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

December 1, 2017

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

Robert S. Miller MD, FACP, FASCO
American Society of Clinical Oncology
Vice President and Medical Director
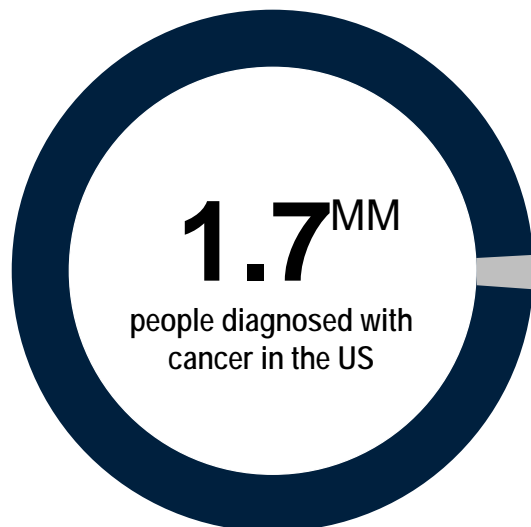**CancerLinQ**

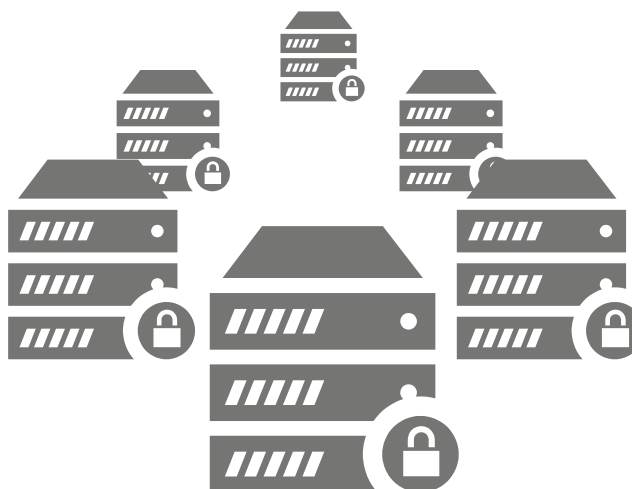CANCER·LINQ

ASCO & CancerLinQ

- Leading professional organization representing physicians caring for those with cancer
- \>44,000 members from 100+ countries
- Mission: Conquering cancer though 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
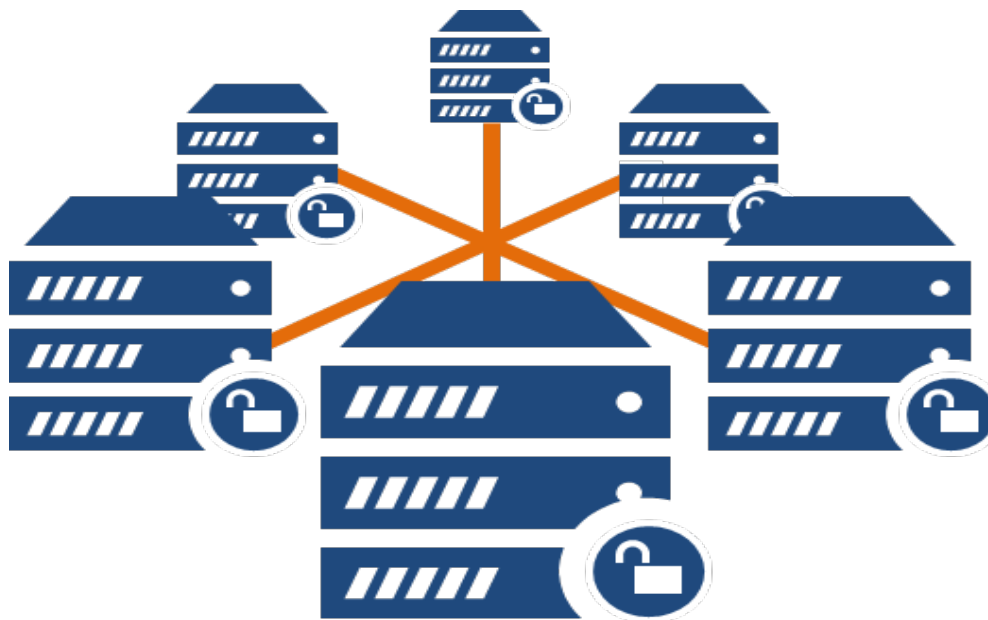
Getting to the data

1.7MM

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 every day care of every cancer patient into one rapid learning network?

