HRV Project

Background Research

Group 31 – Rebecca, Choi-Wan, Calista, Tarane and Eva

Thurs 12th Nov 2020
Contents

1. Brief Overview of Companies
2. Medical Devices Features and Functions
3. Comparison between devices
Brief Overview of Companies

- GE Healthcare
- Abbott (previously St. Jude Medical)
- Medtronic
- Hill-Rom
- Philips Healthcare
- Edwards Lifesciences
- Terumo
- Getinge
- Getinge
- Omron
GE Healthcare

CARESCAPE B650 Monitor

Function

• Provides consistent haemodynamics and cardiac measurements using the CARESCAPE Patient Data Module (PDM)
• Used in: CCU, PACU, NICU, L&D, lower-acuity ICU, OR and emergency dept.

Features

• Parameters: NMT, entropy, EEG, 12-lead ECG, volumetric CO2 and O2, PiCCO, Cardiac Output, SPV, PPV, SvO2, and dual SpO2
• Customisable page views for neurology, respiratory, cardiology, etc.
• MUSE cardiology information system and EK-Pro algorithm
12-lead at the bedside

Histograms

Auto-view on alarms

Adequacy of Anaesthesia NMT and Entropy monitoring
Abbott

CardioMEMS HF System

Function
- Monitors pulmonary artery (PA) pressures to detect heart failures early
- Used in patients with at least one heart failure hospitalisation (HFH) in the past year or would benefit from remote monitoring

Components
- PA sensor, delivery catheter, patient electronics system, hospital electronics system and secure web portal
Abbott

### Features
- Merlin.net Patient Care Network (PCN) and myCardioMEMS Mobile App

### Workflow
- Patient -> sensor -> Merlin.net PCN -> Clinician

### Benefits
- $13,000 reduction in cost (Desai et al., 2017)
- 24% HFH reduction and 30% mortality reduction (Abraham et al., 2019)
- 66% HFH reduction and improved quality of life (Angermann et al., 2020)
- Personalised monitoring for each patient
Medtronic

LINQ II Insertable Cardiac Monitor (ICM)

Function

• Long-term ECG monitoring, management and diagnosis of patients
• Used in patients who are at risk of cardiac arrhythmias or experience transient symptoms such as dizziness, palpitation, syncope or chest pain

Features

• Reduced number of false positives with new pause detection algorithm
• Extended life of 4.5 years due to new hardware architecture
• Safe for MRI
• BlueSync Technology and CareLink network
1) CareLink Network
2) Reveal LINQ Mobile manager (app) or MyCareLink Relay home communicator
3) LINQ II
Medtronic: CareLink Network

**Quick Look Tab**

- **Current Look Data From:** 07-Oct-2016 00:12 to 10-Oct-2016 01:12

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Current</th>
<th>Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Tachy</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Pause</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Brady</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AT</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>AF</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>% of Time in AT/AF</td>
<td>2.2%</td>
<td>4.2%</td>
</tr>
</tbody>
</table>

- **Parameters:**
  - Four 7.5 min Episodes
    - >=150 bpm, >=16 beats
    - >=3 sec
    - < 35 bpm, >=4 beats
    - Off
    - >=10 min

- **Observations:**
  - Device Cleared on 10-Oct-2016
  - Electrical Reset
  - Symptom + Detected Episode
  - Average V. Rate during AT/AF > Threshold
  - AT/AF Daily Burden > Threshold
  - Maximum Episode Count Met
  - Maximum Symptom Count Met
  - Device Data Collection is OFF

**Current:** counters show episodes since last Quick Look access

**Lifetime:** counters continue to show episodes since implant

**Parameters:** moved next to their corresponding event type

**Observations:** Information about patient events associated with programmed CareAlert™ notifications and reflects data uploaded to the CareLink Network from the last time Quick Look was accessed

**NOTE:** Observations and Counters/Parameters are now grouped at the top of the page for easier viewing
Medtronic: CareLink Network

Current ECG

Marker Channel has been moved onto the ECG.

10 seconds of ECG from the most recent patient transmission.
Medtronic: CareLink Network

Summary ECG

Ability for clinicians to assess episodes directly from Quick Look instead of navigating to individual episodes.

Up to 25-second summary ECG showing automatic or symptomatic episodes arranged by episode type.

Episode List Summary text of key ECG data (detection, duration, type, etc.).

