

MID-ATLANTIC PERMANENTE Research Institute

Continuity of Care: Tracking Patients Across Health Plans and Clinical Settings

Basic Information and Some Examples of Applications

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May 9, 2016

Disclosures

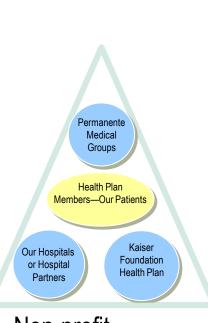
- I am an employee of Kaiser Permanente
 - All opinions expressed are my own
 - But I do think we (KP) do a pretty darn good job at this!
- I will not be discussing any medications during my talk
 - Except to say that most are too expensive and pharma needs to lower their prices!
- I am not a health informaticist!

Setting the Stage

- 1. Describe Kaiser Permanente
 - a) Nationally
 - b) Kaiser Permanente Mid-Atlantic States (where most of my examples come from)
- 2. Our data systems
 - a) The "front end"—what our health care system professionals and patients see
 - b) The "back end"—and how we can make it all fit together data-wise
- 3. How the data systems mesh together
 - a) Within KP
 - ³ b) With multiple systems

Kaiser Permanente (KP)

- Our Mission: To provide high-quality, affordable health care services and to improve the health of our members and the communities we serve
- Integrated delivery system (hospitals, clinicians, pharmacies, lab, x-ray, etc.) and financing
- Operates like a mini-"national health system"
 - Single funding stream with global budget
 - Accountable for total health of a population



- Non-profit
- Prepaid
- Integrated
- Caring for our communities

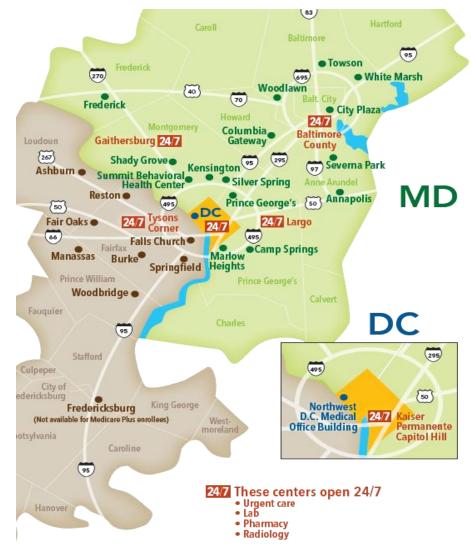
KP defines the integrated model of health care financing and delivery through its unique partnership among hospitals, health plan, and medical group: *contractual* and *exclusive*



Kaiser Permanente is one of the nation's largest notfor-profit health plans, serving over 10 million members in eight states and the District of Columbia

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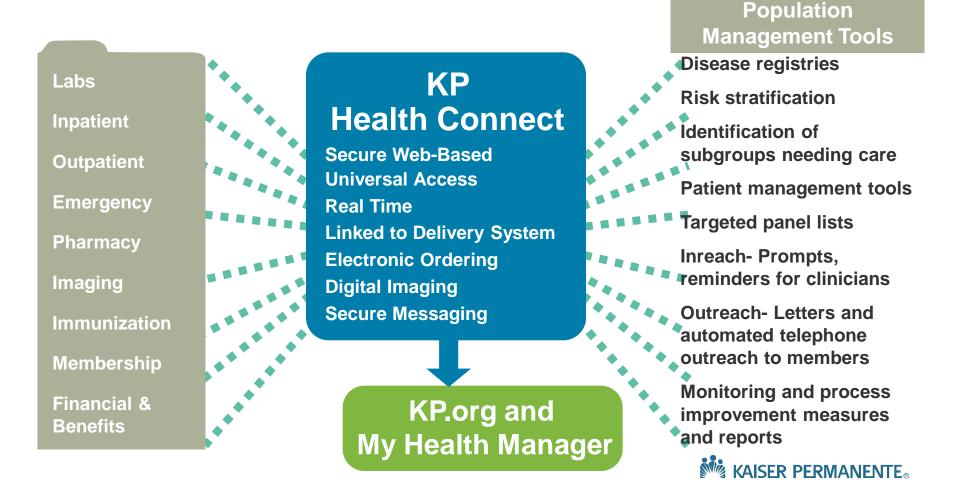
Fast Facts: KP Mid-Atlantic



- Cover much of Maryland, Washington, DC, and Northern Virginia
- >670,000 members
- Over 1,300 Mid-Atlantic Permanente Medical Group physicians
- About 6,000 employees
- 30+ medical facilities
 - Hub and spoke → 5 hubs
- Core hospitals at which KPMAS physicians directly care for members
- 24 hours / 7 days / 365 days care available
- Fully supported by Comprehensive electronic health record (EHR)
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The KP Model—Technology Driven

Kaiser Permanente model: Highly coordinated care through state-of-the-art technology and the area's largest multi-specialty physician group practice



First Key Concept—The Medical Record Number

- All is based on the patient's Medical Record Number (MRN)
 - Uniquely derived number for each patient
 - Is NOT related to any patient attribute intentionally (i.e., SSN, date of birth, gender, etc.)
 - BUT is considered as group A PHI (same as name, SSN)
 - Requires patients to know this number too!
- However, MRN is not coordinated across KP regions
 - Thus, patients can have multiple MRN
 - MAJOR LIMITATION (especially for linking patients across regions)

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- Further, without SSN, cannot get most death data
- Or easily link outside of KP
- NOTE: Other systems use SSN, DOB, etc.
 - 7 However, potential disclosure and HIPAA rules

KP HealthConnect Our EHR—The "front end"

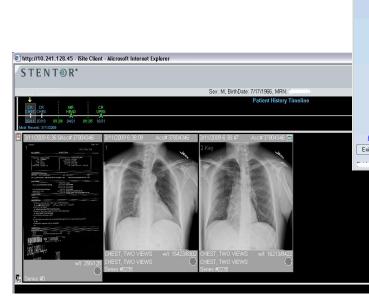
Snap Chart Resu Allerg Medi Flows Probl

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Scar CIPS

- From any computer with an internet connection, our physicians can view x-rays (or any other radiology image) with the member moments after the film is taken.
- Epic[®]-based

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kp.org—our patient website—also "front end"

 From any computer with an internet connection, Kaiser Permanente members can:

- Email their Permanente doctor's office
- Including their doctor
- Schedule appointments
- Fill prescriptions
- View lab test results
- Print immunization records
- View own medical record
- Get their list of medications

 Nationwide, millions of Kaiser
 Permanente members are using this convenient, time-saving technology.

