



Cancer Survivorship & Cardiovascular Disease

Leah L. Zullig, PhD, MPH

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Hayden B. Bosworth, PhD

Susanne Danus, BS

Karen M. Goldstein, MD

George L. Jackson, PhD

Michael J. Kelley, MD

Jennifer Lindquist, MS

Dawn Provenzale, MD

Kellie Sims, PhD

Valerie Smith, DrPH

Corrine I. Voils, PhD

Morris Weinberger, PhD

Christina D. Williams, PhD



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Poll Question #1

- Which best describes your interest in VA cancer survivorship? (check all that apply)
 - This is my clinical interest.
 - This is my research interest.
 - I am a cancer survivor.
 - This is a new topic for me.



Agenda

Landscape of Incident Cancers in VA



CRC Survivors & Cardiovascular Disease

Matched Case Control Study



CRC Survivors' Perceptions of Chronic Disease Management

A Qualitative Study

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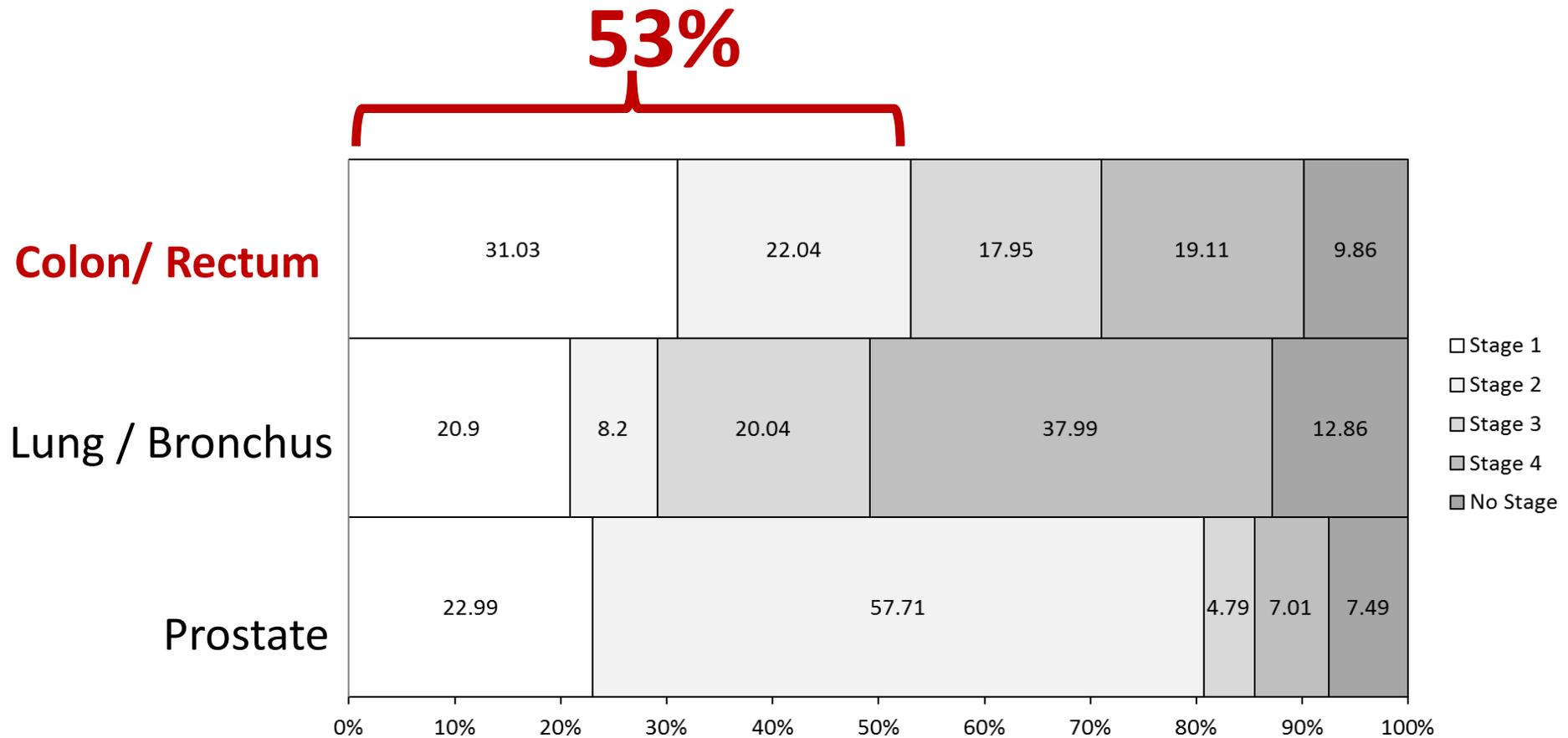
CRC Survivors' Perceptions of Chronic Disease Management
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Most Common Cancers by Sex among VA patients in 2010

