

The background features a dark blue field with several large, textured spheres. Each sphere is covered in a grid of small, raised bumps. Scattered throughout the scene are numerous small, glowing blue particles, some of which appear to be floating or moving. The overall aesthetic is futuristic and scientific.

Global Trends in MedTech 2023

Fundamental Product Change on the Horizon

A.S. Freeman Advisors
July 2023

Executive Summary

- Medtech reaching an inflection point due to healthcare spending and rising patient load
- Economic necessity will lead to emphasis on:
 - New classes of wellness and health monitoring devices
 - Digitally networked devices
 - Healthcare workflow devices for greater accuracy of care and productivity
- Core strategic decisions regarding role for current medtech supply chain

Perspective and Methodology

- Focus on the “seismic trends” driving the industry
- Three- to 10-year horizon
- Source materials:
 - OEM presentations to analysts and investors
 - Contract manufacturer public statements
 - Government health, financial, and demographic data

About A.S. Freeman Advisors



Tony Freeman
President



- Merger and acquisition advisory services
- Corporate value-enhancement strategies
- Focus on precision manufacturing and specialty materials markets
- Publishes *Global Trends: Medical Device and Diagnostic OEM Strategy and Implications for the Supply Chain*

A Note on Terminology

- Medtech rather than Medical Device
- Johnson & Johnson 2021 10k: ¹

“*Beginning in the fiscal first quarter of 2022, the Medical Devices segment will be referred to as the MedTech segment.*”

- Major statement regarding the evolution of the industry and its future direction

More Terminology - Four Types of Health Care

Acute

Chronic

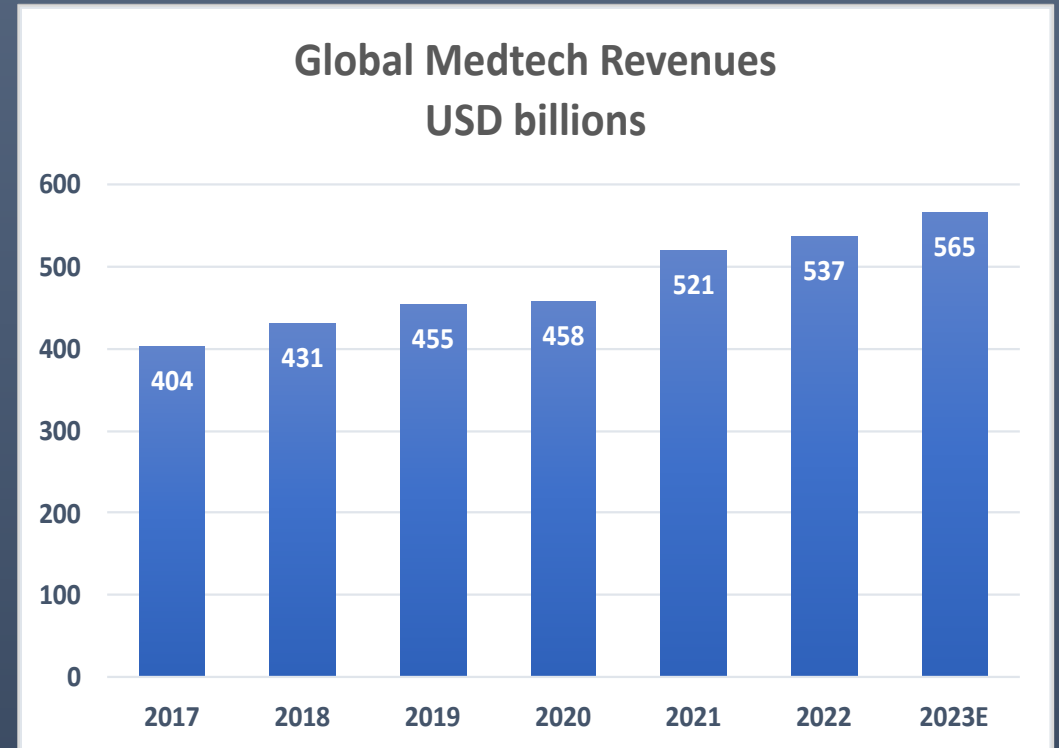
Occasional

**Preventive or
Wellness**

- Most approaches to healthcare are responsive
- Most medtech devices used for acute and chronic care
- Only a small percentage used in preventive care

