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Welcome to the ISPE podcast, Shaping the Future of Pharma, where ISPE supports you on your journey, fueling innovation, sharing insights, thought

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00:00:10,080 --> 00:00:14,240

leadership, and empowering a global community to reimagine what's possible.

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00:00:16,054 --> 00:00:24,934

ATMPs are, of course, a broad range of different therapy types, very different manufacturing chains.

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00:00:25,335 --> 00:00:35,820

And as I've been researching this topic and conducting literature reviews and seeing what available information there is, unsurprisingly, there isn't necessarily a completely fixed

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00:00:35,820 --> 00:00:37,179

answer to the question.

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00:00:37,739 --> 00:00:45,335

And so I work course, in the automation side of the industry rather than the therapy developer myself.

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00:00:45,335 --> 00:00:55,620

And I'm aware that a number of large pharma companies, BMS, for example, have done value stream mapping themselves to look at manufacturing costs of their own

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00:00:55,620 --> 00:00:56,260

products.

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00:00:56,820 --> 00:01:00,659

And of course, they will have a cost model specific to their product.

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00:01:01,219 --> 00:01:11,275

So the way in which I and the ISB team chose to look at this topic was perhaps the biggest drivers of cost.

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Some of those are reasonably well understood and documented already in terms of the drug discovery and the increase in cost of those.

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00:01:21,114 --> 00:01:25,019

There are other good studies out there transportation costs, for example.

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There's a couple of items that you highlighted in your question.

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00:01:29,099 --> 00:01:38,344

So the way in which we sort of tried to sort of rephrase that for ourselves was actually where do we feel that as a community, we can add the most value?

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00:01:38,344 --> 00:01:41,944

So where is actually the greatest opportunity to reduce cost?

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00:01:42,344 --> 00:01:52,680

And it struck us that there's already a reasonable degree of effort being put into understanding transportation

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00:01:52,680 --> 00:01:53,079

costs.

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00:01:53,079 --> 00:01:56,840

And of course, lot of that came out of recent events.

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00:01:56,920 --> 00:02:07,505

So instead, actually, what we focused on and where we saw the greatest opportunity for reducing cost is in and around the manufacturing processes itself.

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00:02:07,505 --> 00:02:10,784

So you mentioned in there manual processes.

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00:02:11,025 --> 00:02:21,310

And really, is a significant cost associated with the largely manual and semi automated processes, which have

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00:02:21,389 --> 00:02:28,750

historically been laboratory based and that transition to GMP, there's a significant cost with that.

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00:02:29,155 --> 00:02:39,555

And so that's where we decided really to focus in on and explore because that's we saw as an engineering community where we felt there was most opportunity

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00:02:39,555 --> 00:02:43,875

to add value and contribute to that reduction in costs.

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I think if you look at today's therapies and how they're manufactured, they're too labour and capital intensive.

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00:02:52,159 --> 00:03:02,675

Kite have built a facility in The Netherlands for Guescarta, which has 900 people, is 19,000 square meters, and that's manufacturing 4,000

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00:03:02,675 --> 00:03:03,875

therapies a year.

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00:03:04,194 --> 00:03:07,235

So 10 therapies a day for 900 people.

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00:03:07,235 --> 00:03:15,810

We know of therapy companies that are needing to liaise with local universities to put in training programs in order just to get enough staff.

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00:03:15,810 --> 00:03:23,645

There simply aren't enough people to be able to make these very manual, complex therapies at scale.

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00:03:23,645 --> 00:03:24,365

Yes.

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00:03:24,444 --> 00:03:34,444

They are very, very manual intense operations and also there are the costs associated to have a clean room, grade or grade B, which basically

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00:03:34,444 --> 00:03:44,849

spike the costs up immensely for any organization to basically have a full key up clean room of this level because they need to basically manage

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00:03:44,849 --> 00:03:52,135

each single samples individually, have cleanup, everything cost in terms of all the clean materials.

