Nursing, Healthcare and Technology:
Promoting Quality and Safety

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Conflicts of Interest Disclosure
Ann Scott Blouin, RN, PhD, FACHE

Has no real or apparent conflicts of interest to report.
Session Objectives

• Discuss how quality and safety are enhanced by technology as seen in the accreditation process

• Explain challenges and concerns which technology can impact in nursing care quality and scope

• Explore how technology advances can enable organizations and nurses towards achieving the principles of high reliability
Nursing, Healthcare and Technology: Promoting Quality and Safety

Ann Scott Blouin, RN, PhD, FACHE
Executive Vice President
Accreditation and Certification Operations
HIMSS12 Nursing Informatics Symposium
February 20, 2012
National Strategy for Healthcare Quality

Equitable Access

- Accreditation & Certification
- Public Reporting
- Performance-Based Payment
- Informed Consumer Decision-making

Patient & Family Engagement
Care Coordination
Palliative & End-of-Life Care
Population Health
Safety
Elimination of Overuse
Better Care
Affordable Care
Healthy People/Communities

Infrastructure Supports
- Welfare Development
- HIT
- System & Community Capacity
- Performance Measurement Development
- Research to Build the Evidence-Base
- Quality Improvement

National Quality Forum
Policy Targets of a Reformed Health Care System

- **Coverage Expansions and Benefit Design**
  - Rates of uninsured and underinsured adults decrease
  - Unmet needs for care because of cost decreases

- **Primary Care**
  - Increased connections to a regular provider that delivers high-quality, patient-centered care
  - Improved availability of rapid appointments for urgent care
  - Timely access and wellness care increases
  - Chronic disease management to reduce unnecessary use of hospitals and emergency departments increases

- **Health Information Technology**
  - Increased adoption and meaningful use of electronic medical records across health care settings

*Result from the National Scorecard on U.S. Health System Performance, 2011*

The Commonwealth Commission on a High Performing Health System
October 2011
Policy Targets of a Reformed Health Care System (continued)

- Prevention and Disease Management
  - Increased delivery of preventive care
  - Increased control of chronic conditions
  - Reduced hospitalizations for ambulatory care-sensitive conditions
  - Improved health outcomes

- Care Coordination and Transitions
  - Result: Improved outcomes
  - Result: Reduced preventable hospital readmissions

*Result from the National Scorecard on U.S. Health System Performance, 2011*

The Commonwealth Commission on a High Performing Health System

October 2011
Drivers for Safe HIT Adoption

- Organizations’ Current Investment in Healthcare Technology:
  - Incredible sums of dollars being spent on various technologies, much of which touches the medication system, (including CPOE, bar code medication administration, automated dispensing machines, smart IV Infusion pumps, and pharmacy-based technology to support dispensing and compounding.)

- Stimulus funding of HIT
  - Explosion of implementation activity with the announcement of the $20-billion stimulus package.

- Identification of Significant Safety Issues with Technology Use
  - If patient-safety aspects of technology are not considered in its implementation, there will be a potential for major patient-safety issues.
Multitude of Entities Impacted by National HIT Related Activities

The Joint Commission
Accreditation Certification ORYX

Eligible Clinicians
Eligible Hospitals
EHR Vendors
ORYX Vendors
Health Plans

CMS
NCQA HEDIS
CDC
States & Regional

ORYX

Health Information Technology

PATIENTS

Aligned Measures
Gartner Healthcare Technology Provider

Application Hype Cycle (HIMSS Analytics presentation)

Plateau will be reached in:
- less than 2 years
- 2 to 5 years
- 5 to 10 years

## Opportunities for Technology Investments in Healthcare

<table>
<thead>
<tr>
<th>Focus Areas</th>
<th>Improvements and Innovation Opportunities</th>
</tr>
</thead>
</table>
| Healthcare Organization as a Whole | • Focused improvement and redesign of all operational areas  
                                    |   • Resource use and care management  
                                    |   • Establishment of a vision for care delivery  
                                    |   • Non-labor cost savings                |
| Laboratory                      | • Focused improvement of operations  
                                    |   • Consolidated/shared services  
                                    |   • Non-labor cost savings  
                                    |   • Expansion of services                |
| Materials Management            | • Supply chain redesign  
                                    |   • Product standardization and use of opportunities  
                                    |   • Vendor standardization  
                                    |   • Consolidated/shared services        |
| Revenue Cycle                   | • Revenue cycle process redesign  
                                    |   • Cash flow acceleration  
                                    |   • Paperless processes  
                                    |   • Consolidation/shared services       |

