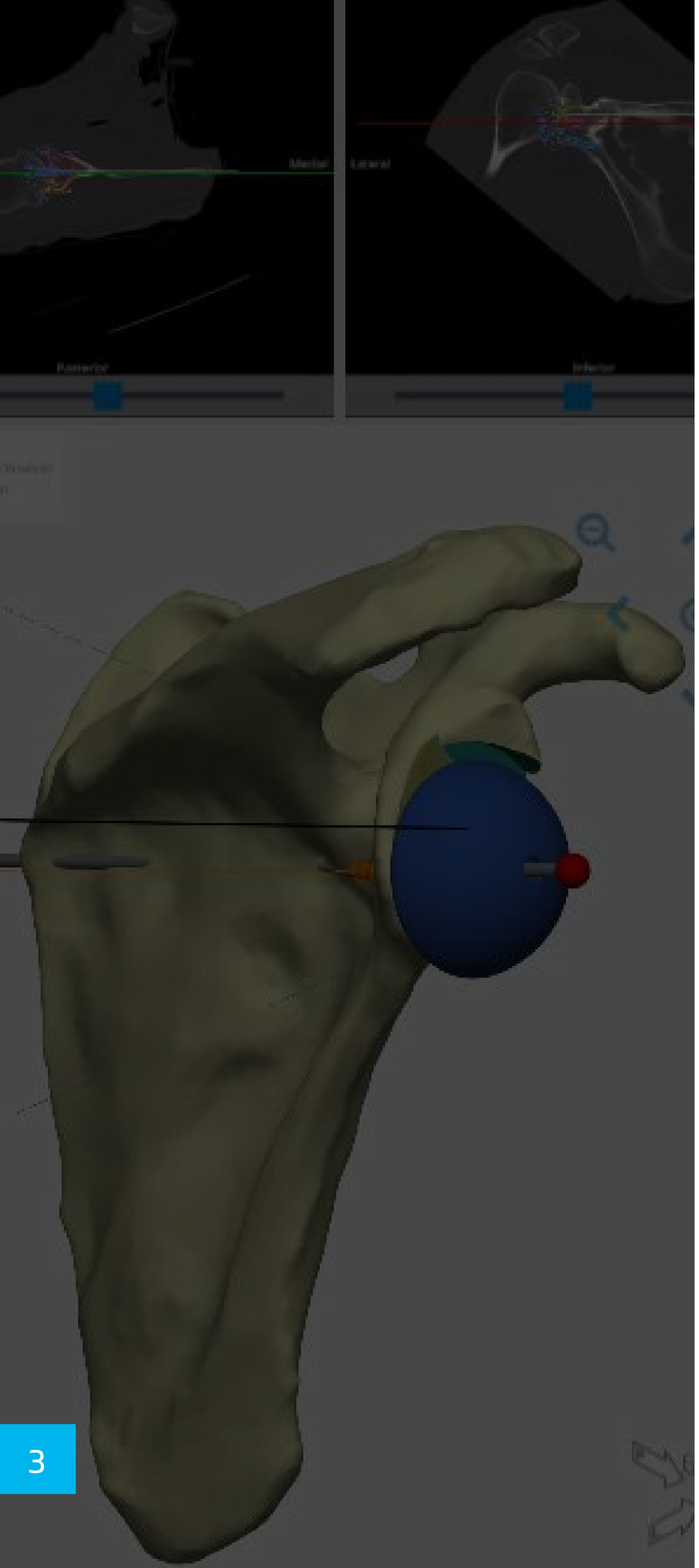
materialise

innovators you can count on

Don’t Compromise. Personalize.

Orthopaedic Solutions
by Materialise

Enhance predictability.
Trust the outcome.



Why compromise?

Orthopaedic surgeries are among the most frequently performed procedures in clinical practice, with over 6,000,000 taking place each year, worldwide. But common does not mean simple, just as standard is no guarantee of success.

While optimizing patient outcomes tops the priority list in every hospital around the world, today, up to 20% of patients are not satisfied with the outcome following total knee replacement (TKR)*. And around 27% of hip revisions are re-revisions**.

Standard procedures and implant choice don't always match the specific patient's anatomy needs. This combined with an increasing demand for more efficient and effective processes, means the expectation on clinical teams is to do more with less.

