

Method of Recording	Paper Record	Electronic Record
Record Content: Data + Meta-Data		
Patient Name/ID	<ul style="list-style-type: none"> • Handwritten; or • Imprinted 	<ul style="list-style-type: none"> • Keyed; and/or • Selected from pick list; or • Copied from prior entry
Provider Name/ID – Organization	<ul style="list-style-type: none"> • Handwritten; or • Imprinted; or • Pre-printed on form 	System/session meta-data, established at login
Provider Name/ID – Individual	Handwritten	System/session meta-data, established at login
Action: e.g., order, care, assessment, therapy, diagnostic procedure	Handwritten	<ul style="list-style-type: none"> • Keyed; or • Selected from pick list
Action Date/Time	Handwritten	<ul style="list-style-type: none"> • Keyed; or • System meta-data
Action Duration	Handwritten	<ul style="list-style-type: none"> • Keyed; or • System calculated
Action Location	Handwritten	<ul style="list-style-type: none"> • Keyed; or • Selected from pick list; or • System meta-data
Entry Date/Time	Handwritten	<ul style="list-style-type: none"> • Keyed; or • System meta-data
Entry Author	Handwritten (signature)	Author digital signature
Entry (source) System/ID	N/A	System digital signature
Entry (source) Device/ID	N/A	Device digital signature
Entry (source) Network Address	N/A	System meta-data
Action Facts, Findings, Observations	Handwritten	<ul style="list-style-type: none"> • Keyed; and/or • Selected from pick list
Record Properties		
Author's signature bound to content	Signature proximal to handwritten entry	System encapsulates digital signature(s) and content via keyed encryption
Persistence, Indelibility	[Written in permanent ink]	[System assured]
Encryption, Obfuscation Data in motion, at rest As applicable	N/A	[System assured]

Continuity over Record Lifespan	Paper Record	Electronic Record
Record Lifecycle Events (per HL7 EHR Lifecycle Model DSTU)		
Originate	Start with blank page or section (may be pre-printed form)	<ul style="list-style-type: none"> • Input new content (as described above); and • Create new record entry
Retain	Save in paper chart	Save record entry in EHR datastore
Attest as to Accuracy	Apply handwritten/wet signature	<ul style="list-style-type: none"> • Apply digital signature to record entry; and/or • Evaluate algorithmically
Attest as to Completeness	Apply handwritten/wet signature	
Amend	<ul style="list-style-type: none"> • Handwritten; and • Noted as pertaining to original entry 	<ul style="list-style-type: none"> • Input new + revised record content (as described above); and • Create revised record entry, preserving original content
Translate Content (code set to code set, human language to language)	Typically N/A	<ul style="list-style-type: none"> • Translate record algorithmically according to mapping rules
Reproduce/Duplicate	<ul style="list-style-type: none"> • Fax (paper to paper) • Copy (paper to paper) • Scan (paper to electronic) See "Method of Reproduction" following	Produce electronic copy of record
Extract Content (Create record subset)	Handwritten on new page or form	Produce record subset as electronic copy
Access/View	Find/view pages in paper chart	Find/view EHR record entry(ies)
Transmit/Disclose	Fax or duplicate (Create paper copy)	<ul style="list-style-type: none"> • Transmit record electronically to external system; or • Produce record copy on electronic media (e.g., CD, DVD, memory stick); or • Produce hardcopy
Receive	Receive/accept paper copy	<ul style="list-style-type: none"> • Capture record copy from electronic transmission or media; or • Scan from hardcopy
De-identify	Handwritten on new page or form	<ul style="list-style-type: none"> • Algorithmically remove record identity; and • Create de-identified record copy
Alias	Handwritten on new page or form	<ul style="list-style-type: none"> • Algorithmically assign alternate identity; and • Create aliased record copy
Archive	Physically transferred to long-term storage location	Produce and transfer record copy to archival media (e.g., CD, DVD, magnetic tape)
Delete/Destroy	Physically obliterated	Securely and permanently erase electronic record entry(ies)
Lose/Displace	N/A	Notate/mark record entry(ies) as lost or missing
Deprecate: e.g., misidentified patient	Handwritten notation on original	Notate/mark record entry(ies) as deprecated

Method of Replication		Produces (to record recipient)	
		Paper Record	Electronic Record
Manual Replication, where Source = Paper			
Fax		EXACT COPY of original • Copy quality may vary (e.g., contrast, clarity)	N/A
Copy			N/A
Scan to electronic form		N/A	EXACT IMAGE of original • Scan quality may vary • Image encoded, data content not
Exchange Replication, where Source = Electronic Record			
TRANSIENT EXCHANGE ARTIFACT	[Now] Via “standard” message • e.g., HL7 v2/v3, ASTM, X12, NCPDP message	N/A	Content often transformed twice (in the course of exchange): • From original (source/sender) encoding to “standard” message • From “standard” message to destination (receiver) encoding
	[Next/Emerging] Via “standard” object • e.g., HL7 CDA R2 as transient document	N/A	Transformation variances may include: • Field format, syntax and length • Range of values • Data type: e.g., numeric, text, coded value, binary, image • Code and value set APPROXIMATE COPY of original content
PERSISTENT	[Ultimately] Via “standard” object • Digitally signed by source/author and persisting unaltered thereafter • e.g., HL7 CDA R2 as persistent artifact	N/A	EXACT COPY of original content

Method of Content Verification		Paper Record	Electronic Record
Manual, where Source = Paper			
Fax		[Human] Visual Inspection Upon receipt	N/A
Copy		[Human] Visual Inspection Comparing original to copy	N/A
Scan to electronic form		N/A	[Human] Visual Inspection Comparing original to scan
Electronic Exchange, where Source = Electronic Record			
TRANSIENT	[Now] Via “standard” message <ul style="list-style-type: none"> e.g., HL7 v2/v3, ASTM, X12, NCPDP message 	N/A	[Software] Automated verification?? Comparing fidelity of original to replicated content: BUT HOW? [Human] Visual Inspection, comparing source to replicated content
	[Next/Emerging] Via “standard” object <ul style="list-style-type: none"> e.g., HL7 CDA R2 as transient document 	N/A	Typically: Sampling and verification during trial runs and exchange testing Rarely: Routine sampling and verification at run-time
PERSISTENT	[Ultimately] Via “standard” object <ul style="list-style-type: none"> Digitally signed by source/author and persisting unaltered thereafter e.g., HL7 CDA R2 as persistent artifact 	N/A	[Software] Automated verification of digital signature(s) and/or fidelity of original to replicated content Thus computable assurance of source and source context (who, what, when, where), content authorship and attestation, persistence and non-alteration