Big Data in Arrhythmia Detection: Real or an Illusion?

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Once we know something, we find it hard to imagine what it was like not to know it.

Chip & Dan Heath, Authors of Made to Stick, Switch
iRhythm Pioneering Digital Health: Novel Biosensor Combined With Big Data Analytics

**Novel Biosensor**
- Single-use patient wearable biosensor
- Proprietary cloud-based data analytic engine

**Big Data Analytics**

**Disruptive Technology**
- Single-use patient wearable biosensor
- Proprietary cloud-based data analytic engine

**Strong Clinical Evidence**
- 14 peer reviewed studies
- Proven to change clinical diagnosis and treatment
- Payer coverage for >275 million lives in the US

**Rapidly Scaling Service**
- Prescribed for ~400,000 patients to date
- World’s largest repository of ECG & patient data
Wearable Biosensors Replacing Older Monitoring Modalities

- Cumbersome for patients and physicians
- Ineffective - only allows 24-48 hour monitoring
- Costly - low diagnostic yield of 20% drives follow on studies

- Easy-to-wear biosensor preferred by patients
- Continuous monitoring & analysis of every heart beat for up to 14 days
- >2x detection of arrhythmias vs. Holter
- High diagnostic yield of ~60 to 80%

Sources:
iRhythm Digital Healthcare Leader Due To Analytical Engine and Data Repository

Patient Data Sources

Long Term Continuous Monitoring

~2 million heartbeats/patient

Patient Reported Health Info

Unprecedented database of annotated, long term continuous ECG recordings with contextual patient information ... 85M+ hours of curated data

Digital Report for Diagnosis and Management

~2 million heartbeats/patient

Unprecedented database of annotated, long term continuous ECG recordings with contextual patient information ... 85M+ hours of curated data
Q3 2015 Results Demonstrates ZIO® Patch Positive Performance in Clinical Use

ZIO Patch Reports with Data Posted in Q3 2015

- Generalizable Population with Mean Age of 61 years (Median 66 years)
  - 51% of Patients Female
- Mean Wear Time: 10 Days (Median 11.8 Days, Max 14.0 Days)
- High Diagnostic Yield: 73% had at least one Arrhythmia
- High Mean Analyzable Time: 96.1% (Median 99.3%)
- 74.2% With Symptomatic Trigger Utilized at Least Once

Source: iRhythm Database
Q3 2015 Experience Demonstrates High Diagnostic Yield of Long Term Continuous Monitoring

High Diagnostic Yield: 73% Had At Least One Arrhythmia

- 24% of records had multiple arrhythmias
- 6% of arrhythmias met critical value notification

Source: iRhythm Database
Q3’ 15 Diagnostic Yield for Arrhythmia (%) Per Day

Source: iRhythm Database – Diagnostic Yield Excluding 100% AFib
Future Considerations

- Clinical Insights in Arrhythmia Detection – Power of the Raw Data
- Long Term Continuous QTc Analysis
- Predictive Modeling in Arrhythmia Detection
- Machine Learning
- Deep Learning
Big Data and Arrhythmia Detection --

*If you can’t explain it simply, you don’t understand it well enough.*

Albert Einstein, Physicist