Find Your Perfect CPAP Fit With MaskFit AR's Tech Transcript

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Introduction to MaskFit AR

Welcome back to this Sleep Deep summit. New approaches in treating sleep apnea and insomnia. I'm your host, Dr. Audrey Wells. And our next speaker is Cox Tan-Ngo who is the CEO of AR Medical Technologies.

He's a registered respiratory therapist, and he trained at the Stanford University Center of Excellence for the Diagnosis and Treatment of Sleep Disorders.

He currently holds copyrights in the United States, in Canada and even globally for facial feature detection. And today we're going to talk about facial measurements, a AI and machine learning used by his program MaskFit AR This is for the selection and recommendation of the ideal CPAP mask, something that is so needed.

Welcome. Thank you so much, Dr. Wells. So happy to be here and happy to share our story and our technology with everybody. Yeah, you know, it's really great.

And I want to say, first of all, that I have used this technology personally. I feel I vetted it out and I think it's really exciting in addressing one of the most problematic pain points for CPAP therapy, which is the part that touches you.

It's the mask. What inspired did you to develop this technology? Well, first of all, I myself am a sufferer of sleep apnea. So I've used the CPAP machine and I actually operated and ran a DME here in Vancouver, B. C.

for a number of years and treated thousands of patients on CPAP.

Why CPAP Mask Selection Matters

And the biggest challenge that I've always found was we were working in a in an environment where for years, the area that really hasn't changed. I mean, the masks have changed.

The technology and the styles of mask have improved. Even the machines have changed. But the ability to to find the appropriate mask for an individual, which is really the most important aspect of it all to develop for established comfort, has never changed.

It's always been a guessing game and the guessing game is not the fault of the clinicians. It's often the the reality based on the fact that you're you're given a set of tools and you're going to make the best out of that.

And then what happens to to the whole process is when you're now setting up a patient and you're trying to establish comfort. The only thing you can actually say to a patient, unfortunately, is, well, if you try this and it works, that's great.

But if it doesn't, we'll probably have to try something else. But when you think about medicine and trying to establish some type of confidence for the patient's perspective, it's very difficult to say that you're guessing right.

And developing this technology was a revolves around the fact that I wanted to have a scientific process that is developed, that is unbiased, that will help the patient and the clinicians that are helping them.

Because we also know that by nature of things, we have experienced clinicians and inexperienced clinicians and through the years of talking to experienced clinicians, we actually have a similar formulary of a thought to to try to establish a good mask for a patient, but unfortunately, it's never been put on paper, nor do we have the tools to actually utilize it at its full effect.

Until MaskFit AR came along. You know, this is fantastic. And you're so right that this is an area of the treatment with CPAP that has not been developed.

And oftentimes I'll liken it to somebody picking out, you know, the right pair of jeans, the right pair of shoes or the right bra for women can relate because there's so much trial and error that's involved.

When you buy something and you try it not only just for that initial comfort, but also comfort after hours of use. So let's dig into the details a little bit.

How is MaskFit AR selecting the right mask for the person who's using this technology? Yeah. So we actually use a very unique process. So first of all, it's important to note that we don't actually take any images or pictures for security purposes.

I know there's a lot of concern out there in relation to Deepfake and the utilization of photos and things like that. So that was the forefront and the foundation of the technology that we establish.

We only take reference points and everything is done on the local device that you have. So it's not transmitted at any point. The only things that are transmitted are reference point measurements and as appropriate to the right mask for you that's being selected.

So but when you start to dig deeper into what the technology does, it's not a facial sizing tool either. It's not the same thing as taking out a package of a CPAP mask and using the sizing tool and guiding it on your face and trying to find the right size for you.

It takes a little deeper dove into things such as demographic information, so they'll take into account the fact that you're male, you're female, you're ethnicity.

If you're Asian, you're Caucasian, you're European. All of these are being established in the background because we know that every person has a unique face and that uniqueness of their face may be related to ethnicity, gender, etc.

So we want to make sure that that's taken into account when making a selection.

How the App Uses Facial and Clinical Data

The next step that we look at is if you have all your information related to your pop data, it actually takes into account that if you're using a BiPAP, a CPAP and auto CPAP, all of these things matter because the the threshold is in the modalities of of treatment are different with different machines.

So even if you said that all things are created equal, well, they're not with relation to the fact that certain masks actually perform better with higher pressures versus lower pressures.

Or if you are an individual that requires a full face mask, which full face mask performs better on a high pressure versus a low pressure device, all of these are factors that we need to take into account.

And then finally, we also take into account things that, like I mentioned earlier, clinicians actually ask about. They'll ask things like if, you know, are you claustrophobic?

What position of sleep do you do throughout the night? And even things related to facial hair and nasal congestion, all of these factor because the mask selection process is not just one that's esthetically driven.

