



# HL7 FHIR®

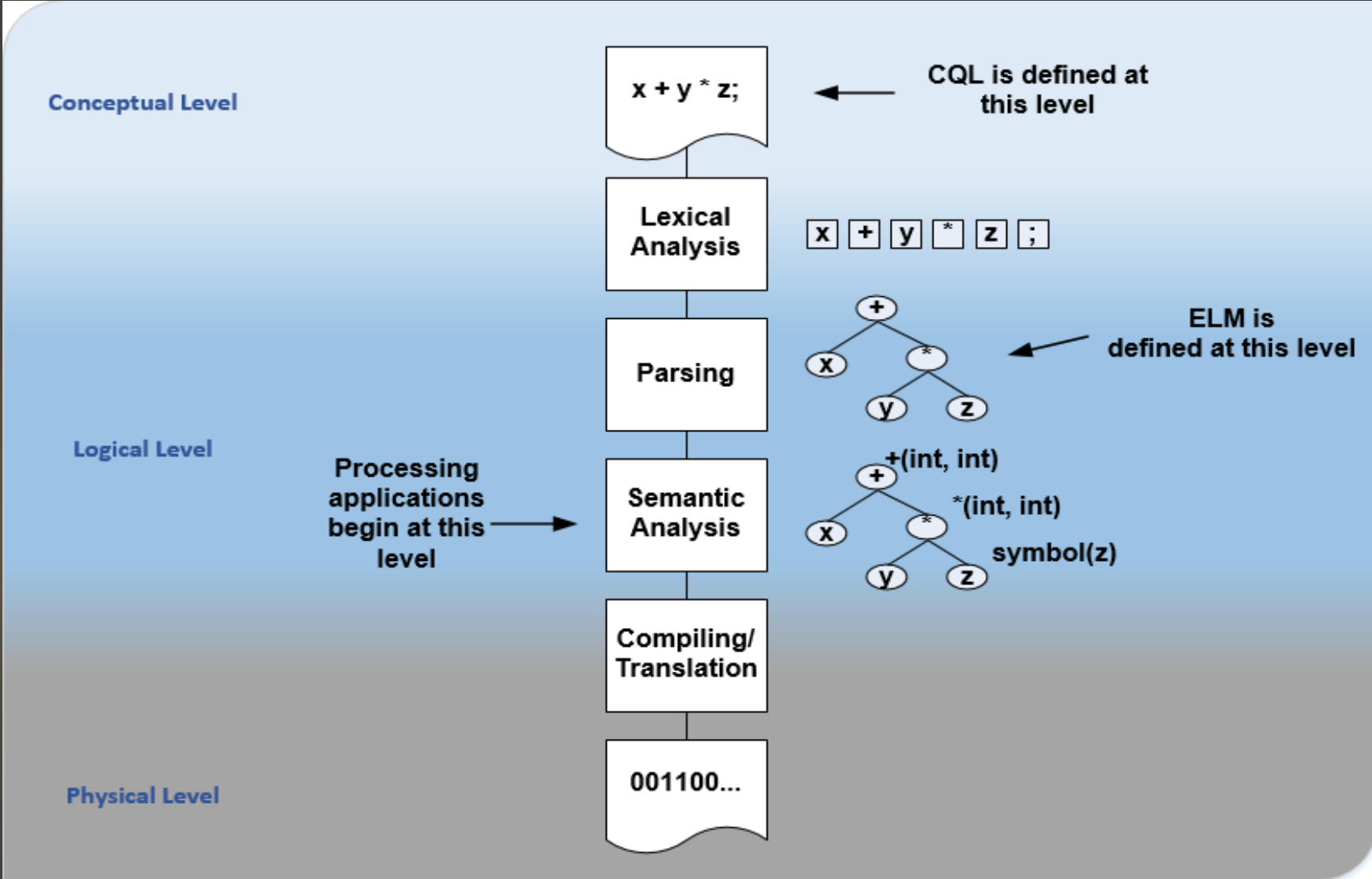
## CQL - CDS Hooks

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# Clinical Quality Language (CQL)

- ▶ CQL Layers
  - ▶ Author View – Artifact authors view, ANTLR4
  - ▶ Logical View – Logical representation of expression logic, UML
  - ▶ Physical View – Physical representation of expression logic, ELM
- ▶ Represent knowledge artifacts with consistent semantics from human-readable to machine-readable
- ▶ Example - HEDIS quality measures represented in CQL



# CDS Hooks - Closing the Loop

- ▶ Triggering FHIR and SMART based application within an EHR - <http://cds-hooks.org/>
- ▶ Triggering events
  - ▶ **patient-view** when opening a new patient record
  - ▶ **medication-prescribe** on authoring a new prescription
  - ▶ **order-review** on viewing pending orders for approval
- ▶ Retrieve FHIR data -
- ▶ Response
  - ▶ *Information card, suggestion card, app link card*



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EHR triggers a CDS hook

**EHR Med Order**

**R<sub>x</sub>** Toprol XL  
50 mg daily

2 CDS Cards & CDS Decisions 4  
(displayed in EHR) & (automatically applied)

information card

\$200 per month  
(patient pays \$30)

suggestion card

Try HCTZ as first-line

Switch to HCTZ

app link card

Managing hypertension?  
Launch JNC 8 Rx Pro

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User reads,  
runs apps,  
and **decides**.

decision

```
[{  
  delete: ...,  
  create: ...,  
}]
```

# Opportunities with FHIR

## CDS – CQL – CDS Hooks

- ▶ Externalization and workflow interoperability of clinical knowledge and decision support
- ▶ Greater transparency in outcome measure development, data aggregation and reporting
- ▶ Directly linking best practices (clinical practice guidelines, care pathways and protocols) decision support and outcome measures
- ▶ Towards a Learning Health System