	n	%	Males	Females		n	%
Prostate	13,438	30%			Breast	402	30%
Lung & bronchus	8,019	18%			Lung & bronchus	197	15%
Colon & rectum	3,705	8%			Colon & rectum	88	7%
Kidney & pelvis	1,733	4%			Uterine corpus	75	6%
Melanoma	1,674	4%			Melanoma	59	4%
Liver	1,553	3%			Thyroid	53	4%
All Sites	44,836	97%			All Sites	1,330	3%



Stage at Diagnosis for Common Cancers among VA patients in 2010



New VA CRC Cases & All-Cause Mortality stratified by Age at Diagnosis, 2009 to 2012

Age (Years)	New Cases		Death Within 3 Years of Diagnosis	
	Male	Female	Male	Female
0-49	343 (2.7)	39 (0.3)	80 (23.3)	<10 (7.7)
50-64	5,200 (41.4)	162 (1.3)	1,329 (25.6)	33 (20.4)
65-79	4,766 (39.0)	73 (0.6)	1,620 (34.0)	20 (27.4)
<u>≥80</u>	1,920 (15.3)	48 (0.4)	1,125 (58.6)	33 (68.8)
All ages	12,229 (97.4)	322 (2.6)	4,154 (34.0)	89 (27.6)



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CRC Survivors' Perceptions of Chronic Disease Management

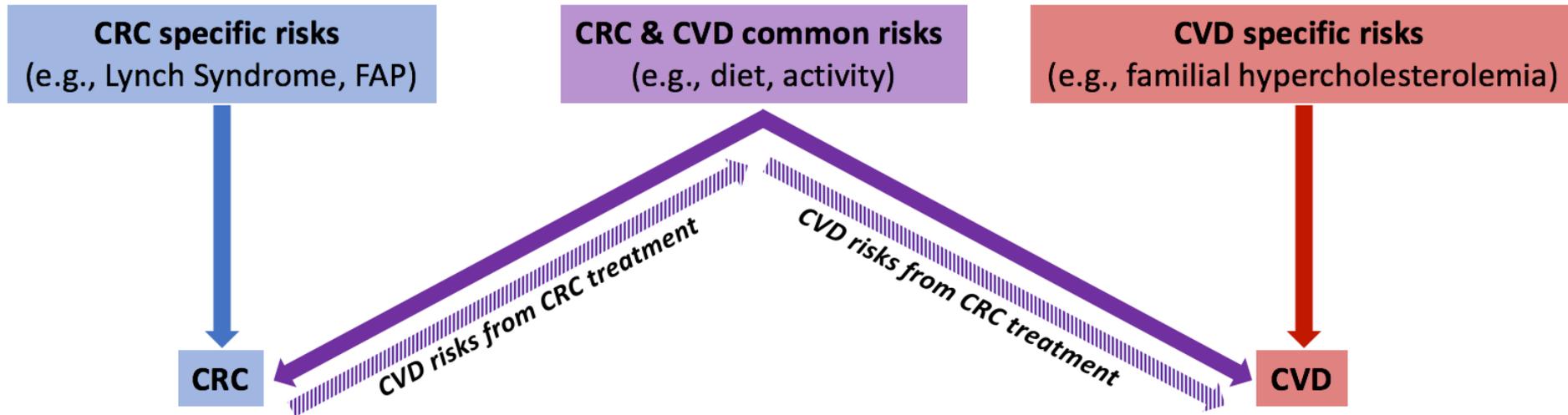
A Qualitative Study

Poll Question #2

- What do you think is the leading cause of death for colorectal cancer survivors 8 years after their diagnosis?
 - Colorectal cancer recurrence
 - Secondary cancer diagnoses
 - Cardiovascular disease
 - Motor vehicle accidents



CRC & Cardiovascular Disease



Objectives

- We compared VA CRC survivors and matched non-cancer controls to:

1

Determine the odds of CRC survivors being diagnosed with CVD-related chronic conditions
(e.g., hypertension, diabetes, hyperlipidemia)

2

Determine their likelihood of CVD-related chronic condition control
(e.g., blood pressure, glucose, cholesterol)

...each over 12 months following CRC diagnosis.



