MEDICAL TECHNOLOGY

- THE USE OF MICROELECTRONICS, SEMICONDUCTORS IN FULFILLING OUR MISSION

TREVOR GUNN
VICE PRESIDENT, INTERNATIONAL RELATIONS
WASHINGTON, DC
WE ARE THE MEDICAL TECHNOLOGY INDUSTRY

BUT WHAT IS MEDICAL TECHNOLOGY?
MEDICAL TECHNOLOGY LANDSCAPE - SIMPLIFIED

Capital Equipment

Therapeutic
- Elekta
- Varian

Diagnostic
- GE
- Philips
- Siemens

Implantable/Disposable
- Boston Scientific
- Abbott
- Medtronic

Medtronic
WE ARE FOCUSED ON MANY PUBLIC HEALTHCARE GOALS BOTH IN OUR MISSION AND TRANSLATED INTO OUR WORK

PATIENT-FOCUSED
- COVID-19/ respiratory disease
- Reduction of disability
- Addressing ageing populations
- Better patient outcomes
- Rapid return to work and family

VALUE AND ACCESS IN HEALTH
- Value-Based Healthcare
- Affordable healthcare access
- Frugal innovation

HEALTHCARE INFRASTRUCTURE
- Building physical healthcare capacity (e.g., hospitals)
- Education, training, and retention of frontline healthcare workers

VALUE BASED CARE
- (Cost, Quality, Results)
<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>MEDTECH</th>
<th>PHARMA</th>
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<tbody>
<tr>
<td><strong>Industrial Differences</strong></td>
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<tr>
<td>Scientific Basis</td>
<td>Engineering: Mech, Elec, IT &amp; Systems</td>
<td>Pharmacology, Chemistry</td>
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<tr>
<td>Product Scope/Diversity</td>
<td>Much greater number/diversity of products</td>
<td>Limited number of products and therapeutic areas</td>
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<tr>
<td>R&amp;D: Clinical Research</td>
<td>• Variable by therapy, Few Randomized Clin Trials(RCT)</td>
<td>All Placebo-Controlled, Double-Blinded, Randomized Clin Trials</td>
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<td></td>
<td>• Best data= post-market</td>
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<td><strong>Technology Differences</strong></td>
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<tr>
<td>Life-Cycle</td>
<td>Rapid obsolescence and Short Life Cycle</td>
<td>Long Life Cycle- Justifies length of regulatory process</td>
</tr>
<tr>
<td>Product Testing</td>
<td>Through evaluation during design-phase</td>
<td>Long-lasting (time-consuming) tests for efficacy and safety</td>
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### CRITICAL SIMILARITIES: MEDTECH AND IT

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<th>CHARACTERISTIC</th>
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<tr>
<td><strong>Industrial Similarities</strong></td>
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<tr>
<td>IP</td>
<td>Accumulated Operating Knowledge</td>
<td>Accumulated Operating Knowledge</td>
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<tr>
<td>Tech Life-Cycle</td>
<td>Rapid, Iterative (18 months), software based</td>
<td>Rapid, Iterative, software based</td>
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<tr>
<td><strong>Technology Similarities</strong></td>
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<tr>
<td>Greater IT Connectivity</td>
<td>Improved Product Performance: Greater prevention, improved patient outcomes</td>
<td>Improved Product Performance: Greater functionality, higher customer satisfaction</td>
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<td>Life Cycle</td>
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**PROOF POINT:** We led our industry’s response to and benefitted from WTO’s Information Technology Agreement (ITA2). This was accompanied by large patient benefits.
MEDTRONIC IS THE WORLD’S LARGEST MEDICAL TECHNOLOGY AND SOLUTIONS COMPANY

Our portfolio includes more than 213,000 global products which diagnose, prevent, mitigate, treat or cure disease or other conditions.

**Medtronic Business Strategy**

**THERAPY INNOVATION:** Introducing and delivering meaningful offerings at the therapeutic, procedural, and system level

**GLOBALIZATION:** Addressing the inequities in healthcare access globally

**ECONOMIC VALUE:** Helping lead the creation of value-based healthcare solutions

**Positive Impact on Non-Communicable Diseases**

**More than Products: Integrated Health Solutions**

Delivering tailored solutions to improve clinical, operational, and financial outcomes through long-term partnerships with hospitals, health systems, physicians, and payers

**Transforming Healthcare:** Value-based Healthcare (VBHC)

- Improving clinical and economic outcomes to expand access and optimize cost and efficiencies
- Under VBHC business models, shared accountability for costs and outcomes are linked to the product, services, or integrated solutions

**Public Private Partnerships**

These partnerships align with our corporate mission by increasing patient access. They drive our globalization strategy and actively contribute to the global push for universal health coverage. They create mutual benefits by leveraging skills and assets through the appropriate transfer of risk. Through jointly defined objectives they enhance economic value by delivering improved outcomes and increased access to therapy innovation.