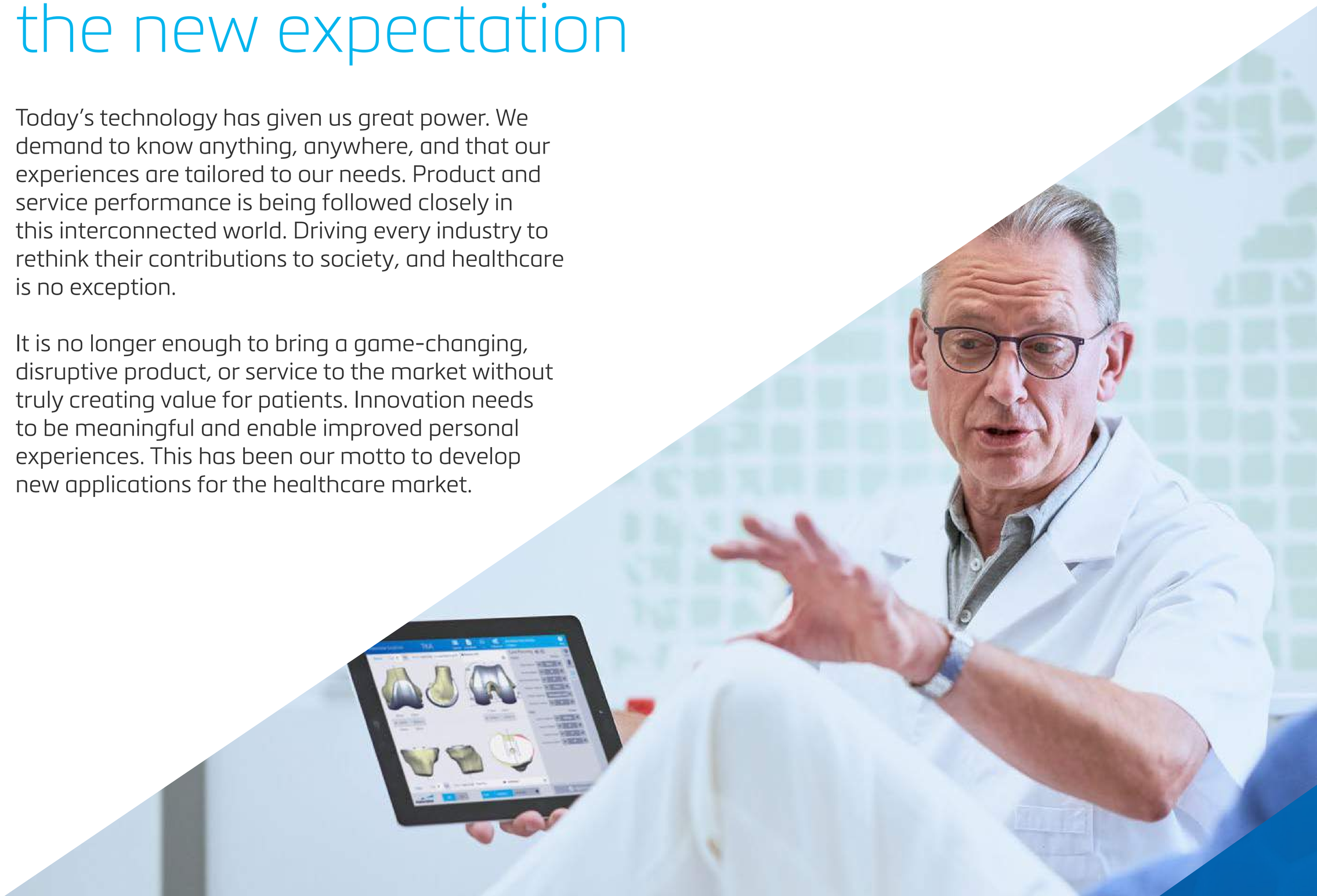
Enhancing surgical predictability through personalized solutions has proved its value to achieve both challenges. Why compromise?

* Scott CE, Predicting dissatisfaction following total knee replacement: a prospective study of 1217 patients. (2010, Sep;92)
**Swedish Arthroplasty Register, Annual Report 2014

Personalization has become the new expectation

Today's technology has given us great power. We demand to know anything, anywhere, and that our experiences are tailored to our needs. Product and service performance is being followed closely in this interconnected world. Driving every industry to rethink their contributions to society, and healthcare is no exception.

It is no longer enough to bring a game-changing, disruptive product, or service to the market without truly creating value for patients. Innovation needs to be meaningful and enable improved personal experiences. This has been our motto to develop new applications for the healthcare market.



30 Years of Meaningful Innovation

Empowering innovation to make complexity, business as usual

Technology will never replace the need for surgical skills. But it does empower surgeons to optimize time in the OR and make patient outcomes more predictable.

Over the last 30 years, 3D technologies have opened new frontiers to push the boundaries of digital planning and design of devices.

Materialise is a pioneer of leading medical applications of surgical planning and 3D printing, enabling researchers, engineers, and clinicians to revolutionize personalized care.

Milestones in Healthcare

Made by Materialise

1992

Accurate image-based engineering with Mimics software launch.

1995

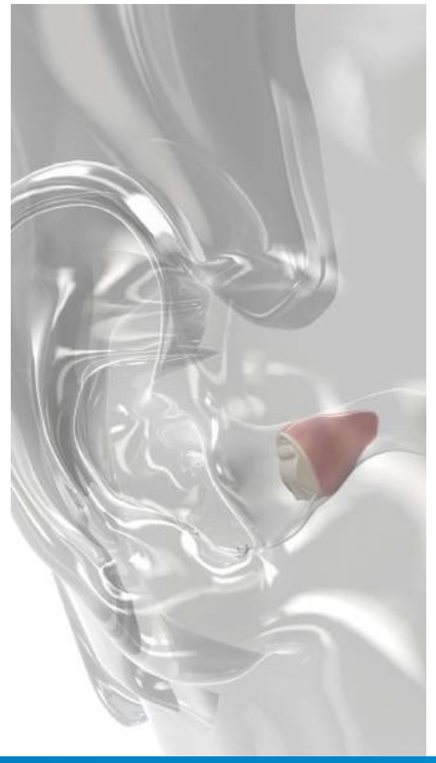
First 3D anatomical models in colors.

1996

Pioneering virtual planning, guides and implants for dental surgeries.

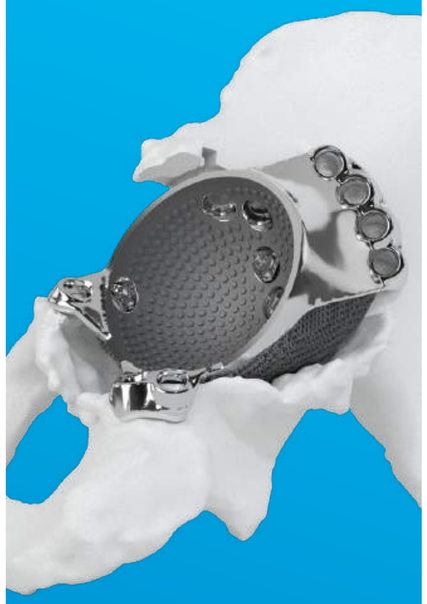
2000

Production of personalized hearing aid shells becomes a reality thanks to Materialise software.



