

MGH Biostatistics: Creating Opportunities for Collaboration

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Chief, Biostatistics, MGH

Professor, Department of Medicine, HMS

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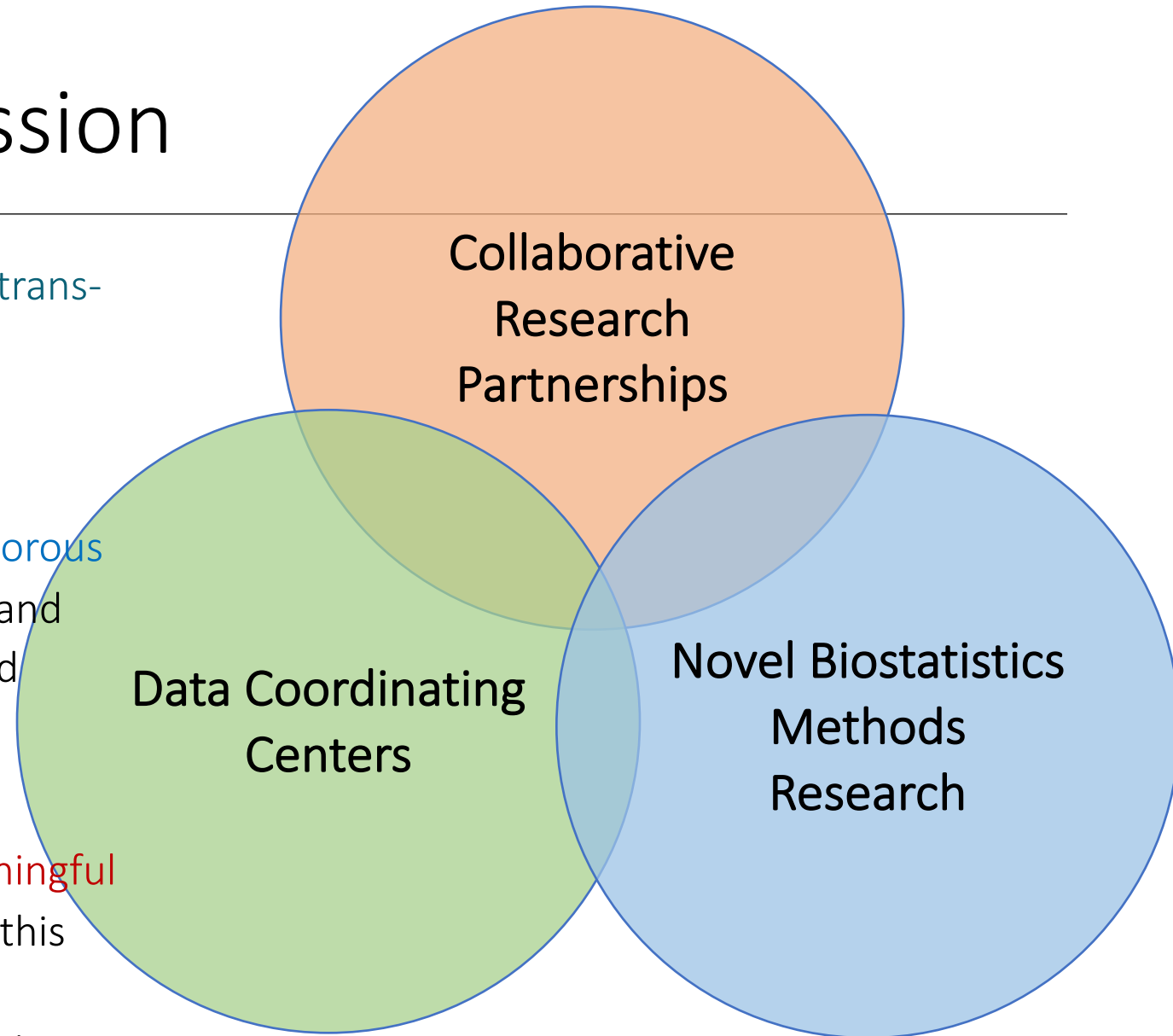
Associate Director, Biostatistics, MGH

Instructor, Department of Medicine, HMS



MGH Biostatistics Mission

- MGH Biostatistics aims to engage in **impactful trans-disciplinary partnerships** involving quantitative methods in public health and biomedicine.
- We collaborate with MGH investigators on the development, application and evaluation of **rigorous statistical and data science methods** to define and address a broad range of hypothesis-driven and exploratory research questions **across the translational spectrum**.
- Translating analytic findings into **clinically meaningful discoveries** is at the core of our efforts and, to this end, we are deeply embedded in collaborative research teams allowing us to gain and hone subject matter expertise



MGH Biostatistics Snapshot

Biostatistics 2021 Snapshot

Faculty and Core Members

Core Faculty (19)