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00:03:52,135 --> 00:03:55,574

So there are a lot of costs associated on this.

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00:03:55,574 --> 00:04:05,759

With all that science, what do we need to standardize or otherwise implement in terms of manufacturing transformations to make

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00:04:05,759 --> 00:04:09,120

such products available and affordable?

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00:04:09,280 --> 00:04:19,279

I think it's important both to recognize the progress that the industry is making in terms of standardizing and gradually improving performances.

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00:04:19,279 --> 00:04:29,464

So more and more therapies are being produced with closed semi automated islands of automation where you have manual operators moving closed single

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00:04:29,464 --> 00:04:38,290

use consumables moving out of the grade B environments into grade C or D environments between different semi automated islands of automation to make therapies.

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00:04:38,529 --> 00:04:45,170

But I think it's also important to recognize why the market has evolved the way it has.

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00:04:45,824 --> 00:04:56,544

And one of the things that we've observed is that therapy developers, early biotechs, when they're developing a therapy, yes, they think about manufacturing and yes, they think about closure,

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00:04:56,544 --> 00:05:03,439

but their core focus is generating great data in their early stage clinical trials that gives them efficacy.

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00:05:03,519 --> 00:05:10,319

And so they want to use the best tools and technologies that are out there that give them the best chance of getting that efficacy.

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00:05:10,319 --> 00:05:20,634

And it's only when they reach near approval or reach actually commercial scale and they really need to industrialize that they really start to put

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00:05:20,795 --> 00:05:26,395

significant capital behind approaches like automation that could help them scale.

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00:05:27,120 --> 00:05:31,759

Challenge then is there's very little you can change in terms of those underlying unit operations.

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00:05:31,759 --> 00:05:41,839

So I think one of the things that we observed is it's key actually to have a manufacturing approach that works with those existing tools and technologies and industrialize and scales

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00:05:41,839 --> 00:05:46,904

them to bring them to produce them in a much more cost effective manner.

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00:05:46,904 --> 00:05:47,625

Yes.

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00:05:47,944 --> 00:05:49,865

Automation and robotic is essential.

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00:05:50,024 --> 00:06:00,269

Taxi is basically the key message because as we discussed earlier and we said earlier, so all those processes are very labor intensive, manual intensive,

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00:06:00,269 --> 00:06:10,584

you need a lot of peoples and literally automations and robotics are key to basically find the right standards to basically

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00:06:10,584 --> 00:06:13,625

produce everything at an affordable cost.

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00:06:13,704 --> 00:06:21,544

Also, I think a discussion that we had in the other presentation, for example, NII is, for example, the consumable part.

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So the consumable part these days is something that needs to be standardized, and it's a discussion that has been recently done in terms of if we look at the past, the consumable views in the past, who

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00:06:31,889 --> 00:06:42,384

would have said, and basically, we are reaching the point this day, for example, on atypical filling machines where vials is standardized for everyone, for everything.

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00:06:42,465 --> 00:06:52,465

So there are a lot of work that needs to be done around the whole industry to basically standardize different parts as is

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00:06:52,465 --> 00:06:55,670

done today, you know, in a typical pharmaceutical factory.

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Surprisingly, it may actually be that the automation is not the mechanisation of process steps.

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And I think that's where a lot of people would traditionally think of automation.

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00:07:04,949 --> 00:07:07,990

It is actually the mechanisation and that being the opportunity.

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00:07:08,595 --> 00:07:12,194

We see a lot about robotics and that's very exciting.

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00:07:12,834 --> 00:07:23,050

But when the processes you actually have a therapy sat incubating or whatever the process step

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00:07:23,050 --> 00:07:26,329

is within a piece of equipment for a significant period of time.

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00:07:26,329 --> 00:07:33,850

The mechanisation doesn't have an immediate transformational impact.

