

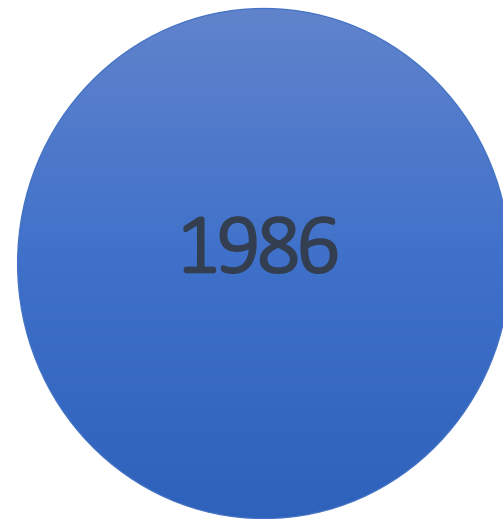


## Using “Big Data” in Cancer to Improve Care and Accelerate Learning

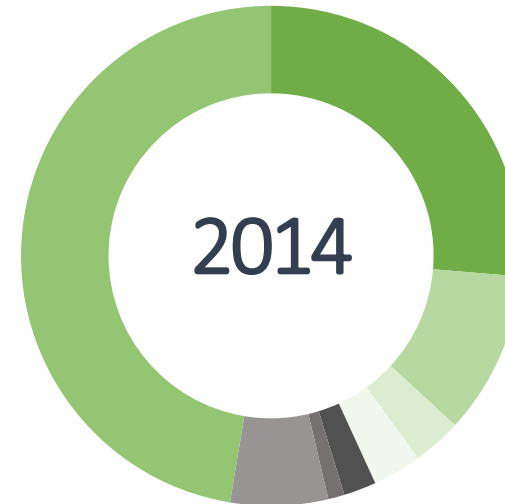
Allen Lichter, MD  
Former ASCO CEO  
Board Member of CancerLinQ

