

## Call for Proposals

# Research on Pre-hospital Diagnostic Delay

Brief Proposal Applications Due March 21, 2023

## Background

This call for proposals is part of a collaboration between AcademyHealth and the Gordon and Betty Moore Foundation to bolster our understanding of delays in diagnosis. The focus is on three particular conditions – sepsis, cancer, and acute cardiovascular events – and on delays that occur before a patient reaches the care setting where these conditions are ultimately diagnosed, which we refer to as pre-hospital delay.

Diagnostic errors account for almost 60 percent of all medical errors and an estimated 40,000-80,000 deaths per year. In its 2015 report *Improving Diagnosis in Health Care*, the National Academy of Medicine estimates that “nearly every American will experience a diagnostic error in their lifetime, sometimes with devastating consequences.”<sup>1</sup> In November 2018, the Moore Foundation announced its **Diagnostic Excellence Initiative** with a focus on diagnostic performance improvement. The initiative aims to reduce harm from erroneous or delayed diagnoses, reduce costs and redundancy in the diagnostic process, improve health outcomes and save lives.

According to a study in *BMJ Quality and Safety*, diagnostic error has multiple causes. First, diagnosis is difficult. There is inherent variability in disease presentation. Furthermore, diagnostic tests are imperfect and clinical encounters inevitably have some lingering and irreducible uncertainty. Additionally, many health care systems are not optimally designed to support efficient and reliable diagnostic processes. There are systematic barriers for optimal diagnosis, including misaligned financial incentives, fragmented delivery systems, racial bias, and socioeconomic disparities. From a patient experience perspective, the diagnosis is often not adequately communicated or well understood.<sup>2</sup>

Through research and quality improvement work, many aspects of diagnostic error that occur once a patient reaches a hospital or other care environment where an actual diagnosis are understood. Much less is understood about delays that occur in the earliest stages of a patient’s diagnostic journey, reflecting the numerous factors that affect how patients perceive symptoms when they seek care, their interactions with emergency medical system (EMS) and other health care personnel, how and when they reach an appropriate health care setting, and the complicated roles of structural racism, geography, the social determinants, and other factors.

Three clinical conditions – cancer, acute cardiovascular events, and sepsis – provide a useful and important lens for exploring these pre-hospital diagnostic delays.<sup>3</sup> A recent analysis of diagnostic er-

rors that result in a malpractice claim shows that these conditions account for three-quarters of all serious harms, including death. Cancer and heart disease are the two most common causes of death in this country, claiming 700,000 each in 2020.<sup>4</sup> In addition, over 1.8 million people in the United States receive a cancer diagnosis each year.<sup>5</sup> Among acute cardiovascular events, heart attacks and strokes each affect over 800,000 people,<sup>6</sup> with another 900,000 diagnosed with venous thromboembolism.<sup>7</sup> Sepsis is responsible for 200,000 deaths, 750,000 hospitalizations, and 850,000 emergency department visits annually in the United States.<sup>8</sup>

The burden of these conditions falls disproportionately on communities of color and on populations in underserved urban and rural communities. These disparities manifest in worse outcomes and greater than average severity at the time of diagnosis for some populations,<sup>9</sup> suggesting that delays are also more common among these populations. Because cancer, acute cardiovascular events, and sepsis have relatively effective treatments when caught early enough, minimizing the time to diagnosis after the onset of symptoms is fundamental to high-quality care.

