Heart Failure Management using Telemonitoring

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About the Center for Connected Health

- Division of Partners IS organization
  - Research and evaluation
  - Program development and rollout
  - Operational systems and support
- Our interest is in the use of technology to deliver care remotely:
  - Heart failure monitoring
  - Diabetic monitoring and coaching
  - Blood pressure self-management for large employer
- Benefits include:
  - Increased patient engagement
  - Improved health outcomes
  - Improved patient-provider communications

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Connected Health as a strategy for chronic care

Care Models Evolve as Populations and The Tools of Medicine Evolve

Health Systems Designed for Discrete Interactions Must Evolve to Support Chronic Care

Disease Landscape	Infectious disease, fatal incurable diseases (eg, diabetes)	Patients living with manageable yet incurable diseases (eg, diabetes)
Care Model	Acute transactions, short term, "cure or die"	Relationships, patient-provider collaboration, co-production
Hierarchy	Clinician sole owner of and dispenser of medical expertise	Diffusion of clinical expertise across providers, recognition of pt expertise
Patient	Receiver of care	Commissioner of their care

Heart Failure – Millions of patients, billions of dollars

- Heart failure affects 5 million people in the U.S.
- Direct cost of over $30 billion.[1]
- Hospital costs represent $17.8 billion - over 50 percent of total.[1]
- 44 percent of patients are readmitted to the hospital within 6 months of discharge.[2]
- At least 20% of hospitalizations are considered to be preventable.[3]

[1] *Circulation.* 2007;115:e69-e171.), American Heart Association. Available at: http://circ.ahajournals.org/cgi/content/full/CIRCULATIONAHA.106.179918

[2] Krumholz HM et al. Readmission after Hospitalization for Congestive Heart Failure Among Medicare Beneficiaries. Archives of Internal Medicine, 1997 Jan 13; 157(1): 99-1-4.

[3] Nohria A et al. Quality of Care for Patients Hospitalized with Heart Failure at Academic Medical Centers. American Heart Journal, 1999; 137(6): 1028-1034.

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Heart Failure – Meta review on impact of remote patient monitoring

Clark et al, 2007 *British Medical Journal*

- Systematic review of heart failure remote monitoring and structured telephone support randomized trials published 2002-May 2006.
- Results:
  - All cause mortality – 20% reduction with remote monitoring programs.
  - Benefits were greater with remote monitoring than structured telephone support.
  - Hospital admissions as a result of heart failure - pooled results showed a 21% reduction.
  - Quality of life - 3/6 trials showed a significant and substantial improvement.

Impact of Care Coordination/Home Telehealth (CCHT) on the VHA

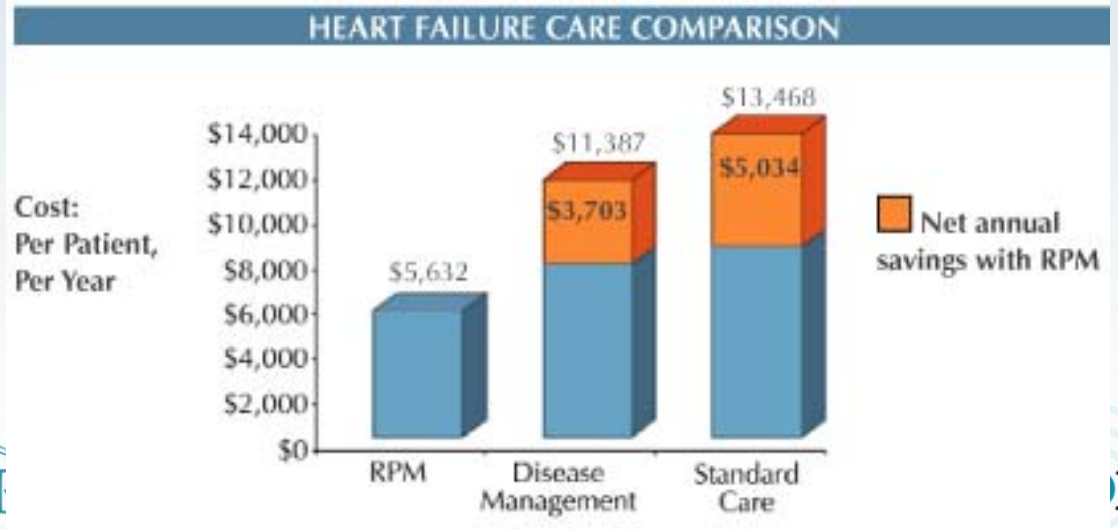
Darkins et al, 2008 *Telemedicine and e-Health*

