



# BIG DATA AND THE PHYSICIAN

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# Kaiser Permanente Oncology Program

- 10 million Members
- 7 Regions- NCAL, SCAL, NW, HI, CO, GA, MAS
- 38 Hospitals
- 63 Oncology Clinics
- 700 Oncologists

# Beacon Oncology Program

Utilizes EPIC electronic medical record

Ambulatory- Live since 2008

Inpatient- Live since 2013

37,767 Outpatients Treated in 2014

Beacon- standardized protocols built nationally

Adherence: >85% Protocols used unchanged

# KAISER OUTCOMES vs SEER

## Relative Five Year Survival Rates 2003-2009

CANCER	KP-SCAL	SEER
Bladder	82.5%	77.9%
Breast, including Non-invasive	95.7%	No comparison
Breast	93.8%	89.2%
Cervix	78.4%	67.9%
Colorectal including Non-invasive	77.1%	No comparison
Colorectal Invasive	75%	64.9%
Esophagus	20.3%	17.3%
Lung	20.7%	16.6%
Melanoma	93.6%	91.3%
Melanoma including Non-invasive	98%	No comparison
OroPharynx	75.4%	62.2%
Ovary	49.1%	44.2%
Pancreas	7.3%	6.3%
Prostate	100%	99.2%
Renal	80.8%	71.8%
Testis	97.5%	95.3%
Thyroid	98.4%	97.7%
Uterus	85.5%	81.5%

# Rapid Learning Health System

## What is Rapid Learning?

- We are often confronted with evidence that doesn't seem to agree with expectations we have in “real world” patients.
  - Randomized trials focus on groups of carefully selected patients to examine the effectiveness and safety of a new treatment.
- We access collected data from real-world experience through the EMR, learn (generate evidence), and feedback to practice.
- With larger databases, we can better understand how well new treatments work in our population.
- We've used Rapid Learning to answer questions about real world therapies in our oncology patients at Kaiser.

# Unexpected Febrile Neutropenia with TC

	KPNW Initial Review	Trial Patients	KPNW Follow-up Review
Number Patients	27	506	43
Primary prophylaxis with growth factor (excluded in 1 <sup>st</sup> review)	3/27 (11.1%)	Not Reported (Nil)	43
Incidence Febrile Neutropenia	6/24 (25%)	5% overall	1 (2.4%) during cycle 2
FN with documented infection	2/27 (7.4%)	Gr 3 and 4 approx 7%	0

# Incidence of FN associated with TC in NCAL

	Primary Prophylaxis	No Primary Prophylaxis
# of Patients (N = 332)	128	204
Unique Patients with ER Visit or Admission	<b>8.6% (11)</b> 95% CI (3.7%, 13.4%)	<b>24.5% (50)*</b> 95% CI (18.6%, 30.4%)
Admission Episodes	11	43
ER Visit Episodes	1	13

## Subsequent Published Article

- “Our data are consistent with those from [Yee, et al](#) that showed a significant difference in the rate of FN with (8.6%) or without (24.5%) primary prophylaxis during adjuvant TC chemotherapy
- TC without G-CSF is associated with unacceptably high FN rates in routine clinical practice. Prophylactic use of GF should be considered for adjuvant TC chemotherapy”

— Younis et al. Cancer Res;2011;71P5-20-04

G-CSF added to TC adjuvant protocols in Beacon



# Screening for Hepatitis B

- June 2013 ASCO poster – NCAL Kaiser Data
- Retrospective review 2000-2010
- 44,590 pts, 289 known HepBsAg +
- Hepatotoxicity ( NCI gr 3-4)
  - 14% with prophylaxis
  - 26% without prophylaxis
- 7 pts died of Fulminant Hepatitis B due to reactivation
  - 6 had lymphoma, 1 had NSCLC

# Hepatitis B

- Subsequently, a pt on adjuvant therapy for Breast CA, developed liver failure, found to be HepB +, required liver transplant
- November 2013 – Recommendation from Governance Group
  - Hepatitis B screening to be added to Beacon Treatment Protocols that are determined to have at least a 10% risk of neutropenia or lymphopenia
- 2014 Collaborative Build – HepBsAg and HepBcore AB added as baseline labs

# Responding to New Data

Keeping up with New Data / Shortages  
InterRegional Chiefs Governance Group  
Webinars  
Regional Subject Matter Experts  
Research Groups

Drug optimization, Clinical Effectiveness,  
Pharmacy Outcomes

# Next Steps

**Utilize our Data System to analyze outcomes and Build  
Decision Support into Beacon**

