

Resource Facilitation 101

Circa 2017

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Outline

- I. Introduction
- II. Overview of the RHI Resource Facilitation Program and Structure
- III. RHI Research in Resource Facilitation
- IV. Future Directions
- V. Discussion

Learning Objectives

- summarize the research findings for return to work and school after acquired brain injury with and without Resource Facilitation,
- Learn about the key components of Resource Facilitation illustrated through clinical case examples , and
- Understand the transition of Resource Facilitation from clinical research to practice and to policy.

Introduction

RTW after TBI

Author	Date Published	Sample Size	Pre-Injury Unemployment (%)	Time after Injury	Post-Injury Unemployment (%)
Levin ¹	1979	27	4	1 year	78
Brooks ²	1987	98	14	≤7 years	70
Gollaher ³	1998	99	22	1-3 years	64
Sander ⁴	1996	322	29	Year 3	48

1. Levin, H. S., Grossman, R. G., Rose, J. E., & Teasdale, G. (1979). Long-term neuropsychological outcome of closed head injury. *Journal of Neurosurgery*, 50(4), 412-422.
2. Brooks, N., McKinlay, W., Symington, C., Beattie, A., & Campsie, L. (1987). Return to work within the first seven years of severe head injury. *Brain Injury*, 1(1), 5-19.
3. Gollaher, K., High, W., Sherer, M., Bergloff, P., Boake, C., Young, M. E., & Ivanhoe, C. (1998). Prediction of employment outcome one to three years following traumatic brain injury (TBI). *Brain Injury*, 12(4), 255-263.
4. Sander, A., Kreutzer, J. S., Rosenthal, M., Delmonico, R., & Young, M. E. (1996). A multicenter longitudinal investigation of return to work and community integration following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 11(5), 70-84.

Systematic Review

Van Velzen, et. al. (2009). How many people return to work after acquired brain injury: A systematic review. *Brain Injury*, 23(6): 473-488.

- traumatic and non-traumatic brain injury
- search yielded 2233 articles based on key words of brain injury and return to work
- 209 articles were then identified based on the following inclusion criteria:
 - non-progressive acquired brain injury,
 - return to work was mentioned in the title
 - Adults were included

Systematic Review

Van Velzen, Van Bennekom et al (2009)

- 49 studies were selected for full review based on:
 - return to work was an outcome measure,
 - participants were working prior to their injury, and
 - the participants were 18-65 years of age.
- Results: Estimated post-injury at two years:
 - 40.8 % of the participants with traumatic brain injury were able to return to work
 - 39.3 % of the participants with non-traumatic brain injury were able to return to work

Systematic Review

Van Velzen, Van Bennekom et al (2009)

- This study however was not able to separate outcomes by severity
 - One study¹ with a 12 year follow-up found an 84% RTW rate which included mild head injury
 - One study² that only included mild TBI found a 78% RTW rate
- Three studies^{3,4,5} looked at only severe TBI and found 0-18% RTW
- Therefore, the 40% RTW overall rate may overestimate rates of RTW for moderate to severe TBI

1. Groswasser Z., et al. (2002). Quantitative imaging in late TBI. Part II: Cognition and work after closed and penetrating head injury: A report of the Vietnam head injury study. *Brain Injury*; 16: 681-690.
2. Hanlon, R.E., Demery, J.A., Martinovich, Z., Kelly, J.P. (1999). Effects of acute injury characteristics on neuropsychological status and vocational outcome following mild TBI. *Brain Injury*; 13: 873-887.
3. Dikmen, S., Machamer, J., Temkin, N. (1993). Psychosocial outcome in patients with moderate to severe head injury: 2 year follow-up. *Brain Injury*; 7: 113-124.
4. Bounds, T.A., Schopp, L., Johnstone B., Unger, C., Goldman, H. (2003). Gender differences in a sample of vocational rehabilitation clients with TBI. *NeuroRehabilitation*; 18: 189-196.
5. Ruff, R.M., et al. (1993). Predictors of outcome following severe head trauma: Follow-up data from the traumatic coma databank. *Brain Injury*; 7: 101-111.