- CCHT is a routine service offered by the VHA to veterans with chronic conditions.
- Analysis of data from cohort of 17,025 CCHT patients.
- Results:
  - 19% reduction in the number of hospital admissions.
  - 25% reduction in bed days of care.
  - Mean satisfaction score rating of 86% after enrollment into the program.
  - At $1,600 per patient annually, CCHT costs 87% less than VHA home-based primary care services.

New England Health Institute: RPM's impact for heart monitoring

2009 NEHI RPM Update, Key Findings:

- 60% reduction in hospital readmissions compared to standard care.
- 50% reduction in hospital readmissions compared to disease management programs.
- Potential to prevent between 460,000 and 627,000 heart failure-related hospital readmissions each year.
- Estimated annual national cost savings of up to $6.4 billion dollars.



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Heart Failure Headlines: Partners HealthCare

- For over 10 years, PHS has been committed to transforming care for patients with heart failure.
- Partners heart failure patients are now reliably identified at admission and connected to post-discharge follow-up programs.
  - NP, home care, telemonitoring, discharge transitions
- Re-admission rates for Partners heart failure patients are below US News “Top 20 Heart Hospital” benchmarks.
- Partners has developed a core competency in monitoring and communication technologies to enhance disease management.

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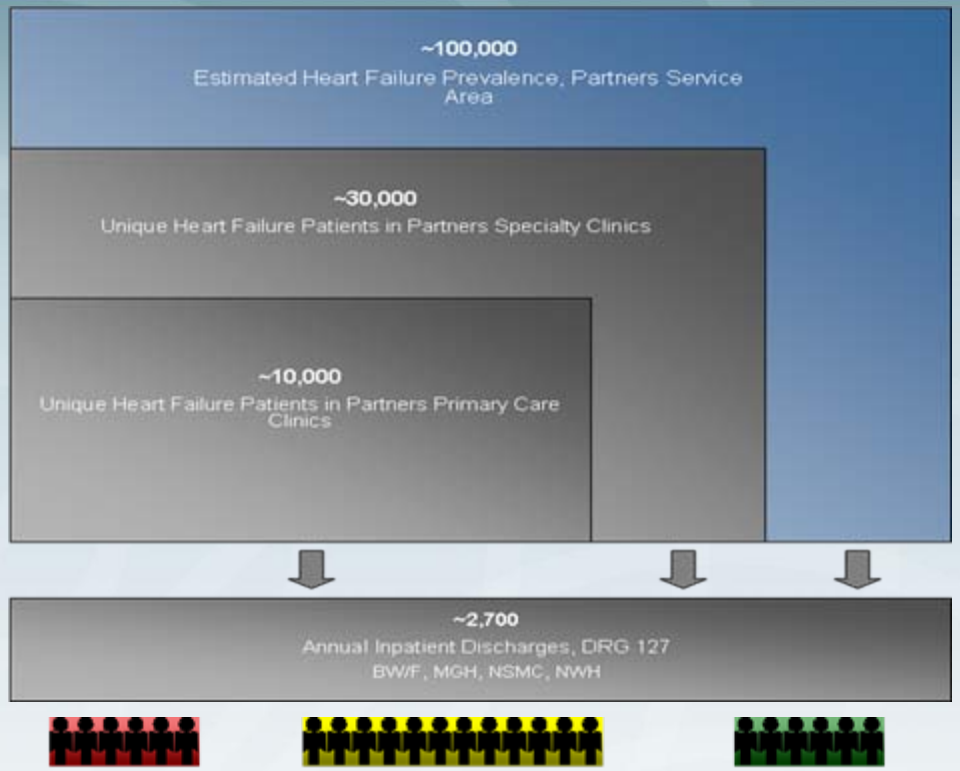
Sizing the Heart Failure Population



