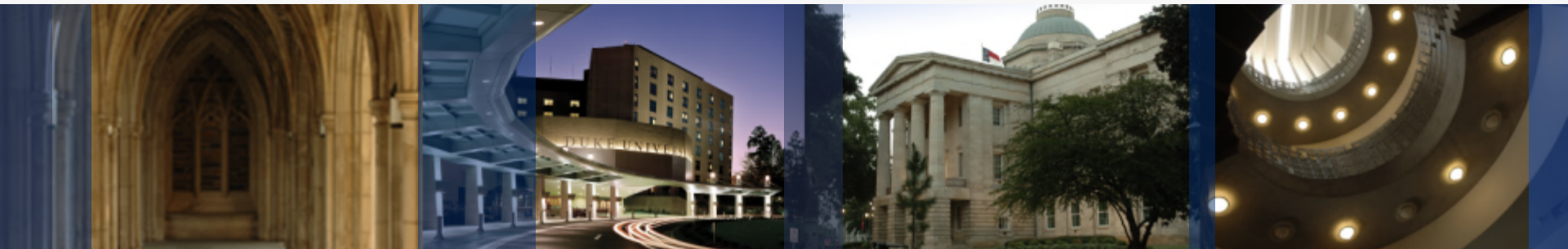


# Integrating Health & Social Services for Veterans by Empowering Caregivers

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## **Robert Wood Johnson Foundation Systems for Action**



# Overview

- Context
- Potential Strategy
- Research Questions and Approach
- Preliminary Results: post 9/11 GI Bill service use
- Next Steps



# Context

## Post-9/11 Veteran

- 3.3 million deployed since 2001
- Advances in battlefield medicine
  - 14% PTSD; 19% TBI
- Some experience reintegration challenges
- Challenges maintaining social relationships, employment, education; economic vulnerability; decline in health



# Context

Veteran: cross cutting medical, social, economic needs

- ### **Veteran Health Administration**
- Evidenced-based medical and psychological care
  - Supported employment
  - Caregiver Support Program

- ### Veteran Benefits Administration
- Education assistance (post 9/11 GI Bill)
  - Vocational rehabilitation



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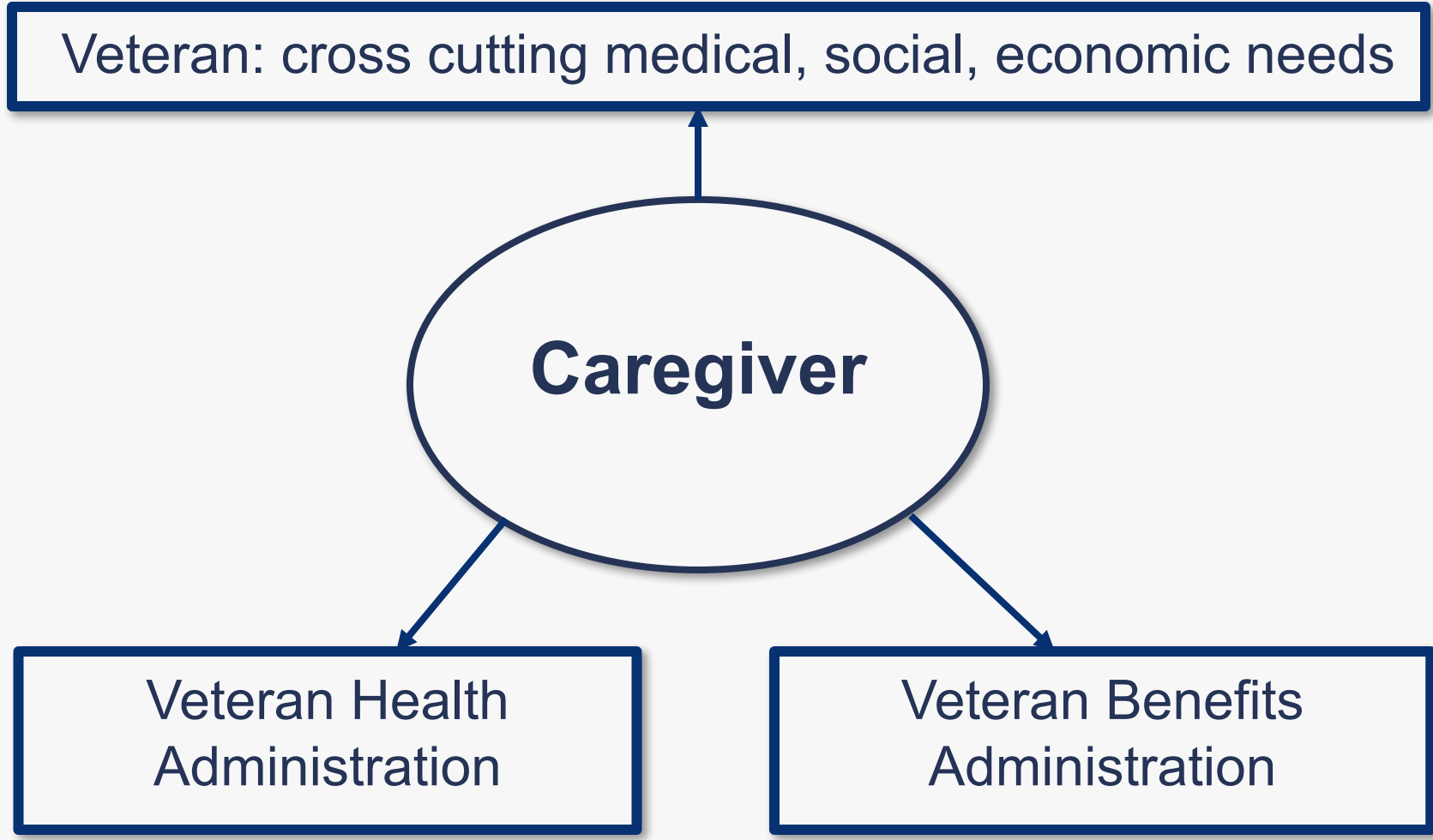


