

Laboratory-Clinical Communications

LCC Profile

IHE Laboratory Domain
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The Problem

- The traditional order-result paradigm does not include clinically-important workflow related to ordering and resulting
 - Recommending and accepting order modification
 - Requests and responses for result verification, clarification, interpretation, annotation (fulfillment)
- Occur on an ad hoc basis outside of systems, limiting documentation, decision support, process standardization, quality improvement
- Clinical lab context, but general applicability

Use Cases


- Order modification initiated by the lab
 - Laboratory-based decision support, utilization policies, clinical guidelines
 - Specimen problems
 - Reference laboratory problems
 - Time-out of “future orders”
- Order fulfillment (post-result actions) initiated by clinician
 - Results inconsistent with clinical picture (e.g., verification request)
 - Test interpretation
 - Incorrect testing
 - Annotation of results

LCC Long Proposal - wiki

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Proposed Work Item: Laboratory-Clinical Communications (LCC)

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Domain: Clinical Laboratory

Summary

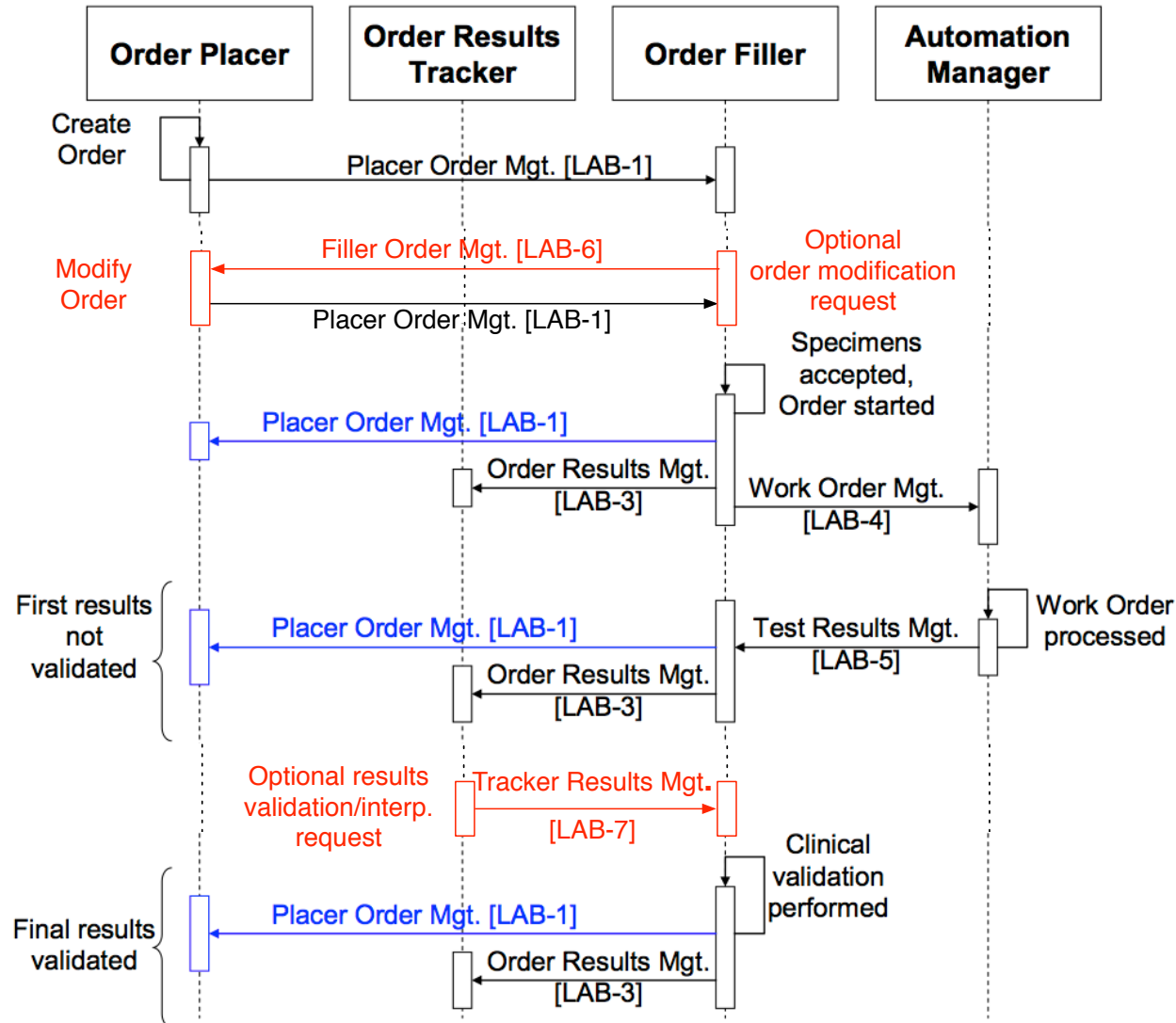
The communication and resolution of order modification, result verification, and result interpretation problems is an integral part of quality laboratory service but it is currently managed outside of information systems. Communications can be delayed or lost and correction of the immediate and systemic problems indicated by these communications is time consuming and error prone. This new profile will enable rapid, standardized, automated capture of and response to sample problems or result questions, and will allow this information to be logged, tracked, and included in QA studies and process improvement projects.

