Open Studies

OHDSI Community Call
May 24, 2022 • 11 am ET

Upcoming OHDSI Community Calls

Date	Topic
May 31	Workgroup OKRs
June 7	Welcome to OHDSI
June 14	OHDSI Scholarship (Publications)
June 21	10-Minute Tutorials
June 28	European Symposium Recap

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Three Stages of The Journey

Where Have We Been?

Where Are We Now?

Where Are We Going?

OHDSI Shoutouts!

Congratulations to the team of **Emily Pfaff, Andrew Girvin, Tellen Bennett, Abhishek Bhatia, Ian Brooks, Rachel Deer, Jonathan Dekermanjian, Sarah Elizabeth Jolley, Michael Kahn, Kristin Kostka, Julie McMurry, Richard Moffitt, Anita Walden, Christopher Chute, Melissa Haendel, and the N3C Consortium** on the publication of **Identifying who has long COVID in the USA: a machine learning approach using N3C data** in The Lancet Digital Health.

Identifying who has long COVID in the USA: a machine learning approach using N3C data

Emily R Pfaff, Andrew T Girvin*, Tellen D Bennett, Abhishek Bhatia, Ian M Brooks, Rachel R Deer, Jonathan P Dekermanjian, Sarah Elizabeth Jolley, Michael G Kahn, Kristin Kostka, Julie A McMurry, Richard Moffitt, Anita Walden, Christopher G Chute, Melissa A Haendel, The N3C Consortium†*

Summary

Background Post-acute sequelae of SARS-CoV-2 infection, known as long COVID, have severely affected recovery from the COVID-19 pandemic for patients and society alike. Long COVID is characterised by evolving, heterogeneous symptoms, making it challenging to derive an unambiguous definition. Studies of electronic health records are a crucial element of the US National Institutes of Health's RECOVER Initiative, which is addressing the urgent need to understand long COVID, identify treatments, and accurately identify who has it—the latter is the aim of this study.

Methods Using the National COVID Cohort Collaborative's (N3C) electronic health record repository, we developed XGBoost machine learning models to identify potential patients with long COVID. We defined our base population (n=1 793 604) as any non-deceased adult patient (age ≥18 years) with either an International Classification of Diseases-10-Clinical Modification COVID-19 diagnosis code (U07.1) from an inpatient or emergency visit, or a positive SARS-CoV-2 PCR or antigen test, and for whom at least 90 days have passed since COVID-19 index date. We examined demographics, health-care utilisation, diagnoses, and medications for 97 995 adults with COVID-19. We used data on these features and 597 patients from a long COVID clinic to train three machine learning models to identify potential long COVID among all patients with COVID-19, patients hospitalised with COVID-19, and patients who had COVID-19 but were not hospitalised. Feature importance was determined via Shapley values. We further validated the models on data from a fourth site.

Findings Our models identified, with high accuracy, patients who potentially have long COVID, achieving areas under the receiver operator characteristic curve of 0·92 (all patients), 0·90 (hospitalised), and 0·85 (non-hospitalised). Important features, as defined by Shapley values, include rate of health-care utilisation, patient age, dyspnoea, and other diagnosis and medication information available within the electronic health record.

Interpretation Patients identified by our models as potentially having long COVID can be interpreted as patients warranting care at a specialty clinic for long COVID, which is an essential proxy for long COVID diagnosis as its definition continues to evolve. We also achieve the urgent goal of identifying potential long COVID in patients for clinical trials. As more data sources are identified, our models can be retrained and tuned based on the needs of individual studies.

Funding US National Institutes of Health and National Center for Advancing Translational Sciences through the RECOVER Initiative.

Lancet Digit Health 2022

Published Online May 16, 2022 https://doi.org/10.1016/S2589-7500(22)00048-6

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†Members are listed at the end of the Article

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OHDSI Shoutouts!

Congratulations to the team of **Justin T. Reese, Ben Coleman, Lauren Chan, Hannah Blau, Tiffany J. Callahan, Luca Cappelletti, Tommaso Fontana, Katie R. Bradwell, Nomi L. Harris, Elena Casiraghi, Giorgio Valentini, Guy Karlebach, Rachel Deer, Julie A. McMurry, Melissa A. Haendel, Christopher G. Chute, Emily Pfaff, Richard Moffitt, Heidi Spratt, Jasvinder A. Singh, Christopher J. Mungall, Andrew E. Williams & Peter N. Robinson** on the publication of **NSAID use and clinical outcomes in COVID-19 patients: a 38-center retrospective cohort study** in Virology Journey.