High Risk
~810 (30%)

~50% (405) of the 810 high-risk patients have a Partners PCP. All will receive:

- Telemonitoring (Home Care or CCCP)
- NP Program

Inclusion Criteria

- All acute HF patients (HFRPM screening algorithm)
- Requires reinforcement of self-care management
- Cannot travel, would likely refuse routine clinic-based interventions

Medium risk
~1350 (50%)

- Home Care RN visits
- Call center follow-up
- Hospital-based risk reduction programs
- NP consult if needed

Inclusion Criteria

- Newly diagnosed HF
- Requires short-term follow-up
- Requires coaching on self-care management

No Program Needed or Exclusion
~540 (20%)

- Has effective self-management program with PCP/cardiologist support
- Out of service area
- ESRD, Dementia, Resides in SNF

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Translation to Programs: Our Focus

HPM Team 4

MEDICAID

- Connection Health Coaching
- BIMA Health Partnership

HEART FAILURE

- NP Program
- Identify & Connect
- Heart Failure-Registry and Population Manager

- Partners Home Care
- Connected Cardiac Care Program

HIGH RISK MEDICARE

- MGH Heart Failure Pilot
- BWH Non-Heart Failure Pilot

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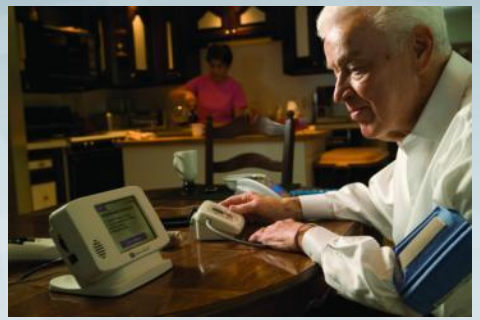
Connected Health is Patient Centered Care

Four Cornerstones of Connected Health



- **H**arnessing accurate physiologic and behavioral data
- **E**ngage patients to view and understand their health information
- **A**ctivate coaching based on personalized data
- **L**everage providers when needed

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Connected Cardiac Care Program

- Daily monitoring of weight, blood pressure, pulse, oximetry
- Telemonitoring nurse at Partners Home Care monitors and intervenes when necessary

Goals:

- Provide intervention at the point of need
- Improve patient education and self-management abilities

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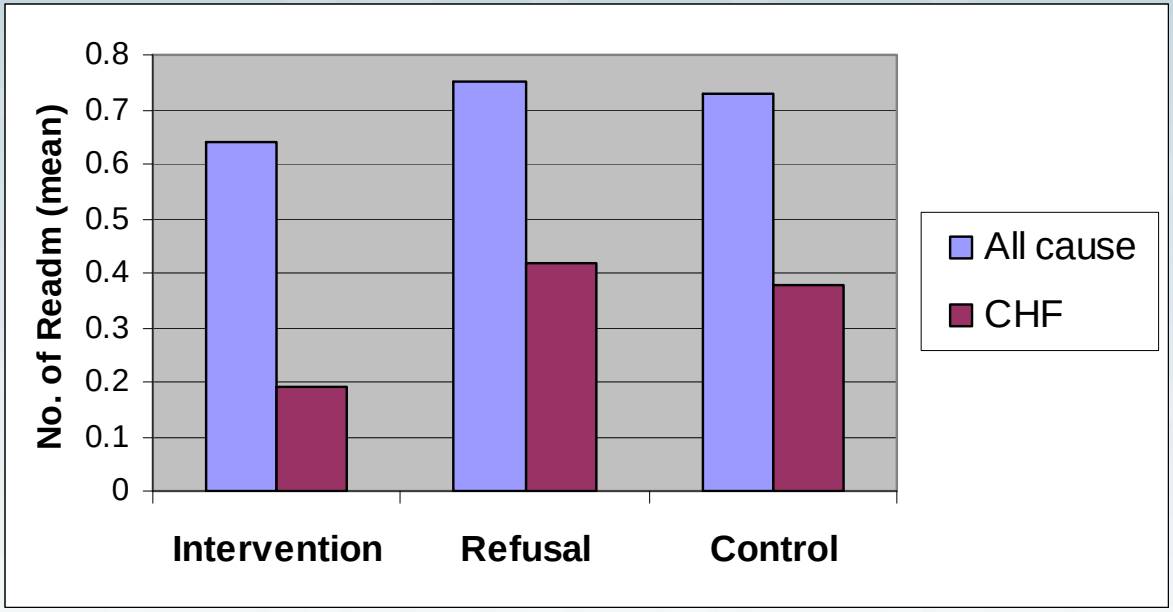
Connected Cardiac Care Program