**Veteran Benefits Administration**

- Education assistance (post 9/11 GI Bill)
- Vocational rehabilitation



# Strategy to Address Problem







# Strategy to Address Problem

Veteran: cross cutting medical, social, economic needs

Institutional support for caregivers

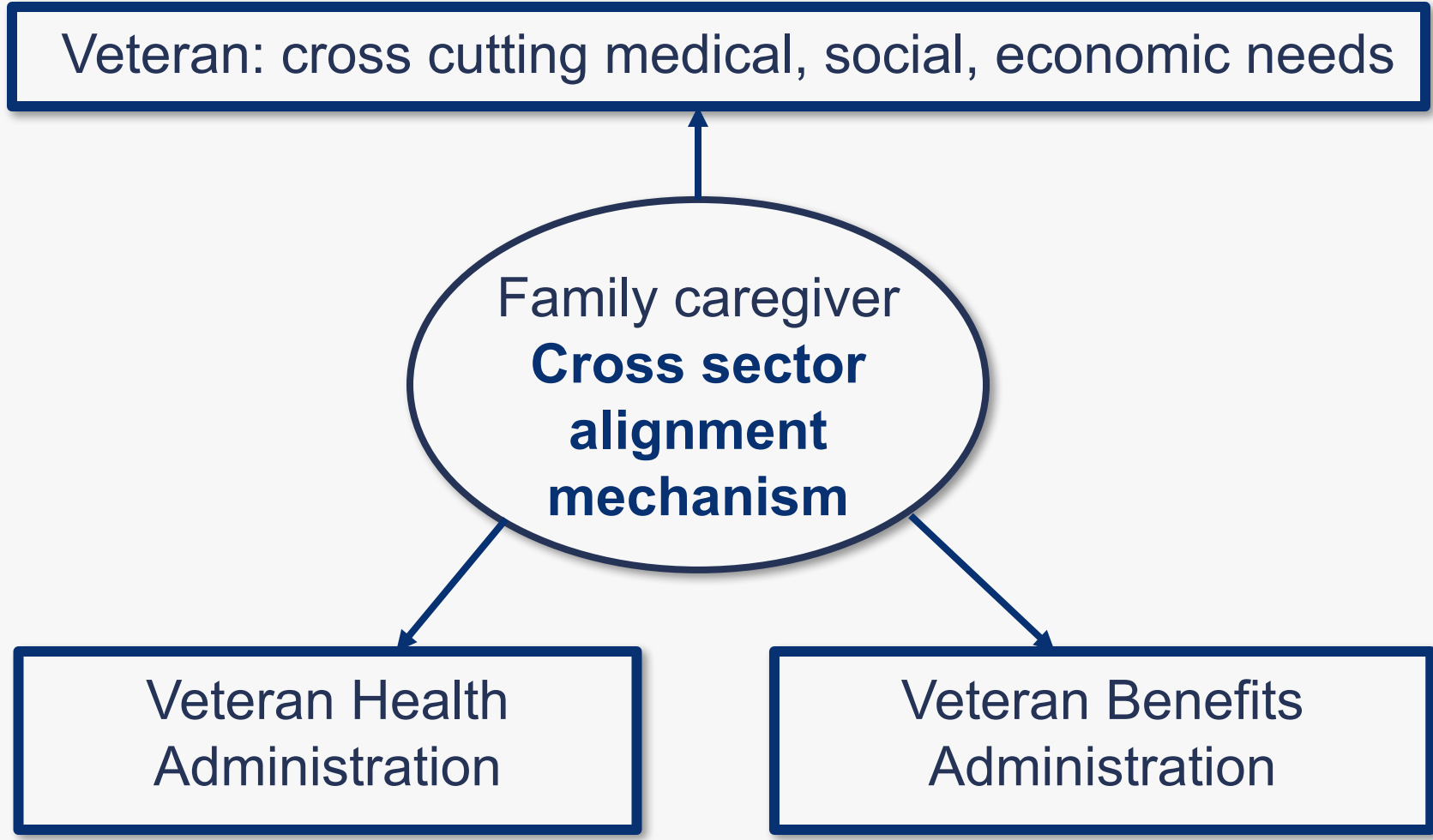
Trained and knowledgeable family caregiver