### Opportunities of Technology Investments in Healthcare (con’t)

<table>
<thead>
<tr>
<th>Focus Areas</th>
<th>Improvements and Innovation Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Imaging</td>
<td>• Focused improvement (patient flow and staff scheduling)</td>
</tr>
<tr>
<td></td>
<td>• Radiologist productivity</td>
</tr>
<tr>
<td></td>
<td>• Non-labor savings opportunities</td>
</tr>
<tr>
<td></td>
<td>• Logistics</td>
</tr>
<tr>
<td>Operative Services</td>
<td>• Capacity planning</td>
</tr>
<tr>
<td></td>
<td>• Patient flow and practice model redesign</td>
</tr>
<tr>
<td></td>
<td>• Product standardization and use</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>• Pharmaceutical care model development</td>
</tr>
<tr>
<td></td>
<td>• Formulary management and drug use</td>
</tr>
<tr>
<td></td>
<td>• Focused improvement of dispensing processes</td>
</tr>
</tbody>
</table>

Potential Benefits of HIT

- Quality and safety benefits related to better information access and decision support
- Improved documentation and measurement of care
- Increased direct care time for providers if HIT is well-designed
- Ability to insert prevention needs into care processes via decision support
- Greater recall capacity of computerized records (e.g., an electronic record never “forgets” a drug allergy)
- Information exchange across settings
<table>
<thead>
<tr>
<th>Information Management Practices</th>
<th>2010</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>All policies &amp; procedures online</td>
<td>82%</td>
<td>71%</td>
</tr>
<tr>
<td>Common IT system</td>
<td>71%</td>
<td>66%</td>
</tr>
<tr>
<td>Medical records are scanned in organization’s IT system</td>
<td>65%</td>
<td>34%</td>
</tr>
<tr>
<td>Care management software developed internally</td>
<td>48%</td>
<td>48%</td>
</tr>
<tr>
<td>Electronic clinical decision support tools integrated with patient data</td>
<td>47%</td>
<td>38%</td>
</tr>
<tr>
<td>Management data is linked to claims payment data</td>
<td>45%</td>
<td>54%</td>
</tr>
<tr>
<td>Care management software was purchased from third party</td>
<td>42%</td>
<td>40%</td>
</tr>
<tr>
<td>Provides have web access for UM criteria</td>
<td>36%</td>
<td>21%</td>
</tr>
<tr>
<td>Clinical data is shared with providers electronically</td>
<td>34%</td>
<td>20%</td>
</tr>
<tr>
<td>Externally management services can be viewed electronically</td>
<td>27%</td>
<td>22%</td>
</tr>
<tr>
<td>Care data is linked to pharmacy claims data</td>
<td>32%</td>
<td>26%</td>
</tr>
<tr>
<td>Management data is linked to claims payment data</td>
<td>21%</td>
<td>NA</td>
</tr>
<tr>
<td>Consumers can access their case information</td>
<td>13%</td>
<td>10%</td>
</tr>
<tr>
<td>Integrated data exchange of information with a consumer’s personal health record is operational</td>
<td>10%</td>
<td>NA</td>
</tr>
</tbody>
</table>

*URAC Survey, 2011*
How HIT can Facilitate Patient Safety

- Technology can facilitate clinical decision-making and reduce reliance on vigilance and memory
  - Medication Safety
- Technology can facilitate system-clinician communication
  - Alerting of Test Results
- Technology can facilitate provider-provider and provider-patient communication
  - Hand-offs
  - Electronic Health Records

Tejal Gandhi, M.D., M.P.H.
“Health Information Technology and Patient Safety.”
Presented at the National Patient Safety Foundation
May 24, 2011
Technology: Sources of Error

