2019 HEALTHCARE PREDICTIONS UNLEASHED – GROWTH OPPORTUNITIES, TECHNOLOGY, AND TRENDS
How Tech and Industry Convergence Will Drive Care Delivery Innovation
2018 Medtech Strategic Snapshot

Medtech companies in 2018, adopted a strategic shift towards achieving tech and data enabled solution efficiencies aimed at enhanced personalization and better post acute care coordination.

Major Strategic Intents Behind the Moves by Top* Medtech Companies in 2018 (n=81)

- Portfolio Optimization: 16.7%
- Patient Safety: 6.9%
- New Pipeline: 19.4%
- New Approval and Launch: 13.9%
- Data and tech enabled disease management: 11.1%
- Enhanced Post acute care coordination: 2.8%

Emerging strategic intent accounting for ~51% of overall medtech strategic focus

Key Strategic Moves by Top* Medtech Companies in 2018 (n=81)

- Organic R&D Enabled Growth: 30
- Move towards integrated platform based solutions: 19
- M&A and Partnerships: 11
- Vendor Provider Collaborations: 7
- Automation and efficiency improvements: 6
- Miniaturization & Cybersecurity of Implants: 5
- Geographic expansion of existing solution: 5
- New commercialization models: 5
- Divestiture: 2

Emerging strategic imperatives for medtech in 2018 and beyond

- Medtech has started focus on out-of-hospital care coordination and personalization for cost and efficiency improvements
  - There has been a definitive uptick in digital, tech and data related initiatives by top medtech companies
  - Value based care compulsions will drive continued vendor provider collaborations in 2019

*Based on analysis of 2018 press releases of 5 medtech giants, viz., Medtronic, J&J, Philips, Abbott Laboratories and Becton Dickinson & Co. “n” refers to number of interpretations out of a total of 70 press releases analyzed

Source: Company Websites; Frost & Sullivan
Key 2019 Medtech Market Predictions

AI in robotic surgery would lead to new applications

AI, ML and DL enabled surgical robotic systems to witness major breakthroughs in terms of application across new areas such as joint replacement, neuro and spinal surgeries.

Data driven business models will account for enhanced medtech revenues

4 in 10 medical device companies will invest in data analytics algorithms to drive Insights-as-a-Service and Intelligence-as-a-Service business models which will drive 3-5% of their revenues in 2019.

Augmented and Virtual Reality Would Enter the Operating Room

Augmented Reality (AR) based headsets and surgical navigation systems to witness first ever commercial adoption in Hip, Knee and Shoulder Arthroplasty, Spine Surgery and Osteotomies.

Smartphone would be the new medical device accessory for clinicians

Medical device companion smartphone apps would reduce GP visits by 2-5% in developed markets. Respiratory and mental health solutions to be new growth areas beyond cardiovascular and diabetes.

Image Source: Thinkstock, Frost Database, Company Logos

Source: Frost & Sullivan
Key 2019 Medtech Market Predictions

**Orthopaedics — Would be the Next Frontier for Clinical Grade Wearables**

Medtech will leverage clinical and non-clinical grade wearables to improve post-acute coordination in orthopedic rehabilitation. 2019 might also witness the first ever clinical grade orthopedic wearable.

**Robotic Automation Of Hospital Processes**

Infection control OEMs, in partnerships with robotic automation providers, will offer customized automation consulting solutions representing an addressable market opportunity of $3.5 billion in 2019.

**Smart Home Based Aging-in-Place Gets Serious About Core Healthcare Needs**

Smart home ecosystems to integrate home based health monitoring, drug delivery and dispensing systems into smart homes designed for aging-in-place, also enabling newer possibilities for telemedicine around continuous care.

**Oncology to be the new area primed for data driven disruption**

Specialties like lung cancer, driven by the unmet need for early detection and timely intervention, will see increase, in adoption of data driven screening, tracking and workflow platforms to streamline care pathways.

*Image Source: Thinkstock, Frost Database, Company Logos*
Growth Opportunities for the Global Medtech Industry in 2019 and beyond

**Patient Centricity**
Shifting focus on proactive patient care, prompt players to explore care gaps across care continuum

- **Top Companies**
  - MNCs: Medtronic, Philips, Sony
  - Start-ups: Smith & Nephew, BD, PDM

- **Top Growth Areas**
  - Patient safety
  - Patient Engagement
  - Patient monitoring
  - Care coordination

**Tech Convergence**
Emerging technologies such as AI, AR, VR have witnessed increased interest from med-tech companies

- **Top Companies**
  - MNCs: Medtronic, Samsung, Johnson & Johnson
  - Start-ups: Verily, Augmedics, IDx

- **Top Growth Areas**
  - Artificial Intelligence (AI)
  - Augmented Reality (AR) / Virtual Reality (VR)

**Data Monetization**
The emergence of “Quantified Self” led to data driven commercialization and risk sharing business models

- **Top Companies**
  - MNCs: Medtronic, GE Healthcare
  - Start-ups: Dexcom, Behind the Curve

- **Top Growth Areas**
  - Product Design and Lifecycle management
  - Commercialization
  - Customer performance improvement
  - Clinical Outcomes improvement