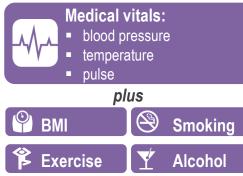


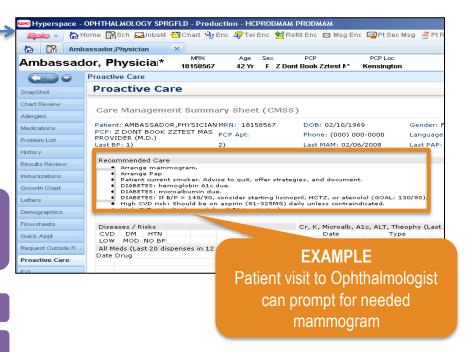


Population Health Built-in: The Front End

Automatic prompts at *every visit in every department*

- Care Gap Identification
 - Immediate electronic action / order placement / booking to address
 - Systematized workflows / Smart Sets
- Document the Right Info





We'll Get Back to this...



Population Health Built-in: The Back End

All members with a chronic condition are automatically "enrolled" in disease management programs.

Population health tools allow us to identify members in need of outreach. The program is owned by the member's primary care team, not a 3rd party.

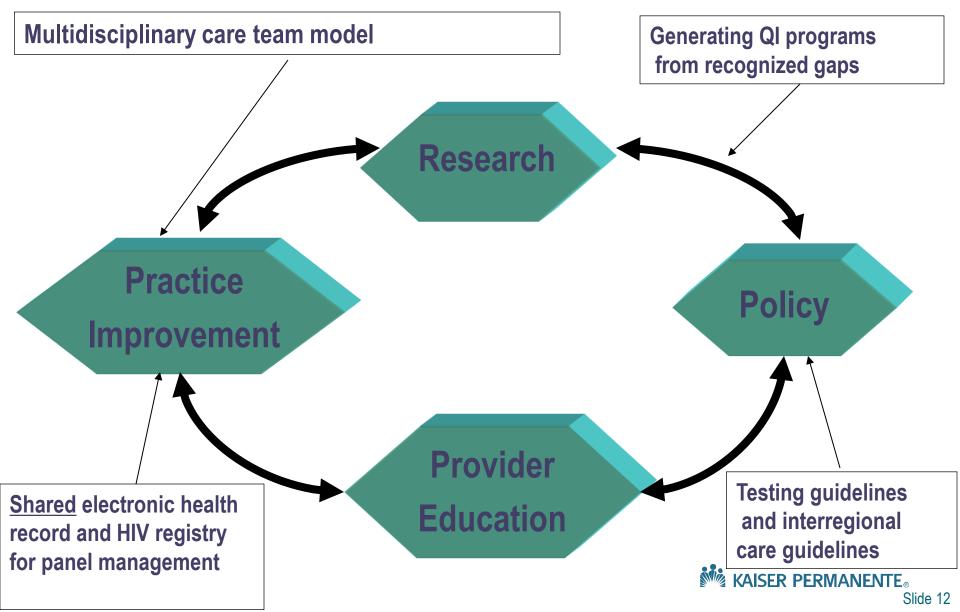
Disease registries

- Not opt in or out
- Algorithms
- Physician definition
- Enriched with clinical data, not simply claims
- Search/Query on demand
 - Each PCP has access
 - Drive outreach calls, letters, email
- Robust Health Ed tools
 - Classes, Coaches, etc.
 - Complete Care Journal

	uo	_	Patient Name		der		Gap Score	L	Medicaid	Medicare Flag		Breast Cancer Screening Coming Due	Breast Cancer Override Flag	Breast Cancer Override Date	Cervical Cancer Screening Overdue	Cervical Cancer Screening Coming Due	Cervical Cancer Override Flag	Cervical Cancer Override Date	Colorectal Screening Due	Colorectal Cancer Override Flag	Colorectal Cancer Override Date	Pneumovax Due	Diabetes			
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KP HIV Overall Program Strategy: *...as a learning organization*