**Potential Sources of Error**

- Human factors errors
- Device-to-device interactions
- Poor or complex work products

- Poor product materials
- Production quality errors

- Unclear labeling or packaging
- Poor manuals, incomplete instructions
- Inadequate check procedures

- Mis-representation of device materials

**Responsibilities**

**Conception and Development**

- Conception and Development

**Manufacture**

- Manufacture

**Packaging and Labeling**

- Packaging and Labeling

**Advertising**

- Advertising

**Sale**

- Sale
  - Poor implementation support
  - Poor pre-purchase evaluation

**Use**

- Use
  - Poor incoming & pre-use inspections
  - Inappropriate use
  - Lack of or incomplete training
  - Poor accident investigation
  - Inadequate maintenance
  - Poor incident reporting
  - External failures (piped gases)
  - Failure to impound devices
  - Environmental controls
  - Radio frequency failures

**Disposal**

- Disposal
  - Re-use errors
    - Poor sterilization, poor maintenance

**Pre-Market**

- Pre-Market

**Placing**

- Placing

**On-Market**

- On-Market

**Post-Market Surveillance/Vigilance**

- Post-Market Surveillance/Vigilance

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Technology & Adverse Events

“Although technology and equipment are often identified as contributors to several types of adverse events …, technology is seldom identified as the source of medical error or adverse event in adverse event investigations. Rather, technology (e.g., computerized physician order entry systems, automated drug dispensing systems) is seen as both a means of reducing error (by reducing possibilities for human error), or as a major contributing factor to adverse events (e.g., equipment failures that lead to adverse events, or through cognitive overload, as in the case of alarm systems that are poorly understood by clinicians). “While automation holds substantial promise for improved safety, error experts caution that all technology introduces the potential for new and different errors.”

Top 10 Health Technology Hazards in Healthcare Facilities

- Medical devices equipped with alarms
- Exposure from radiation therapy
- Infusion pumps and administration errors
- Flexible endoscopes and cross-contamination
- Interconnected medical technology and IT systems
- Feeding tubes misconnections
- Surgical fires
- Needles and sharp objects
- Anesthesia
- Home-use medical devices

Stephanie Baum, ECRI Institute Report, November 8, 2011
“Unintended consequences are not limited to the initial implementation phase… They can occur at any time before, during or even long after EHR implementation. Continuously monitoring the functionality and use of the EHR will help anticipate and avoid adverse unintended consequences.”

Agency for Healthcare Research and Quality
Potential Risks of HIT

- Data and process can threaten to overwhelm the workflow
- Automating a process with underlying faults may lead to an automated faulty process
- The possibility of entering and relying upon compromised data
- The distraction factor: leaders’ attention being pulled toward meaningful use criteria and away from other quality and safety initiatives
- Lack of interoperability
- Overconfidence in the power of HIT: mistakenly believing that HIT is a panacea instead of a means to an end
“Many forces are converging to drive EHR adoption and meaningful use. Healthcare executives play a critical role in ensuring everyone arrive safe, sound, and happy to be there. To achieve goals of quality and organizational excellence, physician EHR use cannot be optional…a compelling argument must be made to physicians regarding why changing now is essential, everyone must participate, and how the organization will help them get there… Healthcare executives must ensure that the EHR is robust, available, responsive, and reliable…”

Michael H. Zaroukian
“Driving on Main Street: The Road to Widespread Physician EHR Use,”
Frontiers of Health Services Management
Fall 2011, Vol. 28, No. 1
The mission of The Joint Commission is to continuously improve health care for the public, in collaboration with other stakeholders, by evaluating health care organizations and inspiring them to excel in providing safe and effective care of the highest quality and value.
Interacting Factors Related to Errors, Quality and Safety

CLINICIAN FACTORS
- Values
- Attentiveness
- Intentions
- Habits of Mind
- Communication Skills
- Emotional Relativity
- Fatigue/Burn-out

LARGER SYSTEM FACTORS
- Structure of the healthcare system
- Reimbursement & Incentives
- Mass Media
- Industry

