

APPLIED HEALTH INFORMATICS

Electronic Health Records (EHRs) & Health IT Systems

From Clinical Encounters to Connected Care: How EHRs Transform Healthcare Delivery

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The lifecycle of clinical information

Electronic Health Records (EHRs) & Health IT Systems

Week 2: Clinical Documentation, Information Quality & Continuity of Care

Central Question: How does information captured during care influence future clinical, operational, and public health decisions?

Module Duration: 1 – 2 Hours

Format: Fully Asynchronous

OpenMRS Practice: Required

Office Hour: Week 1 OpenMRS Orientation

Lesson Objectives

By the end of module, learners will be able to:

- ☐ Explain documentation as a mechanism for continuity of care.
- ☐ Analyze how information quality affects downstream decisions.
- ☐ Evaluate the tradeoffs between structured and unstructured data.
- ☐ Identify sources of information loss across the care continuum.
- ☐ Assess clinical documentation from multiple stakeholder perspectives.
- ☐ Apply documentation principles within OpenMRS workflows.
- ☐ Recognize how documentation supports secondary use of health data.

Before We Begin

A Common Misconception

Many healthcare workers believe documentation is just a record of care.

An informaticist on the other hand views documentation as a reusable information asset.

The Key Question we want to answer is: Who will use this information next?

Documentation is a critical Information Asset

Documentation as an Information Asset

Documentation Is More than a Record

Healthcare organizations often view documentation as something completed after care is delivered. Many healthcare workers view documentation as a record of what happened.

An informaticist views documentation as a reusable **information asset** that continues to create value long after the patient encounter ends.

It is a resource that can be reused to support future decisions.

Why Documentation Is an Information Asset?

A single clinical note may be used for multiple purposes:

- ☐ **Clinical care:** guides future treatment decisions.
- ☐ **Care coordination:** helps other providers understand the patient's history.
- ☐ **Quality improvement:** identifies gaps in care delivery.
- ☐ **Hospital operations:** supports planning and resource allocation.
- ☐ **Research:** contributes data for studies and analysis.
- ☐ **Public health:** informs disease surveillance and reporting.
- ☐ **Policy and funding:** provides evidence for program decisions.

Documentation as an Information Asset

Every note, diagnosis, medication order, laboratory result, or discharge summary becomes part of an information ecosystem that extends beyond the immediate patient encounter. Documentation creates organizational memory.

A clinician may document information for today's patient encounter.

A healthcare system may use that same information years later to improve services, allocate resources, or identify disease trends.

Important!

The value of documentation is not determined only by the clinician who writes it.

Its value is determined by how many important decisions can be supported by that information in the future.

An EHR transforms documentation from a single-use clinical note into a multi-use information resource that can support care, management, research, and population health.

The Information Lifecycle

Patient Encounter: This is where healthcare interactions occur and raw patient data (symptoms, history, observations) is generated. It serves as the foundation for all subsequent information processing.

Documentation: Providers record details of the encounter in a structured format. The accuracy and completeness of this step directly impact all downstream processes.

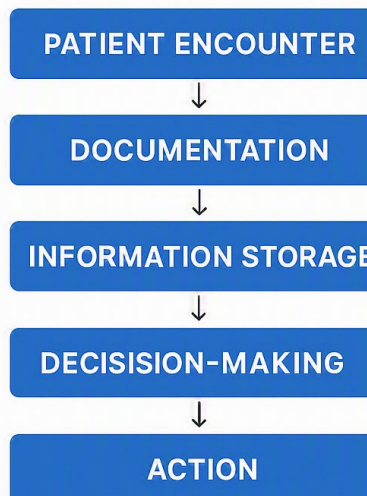
Information Storage: Documented data is securely stored in systems like EHRs using standardized formats and codes. Proper organization ensures data integrity and accessibility.

Information Retrieval: Stored data is accessed by healthcare providers or systems for review and use. Efficient retrieval depends on how well the data was documented and stored.

Decision-Making: Clinicians analyze retrieved information to make informed clinical decisions. The quality of decisions is directly tied to the reliability of the data.

Action: Decisions are translated into patient care actions such as treatments or interventions. Outcomes depend on the accuracy and completeness of all prior steps.

Information Lifecycle in Healthcare



Every documentation decision affects all subsequent steps

Documentation and Continuity of Care

Continuity of Care Depends on Information Continuity. Information Loss Is a Healthcare Risk

Patients frequently move between:

- ☐ Registration
- ☐ Outpatient & Specialty clinics
- ☐ Laboratory services & Imaging departments
- ☐ Hospitals
- ☐ Community settings

At each transition, information can be delayed, omitted, duplicated, misunderstood, or lost entirely.