The Medical Technology Market – SIZE

- 2022 Global Revenues = \$537 billion
- Sharp uptick coming out of covid
- On path for \$565 billion in 2023

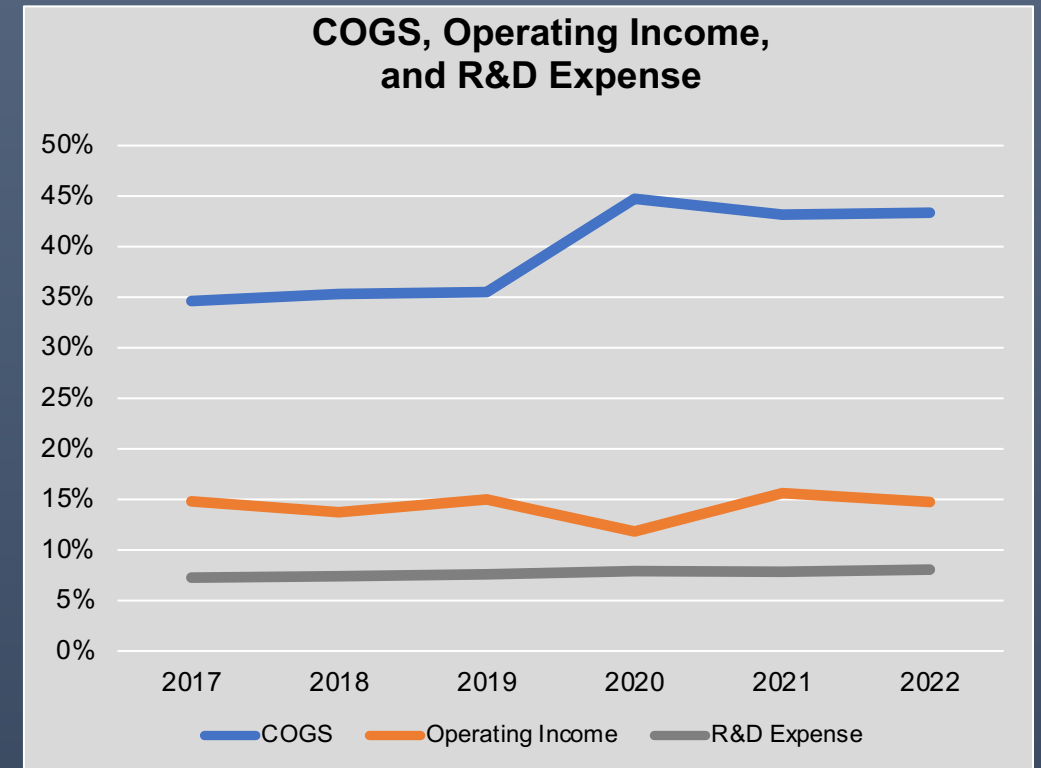


The Medical Technology Market – GROWTH RATE

- Projected revenue growth rate of 5.9%
- In line with 5-year revenue CAGR of 5.8%
- Estimates range from 4% to 8%, depending on OEM
- Medtech remains a steady growth industry and unlikely to diverge in the next several years

The Medical Technology Market – COGS and R&D

- Rise of Cost of Goods Sold
 - Inflation
 - Supply chain disruptions, weaker overhead absorption
- Operating income hovers around 15%
- R&D increasing from 7.25% to just over 8%
 - Telling number
 - Points to significant number of product launches
 - OEM faith/dependence on the future of new products



Medtech Management Perspective in 2023

- Year of “tidying up” from years of supply/demand disruption
- Recovery from
 - Covid
 - Supply chain disruptions
 - Inflation
- Marked by
 - Reorganizations
 - Rebuilding supply chain strategies
 - Cost controls
 - Few large strategic changes this year
- ***Not a year of revolutions***

OEM Supply Chain Strategy – It's Murky

- Many OEMs point to supply chain disruptions as a cause to rethink supply strategy
- Two ~general themes:
 - Regionalization of supply “Build where you sell”
 - Redundancy of supply “Expand dual sourcing”
- Covid was the original driver to “think about the unthought”
- Geopolitics rising
- OEMs considering resilience of an ever-important supply chain. Not much detail on long term plans

What Are MedTech's Key Drivers and Drags?