2006

Launch of PorousiTI, the first titanium 3D printed skull implants with intricate porous structures that behaves like natural bone.



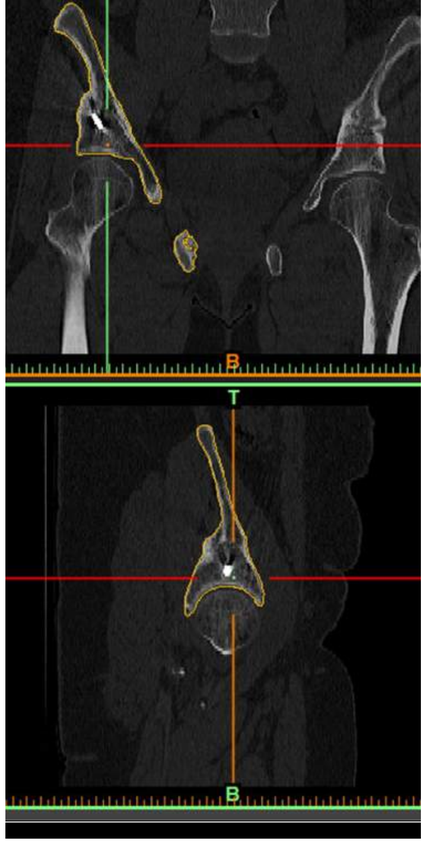
2007/2008

Start production of breakthrough hip and shoulder personalized implants.

Introduction of guides for knee implant placement.

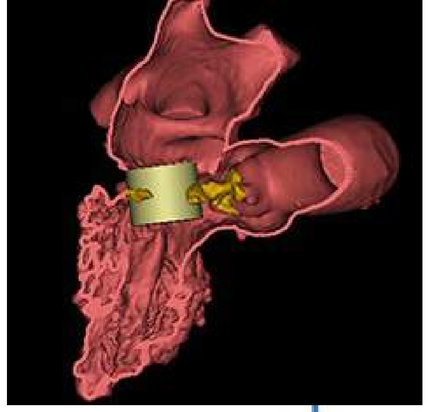
2011

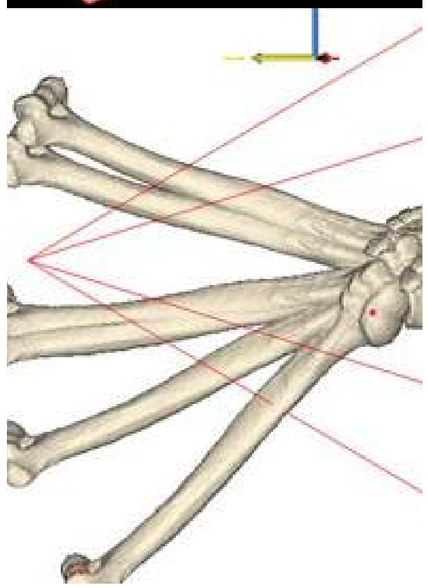
Our CMF medical software and enginnering services contribute to the first face implant.



2018

The Materialise Mimics inPrint became the first 510K -cleared software available for hospitals seeking to set up Point-of-Care 3D printing facilities.





2019

Mimics Enlight TMVR introduces 3D planning for transcatheter structural heart interventions.

Range of motion and defect classification in shoulder.

2020

Materialise passive NIP: An easy-to-use solution that bridges the gap between a simple oxygen mask and intubation.

#MadebyMaterialise

Welcome to Materialise, where surgery meets high-tech engineering.

Materialise is an engineering company specialized in 3D technologies active in the industrial and healthcare markets.

The launch of the Mimics software back in 1992 has pioneered the development of 3D image visualization. Our experience in engineering on anatomy gave us the knowledge to develop the first-ever personalized surgical guide using 3D printing technology.

Today, the Mimics Innovation Suite (MIS) forms the foundation of Medical 3D Printing, in clinical and research environments around the world.

Discover the Materialise MIS >

+5M Scans analyzed with medical software

+350K Personalized models, guides and implants created

+50K Patients helped yearly

Materialise works across the healthcare ecosystem to co-develop new applications and build clinical evidence together.

Partner with us >

Co-creating a healthier world

Strategic partnerships with leading orthopaedic companies have enabled our personalized solutions to pioneer and scale several applications. Hundreds of hospitals and clinics already use our MIS solutions for Point of Care (POC) imaging and printing.

Crucially, use of 3D visualizations and increasingly, 3D printed anatomical models to prepare for procedures is not where the potential of personalization stops.

Surgical teams around the globe rely on our engineering services to provide 3D analyses and planning, surgical guides, and personalized implants to improve predictability, both in standard and challenging surgeries.

DePuy Synthes
PART OF THE Johnson&Johnson FAMILY OF COMPANIES

DJO

smith&nephew

ZIMMER BIOMET

Lima Corporate
Orthopaedic motion

MATHYS
European Orthopaedics

GE Healthcare

INTEGRA
LIMIT UNCERTAINTY

Carestream

FUJIFILM
Value from Innovation

CHANGE
HEALTHCARE

SIEMENS
Healthineers

AGFA
HealthCare

PHILIPS

formlabs

stratasys

Why Personalize?

Plan with surgical accuracy.
Operate without surprises.
Inform your patient better.

Personalized solutions are not limited to niche, complex cases – though in such instances they have often proven to be critical to success.

Read the blog > Why Pre-operative 3D planning tools will replace conventional imaging tools.

Pre-operative planning:
First time right.