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00:07:34,454 --> 00:07:44,935

And therefore, actually, when we're looking at those lower scales, the opportunities appear to be more around process optimisation and increase

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00:07:44,935 --> 00:07:46,375  
in quality.

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00:07:46,534 --> 00:07:52,240  
And really, I think that comes about through instrumentation and therefore digitisation of the processes.

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And some of the tools to support that automation might be as simple as, for example, a barcode scanner, the ability to streamline processes.

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I've done some work in a completely parallel, but interesting sector of sterile instrument processing.

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00:08:11,365 --> 00:08:20,399  
And there are a number of interesting observations in that, in that from the outside, when you first look at it, would say this can't be automated.

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00:08:20,399 --> 00:08:21,839  
It is really difficult.

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00:08:21,839 --> 00:08:23,680  
There are lots of unique process steps.

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00:08:23,680 --> 00:08:24,960  
It's largely manual.

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00:08:25,520 --> 00:08:26,960  
You can't really automate this.

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00:08:26,960 --> 00:08:27,839  
You're a bit stuck.

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00:08:28,495 --> 00:08:38,894  
And I've seen some really superb examples of lean manufacturing thinking being brought into that sector and having an

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00:08:38,894 --> 00:08:49,620  
extraordinary impact on the output of a facility purely based upon lean manufacturing processes of studying

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00:08:49,620 --> 00:08:59,855  
the utilisation of people within that room, the utilisation of tools, tracking materials through that room and

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00:08:59,855 --> 00:09:09,855  
thereby increasing utilisation of the assets that already exist, and having a closer eye on the quality of those processes in which instrumentation

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00:09:09,855 --> 00:09:11,295  
and digitalization can help.

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00:09:11,820 --> 00:09:19,980  
So a different form of automation, I think, would be could offer people that ability to make an initial transformation change.

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00:09:19,980 --> 00:09:22,700  
That's where I'd see that loaf hanging fruit being.

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00:09:22,700 --> 00:09:31,304  
Our approach is to to leverage existing proven technologies and then bring them together and integrate them in a new way.

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00:09:31,304 --> 00:09:35,464  
So we're using proven robotics coming from Stabley.

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00:09:35,464 --> 00:09:40,840  
We're using sterile welding, which is widely used at scale, but in a manual method.

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So what we've done is we've taken sterile welding and we've repackaged it so it happens on the end of an end effector of a robot and automated it.

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00:09:48,679 --> 00:09:53,975  
But the underlying how you join tubes together and make a closed connection is proven.

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00:09:54,295 --> 00:10:04,695

And then finally, the existing tools that we're automating, the magnetic cell selection coming from sites or Harvest Fill Finish from Fresenius or the BioActors

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00:10:04,695 --> 00:10:09,299

from Wilson Wolf are proven underlying tools for that process.

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So we don't want to reinvent the wheel.

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We want to use what's solid, what's proven, what's demonstrated in the industry, but putting it together in a new way, which means that we can scale and industrialize cell therapies.

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So we're working with therapy developers at the moment to be able to automate their existing processes.

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00:10:25,835 --> 00:10:36,379

So working with them to take their existing third party tools, working with the ecosystem of third party tool providers so that we can make those instruments more automatable, and

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00:10:36,379 --> 00:10:39,899

then showing that we can do this in practice.

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I think in addition, we're working very closely with the Cell Therapy Catapult, who are a UK government institution who are there to help spread, really

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00:10:50,595 --> 00:10:53,794

generate a wide ecosystem for the cell therapy community.

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00:10:53,794 --> 00:11:04,995

There we're working with them both to test out the cellular organs technology but also allow access to a much wider group of therapy developers

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00:11:04,559 --> 00:11:14,799

and earlier stage biotechs who can come and see how this technology can be used in practice, learn from the catapult how it can be applied to their therapy to enable

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00:11:14,799 --> 00:11:17,040

a scalable modular approach.