Drivers

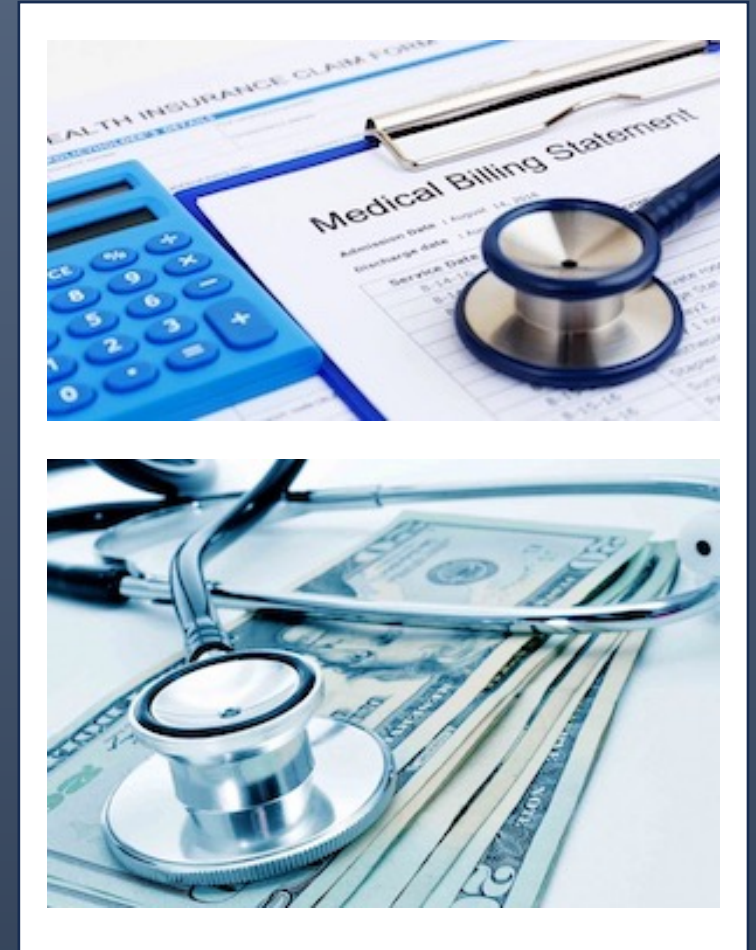
- Aging populations in developed countries
- Growing middle class in developing countries
- Health infrastructure buildout in developing countries
- Treatment of chronic diseases (often “diseases of affluence”)
- Emphasizing wellness – Monitoring health for longer, more active life



What Are MedTech's Key Drivers and Drags?