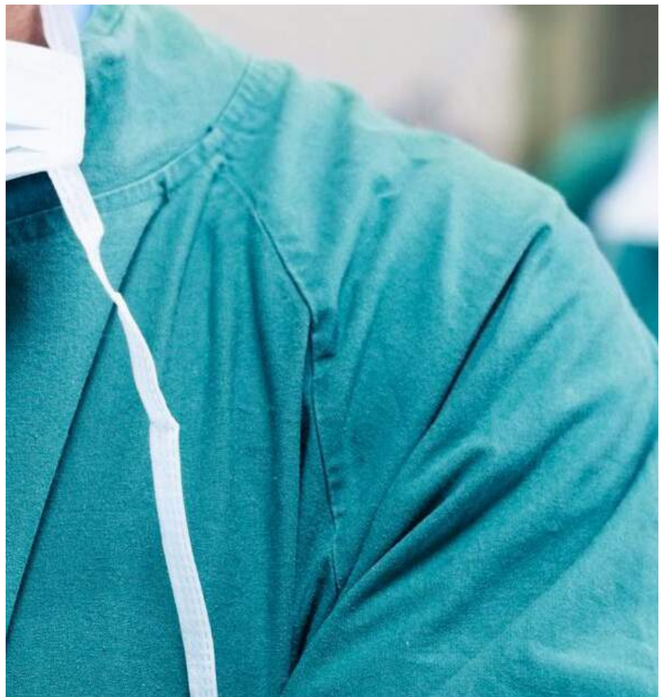
Help OR teams harness 3D visualizations, procedural and soft tissue simulations to predict what they will face in the OR and plan how best to approach it.

Operate with confidence, communicate with clarity, save time in surgery: all contributing to more successful patient outcomes, cost-efficient procedures, and reduced risk of surgical revisions.

Personalized guides: Translate your planning into the OR

Make surgeries quicker and often less invasive, reducing the number of incisions and instruments needed. Optimize implant accuracy and bone alignment for faster recovery times.

Execute plans accurately and efficiently, knowing that more predictable outcomes mean higher patient satisfaction and potentially improved quality of life for the implant recipient.



Personalized implants: Optimize outcomes

Maximize bone preservation by adapting implants to fit the patient, not the other way around.

Help patients recover more quickly by avoiding in-surgery implant adjustments that increase time on the table and potential risk of infection. Minimize the risk of biomechanical malfunction and the need for revisions/re-revisions. Trust better fit implants –to deliver potentially life-changing outcomes.

Double forearm corrective osteotomy guides in a pediatric patient.

Courtesy of Dr. Verstreken AZ Monica, Belgium.

Check case study >

When to go bolder with personalized solutions?

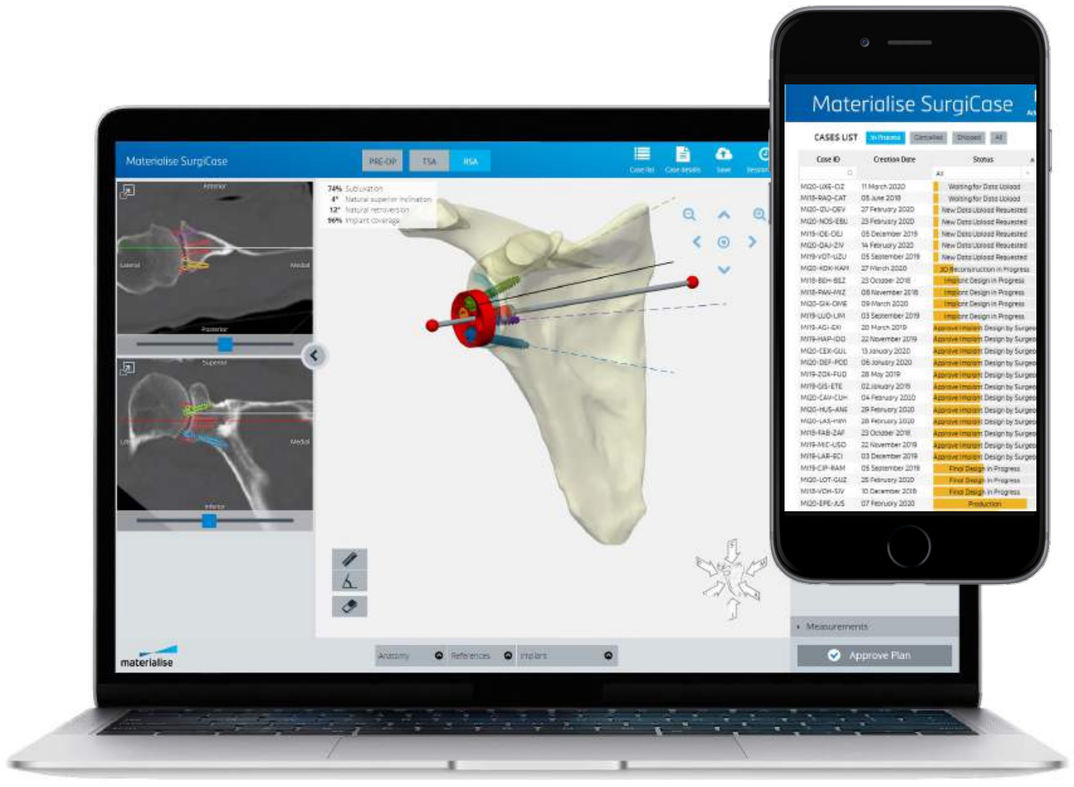
Shoulder arthroplasty is one of the most challenging surgeries in Orthopaedics because of the great variety of glenoid shape and limited intra-operative visibility.

While a correct positioning of the glenoid implant is essential to prevent complications and avoid revision surgery, the limited bone volume and unique shape of the glenoid vault gives little margin for error. Therefore, understanding the patient's shoulder morphology upfront becomes a must to decide the best possible approach.