Veteran Health Administration

Veteran Benefits Administration



# Strategy to Address Problem





# Opportunities in VA



# New law in 2010 → new services for caregivers in VA

1. Program of General Caregiver Support for caregivers of **all Veterans in need of a caregiver**

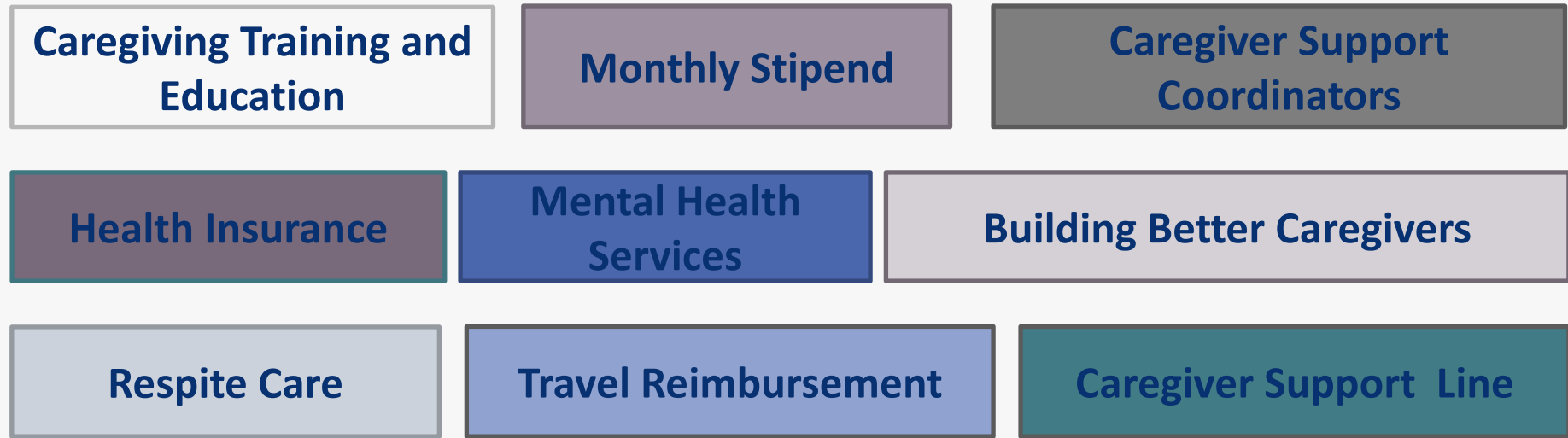
2. Program of Comprehensive Assistance for Family Caregivers (PCAFC) of **eligible Veterans injured in the line of duty on or after 9/11/2001**