# Lung cancer: from one cancer to many

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Three diseases

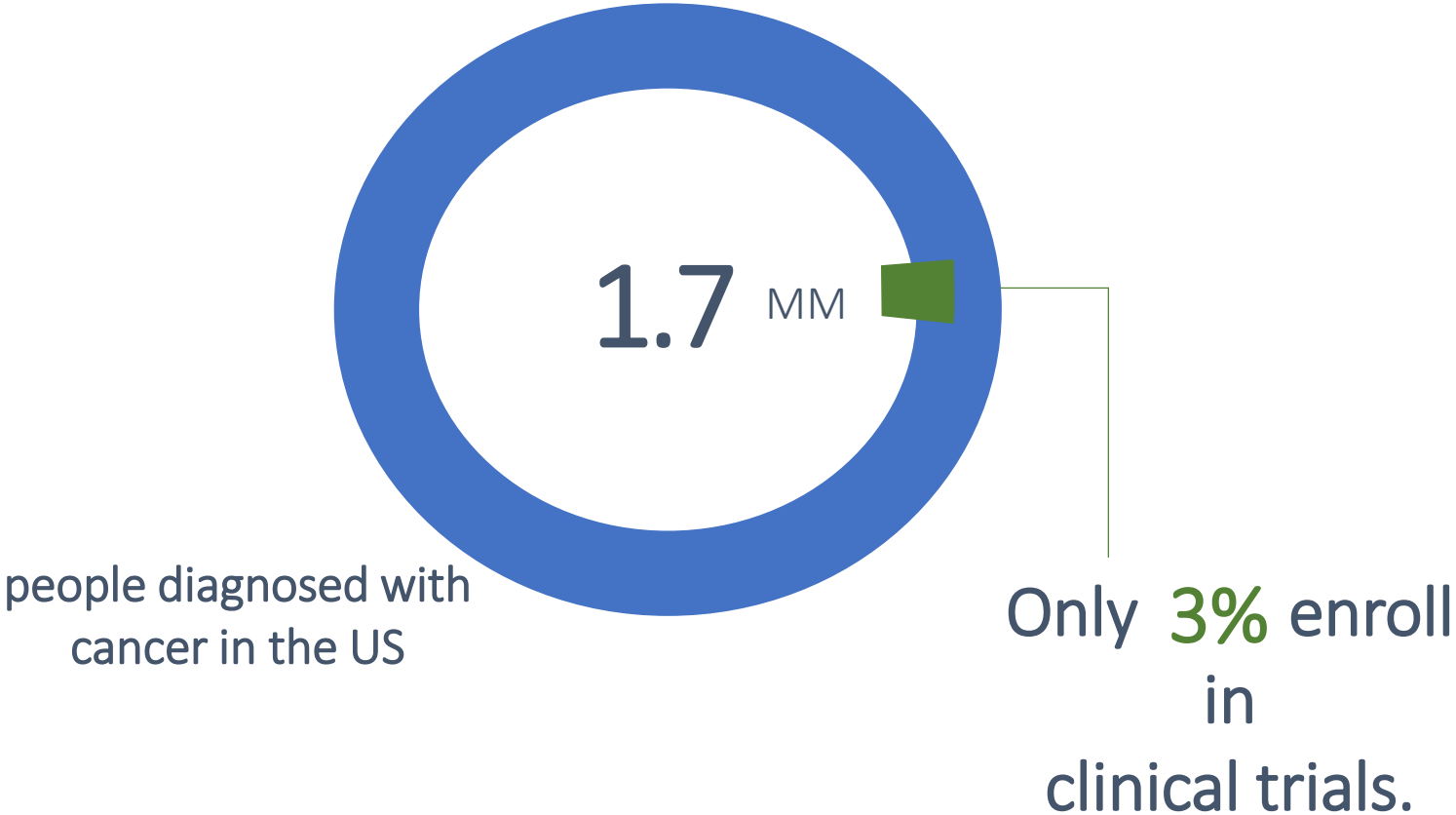


Multiple molecular drivers—and more to be discovered

- KRAS
- EGFR
- BRAF
- PIK3CA
- AKT1
- HER2
- EML4-ALK
- Unknown



# The Oncology Knowledge Base





# Current State of CLQ

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- 1,600,000 individual patient records
- 73 participating institutions
- > 2000 Oncologists
- > 100 institutions in the pipeline
- Onboarding one health system per week
- Collaborations with major health systems
  - UVA Health System
  - Intermountain Healthcare
  - Vanderbilt University Medical Center
  - Case Western
  - Rush University Medical Center
  - Catholic Health Initiatives
  - Sanford Health



# Current State of CLQ

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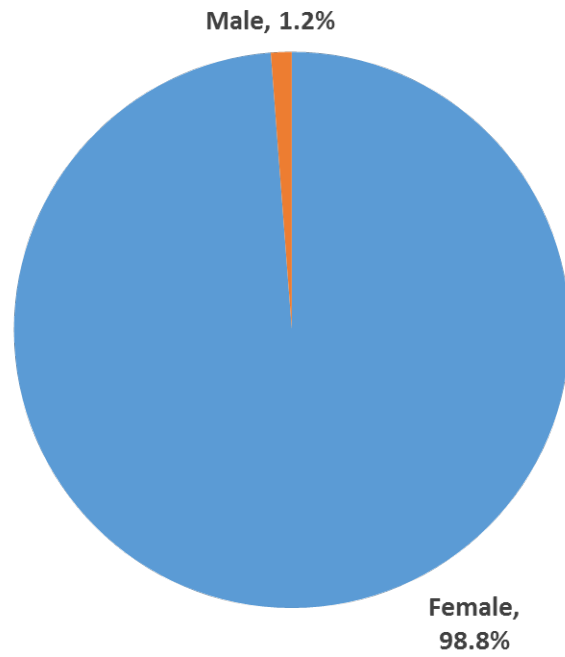
## **Interfaces with a wide variety of EHR systems:**

1. MosaiQ
2. Varian
3. Epic via Data Warehouse
4. Epic via CDA
5. I Know Med via CDA
6. IntrinsicQ
7. GE Centricity
8. All Scripts – Sunrise Clinical Manager (SCM)
9. OncoEMR