PATIENT FACTORS
- Language/Communication
- Literacy
- Trust
- Honesty
- Motivation
- Family Involvement

MICRO-SYSTEM FACTORS
- Team Structure
- Hand-Offs
- Decision Support
- Distractions/Noise

ERRORS QUALITY SAFETY

Examples: A Focus on Risk and Providing Solutions to Mitigate

- Sentinel Event Alerts
- Intracycle Monitoring Process
- Provisions of resources to help organizations improve
  - *BoosterPaks*
  - Leading Practices Library
  - Core Measures Solution Exchange
- Center for Transforming Healthcare Projects
- Joint Commission Resources Safe Adoption of Technology
Sentinel Event Alert

December 11, 2008
Issue 42, December 11, 2008

Safely implementing health information and converging technologies

As health information technology (HIT) and “converging technologies”—the interrelationship between medical devices and HIT—are increasingly adopted by health care organizations,1,2 users must be mindful of the safety risks and preventable adverse events that these implementations can create or perpetuate. Technology-related adverse events can be associated with all components of a comprehensive technology system and may involve errors of either commission or omission. These unintended adverse events typically stem from human-machine interfaces or organization/system design.3 The overall safety and effectiveness of technology in health care ultimately depend on its human users, ideally working in close concert with properly designed and installed electronic systems. Any form of technology may adversely affect the quality and safety of care if it is designed or implemented improperly or is misinterpreted…
Recommended Practices for Avoiding Unintended Consequences from EHRs from the Sentinel Event Alert

- Actively involve clinicians and staff in reassessing and ongoing quality improvement of technology solutions
- Monitor continuously for problems and addressing any issues as quickly as possible, particularly problems obscured by workarounds or incomplete error reporting
- Use interdisciplinary brainstorming methods for improving system quality and giving feedback to vendors
- Carefully review skipped or rejected alerts
- Require departmental or pharmacy review and sign off on orders that are created outside the usual parameters
- Provide an environment that protects staff involved in data entry from undue distractions when using the technology
Building patient safety into your technology use

Let's explore your safe adoption needs

Our team is ready to respond. Please contact Nanno M. Finis, RN, MS, Executive Director, Solutions Consulting, at 833-205-7406 or nfinis@jcrinc.com to arrange a customized consultation.

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What is a Transition of Care: Hand-off Communications?

A hand-off is a transfer and acceptance of patient care responsibility achieved through effective communication. It is a real-time process of passing patient specific information from one caregiver to another or from one team of caregivers to another for the purpose of ensuring the continuity and safety of the patient’s care.

To further define the roles, the sender is responsible for sending or transmitting the patient data and releasing the care of the patient to the receiver, who receives the patient data and accepts care of the patient.

The consequences of substandard hand-offs may include delay in treatment, inappropriate treatment, adverse events, omission of care, increased hospital length of stay, avoidable readmissions, increased costs, inefficiency from rework, and other minor or major patient harm.
Application of Electronic Health Records to the Joint Commission's 2011 National Patient Safety Goals

Ryan P. Badecki, MD
Dean F. Sittig, PhD

Since publication of To Err Is Human, electronic health records (EHRs) and related health information technologies have been promoted as means to improve patient safety. This promise remains largely unfilled. For instance, whereas EHRs with clinical decision support (CDS) interventions integrated into computerized physician order entry (CPOE) have measurably improved clinicians' performance on process metrics, their effect on patient outcomes remains unconfirmed. Recently, the US Department of Health and Human Services (DHHS) launched "Partnership for Patients: Better Care, Lower Costs" by committing $1 billion to improve safety. Meanwhile, EHR vendors and health care organizations have focused considerable effort on meeting standards for "meaningful use" of EHRs as required by the DHHS for incentive payments.

Each year, the Joint Commission issues a concise National Patient Safety Goal (NPSG) advisory identifying the highest-priority topics for quality care. Ideally, addressing the NPSGs should be incorporated into the EHR certification process, requiring each vendor to specifically engineer targeted solutions and each organization to carefully implement and use these systems to improve safety. For 2011, the NPSG priorities for hospital quality improvement initiatives are patient identification, staff communication, medication labeling, infection control practices, medication reconciliation, and interactions, and mitigation of suicide risks.