TBIMS

Cuthbert, J, Harrison-Felix, C, Corrigan, JD et. al. (2015). JHTR 30(3), 160-174.

- 3121 subjects identified in the TBIMS-NDB admitted and discharged between October 1, 2001 and December 31, 2010
- TBIMS-NDB data was weighted to obtain population estimates were obtained to match the US TBI Rehabilitation population based on UDS and eRehab data

TBIMS

Cuthbert, J, Harrison-Felix, C, Corrigan, JD et. al. (2015). JHTR 30(3), 160-174.

- Sample:
 - < 60 years of age at injury (75,411)
 - Not retired at injury (72,165)
 - Alive at two years post-injury follow-up (64,081)
 - Employed = 25,399 (39.6%)
- Unemployed = 38,682 (60.4%)
- Employment = paid legal or illegal work, with or without accommodations
- 65% were full-time

2012 Indiana Vocational
Rehabilitation Services successful
closure (return to work) rate for brain
injury = 18%

Why, at best, do only 40%
of people with brain injury return to work?

Acute Care - - - - - Return to Work



What are the Barriers to Return to Work?

- Individual and Family:
 - Persisting Cognitive & Behavioral Impairments caused by brain injury
 - Co-Morbidities (e.g., depression, social isolation)
 - Family burden, over-commitment and fatigue
- Environmental:
 - Availability Brain Injury Specific Expertise
 - Lack of Awareness of What Services do Exist
 - Access to Services that do Exist

What are the Barriers to Return to Work?

- System:
 - Fragmentation and gaps between systems:
 - Medical
 - Rehabilitation
 - Vocational Services
 - Obstacles to a Continuum from Injury to Return to Work:
 - Different organizations (health care versus community-based resources versus state agencies) that operate in isolation
 - Different Funding Mechanisms:
 - About which awareness is limited
 - That are hard to understand and access

What are the Consequences?

- Loss of pre-injury vocational skills, relationships and networks
- Increased risk for co-morbidities (e.g., depression, anxiety, substance abuse)
- Loss of economic productivity and financial stress for the patient and family
- Increased family burden
- Increased cost to society (e.g., disability, health care expense)

RHI Resource Facilitation Program and Structure

Top Down Implementation of Policy

Indiana Vocational Rehabilitation Services: Lead Agency



Indiana Brain Injury Leadership Board
(State Agencies, Public and Private Organizations)