## **Interfaces in development:**

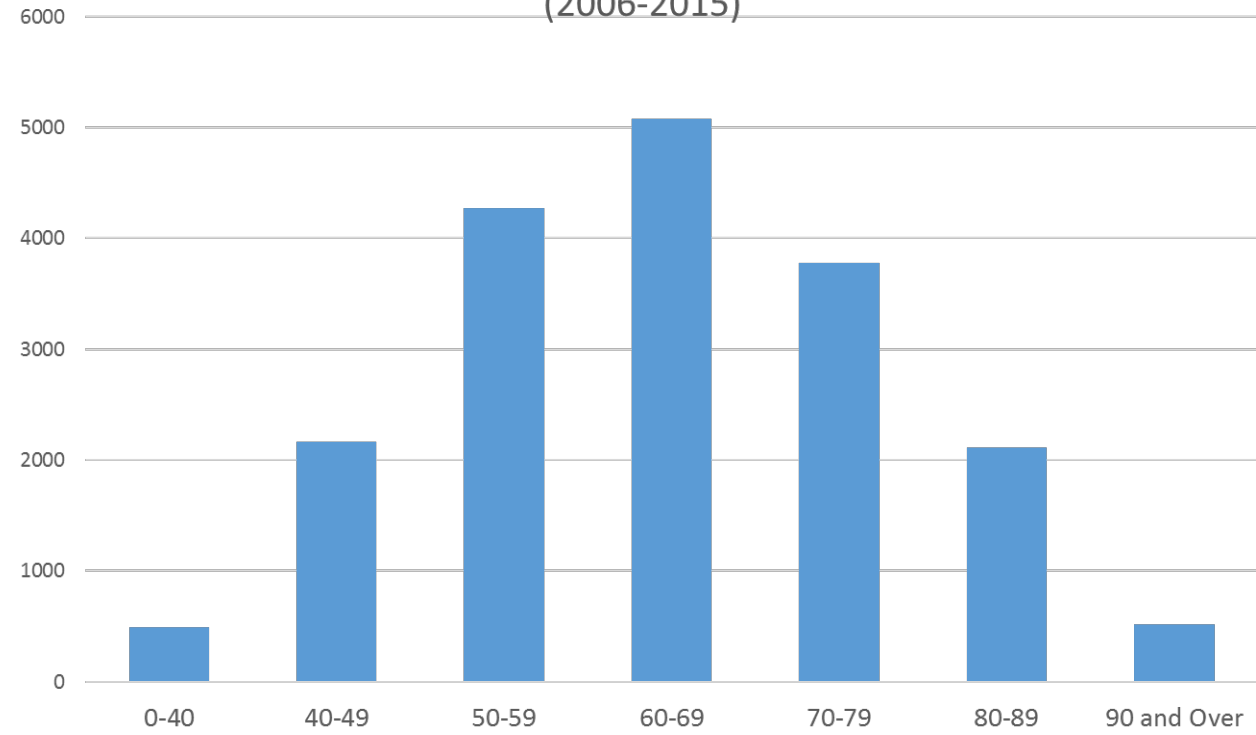
Next Gen  
MosaiQ Hosted  
Varian Hosted  
Cure MD

Proportion of Breast Cancer Patients by Gender (2006-2015)



N = 18420 Patients

Distribution of Breast Cancer Patients by Age Group (2006-2015)