Yes, there's influence with esthetics because obviously you don't want something big and then comfortable on the onset. But the reality is, if you want an effective mask for an individual, you have to take into account all of these things.

And experienced clinicians can do that. But not everybody has the caller database in their head of all the different masks that are out there either. And that's what we we take into account with all the different brands, completely agnostic, unbiased, giving you an output that could be most useful to you and properly result in the greatest greater success for your therapy.

Yeah. So I want to put myself in the shoes of a person who's going to use this app so they would open up the MaskFit AR app. And what you're saying is they would the person would initially get questions about what what body position or sleeping position they have, what sort of pressure setting they might be on, what pressure mode, CPAP, auto PAP, BIPAP they would get questions about whether they're claustrophobic or not and that type of thing.

Then there would be a scanning feature that the app does of the face. Do I have that right so far. Yes. So there's two versions of our technology, the MaskFit AR technology powers everything the ones that are facing the consumer that you'll be able to see on our website is called FitChecker.

So that initial process is a free process that you can actually scan your face and make sure you input what mouse he currently used so that you'll actually know how that ranks in terms of fit for you.

But then if you want to dove deeper into it, you can actually now answer those questions that you had mentioned. And now it starts to use that artificial intelligence and AI to make sure it recommends the style and and Siri is of mask that are most suited for you as an individual.

And then you get the output for that. And that's the list that you can utilize to, you know, work with your clinician or even look on your order to see which you've tried in the past that are unsuccessful or or successful and then work through those whole list of mask for you.

So got it. So what I'm hearing is that even if you already have a mask, you can use the, the software, the app to do the FitChecker part of MaskFit AR and see how well that mask ranks based on your unique facial features and the other questions.

And then if you were to. And let me add too sorry. Yeah, that it's not just the questions that drive it, it's the fact that it actually utilizes all the information that we've collected from other users.

So essentially what you're doing is you're validating your your results are validated by users who've successfully used those masks. And so you're taking the power of everybody that's used this technology and using it as your backup tool to to actually recognize the masks that are most suited for you.

So it's it's not just a single singular linear algorithm. It actually takes into account everything that works in the background from other people as well.

You know, I'm glad you mention that, because that kind of brings this seasoning component to the software where, you know, the collective use of all the people going before the person who's trying to find a mask is actually helping in the selection in.

And it sounds like to if you wanted a new mask, then the program could be used in that way as well. So whether you're a new CPAP user looking for a good mask or you're an established CPAP user who wants to check the fit of your existing mask, this technology would apply in both situations.

Exactly. And the beauty of it, too, is the fact that you may not get a list a month or a year from now. That's the same as the one that you did before, because it's not linear.

It's always evolving and it's evolving with new math. So let's just say to a point even that you want to use saw a new mask and you put in a new mask that just came out.

But you don't know where it ranks for you. You might as well put it in there and say, Maybe I want to see how this

will work for me and it's ranked high, then that's great.

It shows you that it would be an excellent fit for you. Then your confidence to purchase that mask would be much higher than just arbitrarily guessing, buying it, trying it, finding out it didn't work.

FitChecker, Recommendations, and Mask Matching

And then next thing you know, you've thrown it in the garbage right? And 30% of all masks are discarded because of that reason. And, you know, it's resulted in poor compliance and outcomes for patients long term.

Right. So. You know, definitely I've had that experience both as a sleep medicine doctor, but also personally, you know, just trying to find a mask to buy and then get it sized correctly and then trial it for use throughout the night.

So there's a lot of layers that this type of personalization can be beneficial for. And I'm wondering, when you go through this app, what do you get? Do you get recommendations for one mask?

Do you get recommendation for the size of mask? What is the output. The output actually allows you to get up to nine masks, including the sizes that would fit you.

Right. So it really is honed down to the specific ones that you need to acquire for your for your purpose. Right. So it doesn't give you just the brand or just a series of masks, because by nature of things, believe it or not, you can even have the potential of one one style with two sizes, right?

Because you can be kind of in between, but it'll at least rank you based on what fits your facial feature on that size most. Right, based on the population base.

So let's just say it's mass x could have fit you both on a medium and a large, but then our algorithm is designed to say, well, how much more people with the same facial structure fit a medium versus a large?

And then it'll give you the one that is most appropriate for you so you don't have to work through that guesswork of trial and error as a result of it. Yes.

And one of the things about mask fit are in particular is that I also understand it will take into account your nostril size. Correct. And that's one of the unique aspects of what we do, because our system is able to actually measure down 2.1 of a millimeter.

And that's the reason why we can actually measure nostril size, because if your tolerances are greater than a millimeter, you can't really size the nostrils appropriately.

And most technologies don't have that complexity. And but we do because we take observe out depth, we take it account shapes of all different sizes. In fact, our measuring schematic is much greater than what you would get in your your your toolbox with with the fitting guides.