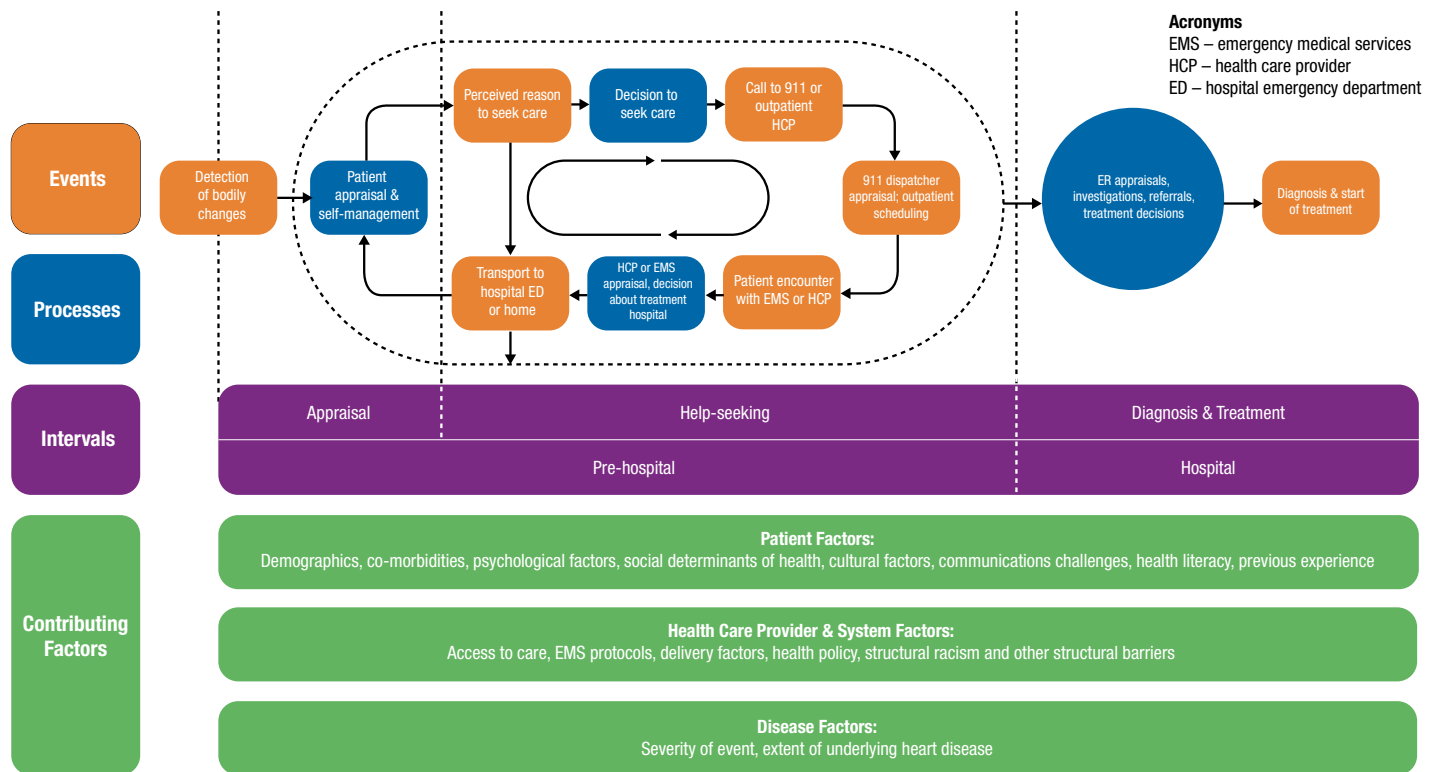
Researchers examining cancer have segmented the diagnostic journey into four distinct intervals<sup>10</sup>:

- **Appraisal:** from detection of bodily changes to perception of a reason to discuss with a health care provider.
- **Help-seeking:** from the time of that perception until the first consultation with a provider.
- **Diagnosis:** from the first consultation to actual diagnosis.
- **Pre-treatment:** from diagnosis to the start of treatment

The length of each of these phases depends on a variety of patient-, provider-, health care system-, disease-specific factors as well as community-based and structural factors. Moving beyond cancer, the acute nature of sepsis and acute cardiovascular conditions introduces additional factors related to the emergency medical system that can affect the timing of diagnosis.

Figure 1 illustrates this framework for patients’ diagnostic journey. The call for proposals below focuses on delays that can occur in the appraisal, help-seeking, and pre-hospital portion of the diagnostic intervals of this journey. An AcademyHealth issue brief and six commissioned papers available at [www.academyhealth.org/dxdelay](http://www.academyhealth.org/dxdelay) provide additional background.

Figure 1: Pathways to Diagnosis and Treatment: Adaptation of Walter, 2012



Adapted from Walter F et al. The Andersen Model of Total Patient Delay: a systematic review of its application in cancer diagnosis. J Health Serv Res Policy. April 2012. 17(2): 110-8.

## Purpose

This goal of this solicitation is to expand the base of rigorous evidence about **pre-hospital delays** – i.e. those delays in diagnosis that **occur before a patient reaches the care setting where their condition is diagnosed**. We are interested in studies that expand our understanding of the causes of pre-hospital diagnostic delay or provide evidence about promising strategies to reduce them. As with other Gordon and Betty Moore Foundation-funded initiatives, proposal research must focus on acute cardiovascular events, sepsis, and/or cancer.

We are particularly interested in projects that are innovative in the questions they ask, the approach they take, or the data and methods they use. This includes studies that make use of real-world data from social media, search data, remote sensing, wearable sensor, mobile phones or other novel sources. We are also interested in projects that will:

- Document and explore important differences among subpopulations;
- Apply methods and insights from the field of behavioral economics;
- Involve patients or community-based organizations in a meaningful way in the research process.

Within these boundaries, we expect to fund studies that collectively cover a variety of topics. Examples of potential research questions include (but are not limited to):

### Technology:

- Does the use of wearable technologies that enable the detection of abnormalities in heart rhythm lead to reductions in pre-hospital diagnostic delays of acute cardiac conditions? How do these technologies impact a patient’s decision to seek care? Does it result in changes in care utilization patterns and health care costs?
- The diagnostic journey for many patients begins with an internet search. In what ways do these internet searches affect a patient’s decision to seek care and how might affect a patient’s pre-hospital diagnostic journey?