Drags

- Max reimbursement approaching in US, Europe, Japan



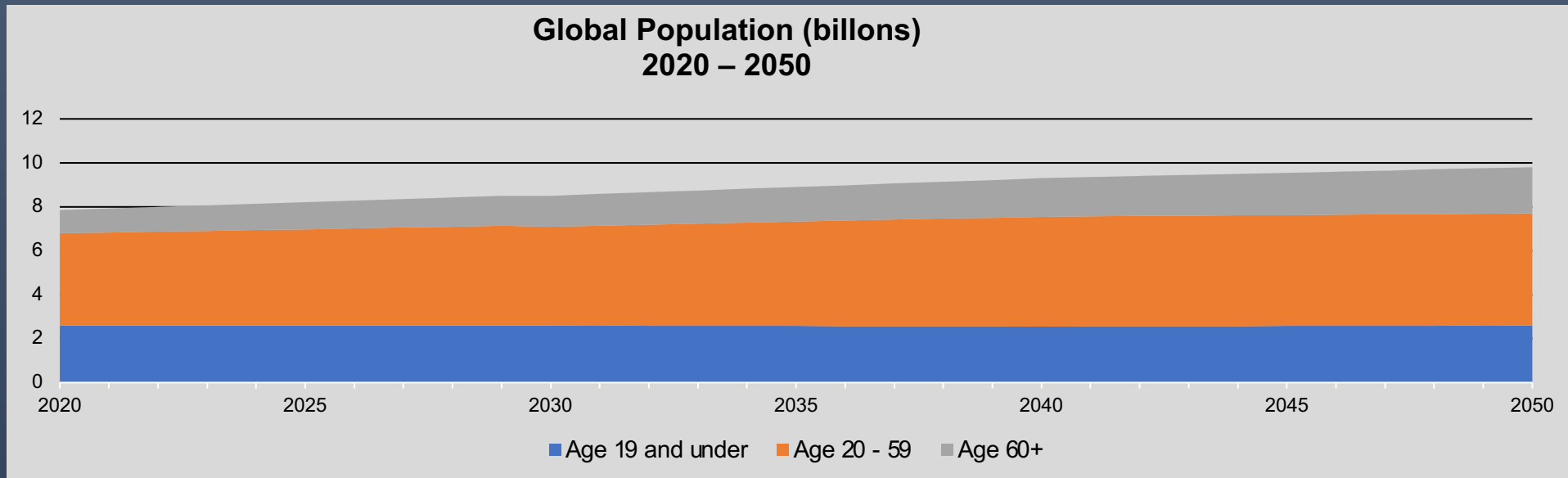
Aging Populations

- 2020 – People over 60

- 1 billion of 7.8 billion
- 12.8% of global population
- More over 60 than under 5

- 2050 – People over 60

- 2.1 billion of 9.7 billion
- 22% of global population



Implications

- **Not enough money**
 - Massive increase in medtech spending
 - Already at peak/near-peak healthcare spending in developed countries
 - US at questionably sustainable at 18% GDP, touched 19.7% during covid
 - Other developed countries between 11% and 16%
 - VBR and ACA will help, but not solve the money problem
 - More old people than young people
- **Too few providers**
 - Insufficient healthcare staff given current productivity
 - Covid demonstrated the limits of care capacity

Forces of Change Building

- Current system unsustainable
 - Economically necessary to change – max healthcare spending in US, high in other countries
 - Not enough healthcare providers
 - Acute and intermittent care focus to treatment – Hospitals are expensive
 - Chronic care is largest cost
- Compelling economics for change
 - Keep people healthier for longer
 - Make healthcare staff more productive

A Volcano Under the Snow

- **A “stick to the knitting” year**
 - Business rationalization
 - Returning to normal after covid
 - Few dramatic transformations
- **Yet, early signs of revolutionary change**
 - Demographics and economics will force profound changes to healthcare
 - New, radically different devices are required to make a pivot to healthier populations and more productive healthcare staffs
 - All these devices require digital capabilities
 - Many will be produced at consumer, not medtech volumes
 - Few current suppliers have the expertise to meet these manufacturing requirements

Three Quickly Evolving Classes of Devices

- Wellness
- Digitized ecosystems
- Workflow management devices
- *All have digital content*

Wellness Devices

- It's cheaper to:
 - Avoid acute episodes
 - Avoid chronic, costly diseases
- Wellness devices will be necessary for:
 - Lifestyle compliance
 - Medication compliance
 - Monitoring/warning
- Consumer devices in many cases
 - Example 1 – Kardia Mobile
 - Example 2 – Fullicon TimerCap



AliveCor KardiaMobile

- Medical-grade EKG system paired to smart phone
- No professional training required
- Warns of a-fib, other unusual heart rhythm symptoms
- Can email EKG to doctor
- Works anywhere
- **\$79 on Amazon** ⁶
- Early warning of CR issues can avoid costly emergency treatments, hospitalization, and rehabilitation

KARDIATM
by ALIVECOR[®]



Fullicon TimerCap

- Medication non-compliance:
 - Up to 25% of hospitalization in US ⁷
 - 125,000 deaths/year ⁷
 - Between \$100 and \$300 billion in costs ⁸
- **\$12.95 on Amazon** ⁹
vs. \$125,000 per year for
debilitating stroke



Rise of Digitization in Acute/Chronic Devices

- Traditionally standalone devices are being knitted into information sharing devices
- Many mechanical/electrotechnical devices require digital hardware and software to be relevant
- Over 70% of major product family releases by key OEMs are digital or digitally enabled devices
 - Medtronic – 11 out of 15
 - BD – 20 of 36
 - ResMed – 100%

Digital Ecosystem - Stryker Crossflow Integrated Arthroscopy Pump

- Arthroscopy pump with “ReconiSense” technology helps determine suction rates for cutters, burrs and RF
- Adjustment provides better, faster adjustment of fluid flow to ensure better visualization
- Result is safer, less costly arthro procedures
- Value is the electronics/software
- Who controls future development of the product line? Who leads manufacturing?



