

# View from the top

- **Medical practice is still human intelligence based, evidence based at best, not yet AI based**
- Physician centered, not truly patient-centered
- Large variations in practice, lack of predictability and accountability
- Expensive, waste, cost-ineffective
- Redundant testing, unnecessary procedures, errors
- Health Information Systems (HIS) with limited automation
- AI is at a starting gate. Still more buzz than reality.
- Most executives are willing to engage in AI. How?

# AI is inevitable and necessary

- **AI should not** take the place of humans, but it can eliminate repetitive tasks so more time with patients
- **AI can optimize** the work of clinicians and team members when integrated with EHR (Epic, Cerner...)
- **AI will provide** predictive tools to improve procedures and outcomes. Do the right thing for the right patient
- **AI will generate** new research methods and ideas
- **AI will be** a fundamental tool for decision support in administration for efficient and cost effective care

## **The Heart Institute Concept creates a specific ecosystem favorable to AI**

- Large infrastructure and large catchment area
- Concentration of resources and expertise in one place care, ideally under one roof
- Specialized cardiac divisions all put together: surgery, anesthesia, cardiology. Optimal teamwork environment for truly disease-oriented care through multi-disciplinary Heart Teams (Mesana et al, CJC 2018)
- Large volumes of cardiac patients providing a fruitful milieu for clinical research improving patient outcomes, changing practice, redefining guidelines.
- Research databases, large registries, generating Big CV Data
- Multi-modality cardiac imaging (Echo, CT, MRI, PET)
- CV Genetics, biomarkers, personalized medicine, prevention

# Advanced Cardiac Technology creates an ideal environment for AI projects and AI expansion

- Smaller and more implantable devices, patient friendly
- Less traumatic procedures, short LOS, cost-effective
- Smarter, connected devices, providing real-time data, remote monitoring (advanced cardiac rhythm devices)
- Advanced Cardiac Imaging technology providing image-guidance for catheter-based procedures:
  - pre-op for predictive analytics (computer simulation)
  - intra-op for quality of immediate result
  - post-op for durability of result

## **Critical is to be building your data warehouse, internal leadership and external partnership**

- Databases harmonization, connectivity (multi-year process)
- Diseased-centered, multi-disciplinary modules
- Institutional research database recreating a virtual Heart Institute, patient centered, towards a “digital patient” (CARDIOCORE)
- Interface with EHR (Epic), international registries (STS, NCDR), and other Canadian centers through Provincial database
- Medical leadership with expertise: “Chief Data Officer”
- AI partnership with other Faculties (Sciences, Business, Law)
- Building partnerships with Industry towards value-added