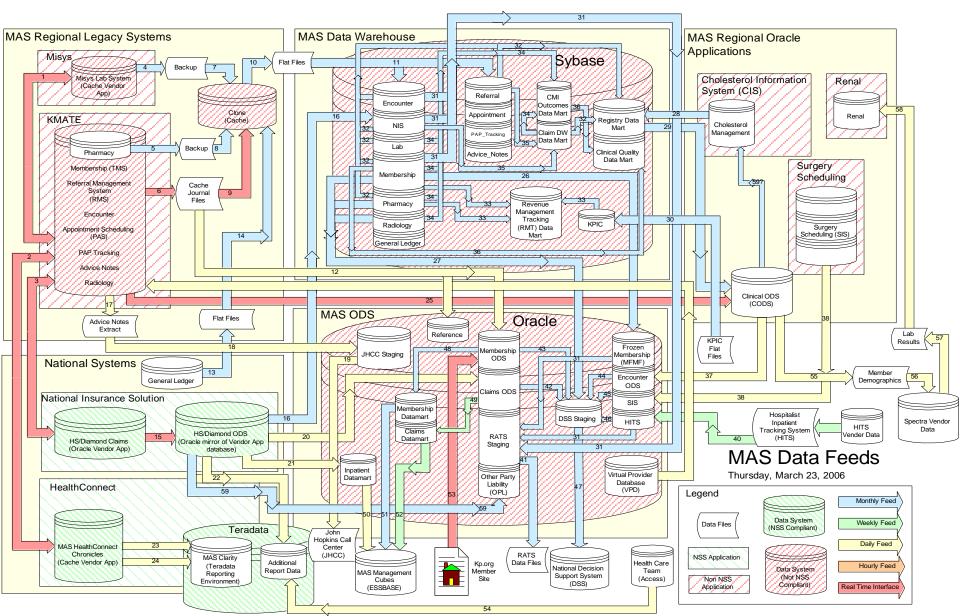


So, Data Coordination is Key

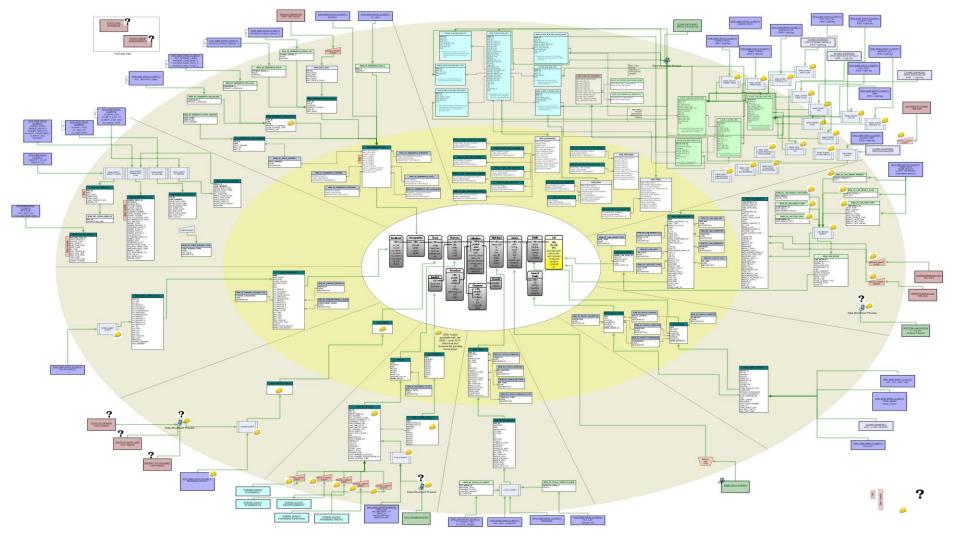
- Demonstrate "garbage in, garbage out.
- Data Management is Complex
- No such thing as a simple data request.
- Data is time consuming, and requires expertise.

- Administrators don't get this...

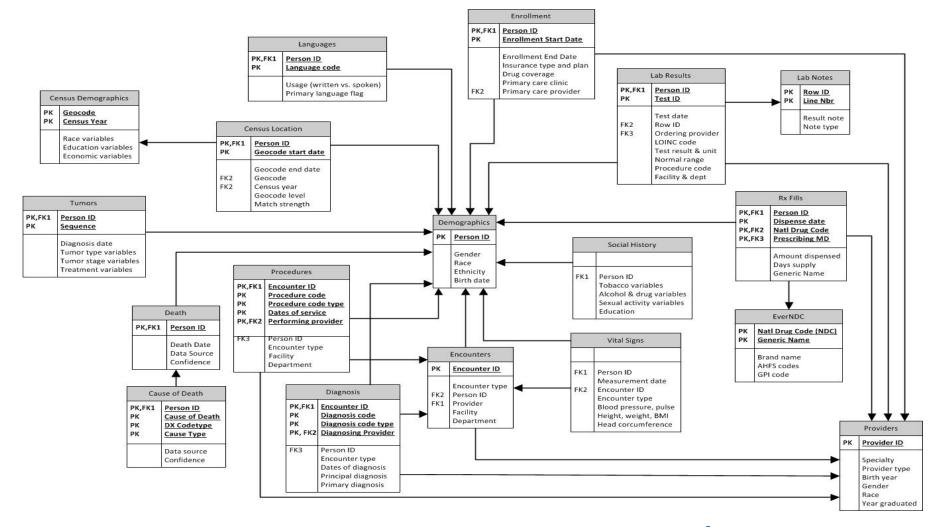
Why Even Simple Data Requests are Complex But all is coordinated via the MRN



Development of KPMAS Data Warehouse: Example in Effort; Each Region Has Own "Data Warehouse"

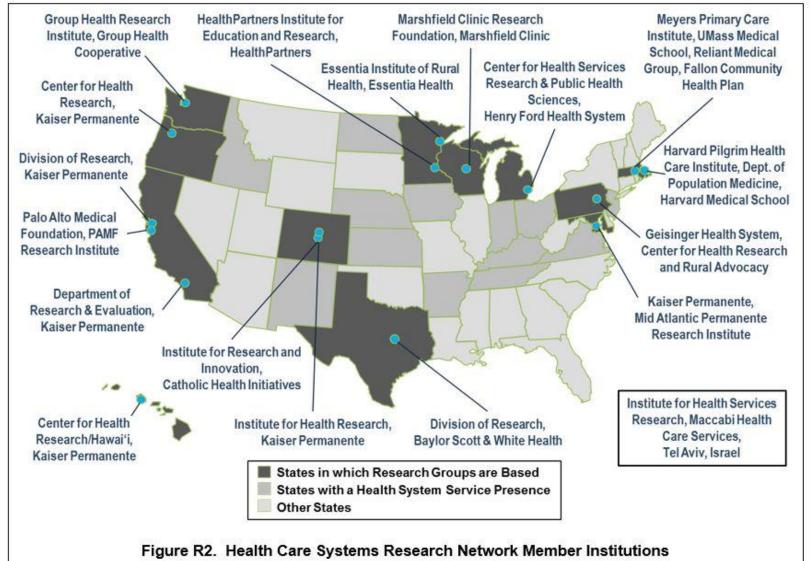


HCSRN Virtual Data Warehouse The Analyst's Toolkit—But again, the MRN is key!



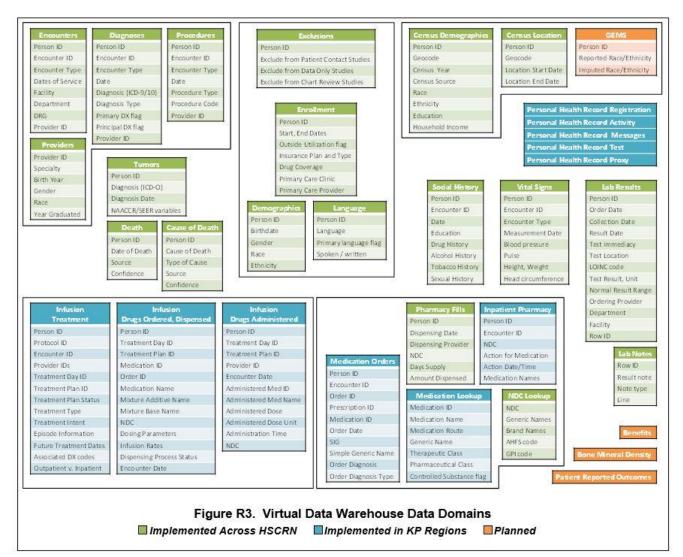


But We Can Also Coordinate this Across Systems--HCSRN



The Virtual Data Warehouse Used by all members of KP and HCSRN

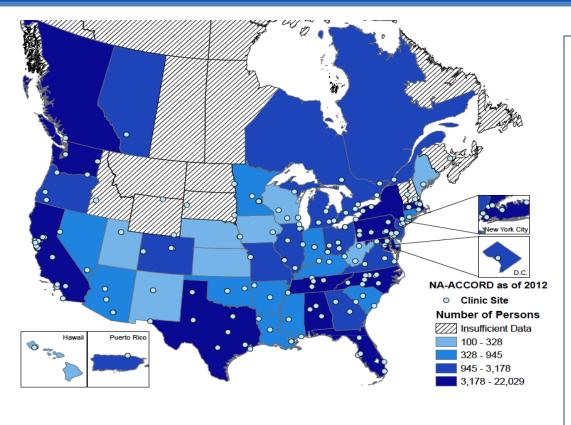
How we do such research



Note that there are other models, including PCORnet Common Data Model Similar principles for NA-ACCORD



