patients there. We often have clinicians there. I'm not sure we often represent patient opinions as well as we could.

You remind me there, Diana, of, I may have mentioned in the past, a project we did in Roma in West Queensland, which was a relatively small project and it really covered almost all services. It's a rural health facility with a limited site. We spent a lot of time looking at what we would call the block and stack or the arrangement and distribution of services. And we engaged with the local community, obviously significant Indigenous community there. And I was probably being a bit naive thinking it'd be great to have the inpatients on the upper level, views over the landscape and the likes. And I remember them engaging and saying, "But Matthew, we don't really want that. We want to be connected to country, connected to ground."

(29:34):

And I suppose having that level of engagement at that point in time we did. We actually changed the block and stack on the project. It was early enough. Bring the inpatient accommodation to the ground floor. Every single bedroom had a direct access to the gardens or the exterior, and that was really successful. I think I was really proud actually how, because of that level of engagement at that moment in time. It wasn't too late, it was early enough that we were able to accommodate it. And it was really good outcome I

think for the community there in Roma, or in Marano. So I think Diana's comment there that there is a place for that engagement and you can't underestimate how meaningful it can be.

Well, I think that's a great example. And I like the cultural sensitivity to that, involving users early on. I have a similar example. You just reminded me of a famous hospice building in the United States whereby they needed to build a new building. They had two different sites, and they actually went to the patients who would be living their final days in this building and said, "Which would you prefer?" And it was on the ocean. One of the sites was on a beach, overlooking the sea, and the other site was in a canyon, overlooking many of the highways around this area.

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And intuitively, I just assumed the beach would be what patients would choose. And actually they all really preferred to be in this canyon where they could see cars whizzing by and have more of a connection to daily life versus looking at the ocean. So really interesting. And I think it just speaks to the importance of who is using the building and get them involved early on. Very important.

It's amazing to hear the role of engagement and how important that patient experience is and through those stories. But I think moving away from that, there's obviously we also need to think about sustainability and return of investment when we talk about healthcare infrastructure and it's two of the key focuses. And at times they seem they can be directly opposed.

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What would be your advice when you're trying to reconcile the two? I mean, there's so much that we trying to achieve in healthcare architecture, but obviously sustainability and return on investment are two key points that have to be kept in mind.

I think it's a good question, and I suppose part of me would question, are they opposed or are they not actually aligned? We have a moral responsibility to respond to the challenges of climate change, global heating and the likes, and healthcare have been a significant contributor to climate change. If you look at the numbers or percentages of how healthcare delivery has been, it could have partly accelerated climate change.

(32:13):

Our response as planners, designers, and the likes, is to adjust or reconcile some of those challenges. I certainly believe and see in most of my clients, that response now becomes the forefront of thinking. Whether that's regarding materiality and the likes in its health facilities, what is in the low-carbon materials. But that has to go further than just the building. I mean, I think we've been talking about low-carbon buildings for some time, but actually then how do we run a health system and the likes which has got decarbonization or the likes, within its full reere'sr0(e)24(c)-7(a)-8(r)24(bo)-e8 Tfor the likes, within i8r-7(ert)15e4n1

And so some of those things about what is the role of the hospital where services are delivered and the likes, again, seeing much more emphasis on where care is delivered. Can we deliver care at the home, is that going to be a lower carbon outcome? What is the decision around all those consumables and the likes within a hospital setting? How do we reduce the waste and the likes? So most of my clients are absolutely engaged on this and I don't really see them thinking it's a conflict. The two have to go together.

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And I think that change is accelerating even further and faster at the moment. And if we don't do it, I don't think we have any choice, we have to get on and do it. And most of my clients are wanting to do it, I find. I don't know about you, Diane, if your thoughts to that?

Yeah, I mean, I have more of an emotional response to this question I think than the others, perhaps, Arthur. But I think it's patient care, bottom line, period, stop. Sustainability, return on investment, that's definitely of a lesser value in my mind. I think it's important to think about, but it's about humanity and people, and the other elements will follow if we do it right and we care for people first. I've seen such a pendulum shift to not thinking about staff health and thinking about return on investment over patient outcomes. And I think it just has to come down to helping people heal or helping them live the best possible life in the healthiest way they can.

(36:16):

And I should say that that's a very striking fall reduction rate, even higher than some of the AI-assisted robotic fall prevention programs. And this is not high-tech, and they're more sustainable. So you almost get the benefits of patient care, you get the sustainability, and you get the return on investment, all in one simple example that is research-based.

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I think that's a good example for this question, but it always has to come back to people. I worry sometimes that we go down a rabbit hole around cost savings and sustainability, but really in my mind as a practicing clinician, it's about the patient in front of me and the next one who's coming in the room. But research, it's all about the data and the research.

Some of these numbers are incredible and the actual effects of the decisions are amazing, from the light bulbs and the impact of it. Incredible. As the last question, what would you say are the future trends in technology you're most excited about in this sector? I think, Matthew, if you can go first?

That's a good question. I mean, technology, we spoke a little bit around digital and how digital is going to interface with healthcare. I suppose one of the things I reflect on a little bit is we talk a lot about the growing, you could say, demand of healthcare and the cost burden of healthcare. And I think that whilst we're in the paradigm of healthcare being a treatment-based service that we're treating things, with the technology, with digital, whether it's my watch on my wrist and the likes, moving healthcare into a prevention or preemptive type model, I think that will be the paradigm shift that we will see over probably in my own lifetime.

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clinical practice. We're going to need lots of different kinds of experts at the table to figure out how we're going to deal with some of the problems and sol

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So let's not forget that high-tech is great, but we also just really need to not forget that we need to connect back to non-high-tech and to nature and bring that in, because it's just part of our humanity and what we really are drawn to and what helps us from a health perspective. So that was my thought on the technology question.

Matthew and Diana, you have provided so many insights that it's made my job really difficult at providing