Adjunct Faculty (3)

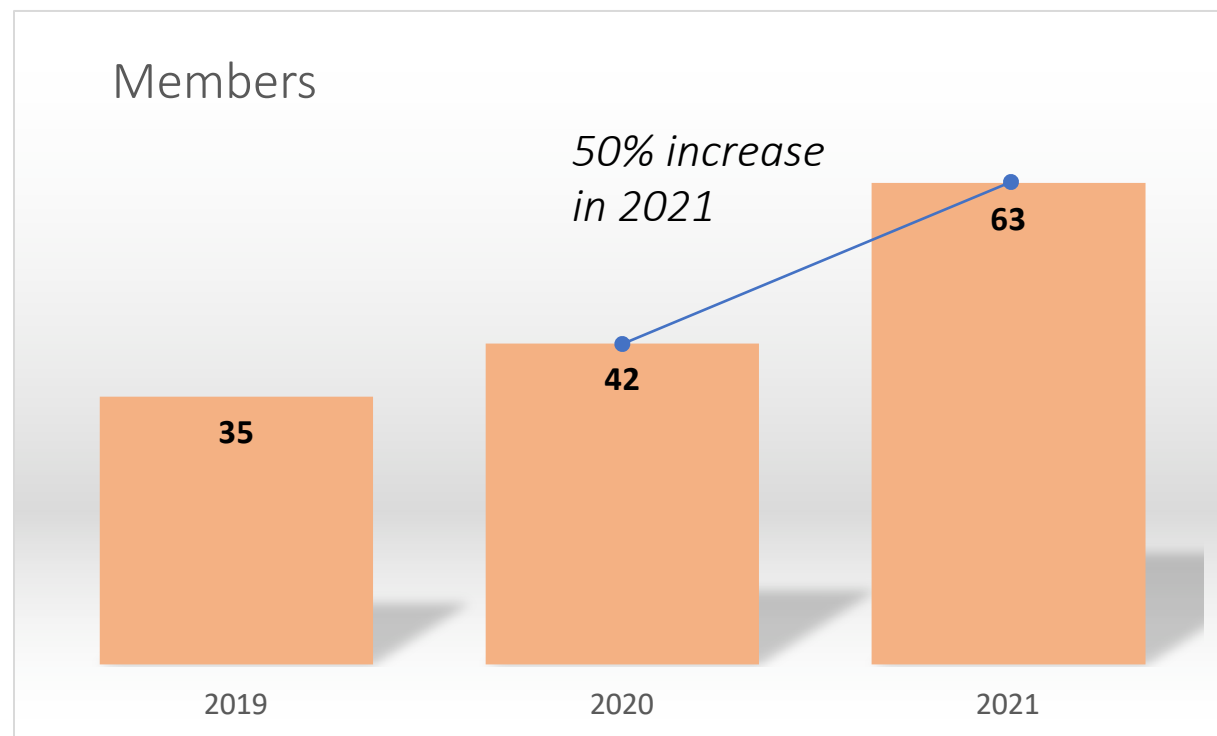
Biostatisticians and Data Analysts (24)

Research Coordinators (8)