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00:11:17,815 --> 00:11:18,214

Yes.

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00:11:18,214 --> 00:11:28,454

You can end up with a double impact on costs there in that, yes, you can make an efficiency improvement in the way in which the operators

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00:11:28,454 --> 00:11:31,334

with the clean room are able to produce that product.

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00:11:32,230 --> 00:11:42,549

But probably the biggest gain is in yield because if they're not making mistakes into the process and you're able to generate a higher yield with that batch or not have any failures within the vaccine

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00:11:42,549 --> 00:11:50,195

manufacturing, that obviously is far greater or can be potentially far greater cost saving than the efficiencies.

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00:11:50,195 --> 00:11:52,195

You can end up with both.

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00:11:52,195 --> 00:11:55,154

Yes, that's the time that I'm referring to.

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It perhaps doesn't sound quite as glamorous implementing robotics and things which you might immediately visualize.

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00:12:02,850 --> 00:12:13,004

But in answering your question around low hanging fruit, it's those small steps that can actually have maybe even tens of percent improvement

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00:12:13,004 --> 00:12:19,164

in the efficiency of a process, but without actually necessarily spending money in order to achieve it.

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00:12:19,164 --> 00:12:29,500

Because that's one of the other factors I've seen frequently come into these arguments is the instinct is to actually spend money to save money and

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00:12:29,500 --> 00:12:39,855

you can fall into the trap of actually having diseconomies of scale where you actually introduce more automation that the payback doesn't really arrive depending

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00:12:39,855 --> 00:12:42,495

on the throughput of your manufacturing process.

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00:12:42,495 --> 00:12:48,095

Over time, what really works starts to become more and more standardized.

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00:12:48,735 --> 00:12:50,575

Where are we on that path?

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00:12:50,575 --> 00:12:51,934

I think we're pretty early.

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00:12:51,934 --> 00:12:55,000

So I very much agree with the previous guest's comments.

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I think we are if you think about where we've come from in the cell therapy industry, it's only over the last few years where we moved beyond the

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00:13:05,000 --> 00:13:07,079

need to treat thousands of patients.

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00:13:07,079 --> 00:13:13,865

So now where we are today where we need to treat tens of thousands, nearly 100,000 patients, then soon it will be much more than that.

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So we're very much at the start of actually this challenge to industrialize.

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For us, we've started by automating and industrializing existing tools, which haven't all been designed for automation and that has particular

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challenges.

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And we see that as a really good solution for now.

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00:13:34,199 --> 00:13:44,565

But we hope actually that we continue to evolve quite quickly as an industry and that all of those tools do change and evolve, become simpler,

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become more suited for automation, make that transition between lab and scale much easier.

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00:13:50,079 --> 00:13:52,559

But we're right at the beginning of that path.

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00:13:52,559 --> 00:13:57,039

The thing I'd say though is we can't just jump to the future.

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00:13:57,199 --> 00:14:07,225

We do need to automate and industrialize the scales, the therapies that are out in front of us right now that are improved and have patients

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literally waiting to receive them.

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00:14:09,065 --> 00:14:19,110

Probably as your previous guest, as I said, so if we look at the S curve in terms of where we are, definitely, we are at the beginning of

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00:14:19,110 --> 00:14:23,269

the growth pace, miles away from the maturity phase.

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00:14:23,830 --> 00:14:33,894

So we are just at the beginning of the growth pace where everybody is getting involved and a lot of players are coming into the sectors and with the different solutions.

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Where I saw immediate value is that is the fact that you can provide this ongoing monitoring not

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00:14:43,899 --> 00:14:53,980

of a process that isn't perhaps practicable to have in some instances, but in others not, where you have an operator and then another operator watching over their shoulder.

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00:14:56,835 --> 00:15:07,475

Therefore, it probably adds that additional assurance because a lot of these processes are particularly challenging to perform and remember each step and perform everything.