### Public Policy and Education:

- Have large-scale public awareness campaigns that highlight concerning symptoms of stroke, heart attacks, or cancers resulted in shorter pre-hospital diagnostic delays? Have they also resulted in longer delays for patients with “atypical” symptoms?
- Does expanding insurance coverage to uninsured individuals or reducing health insurance cost-sharing lead to a reduction in pre-hospital delays for people experiencing acute cardiovascular events, sepsis, or cancer?

### Care Innovation:

- Do innovative approaches to improving communication between EMS and Emergency Department clinicians (e.g., the use of interoperable health record systems that traverse both systems) result in improved time to diagnosis for acutely time-sensitive conditions like sepsis and acute cardiovascular events?

### Social Determinants of Health:

- In what ways does a patient's preferred language, culture / religious beliefs, medical knowledge, urban versus rural location, or trust in the health care system affect their decision to seek care for a new symptom and their overall pre-hospital diagnostic journey?

## Total Awards

A total funding pool of \$600,000 is available for this call for proposals. AcademyHealth will fund a total of four to six projects with budgets of up to \$150,000 each over a 12-month grant period.

## Eligibility Criteria

Researchers as well as providers, community-based organizations, patient advocacy groups, and public or private policymakers working with researchers, are eligible to submit proposals through their organizations. Projects may be generated from disciplines including health services research, economics, sociology, psychology, program evaluation, political science, public policy, public health, public administration, law, informatics, technology, or other related fields.

The Foundation may give preference to applicants that are either public entities or nonprofit organizations that are tax-exempt under Section 501(c)(3) of the Internal Revenue Code and are not private foundations or Type III supporting organizations. Additional documentation may be required. Applicant organizations must be based in the United States or its territories.

## Diversity and Inclusion

Consistent with AcademyHealth's commitment to diversity, equity and inclusion across multiple dimensions such as racial and ethnic identity, socioeconomic status, disability, age, gender, and sexual identity, we encourage proposals that support individuals who will expand the perspectives and experiences brought to their research projects and the initiative as a whole.

## Selection Criteria

Proposals will be reviewed according to the following criteria:

- Potential to generate novel insights relevant to understanding or addressing pre-hospital diagnostic delays.
- Innovativeness of the project.
- Potential impact on policy, practice, or the patient diagnostic experience.
- Strength of the research question and proposed approach.
- Rigor of the proposed data and methods.
- Qualifications of the research team.
- Feasibility of the project within proposed budget and project length.

## Working With AcademyHealth

Principal investigators will periodically meet with program staff at AcademyHealth and the Gordon and Betty Moore Foundation, other grantees, and stakeholders in the diagnostic process to discuss their progress, synergies across projects, and how research findings can best inform policy, practice, and improvements in patient diagnostic experience and outcomes.

## Use of Grant Funds

AcademyHealth will follow Gordon and Betty Moore Foundation policies in its administering grants given as part of this solicitation. Grant funds may be used for project staff salaries, consultant fees, data collection and analysis, meetings, supplies, project-related travel, and other direct project expenses, including a limited amount of equipment essential to the project. Grant funds may *not* be used to subsidize individuals for the costs of their health care, to support clinical trials of unapproved drugs or devices, to construct or renovate facilities, or for lobbying, for political activities, or as a substitute for funds currently being used to support similar activities. Indirect cost rates may not exceed 12.5 percent of direct costs excluding certain categories of expenses.

Full details about the use of grant funds and other Gordon and Betty Moore requirements may be found on its [Grantee Resources web page](#).

## How to Apply

Applicants must submit all proposal materials electronically via our application site, which may be accessed at [www.academyhealth.org/dxdelay](http://www.academyhealth.org/dxdelay). On your first visit to the site, you will be asked to register as a user. The site will allow you to authorize other members of your team to edit or submit your application.

This competitive proposal process has two stages:

- *Stage 1: Brief Proposals.* Applicants must submit an initial, four-page brief proposal describing the project and including a budget estimate. The application site includes a template for the proposal narrative with additional guidance.
- *Stage 2: Full Proposals.* Selected brief proposal applicants will then be invited to submit a full proposal of no more than 10 pages in addition to a budget, budget narrative, and other supporting materials.

Please direct all inquiries about your application to [dxdelayinfo@academyhealth.org](mailto:dxdelayinfo@academyhealth.org) and include your email address. We will try to respond to all inquiries within 24 hours.

We encourage you familiarize yourself with the application site and all requirements for your application well in advance of the submission deadline. Staff may not be able to assist all applicants during the final 24 hours before the deadline. In fairness to all applicants, we will not accept late submissions.