Colorectal Cancer Case Eligibility

- Patients diagnosed with CRC at any VA hospital nationwide from fiscal years 2009-2012 in the VA Central Cancer Registry
- Newly diagnosed with Stage I, II, or III CRC
- At least one primary care or oncology visit in the year prior to their CRC diagnosis



Non-Cancer Control Eligibility

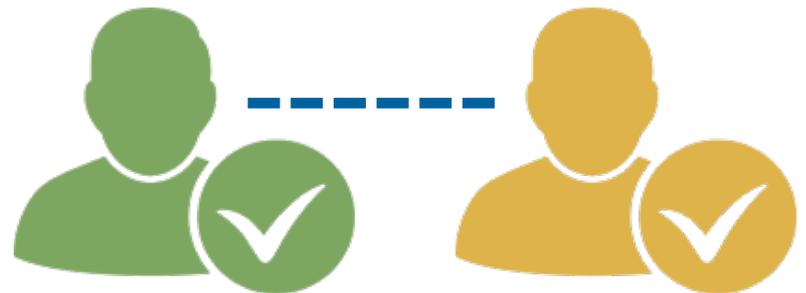
- No history of any cancer from 5 years prior until the matched CRC survivor's diagnosis date
- At least one VA primary care visit in the previous 6 months



Case-Control Matching Process

exact match variables

- Sex
- Race (white, non-white)
- Age (within 5 years)
- Copayment status (no copay-disability, no copay-income, pay)
- VISN
- Distance to VA healthcare
- Health care use (≥ 3 vs. < 3 outpatient visits)



Case-Control Matching Process

additional matching variables

- Categorical BMI
 - Underweight or healthy [BMI<24.9]
 - Overweight [25<=BMI<29.9])
 - Obese [BMI>=30.0]
- CVD-related chronic conditions
 - Hypertension
 - Hyperlipidemia
 - Diabetes



Outcome Measures

Primary Outcomes: Diagnoses

- **Hypertension**

- **Diabetes**

- **Hyperlipidemia**

Secondary Outcomes: Disease Control

- <150/90 mmHg non-diabetic
- <140/90 mmHg diabetic

- A1c <7% vs. >7%

- LDL <100mg/dl vs. >100mg/dl



Simplified Patient Flow Diagram

CRC Cases

Identified in VACCR (n=15,218)

Excluded ineligible (n=5,207)

Potentials for matching
(n=10,011)

**Matched cases for analysis
(n=9,758)**

Non-Cancer Controls

Identified in VA admin data
(n=54,538,312)

Excluded ineligible (n=118,844)

Limit to best 3 matches
(n=36,393)

**Matched controls for analysis
(n=29,066)**



CRC Survivor Characteristics

Diabetes 37%

Hyperlipidemia 52%

Hypertension 69%



Sample Characteristics

	CRC Survivors (n=9,758)	Controls (n=29,066)
Sex		
Male	98%	98%
Female	2%	2%
Race		
White	80%	80%
Minority	20%	20%
Marital Status		
Married	49%	56%
Not Married	51%	44%



Sample Characteristics

	CRC Survivors (n=9,758)	Controls (n=29,066)
Copay Status		
Free- Disability	35%	35%
Free- Low-income	44%	44%
Must pay	16%	16%
Region		
Midwest	21%	21%
Northeast	15%	15%
Southeast	40%	40%
West	23%	23%



