ASCO’s CancerLinQ®: Using real-world evidence for discovery

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2nd Annual Cardio-Oncology Workshop:
Assessment of Cardiovascular Toxicities in Immuno-Oncology Trials

Session 6. From big data to smart data for identification of cardiovascular toxicities in post-marketing

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ASCO & CancerLinQ

- Leading professional organization representing physicians caring for those with cancer
- >44,000 members from 100+ countries
- Mission: Conquering cancer through research, education, and promotion of the highest quality patient care

- Not-for-profit subsidiary of ASCO
- Dedicated staff and governing board
- Mission: Empowering the oncology community to improve quality of care and patient outcomes through transformational data analytics
Getting to the data

\[1.7^{\text{MM}}\] people diagnosed with cancer in the US

97% of patient data locked away in unconnected files and servers
What if…

We could bring all the electronic data that is collected from the everyday care of every cancer patient into one rapid learning network?
CancerLinQ milestones

IOM releases vision for rapid learning health system in oncology

2010

Technology co-innovation agreement signed w/ SAP

2015

>100 practices signed to participate

2017

CancerLinQ prototype completed

2013

1st CancerLinQ practice goes live

2016
Unlock, assemble, and analyze de-identified cancer patient medical records

Uncover patterns to generate knowledge

Provide guidance by identifying the best evidence-based course of care

Measure and benchmark quality of care
Key functions & capabilities

**Quality performance indicators:** real-time clinical quality metrics, prospective opportunities to improve performance

**CancerLinQ Insights:** cohort creation & data exploration for trends from the aggregated, de-identified database

**Visualized timeline:** a longitudinal view of oncologic milestones in a patient’s clinical event history, to construct a patient’s story

**Powerful analytic reports:** suite of analytic reports for quick observations and insights of the practice patient population at a glance
CancerLinQ progress to date

- **113** practices/cancer centers
- **29** implementations in progress
- **39** active sites
- **12** source systems represented
- **~2,500** oncologists
- **~600K** active cancer patient records
How CancerLinQ works

1. Data from your practice are put into CancerLinQ via a daily feed that originates from source systems at your practice. There is no data entry required by practice team members.

2. CancerLinQ ingests and processes the identifiable data at the individual patient level.

3. CancerLinQ uses statistical methodologies to de-identify data included in aggregate data sets.

4. Powerful data analytics tools, parameterized reports, and Quality Performance Indicators are made available to the practice and accessible via a standard Web browser via a secure Web connection.
What is real-world evidence?

REAL-WORLD DATA (RWD)
- Consumer data
- Social media
- Claims databases
- Mortality, other registries
- Test results, lab values, pathology results
- Hospital visits, service details
- Pharmacy data
- Pharma data (RCT, observational)

Electronic medical and health records

Meaningful questions
- Fit-for-purpose data & analytics
- Externally validated findings

REAL-WORLD EVIDENCE (RWE)
Real-World Evidence as a capability—data, tools, processes, organization—underpinning several functions to drive business intelligence.
What is CancerLinQ Discovery™?

An extension of CancerLinQ’s QI-focused database designed to support hypothesis-based research

1. Key structured data elements → additional editorial/curation effort to ensure that those data elements exist in a canonical form
2. Uses natural language processing and manual curation to extract additional data from unstructured data
3. Initial area of focus: non-small cell lung cancer
4. Third parties can submit data requests to the CancerLinQ Discovery Research & Publications Committee for approval
Using CancerLinQ for RWE-driven research

- Hypothesis generation from observational data, e.g., off-label use, risk stratification
- Patterns of care
- Post-market toxicity assessment ★
- Cohort identification, frequency of target population*
- Cohort assembly, location of target population*
- Registry-driven randomized clinical trials
- Comparative effectiveness research
- Collection of patient-reported outcomes

(*use case – clinical trials facilitation)
RWE to gain insights re CV toxicity of IO

Search for diagnostic codes (ICD9/10) - timing

- Myocarditis
- Cardiomyopathy/CHF
- Pericarditis, etc.

Search for biomarkers

- Troponin T or troponin I
- CK-MB
- BNP/NT-proBNP
- AST or LDH (non-specific in ca population)

Search for new drugs

- ACE inhibitors
- Beta blockers
- Diuretics