Reese *et al. Virology Journal* (2022) 19:84
https://doi.org/10.1186/s12985-022-01813-2

Virology Journal

RESEARCH Open Access

NSAID use and clinical outcomes in COVID-19 patients: a 38-center retrospective cohort study

Justin T. Reese[1*], Ben Coleman[2,18], Lauren Chan[3], Hannah Blau[2], Tiffany J. Callahan[4,5], Luca Cappelletti[6], Tommaso Fontana[6], Katie R. Bradwell[7], Nomi L. Harris[1], Elena Casiraghi[6,8], Giorgio Valentini[6,8], Guy Karlebach[2], Rachel Deer[9], Julie A. McMurry[5], Melissa A. Haendel[5], Christopher G. Chute[10], Emily Pfaff[11], Richard Moffitt[12], Heidi Spratt[9], Jasvinder A. Singh[13,14], Christopher J. Mungall[1], Andrew E. Williams[15,16,17] and Peter N. Robinson[2,18*]

Abstract

Background: Non-steroidal anti-inflammatory drugs (NSAIDs) are commonly used to reduce pain, fever, and inflammation but have been associated with complications in community-acquired pneumonia. Observations shortly after the start of the COVID-19 pandemic in 2020 suggested that ibuprofen was associated with an increased risk of adverse events in COVID-19 patients, but subsequent observational studies failed to demonstrate increased risk and in one case showed reduced risk associated with NSAID use.

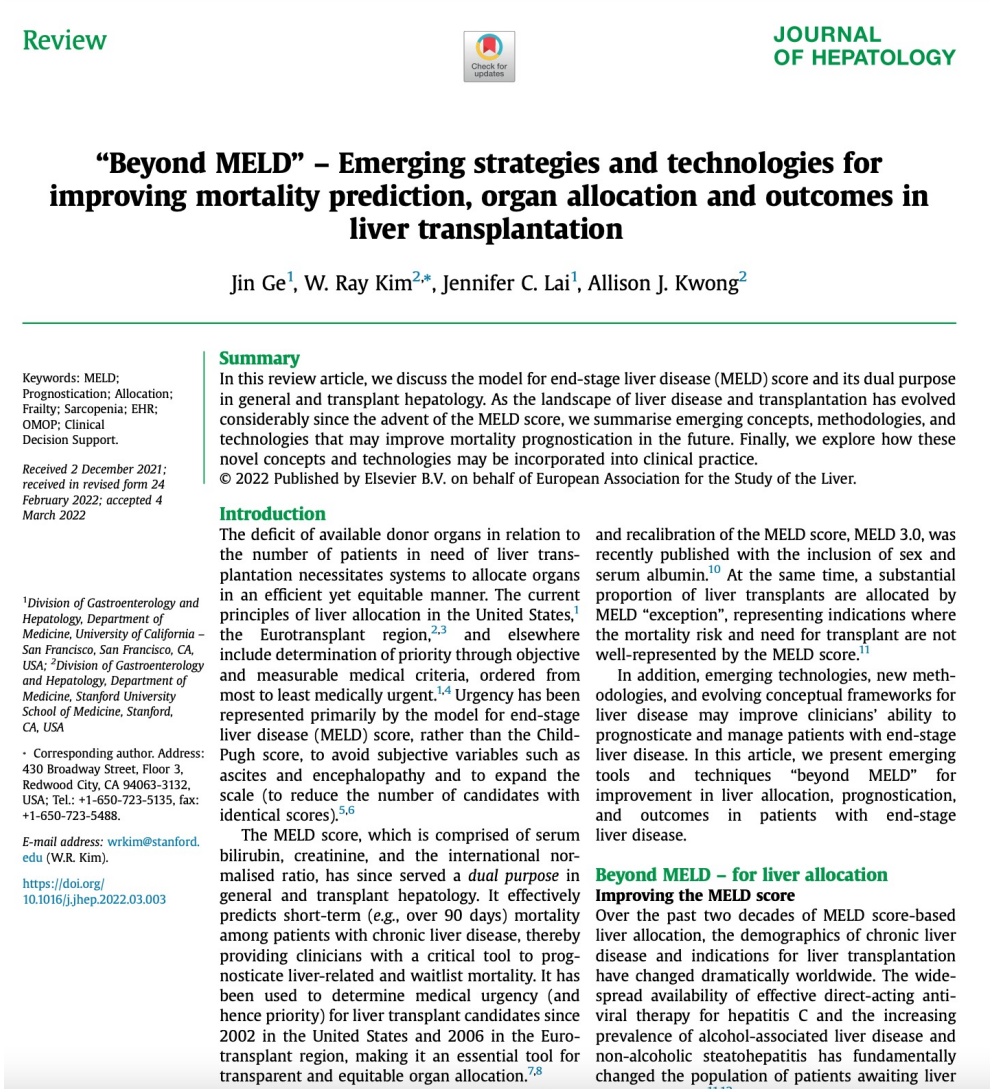
Methods: A 38-center retrospective cohort study was performed that leveraged the harmonized, high-granularity electronic health record data of the National COVID Cohort Collaborative. A propensity-matched cohort of 19,746 COVID-19 inpatients was constructed by matching cases (treated with NSAIDs at the time of admission) and 19,746 controls (not treated) from 857,061 patients with COVID-19 available for analysis. The primary outcome of interest was COVID-19 severity in hospitalized patients, which was classified as: moderate, severe, or mortality/hospice. Secondary outcomes were acute kidney injury (AKI), extracorporeal membrane oxygenation (ECMO), invasive ventilation, and all-cause mortality at any time following COVID-19 diagnosis.