# Data Quality

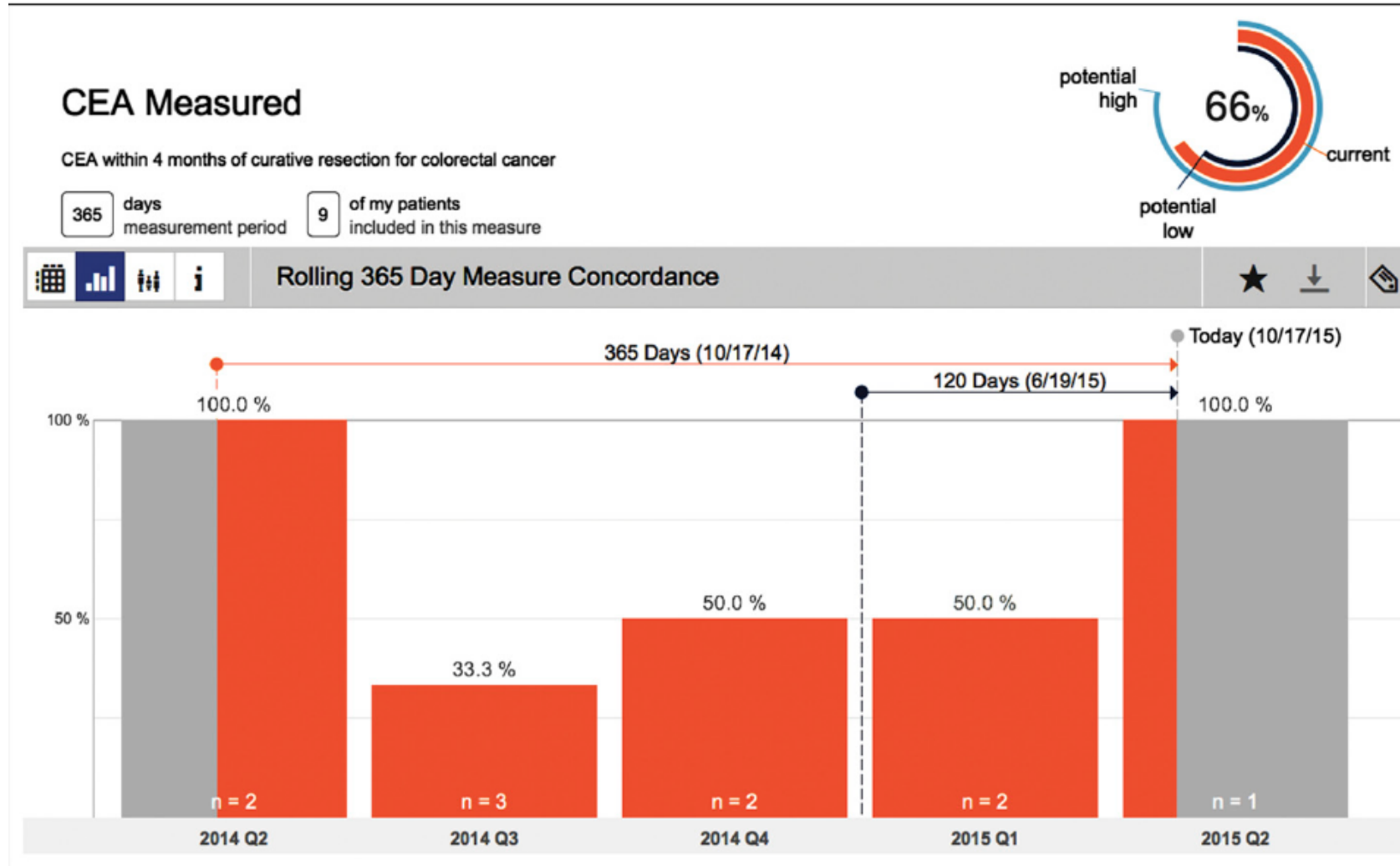
- Just over 1M reported patients have >800M reported clinical events (observations, lab, imaging, medication orders, medication administration, etc.)
- Yet there are numerous missing data elements
  - Example: Estrogen receptor status in breast cancer is reported ~100% when we use manual chart abstraction and barely 50% when we look for it as a structured data element
- There are key pieces of data sitting in unstructured data (notes, reports, PDFs, etc)
- Digging these data elements out is going to be a key challenge for us

# CancerLinQ Collects PHI

- Resolve the identity of individual patients to create a longitudinal patient record.
- Develop clinically relevant quality analytics capable of determining which individual patients are “actionable”.
- Collect unstructured data to capture insights from clinical notes, pathology reports, imaging studies, etc.
- Display individual patient records in a manner not currently available in current EHR systems.
- The PHI is then de-identified and can be used to accelerate our learning about what works and what doesn't.