VA Caregiver Support Program



# PCAFC Overview

Clinical program, provides services directly to eligible caregivers





# 1. Problem (complex health/social needs among Veterans)



1. Problem (complex health/social needs among Veterans)



2. Potential strategy (family caregivers)



1. Problem (complex health/social needs among Veterans)  
↓
2. Potential strategy (family caregivers)  
↓
3. Opportunities in VA (institutional support, data integration)





1. Problem (complex health/social needs among Veterans)  
↓
2. Potential strategy (family caregivers)  
↓
3. Opportunities in VA (institutional support, data integration)  
↓
4. Research questions:
  - **Aim 1:** Can institutional support for family caregivers through PCAFC increase social service use (education assistance and vocational rehabilitation programs)?
  - **Aim 2.** What features of family caregiver support facilitate alignment of health, psychological and social service delivery systems to meet veteran physical, mental and social needs?



## Aim 1 Approach

*Does participation in PCAFC impact time to use of the post 9/11 GI Bill benefit, vocational rehabilitation, and supported employment?*

- Merged three sources of data:
  - Veteran Health Administration electronic health records and administrative data
  - Caregiver Support Program administrative data
  - Veteran Benefits Administration data
- Sample: Veterans aged 55 or under whose caregivers applied to PCAFC between May 1, 2010 and Sept. 30, 2014 and had not used social service prior to application
  - 3 cohorts
- Control: Caregivers applied to PCAFC and were never approved



# Aim 1 Approach

Instrumental variable cox proportional hazards regression models

- **Treatment:** Ever approved for PCAFC
- **Outcome:** Time to application for the post 9/11 GI Bill benefit, supported employment, or vocational rehabilitation
- **Instrumental variable:** facility-level percentage approval for PCAFC in the 6 months prior to application



## Aim 1 Approach: Rationale for IV

- Unable to randomize individuals to PCAFC
- Assume non-random selection
  - Individuals accepted into PCAFC may have unobserved characteristics that also affect use of social services
    - Personal expectations for engaging in work/school may be related to health
- IV allows analyst to pseudo randomize individuals such that their characteristics are balanced across groups



# Aim 1 Approach: Rationale for IV

- IV must be strongly related to treatment (IV strength) and must not be related to outcome except through treatment (IV validity)
- Used new IV method<sup>1</sup> developed for Cox PH models, which applies a two-stage residual inclusion (2SRI) plus a frailty term in the second stage equation

<sup>1</sup> Camblor-Martinez et al, 2018



## Aim 2 Approach

*What features of family caregiver support facilitate use of social and medical services?*

- 25-30 in-depth telephone-based Veteran/caregiver dyad interviews
  - Veteran and caregiver participate together
- Sample: Enrolled in PCAFC and used one of social services
- On-going analysis using *a priori* themes
  - Completed 25 interviews and analyzed 9 transcripts
  - Dyad unit of analysis



Sampling Frame N=1756, Veterans whose caregivers applied to and were approved for PCAFC between May 1, 2010 and September 30, 2014, live within the US, age less than 68 years at the time of PCAFC application, and used both health and social services.