Workflow and Process Navigation Systems

- We have seen the rise of workflow and process analysis on factory floor
- Now seeing rise of workflow and process inside and outside the hospital

ResMed Suite

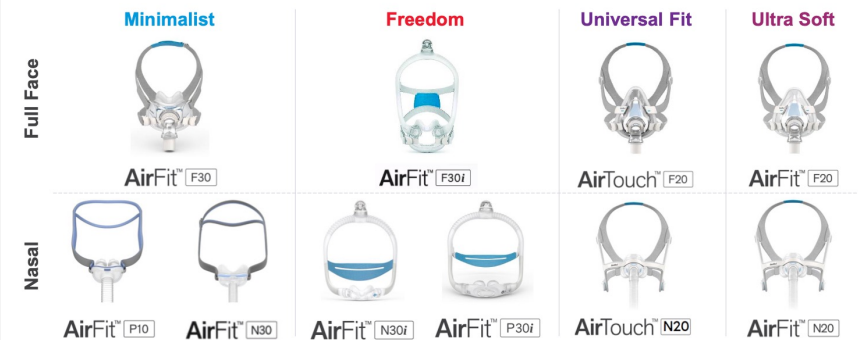
- Tend to think of ResMed as a respiratory products company
- Ventilation, COPD, sleep apnea for hospital and home
- Only a fraction of ResMed's strategy



Devices



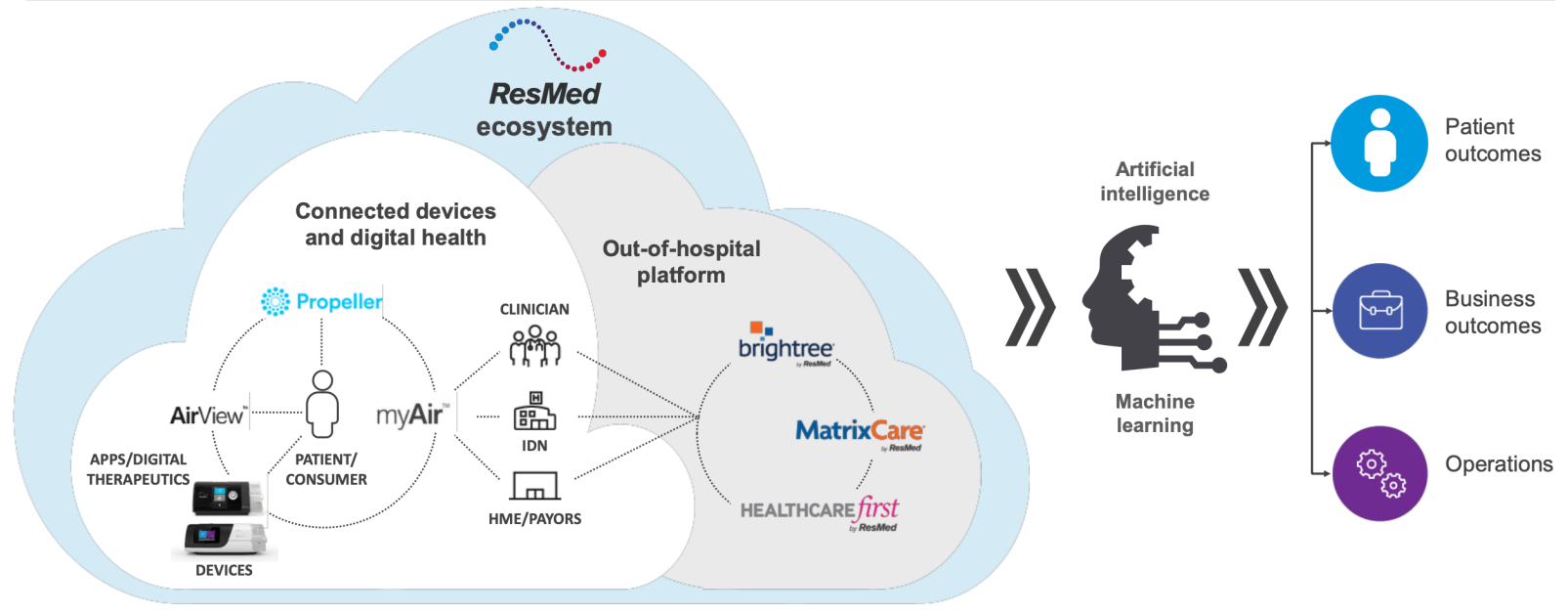
Masks¹



Not the Right Way to Understand ResMed

Refer to themselves as a digital healthcare company

Our digital health solutions improve outcomes and lower costs



Focused on interoperability so our ecosystem works with the broader healthcare ecosystem