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00:15:07,475 --> 00:15:17,629

One of the things that we tried to show quite early on is the potential of what we could achieve with industrialization and how in their 100

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00:15:17,629 --> 00:15:27,934

square meter Gracie clean rooms, actually if we start to approach things with domination, we're not going to do it on day one, but if we gradually, we can take their existing tools and we can

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00:15:28,014 --> 00:15:31,295

take that same 100 square meter grade C clean room.

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00:15:31,295 --> 00:15:41,440

Rather than today, they produce 300 batches a year in that sort of space in a semi automated manner, We work with them to show a concept where we could do 10,000 per year in the same space, so a 30

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00:15:41,440 --> 00:15:43,519

times improvement in output.

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00:15:43,759 --> 00:15:45,120

Is that theoretical?

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00:15:45,519 --> 00:15:46,480

Or is that proven?

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00:15:46,480 --> 00:15:47,120

That's theoretical.

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00:15:47,120 --> 00:15:48,639

So it's based on space.

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00:15:48,705 --> 00:15:58,865

It's based on actually if you start to it's pretty standard manufacturing principles in one way in that if you break up the process and add capacity at the rate limiting steps, which is something

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00:15:58,865 --> 00:16:07,799

I think has been a challenge for the cell therapy industry because in order to maintain the fully closed process, typically the directions has been let's link everything together.

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00:16:07,960 --> 00:16:18,120

And that means that not only are you carrying around your patient cells in a bioreactor, you're carrying around a centrifuge with you, you're carrying around magnetic cell selection, all sorts

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00:16:18,120 --> 00:16:18,440

of things.

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00:16:18,440 --> 00:16:28,464

So we showed that actually if you do take a modular approach adding capacity at the rate limiting steps, just from a space perspective, can start to fit in

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00:16:28,625 --> 00:16:32,065

banks of incubators holding hundreds of patients at any given time.

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00:16:32,509 --> 00:16:37,149

And the capacity calculations then show what that works out to be.

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00:16:37,230 --> 00:16:39,070

Will it end up being 30 times?

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00:16:39,149 --> 00:16:39,789

We'll see.

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00:16:39,789 --> 00:16:46,044

That's the work we've got to do over the next few years, but it's definitely a step change to aim for.

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Yes.

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00:16:46,365 --> 00:16:51,965

But also the keywords that you use there is modular because that is the most important thing.

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00:16:51,965 --> 00:16:56,845

So you can adjust to your productions and your modules, base of the volume that you want to produce.

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00:16:57,139 --> 00:17:01,059

If you want to grow, you want to grow the production, you add more modules.

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00:17:01,059 --> 00:17:11,075

If you need more modules of a different process, you can add another modules, grow and grow and grow your production as you grow basically your

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00:17:11,075 --> 00:17:16,115

needs for your customers and the need of produce small, you can grow your productions.

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00:17:16,115 --> 00:17:26,490

So that is a really important thing because you don't have to basically start with the investments all at the beginning of a large, massive production scales, so you can start small and gradually

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00:17:26,490 --> 00:17:26,970

grow up.

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00:17:26,970 --> 00:17:37,450

What do you see as the current barriers to adoption of truly impactful, from a cost perspective, automation into ATMP manufacturing?

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00:17:38,384 --> 00:17:43,984

Really, fundamental change as I see it is actually driven by the consumables.

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00:17:44,625 --> 00:17:45,105

Okay.

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00:17:45,105 --> 00:17:47,904

And this was something I was talking about in my presentation.

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00:17:48,224 --> 00:17:58,279

If you look to other sectors, whether in the pharmaceutical or elsewhere,  
Part of the or a key part of that journey

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00:17:58,359 --> 00:18:08,599

has been around standardization of componentry, USB, for example, C and  
the standardization

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00:18:08,599 --> 00:18:10,214

of that connector.

