



MedTech

Broad Definition

Products, usually having a tangible structure in the form of a device, that can be used to solve a health problem and improve the quality of lives. This includes devices that can both diagnose, treat, and monitor health situations.

Software, by the FDA, is often included in such categorization but is *not the focus of this cheat sheet*.

Behaviors

- Medtech can be differentiated into three different types of products: wearables, electronic-mechanical solutions, and purely mechanical solutions
- Wearables: include devices like the Apple watch
 - Function like tech companies/tech startups, structured as so
 - Industry is growing fast with many small startups being funded and large tech companies having a stake too; diversity of sizes of companies
 - Prioritizes hardware and software engineers vs medical professionals and mechanical engineers
- Purely mechanical solutions: includes products such as stents and orthopedic implants
 - Industry is consolidated into a few players that are massive conglomerates
 - These large companies have product suites in the majority of mechanical-medical device areas (spine, knee, facial reconstruction, etc)
 - Startups are quickly bought by these large companies
 - Low investment in this field; <100 companies in the US; M&A is the norm
 - Act like pharmaceutical companies: structured hierarchies, set roles
 - Prioritize medical doctors (directly innovate/converse with doctors, most doctors have personal relationships to medical device companies); mechanical engineers heavily favored
 - Very competitive product space; highly focused on orthopedics

- Electronic-mechanical solutions: includes surgical robots, continuous glucose monitoring devices, pacemakers, etc.
 - Structured on a spectrum: some act like tech companies, others act like purely mechanical solutions
 - Both large companies (incorporate both electronic and non-electronic) and startups
 - Generally well-funded if unique approaches to innovation
 - Well-connected to doctors, and often founded by doctors
 - Cover all areas of the medical technology spectrum, including heart, brain, kidney, nerves, etc.
- Companies are scattered across the US, with MI, TX, FL, NC, CA, IN, IL, and MA being popular spots for headquarters
 - Location often determined by product suite that person is working on
 - Canada and Europe have strong medical device industries alongside the US
 - Unlike biotech, not heavily associated with universities
- Current medtech trends are centered around surgical robotics, wearable devices for continuous monitoring, and machines that incorporate AI diagnostics
 - See [this infographic](#) from the Economist for more information

Types of Roles Available

- *Product Engineering*: works with engineering teams and doctors to create medical device products. Specialized by area (i.e. foot, eye, cardiovascular)
- *Quality Engineering*: find defects in products, perform validations in line with standard operating procedures, write quality protocols
- *Manufacturing Engineering*: discover ways to scale up device production, suggest necessary product changes to do so
- *Software Engineering*: role depends on company: will be manufacturing or IT if mechanical; will be platform development if not
- *Electrical Engineering*: same role differentiation as above
- *Regulatory Affairs Specialist*: makes sure licenses are up to date, analyzes FDA (etc) approval processes and structures procedures
- *Clinical Specialist*: works with doctors in the office to assist in research projects using medical devices; specialized by area
- *Clinician*: requires a special degree; works with doctors directly in the operating room to suggest fits/specific devices to use. Company-specific clinicians employed by hospital,

specialize in product suites.

- *Sales/Marketing*: talks to hospitals, doctors, and businesses across the globe to sell devices in specific product suite.
- *Corporate Roles*: include finance, portfolio management, legal, compliance, etc.

Valued Skills

- Hard engineering + simulation
- Teamwork, as everything is collaborative
- Communication, as interface with surgeons often + paperwork filing
- Timeliness: deadlines are important
- Precision: making sure the designs are the best they can be; make sure all directions are followed and all forms are filled to the T
- If working in finance/corporate, good background knowledge of space + competitors

Relevant Companies

Large Companies	Wearables	Startups
Boston Scientific	Apple	Intuitive Surgical
Becton Dickinson	FitBit	Butterfly
Zimmer Biomet	AliveCor	ZenFlow
Johnson & Johnson	NeuroMetrix	Shift Labs
Medtronic	VivaLNK	Hyalex Orthopedics
Abbott Labs	Vena Vitals	BloomerTech
Stryker	Empatica	3Derm
Siemens	Augmedix	Beta Bionics
Baxter	Parasym	Atlas5D
Smith & Nephew	Google	Portal Instruments

To Follow/Join:

- MassDevice: Medtech industry news
- Johnson & Johnson Innovation: hosts JLABs (competition for life sciences and medical device prototyping); JJDC is venture arm, releases newsletter

- Wyss Institute: launches innovative biomechanical/biomedical devices ● Stanford Byers Center for Biodesign: offers fellowships, classes, degrees in medical device design
- Crunchbase News: general newsletter for startup news, often features meddevice acquisitions
- AngelList: general startup hiring website, has some medical device startups

Relevant Majors: MechE, BME with mechanical prototyping experience, EE, CS

- *MENG 404/BENG 404*: Medical Device Design class that involves trip to prominent industry companies (orthopedics-focused) and medical device prototyping ● *BENG 406*: Medical Software Design class that brings speakers from software-device companies and involves prototyping component