# CLQ is First and Foremost a Quality Program

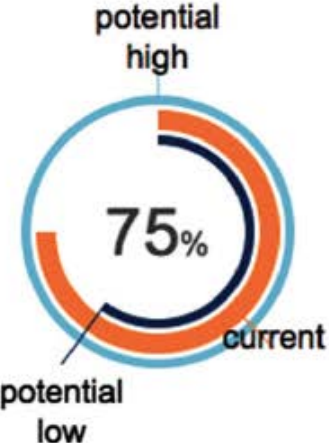


# More Than a “Gotcha” Quality Program

## Color Colonoscopy

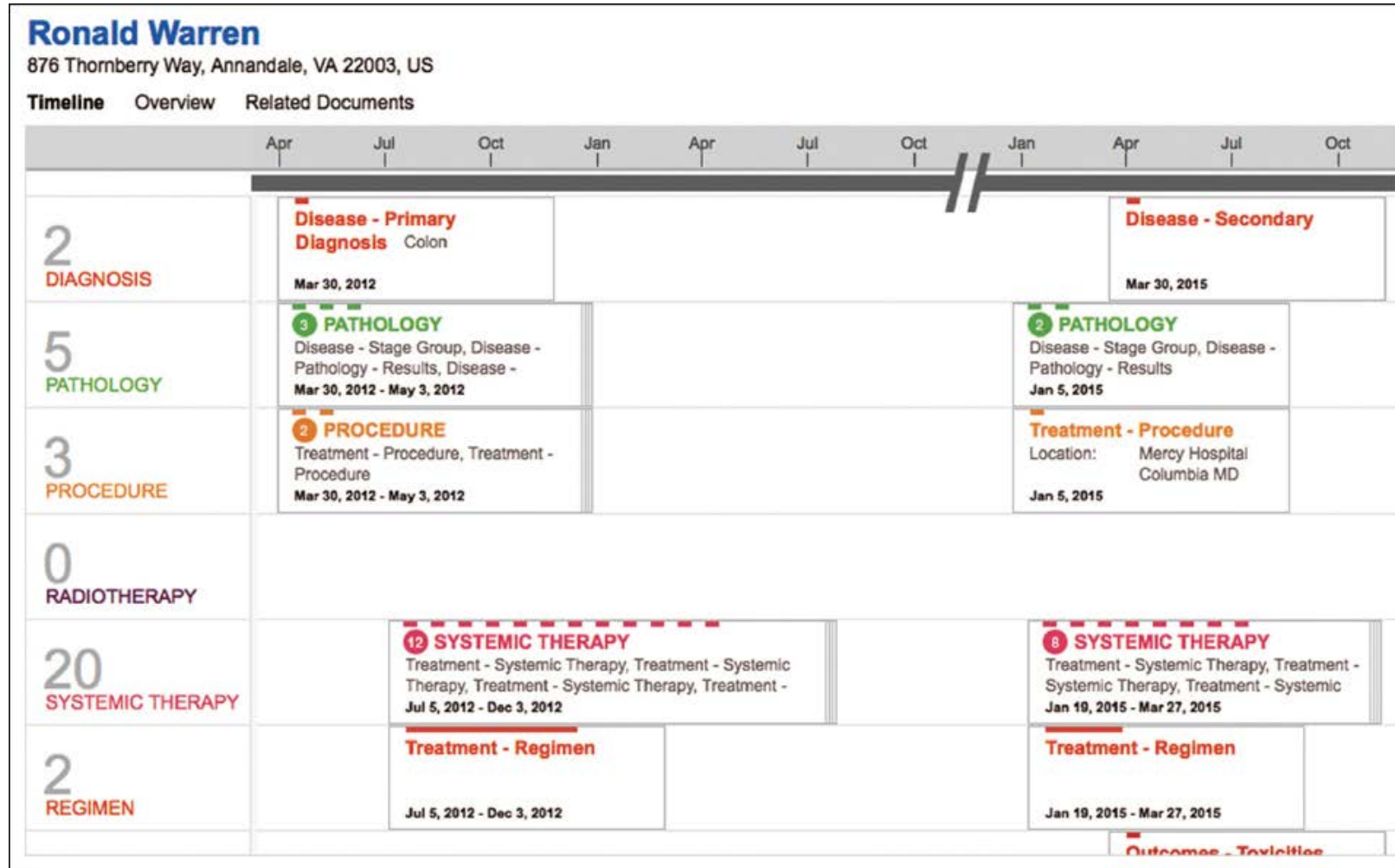
Colonoscopy before or within 6 months of curative colorectal resection or completion of primary adjuvant chemotherapy

365 days measurement period      8 of my patients included in this measure



Firstname	Lastname	Date of Birth	Gender	Diagnosis	Date of Diagnosis	Notes
<b>PATIENTS IN ACTIONABLE TIME FRAME</b>						
BYRON	Ortiz	2/24/1920	M	Colon	3/29/2015	(0)
MORGAN	O'Doherty	5/3/1962	M	Rectal	11/10/2014	(0)
<b>NON CONCORDANT PATIENTS</b>						
FERNANDO	Carr	4/28/1966	M	Rectal	4/5/2014	(0)

# Improving Care Through Data Presentation



# Summary

- CancerLinQ is launched and running.
- Well over 1M cases have been accessioned into our system to date.
- The response of the physician community as well as the patient community has been very gratifying.
- The multiplicity of EHR systems and their lack of interoperability costs us lots of time and many dollars to overcome
- Data quality is an issue that we will wrestle with for a long time.
- We are excited to continue this journey.