White paper

Navigating the Complexities of C-Arm Use in Orthopedic Surgery

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Navigating the Complexities of C-Arm Use in Orthopedic Surgery

C-arm imaging is essential to orthopedic and trauma surgery to facilitate precise alignment and support procedural outcomes. Yet, the operating room often falls short of providing the seamless environment surgeons need to perform at their best. From staffing shortages to inconsistent image reproducibility, frustrations create a cascade of inefficiencies that affect surgeons, staff, and ultimately, patients.

Challenges with Traditional C-Arm Imaging

Time Inefficiencies and Operational Stress

Many orthopedic surgeons report significant time waiting for staff or equipment. "For complex poly trauma you think about how much work you're going to have to do with the C-arm to do these cases. For a pelvis we are going to need multiple different fluoroscopic views for each screw, and for the proximal femur, we're going to need APs and laterals of the proximal femur, which are different, and how many times you even go back and forth" says Geoffrey Marecek, Trauma Surgeon at Cedars-Sinai in Los Angeles, CA. "Then I'll say, 'let's bring in the C-arm' and it turns out the staff called for it 10 minutes ago, but it's not yet there" continues Dr. Marecek.

"Eventually, I'll just un-scrub and push the C-arm in so my fellow can start. ***It's torture to stand there and wait and wait and wait."***

Geoffrey Marecek, MD
Trauma Surgeon at Cedars-Sinai,
Los Angeles, CA

These delays aren't just stressful - they also carry financial consequences.

"We talk about cost as time per minute," says Daniel Coll, Physician Assistant at Tahoe Forest Hospital. "Every minute counts."

With the national average operating room cost at $48 per minute—and $78 per minute in California, where staffing costs are among the highest in the country—delays can result in significant expenses for hospitals.

Staffing Shortages and Burnout

Radiology technologists are critical to ensuring smooth imaging workflows, but many hospitals face staff shortages and high turnover rates.

The fluoroscopists are not exclusively the domain of orthopedic trauma; they also assist in GI, cardiac surgery, general surgery, and multiple ORs. "At night, there are just three techs across six floors in my hospital," says Dr. Marecek.

Smaller hospitals like Tahoe Forest Medical Center often have even fewer resources, with technologists responsible for multiple responsibilities.

"We're frequently down to one tech at night, and they're often needed in the ER or for CT scans. It leaves us scrambling," says Orthopedic Trauma Surgeon at Tahoe Forest Hospital, Dr. Andrew Ringnes.

Rotating technologists and varying skill levels further complicate imaging workflows. As Daniel Coll, puts it: "It just depends on who you're going to get that day, what their passion is, and what they like to do. Their skill sets vary wildly."

These challenges can lead to surgical delays, inconsistent imaging quality based on the technologist's experience, surgeon frustration, longer staff hours, heavier workloads, and ultimately contribute to burnout and staffing shortages.

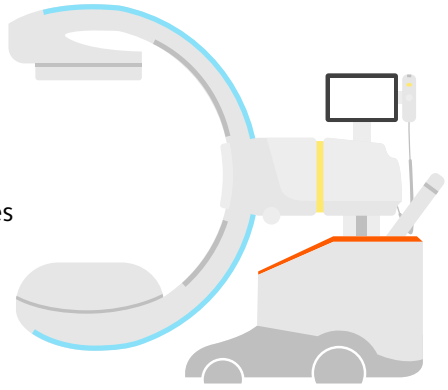
Reproducibility and Radiation Exposure

Achieving the precise anatomical view needed for surgical success requires consistent and reproducible imaging. Repeated imaging to capture precise anatomical views is challenging due to the lack of standard positioning terminology for C-arms, language barriers, technologist experience, machine precision and human ergonomics. After multiple attempts to position, using remarks such as, "Okay, I need you to move this here or there," or "No, I want it here," or "Just a bit more, a little bit" frustration builds and "I get handsy with the C-arm," and adjust it myself emphasize Drs. Marecek and Ringnes.

This inefficiency not only takes time but increases the risks of radiation exposure for patients and staff, while heightening the tension in the room.

"For pelvic cases alone, you may be looking at six or more shots just to get the first correct position," explains Dr. Marecek. "Then when you're taking two or three shots for every repeat image," adds Dr. Marecek, "you're exposing the patient to unnecessary radiation, and you're adding to the psychological stress in the room."

How CIARTIC Move Transforms Imaging Workflows



The CIARTIC Move is purpose-built to address the inefficiencies and frustrations of traditional C-arm use, delivering significant improvements in precision, workflow efficiency, and cost-effectiveness.

Automated Positioning for Speed and Reproducibility

The CIARTIC Move enables surgeons to pre-program up to 12 imaging positions, eliminating the trial-and-error process of returning to a specific angle, required with traditional systems.

"It's a game-changer. You can save your inlet, outlet, and lateral views, and the C-arm will return to those positions with the push of a button. ***This system eliminates the guesswork.*** *Once you've set your views, the machine reliably returns to them every time."*

Andrew Ringnes, MD
Orthopedic Trauma Surgeon,
Tahoe Forest Hospital

By ensuring consistent, reproducible imaging, the system reduces intraoperative imaging time by up to 50% based on pre-clinical studies. Shorter case times lead to faster room turnovers, greater staff availability, and improving overall efficiency.

Seamless Mobility for Technologists

The CIARTIC Move is remarkably easy to maneuver, thanks to its holonomic wheels and touch-sensitive handles. These design elements reduce physical strain on technologists, while allowing them to position the system with greater accuracy and minimal effort.

"The techs like it because they can move the C-arm utilizing the remote from off the field so they're not having to put in the effort to move things around," says Dr. Ringnes. The lead OR technologist at Tahoe Forest, Linda Esparza, agrees. "I'm 5'5" and 120 pounds, and with this machine, you just touch it, and it moves."

This effortless maneuverability also allows technologists to work more efficiently, minimizing delays caused by repositioning or adjustments.

"The image reproducibility and the position reproducibility has been excellent in my experience," says Dr. Ringnes "It's like a giant ballerina—graceful, precise, and surprisingly easy to move."

Cost and Safety Benefits

The time saved by CIARTIC Move's automation and precision directly contributes to significant cost savings.

"If we're saving 30 hours of OR time per year on pelvic fractures alone, that's $150,000 back in the hospital's pocket," shared Dr. Marecek.

The system also enhances safety by reducing the need for repeated imaging, which decreases radiation exposure for both patients and staff.

"Every reduction in radiation exposure makes a meaningful difference for long-term safety," Dr. Ringnes explains.

Empowering Technologists and Supporting Collaboration

By removing much of the trial-and-error associated with traditional systems, the CIARTIC Move reduces stress for the entire surgical team. Its ability to consistently achieve desired imaging positions allows even less experienced technologists to perform confidently.

"It's a relief for the entire team. Everyone knows exactly what to expect, which minimizes miscommunication and frustration," says Esparza.

Redefining the OR Experience

The CIARTIC Move isn't just a tool; it's a comprehensive solution to the inefficiencies and frustrations of traditional C-arm imaging. By empowering surgeons and supporting technologists, it enhances collaboration, reduces costs, and improves care outcomes.

"It's more than a tool—it's a ***game-changer for orthopedic imaging,"*** *concludes Dr. Marecek.*

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Published by Siemens Healthineers AG · SU-25-NAM-6727 · QR700019713 · 03.2025 ·