Results: Logistic regression showed that NSAID use was not associated with increased COVID-19 severity (OR: 0.57 95% CI: 0.53–0.61). Analysis of secondary outcomes using logistic regression showed that NSAID use was not associated with increased risk of all-cause mortality (OR 0.51 95% CI: 0.47–0.56), invasive ventilation (OR: 0.59 95% CI: 0.55–0.64), AKI (OR: 0.67 95% CI: 0.63–0.72), or ECMO (OR: 0.51 95% CI: 0.36–0.7). In contrast, the odds ratios indicate reduced risk of these outcomes, but our quantitative bias analysis showed E-values of between 1.9 and 3.3 for these associations, indicating that comparatively weak or moderate confounder associations could explain away the observed associations.

Conclusions: Study interpretation is limited by the observational design. Recording of NSAID use may have been incomplete. Our study demonstrates that NSAID use is not associated with increased COVID-19 severity, all-cause

OHDSI Shoutouts!

Congratulations to the team of **Jin Ge, W. Ray Kim, Jennifer Lai, and Allison Kwong** on the publication of **"Beyond MELD" – Emerging strategies and technologies for improving mortality prediction, organ allocation and outcomes in liver transplantation** in the Journal of Hepatology.



Review

JOURNAL OF HEPATOLOGY

"Beyond MELD" – Emerging strategies and technologies for improving mortality prediction, organ allocation and outcomes in liver transplantation

Jin Ge[1], W. Ray Kim[2,*], Jennifer C. Lai[1], Allison J. Kwong[2]

Keywords: MELD; Prognostication; Allocation; Frailty; Sarcopenia; EHR; OMOP; Clinical Decision Support.

Received 2 December 2021; received in revised form 24 February 2022; accepted 4 March 2022

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E-mail address: wrkim@stanford.edu (W.R. Kim).

https://doi.org/10.1016/j.jhep.2022.03.003

Summary

In this review article, we discuss the model for end-stage liver disease (MELD) score and its dual purpose in general and transplant hepatology. As the landscape of liver disease and transplantation has evolved considerably since the advent of the MELD score, we summarise emerging concepts, methodologies, and technologies that may improve mortality prognostication in the future. Finally, we explore how these novel concepts and technologies may be incorporated into clinical practice.

Introduction

The deficit of available donor organs in relation to the number of patients in need of liver transplantation necessitates systems to allocate organs in an efficient yet equitable manner. The current principles of liver allocation in the United States,[1] the Eurotransplant region,[2,3] and elsewhere include determination of priority through objective and measurable medical criteria, ordered from most to least medically urgent.[1,4] Urgency has been represented primarily by the model for end-stage liver disease (MELD) score, rather than the Child-Pugh score, to avoid subjective variables such as ascites and encephalopathy and to expand the scale (to reduce the number of candidates with identical scores).[5,6]

The MELD score, which is comprised of serum bilirubin, creatinine, and the international normalised ratio, has since served a *dual purpose* in general and transplant hepatology. It effectively predicts short-term (*e.g.*, over 90 days) mortality among patients with chronic liver disease, thereby providing clinicians with a critical tool to prognosticate liver-related and waitlist mortality. It has been used to determine medical urgency (and hence priority) for liver transplant candidates since 2002 in the United States and 2006 in the Eurotransplant region, making it an essential tool for transparent and equitable organ allocation.[7,8] and recalibration of the MELD score, MELD 3.0, was recently published with the inclusion of sex and serum albumin.[10] At the same time, a substantial proportion of liver transplants are allocated by MELD "exception", representing indications where the mortality risk and need for transplant are not well-represented by the MELD score.[11]

In addition, emerging technologies, new methodologies, and evolving conceptual frameworks for liver disease may improve clinicians' ability to prognosticate and manage patients with end-stage liver disease. In this article, we present emerging tools and techniques "beyond MELD" for improvement in liver allocation, prognostication, and outcomes in patients with end-stage liver disease.

