Artificial Intelligence in Health Care Delivery: A Webinar

January 21, 2021 | 3:00 - 5:00pm ET

Hosted by the National Academy of Medicine and the U.S. Government Accountability Office

Share your thoughts!

@theNAMedicine
@USGAO
Welcome & Introduction

Michael McGinnis
National Academy of Medicine

Karen L. Howard
United States Government Accountability Office
Part I

**GAO Tech Assessment: AI in Health Care: Benefits and Challenges of Technologies to Augment Patient Care**  3:15-3:25 PM

Karen Howard, U.S. Government Accountability Office

**Panel Discussion and Q&A**  3:25-4:05 PM

Mark Sendak, Duke University
Marzyeh Ghassemi, University of Toronto
Ozanan Meireles, Harvard Medical School

**Moderator: Jon D. Menaster, U.S. Government Accountability Office**

*Panelists to answer questions submitted by participants via Q&A box*
Artificial Intelligence in Health Care: Benefits and Challenges of Technologies to Augment Patient Care

Karen L. Howard, PhD
Director
Science, Technology Assessment, and Analytics
Government Accountability Office
Thursday, January 21, 2021
Science, Technology Assessment, and Analytics, (STAA) is the 15th and newest mission team at the Government Accountability Office.

With congressional interest in science and technology growing rapidly, our goal is to meet that demand with innovation and agility while upholding GAO’s core values.
Science & Tech Spotlights

- Social Distancing During Pandemics
- CRISPR Gene Editing
- Probabilistic Genotyping Software
- Opioid Vaccines
- COVID-19 Testing
Technology Assessments

- Artificial Intelligence in Health Care
  Benefits and Challenges of Medical Drug Development
  With input from the National Academy of Medicine

- Medical devices
  Capabilities and challenges of technologies to enable rapid diagnoses of infectious diseases

- COVID-19
  Data Quality and Considerations for Economic Analysis

- Artificial Intelligence in Health Care
  Benefits and Challenges of Technologies to Augment Patient Care
  With content from the National Academy of Medicine
Clinical and Administrative AI Tools

Monitoring patients
Guiding surgical care
Predicting health trajectories
Supporting population health management
Recommendating treatments
Automating laborious tasks
Recording digital clinical notes
Optimizing operational processes
Promise

- Improving Treatment
- Increasing Resource Efficiency
- Reducing Provider Burden
# Challenges Surrounding AI Tools to Augment Patient Care

<table>
<thead>
<tr>
<th>Difficulty</th>
<th>Challenge</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Difficulties Accessing High-Quality Data</strong></td>
<td>- Accessing sufficient high-quality data to develop AI tools is a significant challenge.</td>
</tr>
<tr>
<td></td>
<td>- As a result, innovation in AI tools for augmenting patient treatment is being hampered.</td>
</tr>
<tr>
<td><strong>Potential Bias in Data</strong></td>
<td>- Bias in data used to develop AI tools can reduce their effectiveness and accuracy.</td>
</tr>
<tr>
<td></td>
<td>- Addressing bias is difficult because electronic health data currently available do not represent the general population.</td>
</tr>
<tr>
<td><strong>Difficulties in Scaling</strong></td>
<td>- AI tools can be challenging to scale up and integrate into new settings because of differences among institutions and the patient populations they serve.</td>
</tr>
</tbody>
</table>
## Challenges Surrounding AI Tools to Augment Patient Care

- **Limited Transparency of AI Tools**
  - Both interpretability and explainability pose challenges to explaining an AI tool’s decision-making in an understandable way.
  - This limited transparency can make it difficult or impossible for providers to understand how an AI tool came to a decision and whether and how an error occurred, as well as hampering the development of trust in the AI system.

- **Difficulties Protecting Patient Privacy**
  - As more AI systems are developed, large quantities of patient data will be in the hands of more people and organizations. This dispersion of data contributes to patient privacy risks.
  - Patient advocacy groups and others have raised concerns, such as about the proliferation of potentially sensitive patient data, potentially without patient consent.

- **Uncertainty about Liability for AI Tools**
  - There is uncertainty about liability issues related to AI tools for augmenting patient treatment.
  - The large number of people involved with developing and using AI tools as well as limited transparency of the tools contribute to this uncertainty.
Policymakers is a broad term, including, for example, Congress, elected officials, federal agencies, state and local governments, academic and research institutions, and industry.
Collaboration
Policymakers could encourage interdisciplinary collaboration between developers and health care providers.