NA-ACCORD Collaboration



Slides courtesy of Richard Moore, JHM

- 130,000 HIV-infected persons in the cohort; >1 million person-years of follow-up time; reflects the North American epidemic demographically
- Productive collaboration:
 - Over 60 national and international presentations
 - Over 40 papers
 published
 - 10 other federal grants using this resource

25 Collaborating Cohorts in Canada and US (>200 sties) Participants from: 47 US states and D.C., 1 US territory, and 5 Canadian Provinces

NA-ACCORD Data Elements

- Demographic
- Clinical
 - Clinical diagnoses
 - Laboratory
 - Medications
 - Procedures (some)
 - Hospitalization and Ambulatory visits
 - Health Insurance
- Cause of death
- Data transmitted from each participating cohort to a central data core, data transmitted in a standardized fashion, combined with data from other cohorts for analyses

www.naaccord.org @NAACCORD

Some Examples of How We Use This—Back End and Front End



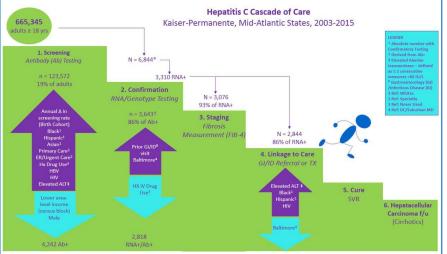
Mid-Atlantic Permanente Research Institute

 Our mission is to advance medical knowledge and improve the quality of care and health of our patients and communities we serve by conducting innovative scientific and clinical research.

ORIGINAL RESEARCH & CONTRIBUTIONS

Expanding Access to Care and Improving Quality in the Mid-Atlantic States Safety-Net Clinics: Kaiser Permanente's Community Ambassador Program

Jarred Lane K Maeda, PhD, MPH; Jacquelina J Bradley, MSN, CRNP; Sarah R Eissler, MSN, CPNP; Marcia LoBrano, MD, MPH; Mindy R Rubin; Maritha Gay; Michael A Horberg, MD, MAS, FACP, FIDSA; Bernadette C Loftus, MD http://dx.doi.org/10.7812/TPP/14-109



Rodriguez CV, Rubenslein K, Hu H, Linus B, Horberg M. Increasing Hepatitis C Virus (HCV) Screening and Linkage to Care in a Large Integrated Health System 2015 American Association of Liver Diseases 66th Annual Meeting, San Francisco, CA, Nov 2015



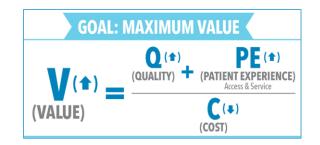
AIDS PATIENT CARE and STDs Volume 29, Number 11, 2015 @ Mary Ann Liebert, Inc. DOI: 10.1089/apc.2015.0139 CLINICAL AND EPIDEMIOLOGIC RESEARCH

The HIV Care Cascade Measured Over Time and by Age, Sex, and Race in a Large National Integrated Care System

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How does MAPRI contribute to the Value Equation?

- 1. Study quality measurement and quality improvement
 - Examples include HIV and HCV
- 2. Provide access to clinical trials
 - Internalizing care
 - Gaining access to the latest in medical care
 - Improve the care for these patients
- 3. Study new programs in care
 - Studying the ongoing implementation of HCV screening and early treatment pathway
 - Studied our new "Exchange" patients
 - Sickle cell transitions program
 - Improving Transitions from Pediatrics to Adult Heme-Onc
- 4. Registry Development with Intentional Clinical Applications
- 5. Monitoring Drug Safety
 - "Sentinel" work with FDA
 - Raltegravir Study (with TPMG and SCPMG)



How We're Working with KPMAS Daily

Registry Work:

- Use of Tableau enhanced HIV physician reports is helping to shape data driven care
- Development of Clinical Disease Registries are being used by operations for targeting patients for case management
- Working with Population Care
 Management to develop enhanced
 Diabetes registry--in progress
- Development of CKD, COPD, HCV, HBV,
 Sickle Cell Registries—all with clinical component and provider reports
 - Including HCV reports for clinical pharmacy

- Disease Registries within MAPRI
 - HIV
 - HCV
 - HBV
 - CKD and ESRD
 - COPD
 - CHF
 - Congenital Heart Disease
 - Rheumatoid Arthritis
 - Sickle Cell
 - Tumor
- In Development
 - Asthma
 - Diabetes
 - Cirrhosis

How We're Working with KPMAS Daily (2)

- Data Driven Visual Analytics
 - Development of basic query tools and analytics for physician leaders
 - Introduce novel Visual Analytics for population insights

	es Population (Overview (dat	ta: 2014-Present)						Gen	<u>ider</u>
									Female	19,363 (49.31%)
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	NC	OVA	(32.34%)						Black	20,173 (51.37%)
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Interactive HIV Physician Centric Actionable Dashboard