RHI Resource Facilitation Clinical and Research Team



Northern Indiana Local Support Network



Central Indiana Local Support Network



Southern Indiana Local Support Network



Resource Facilitation Services



Resource Facilitation Services



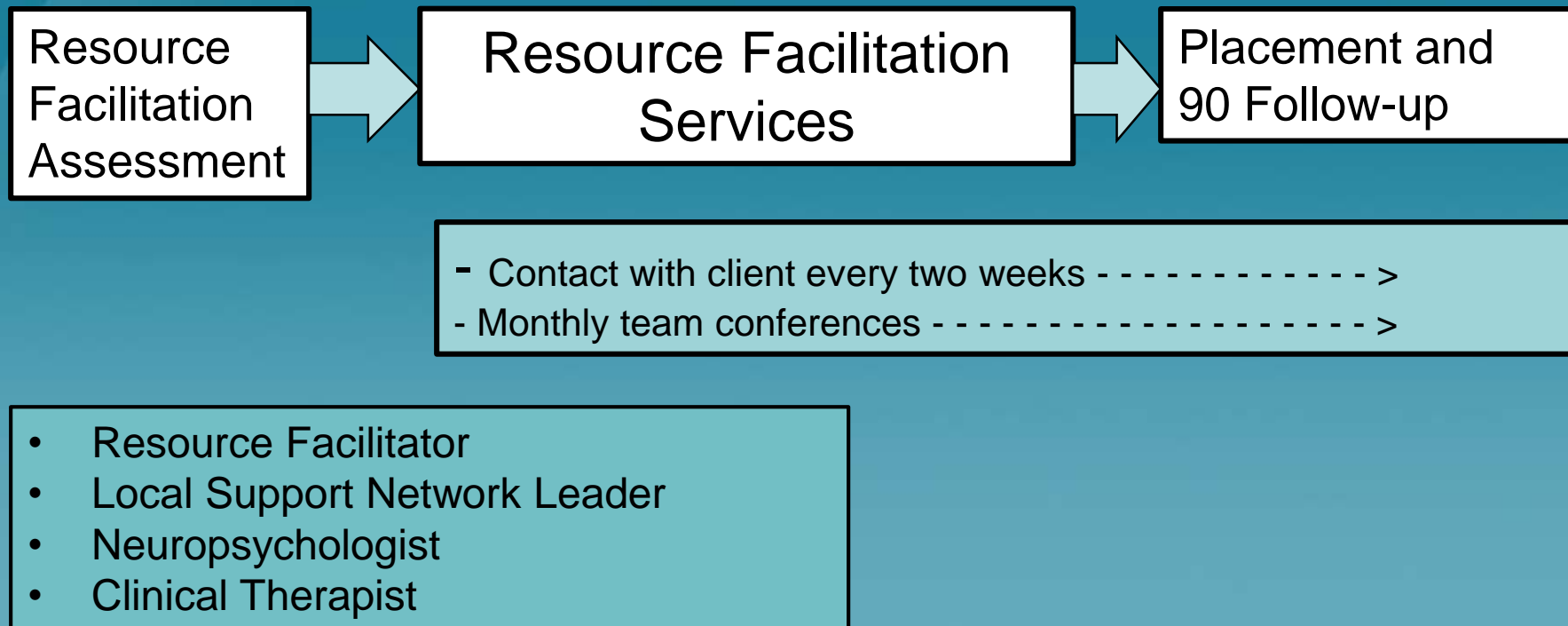
Resource Facilitation Services



Bottom Up Identification of Service and System Needs



Resource Facilitation Timeline



Purpose of the NeuroVocational Evaluation (NVE)

- To capture the brain injury-specific biopsychosocial scope of predictors of return to work
- To objectively assess functional disability associated with brain injury
- To address all of the eligibility and OOS types of functional capacity
- To determine plan:
 - what are vocationally necessary services and supports
 - where to access these services
 - how to access these services (various sources of support)
- 5-10% RF services are not recommended by RF team

Domains & Scope of the NVE Relative to the Neuropsychological Examination

New

- Pain
- Fatigue
- Sleep
- Mobility
- Self-Efficacy

Previous

- Cognitive
- Neurobehavioral
- Psychological
- Social - family
- Activities of daily living
- Substance abuse
- Brain injury disability
- Vocational barriers, preferences and values