Beyond MELD – for liver allocation

Improving the MELD score

Over the past two decades of MELD score-based liver allocation, the demographics of chronic liver disease and indications for liver transplantation have changed dramatically worldwide. The widespread availability of effective direct-acting antiviral therapy for hepatitis C and the increasing prevalence of alcohol-associated liver disease and non-alcoholic steatohepatitis has fundamentally changed the population of patients awaiting liver

OHDSI Shoutouts!

Any shoutouts from the community? Please share and help promote and celebrate OHDSI work!

Have a study published? Please send to sachson@ohdsi.org so we can share during this call and on our social channels.
Let's work together to promote the collaborative work happening in OHDSI!

Three Stages of The Journey

Where Have We Been?

Where Are We Now?

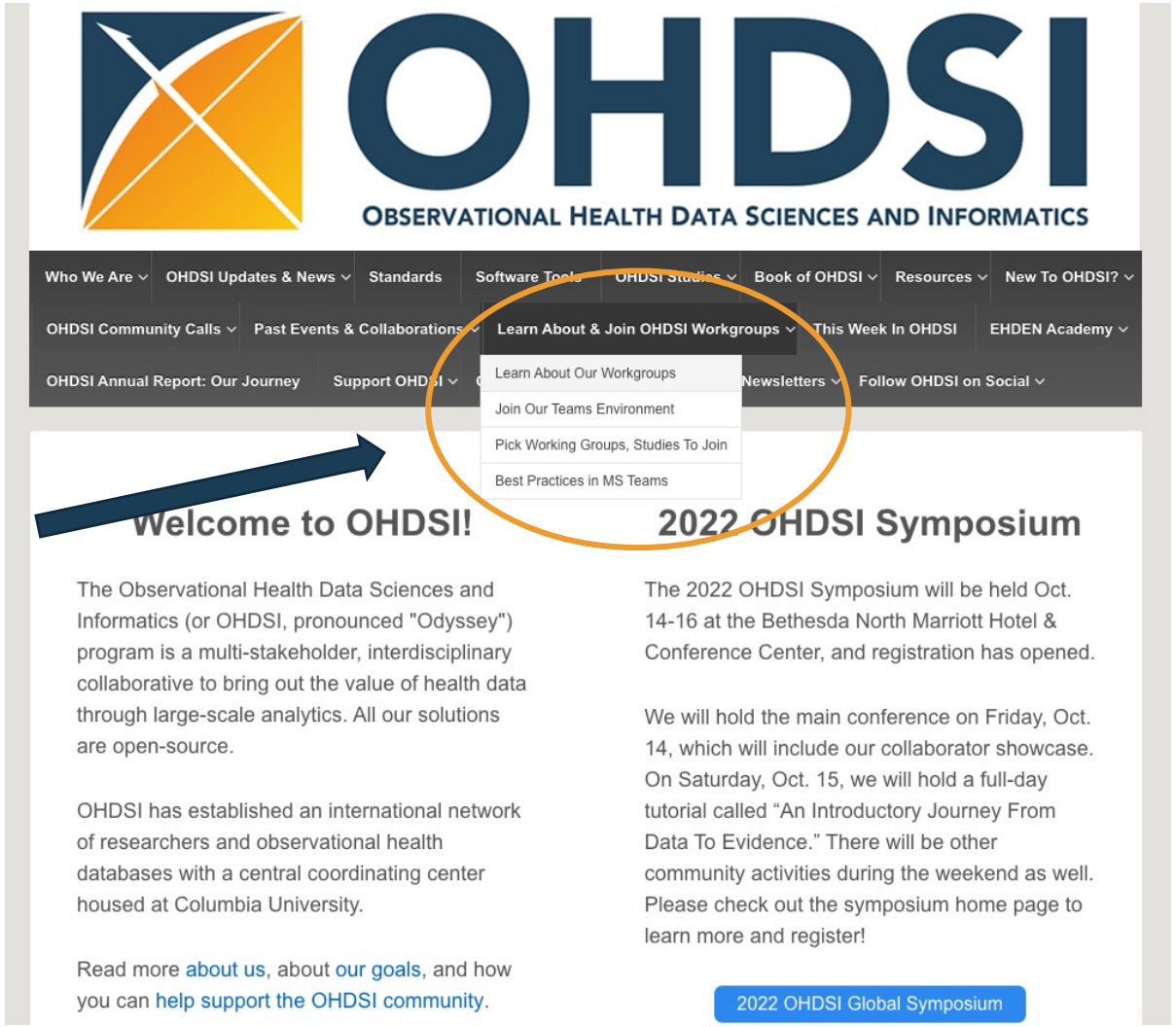
Where Are We Going?