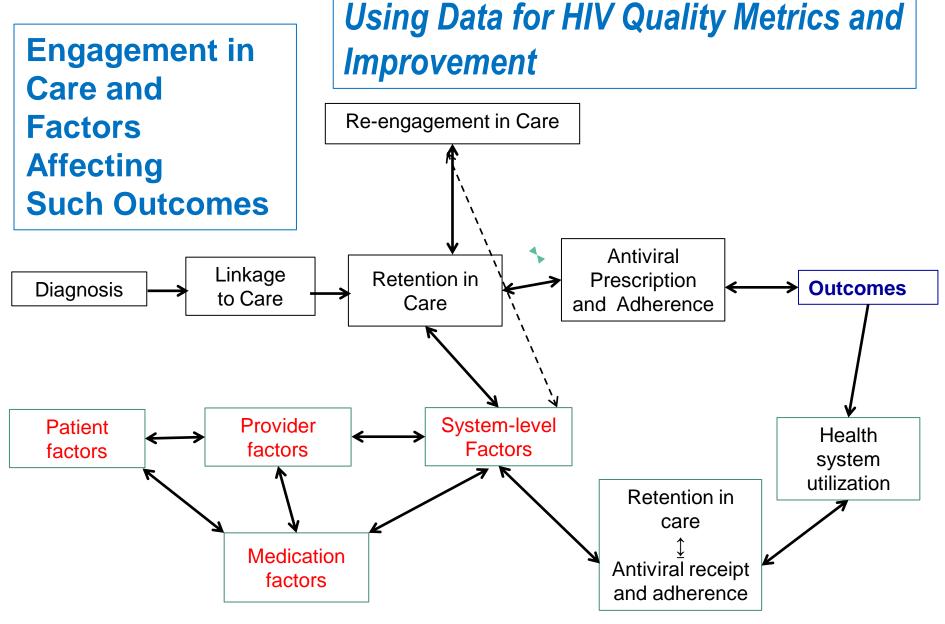


- To improve physician performance
 - Quickly identify and close care gap

Mane K, Blank J, Horberg M. (2016) Visual approaches to bring population data insights at your fingertips. 22nd Annual HCSRN Conference, Atlanta, GA. April 2016.

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Adapted from Mugavero, 2011

Kaiser Permanente®

	Unadj	usted Analysi	S	Adju	isted Analysis'	
		Reference g	roup: ≥2 i	n-person visits	annually	
	Odds Ratio	95% CI	p-Value	Odds Ratio	95% CI	p-Value
1 In-Person only	0.48	(0.31, 0.75)	< 0.01	0.48	(0.30, 0.74)	<0.01
1 In-Person + Telephone only	0.47	(0.28, 0.78)	< 0.01	0.46	(0.28, 0.78)	< 0.01
1 In-Person + E-mail only	0.88	(0.59, 1.30)	0.51	0.81	(0.54, 1.21)	0.29
1 In-Person + Telephone + E-mail	1.16	(0.69, 1.95)	0.57	1.06	(0.63, 1.80)	0.82
1958 patients included in this analysis, wi	th exclusions due to	missing lab va	alues in 20	14		
Regression adjusted for sex, age, race/	ethnicity, HIV risk be	havior				

1 in-person visit only per year is insufficient to achieve viral suppression at rates similar to 2 or greater in-person visits annually (OR=0.48, p<0.01), even if supplemented by a telephone visit (OR=0.46, p<0.01).

However, 1 in person plus e-mail alone (OR=.81, p=0.29) or e-mail plus telephone (OR=1.06, p=.82) was associated with similar HIV viral suppression as 2 in-person visits.

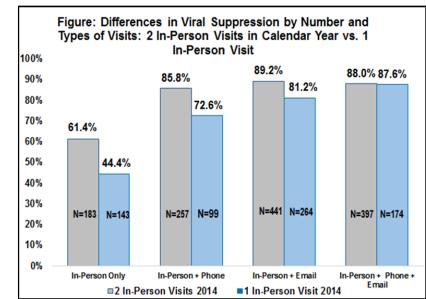
	Unadj	usted Analys	is	Ad	justed Analysi	S
		Reference gr	oup: 2 in-p	person visits or	nly annually	
	Odds Ratio	95% CI	p-Value	Odds Ratio	95% CI	p-Value
2 In-Person + Telephone only	1.33	(0.78, 2.27)	0.30	1.28	(0.75, 2.21)	0.37
2 In-Person + E-mail only	1.82	(1.10, 3.00)	0.02	1.57	(0.94, 2.63)	0.09
2 In-Person + Telephone + E-mail	1.53	(0.93, 2.53)	0.09	1.35	(0.80, 2.25)	0.26

Among the subset of patients with at least 2 in person visits, supplementing with telephone and/or email was associated with a greater odds of viral suppression compared with 2 in person visits only, although results did not reach statistical significance.

How often do patients need to be seen?

Resetting the standard definition of retention in care

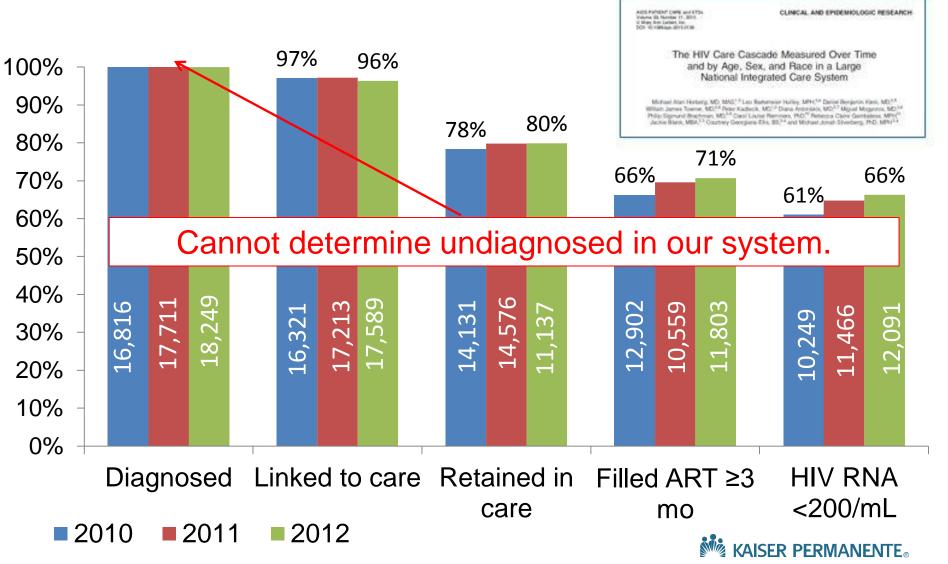
Horberg, Blank, Rubenstein, Kadlecik, et. al., "Differences in HIV Viral Suppression by Frequency and Type of Healthcare Visits," *CROI 2016*, Boston, MA, February, 2016