Sample Characteristics

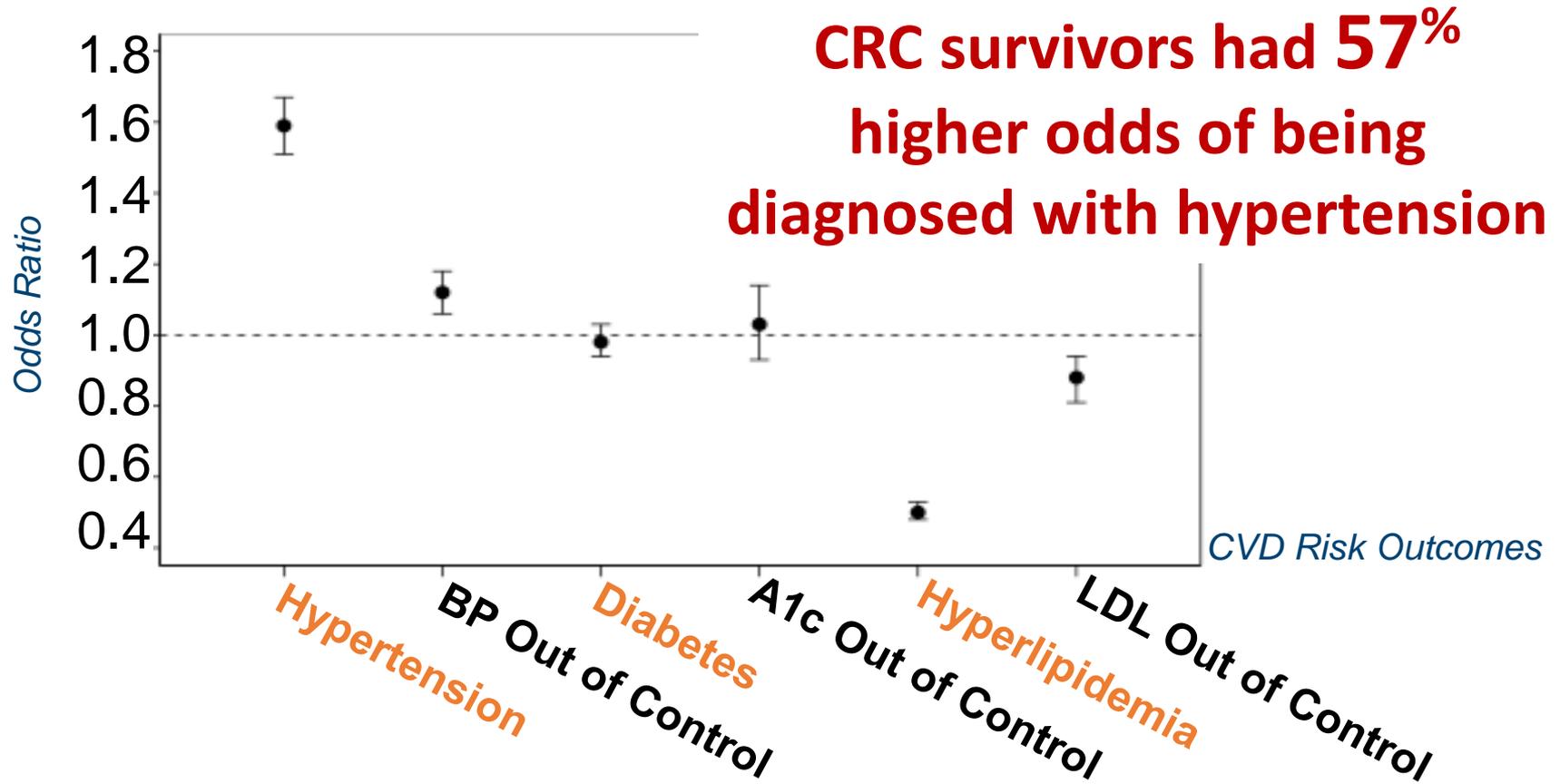
	CRC Survivors (n=9,758)	Controls (n=29,066)
Body Mass Index		
Under & Healthy (<18.5-24.9)	20%	20%
Overweight (25.0-29.9)	30%	30%
Obese (\geq 30.0)	33%	33%
Age, years*	67 (10.3)	66.7 (10.3)
Distance, miles, mean*	12.4 (12.5)	12.1 (11.9)
No. of primary care visits*	3.6 (3.5)	3.8 (4.1)

*mean (SD)