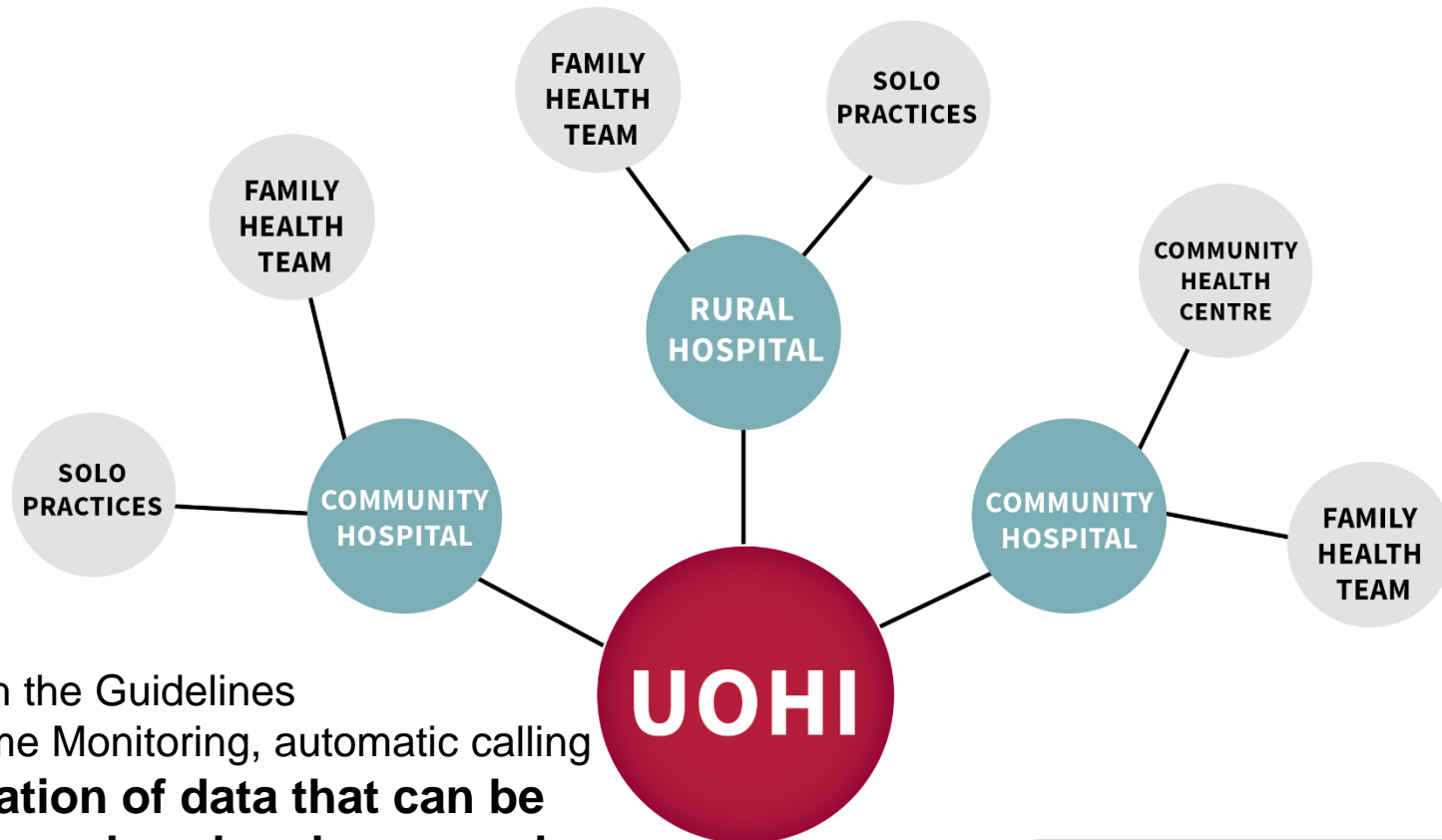
# Current and Planned Projects

- Construction of cardiac imaging databases linkage
- Imaging-guided prediction of response to treatment (surgical and catheter-based)
- Predictive modeling of heart failure progression
- Prediction of medical and surgical readmissions
- Predictions of complications/survival in ICU
- Prescription of personalized therapy based on multi-dimensional factors (genomics, clinical risk factors)
- Hub and spoke applications, satellite robots and bringing back the doctor at home through technology

# Integrated Regional Programs: Hub and spoke

Make an impact outside hospital walls.

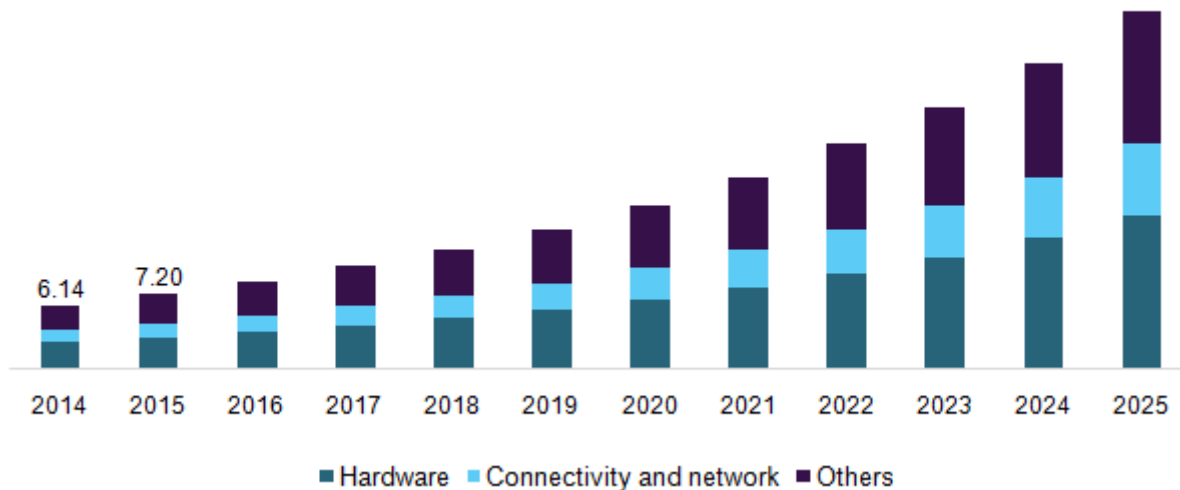
Best Practices Independent of Location



- Get with the Guidelines
- Telehome Monitoring, automatic calling
- **Generation of data that can be further analyzed and managed with AI for ultimately better patients outcomes and enhanced patient satisfaction**

