Abstract
The need to advance clinical science using highly optimized, efficient research practices is widely recognized. The proliferation of electronic health data and heightened awareness of the potential value gained by leveraging the data are driving the transformation of existing clinical research methods and models. Understanding the nuances in purpose, driving the transformation of existing research practices is widely recognized.

Background
Health and delivery processes are sources of evidence that advance clinical science and improve health care. The expectation to elevate the standards of care, the proliferation of electronic health data, and the increasing need to reduce research costs and time are fostering the rapid emergence of innovative, applied research methods that include, for example, pragmatic clinical trials, population surveillance strategies, and predictive analytics. This evolution presents opportunities and challenges for investigators to optimize their research designs to more efficiently generate evidence and synthesize knowledge by everyday data beyond its normative context.

Methods
• Identify research paradigms
• Prospective clinical trials
• Disease registries
• Observational research studies
• Characterize data
• Optimization
• Collection & preparation
• Generalizability
• Follow-up Information
• Describe workflow process
• Evaluate feasibility data elements
• Evaluate implications of differences in paradigms and data sources

Results
Selected dimensions from the typology of research paradigmes

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<th>Data Structure</th>
<th>Clinical Trials</th>
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EXAMPLE: Left ventricular ejection fraction
The amount of blood ejected during a ventricular contraction of the heart. The calculated resting left ventricular ejection fraction (LVEF) represents a conti... (as measured)...

EXAMPLE: Acute myocardial infarction
A condition that determines diagnostic / therapeutic approach

Areas for Discussion
• How can we improve clinical science and design efficiency?
• How can we use and allocate resources wisely?
• How can we increase the viability of research proposals?
• Can claims or financial data be leveraged to add new dimensions to research approaches?

INFORMATION & IT PROFESSIONALS
• What can we do to advance, align and harmonize clinical data standards that support evidence and systematic interoperability?
• How can we improve EHR designs so that data collected during care delivery can be used in research?

Health Care Administrators
• What data option systems can we purchase that will maximize operational efficiency (collect once, reuse for multiple purposes with minimal transformation)?
• How can we adjust workflow to improve data capture for multiple uses?
• How can we reuse data to expedite the translation of information into knowledge, support evidence-based medicine, and evaluate clinical, financial, and operational outcomes?
• How can we support researchers without disconnecting from healthcare operations?

POLLICY MAKERS
• How can we use our influence to change accreditation and certification requirements in order to encourage EHRs to implement efficient systems?
• How can we incentivize uptake of interoperable data?

Future Areas of Study
• Evaluate the differences in cost implications and resource utilization associated with re-purposing of sources in traditional data acquisition methods.
• Evaluate the degree of interoperability among data extracted from various EHR systems when used for one or more research paradigms.
• Generate recommendations for system and workflow design to optimize data for use beyond its normative context.

Summary of Conclusions
The most appropriate use of available data—
• Increases viability of research proposals
• Supports the evolution of evidence-based practice
• Shortens time from hypothesis generation to dissemination of knowledge

By recognizing the opportunities for optimization of each research paradigm, investigators can most appropriately leverage clinical and personal data to design efficient and cost-effective research projects that ultimately improve healthcare delivery processes and elevate the standard of care.