Results from pilot study at MGH
Intervention group had lower 6 month readmission rate



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Connected Cardiac Care Program

“With my two bouts that put me in the hospital, I didn’t know anything until it was too late. I would have landed at least two more times in the hospital if it weren’t for this computer.”

Mariano, Heart Failure Patient

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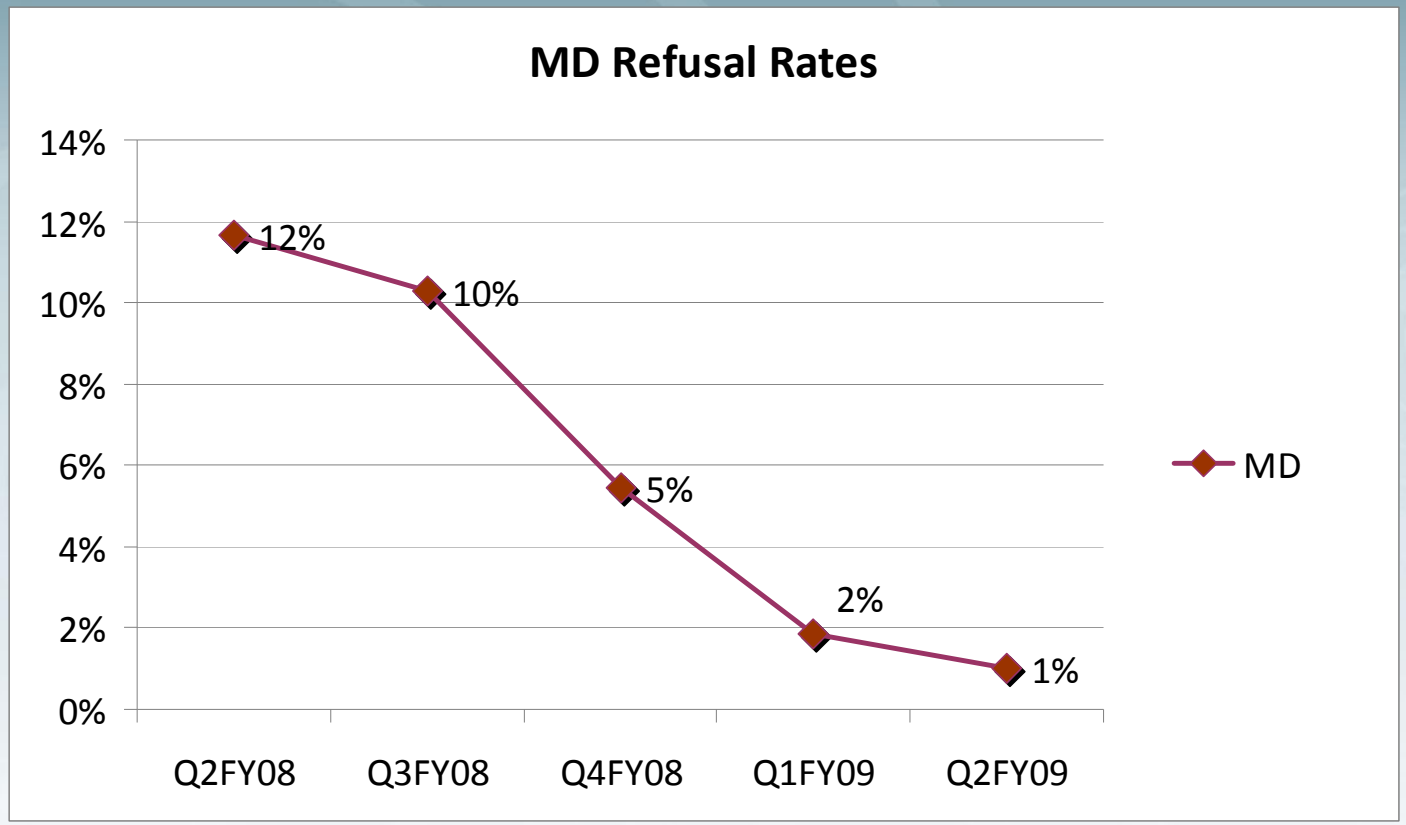
MD Refusal Rates