## Program Direction

Responsible staff at AcademyHealth are:

- Michael E Gluck, PhD, MPP, Vice President (*Program Director*), [michael.gluck@academyhealth.org](mailto:michael.gluck@academyhealth.org).
- Allison Isaacson, MPH, Senior Manager, [allison.isaacson@academyhealth.org](mailto:allison.isaacson@academyhealth.org)
- Jackson Foyle, BA, Research Assistant, [jackson.foyle@academyhealth.org](mailto:jackson.foyle@academyhealth.org)
- Tamika King, MBA, Director of Grants and Contracts, [tamika.king@academyhealth.org](mailto:tamika.king@academyhealth.org)
- Lisa Simpson, MB, BCh, MPH, FAAP, President and CEO (*Senior Advisor*)

AcademyHealth will work in close collaboration with program staff at Gordon and Betty Moore Foundation's Patient Care Program:

- Daniel Yang, MD, Program Director, Patient Care
- Caroline Jens, MPH, Program Associate, Patient Care

## Key Dates and Deadlines

- January 17, 2023: Call for proposal and applicant resources published.
- February 2, 2023, 12:00 pm ET: Webinar for prospective applicants.
- February 7, 2023, 1:00 pm ET: Brief proposal application period begins.
- March 21, 2023, 3:00 pm ET: Deadline for submission of brief proposals.
- May 23, 2023: Applicants notified if they are (or are not) invited to submit full proposals.
- June 30, 2023, 3:00 pm ET: Deadline for submission of full proposals.
- October 15, 2023: Grants begin.

## Additional Resources

Potential applicants can access additional resources about pre-hospital diagnostic delay and this solicitation on AcademyHealth's website at [www.academyhealth.org/dxdelay](http://www.academyhealth.org/dxdelay) including an issue brief introducing the topic, six in-depth background papers, a summary of an October 2022 convened by AcademyHealth, and a webinar for applicants.

## About AcademyHealth

Since its inception, AcademyHealth has advanced health services research by acting as an objective broker of information, bringing together stakeholders to address the current and future needs of an evolving health system, inform health policy and practice, and translate evidence into action. As the professional home and leading national organization for health services researchers, policymakers, and health care practitioners and stakeholders, AcademyHealth – together with its members – increases the understanding of methods and data used in the field, enhances the professional skills of researchers and research users, and expands awareness. Through its grantmaking programs, AcademyHealth works with research funders to support the creation and dissemination of new evidence on timely health care topics.

## About the Gordon and Betty Moore Foundation

The Gordon and Betty Moore Foundation fosters path-breaking scientific discovery, environmental conservation, patient care improvements and preservation of the special character of the Bay Area. Visit [moore.org](http://moore.org) and follow @MooreFound.

## Endnotes

- 1 National Academies of Sciences, Engineering, and Medicine. 2015. *Improving Diagnosis in Health Care*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/21794>
- 2 McDonald KM, Bryce CL, Graber ML. The patient is in: patient involvement strategies for diagnostic error mitigation. *BMJ Qual Saf*. 2013 Oct; 22(Suppl 2):ii33-ii39.
- 3 Sepsis is defined as “life-threatening organ dysfunction due to a dysregulated host response to infection.” Singer et al. The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3). *JAMA*. 2016;315(8):801-810.
- 4 Murphy SL, Kochanek KD, Xu JQ, Arias E. *Mortality in the United States, 2020*. NCHS Data Brief, no 427. Hyattsville, MD: National Center for Health Statistics. 2021. <https://www.cdc.gov/nchs/data/databriefs/db427.pdf> Accessed March 16, 2022
- 5 American Cancer Society. *Cancer Facts and Figures, 2020*. <https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2020/cancer-facts-and-figures-2020.pdf> . Accessed July 7, 2022.
- 6 Virani SS, Alonso A, Benjamin EJ, Bittencourt MS, Callaway CW, Carson AP, et al. Heart disease and stroke statistics—2020 update: a report from the American Heart Associationexternal icon. *Circulation*. 2020;141(9):e139–e596.
- 7 Beckman MG, Hooper WC, Critchley SE, Ortel TL. Venous thromboembolism: a public health concern. *Am J Prev Med*. 2010 Apr;38(4 Suppl):S495-501.
- 8 Chaudhary N et al. Racial Differences in Sepsis Mortality at United States Academic Medical Center-Affiliated Hospitals. *Crit Care Med*. 2018 June ; 46(6): 878–883.
- 9 Institute of Medicine (US) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care; Smedley BD, Stith AY, Nelson AR, editors. Washington (DC): National Academies Press (US); 2003.
- 10 Walter F et al. The Andersen Model of Total Patient Delay: a systematic review of its applicatio in cancer diagnosis. *J Health Serv Res Policy*. April 2012. 17(2): 110-8.