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00:18:10,934 --> 00:18:15,734

No, that's actually more from the in that instance, from the consumer  
benefit perspective.

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00:18:16,134 --> 00:18:26,220

In this instance, standardization of consumable components, I see as  
being one of the

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key milestones in enabling cost reduction.

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There's the reasons for that.

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00:18:31,340 --> 00:18:41,644

Now it's because one, you can actually allow a lot of mechanisation style  
automation to be designed around these

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00:18:41,644 --> 00:18:45,644

common sets of components, continuables.

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00:18:46,125 --> 00:18:56,900

That in itself promotes competition within that space but also if you  
have consumables, as that are themselves designed to be automated

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00:18:56,900 --> 00:19:07,059

in their actuation, which historically they haven't been designed in  
classic sterile connectors designed for dexterous use of thumbs, etc,

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00:19:07,380 --> 00:19:09,404

not operated by a robot.

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00:19:09,404 --> 00:19:17,804

So I suspect that we should hopefully see a transformational change in consumables and that's unlocking mechanisation style automation.

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And along with that, as we get more standardisation in consumables and whether that be bioractors themselves, tubing sets, sterile connectors,

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00:19:29,109 --> 00:19:39,585

filtration that are set, etc, that should also enable large volumes of componentries and more assurance in supply chains that allows

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00:19:39,585 --> 00:19:41,744

the cost of those components to come down.

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00:19:41,744 --> 00:19:49,744

So you can end up with a snowboard effect as we start to coalesce around more standardised componentry.

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00:19:49,744 --> 00:19:56,230

At the moment, I see it that we're in a diversification phase as everyone's exploring different technologies.

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00:19:56,230 --> 00:20:03,109

And again, see these parallels happen in other industries, and there is good pattern as this in the industrialisation of other sectors.

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00:20:03,429 --> 00:20:11,575

You go through this growth phase of diversification as people try and explore what's the best way of solving this problem, what are all these best technologies.

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00:20:11,894 --> 00:20:21,910

But after a number of years, history shows us we always end up coalescing around a number of key solutions, which the industries

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00:20:21,910 --> 00:20:27,430

unify around, no less around, and that then unlocks the next phase.

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00:20:27,750 --> 00:20:29,110

So that's where I see it really.

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00:20:29,110 --> 00:20:31,190

It's probably the consumer that's the core.

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00:20:31,190 --> 00:20:38,164

Key is that therapy developers know what automation per scale looks like.

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00:20:38,164 --> 00:20:47,240

I think where I take a different view to some in the industry is I don't think they should be investing in large amounts of capital too early.

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00:20:47,240 --> 00:20:56,999

I think having islands of automation makes a lot of sense for when you're in a Phase one trial and you're only treating 10 patients or 100 patients.

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00:20:57,159 --> 00:21:07,204

So I think what's critical is having centers of excellence around the world where people can get an understanding of what it means to develop a process that's automatable,

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00:21:07,845 --> 00:21:17,849

closed certainly, and then be able to develop with that process in that way, but without having to invest in the automation, or at least the type of automation that we talk

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00:21:17,849 --> 00:21:20,169

about, the full end to end robotic automation.

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00:21:20,169 --> 00:21:20,970

Too early.

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00:21:20,970 --> 00:21:23,690

It's also a discussion that probably your previous guests.

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00:21:23,690 --> 00:21:25,529

You you have to be careful.

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00:21:25,769 --> 00:21:35,825

Automations can be very useful, can be help to make, you know, affordable drugs, affordable cell and gene therapy,

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00:21:35,825 --> 00:21:38,945  
but it can also be a double sword.

204  
00:21:38,945 --> 00:21:46,730  
So if you invest too much, it can basically make you cost more than  
basically make it more affordable.

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00:21:46,730 --> 00:21:56,904  
My aim in content I'm sort of producing here is wanting to share  
information with the community and seek

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00:21:56,904 --> 00:21:58,825  
additional input from the community.