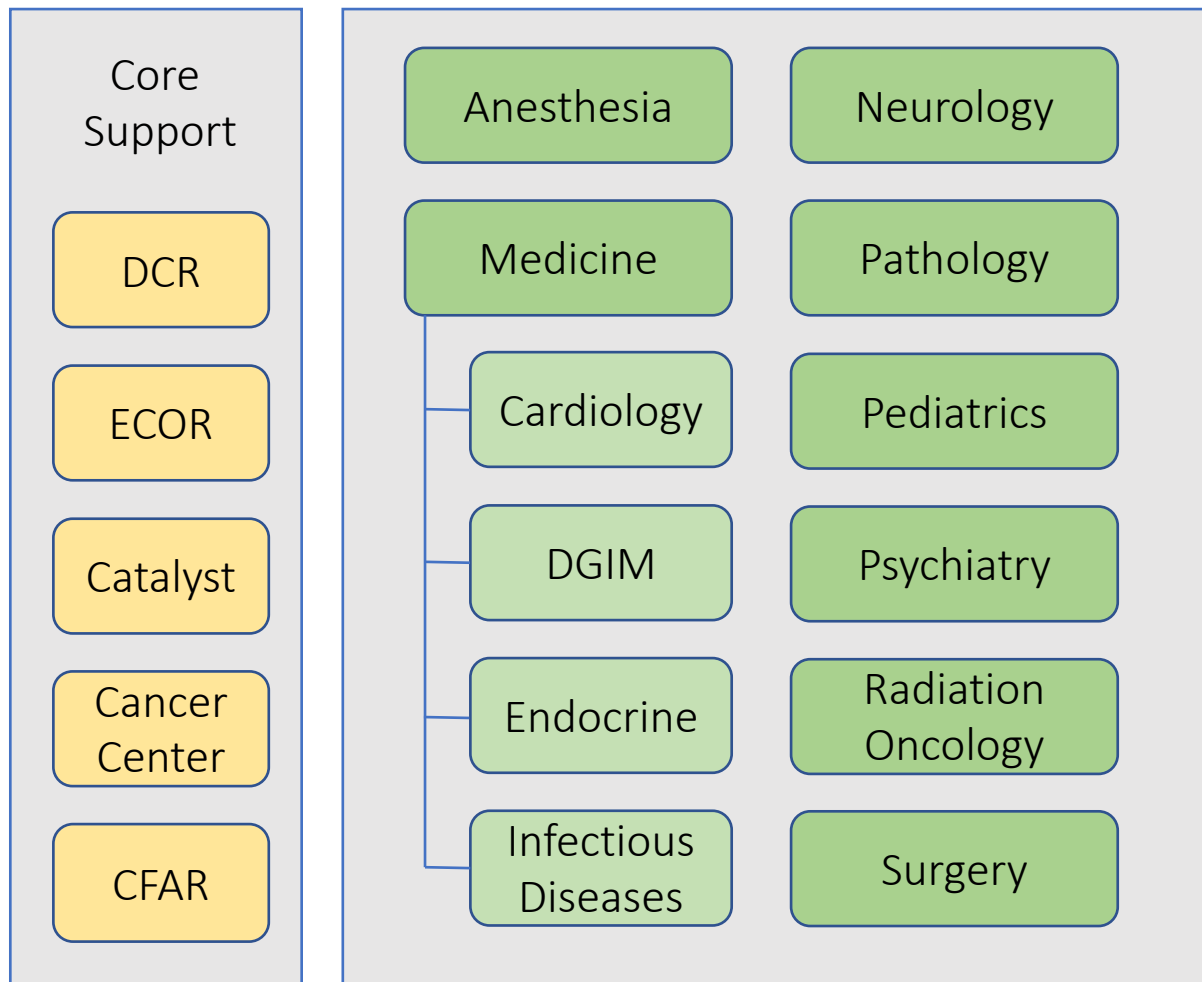
Business and Computer Systems (6)

Research Assistants (3)

63 Total (including 21 new) Members



Biostatistics 2021 Snapshot



Research Partnerships

186 Collaborative Research Projects
in partnership with
>25 MGH Divisions/Departments
resulting in
297 Research Publications in 2021

contributing to
\$587 Million in Research Funding

Biostatistics Highlights

Collaborative Research Partnerships

Biostatistics Highlights



The NEW ENGLAND
JOURNAL of MEDICINE

ORIGINAL ARTICLE

Trial of Sodium Phenylbutyrate–Taurursodiol for Amyotrophic Lateral Sclerosis

Sabrina Paganoni, M.D., Ph.D., Eric A. Macklin, Ph.D., Suzanne Hendrix, Ph.D., James D. Berry, M.D., Michael A. Elliott, M.D., Samuel Maiser, M.D., Chafic Karam, M.D., James B. Caress, M.D., Margaret A. Owegi, D.O., Adam Quick, M.D., James Wymer, M.D., Ph.D., Stephen A. Goutman, M.D., [et al.](#)

HEALEY ALS Platform Trial
PIs M. Cudkowicz & S. Paganoni
Sean M. Healey & AMG Center for ALS