Using Big Data to Answer Ongoing Quality Questions of Care

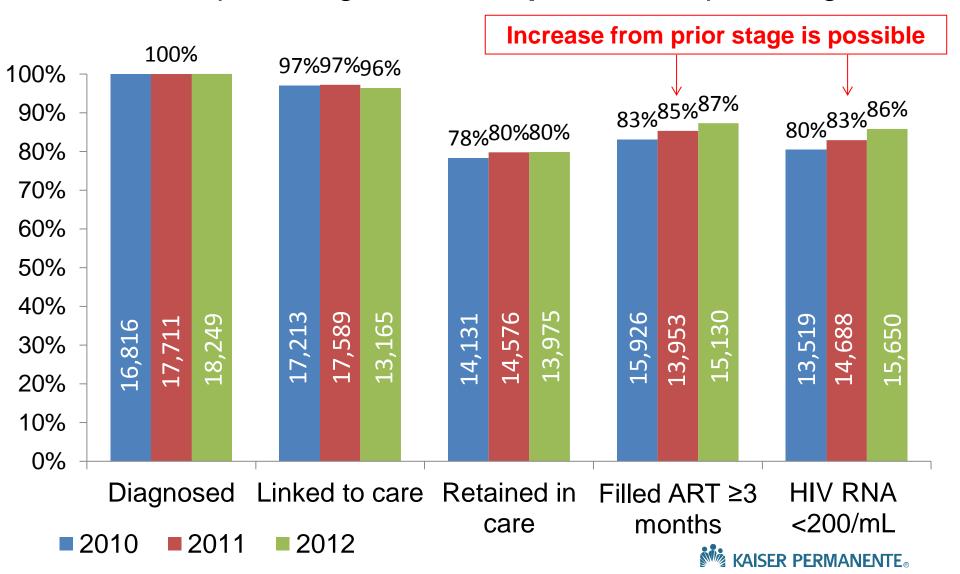
KP HIV Care Cascade 2010-2012

Subsequent stage is **dependent** on prior stage



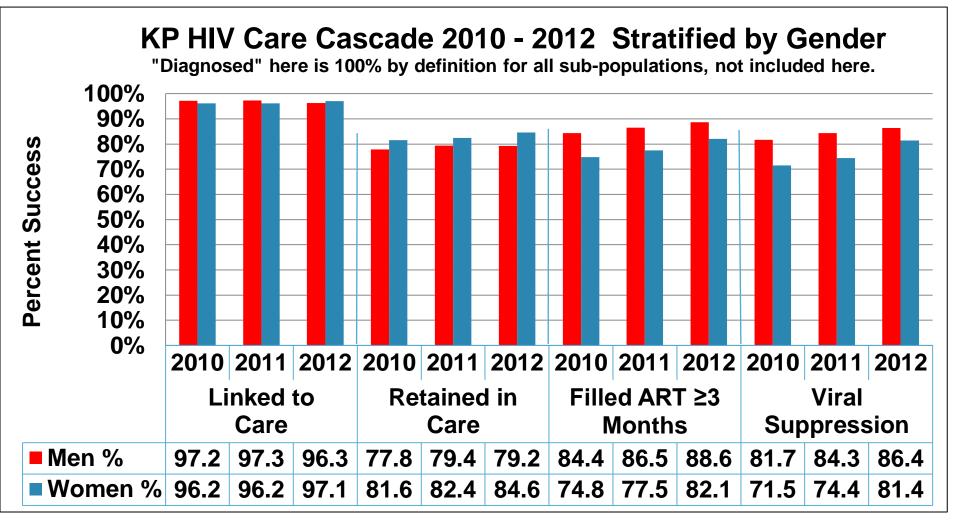
Horberg, et. Al., AIDS, Patient Care, and STDs; 2015

But Methodology Matters! Subsequent stage is NOT dependent on prior stage



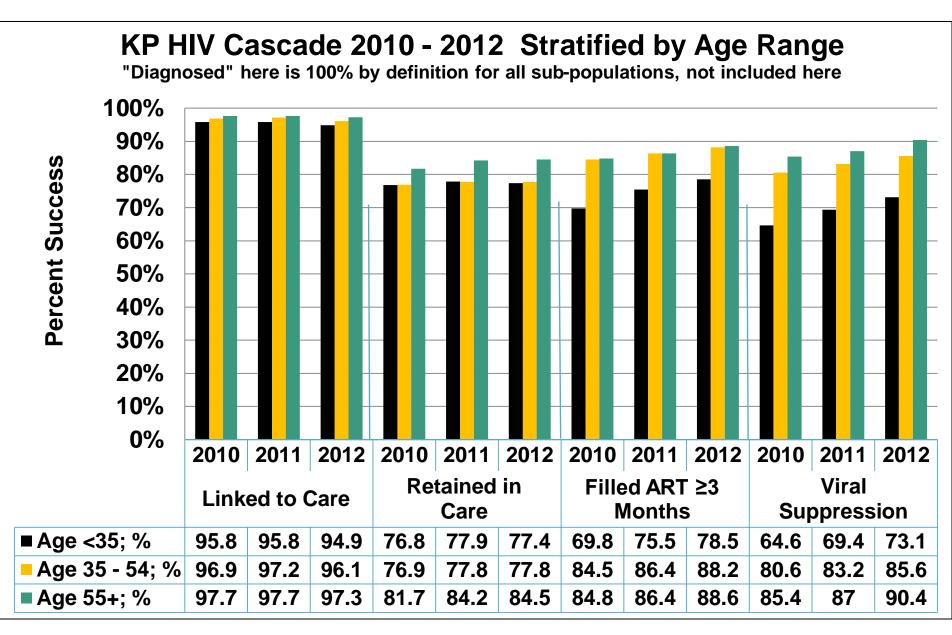
Horberg, et. Al., AIDS, Patient Care, and STDs; 2015