Common Examples

- ☐ Diagnoses are documented inconsistently across departments
- ☐ Medication changes are not communicated during handoffs
- ☐ Referral letter never reaches the receiving facility.
- ☐ Pathology result remains in a paper file but is not communicated to the oncology team.
- ☐ Laboratory results are available but cannot be matched to the correct patient.
- ☐ Discharge summary is incomplete or unavailable during follow-up.
- ☐ Patients carry information verbally because records are inaccessible.

Documentation and Continuity of Care

Information loss can lead to:

- ❑ Delayed treatment decisions.
- ❑ Repeated laboratory or imaging tests.
- ❑ Fragmented care between facilities.
- ❑ Poor continuity of care.
- ❑ Higher healthcare costs.
- ❑ Worse patient outcomes

Some LMIC Mitigation Strategies

- ❑ **Standardized Documentation Templates:** Structured referral forms, discharge summaries, and handoff tools ensure essential information is consistently captured. Use the same core data elements at every level of care (patient identifier, diagnosis, treatment given, next action). This reduces variation and makes information easier to interpret across facilities
- ❑ **Longitudinal Shared Patient Records:** Even simple digital systems that maintain a single patient record across visits reduce fragmentation and improve continuity of care. Even when systems are not electronically connected, using a consistent patient identifier and structured demographic fields improves the ability to match records across facilities.

Information Captured vs Knowledge Preserved - Mrs. Ade's Pathology Result

Mrs. Ade is a 52-year-old woman who presents to a district hospital with a left breast lump. During her clinic visit, the clinician documents the breast mass and refers her for a biopsy.

Two weeks later, the pathology laboratory completes the biopsy and issues a report:

Diagnosis: Invasive Ductal Carcinoma, Grade II Breast Cancer.

The pathology report is printed and placed in a paper folder in the laboratory records office.

Unfortunately:

- ☐ The result is never entered into the patient's chart.
- ☐ The oncology clinic is not notified & the referring clinician never receives the report.
- ☐ No follow-up appointment is scheduled.
- ☐ Mrs. Ade assumes she will be contacted if anything is wrong.

Three months later, Mrs. Ade returns to the hospital because the lump has grown significantly larger and she is now experiencing pain.

The new clinician reviews her chart and finds:

- ☐ Documentation of the original breast lump but no documentation of the biopsy request
- ☐ No pathology result
- ☐ No diagnosis recorded
- ☐ No treatment plan.

The clinician orders another biopsy because no result can be located in the patient's record.

Information Captured vs Knowledge Preserved - Mrs. Ade's Pathology Result

Question 1: Has Information Been Captured? **Answer: Yes**

Information was captured when the pathology laboratory completed the biopsy and generated the report. The cancer diagnosis exists as documented information somewhere within the health system. The laboratory successfully performed its role of producing diagnostic information.

Question 2: Has Knowledge Been Preserved? **Answer: No**

Although the information exists, it was not available to the people responsible for making treatment decisions. The diagnosis was not:

- ☐ Communicated
- ☐ Documented in the patient record
- ☐ Accessible to future providers
- ☐ Incorporated into care planning

As a result, the healthcare system behaved as though the diagnosis did not exist. The information was captured, but the knowledge was not preserved where it could support patient care.

Why This Matters

From a traditional perspective, the hospital may believe: "We have the result."

From an informatics perspective, the more important question is: "Can the right person find and use the result when a decision must be made?"

If the answer is no, then the information has limited practical value

Information Captured vs Knowledge Preserved - Mrs. Ade's Pathology Result

Difference 1: Existence vs Accessibility

Information Captured: The information exists somewhere in the system

Example: The pathology report sits in a filing cabinet or laboratory database.

Knowledge Preserved: The information can be found, understood, and acted upon by future users.

Example: The pathology diagnosis appears in Mrs. Ade's chart, is visible to the oncology team, and informs treatment decisions.

Difference 2: Storage vs Decision Support

Information Captured: Focuses on whether data was recorded.

Knowledge Preserved: Focuses on whether the information can influence future decisions.

Informaticist Insight

One of the most common failures in healthcare is not failure to generate information—it is failure to preserve and move knowledge to the point where decisions are made.

Many organizations collect large amounts of data every day. The true value of health informatics is ensuring that important information remains available, understandable, and actionable throughout the patient's journey.