**Non-Traditional Entrants**
Entry of tech, automotive and logistics players prompting OEMs to re-evaluate their strategies

- **Top Companies**
  - MNCs: Medtronic, Apple
  - Start-ups: Uber, Lyft, Amazon, Lyft

- **Top Growth Areas**
  - Improved Access to Care
  - Healthcare Efficiency improvements
  - Outcomes Improvement
  - Preventive Disease Management

Source: Frost & Sullivan
Five Big Themes of the APAC Medical Technology Industry

1. **Innovation and Adoption of Digital Solutions**
   - Shift from treatment and cure to predict and prevent

2. **Distribution and Route Optimization channel**
   - Optimization, online sales, sustainable and scalable value chain

3. **Unprecedented change in Reimbursement landscape**
   - Creating favorable environment for medical device industry and payers

4. **Value products vs Low cost vs Premium**
   - Affordability, right-fit-products/services and cost-optimization strategies

5. **Patient Centricity - Owning the patient care continuum**
   - Reinforcing market adoption to manage patient care inside and outside the hospitals

Source: Frost & Sullivan
Theme 1: Adoption of Digital Solutions

APAC will emerge as the fastest growing market in connected medical device segment due to comprehensive and focused attempts by key stakeholders like government to promote the digital adoption.

**APAC share in global connected medical devices market**

<table>
<thead>
<tr>
<th>Year</th>
<th>APAC Share (%)</th>
<th>Global Market</th>
<th>CAGR (2018-2024)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>&lt;7%</td>
<td>~$0.95 Billion</td>
<td>18.6%</td>
</tr>
<tr>
<td>2024</td>
<td>12%</td>
<td>~$4.0 Billion</td>
<td>24.5%</td>
</tr>
</tbody>
</table>

APAC Share in global connected devices market is predicted to increase from **7%** to **12%** in next 5 years.

**Key Take-away**

- APAC will be the fastest growing markets for connected medical device with CAGR of 24.5% during 2018-2024, while global markets are growing at an average 18.6% CAGR.
- Government push for digital adoption, raising smart hospitals, demand from home care segment will stimulate the growth.

**Share of connected medical devices in total medical device market in APAC**

- **Revenue**
  - CAGR 22.7% (2018-2024)

- Share of connected devices in the total medical devices market will increase from less than **1%** to **3%** in next 5 years.

**Key Take-away**

- Japan and China will capture the largest share, around 2/3rd of total APAC’s connected device market.
- High cost of devices and stringent reimbursement polices in emerging markets like India, ASEAN will hamper the growth in shorter run.

Source: Primary Research; Frost & Sullivan
Increased adoption of complementary technologies like cloud computing, IOMT and Big Data analytics by healthcare institutions across APAC will be a driving factor for medical device firms to further align their strategizes toward innovations and digital solutions.

Contributory technologies for optimal adoption and usage of connected medical devices:

- **Platform**
  - Cloud Computing
  - CAGR – 28.6% (2018-2024)
  - 90% of hospitals in APAC are planning to invest, around $400 million, in cloud technologies to explore the innovative solutions for patient centric care

- **Integrators**
  - Internet of Medical Things
  - CAGR – 30.29% (2018-2024)
  - Overall market for IOMT healthcare is expected to reach 10.9 billion by 2024

- **Analyzer**
  - Big Data Analytics
  - CAGR – 38.7% (2018-2024)
  - 52% of Hospitals in APAC are planning to invest around $2.5 billion in next 2 years

Source: Frost & Sullivan
### Theme 2: Distribution and Route Optimisation

Moving towards digitalized distribution systems

<table>
<thead>
<tr>
<th>Key elements of distribution</th>
<th>Current level of technology adoption in distribution across major APAC markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-procurement systems</td>
<td>China</td>
</tr>
<tr>
<td>Virtual Marketing and training</td>
<td>Japan</td>
</tr>
<tr>
<td>Payment systems (Fee, EMIs, Renewals)</td>
<td>Australia</td>
</tr>
<tr>
<td>Licensing applications for product usage</td>
<td>India</td>
</tr>
<tr>
<td>Online purchase (Ecommerce)</td>
<td>ASEAN</td>
</tr>
</tbody>
</table>

- Over 70% hospitals in India and ASEAN are still following manual procurement systems for medical device purchase, this trend is widely seen in public hospitals.
- Standard order to remittance (OTR) time for a product is around 30% lesser in China and Japan, when compared to India, this is attributed to digital transactions for payments, licenses etc.
- Virtual marketing, 3D product experience has gaining popularity in the region, Distributors and OEMs are in early stages of partnering with large hospital groups to expand this model of selling, eventually, the remote hospital segment is beneficiary.

Source: Primary interviews and Frost & Sullivan
Theme 3: Reimbursement Landscape

Percentage of reimbursements for medical devices in APAC is expected to increase significantly in next five years.

Share of value products in total medical reimbursements is expected to increase during 2018-2023.