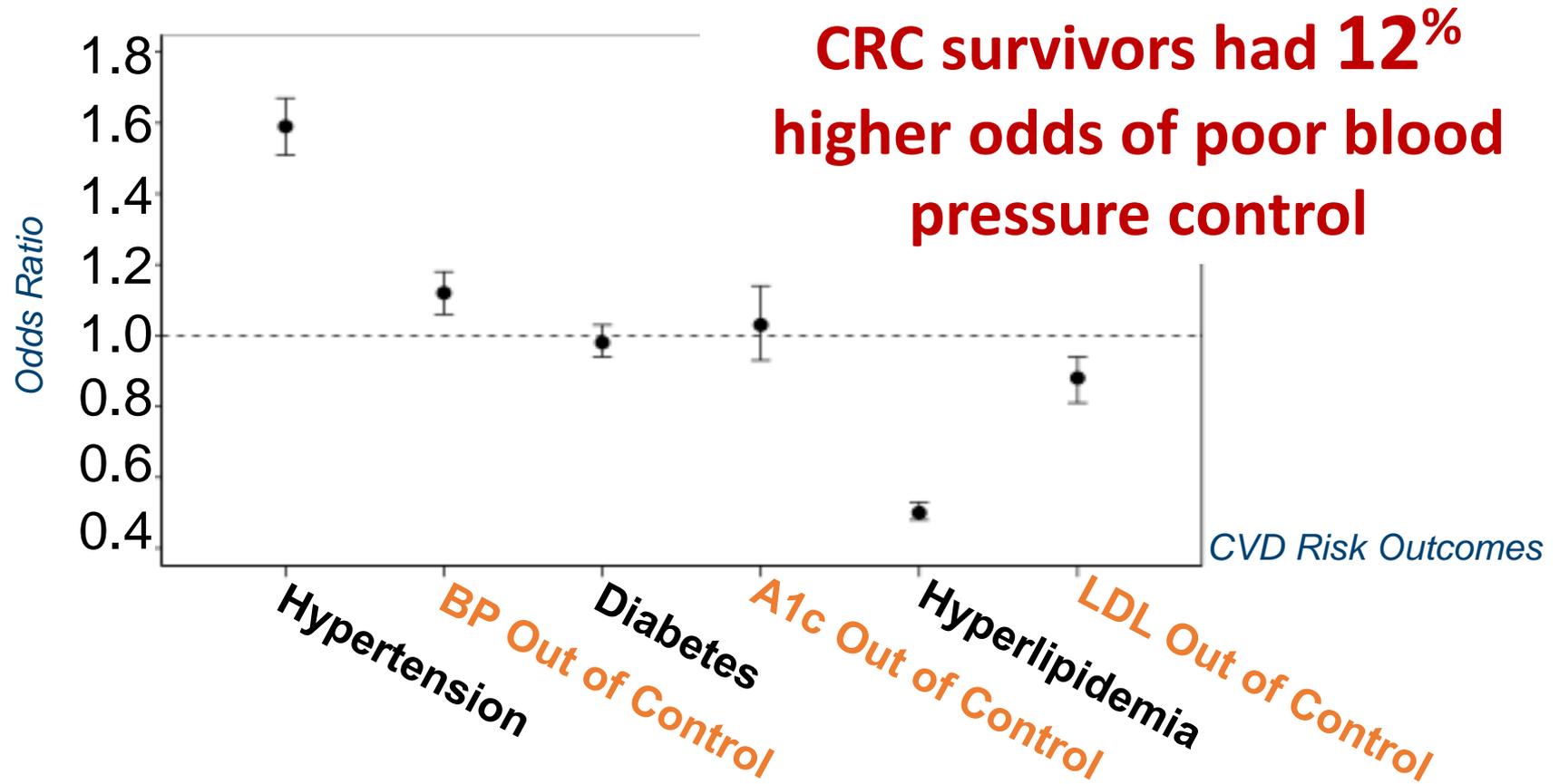
CVD-Related Chronic Conditions

Logistic Regression Model Results



CVD-Related Chronic Condition Control

Generalized Linear Mixed Models



Antihypertensive Medication Adherence

Post-Hoc Analysis

- Similar numbers of overall oral medications
 - CRC cases: mean=4.21, SD 3.70
 - Matched non-cancer controls: mean=4.13, SD 3.67
- Adherence was significantly lower among CRC survivors compared with matched non-cancer controls
 - CRC cases: mean MPR 85%
 - Matched non-cancer controls: mean MPR 93%
 - $p < 0.001$



Next Steps

- Additional research on adherence to chronic disease medications across the cancer treatment and survivorship trajectory
- Develop programs to support cardiovascular behavioral risk factor management among cancer survivors



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Poll Question #3

- What do you think colorectal cancer survivors reported as significant health concerns?
 - Monitoring for colorectal cancer recurrence
 - Their heart health
 - Changes in their daily routines
 - Understanding their medications



Shifting Focus from Surviving Cancer to Managing Chronic Disease

My biggest problem is my heart...
I figure if I take care of my heart, I will be
around a whole lot longer...
I was careful for about a year.
Then it just went all to pieces.
When I started back at the VA, I had talks
with the doctors...Then I started
changing my living habits drastically.

- man, stage I colon cancer



Challenges with Taking Medications

[Now I'm] takin' the medications I'm supposed to...Nothing to do with the cancer. Just the heart stuff.

- man, stage III colon cancer

I used to have medications and I wouldn't take [them] like I was supposed to, but now I make sure that that I do.