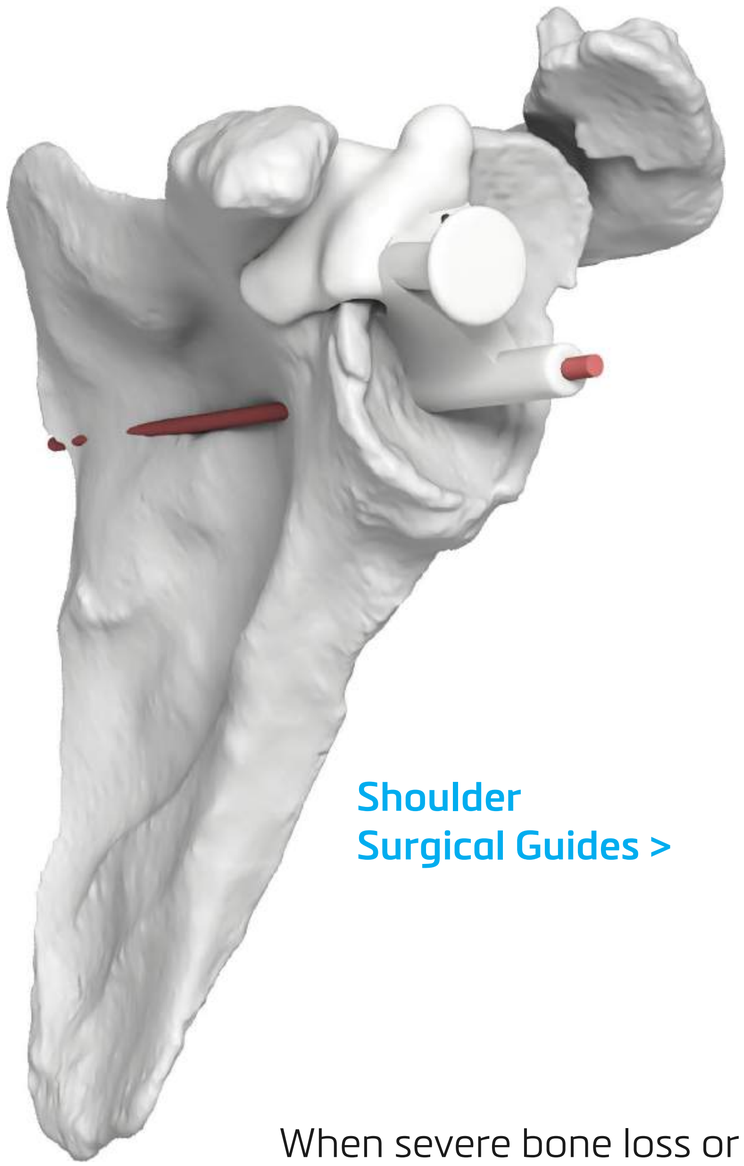
Planning becomes a key driver for better outcomes

Pre-operatively planning a shoulder arthroplasty in 3D enables accurate visualization of the anatomy and provides reliable landmarks for treatment decisions.

Our intuitive SurgiCase 3D planner allows the surgeon to simulate the surgery in a safe and stress-free environment. The practice of digital planning narrows the chances of misalignment and unexpected complications before entering the OR. Better patient outcomes planning it first time right.



SurgiCase 3D Planner >



Sure-fire surgical strategy: optimal fit guides and implants

Where pre-operative imaging has shown standard implant design to match the patient's individual bone pathology, patient-specific guides ensure surgery goes exactly as planned. The guide is printed to form a single and unique fit on the patient's glenoid, which accurately transfers the planned location and orientation of the pilot hole and screw positioning for optimal fixation and stability.

Shoulder Surgical Guides >

When severe bone loss or deformity have dramatically compromised the glenoid or scapula – a personalized implant extends the perfect fit one step further. The use of our Glenius implants has being reported to enable both bone preservation and prosthesis fixation while maximizing optimal alignment that may otherwise be impossible to achieve.

Glenius Glenoid Reconstruction System >

Glenius not availabe in the USA and Canada.