Interdisciplinary Education
Policymakers could create opportunities for more workers to develop interdisciplinary skills.

Data Access
Policymakers could develop or expand high-quality data access mechanisms.

Oversight Clarity
Policymakers could collaborate with relevant stakeholders to clarify appropriate oversight mechanisms.

Best Practices
Policymakers could encourage relevant stakeholders and experts to establish best practices for development, implementation, and use of AI.

Status Quo
Policymakers could maintain the status quo (i.e., allow current efforts to proceed without intervention).
Thank you!
GAO Panel Discussion and Q&A

Mark Sendak
Duke University

Marzyeh Ghassemi
University of Toronto

Ozan Meireles
Harvard Medical School

Moderated by Jon Menaster, GAO
Q & A Instructions

• Please type in questions into the Q&A located at the bottom of the screen on your zoom interface
• Question format:
  • Your name
  • To whom?
  • Question?
Step 1
Go to the evaluation link:
bity.com/aicaredelivery

Step 2
Sign In using your email and password or create new account

FACULTY DISCLOSURE
The Stanford University School of Medicine adheres to ACCME Criteria, Standards and Policies regarding industry support of continuing medical education.

The content of this activity is not related to products or the business lines of an ACCME-defined commercial interest. Hence, there are no relevant financial relationships with an ACCME-defined commercial interests for anyone who was in control of the content of this activity.

ACCREDITATION STATEMENT
The Stanford University School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

AMA CREDIT DESIGNATION STATEMENT
The Stanford University School of Medicine designates this live activity for a maximum of 2.0 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Questions? Email: stanfordcme@stanford.edu
Part II

NAM Perspective: AI in Health Care Settings Outside the Hospital and Clinic  4:05 – 4:15 PM

Noor Ahmed, National Academy of Medicine

NAM Report Panel Discussion and Q&A  4:15 – 4:55 PM

Michael Matheny, Vanderbilt University Medical Center and Veterans Affairs
John Curtin, University of Wisconsin-Madison
Sanjay Basu, Harvard University
Barbara Evans, University of Florida

Moderator: Sonoo Thadaney- Israni, Stanford University

Panelists to answer questions submitted by participants via Q&A box
NAM Perspective: Advancing Artificial Intelligence in Health Settings Outside of the Hospital and Clinic (HSOHC)

Noor Ahmed, M.Eng.
NAM Leadership Consortium
January 21, 2021
What do we mean by **HSOHC**?

**HSOHC include:**
- Home
- Office
- School
- Retail Clinics
- Community spaces

vs.
- Hospitals
- Clinics
- Urgent care centers
- Medical offices
Motivating factors

- Decrease health care costs, waste, and medical errors
  - U.S. health care - $11k per capita
  - 2019 Total - $3.8 T; 31% is hospital spending

- Correct health disparities
  - Mobile device use same across Blacks, Hispanic, and White adults, but Blacks and Hispanics more likely to rely on smartphones for health info (Pew, 2019 and 2015).

- Broaden health care access
- Leverage mHealth

The U.S. Has Among the Highest Rates of Hospitalizations from Preventable Causes Like Diabetes and Hypertension

<table>
<thead>
<tr>
<th>Country</th>
<th>Diabeties</th>
<th>Hypertension</th>
</tr>
</thead>
<tbody>
<tr>
<td>NETH</td>
<td>135</td>
<td>217</td>
</tr>
<tr>
<td>UK</td>
<td>152</td>
<td>240</td>
</tr>
<tr>
<td>SWE</td>
<td>137</td>
<td>220</td>
</tr>
<tr>
<td>NOR</td>
<td>142</td>
<td>153</td>
</tr>
<tr>
<td>ITA</td>
<td>139</td>
<td>204</td>
</tr>
<tr>
<td>AUS</td>
<td>140</td>
<td>152</td>
</tr>
<tr>
<td>CAN</td>
<td>139</td>
<td>204</td>
</tr>
<tr>
<td>OECD avg</td>
<td>135</td>
<td>204</td>
</tr>
</tbody>
</table>

Commonwealth Fund, 2020

FIGURE 2

Consumers’ use of technology for health and fitness purposes has increased since 2013 but has leveled off in recent years

In the last 12 months, have you used any technologies including websites, smartphone/tablet apps, personal medical devices, or fitness monitors for any of the following health purposes?