207  
00:21:59,144 --> 00:22:09,224  
And in this instance, I think there is a reduction in

208  
00:22:09,224 --> 00:22:10,105  
cost of goods.

209  
00:22:10,700 --> 00:22:15,259  
The natural question that comes immediately back is, well, to what  
extent?

210  
00:22:15,259 --> 00:22:16,380  
Where are we going to see it?

211  
00:22:16,380 --> 00:22:17,339  
By how much?

212  
00:22:18,380 --> 00:22:20,779  
That's, of course, a very, very difficult question.

213  
00:22:20,779 --> 00:22:31,164  
So there was a particular table that I put up in the presentation where  
I'm trying to add a degree of clarity into what does cost of goods  
actually mean.

214  
00:22:31,164 --> 00:22:32,924  
What are all of the drivers?

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00:22:36,605 --> 00:22:44,069

Where the manufacturer of AT and Ps compare and contrast with other sectors but also other pharmaceutical products.

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00:22:44,470 --> 00:22:54,869

And the patient population is obviously a key component in that and awareness of it is necessary in order to understand what the limitations

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00:22:54,869 --> 00:22:55,190

are.

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00:22:55,190 --> 00:23:01,134

So that's one aspect is really helping Trian as we try and pick apart some clarity.

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00:23:01,375 --> 00:23:09,615

The other component is actually when I was talking about standardisation, we're in this diversification stage.

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00:23:09,615 --> 00:23:20,240

We're obviously diversification in terms of number of therapy types, the manufacturing processes associated with them and the technologies associated with there's diversification

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00:23:20,240 --> 00:23:21,679

in many different areas.

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00:23:21,679 --> 00:23:26,774

That means that it is quite hard to standardize.

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00:23:26,774 --> 00:23:36,855

By reflecting back this diversification, my aim is then to try and help the community identify where we can

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00:23:36,855 --> 00:23:39,170

start seeing these pockets of similarity.

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00:23:39,170 --> 00:23:49,650

Because the sooner we start identifying where similarities exist in therapy types A, B and C, whilst they are wildly different, actually there's commonalities

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00:23:49,650 --> 00:23:50,690

in these areas.

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00:23:50,849 --> 00:23:58,974

If we can unify manufacturing processes in there, we can then effectively increase the size of the patient population.

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00:23:59,615 --> 00:24:10,319

Not by changing the therapy itself, which of course as manufacturers we can't do, but by creating commonality within pockets of the manufacturing process.

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00:24:10,480 --> 00:24:18,720

The positive stories like hers, which show what a success these therapies can have and be truly motivating, but actually also some of the less positive stories.

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00:24:18,955 --> 00:24:28,315

I was at a conference a couple years ago and heard from Lisa Ward, whose son, Jase Ward, was diagnosed with a rare form of brain cancer.

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00:24:28,634 --> 00:24:38,190

And he or she got onto a cell therapy trial and talking through that story, it felt like it was going to have a positive outcome, but ultimately it didn't.

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00:24:38,269 --> 00:24:45,150

And he passed away and just looked at the audience in the conference center and everyone was very, very moved by that whole story.

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00:24:45,150 --> 00:24:49,309

It made us, you know, it's still recognizing that there's still work to do.

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00:24:49,305 --> 00:24:51,865

There's work to do to get these therapies out.

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00:24:52,025 --> 00:25:02,659

It's not easy in terms of everything that all needs to happen to move from where we are now to where we're producing tens of thousand therapies and also move from treating

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00:25:02,900 --> 00:25:07,539

blood cancers that we are now to some of the other cancers, solid tumors and so on and so forth.

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00:25:07,700 --> 00:25:17,914

But ultimately there are patients waiting for these amazing therapies and the impact that it can be had is really transformative and in the case

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00:25:17,914 --> 00:25:26,714

of Lisa Wardhamton she commented that it's not just the individual that's impacted, it's the whole family that's impacted by whether those therapies are.