Neuropsychological Examination

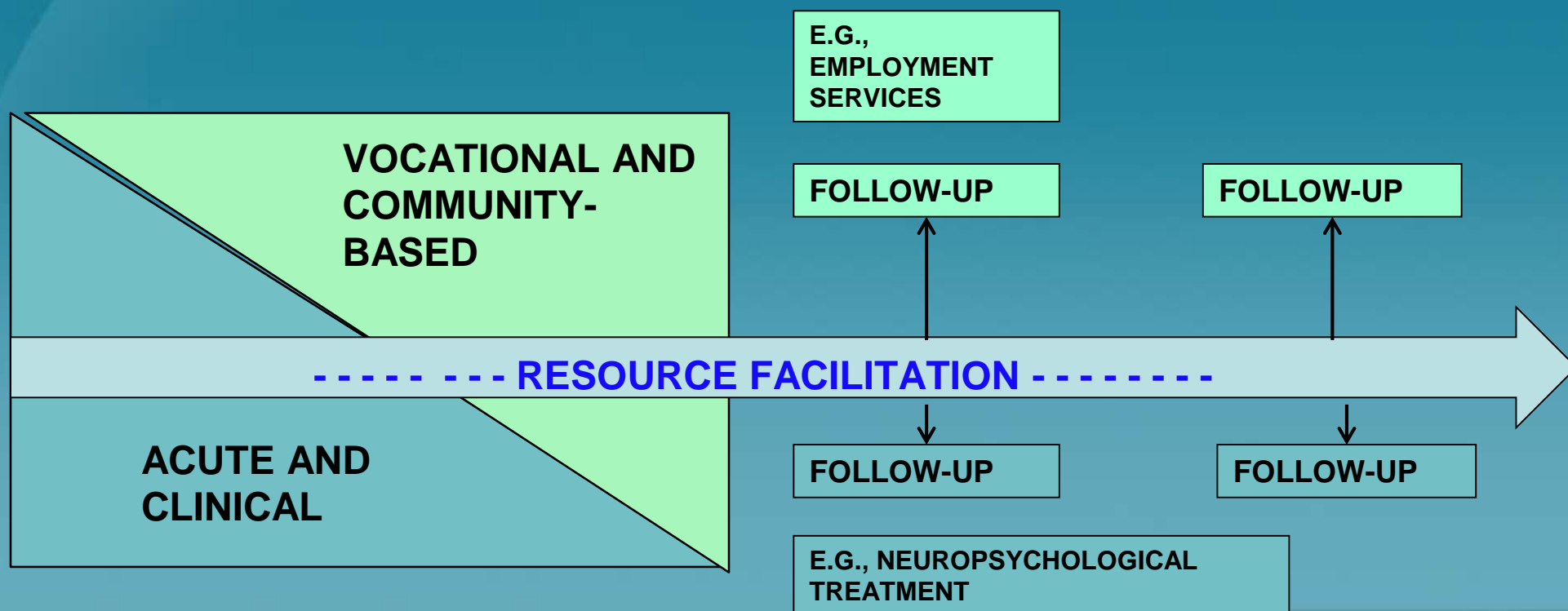
Brain Injury and Functional Disability

- You typically can't "see" the disability after brain injury (that is why hundreds of different tests have been developed)
- Neuropsychologists don't know the level of disability until they get test results
- Most of the time the client isn't aware of their disability, and therefore, they cannot report it
- Many different biopsychosocial factors influence the level of disability
- Medical records are not likely to provide the information necessary to determine level of disability
- Level and type of disability changes significantly over time

Resource Facilitation Defined

- individualized assessment
- provide brain injury specific education and promote awareness of resources
- proactive navigation to community-based supports, resources and services
- remove instrumental barriers (e.g., housing) as well as brain injury-specific barriers (e.g., memory impairment) to successful community re-integration and return to work.