- Increase in private insurance and broader coverage across continuum are the key factors driving the shift.
- India and ASEAN will witness a decrease in % of out-of-pocket expenses, which is currently higher than the APAC’s average.
- Value medical products will account for higher reimbursement amount (estimated to be over 90% of its price) and so large portion of incremental reimbursement value in next 5 years is captured by value segment.

Share of value products in total medical reimbursements is expected to increase during 2018-2023.

- Shit toward outcome based reimbursement will fuel the growth of value products.

- Increasing adoption of integrated mechanism to determine clinical and economic value of product by insurance companies will boost the market for value products.
- Increased transparency in the eco-system will enable OEMs to predict the adequate level of investments in R&D that are aligned with insurance value requirements and the future reimbursement trends.

Source: Frost & Sullivan
Reimbursement outlook 2023: 2019 will set the direction for rapid transformation to achieve sustainability

- Patients' engagement towards their health is critical to promote better outcome at lower price, which is key element to achieve sustainable reimbursement structure.
- Insurance companies fix premium not based on age but based on health data of patient. Incentivize patients for healthy behavior to promote preventive care.
- Standardized framework to determine the value based on products true clinical and economic outcome. Adoption of digital solution is imperative.
- Patients or consumers:
  - Low or zero out of pocket expenditure and full coverage of care across care continuum. Care is aimed for better outcome at lower cost.
  - Transparent and integrated mechanism, so that OEMs can predict the adequate level of investments in R&D that are aligned with the future reimbursement trends.
- Providers:
  - Standardize purchasing decision to determine a product based on its value and e-procurement process to align with Insurance.
  - Local innovations, value products to get desired level of reimbursement. Local manufacturing or local partnerships are strategic imperatives.
- Medical Device Firms:
  - Purchase of only value products whose value is determined by clinical and economic outcome and payment is based on measured outcome.
- Insurer:
  - Annual premium fee
  - Rewards
  - Government, private
  - Products and services
  - Payment-reimbursement
  - Standardize purchasing decision to determine a product based on its value and e-procurement process to align with Insurance.

Source: primary interviews; Frost & Sullivan
Theme 4: The Value Product Segment

Market for value products is expected to occupy a significant dollar share in total purchase, driven by emerging markets with growing, tier I, tier II and public hospitals

Exponential growth of value product market in APAC

- 2018: 10.8 USD Billion
- CAGR: 26.7% (2018-2022)
- 2023: 26.1 USD Billion

Value segment is expected to reach USD 26.1 billion by 2023 from 10.8 billion in 2018

Revenue share of value products in total medical device in APAC

- 2018: 12%
- 2023: 19%

Share of value segment in medical device is expected to increase from 12% in 2018 to 19% in 2022

Value product market revenue growth rate

- ~26% APAC
- ~10% Global

APAC will experience the fastest average growth rate in value product category compared to global, over next five years

Market shifts + “Hand-me-down” approach in APAC has impacted market growth and resulted in a deeper look at right fit products for markets
An integrated eco-system that enables us to define “VALUE” is critical to success.
Theme 5: Key Components of Patient Centricity and the Medtech Market Opportunity

Key Drivers
- Value Based Care
- Healthcare Consumerism
- Digitization of Business Models
- Healthcare Data Democratization
- Emergence of the “Quantified Self”

Key Components of Patient Centricity
- Patient Safety
- Patient Monitoring
- Patient Engagement
- Patient Care Coordination

Medtech Market Opportunity
- Medication management safety
- Patient diagnostics safety (timely and correct diagnosis)
- Unnecessary ED admissions
- mHealth tools
- Smartphone, wearables, hearables
- Sensor based health monitoring
- Smart home based monitoring
- mHealth apps
- Robots, chatbots, digital avatars and other AI enabled conversational engines
- Healthcare gamification
- Chronic condition management
- Patient experience, outcomes mngmt
- Pre and post discharge care
- Home health management

Current Medtech Focus
- Strong
- Significant
- Limited

Future Market Potential
- Strong
- Significant
- Limited

Source: Frost & Sullivan
Shaping the Future of Healthcare Personalization, Decentralization, Collaboration and Prevention

<table>
<thead>
<tr>
<th>From...</th>
<th>Approach</th>
<th>Personalized Medicine</th>
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</thead>
<tbody>
<tr>
<td>One Size Fits All</td>
<td>Information Flow</td>
<td>Integrated, Two Way</td>
</tr>
<tr>
<td>Fragmented, One-way</td>
<td>Focus</td>
<td>Patient Centric</td>
</tr>
<tr>
<td>Provider Centric</td>
<td>Reimbursement</td>
<td>Bundled, Capitated</td>
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<tr>
<td>Procedure-based</td>
<td>Location</td>
<td>Decentralized, Community-based</td>
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<tr>
<td>Centralized, Hospital-based</td>
<td>Treatment</td>
<td>Collaborative, Shared Information</td>
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<tr>
<td>Fragmented, Specialized</td>
<td>Decision Making</td>
<td>Based on Protocols and Analytics</td>
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<tr>
<td>Based on Individual Expert</td>
<td>Objective</td>
<td>Preventing Sickness (Wellness)</td>
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<tr>
<td>Treating Sickness</td>
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Source: Frost & Sullivan
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Appendix

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