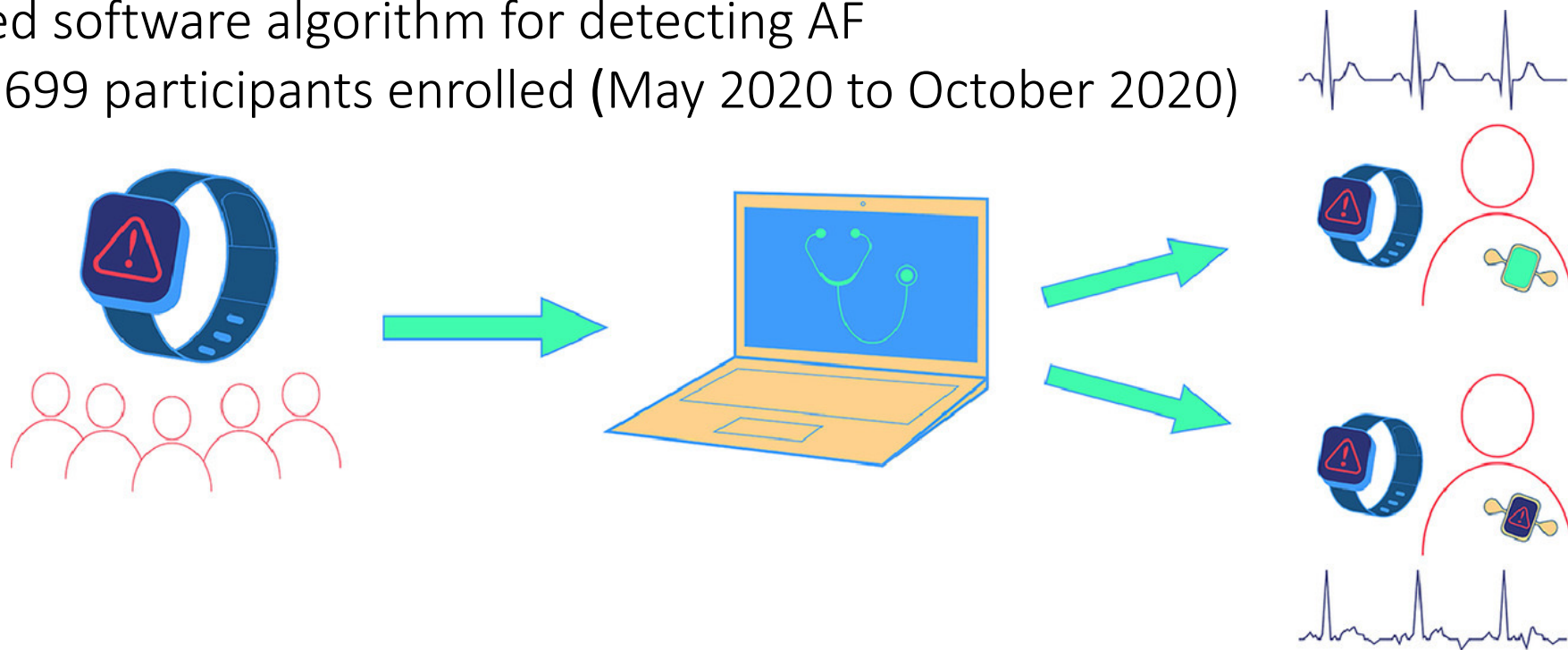
- Statistical design and analysis support
- Multiple regimens enter and exit over time with shared placebo across all regimens
- 4 active regimes; 2 completed enrollment; 1 launching in November; first 3 to lock in May/June 2022

Biostatistics Highlights

Fitbit Heart Study

PI S. Lubitz

- Single-arm remote clinical trial examining the validity of a novel PPG-based software algorithm for detecting AF
- 455,699 participants enrolled (May 2020 to October 2020)



Biostatistics Highlights

Data Coordinating Centers

Biostatistics Highlights



Effect of Hydroxychloroquine on Clinical Status at 14 Days in Hospitalized Patients With COVID-19

A Randomized Clinical Trial

Wesley H. Self, MD, MPH¹; Matthew W. Semler, MD²; Lindsay M. Leither, DO^{3,4}; [et al](#)

[» Author Affiliations](#) | [Article Information](#)

JAMA. 2020;324(21):2165-2176. doi:10.1001/jama.2020.22240

PIs T. Thompson & A. Foulkes
Authorized budget: >\$55 million

- Data and Clinical Coordinating Center (CCC) for the PETAL Network (52 hospitals across 12 clinical sites)
- Led five RCTs in acute respiratory distress syndrome and COVID in past five years.
- Serves as a critical network for patient accrual for ACTIV-3 and ACTIV-4.

Biostatistics Highlights

PIs A. Foulkes, S. Murphy & E. Karlson
Authorized budget: >\$50 million

- Data Resource Core for the NIH RECOVER Initiative
- Partnership between MGH, BWH, HMS and HSPH
- >50 DRC team members



Three observational cohort studies
(Adult, Pediatric and Autopsy)

