

# A Glance into Orthopedic Industry

December 2023

# The orthopedics segment is constantly advancing, with ongoing developments aimed at enhancing the overall patient experience



## Key Drivers

- **Rising demand for minimally invasive surgeries:** Companies are heavily investing in R&D for consumer-focused minimally invasive and advanced surgical procedures
- **Developments in orthopedic software:** Enhanced surgical planning to reduce administrative complexity and improve patient care. E.g., InVisionOS by PrecisionOS can create 3D reconstructions from CT scans in seconds, aiding the management of orthopedic procedures<sup>1</sup>
- **Advanced orthopedic power tools:** Development of lightweight and user-friendly power tools, as compared to conventional heavy orthopedic tools, are easy to handle while performing orthopedic surgeries



## Barriers

- **Adoption barriers:** Adoption barriers exist in hospitals, ASCs, patients, and surgeons due to multiple factors such as technology, high costs, and the need for training programs and robotic assistance
- **Shortage of orthopedic surgeons:** HRSA has projected a global shortage of orthopedic surgeons, with an estimated shortfall of 5,080 specialists by the year 2025<sup>2</sup>
- **Concerns related to implant material:** Allergic reactions and surface contamination related to implanted materials are major concerns in orthopedic segment



## Trends

- Current **digital trends** such as robotics, automation, 3D printing, telemedicine, remote monitoring, etc. reflect the ongoing efforts to improve patient outcomes, enhanced surgical techniques, and integrate innovative technologies in the orthopedic field
- In addition, **futuristic trends** include minimally invasive techniques, digital orthopedics, etc. which reflect the efforts to improve orthopedic care through data-driven diagnosis, wearables, and advanced imaging techniques

# Key Highlights of Top Orthopedic Players (1/2)

Comparing key players to assess their orthopedics portfolio across implants and associated digital solutions



	Headquarters and Revenue	Portfolio Expansion	Major Deals/ Partnerships	Analyst Comments
Zimmer Biomet	<p>HQ: Warsaw, Indiana, US</p> <p><b>FY 2022 Net Sales:</b> USD 6.9 Bn (Both Total and Ortho Net Sales)</p>	<ul style="list-style-type: none"> <li>AAOS 2023: ZB unveiled the <b>latest enhancements to ZBEdge dynamic intelligence</b> including updates to mymobility Digital Care Management Platform, ROSA Knee and Persona IQ</li> <li>Nov 2022: ZB introduced the <b>Persona OsseoTi Keel Tibia, a cementless knee replacement</b> solution</li> </ul>	<ul style="list-style-type: none"> <li>Jan 2023: ZB has reached a <b>definitive agreement to acquire Embody</b>, enhancing its <b>sports medicine with collagen solutions</b></li> <li>Sep 2022: Signed <b>multi-year co-marketing agreement</b> with Surgical Planning Associates to commercialize <b>HipInsight</b> for total hip replacement</li> </ul>	<ul style="list-style-type: none"> <li>The company's <b>knee business is set to grow</b> due to multiple factors such as higher usage of the Persona knee system, and the launch of <b>Persona OsseoTi Keel Tibia for cementless knee replacement</b> in Nov 2022</li> </ul>
Smith+Nephew	<p>HQ: Watford, Hertfordshire, UK</p> <p><b>FY 2022 Revenue:</b> USD 5.2 Bn (Ortho: USD 2.1 Bn (40%))</p>	<ul style="list-style-type: none"> <li>AAOS 2023: Announced '<b>Precision in Motion</b>' for its orthopedics arthroplasty portfolio</li> <li>It expects to <b>launch 25 new products in 2023</b> where 13 products have already been delivered in H1 2023</li> </ul>	<ul style="list-style-type: none"> <li>Nov 2023: Entered into a definitive agreement to <b>acquire CartiHeal</b>, a novel sports medicine technology for cartilage regeneration in knee</li> <li>March 2023: Introduced the <b>QUADTRAC System</b>, revolutionizing graft visualization and enhancing harvest optimization capabilities</li> </ul>	<ul style="list-style-type: none"> <li>As announced in July 2022, the company is growing, following the <b>12-point plan to enhance the orthopedics franchise</b>, increase productivity, and strengthen the success of <b>Advanced Wound Management and Sports Medicine</b></li> </ul>
Stryker	<p>HQ: Kalamazoo, Michigan, US</p> <p><b>FY 2022 Net Sales:</b> USD 18.4 Bn (Ortho: USD 7.8 Bn (42%))</p>	<ul style="list-style-type: none"> <li>AAOS 2023: Stryker unveiled <b>Mako Total Knee 2.0</b>, the next chapter in Mako SmartRobotics</li> <li>July 2023: Stryker launched the industry's only fully autonomous <b>Ortho Q Guidance System with Ortho Guidance Software</b></li> </ul>	<ul style="list-style-type: none"> <li>June 2022: <b>Inked deal with Shanghai's Pudong</b> to increase local investment and would set up its regional headquarters in Pudong</li> <li>Feb 2022: Completed the <b>acquisition of Vocera Communications</b> to enhance its Advanced Digital Healthcare offerings</li> </ul>	<ul style="list-style-type: none"> <li>Stryker is bullish on the future of Mako. It has a <b>good presence</b> in Europe. In APAC, it has started to pick up steam in Japan, India, China. This is a leading indicator that will produce <b>growth in both hips and knees</b> for many quarters as the momentum continues</li> </ul>

