Real-world evidence about EHRs and diabetes outcomes: the good, bad, and ugly

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Electronic Health Records (EHR), used in clinical care for patients with diabetes, form the information backbone for diabetes care delivery, and offer the ability to extend data access to patients to interact with their own EHR for self-management. In this session we will examine research evidence from an integrated delivery system about the impacts of EHR use, both clinician-facing and patient-facing, on diabetes care and outcomes, and use of the EHR in telemedicine delivery. We will discuss implications of the EHR as a large data source for real-world research on diabetes care and outcomes, including strengths and potential weaknesses of various EHR data sources.

References


Reed M, Huang J, Brand R, Ballard DB, Yamin C, Hsu J, Grant R. Communicating through a patient portal: conveniently engaging family care partners. JAMA Internal Medicine, 2018 Jan 1;178(1):142-144.


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No conflicts of interest to declare – Research supported by NIDDK (R01DK085070) and PCORI (IH-12-11-4925)

American Diabetes Association Research Symposium November 2018

HITECH act kickstarted US EHR adoption

![Graph showing percent of non-Federal acute care hospitals with adoption of at least a Basic EHR with notes system and possession of a certified EHR: 2008-2014]

Source: Health IT.gov

Kaiser Permanente Research
Nearly all hospitals allow patients to view their health information electronically – healthit.gov

Look for better figure? Switch to bullets

Health Information Exchange (HIE) & interoperability – data to user & in time

What is HIE?
Health Information Exchange allows health care professionals and patients to appropriately access and securely share a patient’s medical information electronically

Source: Health IT.gov
Kaiser Permanente Research
Broadening definition of Electronic Health Records (EHRs): building blocks of real-world diabetes health care data

- **Clinician EHR Use**: federal incentive programs kickstarted uptake
- **Patient EHR Access**: federal measures incentivize basic portal tools
  - Secure messaging
  - Lab results
  - Appointment scheduling
  - Medication refill orders
- **EHR Health information exchange (HIE)**: growing but uncertain
- **Telemedicine**: Using integrated EHR to support video visits

Clinician-facing Outpatient EHR Impacts on Diabetes care and Outcomes
EHR &Quality - Implementing an EHR:

- Increased treatment intensification for patients with high HbA1c values
- Improved monitoring
  - Increased yearly retesting for all patients
  - 90 day retesting decreased if patient already at goal
- Improved HbA1c and LDL values
  - Greater reductions if patient is farther from control
  - Greater patient improvements in cohesive clinical teams
EHR & Utilization/Events – Implementing an EHR:

- No change in office visit rate
- Reduced ED visits
- Reduced preventive hospitalizations
- Modest savings: EHR could reduce costs for patients with diabetes by $158,478 annually per 1,000 patients
What in the EHR produced these outcomes?

• Increased information availability
  • Increased visibility of the information
  • Increased speed when information was available to teams

• Increased electronic clinical decision support
  • When patients’ diabetes is not well controlled
  • When patients overdue for testing
  • When patients needed drug initiation

• Increases in order-entry functionality
  • Easier for clinicians to order appropriate tests or treatment using streamlined prompts and short cuts
Patient-reported impacts of portal use:

- 90% reported that it was convenient
- 81% that it helps get faster answers
- 81% that it helps to prepare for visits
- 92% that the info integrated with other care
- 31% of patients reported that portal use improved their health
- 35% still prefer in-person care
- 17% have concerns about privacy online

Patient portal impacts on Utilization/Events – When patients with diabetes use the portal:

- Higher office visit rate
- Lower ED visit rate
- Reduced preventive hospitalizations
  - Greater impact in patients with diabetes + other complex conditions
Mobile patient portal
Impacts on reach and access

Frequency of portal use increases after adding mobile use

Graetz I, Huang J, Brand R, Hsu J, Reed M. Mobile-Accessible Personal Health Records Increases the Frequency and Timeliness of PHR Use for Patients with Diabetes. Journal of the American Medical Informatics Associations [epub ahead of print].
Mobile patient portal access expands reach


Video Telemedicine
Integrating EHR access to expand patient health care access
Evidence on EHR impacts: diabetes care

- Promising direct **improvements in diabetes management** and health care delivery
  - Improvements in quality and control
  - Decreases in over-testing
  - Reduction in health events
- EHRs offer direct **patient engagement for self-management** – can mobile overcome ‘digital divide’?
- EHR-integrated **telemedicine can expand access** and support patient-physician relationship
Generating real-world evidence from EHR data

• **The Good: Abundant data**
  • Provider-facing & patient facing
  • Impacts on clinical care and support learning health systems

• **The Bad: Design limitations still remain**
  • Observational studies – challenges to causal inference
  • Intervention studies – site-specific limits translation

• **The Ugly: Unintended consequences**
  • Unstructured data
  • Un-captured/missing data
  • User-experience and workflow challenges

Emerging opportunities to harness real-time EHR data in clinical care:

• mHealth/Telemedicine
• Remote monitoring
• Personalized clinical decision support
• Advanced analytics & machine-learning
Thank you!

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