- >250 clinical sites
- >30K acute and post-acute participants

Biostatistics Highlights

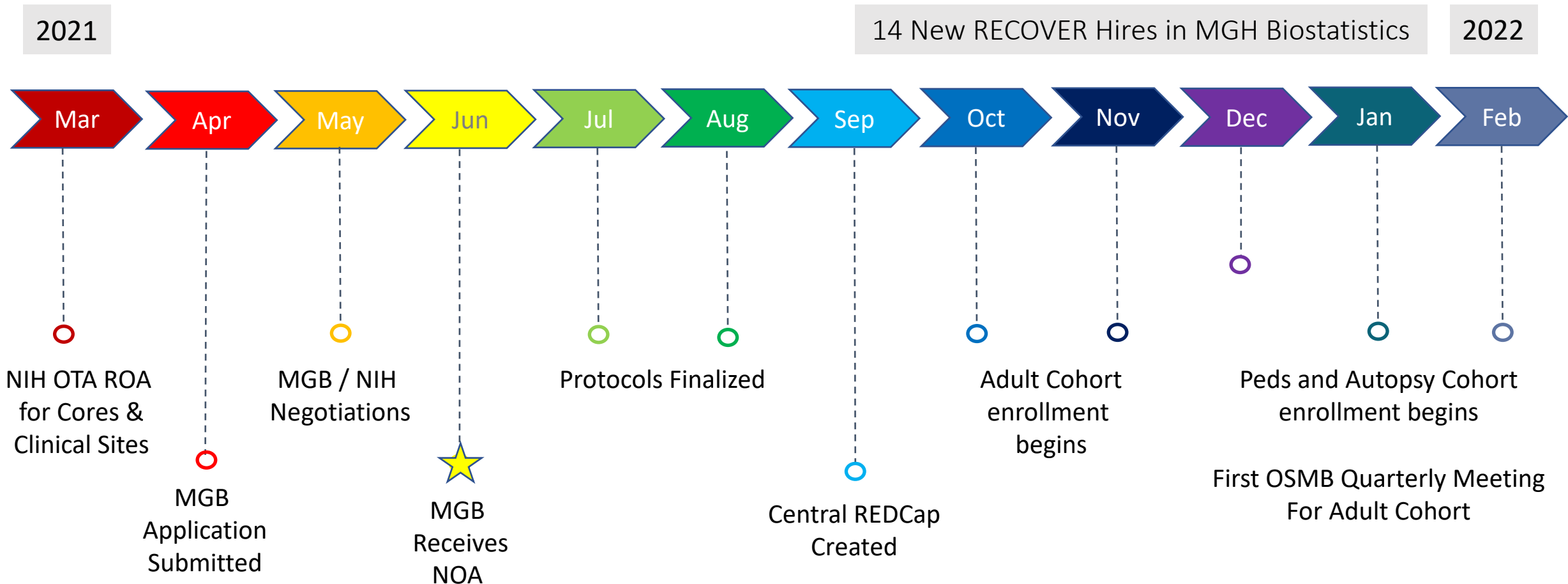
Principal Goals of RECOVER:

1. Determine factors contributing to PASC and PASC recovery including demographic, biological and social determinants of health
2. Characterize the effectiveness of pharmaceutical and non-pharmaceutical interventions on likelihood of PASC and time to PASC recovery.
3. Unravel the causal mechanisms between infection, post-acute sequelae, organ dysfunction and other outcomes.
4. Understand how demographics, biological factors and SDoH modify intervention effects and underlying biological mechanisms.