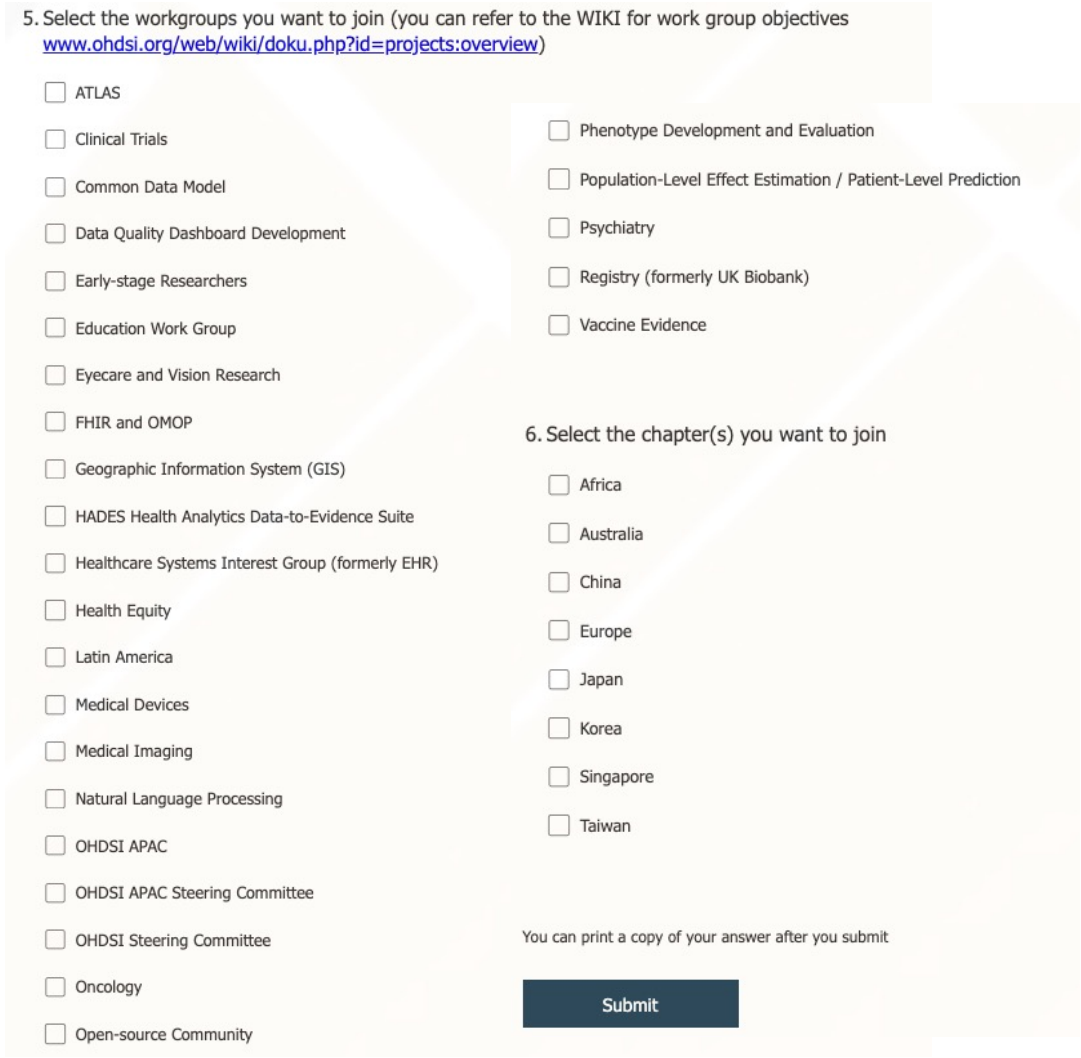
Upcoming Workgroup Calls

Date	Time (ET)	Meeting
Tuesday	12 pm	Common Data Model Vocabulary Subgroup
Tuesday	3 pm	OMOP CDM Oncology Outreach/Research Subgroup
Wednesday	10 am	FHIR and OMOP Digital Quality Measurments Subgroup (ZOOM)
Wednesday	10 am	Latin America
Thursday	10 am	Medical Devices
Thursday	12 pm	FHIR and OMOP Oncology Subgroup