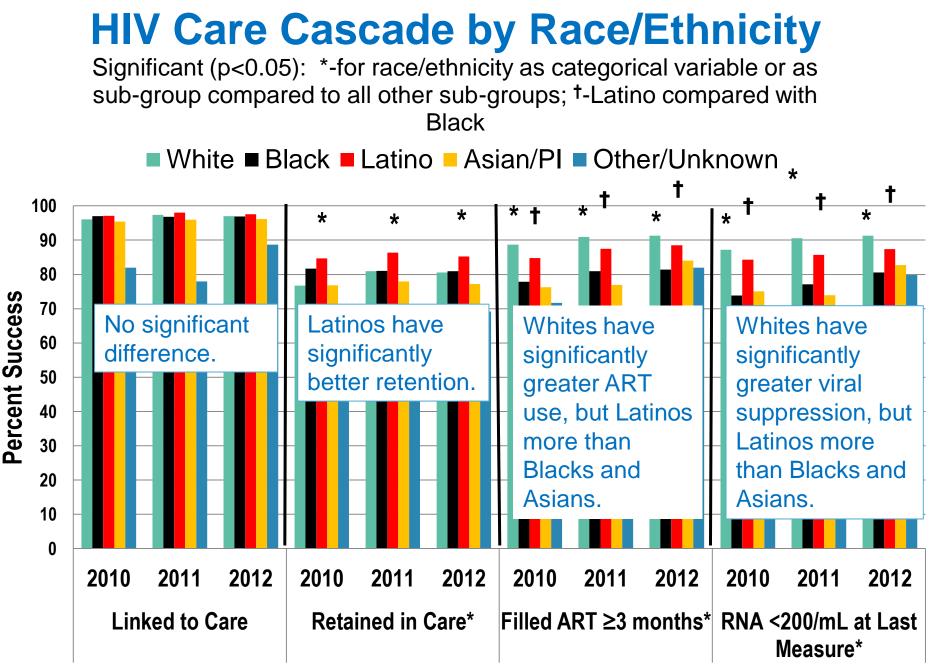
Can Stratify by Demographics: by Gender



Horberg, et. Al., AIDS, Patient Care, and STDs; 2015

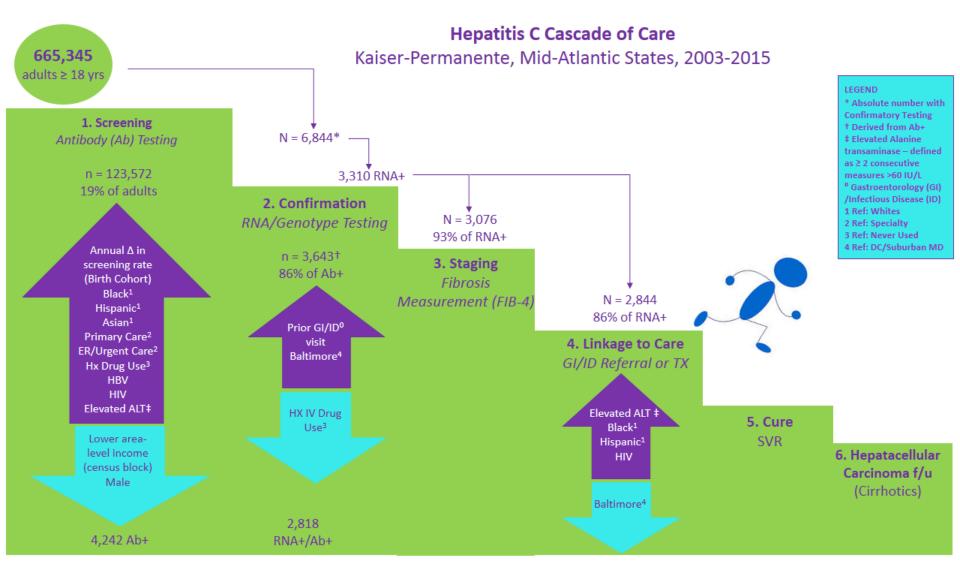
Can Stratify by Demographics: by Age





Horberg, et. Al., AIDS, Patient Care, and STDs; 2015

But Can Also Do for HCV—KPMAS Data



Rodriguez CV, Rubenstein K, Hu H, Linus B, Horberg M. Increasing Hepatitis C Virus (HCV) Screening and Linkage to Care in a Large Integrated Health System.2015 American Association of Liver Diseases 66th Annual Meeting, San Francisco, CA, Nov 2015

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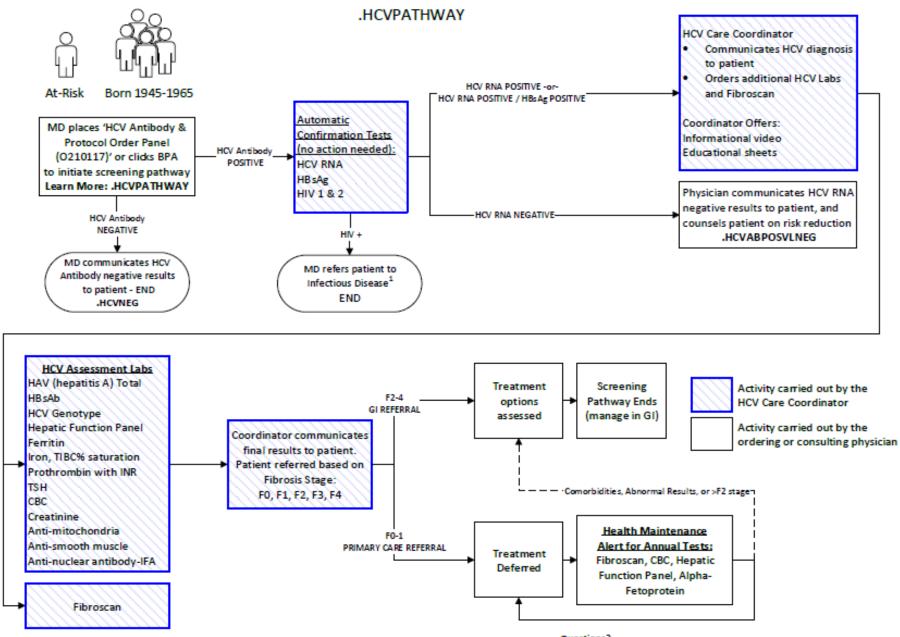
For Screening: Hepatitis C in KPMAS

- >5,100 active members with HCV in 2015
 - >10,000 in recent past have had HCV (active or former KP members)
- <10% have ever been treated for HCV</p>
 - Fortunately, ~25-30% have cleared the virus (RNA -, don't need treatment)
- 40% have not had recent labs or been evaluated by GI
- We are now diagnosing about 90-100 new cases monthly with increased testing





Hepatitis C Cascade of Care in KPMAS



¹Infectious Disease physician completes HCV workup concurrent with HIV treatment

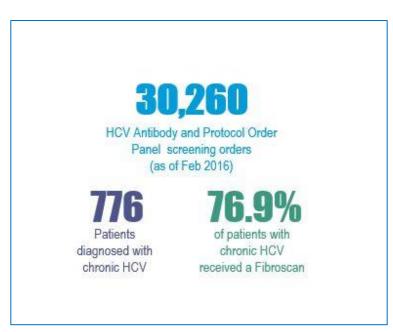
Questions?