Biostatistics Highlights

Timeline for RECOVER Launch



Biostatistics Highlights

Independent Methods Research

Biostatistics Highlights

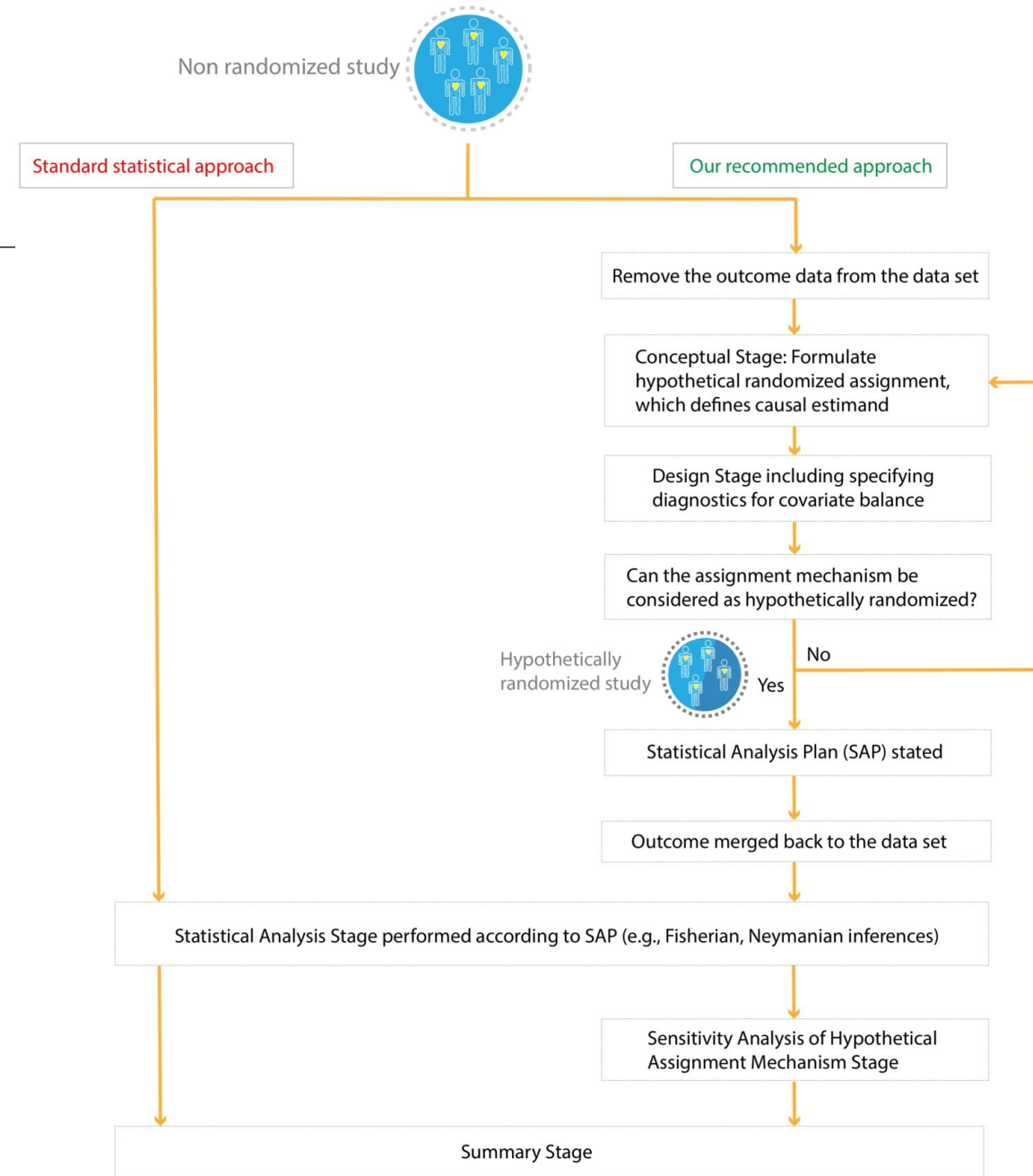
Causal Inference Methodology

- Develop and apply causal inference methods in environmental epidemiology
- Applications include air pollution and epigenomics, MS relapse, gut microbiome, COVID-19, ASD

Dr. Marie-Abele Bind (NIH DP5)