Condensed rate trend plot outlining episode detection, term, and symptom marking.
Hill-Rom

Connex Vital Signs Monitor

Function

• Displays NIBP, EtCO2, respiratory rate, heart rate, etc.

Features

• Touchscreen & wireless
• Multiple profiles
• Measurements in 15s
EarlySense Vitals Surveillance System

Function

- Displays HR, RR and motion
- Quick access to vital information for early detection

Features

- Cybersecurity: verification and encryption
- No direct physical contact

Other products

- ELI 380 Resting Electrocardiogram
Philips Healthcare

IntelliVue MX750

Function

- Bedside patient monitor, actively displaying extensive range of measurements
- IPC, compatible to Window OS and many medical devices

Features

- Cybersecure
- Cost-friendly
- Alarms for surveillance

Other products

- EarlyVue VS30
- InttelliVue X3
Edwards Lifesciences

Global leader in hemodynamic monitoring

Monitoring Platforms

- EV1000 Clinical Platform
- HemoSphere Advanced Monitoring Platform
Edwards Lifesciences

EV1000 Clinical Platform

Access to advanced hemodynamic parameters
  • Facilitate volume administration decisions

Communicate patient's status quickly
  • Using color based indicators

Immediate recognition and increased understanding of clinical situations
  • Through visual support screens
Edwards Lifesciences

**KEY FEATURES**

- Provides choice of parameters you want to view + how you want to view them
  - 5 screen options available

- Real time physiology screen
- Cockpit screen
- Goal positioning screen
- Graphical trend screen
- Physio-relationship screen
Edwards Lifesciences

HemoSphere Advanced Monitoring Platform

- Cerebral desaturations
  - Provide comprehensive picture of oxygen delivery and consumption

- Sepsis management
  - Early detection through access to CO and SV

- Hypotension (MAP < 65mmHg)
  - Continuous hemodynamic monitoring allows early detection

- Hemodynamic instability
  - Proactive monitoring of SV and SVV can guide proper fluid administration
Edwards Lifesciences

KEY FEATURES

- Real time physiology screen
- Cockpit screen
- Goal positioning screen
- Graphical trend screen
- Physio-relationship screen
- Graphical/Tabular Split Screen
- Brain screen
Edwards Lifesciences

KEY FEATURES

Hot Swappable Battery

Predictive decision support software

Compatibility with a range of products

Mobility
Terumo

CDI® Blood Parameter Monitoring System 550

Delivers 12 critical continuous blood parameters readings

Alerts changes in patient status quickly

- Average response time in seconds

Optimize perfusion during cardiopulmonary bypass surgery
# Terumo

## Key Features

<table>
<thead>
<tr>
<th>Monitor</th>
<th>H/S Cuvette</th>
<th>Calibrator</th>
<th>Shunt Sensor</th>
</tr>
</thead>
</table>
| • Large, color liquid crystal display  
• Visual and audible indicators  
• Graphic/Tabular format display | • Optical reflectance technology | • Fast two point gas calibration  
• Mountable onto monitor pole clamp | • Unique fluorescence sensor technology |
Getinge

Focus: Use in clinical settings

NICCI Technology

- Continuous blood pressure measurement.
- Provides dynamic parameters such as mean arterial pressure, cardiac index, stroke volume variation and pulse pressure variation.
- 2 finger sensor in different sizes.
- Cuff docks on a mouse which fits in patient's palm.
- Integrated NIBP calibration automatic calibration to gold standard when using the cuff.
- Use during surgeries or other medical procedures.

reddot winner 2020
Omron – HeartGuide TM

Wearable blood pressure monitor
Use with companion app HeartAdvisor.
80 new patents that miniaturize the components for traditional oscillometric measurement
Inflatable cuff within the watch band to take blood pressure readings
sets HeartGuide apart from other wearables that rely on sensor technology, which only provide blood pressure estimates
Records blood pressure to clinical accuracy in 30 seconds. Tracks sleep, and activity
Omron

Complete® Wireless Upper Arm Blood Pressure Monitor + EKG

KardiaMobile EKG

Professional IntelliSense® Blood Pressure Monitor
Comparisons

**Similarities**

- Monitor similar parameters
- Automatic link records
- All visual
- Compatibility with other devices used in clinical setting

**Differences**

- How measurements are taken
- Portability
- Use in home or in clinical setting
- Focus on parameters
- Price
- Accuracy
- Additional components for functionality