Clinical: Dr. Michael Horberg 301-852-9307 (cell) or the GI Chiefs Operational: Cabell Jonas, PhD 202-594-7836 (cell) Hepatitis C Care Coordinator: Linda Steeby 703-674-7684

Ordering the Pathway

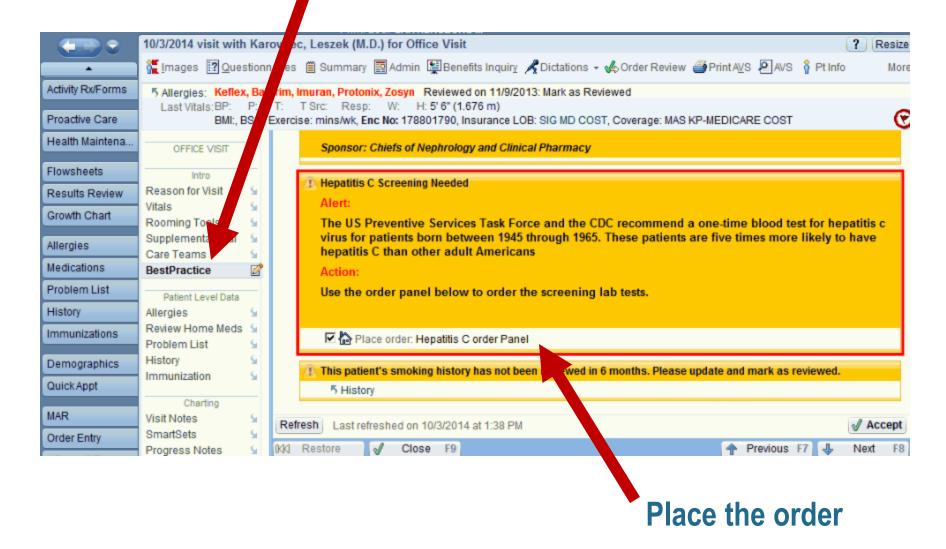
Best Practice Alert for Baby Boomers

- If your patient is a Baby Boomer and is eligible, order the new screening pathway by clicking the BPA and placing the order inside.
- BPA fires in Adult Primary Care, GI, ID, and OBGYN
- Within the STI (sexually transmitted infections) Screening Order Set and Adult Health Assessment The new HCV screening pathway replaces the single HCV Ab test in these two Order Sets



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Ordering for Baby Boomers – Preventive Screening: Click Visit Navigator → Best Practice at Left



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STI Screening Order Set

Age: 42 yr. PCP Vadiakonda, Ningas. Age: 42 yr. PCP Vadiakonda, Ningas. Age: 43 yr. PCP Vadiakonda, Ningas. Structure, SILVER SPRIN. Unknown: Not. Structure, PCP Vadiakonda, Ningas. Structure, SILVER SPRIN. Unknown: Not. Structure, PCP Vadiakonda, Ningas. Structure, SILVER SPRIN. Unknown: Not. Structure, PCP Vadiakonda, Ningas. Structure, SILVER SPRIN. Unknown: Not. Structure, PCP Vadiakonda, Ningas. Structure, SILVER SPRIN. St
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Adult Health Assessment Order Set

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	t Notes S		Use the HCV Antibody and Protocol Order Panel for routine Hepatitis C screening. Pathway automatically tests for HCV RNA (viral load) if HCV Ab positive. If Ab and RNA backeting Change and the CV Antibody and Protocol Order Panel for routine Hepatitis C screening. Pathway automatically tests for HCV RNA (viral load) if HCV Ab positive. If Ab and RNA	positive, the Hepatitis C Coordinator will place additional orders
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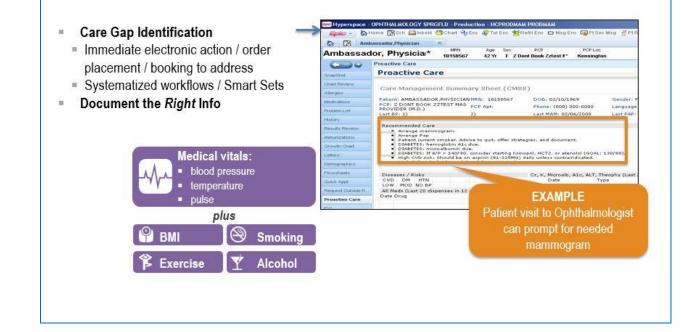


The Next Frontier?—Putting the Data at the Provider's Fingertips --And Making Them Use It!

Population Health Built-in

PROACTIVE CARE DRIVEN BY TECHNOLOGY

Automatic prompts at every visit in every department

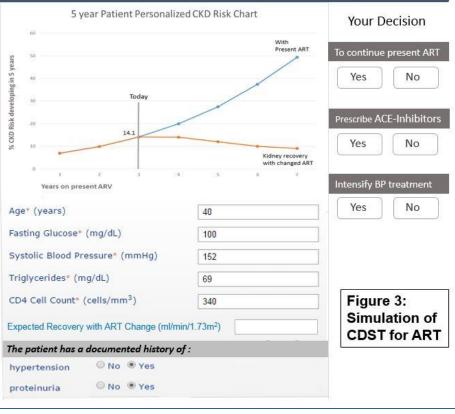


What if we did this for HIV?

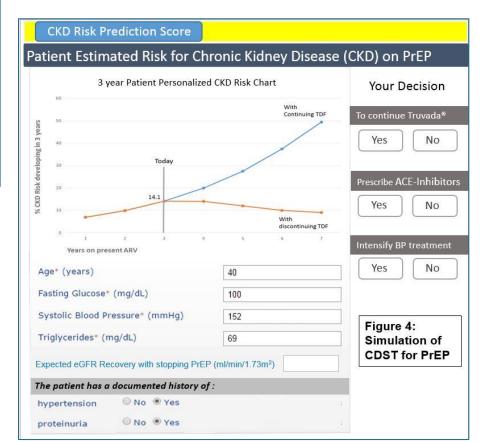


CKD Risk Prediction Score

Patient Estimated Risk for Chronic Kidney Disease (CKD)



To Improve Kidney Health among Patients Using ART or PrEP



Concluding Thoughts

- Need to think about the back end as well as the front end of the EHR
- The EHR is a powerful tool
 - But need to know how to use it
- Data across systems is not only coming—it's here!
- HIPAA is not a small issue
- It has wide application for HIV and HCV
 - For screening, care improvement, quality measurement
- You need a Health Imformaticist for best results



"Working together, I am confident that we can stop the spread of HIV and ensure that those affected get the care and support they need."

--President Barack Obama

Strive only for the best. Be proud. The great work continues. Thank you