Feeder Hospitals: 14

# Telemedicine market growth worth 113.1 billion by 2025

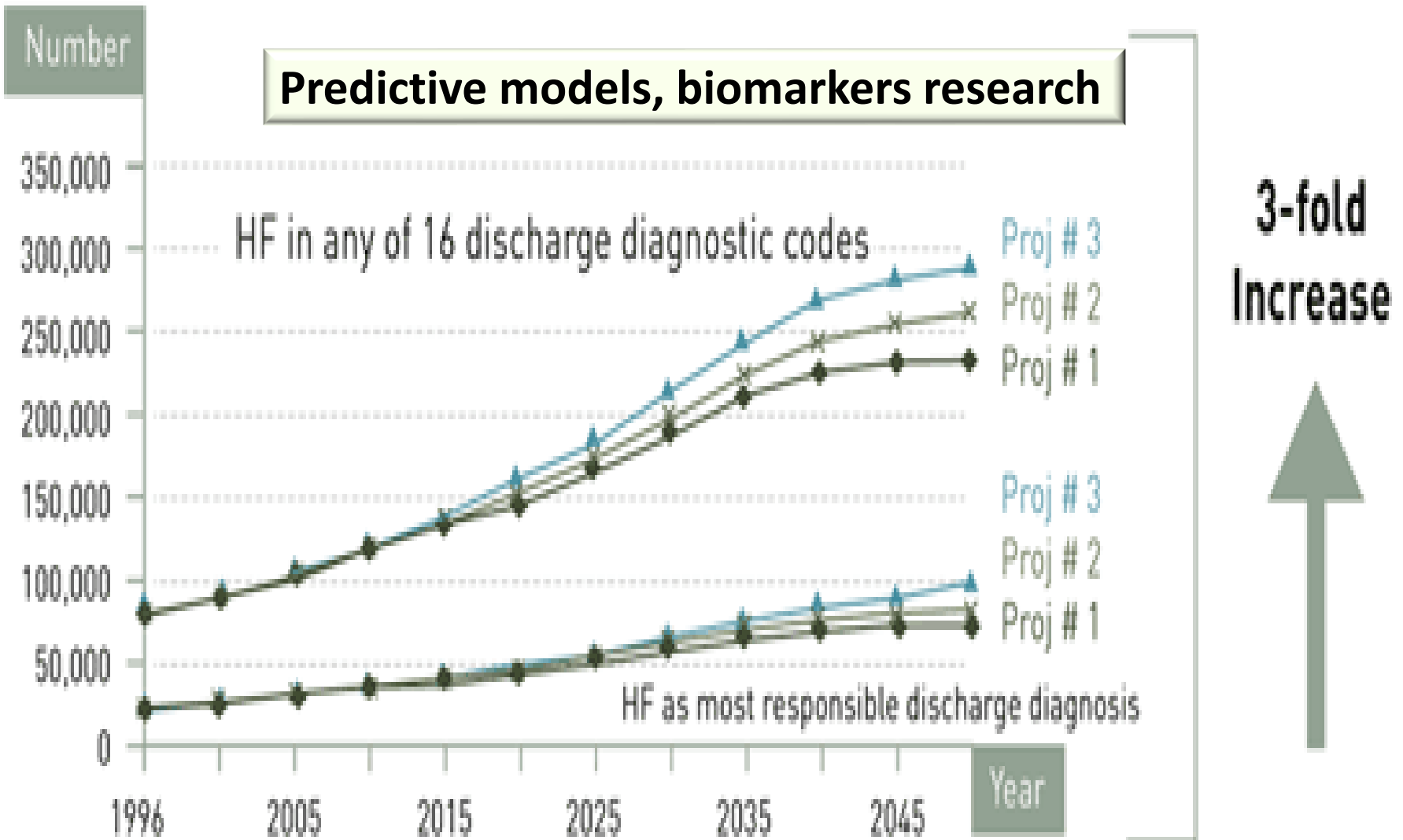


**Key drivers: increasing chronic conditions and rising demand for self care**  
**Report from Grand Vie Research, inc , April 2017**



# Chronic HF: Increasing Impact on Canadian hospitals

## More beds or new models of care using AI?



# Strategic thinking around AI

## Deep thinking...

### **The right infrastructure**

EHR fully automated level 6 (EPIC, CERNER,...)

Data warehouse with high quality and clean data

### **The right people**

Data scientists, data engineers

Epidemiologists, biostatisticians, support staff

Dedicated CV physicians understanding IT

### **The right targets**

Disease centered, High-acuity units (ICU, OR's)

Cross-disciplinary, multiple expert-based

**AI that matters to patients, ethical AI**