AAOS: American Association of Orthopedic Surgeons

Sources – [S+N QUADTRAC](#), [ZB AR 2022](#), [S+N AR 2022](#), [Stryker AR 2022](#), [S+N Invst PPT 2023](#), [S+N Precision in Motion](#), [S+N CartiHeal](#), [ZB AAOS](#), [ZB Persona IQ](#), [Stryker AAOS](#), [Stryker Ortho Q](#), [ZB Embody](#)

[ZB HipInsight](#), [Stryker Pudong](#), [Stryker Vocera](#), [Evalueserve Analysis](#)

**Orthopedic focus of each player:** ZB: Knee, Hip, S.E.T (Sports, Extremities and Trauma) and others; S+N: Knee, Hip, Other reconstruction and Trauma & Extremities; Stryker: Orthopedics and Spine

# Key Highlights of Top Orthopedic Players (2/2)

Comparing key players to assess their orthopedics portfolio across implants and associated digital solutions



## Headquarters and Revenue

**Principal Executive Office:** Ireland

**FY 2023 Revenue:**  
USD 31.22 Bn  
(Ortho: 1.1 Bn (3.5%))

## Portfolio Expansion

- July 2022: Received FDA (510k) approval for **UNiD Spine Analyzer v4.0 planning platform**
- Sept 2021: It **expanded its spine and robotics segment** with a new minimally invasive portfolio in the spine division. This allows for pedicle screw-based distraction, retraction, and compression technique

## Major Deals/ Partnerships

- Oct 2022: Partnered with **Australian MedTech company DorsaVi** to develop wearable for spinal sensors (cord injuries)

## Analyst Comments

- The company's **spine business** is showing a change in **minimally invasive spine technologies**. Instead of focusing on devices, it is **emphasizing on the adoption of specific procedures** to improve patient outcomes and treatments



**HQ:** New Brunswick, New Jersey, US

**FY 2022 Net Sales:**  
USD 94.9 Bn  
(Ortho: USD 8.6 Bn (9%))

- Oct 2023: Received FDA (510k) approval for **TriALTIS Spine System & Navigation Enabled Instruments** and **TriLEAP Lower Extremity Anatomic PS**
- Oct 2023: **VELYS Robotic-assisted solution** launched in the European market

- Sept 2023: Announced agreement with Ortoma AB to provide **AI-based solution** for total hip arthroplasty
- July 2023: Signed a business agreement with Chonbuk National University Hospital to analyze its digital platform **VELYS Hip Navigation**

- The company continues to improve patient satisfaction through the utilization of **kinematically advanced implants, data-driven enabling technologies**, and personalized patient-specific techniques