Electronic health records, along with CPOE, CDS, and barcode medication administration (BCMA), if designed, developed, implemented, and used correctly, potentially play critical roles in addressing these safety goals. In this Commentary, we provide an overview of these goals, current EHR solutions and shortcomings, and potential for improvement. Emergency department physicians using eye tracking showed that physicians frequently failed to adequately confirm the identity of patients prior to order entry.

A goal of EHRs and CPOE should be to enable clinicians to reliably identify patients when accessing records and entering orders. To increase the likelihood of correct identification, multiple contextual cues should be prominent within the EHR. Examples include visual reminders, such as displays of patient name, sex, date of birth, and a photograph, and clinical reminders, such as a concise summary of the patient's active problem list. The EHR should highlight patients with sound-alike or look-alike names and require reentry of the patient's initials or date of birth before order completion. In addition, BCMA systems should be used in the pharmacy and at the point of care to ensure that the correct patient receives the correct medication or blood product.

Conclusion

The 2011 NPSGs provide high-yield guidance to EHR certification and oversight bodies who should refine their criteria for meaningful use to include incentives for development and use of tools to enhance safety. As with all computer-based interventions, incorporation of EHRs into routine clinical workflow is critical; their effectiveness depends on appropriate maintenance, effective user training, periodic institutional self-assessment of EHR safety and effectiveness, and clinically focused policies to support their use. Although EHRs by no means represent all necessary mechanisms to address critical safety problems, they can provide tools to help organizations improve their performance.

JAMA, July 6, 2011, Vol. 306, No.1
Framework for Patient Safety, Part 1

Culture as an Imperative

Ann Scott Blouin, PhD, RN, FACHE
Kathryn J. McDonagh, PhD, RN, FACHE, FAAN

Nurse leaders play a critical role in patient safety. They are essential in building a culture of safety and engineering resilience into workflows and patient care processes enabling healthcare organizations to progress toward high reliability. In part 1 of this 2-part series, the authors discuss the critical nature of a safety culture: why trust and respect lead to teamwork and collaboration in preventing serious safety events. Part 2 will introduce the emerging healthcare concept of high reliability, described through examples of health systems that have successfully adapted models from other industries. Use of technology and other advancements provides a context for advancing patient safety. Aligning culture and engineering technology for safety, when coupled with effective leadership, can provide a long-term approach for safe and effective care.
Building Blocks to Achieving High Reliability

- All people always experience the safest, highest quality, best value health care across all settings
- Robust Process Improvement
- Safety Culture
- Leadership Commitment

Widespread Adoption of RPI
Process Improvement Training
Process Improvement Methods
Identifying Unsafe Conditions
Strengthening Systems
Trust
Accountability
Assessment
Quality & Safety Strategy
Quality & Safety Measures
Governing Body Commitment
CEO/Senior Leadership Commitment
Physician Leadership
Information Technology

Compliance with Joint Commission Standards & National Patient Safety Goals
Excellent Accountability Measure Performance
“Nurses are key leaders in developing the infrastructure for effective and efficient health information technology that transforms the delivery of care. Nurse informaticists play a crucial role in advocating both for patients and fellow nurses who are often the key stakeholders and recipients of these evolving solutions. Nursing informatics professionals are the liaisons to successful interactions with technology in healthcare’….

As clinicians who focus on transforming information into knowledge, nurse informaticists cultivate a new time and place of care through their facilitation efforts to integrate technology with patient care. Technology will continue to be a fundamental enabler of future care delivery models and nursing informatics leaders will be essential to transforming nursing practice through technology.”
## IOM/RWJ Recommendations and HIMSS