Not the Right Way to Understand ResMed

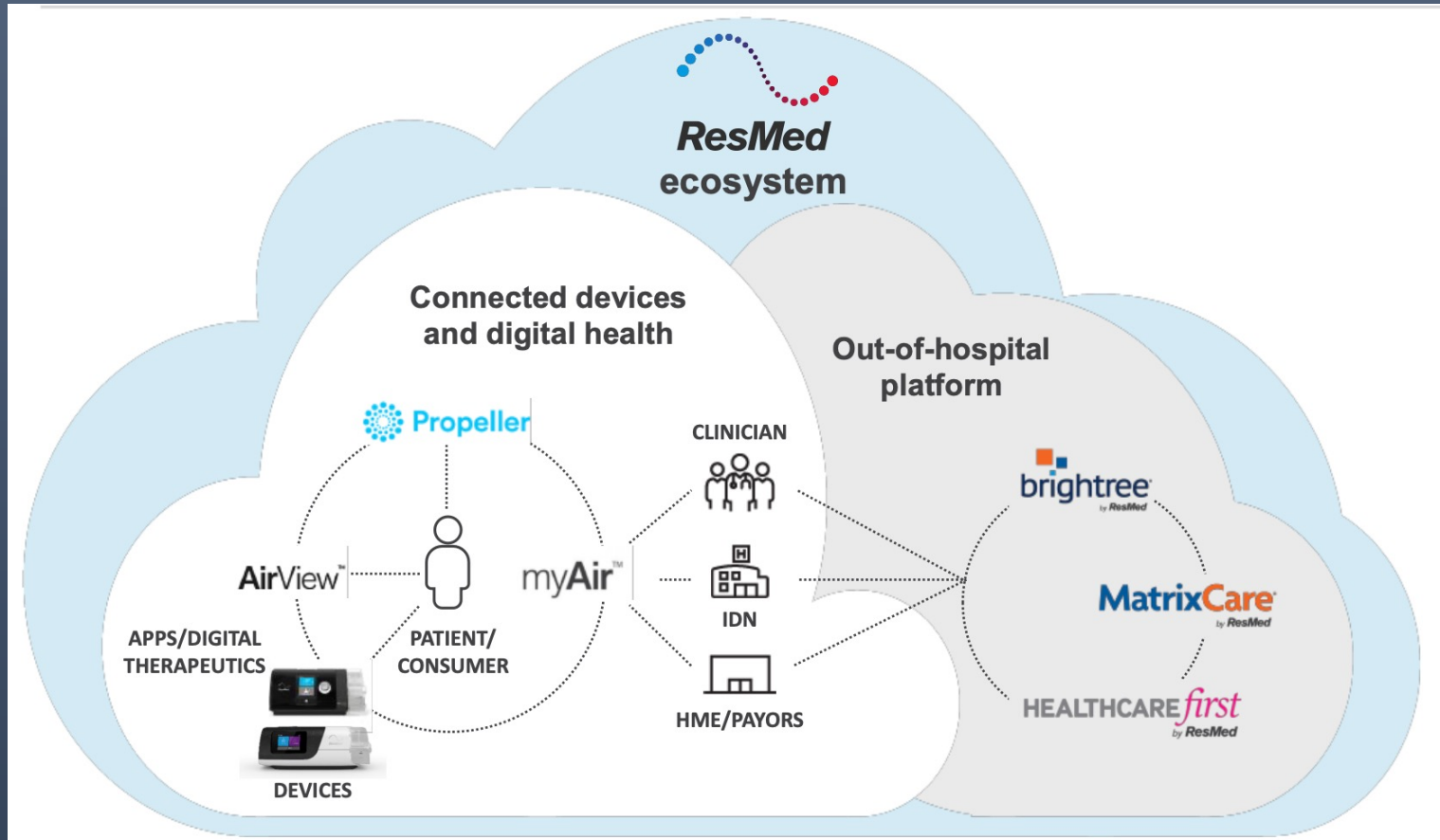
Four digital offerings

- Propeller – patient reporting and monitoring
- Brightree – “Revenue cycle management”
 - Reorder supplies for home users
 - Tracking and record keeping
 - Billing
 - Electronic prescription/referrals
- MatrixCare
 - Electronic health records from primary care through post-acute care (rehab, home care, nursing homes)
- Healthcare First
 - Scheduling out-of-hospital services
 - Communications among healthcare staff and patients for appointments and therapies



Not the Right Way to Understand ResMed

SaaS is about 12% of ResMed revenues



Graphic from ResMed

Open or Closed Systems?