Key Takeaway

Healthcare quality often depends less on whether information was created and more on whether that information can be reliably transformed into action when it is needed.

Documentation Quality

What Makes Information Fit for Use?

Documentation quality is not measured by volume. Information is valuable when it is:

- ☐ **Accurate:** The information correctly represents the patient's actual condition, treatment, or outcome.
- ☐ **Complete:** All essential information needed to support safe and effective decisions is present.
- ☐ **Timely:** The information is available when the decision needs to be made, not after the opportunity has passed.
- ☐ **Interpretable:** Different users can understand the information consistently without confusion or ambiguity.
- ☐ **Relevant:** The information contributes directly to the clinical, operational, or public health decision being addressed.

Healthcare organizations often believe they have solved a problem because the information exists somewhere.

Informatics asks a different question: Can the right person find and use that information when a decision must be made?

Structured vs Unstructured Information

The Structured-Unstructured information Tension is one of the most important design challenges in health informatics – Deciding what should be entered as structured data and what should remain as unstructured (clinical narrative).

The Tension

More structure improves reuse. More narrative improves understanding.
The challenge is finding the right balance.

Structured Data Supports	Unstructured Data Supports
☐ Reporting and analytics. ☐ Disease surveillance. ☐ Quality measurement. ☐ Interoperability. ☐ Automation and decision support.	☐ Clinical reasoning. ☐ Complex patient stories ☐ .Unusual presentations. ☐ Risk assessment ☐ Context that does not fit predefined fields.

Important

Good EHR design does not try to eliminate narrative. It identifies which information must be standardized for reuse and which information must remain descriptive to preserve clinical meaning.

Informaticist Perspective: Structured vs Unstructured Data

An informaticist asks three questions:

1. What decisions will this information support?

- ☐ If the information will be used for reporting, surveillance, quality metrics, or interoperability, it usually needs a structured component.

2. What clinical meaning could be lost?

- ☐ If forcing information into a predefined field removes important context, a narrative component may be necessary.

3. How will this information be reused in the future?

- ☐ Information that may support research, policy, or population health often benefits from standardization.

Practical Principle

Structure the information that must be counted, compared, shared, or analyzed; preserve narrative for the information that must be explained, interpreted, or contextualized.

Information should be as structured as necessary, and as narrative as useful.

One Encounter, Many Stakeholders

A single patient encounter may support many different decisions.

- ❑ **Clinical Team:** Uses documentation to diagnose, treat, monitor progress, and continue care safely.
- ❑ **Administrator:** Uses documentation to understand patient volumes, service utilization, staffing needs, and operational performance.
- ❑ **Researcher:** Uses documentation to study outcomes, identify patterns, and generate evidence.
- ❑ **Quality Officer:** Uses documentation to measure adherence to standards and identify opportunities for improvement.
- ❑ **Public Health Program:** Uses documentation to monitor diseases, evaluate programs, and support population-level decisions.
- ❑ **Patient (Most Important):** Uses documentation indirectly through safer, more coordinated, and more consistent care. Accurate documentation helps ensure that future providers understand the patient's history, previous treatments, and ongoing needs.

Key Insight

The patient may never read every note, but the quality of that documentation can influence every future interaction the patient has with the healthcare system.

Documentation Is Not Merely a Clinical Activity

EHRs Transform Documentation Into a Shared Organizational Resource.
EHRs make documentation visible and reusable across the healthcare system.

EHR Roles

- ❑ **Clinical Role:** Creates a shared patient record across providers and departments. Supports patient care and continuity.
- ❑ **Operational Role:** Generates data for management and planning. Supports scheduling, resource planning, and service management.
- ❑ **Quality Role:** Supports monitoring of performance and outcomes.
- ❑ **Public Health Role:** Supports surveillance and population health reporting.
- ❑ **Learning Health System Role:** Supports organizational learning and continuous improvement.

Final Insight

An EHR does not simply store documentation.

It transforms documentation into a strategic asset that can improve decisions across the entire health system.

Key Takeaways

The Important Shift

In a paper environment, documentation often remains where it was written.

In an EHR environment, documentation can become part of a larger information ecosystem that supports clinical care, operations, quality improvement, research, and population health simultaneously.

The moment documentation can be searched, analyzed, shared, reported, and reused, it becomes more than a clinical note. It becomes a strategic health information resource that can influence decisions far beyond the original patient encounter.

An EHR is not simply a digital record.

It is a tool that helps transform information into action, supports continuity of care, and enables healthcare systems to learn, improve, and serve patients more effectively.



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