Two New Transactions

- Order modification
 - Information about the patient or specimen is available at the Order Filler that indicates orders should be changed for optimal care
 - Filler recommends changes to Placer
 - Based on existing order replacement mechanisms
- Result verification/interpretation/annotation
 - Result does not fully satisfy the clinical need, or conflicting information is available to the Placer
 - Placer requests follow-up or annotation from Filler
 - Mechanism TBD

Tentative LCC Implementation

(additions shown in red)



Order Modification Transaction Goals

- Communicate a rec. to add to, replace, or cancel existing clinical lab orders prior to resulting
 - Queue up recommended replacement orders
 - Do not constrain replacement orders
- Accommodate modification any time before resulting
 - At issue of order (immediate)
 - Prior to specimen receipt
 - After specimen receipt but before resulting
 - After shipment to reference lab, but before resulting
- Single recommendation event per order
- Consistency with and fully optional in current IHE LTW (and possibly ILW) profile: HL7 2.5.1, no changes in existing communication flow

Order Modification Transaction Strategy

- Based on unsolicited order update transaction; OML O21, O33, O35
- Filler sends recommended order modification message to Placer
 - Original orders to be modified
 - Control Code 'RP' for replacement (ORC-1); 'CA' if no replacement, 'NW' if add only
 - Placer and filler order numbers (ORC-2 and -3)
 - Status 'HD' (ORC-5, code in HL7 but not current LTW?)
 - Reason for replacement (ORC-16, may use new codes) and NTE following ORC/OBR
 - Hold timeout (ORC-27, filler's expected availability date/time)
 - Must include OBR segments
 - Replacement orders
 - Control Code 'RO' for replacement orders, may carry additional reason in ORC-16
 - Replacements do not carry order numbers
 - OBR segments?
- Placer response is via return of the "unsolicited" order update
 - Acknowledgement of recommendation in ORC-16 secondary identifier in replaced orders (ORC-16.4-.6); link response to recommendation event?
 - Control code 'UM' in orders that are not replaced
- If UM response or hold timeout is reached without response, processing continues as now (loose coupling of recommendation and response)
- To do: communicate whether additional specimen(s) are needed