Thursday	1 pm	OMOP CDM Oncology Vocabulary/Development Subgroup
Thursday	6 pm	FHIR and OMOP Terminologies Subgroup (ZOOM)
Friday	9 am	GIS – Geographical Information System General
Friday	10 am	Phenotype Development and Evaluation
Friday	10:30 am	Clinical Trials

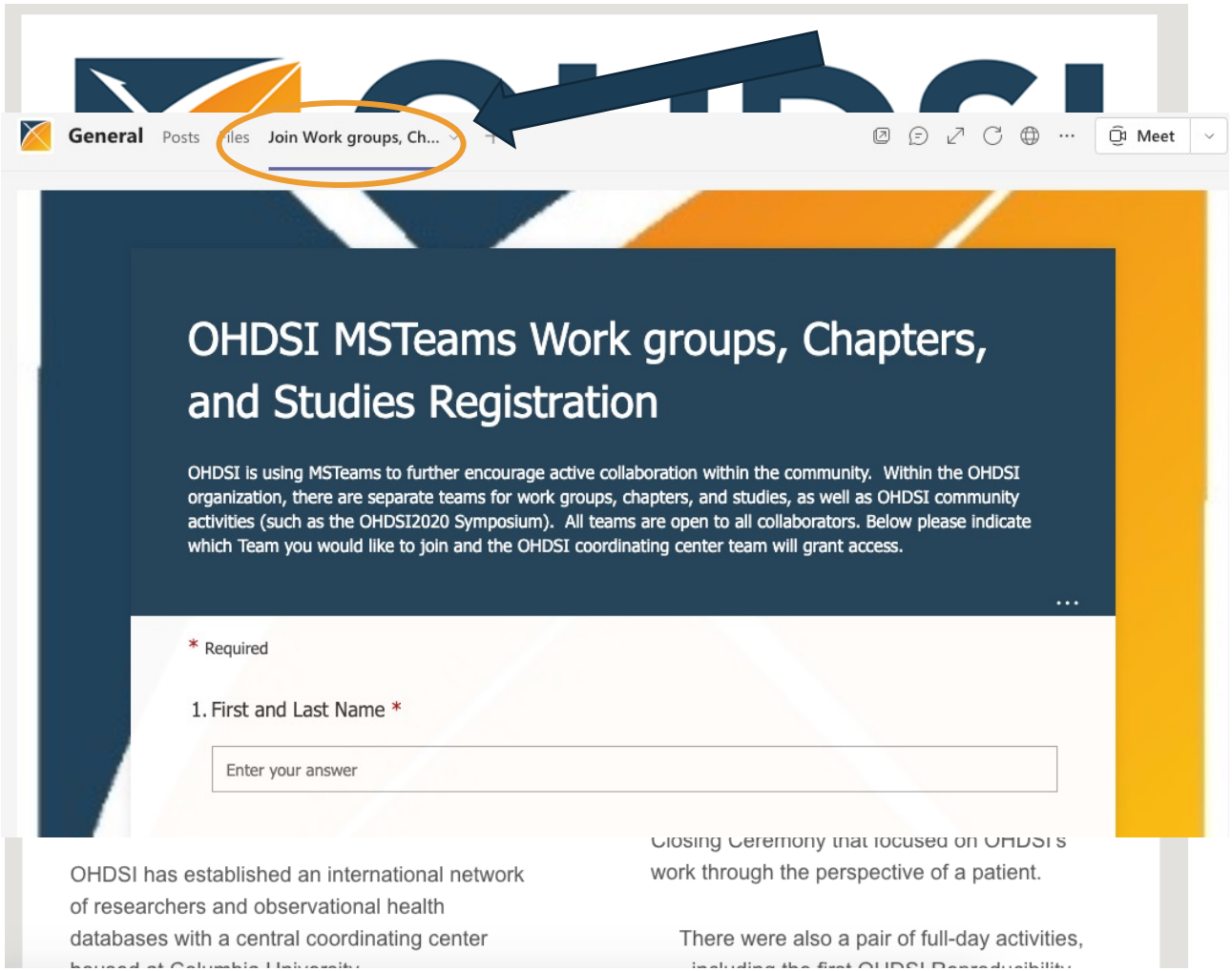
www.ohdsi.org/upcoming-working-group-calls