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00:25:26,714 --> 00:25:33,720

So yeah, it's really motivating to hear from the patients themselves and there's a lot of work we've got to do to get these therapies out there.

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00:25:33,720 --> 00:25:43,984

To make it more affordable because these days, yes, just the discussion we were having earlier, just privileged people these days cannot have this kind of treatment because the cost we're talking about

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00:25:43,984 --> 00:25:45,184

millions of dollars.

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00:25:45,664 --> 00:25:48,704

And it's yet just privileged people cannot have these days.

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00:25:48,704 --> 00:25:53,664

We're talking about the 1% of the populations that can have these kind of treatment.

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00:25:53,664 --> 00:26:00,039

Making affordable to the rest of 99% of the people that sees the main challenge.

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00:26:00,519 --> 00:26:02,839

And this is what we are trying to do here.

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00:26:02,920 --> 00:26:07,480

When we talk about ATMPs, that becomes a considerably more difficult question.

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00:26:07,880 --> 00:26:14,119

And from some of the studies, as I've seen, that becomes one of the challenges, is that you invest in this infrastructure.

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00:26:14,734 --> 00:26:25,214

But you have far less control over the patient population demand upon that service.

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00:26:25,855 --> 00:26:32,940

And if you end up with a relatively low utilisation, you end up unfortunately with a relatively high cost.

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00:26:33,099 --> 00:26:43,194

I think that's one of the things that have is where I suspect that the

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00:26:43,595 --> 00:26:53,835

change in the style of the ATMPs, the efficacy of them, actually means that we will end up moving more towards first line treatments,

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00:26:53,835 --> 00:27:04,450

larger populations, and making these types of systems affordable in that you can achieve a higher utilisation from them because they become more norm.

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00:27:04,529 --> 00:27:11,664

I suspect what we're going to see in the industry is this snowballing type effect where one impacts the other.

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00:27:11,664 --> 00:27:12,625

It's just a privilege.

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00:27:12,625 --> 00:27:20,785

It's a great industry to work on where I think together as an industry we have the chance to transform healthcare in the next ten to twenty years.

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00:27:20,785 --> 00:27:23,825

It makes me feel amazing a lot of times.

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00:27:23,825 --> 00:27:33,950

So I've been at a conference where people as well, considering I'm more involved into the robotics side, I get involved a lot into the pharmaceutical industries on different

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00:27:33,950 --> 00:27:39,444

type of therapies and talking about cancers, research and everything.

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00:27:39,444 --> 00:27:46,085

And I've been to a school and presenting and a mother basically kept So you get involved into cancer research?

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00:27:46,085 --> 00:27:47,044

I said, yes.

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00:27:47,365 --> 00:27:51,845

And, you know, I was basically presented to teachers, not to students, to a college.

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00:27:52,369 --> 00:27:54,210

And she said, alright.

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00:27:54,210 --> 00:27:59,089

So I've got a, you know, part of my family, you know, they are treated by cancer.

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00:27:59,170 --> 00:27:59,809

What do you know?

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00:27:59,809 --> 00:28:01,490

I said, listen, you know, we can have a conversation.

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00:28:01,490 --> 00:28:10,634

I can tell you, you know, what I know around the industry, what is coming available, and what there is and the possibility that there are these days.

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00:28:10,634 --> 00:28:20,795

But I said, I'm a robotic industry, I'm not pharmaceutical, I'm not heavily involved into the full discovery, with my knowledge

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00:28:20,795 --> 00:28:26,750

visiting and talking to the people into the industry sectors, I can tell you that this is coming.

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00:28:26,750 --> 00:28:35,789

She was very, very touched about the knowledge that I had and she didn't know about a lot of things that I mentioned to her, so it makes me feel there.

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00:28:35,869 --> 00:28:37,230

Amazing, absolutely amazing.