Table 3.5-1: ORC Segment

SEQ	LEN	DT	Usage	Card.	TBL #	ITEM#	Element name
1	2	ID	R	[1..1]	0119	00215	Order Control
2	22	EI	C	[0..1]		00216	Placer Order Number
3	22	EI	C	[0..1]		00217	Filler Order Number
4	22	EI	RE	[0..1]		00218	Placer Group Number
5	2	ID	C	[0..1]	0038	00219	Order Status
6	1	ID	O	[0..1]	0121	00220	Response Flag
7	200	TQ	X	[0..0]		00221	Quantity/Timing
8	200	EIP	C	[0..1]		00222	Parent
9	26	TS	R	[1..1]		00223	Date/Time of Transaction
10	250	XCN	RE	[0..*]		00224	Entered By
11	250	XCN	RE	[0..*]		00225	Verified By
12	250	XCN	O	[0..1]		00226	Ordering Provider
13	80	PL	O	[0..1]		00227	Enterer's Location
14	250	XTN	O	[0..2]		00228	Call Back Phone Number
15	26	TS	O	[0..1]		00229	Order Effective Date/Time
16	250	CE	O	[0..1]		00230	Order Control Code Reason
17	250	CE	C	[0..1]		00231	Entering Organization
18	250	CE	O	[0..1]		00232	Entering Device
19	250	XCN	O	[0..*]		00233	Action By
20	250	CE	X	[0..0]	0339	01310	Advanced Beneficiary Notice Code
21	250	XON	O	[0..1]		01311	Ordering Facility Name
22	250	XAD	O	[0..1]		01312	Ordering Facility Address
23	250	XTN	O	[0..1]		01313	Ordering Facility Telephone Number
24	250	XAD	O	[0..1]		01314	Ordering Provider Address
25	250	CWE	X	[0..0]		01473	Order Status Modifier
26	60	CWE	X	[0..0]	0552	01641	Advanced Beneficiary Notice Override Reason
27	26	TS	C	[0..1]		01642	Filler's Expected Availability Date/Time
28	250	CWE	O	[0..1]		00615	Confidentiality Code
29	250	CWE	RE	[0..1]		01643	Order Type
30	250	CNE	O	[0..1]		01644	Enterer Authorization Mode
31	250	CWE	X	[0..1]		02286	Parent Universal Service Identifier

* RP CA RO UM
 *
 *

* HD (R)

Reason:
 Primary and
 secondary
 identifiers (R);
 CWE in 2.6

* Timeout (R)

4.5.1.16 ORC-16 Order Control Code Reason (CE) 00230

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^
<Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate
Coding System (ID)>

Definition: This field contains the explanation (either in coded or text form) of the reason for the order event described by the order control code (*HL7 Table 0119*). Whereas an NTE after the order-specific segment (e.g., RXO, ORO, OBR) would provide a comment for that specific segment, the purpose of the order control code reason is only to expand on the reason for the order event.

—HL7 2.5.1 Ch. 4

4.5.1.16 ORC-16 Order Control Code Reason (CWE) 00230

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^
<Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate
Coding System (ID)> ^ <Coding System Version ID (ST)> ^ <Alternate Coding
System Version ID (ST)> ^ <Original Text (ST)> ^ <Second Alternate
Identifier (ST)> ^ <Second Alternate Text (ST)> ^ <Name of Second
Alternate Coding System (ID)> ^ <Second Alternate Coding System Version ID
(ST)> ^ <Coding System OID (ST)> ^ <Value Set OID (ST)> ^ <Value Set
Version ID (DTM)> ^ <Alternate Coding System OID (ST)> ^ <Alternate Value
Set OID (ST)> ^ <Alternate Value Set Version ID (DTM)> ^ <Second Alternate
Coding System OID (ST)> ^ <Second Alternate Value Set OID (ST)> ^ <Second
Alternate Value Set Version ID (DTM)>

Definition: This field contains the explanation (either in coded or text form) of the reason for the order event described by the order control code (*HL7 Table 0119 - Order control codes*). Whereas an NTE after the order-specific segment (e.g., RXO, ORO, OBR) would provide a comment for that specific segment, the purpose of the order control code reason is only to expand on the reason for the order event.

—HL7 2.7 Ch. 4

Order Modification Message

General Structure

```
MSH|...|OML^021|...  
...                5                16                27  
ORC|RP|<placer #>|<filler #>||HD|||...|<reason><prior rec>|...||<timeout>|...  
OBR|...  
NTE|...|<explanation and decision support>  
ORC|CA|<placer #>|<filler #>||HD|||...|<reason><prior rec>|...||<timeout>|...  
OBR|...  
NTE|...|<explanation and decision support>  
ORC|RO|||.....|<reason><prior rec>|...  
OBR|...  
NTE|...|<explanation and decision support>  
ORC|RO|||.....|<reason><prior rec>|...  
OBR|...  
...
```