We actually measure more parts of the face and more parts of the mask because we do have a system to measure masks themselves. If you look at the different styles or brands of max out there, even if you looked at a nasal mask, for example, there are some masks that will just measure the base of the nose, but they won't measure the height or the depth of the nose.

We take into account all of that so that you can get the most accurate fit possible. And it sounds like you're also measuring the masks themselves to kind of make that pairing, that match for the best fit.

Exactly. Because the challenge that we see between the assumption of the mask be a certain size is, again, if you're giving a sizing tool and we base it on that, that's great.

But if you don't measure all the different parameters and match it to what we're actually obtaining as a as a

measurement reference guide, then we're really missing a whole gap there and you're going to have a lot more errors. It's not a perfect science.

Buy it by nature already, but you're trying to reduce the margins of error. And the only thing that you can do to do that is really match up identical systems, basically.

Yeah, it makes so much sense and for for people at home, I want to summarize up to this point some of the differences between mask, fit air and the other mask technology that I've tried.

So we're talking about the measurement of these parameters down 2.1 millimeter, including nostril size. We're also talking about the fact that mask fit air will give you nine types of masks.

And as I understand, it's three in the nasal pillow, category three in the nasal category and three in the full face category. So potentially nine masks for the user.

And then thirdly, and I wanted to delve into this a little bit more, you mentioned that this is an agnostic technology, which means that you're not limited in recommending certain brands of masks because you're not adherent to that brand.

And one example is the the mask that technology from Restaurant X or Philips are going to, of course, recommend those types of masks. But give us an example of how many different brands mask that air technology is able to recommend.

There's a lot of brands out there, but in terms of the totality of mass, believe it or not, we have about 180 masks globally. And because we are a global platform, the neat thing of what we've done is we've regionally appropriated the masks as well.

Privacy, Platform Support, and Security

Meaning if you are located in Europe, you will be given the masks that are available in your region. Same thing in North America, South America, etc..

So that's the beauty of our technology. And every day we get constant emails from even smaller mask manufacturers out there that have never had the platform to show their showcase, their their goods and their say, Hey, can we at least be part of this?

And our goal, remember, is not to sell a brand, not to sell a mask. Our goal is for the patient to get the best mask so that they can have the best treatment possible and a successful CPAP therapy long term.

Right. So that's really our goal and that's why we've always kept the the patient as the focus. And we don't really consider the brand as a primary reason to recommend one or the other.

We consider all masks to be good as long as we've selected it for the right individual. I so align with that philosophy because at the end of the day it's really the outcome that that particular individual is getting from their CPAP and their comfort with the CPAP mask.

That's really the center of why we do these things is to help people. One by one by one get the best night of sleep that they possibly can. Now, I mentioned that there's some other facial scanning software out there.

Have I completely highlighted the differences that mask that air has or are there other things that sets it apart? I think you, for the most part, outline what we do to show people or tell people about Best Fit Air.

But it's also important to note that, you know, our technology is multi-platform. So it's it can be used on a webcam that we're having now using right now.

We can use it on any tablet, any phone. And that makes it quite unique in that sense, because now the power can be utilized everywhere right? So even in a telemedicine platform that we have now, you don't necessarily have to embedded into the Zoom meeting or a teams meeting.

You can actually send a text over to your patient at this moment and then say, hey, go fix your mouse and see how an and on your end you'll be able to see the list as well as the patient will be able to see the list.

So that's a very unique, real time way to engage with your patient. And finally, back to the security aspect, I can never reiterate enough the fact that we are an encrypted system.

So nothing that is put into our servers can be regenerated in any way. And our bit encryption is so high that you can't even determine who the patient is that appropriates to the mask.

And then going back again that we don't take and images or videos for that matter, which is very unique in our industry because the old way, especially during COVID, where really this technology started to proliferate as quickly as it has, you know, a lot of technologies out there were quick to jump at the fact that you take the selfie and I'll look at your face and then well appropriate about for you, they take manual measurements of the background or automatic measurements on their end, but it's all processed on the server.

We've been developing this technology. I conceptualized it in 2006. I started developing it in 2013. So this is a long time process that we really thought through the whole system to the fact that we also have an ecosystem with web portals and things like that.

So clinicians can use it appropriately, patients can use it, and physicians can also deploy it as quickly as possible to their patients. Yeah. And you know, I when I tried this technology myself, I was surprised at how easy it was.

You know, it's just a matter of opening up a website from a text message. And then I held my phone out and then there was a little motion like this. I assume that's when I was having my nostrils scanned, but also different parts on my face.

And then it was just a matter of seconds before the mask selection was coming back to me. Yes. And that's that's the beauty of beauty of the long term development, because we wanted to execute the process quickly.

We didn't want you to have to like the old way. When we first started this was you actually had the panic device and it took like it started a minute and 20 seconds and then we got it down to 20 seconds.