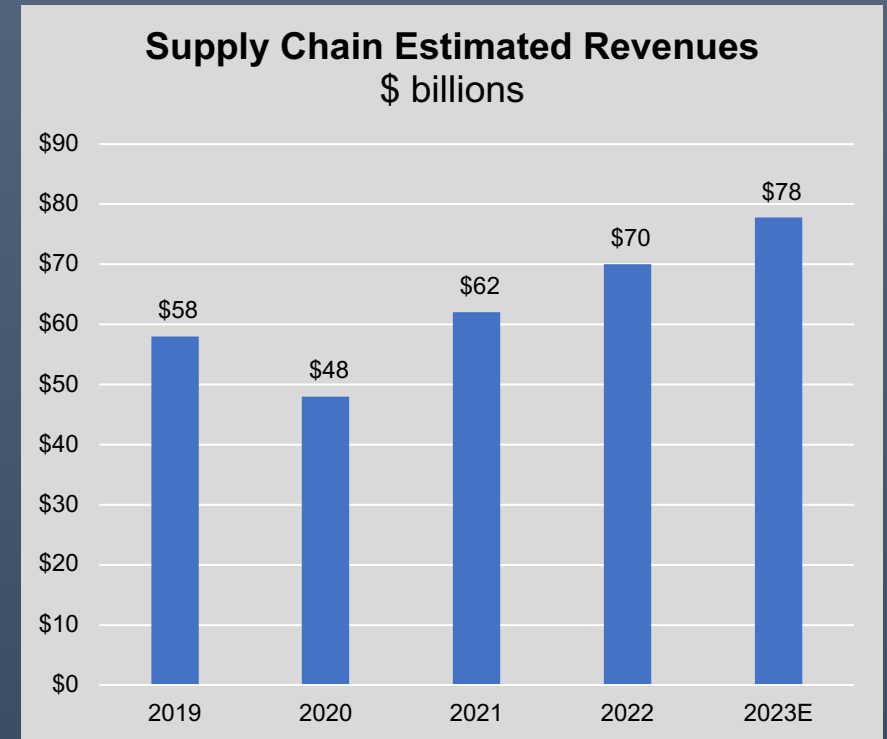
- Classic question
- Open APIs
 - GE Healthcare
 - ResMed
 - Dexcom
 - Siemens
 - Medtronic
- Open APIs offer OEMs
 - A more complete offering with little investment
 - Multiple solutions to same issue, greater stickiness
- Measure and report API calls in public filings

The Supply Chain



Supply Chain Size and Growth Rate

- Supply chain *roughly* ~\$78 billion in 2023. Always a murky number
- Growing between 8-12.5% per annum through 2025 (*ASFA estimates 10% CAGR through 2025*)
- Return to normal in 2023
 - Rebuild inventories post-covid
 - Delayed programs coming to market



Top 10 CMs Dominate Revenues

- Top 10 CMs: ~29% of overall supply chain revenues (approximately \$23 billion in revenue for 2023)
- Top 40 CMs: *Very roughly* 40-44% of supply chain revenues
- Less precise than OEM revenues due to segment reporting and privately held firms

Which Supply Chain Firms Will Dominate Digital Devices?

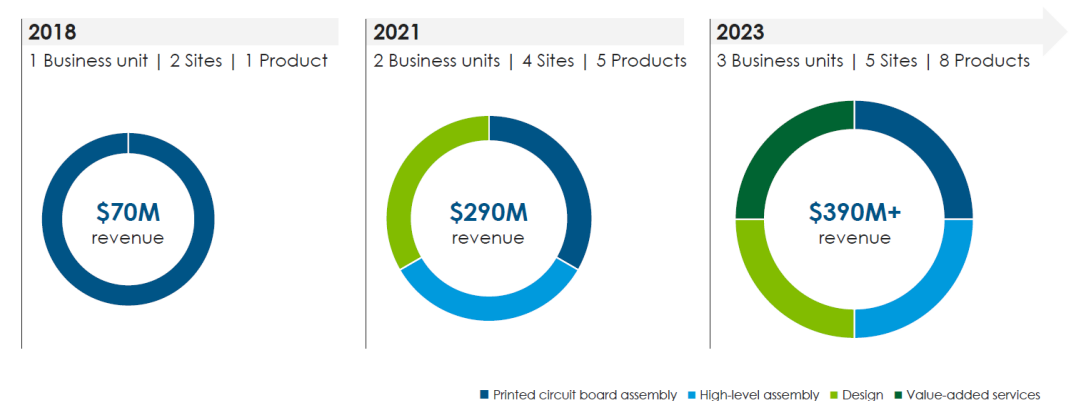
- Many of the incumbent CMs face a challenge
 - Focus on metal and plastic components, assemblies, and secondaries
 - Limited to none electronics or digital design capability
 - Limited experience with digital standards (communications, networking, security)
- ***Global CMs with electronics backgrounds are in the strongest position***