- man, stage I colon cancer



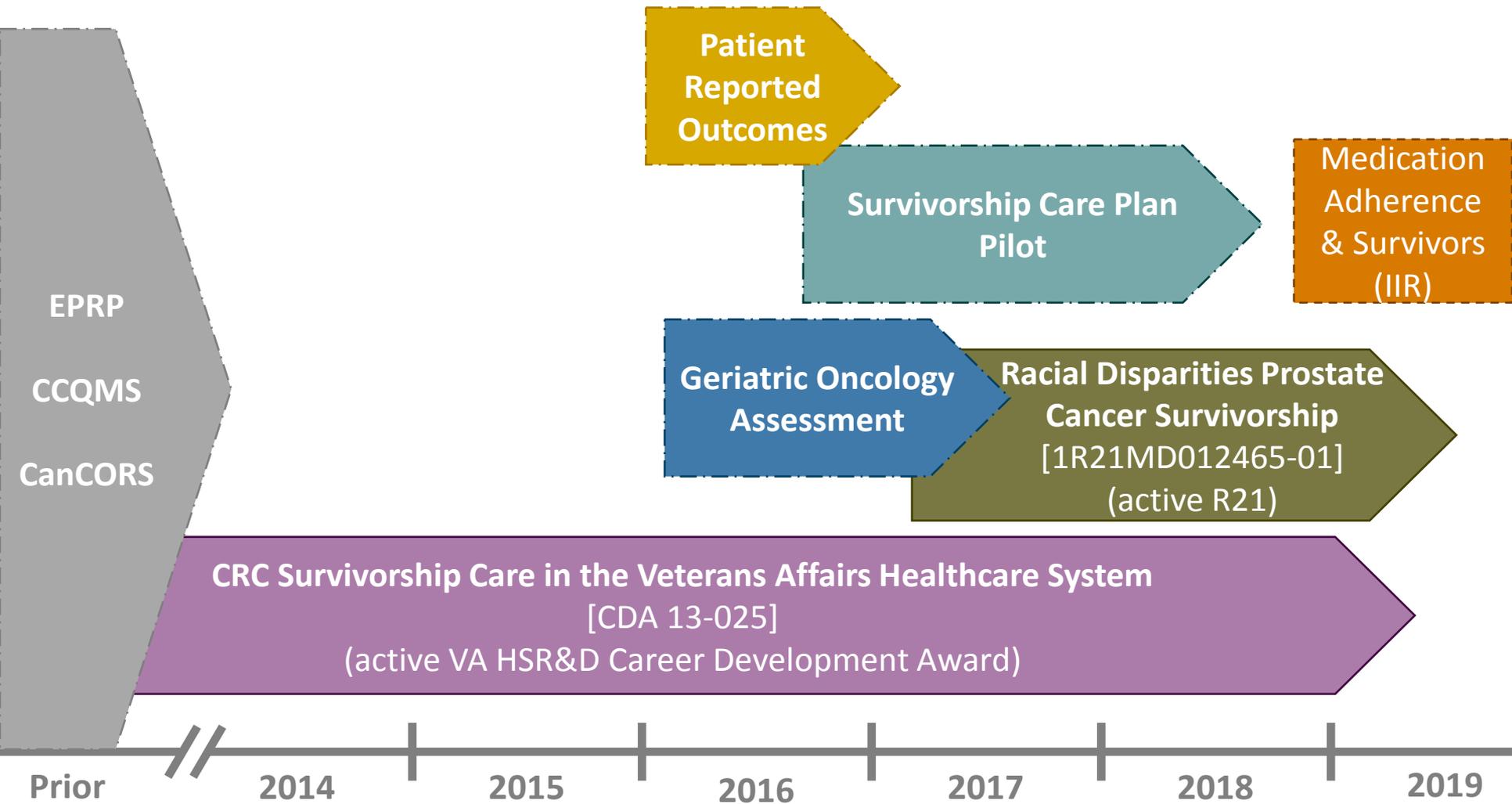
Challenges with Taking Medications

I take insulin every night... [When] you take chemo, you know, [your blood sugar] automatically shoots up 200 ... [After the] treatment, my sugar levels are different now... I was just taking pills for my sugar diabetes, now I'm taking 30 units of insulin every night. I hope that [it doesn't get] worse... It's all different...

- man, stage III colon cancer



Current Work in Context with Other Studies



— · — Past

— Active

- - - Proposed





Leah L. Zullig, PhD, MPH

leah.zullig@va.gov

leah.zullig@duke.edu

Thank You