As MDs gain experience with the telemonitoring program, they are more likely to enroll their patients.

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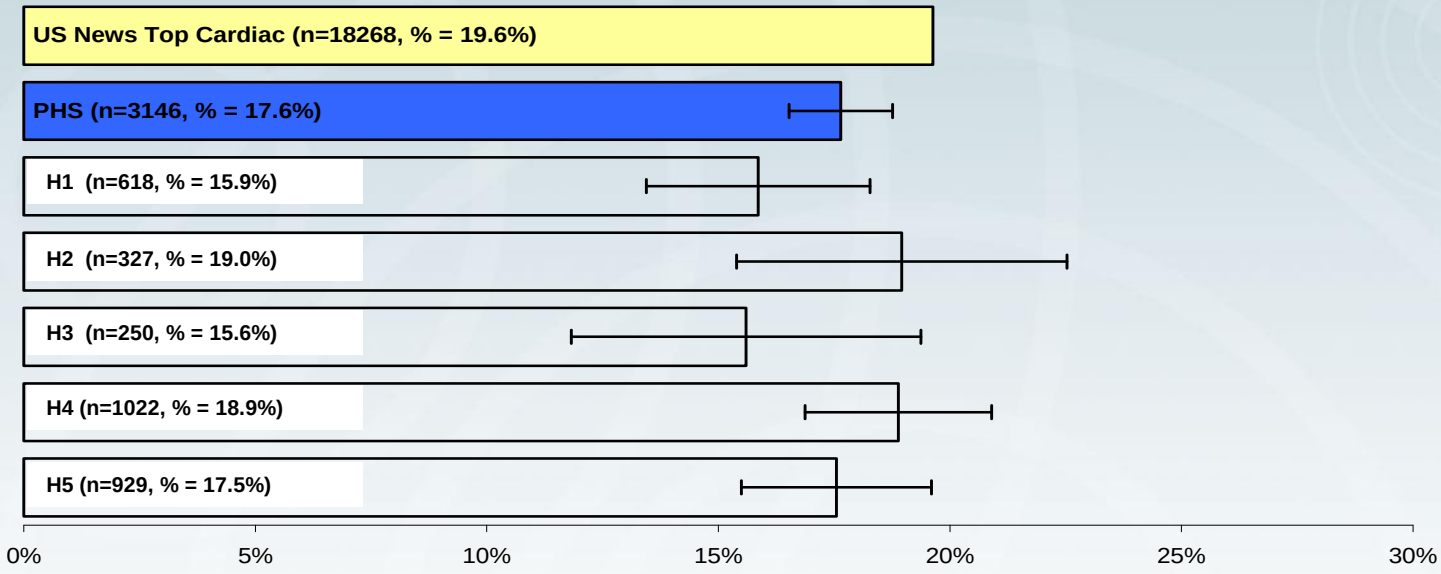
Heart Failure 90 day readmissions

Heart Failure Readmissions

Heart Failure 90-Day Readmission to any Partners Hospital with 90% confidence intervals, Year Ending June 2008

The proportion of heart failure discharges with a subsequent related readmission to any Partners hospital within 90 days post discharge, in comparison to the US News top Cardiac hospitals and their affiliates in 2008. 90% Confidence intervals are provided around the Partners estimates.