But, you know, by nature of individuals, when you're having to do things too much, it takes too long. And as a result that the the comfort level and even the the confidence level goes down quite a bit.

So we needed to make it so in such a way where it's quick, it's easy to use. We develop our user interface based on inputs from many people physicians, therapists, clinical groups.

All of these things were were developed with that in mind. And I should also mention one thing that you had asked earlier is, you know, part of the questionnaire, we even included updates to include the the concerns with magnets.

Reducing Refits and Improving CPAP Success

So if you have issues with magnets as a background based on medical history, it and you actually input that we will eliminate those magnetic based masks from the selection process as well as our recommendation process.

Yeah, that's really important and I think it speaks to your agility as a company to keep up with things that are changing. You mentioned adding new masks to the pool for selection and there's stuff being developed all the time.

I want to go back to something else that you said just to kind of crystallize it for people who are watching. You mentioned a 30% refit rate. For me, it seems like some people are having almost a 100% refit rate as they cycle

through and they start developing a mask graveyard kind of in the corner of their bedroom.

Tell me with mask fit air, what is the refit rate and what does that mean? So refit rate for us is the number of masks that needs to be replaced for any reason.

And we actually take into account that the fact that our goal is to reduce the refit rates of the 30% because that's a lot of based on a given day. When you think about globally how many masks are thrown away and through our partners, you know, we're still collecting data.

This is an infant technology and I'd hate to publish any information that is, you know, very low data based. So but our partners have already expressed how much it's reduced their number of patients that come back to replace their mask for a different size, for a different call it a different style.

And, you know, we've had it as low as 5% for for sleep labs that use it even for titration, because now they're not having to wake up their patient and fit multiple mask.

They actually pre-selected these for four patients so that when they do the split night study in the lab, they just select the top mask that was recommended and they put it on and they often don't have to replace that.

And that's the same mask that the patient will take away later on and use permanently for the therapy. So we've managed to to reduce it to a bare minimum.

I don't think it's ever going to be perfect. Right, because there's many elements and variables that contribute to this satisfaction to a mask. But what we want to do, at the very least, is reduce those avoidable issues like sizing issues, irritation due to pressure point issues, mask issues, if we can reduce those, that represents a great majority of things that people complained about.

And those are the the concerns that actually are more geared to having people discontinue therapy. Right. And so if you eliminate that and you can at least achieve some level of good sleep quality with with their PAP as a result of it, they're likely not going to discontinue therapy and the other variables that caused them to want to replace a mask, you know, is up to them.

I mean, believe it or not, in the years that I've done this, I've had people replace a mask because of the color of a mask. So, I mean, there's nothing we can do there, right?

Yeah. Hopefully as our technology evolves, we maybe there's some something there that we could do that's funny. That level of personal preference is that's something that can always be addressed.

And, you know, if you told me this was a 100% accurate technology, I'd be giving you major side eye right now. So what I just want to highlight is the improvement that can be had when these facial measurements are made and combined with the machine learning and combined with the other elements that are known variables of a person's therapy.

So you're reducing waste, you're reducing frustration, you're really setting things up for a person to have success with their pap therapy. And, you know, I like to say the mask is the most important part because it's the part that touches you.

So getting a leg up on what would be a good fit is always a great thing. In my book. I wonder you mentioned your partners, so you work with SleepLabs, MaskFit AR works with durable medical equipment companies or DME companies, and you also work with people at the individual level.

Can you tell us how someone would find a way to connect with this technology and use it even for the Fit tracker or the FitChecker?

Accessing the Tool and Final Thoughts

Or if they wanted a new mask? Yeah. So, you know, you can find us very easily on our website, which is www.MaskFitAR.com And so they're right on the top.

You'll see FitChecker and you know, for the month of February during the Deep Sleep Summit, we also are promoting a 25% off the you know, if you are going to get a fully recommended list of masks, you'll get a 25% discount on that, which we're really happy to share.

And really what we want to do is get this in the hands of everybody. And that's why we've created a system that is for all parties involved with sleep and the treatment of sleep apnea.

We're not trying to keep this at a back burner for just exclusive clients or anything like that. We want it in your hands because like I said, although I am a respiratory therapist, I've owned a DME, I'm also a patient and a user of this device.

And what I want to do is share the experience that I have, share the technology I have, and hopefully this can be a global standard one day that, you know, everybody can utilize.

Because our goal as clinicians by nature is to make sure that our patients are treated properly. And if that is always at the foundation of everything that we do, everything else is simple, right?

And sharing the technology is simple. I love that. And, you know, your personal experience as a CPAP user is ever important in driving your motivation to continue helping people.

Thank you so much, Cox, for bringing your expertise today and introducing people to this really new concept that can help eliminate a lot of the mask headache.

Thank you so much. Thank you.