**Post 9/11 GI Bill Benefit  
n=768**

Letters sent: 76

**Total # of interviews  
completed : 12**

In process: n=20

Excluded: unable to contact n= 32

Excluded: n=0

Refused: n= 13

**Vocational Rehabilitation  
and Employment n=927**

Letters Sent: 130

**Total # of Interviews  
completed : 13**

In process: n=24

Excluded: unable to contact n= 62

Excluded: n= 6

- Veterans did not pursue program beyond initial contact
- Language barrier
- Veteran ineligible for program
- Many Veterans did not recall using VRE

Refused: n= 28

**Supported  
Employment n=207**

Letters Sent: 191

**Total # of Interviews  
completed : 6**

In process: n=87

Excluded: unable to contact n= 55  
Excluded: n= 19

- MANY did not recall using SE
- Health Issues/Mental disability
- Veterans did not pursue service beyond initial contact
- Language barrier

Refused: n= 25



# **Preliminary Results Aim 1: Post 9/11 GI Bill benefit use**





# Aim 1 Demographics

	Overall	Approved	Denied
	<b><i>N=11,068</i></b>	<b><i>N=6,463</i></b>	<b><i>N=4,605</i></b>
<b>Veterans who used GI Bill</b>	13.1%	13.62%	12.46%
<b>Demographics</b>			
Age at application date, median (IQR)*	37 (30, 47)	35 (30, 44)	42 (32, 52)
Race			
White or Unknown*	72.4%	77.5%	65.3%
Black or Other*	27.6%	22.5%	34.7%
Hispanic or Latino/a*	12.4%	14.8%	9.0%
Married**	68.5%	69.5%	67.0%
Caregiver Relationship to Veteran*			
Spouse	79.7%	82.8%	75.4%
Parent	7.6%	8.3%	6.6%
Other (e.g. sibling, friend)	12.6%	8.9%	17.9%
Service Connection*			
High (>=70%)	67.2%	71.0%	61.9%
Medium high (50%-69%)	12.5%	11.0%	14.6%
Medium low (10-49%)	6.4%	5.0%	8.5%
Low (<10%)	13.9%	13.0%	15.0%

\*<0.001

\*\*0.005



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Other (e.g. sibling, friend)	12.6%	8.9%	17.9%
<b>Service Connection*</b>			
<b>High (&gt;=70%)</b>	<b>67.2%</b>	<b>71.0%</b>	<b>61.9%</b>
Medium high (50%-69%)	12.5%	11.0%	14.6%
Medium low (10-49%)	6.4%	5.0%	8.5%
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# Aim 1 results

- **IV Strength:**

<b>Outcome</b>	<b>F-Statistic</b>
GI Bill	F-statistic 12.8, $p < 0.001$
Vocational Rehabilitation	F-statistic 20.8, $p < 0.001$
Supported Employment	F-statistic 39.9, $p < 0.001$

- IV Validity



# Aim 1 results

- IV Strength:

Outcome	F-Statistic
GI Bill	F-statistic 12.8, $p < 0.001$
Vocational Rehabilitation	F-statistic 20.8, $p < 0.001$
Supported Employment	F-statistic 39.9, $p < 0.001$

- **IV Validity** (untestable assumption); can compare balance of observed covariates across treatment and IV, improved balance across IV could indicate that unobserved confounding would also be improved by IV



# Aim 1 Balance by Approved for PCAFC: GI Bill

	Approved	Denied
	N=6,463	N=4,605
<b>Comorbidities</b>		
<b>Diabetes*</b>	<b>8.4%</b>	<b>16.6%</b>
Musculoskeletal	64.2%	60.2%
Alcohol or Substance Abuse	20.4%	19.0%
Hearing loss, pain, other	18.4%	14.9%
<b>Hyperlipidemia*</b>	<b>29.1%</b>	<b>34.2%</b>
<b>Hypertension*</b>	<b>25.2%</b>	<b>34.3%</b>
Obesity	18.7%	19.0%
<b>Pain of psychogenic origin (not including back pain) *</b>	<b>47.2%</b>	<b>39.7%</b>
<b>Traumatic brain injury*</b>	<b>30.9%</b>	<b>15.6%</b>
<b>Headache*</b>	<b>19.5%</b>	<b>12.7%</b>
Joint pain and effusion, not including back	38.3%	35.1%
Anxiety	26.0%	22.4%
<b>Depression*</b>	<b>52.4%</b>	<b>44.7%</b>
Other mental health	16.6%	14.5%
<b>Post traumatic stress disorder*</b>	<b>72.9%</b>	<b>54.1%</b>
Tobacco use	23.5%	21.3%
Acute myocardial infarction	7.0%	8.5%