Annual Results (Jul2007-Jun2008)



Note: Denominator = HF discharges from a particular hospital in the specified time period, excluding discharges with dispositions of in-hospital death or transfer to another acute care hospital; Numerator = number of HF hospitalizations to any Partners hospital within 90 days of discharge. The US News comparison population includes the 16 of the top 20 top cardiac hospitals in 2008 (excluding MGH BWH) and 5 affiliates of these hospitals. 2 US News Top Heart Hospitals that are not UHC members (Cleveland Clinic and Beaumont Hospital, Michigan) are excluded. Only readmissions back to the discharging hospital are counted for the US News comparison.

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Telemonitoring for CHF patients: Hospital ROI

- Pay for performance
- Bundled payment scenario – 30 days of post hospital admission care
- Shared savings-type scenario
- Context of the medical home

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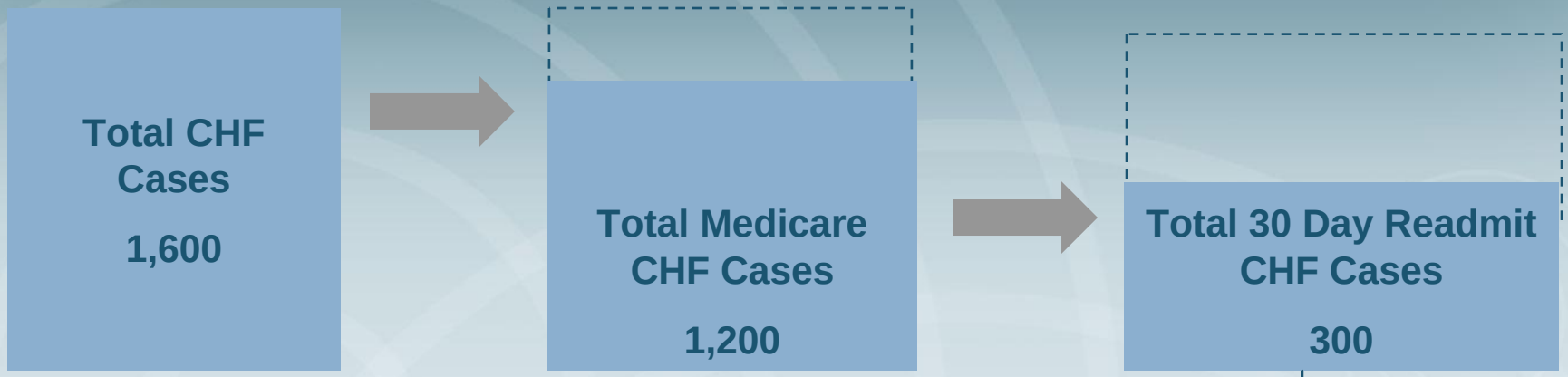
30-Day Readmissions: A System Scenario



Impact to System:	
Risk to System	**With no preventable readmissions**
Revenue = $0 Direct Cost = $2M **Direct Margin = -$2M**	By avoiding admissions could save up to **$2M** Plus, backfill opportunity resulting from 300 avoided admissions **~$1.7M**

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Remaining Challenges

- Cost reduction
- Patient identification
- Workforce optimization
- Program optimization

Conclusions

- Telemonitoring is a useful tool to prevent 30 and 60 day readmissions, and to improve patient satisfaction.
- Critical components:
  - Accurate, timely data
  - Patient education, self-care and insight
- Learn more:
  www.connected-health.org

  LinkedIn group – Connected Health Community

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