Get Access To Different Teams/WGs/Chapters





Get Access To Different Teams/WGs/Chapters



5. Select the workgroups you want to join (you can refer to the WIKI for work group objectives www.ohdsi.org/web/wiki/doku.php?id=projects:overview)

- ☐ ATLAS
- ☐ Clinical Trials
- ☐ Common Data Model
- ☐ Data Quality Dashboard Development
- ☐ Early-stage Researchers
- ☐ Education Work Group
- ☐ Eyecare and Vision Research
- ☐ FHIR and OMOP
- ☐ Geographic Information System (GIS)
- ☐ HADES Health Analytics Data-to-Evidence Suite
- ☐ Healthcare Systems Interest Group (formerly EHR)
- ☐ Health Equity
- ☐ Latin America
- ☐ Medical Devices
- ☐ Medical Imaging
- ☐ Natural Language Processing
- ☐ OHDSI APAC
- ☐ OHDSI APAC Steering Committee
- ☐ OHDSI Steering Committee
- ☐ Oncology
- ☐ Open-source Community
- ☐ Phenotype Development and Evaluation
- ☐ Population-Level Effect Estimation / Patient-Level Prediction
- ☐ Psychiatry
- ☐ Registry (formerly UK Biobank)
- ☐ Vaccine Evidence

6. Select the chapter(s) you want to join

- ☐ Africa
- ☐ Australia
- ☐ China
- ☐ Europe
- ☐ Japan
- ☐ Korea
- ☐ Singapore
- ☐ Taiwan

You can print a copy of your answer after you submit

Submit

#OHDSI2022 Collaborator Showcase

We are approximately one month away from the submission deadline for the 2022 OHDSI Global Symposium. All submissions for poster presentations, software demos and/or lightning talks are due no later than 8pm (EST) on Friday, June 24.

www.ohdsi.org/ohdsi2022collaboratorshowcase

2022 OHDSI Symposium

Registration is OPEN for #OHDSI2022!





The 2022 OHDSI Symposium will be held Oct. 14-16 at the Bethesda North Marriott Hotel & Conference Center.

www.ohdsi.org/ohdsi2022symposium

An Introductory Journey From Data To Evidence

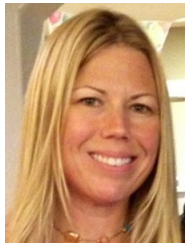
OHDSI2022 Tutorial • Saturday, Oct. 15 • Bethesda, Md.

The OHDSI Journey: Where Are We Going?

Patrick Ryan

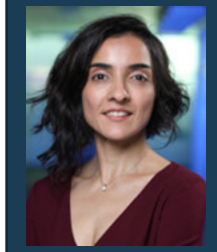
OMOP Common Data Model and Vocabulary

Clair Blacketer



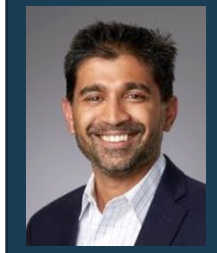
ETL – A Source Database Into OMOP CDM

Melanie Philofsky



Creating Cohort Definitions

Asieh Golozar



Phenotype Evaluations

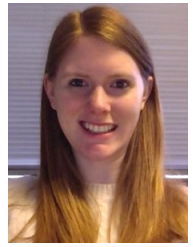
Gowtham Rao

Characterization

Kristin Kostka

Estimation

Martijn Schuemie



Prediction

Jenna Reps

The OHDSI Journey: Where Do We Go From Here?