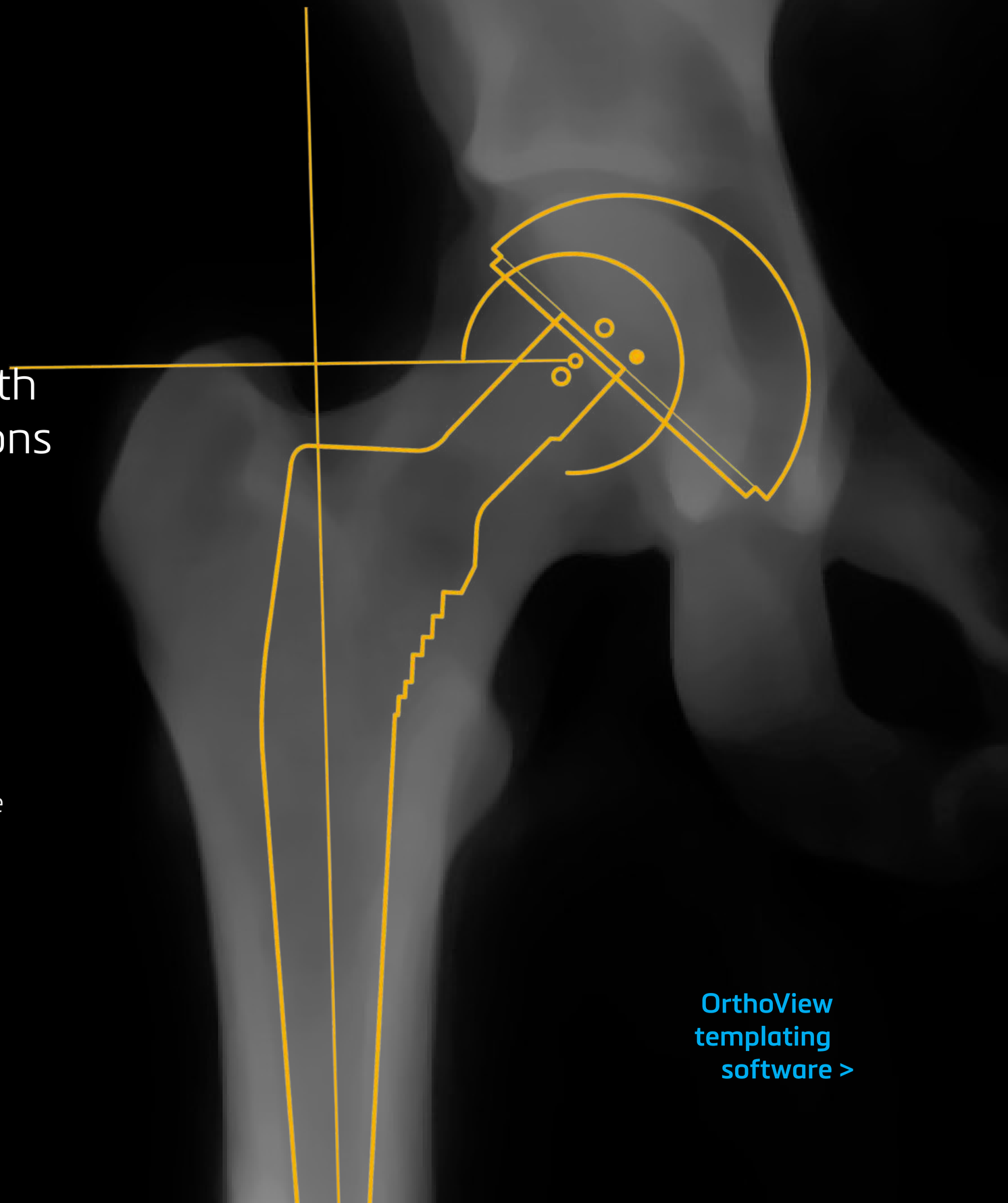
Improving surgical outcomes

Personalization starts with the right planning solutions

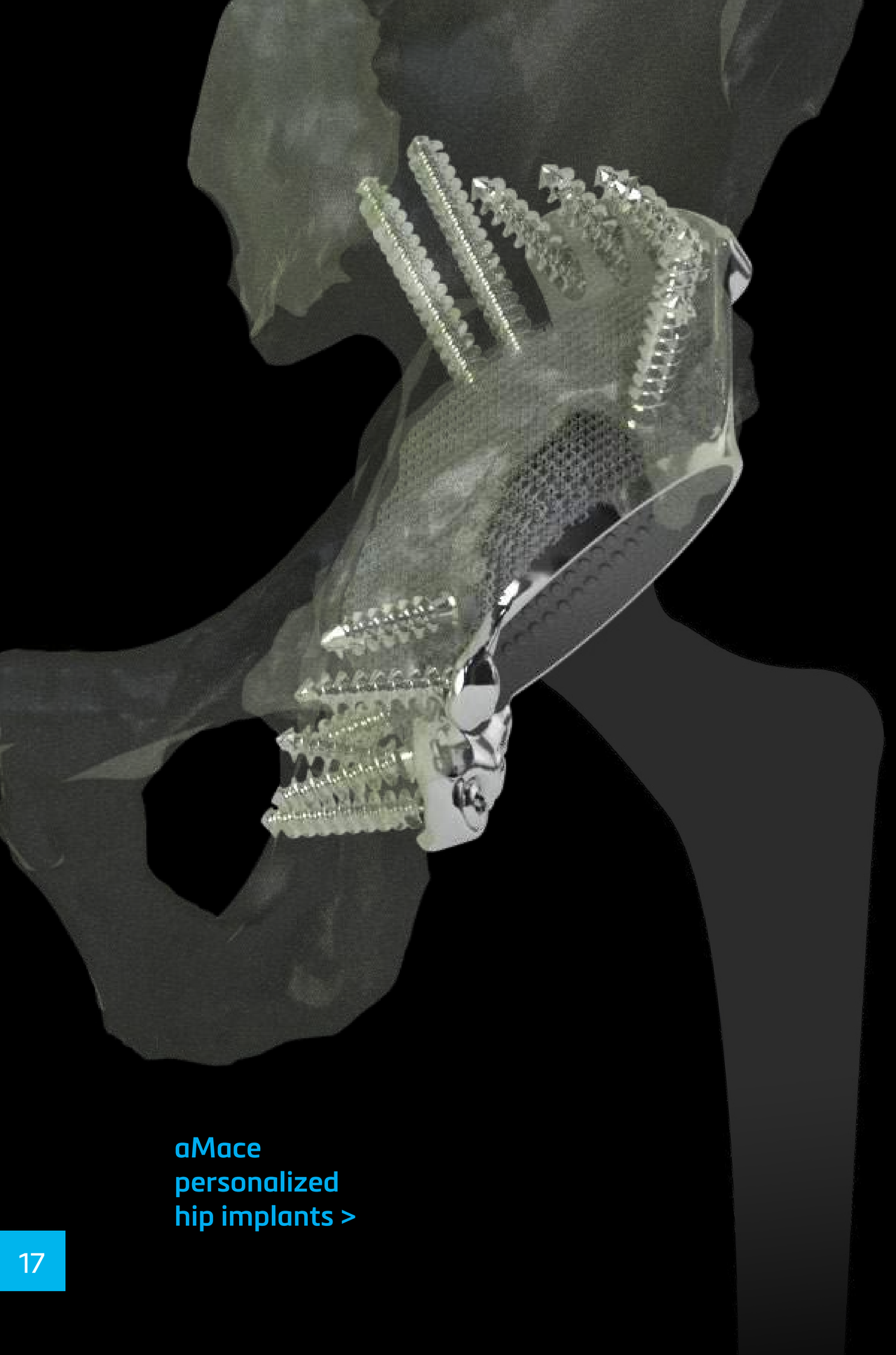
The benefits of digital pre-operative planning can be realized, whatever the case of surgical need.

