Director of Manufacturing

Virtuoso Surgical, Nashville, TN

On-Site | Reports to: Chief Operating Officer | Full-Time

About Virtuoso Surgical

Virtuoso Surgical is developing a first-of-its-kind robotic system for endoscopic surgery, designed to give surgeons dexterity and control at a scale far smaller than current surgical robotic systems. Our technology has earned FDA Breakthrough Device Designation, has been used successfully in its first-in-human clinical cases, and is nearing regulatory approval. The company is at a pivotal moment: we expect to scale significantly over the next few years as we move from engineering-heavy R&D into full commercial production and sales.

The Opportunity

We seek a Director of Manufacturing to own the transition from engineering design to a production-ready system and build our production operation from the ground up. This is a rare opportunity to architect the manufacturing function at a pivotal stage; you'll build on a strong foundation of existing engineering work, early clinical success, and an established supplier base to deliver reliable, high-quality products to customers. This role directly impacts the performance of systems used in real clinical procedures, with clear implications for patient outcomes and surgeon experience, and serves as a key cross-functional leadership role aligning engineering, quality, and supply chain around commercialization.

You'll have real authority to define manufacturing strategy and design the production system that takes us from pilot builds to reliable, commercial-scale output, including building and scaling the manufacturing organization from the ground up. You'll define team structure, hire and develop manufacturing engineering and production talent, and establish the operating cadence and culture of the function. You'll operate across strategy and execution—setting direction while also solving complex design-transfer and production challenges firsthand to ensure a manufacturable, high-yield, clinically reliable system.

Day to day, you'll partner closely with engineering and quality to ensure manufacturing and quality systems scale together. You'll drive design for manufacturability, process improvement, supplier robustness, production planning, and GMP compliance, operating across manufacturing, quality, and supply chain to support a successful product launch and ramp. This role requires strong judgment in balancing speed, cost, and regulatory rigor while moving fluidly between strategic decisions and hands-on problem-solving.

This role is on-site in Nashville and requires occasional travel, typically less than 10%, for supplier visits, conferences, and observing clinical use of the system in real procedures.

Key Responsibilities

- Lead manufacturing scale-up from pilot builds through commercial volume — selecting the equipment and systems our production runs on, and planning capacity and facility needs as the company grows.
- Own manufacturing planning: scheduling, capacity, inventory, and production flow to meet delivery commitments.

- Lead design transfer to production, including new product introduction (NPI), building the connection between approved design and repeatable manufacturing, including process validation (IQ/OQ/PQ) and simplifying designs for manufacturability (DFM) in partnership with engineering.
- Lead manufacturing engineering work — fixture design, assembly optimization, automation, and validation — for high-precision electromechanical assemblies with stringent reliability and traceability requirements.
- Own supplier strategy and performance, including selection, qualification, and ongoing management, building on our existing core suppliers to reduce cost and de-risk single points of failure.
- Drive cost-reduction, process-improvement, and diagnostics initiatives without compromising quality.
- Ensure manufacturing processes are audit-ready and scalable, supporting internal audits, FDA inspections, and external regulatory reviews.
- Partner with our quality function to ensure GMP compliance, documentation, and audit readiness — work instructions, product release protocols, device history records/travelers — in step with production.
- Support nonconformance and CAPA processes in partnership with quality, and lead manufacturing process risk assessments (e.g., process FMEA).
- Partner with Quality on the customer feedback and complaint handling process, lead investigations into reported issues, and drive design changes that improve system reliability, in partnership with quality and engineering.
- Define and track manufacturing metrics (yield, scrap rate, on-time delivery, cycle time, process capability) to drive continuous improvement.
- Hire, train, and scale the production and manufacturing organization, including manufacturing engineering, technicians, and production staff.
- Ensure robust production documentation and record-keeping systems that meet regulatory requirements.

Qualifications

- 8–10+ years of manufacturing experience in the medical device industry, including personally driving production ramp from development into commercial production and scaling a manufacturing organization.
- Bachelor's degree, at minimum, in engineering or a related technical field.
- Demonstrated success operating within FDA-regulated, ISO 13485-certified manufacturing environments; experience with a Class II or Class III device is strongly preferred.
- Direct experience in manufacturing engineering — process development, fixture design, assembly optimization, automation, and validation — ideally for complex electromechanical or robotic systems.
- Experience leading design transfer from engineering to production, including developing work instructions, release protocols, travelers, and audit documentation.
- Demonstrated experience managing supplier relationships and building supplier redundancy (dual-sourcing, qualifying alternate suppliers) to reduce cost and risk.

- Experience with post-market surveillance, complaint handling, or medical device reporting (MDR) processes is a plus.
- Strong hands-on engineering problem-solving skills — comfortable diagnosing and resolving issues on the floor, not just directing others to do so.
- Strong written and verbal communication skills; able to clearly document processes and communicate across engineering, quality, and suppliers.
- Critical thinker, comfortable moving fluidly between strategic planning and hands-on execution in a small-company environment.
- Multidisciplinary mindset and willingness to take on responsibilities beyond a job description.
- Demonstrated judgment in balancing speed, cost, and regulatory rigor in a production environment.

Benefits

- Competitive salary and relocation support.
- Company-sponsored health insurance.
- 4% retirement contribution.
- 4 weeks paid vacation, plus company holidays.

How to Apply

Interested candidates should submit their application via Virtuoso's Careers page or by emailing careers@virtuososurgical.net. Please include a resume and brief cover letter describing relevant medical device manufacturing and quality system experience.