George Hripcsak

Next CDM Workshop

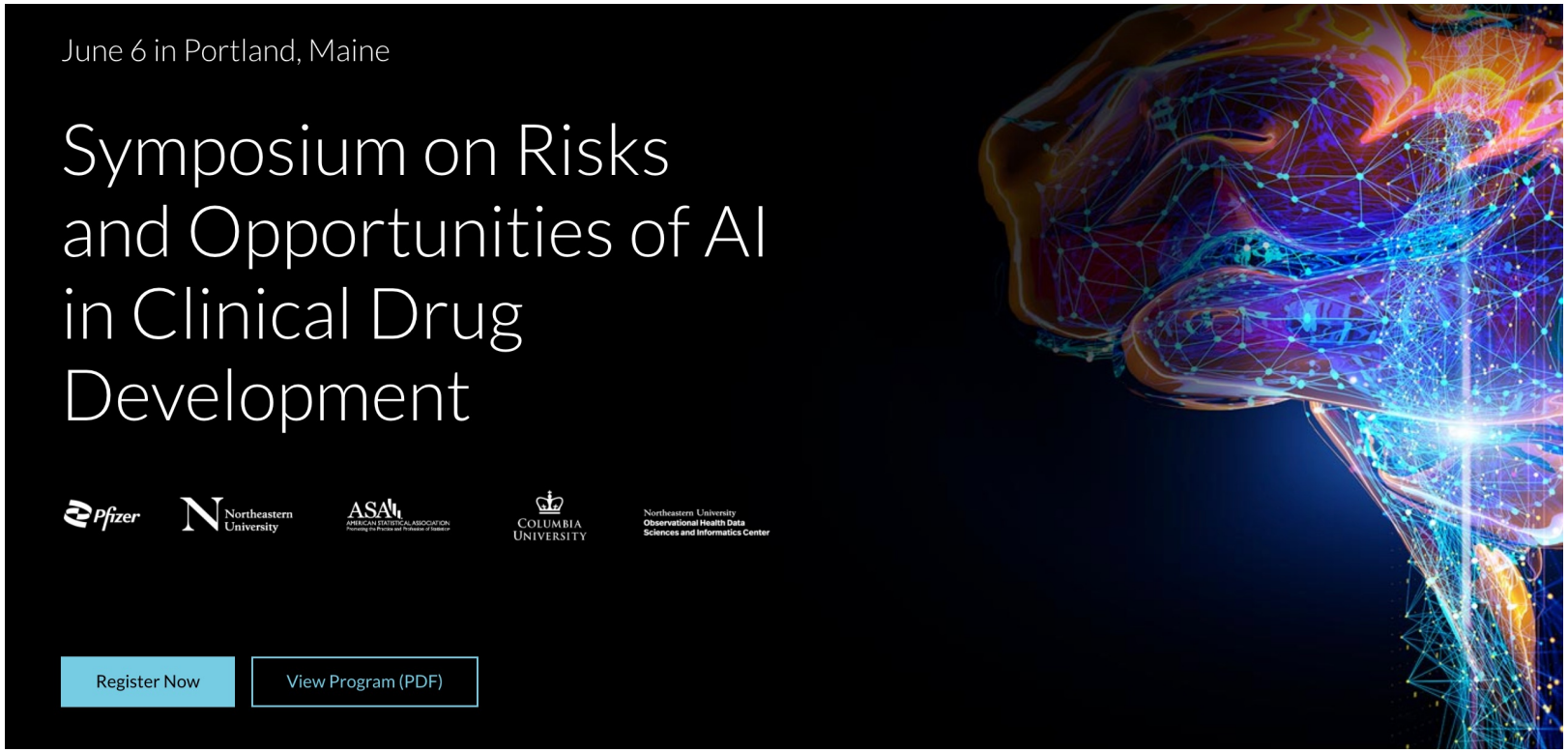
The **next CDM Workshop** will be held inside MS Teams this Thursday, May 26 (1 pm ET), and it will focus on **ETL Vocabulary Mapping**.

Please fill out the form on the Community Calls page if you are interested.

Roux Institute Event

The Roux Institute will host a one-day **Symposium on Risks and Opportunities of AI in Clinical Drug Development** on June 6.

This event will be both in-person and virtual. There is a promo code to attend for free.



roux.northeastern.edu/aipm/

Where Are We Going?

Any other announcements of upcoming work, events, deadlines, etc?

Three Stages of The Journey

Where Have We Been?

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May 24: Network Studies

IBD characterization
Presenter: Chen Yanover

Characterization of Health by OHDSI Asia-Pacific chapter to identify Temporal Effect of the Pandemic (CHAPTER) Study
Presenter: Seng Chan You

Applying the Decentralized Generalized Linear Mixed Effects Model (dGEM) for Hospital Profiling of COVID-19 Mortality Data across OHDSI Network
Presenter: Jessie Tong

Real world safety of treatments for multiple sclerosis
Presenter: Nicole Pratt

Comparison of mortality, morbidities & healthcare resources utilization between patients with and without a diagnosis of COVID-19
Presenter: Ivan Lam

Quality assessment of CDM databases across the OHDSI-AP network
Presenter: Chungsoo Kim