Placer Order Process with Modification Recommendation

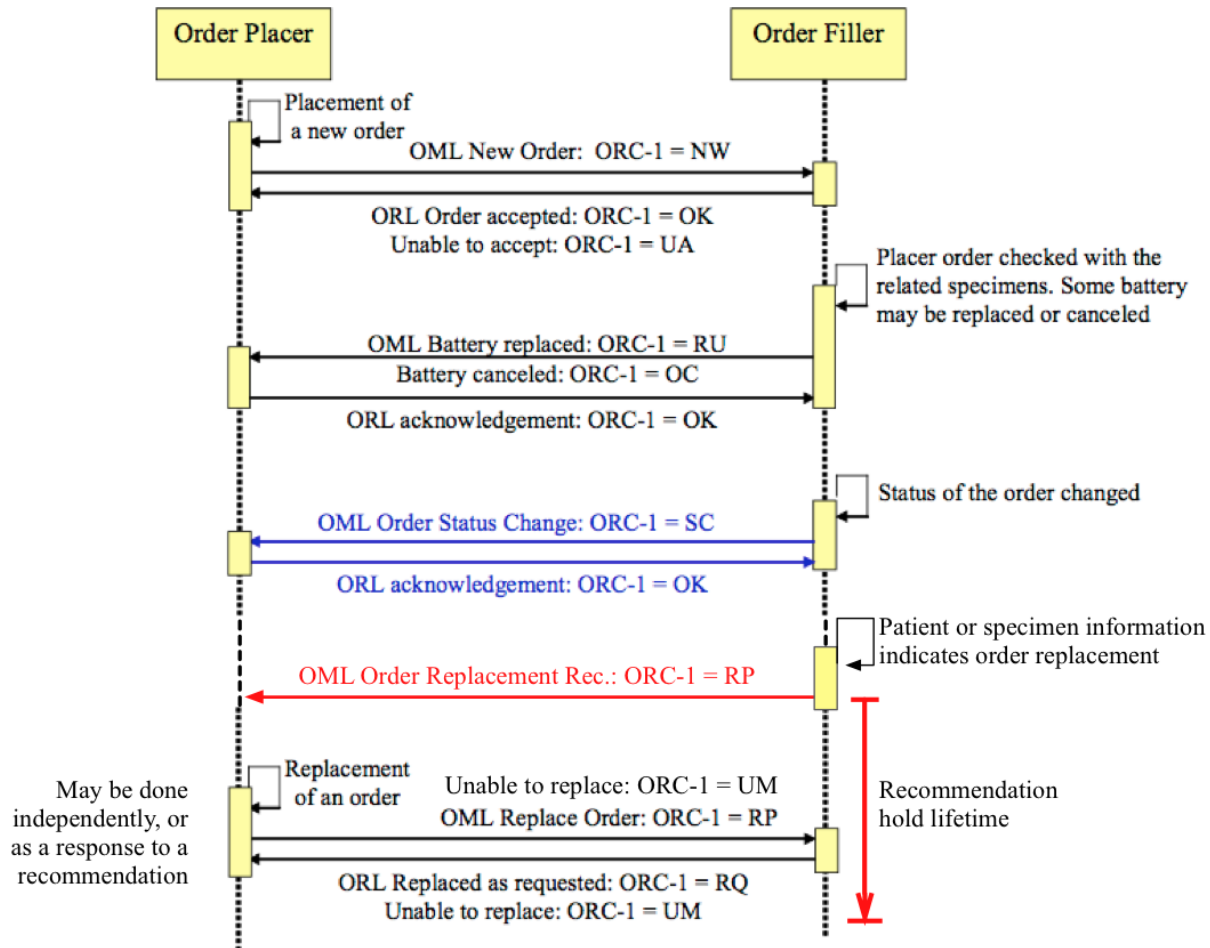
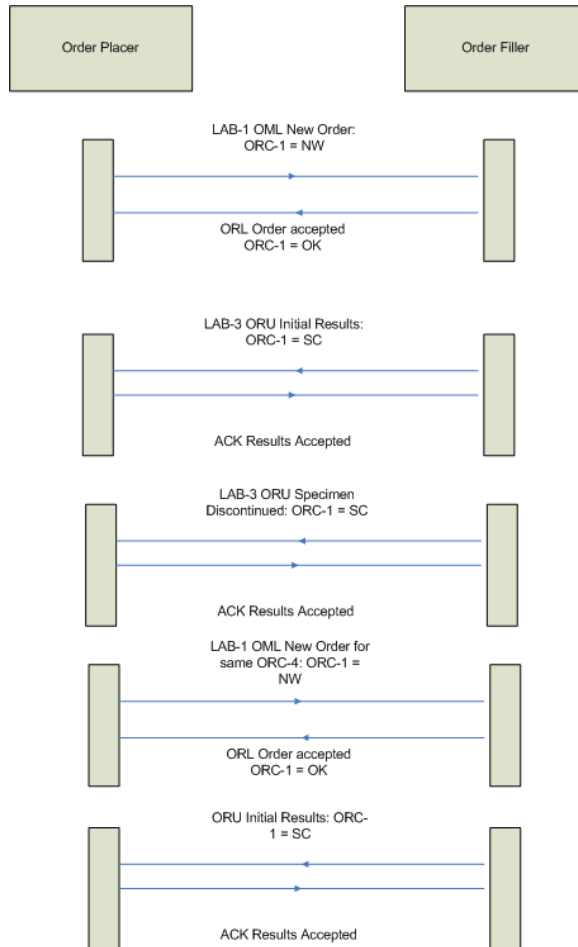