CancerLinQ milestones

IOM releases vision for rapid
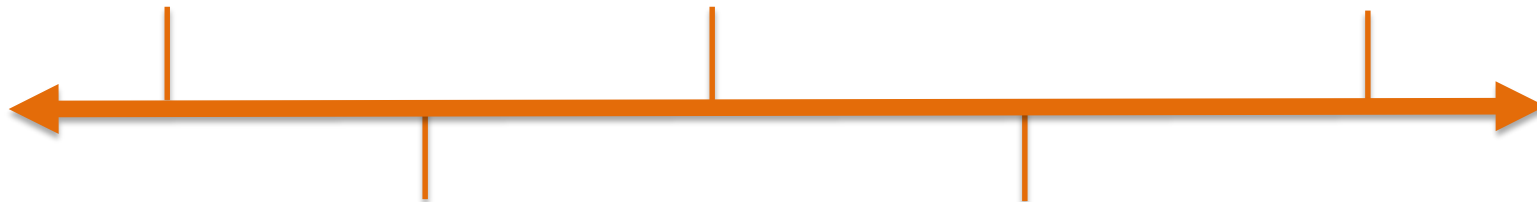learning health system in oncology

2010

Technology co-innovation
agreement signed w/ SAP

2015

>100 practices signed to participate

2017

2013

CancerLinQ prototype completed

2016

1st CancerLinQ practice
goes live

QI — Measure and benchmark quality of care

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

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

Research — Uncover patterns to generate knowledge

ASCO CANCER LINQ™
Learning Intelligence Network for Quality

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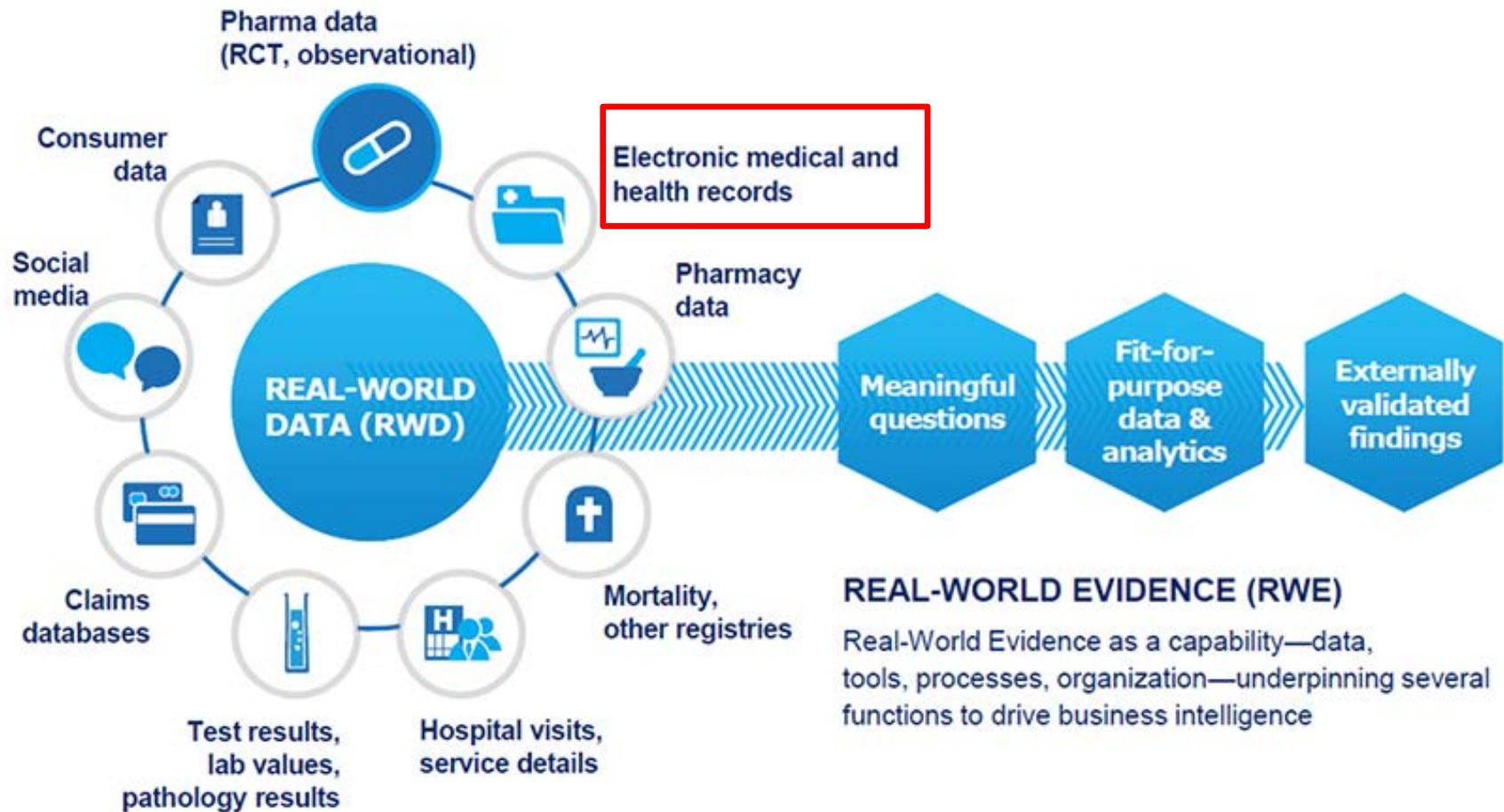
3 CancerLinQ uses statistical methodologies to de-identify data included in aggregate data sets.

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?

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