<table>
<thead>
<tr>
<th>Category</th>
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<th>HIMSS Recommendations for Nursing Informatics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Leadership</strong></td>
<td>1. Prepare &amp; enable nurses to lead change to advance health</td>
<td>• Partner with nurse executives to lead technology changes that advance health and the delivery of healthcare</td>
</tr>
<tr>
<td></td>
<td>2. Expand opportunities for nurses to lead and diffuse collaborative improvement efforts</td>
<td>• Support the development of informatics departments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Foster the evolution of the Chief Nursing Informatics Officer role</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>3. Increase the proportion of nurses with a baccalaureate degree to 80% by 2010</td>
<td>• Transform nursing education to include informatics competencies and demonstrable behaviors at all levels of academic preparation</td>
</tr>
<tr>
<td></td>
<td>4. Double the number of nurses with a doctorate by 2020</td>
<td>• Promote the continuing education of all levels of nursing, particularly in the areas of EHRs and health IT</td>
</tr>
<tr>
<td></td>
<td>5. Ensure that nurses engage in lifelong learning</td>
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**HIMSS Position Statement on “Transforming Nursing Practice Through Technology & Informatics”**  
Approved June 17, 2011
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<tbody>
<tr>
<td>Practice</td>
<td>6. Remove scope of practice barriers</td>
<td>• Ensure that data, information, knowledge and wisdom form the basis of 21st century nursing practice by incorporating informatics competences into practice standards in all healthcare settings</td>
</tr>
<tr>
<td></td>
<td>7. Implement nurse residency programs</td>
<td>• Facilitate the collection and analysis of interprofessional healthcare workforce data by ensuring data can be collected from existing health IT systems</td>
</tr>
<tr>
<td></td>
<td>8. Build an infrastructure for the collection and analysis of interprofessional healthcare workforce data</td>
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</tr>
</tbody>
</table>

HIMSS Position Statement on “Transforming Nursing Practice Through Technology & Informatics”
Approved June 17, 2011
HIMSS Call to Action

- Vendor organizations that develop electronic systems for clinician should employ nurse informaticists in analyst, leadership, and officer roles
- Provider organizations should develop informatics departments that include nurse informaticists
- Provider organizations should employ nurse informaticists in leadership roles, such as a Nursing Informatics Executive, Chief Nursing Informatics Officer, Chief Clinical Information Officer or Vice President of Nursing Informatics
- Nursing informatics leaders should be knowledgeable and current in public policy
- Government agencies should recognize that regulations and reimbursement policies that remain exclusively physician-focused will not achieve the goals of healthcare transformation
- Academic organizations should integrate informatics content throughout the nursing undergraduate and graduate curriculum

HIMSS Position Statement on “Transforming Nursing Practice Through Technology & Informatics”
Approved June 17, 2011
Impact Point for Nursing:  
EHR as Enabler for Clinical Practice Change

- Plan and execute the EHR project as a *practice* change that is *facilitated* by technology, and not as an IT implementation
- Create the Nursing Practice Model and framework for care planning & documentation *before* automation
- Technology change needs to take a supportive role to the people/process/practice change enabled by the technology
- Be clear about the purpose of the EHR, as demonstrated by the “meaningful use” objectives and quality measures
- EHR implementation as the *means to an end*, and not as *an end itself*

Judy Murphy  
“*Shifting Sands: Charting the Course*”  
AONE 44th Annual Meeting  
April 13-16, 2011
Impact Point for Nursing:
Focus on Patient and Patient-Centric Care

- “Patient as Partner” – Increasing patient participation in care
- Encouraging patient use of a Personal Health Record (PHR)
- Customizing delivery of information to the patient – electronic copy of discharge instructions and summary of care
- Interoperability and portability of electronic records – EHR to/from PHR, EHR to/from EHR in different care venues
- Improving care coordination between all care venues; e.g., hospitals, clinics, physicians, home care, pharmacies
How Nurse Leaders can Help

- Lead by example
- Get educated; stay informed on health care policy and advocacy issues
- Take ownership
- Consider creating a Department of Nursing Informatics/Transformation/Integration
- Ensure strong dedicated “transformation” team and “superuser” group for ongoing support
- Provide input and constructive suggestions about the clinical applications
- Ensure HIT system supports the process of critical thinking…“nursing-thoughtflow”
- Make sure Nursing does their own competency-based training and incorporates content and process/workflow changes, not just IT application skills

Judy Murphy
“Shifting Sands: Charting the Course”
AONE 44th Annual Meeting
April 13-16, 2011
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