Learn more at [www.medtronic.com](http://www.medtronic.com)

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**Key Figures**

- **150+** COUNTRIES
- **76** MANUFACTURING SITES
- **95,000+** EMPLOYEES
- **10,000+** ENGINEERS & SCIENTISTS
- **131,000** TECH’S (SKU’S) IN PRODUCTION
- **21** LAB & RESEARCH DEVELOPMENT SITES
- **47,000+** TOTAL PATENTS IN OUR PORTFOLIO
- **$2.3B** R&D INVESTMENTS LAST YEAR
- **MORE THAN 70** conditions in the human body treated with our therapies
- **MORE THAN 2** people every second have their lives improved

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OUR THERAPIES AND SOLUTIONS IMPROVE LIVES

CARDIAC & VASCULAR
- Aortic, Peripheral, & Venous
- Atrial Fibrillation Solutions
- Cardiac Rhythm and Heart Failure
- Coronary and Structural Heart

MINIMALLY INVASIVE THERAPIES
- Care Solutions
- Respiratory, Gastrointestinal & Informatics
- Surgical Innovations

DIABETES
- Advanced Insulin Management
- Automated Delivery Systems
- Multiple Daily Injection Solutions
- Customer Retention & Experience
- Non-intensive Diabetes Therapies

RESTORATIVE THERAPIES
- Therapies
- Pain Therapies
- Specialty Therapies
- Spine
Established in 1973 by seven former Motorola engineers as Micro-Rel, the Medtronic Tempe Campus began assembling electronics for Medtronic’s implantable pacemakers. Today, the Tempe Campus has become the primary point for electronic solutions for implantable medical applications.
TEMPE MICROELECTRONIC SOLUTIONS SPAN THE BODY

- CRHF MRI SAFE AND LEADLESS PACEMAKERS
- CRHF CARDIO DEFIBRILLATORS
- CRHF LINQ II INSERTABLE LOOP RECORDER
- DEEP BRAIN STIMULATION
- RTG DRUG PUMPS
- RTG SPINAL CORD STIMULATORS
- RTG SACRAL NERVE STIMULATORS
- MITG PATIENT MONITORING
- DIABETES CONTINUOUS GLUCOSE MONITORING
A SHARED MICROELECTRONICS TECHNOLOGY CENTER

Ultra Low Power Electronics

Physics of Failure & Reliability Labs

Implantable Sensors and Microsystems

Wearable Sensors and Interfaces

‘No Rework’ Microelectronics Assembly & Test
Medical Technology is affecting all areas of healthcare
These technologies build upon each other
COVID-19 – EXAMPLE – CONNECTED VENTILATOR
INNOVATION AT SPEED

- **Background** – Accessing Ventilators created burden on staff and PPE
- **Solution** – Create capability to remotely view and control multiple Ventilators, using Medtronic-engineered connected devices and software solutions

- **Result** – Technical solution developed to allow remote control
DIABETES - EXAMPLE

- **Background** – Type 1 Diabetes impacts huge numbers of people globally and lack of management can have dramatic consequences

- **Solutions** – Diabetic patients have many – including Connected Devices, AI, Remote Care

- **Result** – Improved clinical outcomes and lower costs

- **Doctors/nurses** have “real-time access” to patient data uploaded to the cloud, expediting remote diagnosis and response times
VIRTUAL TRAINING & EDUCATION

- COVID-19 has driven rapid change from in-person
- Training for clinicians and patients
- Opens up huge opportunities for emerging mkt doctors
- Increased leverage of technology
- Travel not required
- Interactive capabilities
- Access to global experts
- Reduced burden on healthcare
- Achieve similar outcomes
- Creates foundation for future

Medtronic Education & Innovation Ctr- Istanbul
MEDTRONIC AND COVID-19: INFINITE DEMAND, LIMITED SUPPLY
CRITICAL MEDTRONIC ACTIONS RELATED TO PUBLIC HEALTH

01 INCREASING SUPPLY

02 FIGHTING AGAINST TRADE RESTRICTIONS

03 EXPANDING HUMAN CAPACITY

04 ENGAGING GLOBALLY WITH INTL ORG’S
CONTACT INFORMATION

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