Since 2002, more than 6,000,000 procedures have been planned by more than 15,000 surgeons using our pre-operative planning OrthoView.

A reliable, easy to use, and cost-effective X-Ray based templating software that helps surgeons to plan and template procedures accurately.



OrthoView templating software >



From standard to stand-out

Co-creating value across clinical teams

A personalized implant is an excellent example of what 3D planning and personalized implant design can achieve. Our aMace hip implant is designed to break the revision cycle. It maximizes bone preservation and minimizes radiological loosening.

Results are excellent - 98% implant survival rate, 83% of patients reporting less pain and more mobility, and 100% patient satisfaction even in the most challenging cases.

A positive, predictable outcome that lasts.

aMace personalized hip implants >

aMace not available in the USA and Canada.

Personalization becomes the new normal

Over ten years ago, we introduced the first 3D printed surgical guides on the market – our knee guides.

This technology opened the door to what 3D surgical planning and printing can do for personalized orthopaedics.

Uniquely designed to each patient for optimal implant alignment, the guides accurately position the knee implant during surgery, enabling surgeons to transfer the pre-operative planning into the OR efficiently. The use of the guides also translates into less invasive surgery for the patient.

All the steps to adapt the surgical planning to the patient's specific anatomy are supported by an online 3D planner, using advanced interactive tools for decision making such as the cartilage colormap. Component size and implant alignment are decided before the surgery, meaning less inventory and streamlined workflows for the entire surgical team.

Read the blog >

Knee guides

The surgical application that has put personalization inside of the OR

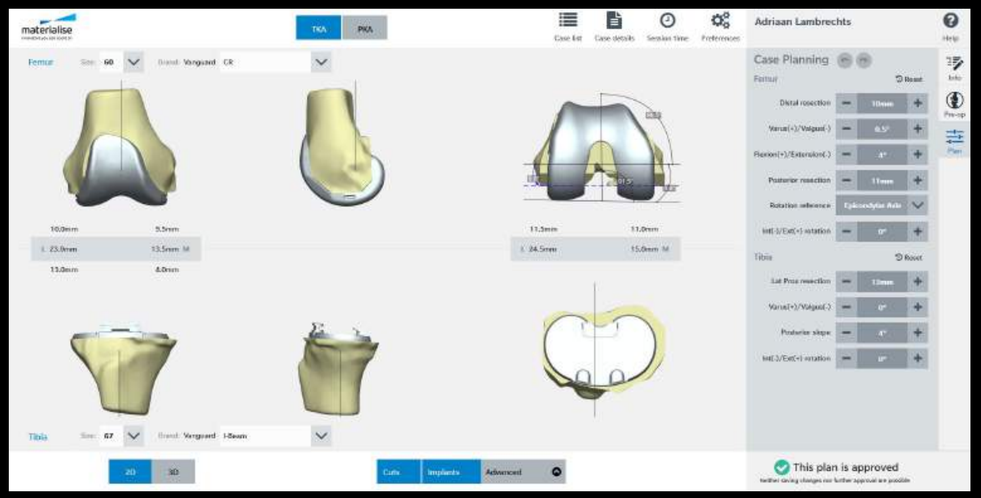
Our medical engineering expertise, combined with the deep clinical understanding from our orthopaedic partners, made the surgical knee guides accessible at scale. Since the launch of the knee guides, more than 300,000 cases of total knee arthroplasty (TKA) have benefitted from 3D planning and guides produced in our facilities. New became normal.

Watch the video >

Accelerating innovation through AI

The future of healthcare is one that will demand fast learning curves and agility while being able to adapt to unforeseen changes quickly.

Image-based 3D planning has improved a surgeon's ability to prepare a case and create intra-operative guidance. Today only 10% of the knee surgeries performed worldwide are digitally planned. Artificial intelligence will play a substantial role in changing this scenario, improving accessibility to digital planning.



Artificial Intelligence* cuts number of changes to knee surgery planning by 50%

The success of any surgery will still rely on the surgeon's knowledge, but the AI technology will reshape the way we plan, and access acquired knowledge.

In a digital total knee arthroplasty (TKA), our AI solutions* in research have been able to demonstrate that 50% fewer changes were needed to correct preoperative plans.

Watch the webinar >

*Product in development

Artificial Intelligence Enables Smarter Surgical Plans

Patient profile

Defect quantification

Native bone anatomy

Outcome data:

- Pain scores
- Mobility score

Surgeon preference

Augmented Reality

Mixed reality tools are creating a new, immersive, and adaptable way of visualizing 3D data and plans before and during surgery.

Augmented reality (AR) tools will enable a reliable, safe, and accurate workflow for translating pre-operative plans into the theater and the ability to adapt it immersively based on intra-operative data and insights.

Compared to other digital technologies such as robotics, it will be less resource-intensive to deploy, and more convenient for surgeons to use because of its immersiveness and small OR footprint.

Practice before entering the OR

Anatomical models help surgeons to understand challenging anatomies better and make the most suitable decisions before the surgery. AR applied to 3D anatomical models supports practicing, training and educational programs.

