

Vuzix + Medacta NextAR Surgical Platform

Bridging the Gap Between Innovation and Sustainability

It's no surprise that Augmented Reality (AR) provides many benefits in the medical field. AR is being adopted more widely for use of surgery, virtual operating theatres, training, education, and so on. This is largely due to the fact that real-time access to information has always been among the highest priorities for surgeons. Augmented reality now makes that possible through hands-free smart glasses displays.

Medacta, one of the world's largest providers of orthopedic products, has used Vuzix Blade smart glasses in the operating room for some time now – successfully completing the first of many total knee replacements in 2020. Due to the large success of that procedure, they now have Vuzix Blade smart glasses being used in various other surgical disciplines (shoulder, knee, and spine), serving as the primary hardware for their NextAR surgical platform.

What is NextAR?

The NextAR platform by Medacta introduced AR into the operating room and an overall better way to perform surgery. The platform allows surgeons to take a preoperative scan, with proprietary algorithms, that then creates a personalized biomechanical model for each replacement. Surgeons equipped with Vuzix Blade™ smart glasses can then access the biomechanical visualizations during surgery, using augmented reality, in real-time, without having to divert their eyes from the procedure to glance at a computer screen. "I don't have to do anything differently than I'd normally do in a surgery to get the information that I want. I'm not looking to a peripheral site, or a screen, or a monitor, or anything like that, which is critically important," said Dr. Cox, Orthopedic Shoulder and Elbow Surgeon and Section Chief at the Shoulder Center of Arkansas, and one of the early adopters of the NextAR solution using Vuzix smart glasses.

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“Having Vuzix glasses gives you the truth. Immediately you know that not only is this what you intended to do, but this is what you’re about to do.”

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Benefits of NextAR

The benefits of the platform when paired with lightweight, hands-free smart glasses are endless. The NextAR surgical platform is cloud-based, meaning that surgeons can have access to cases anywhere, at any time, on any device. Additionally, the automated algorithm allows for ligament attachment detection and accuracy tracking, in real-time, in the OR. The tracking system platform

is infrared, single-use, and made up of optimized optical sensors connected to high-speed Blue-tooth for fast and accurate modeling. Last, and arguably most important when there is human life involved, is the ability to allow the surgeon to always keep their eyes and hands on the surgical field with minimal distractions.



Dr. Wes Cox

Orthopedic Shoulder & Elbow Surgeon
and Section Chief at UAMS Orthopaedics

Vuzix Blade Smart Glasses: Lightweight and Powerful

Any form of distraction for the surgeon while operating is a potential detriment to high quality outcomes. The Personal Protective Equipment (PPE) that a surgeon must wear while in the OR, sometimes up to 12 hours a day, is extensive. The need to add one more piece of equipment can be a serious enemy to adoption. However, what Dr. Cox found when putting on the Vuzix Blade was quite the opposite.

Vuzix Blade smart glasses are built for wearability. Durable, lightweight, and powerful, this form factor was expressly engineered for all-day ergonomic wear. In addition, the advanced waveguide optics enable surgeons to keep their hands free and their eyes focused. The see-through waveguide lens can merge digital instruction into real-world tasks, reducing visual occlusion and reducing error rates. In addition,

surgeons can issue voice commands to zoom, take photos or manipulate the display without ever taking their hands off their patient.

The glasses allow the surgeon to simply do their job, more accurately, without negatively impacting the level of comfort or the ability to keep focus on the patient. That is one of many reasons why Vuzix Blade is the hardware exclusively supporting Medacta with their NextAR Surgical Platform implementation to revolutionize the way that surgeries are performed across specialties.



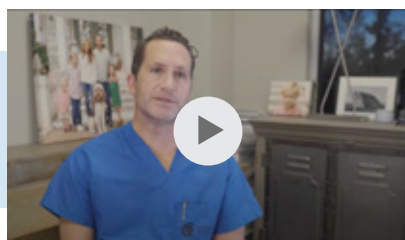
VUZIX BLADE™
SMART GLASSES

Benefits of Smart Glasses

When asked about the benefits of Vuzix smart glasses in the OR, Dr. Cox repeatedly points to the lightweight, compact design, making them easy and comfortable to wear during lengthy procedures. In addition to their compact design, the glasses are also wireless, giving the surgeon complete freedom of movement. Another benefit highlighted was the large field of view. There is a more than sufficient field of view to be able

to reap the benefits of the augmented reality without ever compromising awareness of the surgical field. Lastly, when asked about the learning curve, he pointed out that, "after a minute or two of having them on, I'm just appreciating the visual effects. Nothing felt different. It was like I was doing normal surgery; except I had all these extra cool boxes giving real time feedback."

Watch the Video



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How NextAR is being used for the OR

The NextAR surgical platform is being used across multiple surgical specialties now with great success. Prior to surgery, there are Pre-Op scans, which are fed through a series of algorithms. This then provides personalized biomechanical models for that given patient and surgery type (whether it be shoulder, knee, or spine) – automating one of the most difficult parts of any surgery. This allows the surgeon to be able to visualize that model, using the Vuzix Blade, in real-time during surgery. The glasses

project how the model will look in its display, overtop of the patient, allowing the surgeon to visualize the end result. This procedure, from start to finish, not only guarantees that the surgeons' eyes always stay on the surgical field, but it also eliminates the need for additional equipment in the OR (such as robotic arms, displays, etc.) and/or dedicated equipment operators – ultimately reducing costs for hospitals.

What does the future look like for AR technology in assistive surgery?

When asked how he envisions the future, Dr. Cox imagines this technology branching out into many different surgical specialties. He also sees promise from a communications standpoint.

While in surgery, when the anesthetic parameters are called out, smart glasses offer the surgeon the ability to see blood pressure, heart rate, etc., right on the screen; effectively mirroring what the anesthesiologist is seeing, without ever taking eyes off the patient.

He also believes that augmented reality could have a huge impact on education due to the endless opportunities when it comes to teaching. The ability to see exactly what you're doing and receive immediate feedback is something that's invaluable in education. "You don't have to be at the wrong angle to realize it before you come to the right angle," said Cox. "Having Vuzix glasses gives you the truth. Immediately you know that not only is this what you intended to do, but this is what you're about to do."



For more information about Vuzix Blade smart glasses, visit vuzix.com/products/vuzix-blade-2-smart-glasses