



**HL7 EHR Guidance: Solving the Fax Dilemma,**  
**Edition 1**  
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**HL7 Comment-Only Ballot**

**Sponsored by:**  
**Electronic Health Records Work Group**

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## HL7 EHR Work Group – Data Quality Project

### Solving the Fax Dilemma – Why a “Comment Only” Ballot?

The HL7 Electronic Health Record Work Group continues to assess a range of issues related to the quality of health data/records. This is (in part) prompted by our work in the Reducing Clinician Burden Project where we have found that *evidence of data quality* is vital to address concerns regarding whether health data/records are reliable and fit for use.

Data quality is foundational and is of vital interest to ALL stakeholders in, and for ALL purposes/uses of, health data/records:

- For the subject of data content (i.e., patient)
- For the author of data content
- For the end user of data content
- For primary use, secondary use and re-use of data content
- For ensuring integrity and effectiveness of the clinical process
- For assuring patient safety
- For data content ingested by artificial intelligence, including machine learning and (natural) language processing
- ...

What capabilities might ensure fidelity to source – maintained from the point of origination (source) to each ultimate point of access/use? Is received health data/information trustworthy and usable? If so, what is the basis or evidence to support such confidence? How is such evidence made available to the end user?

Our attention has long been trained on standards which address data quality and evidence thereof. See Annex A for a representative enumeration of HL7, ISO and ASTM Standards which are so focused.

As we consider additional topic areas, in this case the role of fax and photocopiers in data quality assurance, we decided to reach out to the HL7 International community to gather expert guidance and real-world experience to inform standardization efforts in this space.

Fax and photocopies have been a mainstay in replication and sharing of health data/records for many years. This “comment only” ballot is centered on a Problem Statement (next page) laying out specific qualities of fax and photocopy technology that ensure robust reproduction and exchange of health data/record content from point of origination to point of end use.

Thus our inquiry for your consideration and feedback:

1. *How can we ensure that original health data/record content/context is conveyed such that the source rendering (what the author sees and intends) matches the transmitted and received rendering (what the end user sees) – such that this most basic capability of fax and photocopiers is fulfilled without fail in each and every instance?*
2. *What are standards-based options which provide this capability?*
3. *Might standards, such as a decentralized, immutable public ledger (e.g., blockchain), be considered best practice to ensure full fidelity to source? If not, what are alternatives to consider?*
4. *What are downsides to the use of decentralized, immutable public ledger (e.g., blockchain) for routine health information capture, sharing and use?*

## **HL7 EHR Work Group – Data Quality Project**

### **Solving the Fax Dilemma – The Problem Statement**

Fax → a facsimile; an exact copy, especially of a document; an image of a document made by electronic scanning and transmitted via telecommunication links

While there is widespread agreement with the objective to replace fax machine transmission/reproduction of health records with “interoperability” between EHR/HIT systems, the question is whether the current set of interoperability schemes are in fact competent to achieve/replace a basic fax function. Indeed there is one vital characteristic where it remains superior, if not infallible... What goes in (source artifact) is identical to what comes out (artifact produced by the fax). If not, these devices would be immediately placed out of service and then repaired or replaced.

The design of today’s interoperability schemes has largely disregarded the requirement to reproduce (for purposes of exchange and end use) an identical copy of the original (source) record, as an authentic reproduction without alteration. It also has implications for whether an artifact can be construed as a legal record.

Today’s interoperability schemes are mostly comprised of “standardized” exchange artifacts, e.g., HL7 v2/v3 messages, CDA/C-CDA documents or FHIR resources. Use of these artifacts typically **REQUIRES** data content transformation twice in the course of exchange: first at transmission, from source representation to exchange artifact representation, then again on receipt, from the exchange artifact to receiver representation. Thus: Source → Exchange → Receiver.

Transformations often **INTRODUCE** alterations, omissions, errors and disjunctions in data content. Transformations often **LOSE OR DISJOIN** attribution, authorship/signature, verification/attestation, provenance, context, purpose of capture, consistency, comparability, units of measure and binding to conventions of coding, classification and vocabulary systems.

The risks (to data integrity) introduced by data transformation – as described above – also represent major risks to the integrity of the clinical process and most importantly, **SERIOUS RISKS TO PATIENT SAFETY**.

These risks also strike at core principles of trust (assurance) and truth (authenticity) which are essential to achieve full interoperability and usability of, and confidence in, health information – for providers and individual subjects of care alike.

## **ANNEX A – Key Reference Sources and Standards** – which focus on data quality and evidence thereof

- [HL7 EHR WG/Data Quality Confluence Page](#)  
Collateral and Reference Material for the EHR WG/Data Quality Project
- [ISO 21089:2018, Health Informatics – Trusted End-to-End Information Flows](#)  
Requirements Standard for management of Record Entries – across multiple systems  
Record Entry Lifespan – from point of data origination to point of data access/use or point of data archive or deletion  
Record Entry Lifecycle Events – occurring within lifespan
- [HL7/ISO 10781:2023, Health Informatics – Electronic Health Record System Functional Model R2.1](#)  
Record Infrastructure Section  
Requirements Standard for management of Record Entries – within an EHR system
- [HL7/ISO 16527:2023, Health Informatics – Personal Health Record System Functional Model R2](#)  
Record Infrastructure Section  
Requirements Standard for management of Record Entries – within a PHR system
- [HL7/ASTM 2147:2018, Standard Specification for Audit and Disclosure Logs for Use in Health Information Systems](#)  
Requirements Standard for health record/data audit
- [HL7 FHIR R5 Record Lifecycle Event Implementation Guide \(2023\)](#)  
Implementation Standard for FHIR, based requirements specified in ISO 21089, HL7/ISO 10781/16527 and HL7/ASTM E2147