\* Indicates standardized difference >10





# Aim 1 Balance by Approved for PCAFC: GI Bill

	Below IV Median	Above IV Median
<b>Comorbidities</b>		
Diabetes	12.3%	11.3%
Musculoskeletal	60.6%	64.6%
Alcohol or Substance Abuse	18.3%	21.4%
Hearing loss, pain, other	15.6%	18.4%
Hyperlipidemia	31.6%	30.9%
Hypertension	28.9%	29.1%
Obesity *	17.2%	20.6%
Pain of psychogenic origin (not including back pain)	41.6%	46.7%
Traumatic brain injury	22.6%	26.6%
Headache	16.9%	16.4%
<b>Joint pain and effusion, not including back*</b>	<b>35.5%</b>	<b>38.7%</b>
Anxiety	22.8%	26.2%
Depression	47.2%	51.4%
Other mental health	14.7%	16.8%
<b>Post traumatic stress disorder*</b>	<b>62.4%</b>	<b>68.0%</b>
Tobacco use	40.8%	42.8%
Acute myocardial infarction	7.2%	8.1%

\* Indicates standardized difference >10; all standardized differences were less than 12



# Aim 1 Results: GI Bill

Model	Coefficient, 95% CI
<b>Time to application for the post 9/11 GI Bill benefit</b>	
Naïve adjusted Cox PH model	HR=0.98, 0.89-1.08
IV adjusted Cox PH model (2SRI + frailty)	HR=1.00, 0.51-1.75

*Models adjusted for health comorbidities, demographics, distance to nearest facility, caregiver/veteran relationship, VA-level disability and insurance variables, service use, facility fixed effects, and application time period fixed effects.*

*Instrumental variable=facility-level percentage approval for PCAFC in the 6 months prior to application*



# Aim 1 Results: Vocational Rehabilitation

Model	Coefficient, 95% CI
<b>Time to application for the post 9/11 GI Bill benefit</b>	
Naïve adjusted Cox PH model	HR= 0.86, 0.77-0.96
IV adjusted Cox PH model (2SRI + frailty)	HR=0.99, 0.65-1.59

*Models adjusted for health comorbidities, demographics, distance to nearest facility, caregiver/veteran relationship, VA-level disability and insurance variables, service use, facility fixed effects, and application time period fixed effects.*

*Instrumental variable=facility-level percentage approval for PCAFC in the 6 months prior to application*



# Aim 1 Results: Supported Employment

Model	Coefficient, 95% CI
<b>Time to application for the post 9/11 GI Bill benefit</b>	
Naïve adjusted Cox PH model	HR= 1.29, 1.01-1.67
IV adjusted Cox PH model (2SRI + frailty)	HR= 1.30, 0.97-1.72

*Models adjusted for health comorbidities, demographics, distance to nearest facility, caregiver/veteran relationship, VA-level disability and insurance variables, service use, facility fixed effects, and application time period fixed effects.*

*Instrumental variable=facility-level percentage approval for PCAFC in the 6 months prior to application*



# **Preliminary Results Aim 2: Post 9/11 GI Bill service use**



# Aim 2: Demographics of participants of analyzed transcripts (n=6)

	<b>Caregiver relationship to Veteran</b>	<b>Participation in Caregiver Support Program</b>	<b>Age of Veteran</b>
<b>Veteran/Caregiver #1</b>	Spouse	Active	34
<b>Veteran/Caregiver #2</b>	Spouse	Active	36
<b>Veteran/Caregiver #3</b>	Spouse	Active	45
<b>Veteran/Caregiver #4</b>	Spouse	Transition out	36
<b>Veteran/Caregiver #5</b>	Spouse	Transition out	34
<b>Veteran/Caregiver #6</b>	Spouse	Active	41



## Aim 2 preliminary results

- Emerging themes
  1. Veterans used the GI Bill to integrate back into civilian life

*CG: “Having the GI Bill helps him to figure out another path for his future and reinvent himself”*



## Aim 2 preliminary results

2. Recognized direct link between addressing social needs (i.e. relationships, school, work, sense of self, etc.) and health

*Veteran: "Sports has become a really huge factor in my recovery, not only sobering up, but redefining not only who I am, but who I want to be [...] I figured what better way to be who I want to be than educating the next generation in the pros and cons of what sports has to offer."*