Figure 4.4.1-1: Normal process of a placer order

Use Case Verification: Order Mod

- Specimen damage, inappropriate specimen, or inadequate volume requiring discretionary change
 - Order replacement request from LIS to EMR:
 - Original test listing: RP
 - Testable orders with “guessed” priority: RO
 - Includes reason for request, additional description can be in an optional NTE after the ORD
 - Alerts to the need to issue a follow up order with another sample
 - Order update from EMR to LIS:
 - Allows clinician to confirm or re-prioritize
 - Replacement reasons & recommendation doc in ORC

Specimen Problem Alternative (Filip)



- Order placed
- Problem; lab decides tests
- Partial results returned
- Specimen discontinued; alerts to need for follow up
- New order placed with new specimen
- Results returned

Use Case Verification: Order Mod

- Clinically inappropriate order based on in-lab information
 - Order replacement request from LIS to EMR:
 - Original test listing: RP or CA
 - Laboratory recommended replacement orders: RO
 - Reasons for replacement recommendation
 - May include additional decision support in an optional NTE segment following the OBR
 - Order update from EMR to LIS:
 - Allows clinician to confirm, deny, or choose other tests
 - Replacement reasons & recommendation doc in ORC

Use Case Verification: Order Mod

- Future orders that time-out
 - Order replacement request from LIS to EMR:
 - Original test listing: RP
 - Repeat original listing: RO
 - Order update from EMR to LIS:
 - Physician may re-order or cancel
 - Reason for replacement is time out without specimen

Use Case Verification: Order Mod

- Clinically evident missing or erroneous data in original order
 - Order replacement request from LIS to EMR:
 - Original test listing: RP
 - Repeat listing with missing or problematic data: RO
 - Includes reasons for replacement in the ORC
 - Data requirements or problematic data may be included in an optional NTE segment following the OBR
 - Order update from EMR to LIS:
 - Allows clinician to correct or add data as appropriate
 - Replacement reasons & recommendation doc in ORC

Use Case Verification: Order Mod

- Specimen damage, inappropriate specimen, or inadequate volume at reference laboratory
 - Possibly use in both ILW and LTW
 - Ref lab order replacement message from refLIS to LIS
 - Original test listing: RP, CA
 - Testable orders with “guessed” priority: RO
 - Order replacement message from LIS to EMR:
 - Original test listing: RP
 - Testable orders with “guessed” priority: RO
 - Order update from EMR to LIS:
 - Allows clinician to confirm or re-prioritize
 - Alerts to the need to issue a follow up order with another sample

Issues

- Is the general approach of essentially creating a recommended update message for the Placer system reasonable?
- Is control code RP optimal? Would XO (change order/service request) be more appropriate? (*HL7 O&O likes RP*)
- Is the ORC-16 secondary identifier the right location for a change recommendation acknowledgement? (*HL7 O&O likes it*)
- Development of a set of recommendation reason codes that could be used in ORC-16 primary & secondary ID (*HL7 O&O concurs*)
- Is a defined recommendation timeout the best way to handle the loose coupling between recommendation and response? Is ORC-27 appropriate for this value? (*OK with HL7 O&O*)
- Linkage of order updates to specific recommendations?
- Specimen management needs to be addressed.
- Should there be a pathway to fold LCC into ONC LOI in the future? If so, what's the best way to plan for that and coordinate LCC to LOI?