- Companies such as Zimmer Biomet, Stryker, etc. are **strongly emphasizing on robotic technology**. Robotic-assisted surgery (RAS) is expected to offer precise and advanced support for orthopedic surgical procedures
- Stryker is expected to launch **MAKO Spine** in Q3 2024 as well as **MAKO Shoulder** by the end of 2024
- Medtronic's** orthopedic division remains primarily **centered on the spine business** concentrating on cutting-edge devices and patient care
- Smith+Nephew follows **12-point plan to enhance the orthopedics franchise**. As of Q3 2023, the company is approaching the halfway point of the two years of 12-point plan **with 65% progress**
- While Zimmer Biomet's **focus is on expanding in the cementless knee segment**, on the other hand, companies such as **DePuy Synthes and Stryker** are directing their **efforts towards expanding their robotic technology**

PS: Plating System

Sources – [DPS TriALTIS](#), [DPS VELYS Robot](#), [DPS Ortoma AB](#), [DPS Chonbuk](#), [MDT UNiD](#), [MDT Expansion](#), [MDT DorsaVi](#), [Medtronic FY 2023](#), [Medtronic AR 2022](#), [J&J AR 2022](#), [Evalueserve Analysis](#)

Note: \*Medtronic Q4 2023 includes months Feb to Apr 2023; **Orthopedic focus of each player:** Medtronic: *Cranial & Spinal Technologies*; DePuy Synthes: *Knee, Hip, Trauma, Spine, Sports and Others*

# Analyzing Digital Trends in Orthopedic Industry

Digital horizons in orthopedic healthcare: Navigating current and future trends

- **Robotics & Automation:** The use of robotics and automation in orthopedic surgeries is increasing, allowing for more precise and efficient procedures
- **Ambulatory Surgery Centers (ASCs):** Shift in the site of care to ASCs is leading to the development of instruments tailored to meet their needs
- **3D Printing:** 3D printing technology is being utilized to create customized implants and prosthetics, enhancing patient outcomes and reducing surgical complications
- **Telemedicine and Remote Monitoring:** Telemedicine and remote monitoring solutions are being used to provide virtual consultations, remote follow-up care, and monitoring of patients' orthopedic conditions
- **Minimally Invasive Techniques:** These are gaining popularity, enabling faster recovery times, reduced scarring, and lower risks for patients



## Current Trends

## Future Trends



- **Digital Orthopedics:** Provides physicians with auxiliary diagnosis functions based on medical principles and data analysis models, thus prompting more efficient and effective diagnosis and treatment. The primary applications of digital orthopedic technology include clinical computer-aided design/ manufacturing, 3D virtual simulation and visualization, finite element technology, surgical navigation and robot-assisted technology
- **Orthopedic Monitoring Devices:** Wearables such as smart bands have been gaining much attention in the medical industry. They can be especially useful in sports medicine because they can record steps that can help orthopedic doctors determine diagnoses or perform assessments
- **Advanced Imaging Technology:** AR (augmented reality) and VR (virtual reality) are technologies that help in performing more efficient and precise surgeries thus improving patient outcomes and minimizing the risk of complications

# Synergizing the Future: Advancements in Orthopedic Implants

Evolving landscape of orthopedic implants

01

**Cementless knee system**, a key focus area of the orthopedic players, is a type of knee replacement that relies on **bone ingrowth** to hold the implant in place instead of using bone cement. Major knee systems available are Stryker's Triathlon Tritanium, Zimmer Biomet's Persona, DePuy Synthes' Attune, etc.

02

**Orthopedic implants** use stainless steel, cobalt-based alloys, and titanium for their durability and compatibility. **Polymer implants**, often made of high-density polyethylene, are favored for prosthetic limbs. **Ceramics**, with wear-resistant properties, are utilized in joint replacement surgeries

03

Infections are one of the major complications after orthopedic surgery. Putting a special covering on implants helps stop infections. **Hydroxyapatite based coatings** are most effective in controlling infection, corrosion, foreign body effects and improving osseointegration

04

**Nanotechnology-enhanced metals and alloys** have received a lot of attention from the orthopedic community. The enhanced properties include strength, super-plasticity, wear resistance, biocompatibility, and osteogenic or osseointegration properties

05

Using **3D printing for customized implants** with high-resolution imaging and computer modeling, doctors can design a custom implant that perfectly matches the patient's bone structure and joint mechanics. These implants can improve implant stability and help patients recover faster

06

**Biodegradable implants** are designed to break down over time, gradually replaced by new tissue as the body heals. These biodegradable implants have the potential to reduce the risk of implant rejection and eliminate the need for additional surgeries to remove the implant

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