# Aim 2 preliminary results

3. Life goals generally included both social and medical needs

	<b>Social aspect of goals</b>	<b>Medical aspect of goals</b>
<b>Veteran #1</b>	Focusing on career, having children	Reaching sobriety
<b>Veteran #2</b>	Taking care of family	Controlling anxiety and PTSD
<b>Veteran #4</b>	Getting an education and career, maintaining his relationship with wife	Focusing on his health (back injury), finding a job that is realistic considering his injury
<b>Veteran #5</b>	Be a good dad	Take care of medical issues



# Aim 2 preliminary results

4. Caregivers were a critical facilitator of engaging in medical care and the post 9/11 GI Bill; across both services play similar functions

<b>CG functions</b>	<b>Medical Care</b>	<b>Post 9/11 GI Bill</b>
<b>Logistical</b>	Managing appointments and records (n=4), managing medications (n=3), attending appointments (n=4)	Completing assignments (n=4), administrative academic tasks (n=2), managing household (n=2), transportation (n=1)
<b>Emotional</b>	Remain engaged to address frustrations (n=1) [quote]	Emotional support to manage anxieties, uncertainty, frustration (n=3)
<b>Advocacy</b>	Asks for additional services/help (n=2), communicates with providers (n=4) [quote]	Spoke with instructors, sought disability services (n=1) [quote]



CG: "I try to make sure he's seeing who he needs to be seeing and for issues. I like to make sure he's following up with one of his providers that can help him out in that aspect, whatever he's having an issue with, but they've got a lot of bumps in the road when it comes to his medical history and everything with the depression, and sometimes he looks like he's going absolutely crazy so I do try to stay engaged in the medical areas"



## Aim 2 preliminary results

- Caregivers were a critical facilitator of engaging in medical care and the post 9/11 GI Bill

<b>CG functions</b>	<b>Medical Care</b>	<b>Post 9/11 GI Bill</b>
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<b>Advocacy</b>	Asks for additional services/help (n=2), communicates with providers (n=4) [quote]	Spoke with instructors, sought disability services (n=1) [quote]



CG: Ensure that “professors were aware that he isn’t a joke and he’s here, and he wants to be taken seriously, but it’s more than just the arm that’s missing. It’s the intellectual and emotional disabilities that affect these Veterans more because it’s harder for us able bodies to recognize the difference.”



## Aim 2 preliminary results

5. Institutional support for caregivers through PCAFC was a critical facilitator for medical care; less clear for the post 9/11 GI Bill
  - Medical care facilitators: referrals for health services and medical equipment, disease education, caregiver skills education, acknowledgement of caregiver role
  - Post 9/11 GI Bill: stipend (n=3), encouragement to attend school [acknowledgement of ability] from program staff (n=1)

*CG: "It [stipend] was nice because it gives us time for [Veteran] to kind of figure out what he needs to do to get back on his feet [...] like I said he's trying to figure out what he was going to [be] after the military. It's been a couple years, but it's been nice for him to have that, along with the GI Bill to create a new career."*



# Preliminary conclusions for post 9/11 GI Bill

- Medical, psychological and social needs are highly interconnected
- Caregivers are critical facilitators of engaging in GI Bill
- Participation in PCAFC is not associated with application to the post 9/11 GI Bill, but plays a strong role in medical care
- Early indications that some program features could be effective for supporting engagement with the post 9/11 GI Bill benefit
  - Stipend, information/resources about GI Bill benefits, encouragement from program staff



**Thank you!**





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- Robert Wood Johnson Foundation



## Resources

### Caregiver Support Program

<https://www.caregiver.va.gov/>

### Post 9/11 GI Bill

[https://www.benefits.va.gov/gibill/post911\\_gibill.asp](https://www.benefits.va.gov/gibill/post911_gibill.asp)

### Vocational Rehabilitation and Employment

[https://www.benefits.va.gov/VOCREHAB/edu\\_voc\\_counseling.asp](https://www.benefits.va.gov/VOCREHAB/edu_voc_counseling.asp)

### Compensated Work Therapy Program (Supported Employment)

<https://www.va.gov/health/cwt/supportedemployment.asp>