- Measure fitness and health improvement goals: (e.g., exercise, diet, weight, sleep)
- Monitor health issues: (e.g., blood sugar, blood pressure, breathing function, mood)

Note: Chart shows percentage of consumers who said “yes.”
Source: Deloitte Center for Health Solutions. 2015-2020 Surveys of Health Care Consumers.
AI in HSOHC for personalized care

**Goal**: Facilitating communication

*Type of AI*: Computer vision, natural language processing (NLP)

*Applications*: AI triaging platforms (chat bots), digital scribes

---

**Goal**: Augmenting Clinical Care

*Type of AI*: Machine learning (ML)

*Applications*: 
- Primary Care – continuous glucose and SPO₂ management
- Cardiac – arrhythmia detection, BP management

---

**Goal**: Bolstering psychiatric and behavioral health

*Types of AI*: NLP and ML

*Applications*: depression and suicide risk detection, substance abuse management
Promoting population and public health using AI in HSOHC

**Goal:** Identifying large-scale health trends for community-based interventions

**Approach:** Aggregation of patient-level data in combination with environmental and social data

**Types of AI:** Combination of ML and computer vision techniques

**Applications:**
- Pop. health – cardiovascular health, dementia, medication adherence
- Public health – COVID-19 detection (HealthMap, BlueDot), air quality monitoring
# Towards a successful future for AI in HSOHC

## Challenges and Considerations

- **Data standardization and interoperability issues** that limit integration of consumer-generated and app data with clinical data
- **Data sourcing and privacy concerns** stemming from non-HIPAA-covered health-related entities
- **Data and algorithmic biases** that introduce harm and exacerbate inequities among communities who can gain the most from AI
- **Inadequate and incomplete reimbursement and coverage** for HSOHC digital health tools
- **Accountability and liability concerns** with AI tools for population and public health
- **Variable reliability** and non uniform and incomplete landscape of **safety oversight**

## Priorities

- **Developing policies** for greater data interoperability and device integration standards with hospital clinical systems
- **Reconsidering informed consent and patient privacy** in the context of HSOHC and big data
- **Recognizing and mitigating biases and broadening access** to personal health devices
- **Advocating for health care payment reform** that incentivizes adoption of AI and consumer health tools in clinician workflows
- **Building broad regulatory oversight** to promote patient safety by engaging orgs. Beyond FDA
- **Establishing clarity in regard to liability** for AI health apps in a way that supports innovation
Authors

Nakul Aggarwal, University of Wisconsin-Madison
Noor Ahmed, National Academy of Medicine
Sanjay Basu, Harvard University
John Curtin, University of Wisconsin-Madison
Barbara Evans, University of Florida
Michael Matheny, Vanderbilt University Medical Center and Tennessee Valley Healthcare System VA
Shantanu Nundy, Accolade, Inc.
Mark Sendak, Duke University
Carmel Shachar, Harvard University
Rashmee Shah, University of Utah
Sonoo Thadaney-Israni, Stanford University
NAM Panel Discussion and Q&A

Sanjay Basu
Harvard University

John Curtin
UW-Madison

Barbara Evans
Univ. of Florida

Michael Matheny
Vanderbilt University Medical Center

Moderator: Sonoo Thadaney-Israni
Stanford University

@theNAMedicine
Q & A Instructions

• Please type in questions into the Q&A located at the bottom of the screen on your zoom interface
• Question format:
  • Your name
  • To whom?
  • Question?
Closing Remarks

Thank you for joining!

For more information about the National Academy of Medicine’s and U.S. Government Accountability Office’s initiatives, please visit us at: nam.edu and www.gao.gov

@theNAMedicine
@USGAO
Step 1
Go to the evaluation link:
bitly.com/aicaredelivery

Step 2
Sign In using your email and password or create new account

FACULTY DISCLOSURE
The Stanford University School of Medicine adheres to ACCME Criteria, Standards and Policies regarding industry support of continuing medical education.

The content of this activity is not related to products or the business lines of an ACCME-defined commercial interest. Hence, there are no relevant financial relationships with an ACCME-defined commercial interest for anyone who was in control of the content of this activity.

ACCREDITATION STATEMENT
The Stanford University School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

AMA CREDIT DESIGNATION STATEMENT
The Stanford University School of Medicine designates this live activity for a maximum of 2.0 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Questions? Email: stanfordcme@stanford.edu

Stanford Center for Continuing Medical Education