NIH DIRECTOR'S
EARLY
INDEPENDENCE
AWARD

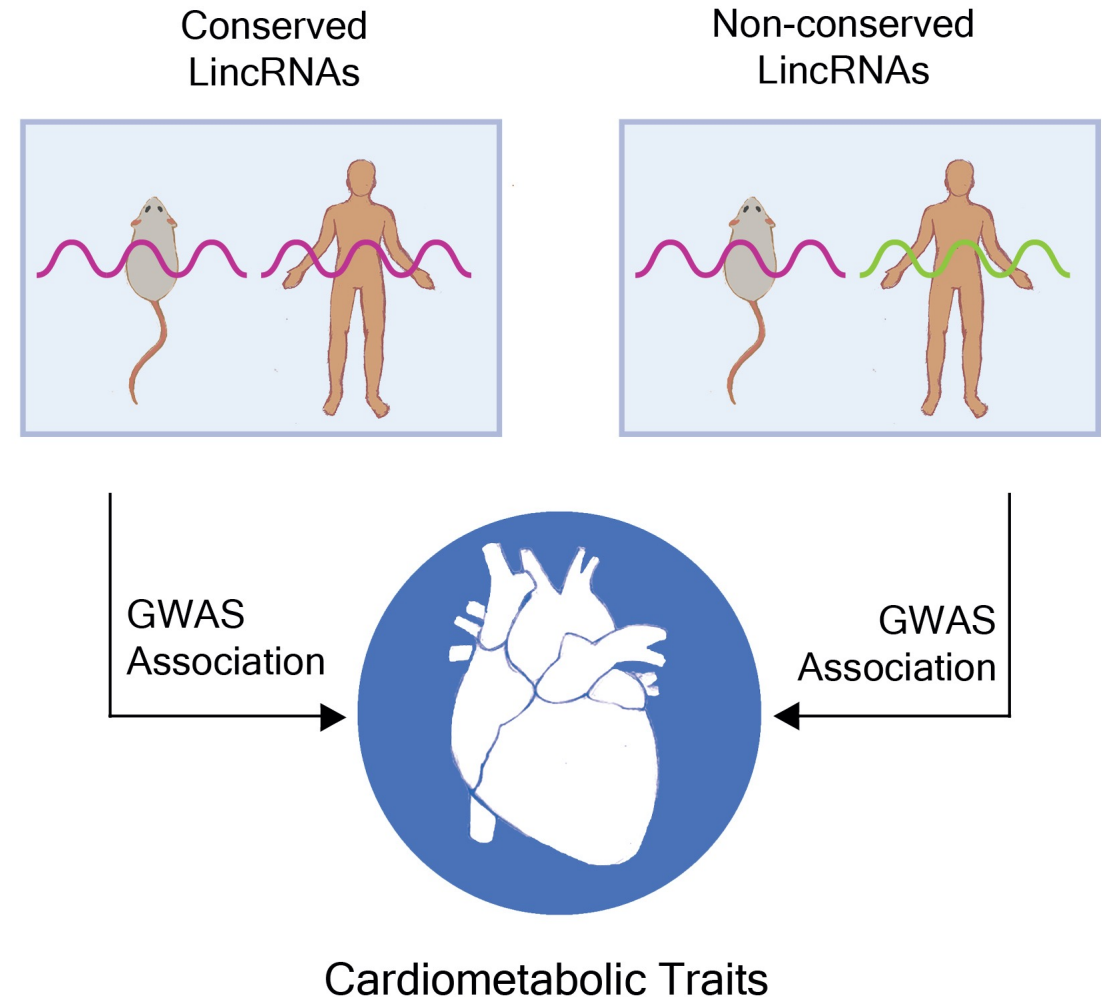


Biostatistics Highlights

Multi-Level Omics Data

- Develop and evaluate principled statistical methods for interrogating the mechanistic underpinnings of genetic and genomic associations with complex disease traits
- High-dimensional data methods for multiple biomarker investigations
- Methods for handling time-varying and irregularly spaced biomarkers

Dr. Andrea Foulkes (NIH/NIGMS R01)



New Initiatives and Opportunities for Engagement

NEW MGH BIostatISTICS LEADERSHIP MODEL

Andrea S Foulkes, ScD
Director, MGH Biostatistics

Director

Associate
Directors

Admin
Core

Carolyn Hintlian, RDN, MPH, MBA
Senior Administrative Manager

Nora Horick, MS
Head, Biostatistics Core &
Lead Staff Biostatistician

Richard Morse, AB
Systems Manager

Dustin Rabideau, PhD
Associate Director, Biostatistics and
Strategic Initiatives

Tanayott Thaweethai, PhD
Associate Director,
Biostatistics Research and Engagement