More about anatomical models >

Enabling intra-operative predictability

Materialise is leading several initiatives to translate planning expertise into the OR using augmented reality*.

*Product in development

Join our #PersonalizedOrtho conversation

"I am a big fan of the patient-specific knee guides because this technology allows me to place the components of the knee arthroplasty exactly in the right axis of the leg in all dimensions".

Dr. Saskia Boekhorst, Orthopedic Surgeon, Orthoparc, The Netherlands

"Reducing your surgical time is an important advantage of these custom-made implants. I'm very well prepared before I go into an operation. It's like having a manual: I know what to do, I know the bone quality, I know the good and the bad parts of the pelvis."

Prof. Dr. Med. G. Flivik, Associate Prof Orthopedics Lund University, Sweden

"I am strongly convinced that 3D planning technology has many benefits. It allows us to precisely evaluate the deformity and plan surgical correction. When needed, surgical guides will make the procedure easier and shorter, while leading to a more predictable outcome with less risk of complications".

Dr. Frederik Verstreken, Hand Surgeon, AZ Monica Hospital in Antwerp, Belgium

medical@materialise.com

Eyeballing, guessing, trying to be as precise as possible – everything depended strongly on the skill of the surgeon. We used to measure surgeries quite archaically on chalk paper, and some doctors were better at it than others. There were so many margins for error that you could never be precise. Now we can be precise, and dependable. As the patient, you can also be more certain of the results of your surgery."

Prof. Dr. Stefaan Nijs, Traumatologist, UZ Leuven, Belgium

"Interfacing with the engineers is straightforward and first rate, leaving you with a sense of confidence, which is an important part of a surgeon's preoperative approach."

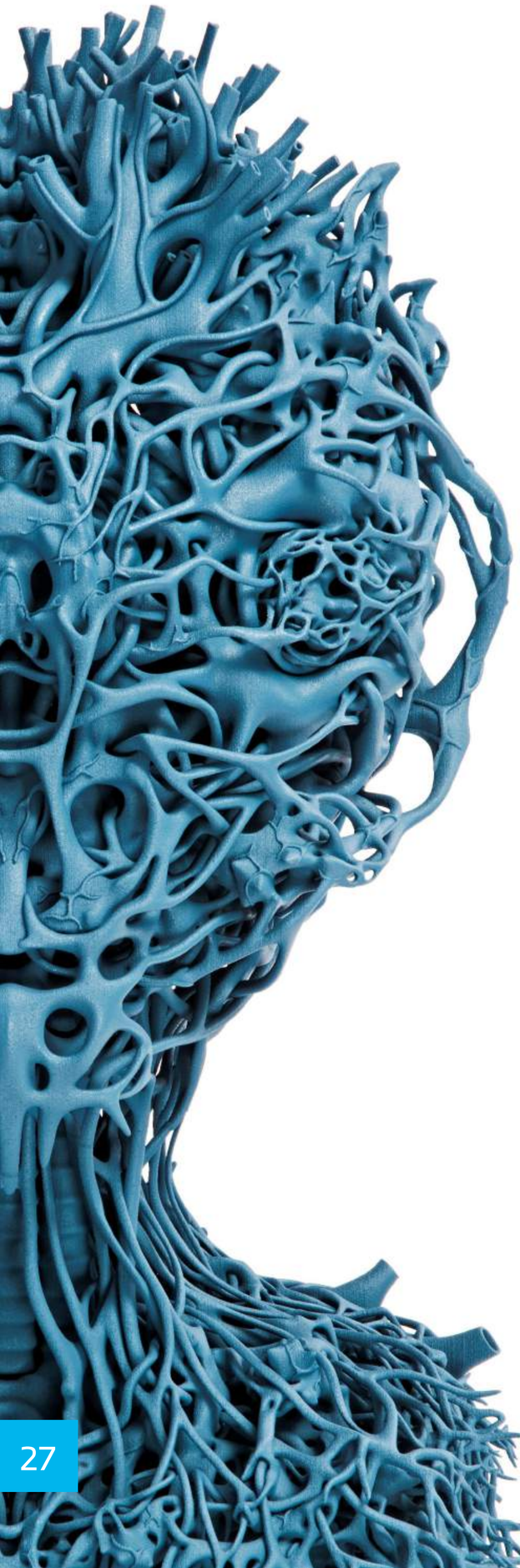
Prof. Douglas Dunlop, Consultant Orthopedic Surgeon, University Hospital Southampton, Uk

The more thought that is put into planning the procedures before surgery, the quicker and more accurate the surgery will be. Orthopaedic surgeons need dimensional and relational data, relating to offset and leg length, and that's what OrthoView allows us to do."

Brett Levine, MD, MS, Associate Professor, Rush University Medical Center, Chicago, USA

Personalization is the key to achieving better patient care

Read the blog >



Towards a Healthier Tomorrow

Boosting patient outcomes and supporting sustainable, cost-effective care is the goal of every stakeholder developing new technology for healthcare. After 30 years of developing meaningful applications across several medical segments, we are proud to look back and see how our technology is helping to create an impact on thousands of lives.

From our first personalized application, the 3D printed hearing aids that revolutionized an entire industry, to our vast orthopaedics portfolio today, we truly believe that personalization is the key to achieving better patient care.

We are not alone in this belief. The medical device companies we partner with and the visionary surgeons that have developed those applications side-by-side with us are also convinced of all the benefits brought by a personalized approach.

Increased predictability, optimized patients' outcome, and satisfaction while providing excellent guidance to clinicians to perform shorter OR procedure times. Individually these are all important benefits for orthopaedics. Together they are the path for a more sustainable healthcare. And that's better for everyone.

Contact us >

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innovators you can count on

Creating a better and healthier world

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