Flex's Approach

- Starting with printed circuit board expertise
- Captured more content in design, manufacturing, and assembly
- *Few CMs can offer this portfolio of services*

Increasing scope and scale

Case Study: Multi-segment MedTech customer



35

flex.

Can “Non-Digital” CMs Survive?

- Depends on strategy
- Three approaches
 1. Stick to the tangible
 2. Invest in electronic/digital capabilities
 3. Become an integrator



1. Stick To the Tangible

- Continue on course
- Medtech devices always have assembled metal and plastic components
- Demand is likely to increase with the market
- Will be disintermediated from OEMs as digital suppliers capture more economic value and content
- A series of defensive alliances and battles

2. Go Digital

- Adding digital expertise requires
 - Significant capital for hiring and/or acquisitions
 - A long period to master the technology, build a reputation comparable to established players
 - Willingness to take smaller projects to start
 - Economics may require sophisticated international sourcing expertise
- A successful transition offers a powerful position in the market
 - Marries medtech expertise with tangible and digital skills
- Still, a risky strategy to enter a sharply different, competitive world

3. Become an Integrator

- Integrators blend different vendors' products into a “solution”
- Requires minimal capital, ability to hire digital firms and experts
- More coordination than committed manufacturing
- Faster, more flexible than committing to a digital path
- Finding the first customer may be challenging. Modest expectations are critical

End Notes

1. Johnson & Johnson 2021 10-K, page 2, <https://www.sec.gov/ix?doc=/Archives/edgar/data/0000200406/000020040622000022/jnj-20220102.htm>
2. Estimate formed by A. S. Freeman Advisors staff from publicly reported revenues of MPO's Top 30 OEMs (<https://www.mpo-mag.com/top-30>) and their estimated share of complete medtech contract manufacturing market.
3. Reported COGS, Operating Income and R&D spending for the 19 of the MPO Top 30 OEMs that separately report these three categories of expense in their annual reports.
4. *Ageing and Health*, World Health Organization data sheet, October 1, 2022, <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
5. United Nations, Department of Economic and Social Affairs, Population Division (2017). *World Population Prospects 2017 – Data Booklet* (ST/ESA/SER.A/401). https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/files/documents/2020/Jan/un_2017_world_population_prospects-2017_revision_databooklet.pdf
6. AliveCor KardiaMobile on Amazon.com. <https://www.amazon.com/KardiaMobile-Single-Lead-Personal-Monitor-FDA-Cleared/dp/B01A4W8AUK/>
7. *Medication Adherence: The Elephant in the Room*, U.S. Pharmacist, January 19, 2018. <https://bmjopen.bmj.com/content/bmjopen/8/1/e016982.full.pdf>
8. Cutler RL, Fernandez-Llimos F, Frommer M, et al. Economic impact of medication non-adherence by disease groups: a systematic review. *BMJ Open* 2018;8:e016982. doi:10.1136/bmjopen-2017-016982, <https://bmjopen.bmj.com/content/bmjopen/8/1/e016982.full.pdf>
9. Fullicon TimerCap on Amazon.com. <https://www.amazon.com/TimerCap-Automatically-Displays-Opened-Built/dp/B0BMSL2N85/> Estimate formed by A. S. Freeman Advisors staff from publicly reported and estimated revenues of medtech contract manufacturers. Additional support from estimates by other investment banking and research firms.
10. Flex Investor Day 2022 Virtual Investor and Analyst Day Presentation. <https://investors.flex.com/events-and-presentations/events/event-details/2022/Flex-2022-Virtual-Investor--Analyst-Day/default.aspx>

For More Information:

Please contact:

Tony Freeman

tfreeman@asfreeman.com

(917) 868-0772