Hang Lee, PhD
Associate Director, Collaborative
Research and Consulting Services

Core Faculty

Research Staff

Business Operations

Affiliate Members

Dustin Rabideau, PhD

Associate Director

Biostatistics and Strategic Initiatives

MGH Biostatistics

Instructor in Investigation, MGH

Instructor in Medicine, HMS

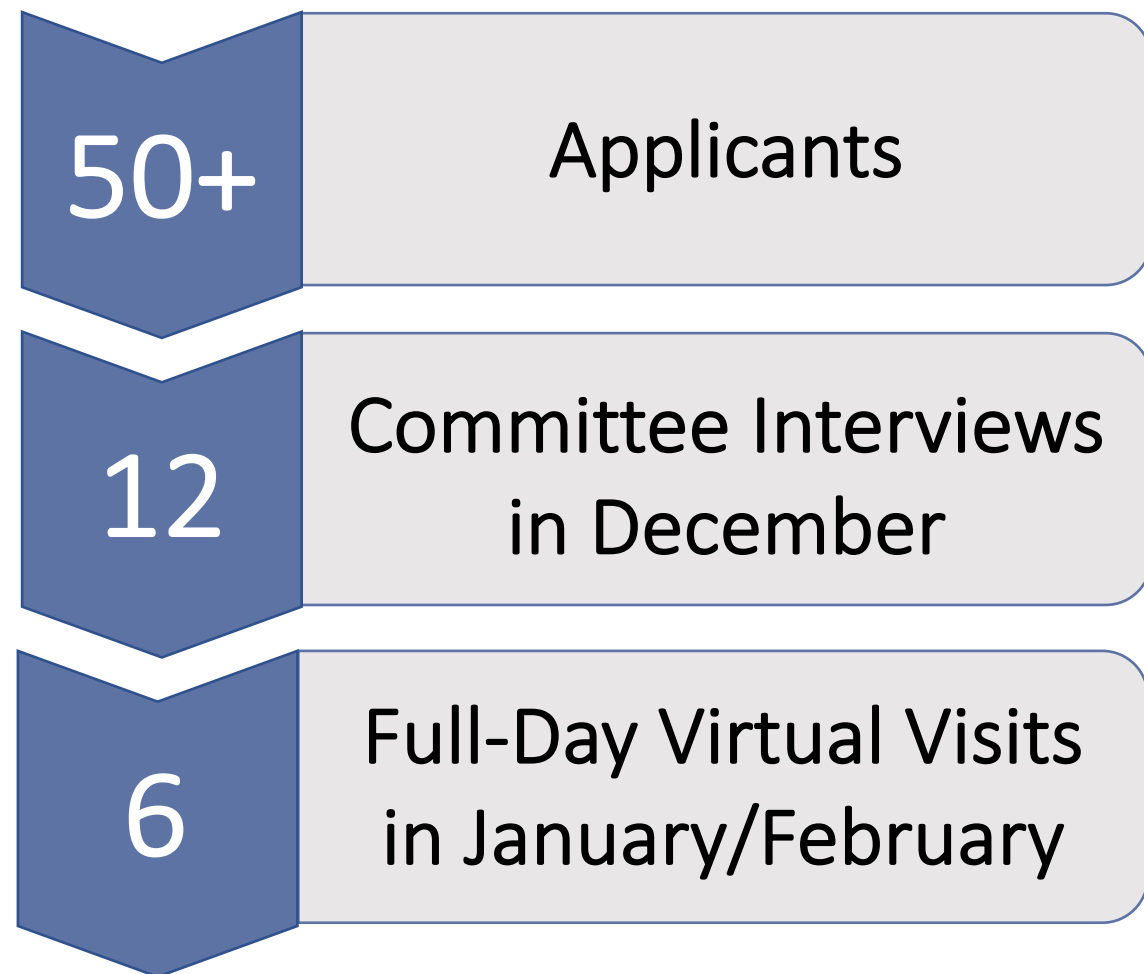


MASSACHUSETTS
GENERAL HOSPITAL

New Initiatives

1. Faculty Recruitment
2. Student Engagement
3. Support for MGH Investigators

Biostatistics Faculty Search



Expertise in:

- Design/analysis of randomized trials
- Competing risks survival analysis
- Measurement error
- Causal inference
- Cost-effectiveness analysis
- Network analysis

- Cluster randomized trials
- Observational studies
- Electronic health records
- Medical image data

Student Engagement



- 10 biostatistics students from HSPH joining MGH Biostatistics, Spring 2022
- Diabetes, COVID-19, Bipolar Disorder, ALS, Environmental Health, Biostatistics
- Capstone student research symposium in May 2022
- Led by **Tanayott Thaweethai**, PhD, Associate Director, Biostatistics Research and Engagement, MGH

Other Biostatistics Initiatives

1. Data Coordinating Center Applications
2. Workforce Development Practices
3. Applied Biostatistics Seminar Series
4. Communications and Outreach

Support for MGH Investigators

Short-Term Consultations

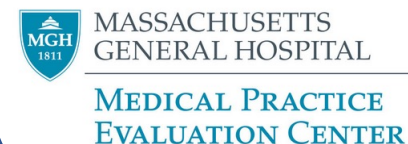


Fee-for-Service Collaborations

Biostatistics Core

Led by
Nora Horick, MS

Long-Term Scientific Partnerships

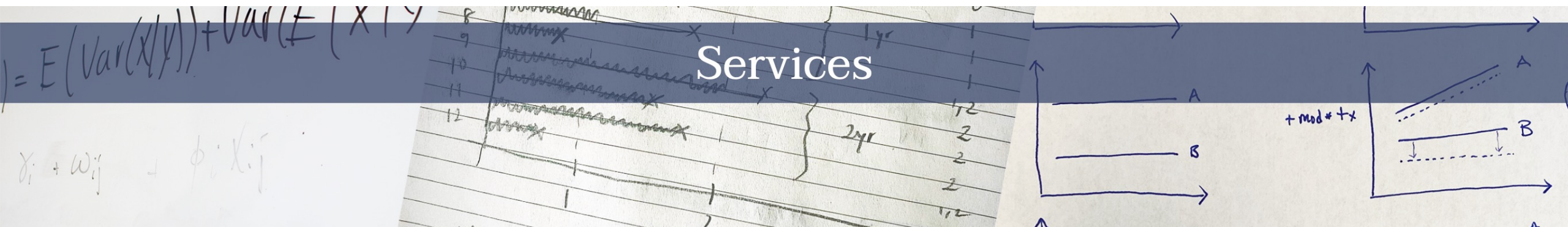


MGH Biostatistics Website



We turn data into actionable clinical knowledge

MGH Biostatistics Website



MGH Biostatistics provides support to investigators in the design and analysis of research studies, as well as long-term scientific collaboration and data coordination for large, multi-center research programs.

Use the button below to initiate a request for a consultation with MGH Biostatistics. The information will be reviewed and a member of our team will contact you. Please note: These consultation services are typically available to investigators at MGH only.

[Request a Consultation](#)

Study Development And Design

Data Collection And Coordination

Analysis

Thanks!



Biostatistics Associate Directors:

Hang Lee, PhD

Associate Director

Collaborative Research and Consulting Services

Tanayott Thaweethai, PhD

Associate Director

Biostatistics Research and Engagement

Special Thanks:

Maurizio Fava, MD

Director, Division of Clinical Research, MGRI

Vice Chair, Executive Committee on Research

Chief, Department of Psychiatry

Harry Orf, PhD

Senior Vice President for Research

Mass General Research Institute

Merit Cudkowicz, MD, MSc

Chair, Executive Committee on Research

Chief, Department of Neurology

Katrina Armstrong, MD

Chief, Department of Medicine

MGH Biostatistics

<https://biostatistics.massgeneral.org/>