Resource Facilitation and the Post-Acute Continuum

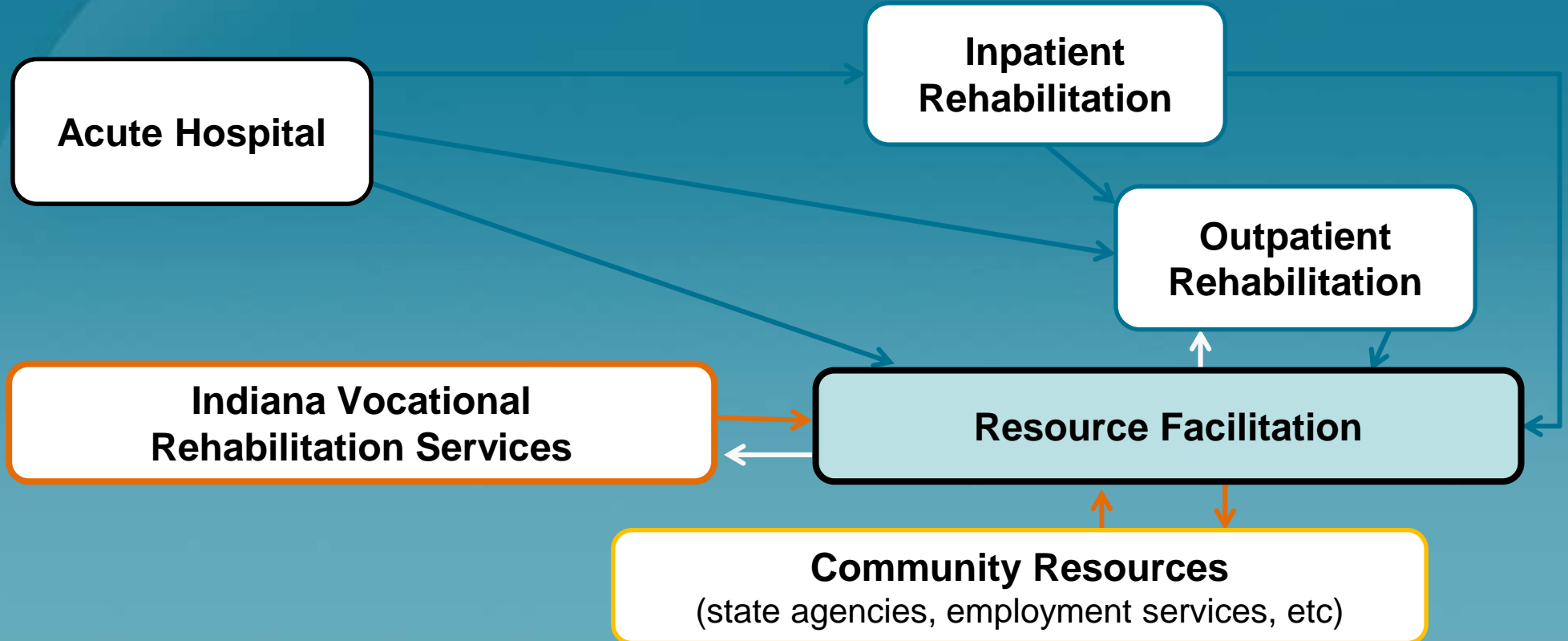


Two Levels of Intervention in Resource Facilitation

Environmental and Social Barriers (Systems Level): The Local Support Network Leader

- Community brain injury education and awareness for providers, state agencies, etc
- Identification of private and public resources & services applicable to brain injury (e.g., health & mental health care, rehabilitation, state agency, transportation, employment services)
- Coordination and partnerships to promote seamless continuum from acute and clinical organizations to vocational and Community-based organizations

System Navigation/Coordination and the Local Support Network Leader



Two Levels of Intervention in Resource Facilitation

- Individual and Family Barriers (Service Level):
The Resource Facilitator works with the person with brain injury and their family to provide:
 - Brain injury education
 - Facilitation of access to and coordination of services, systems and supports applicable to each person as derived through the initial evaluation for instrumental and brain injury-specific needs
 - Ongoing assessment of progress towards goals
 - Monthly team conferences

Resource Facilitation Services and Supports

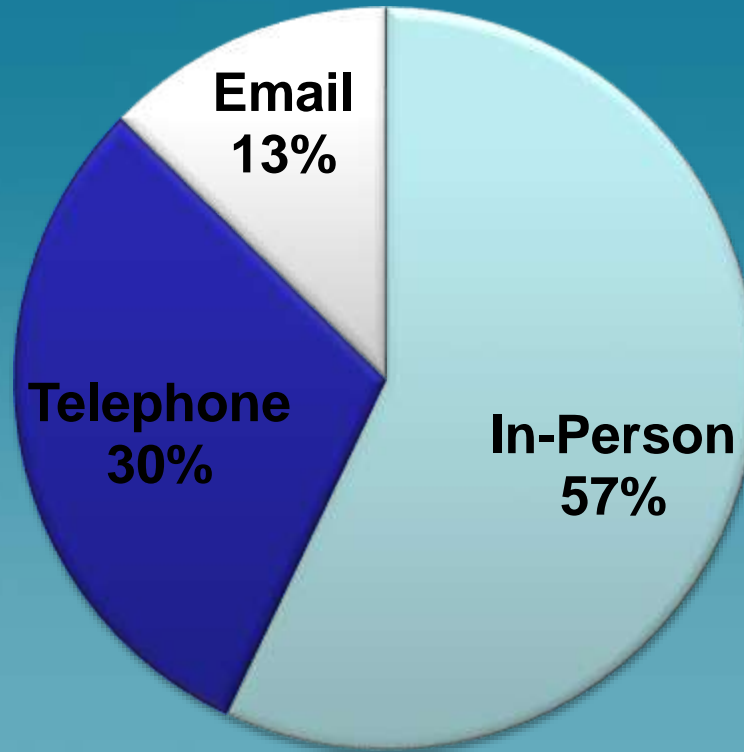
Instrumental Examples

- Housing
- Food
- Transportation

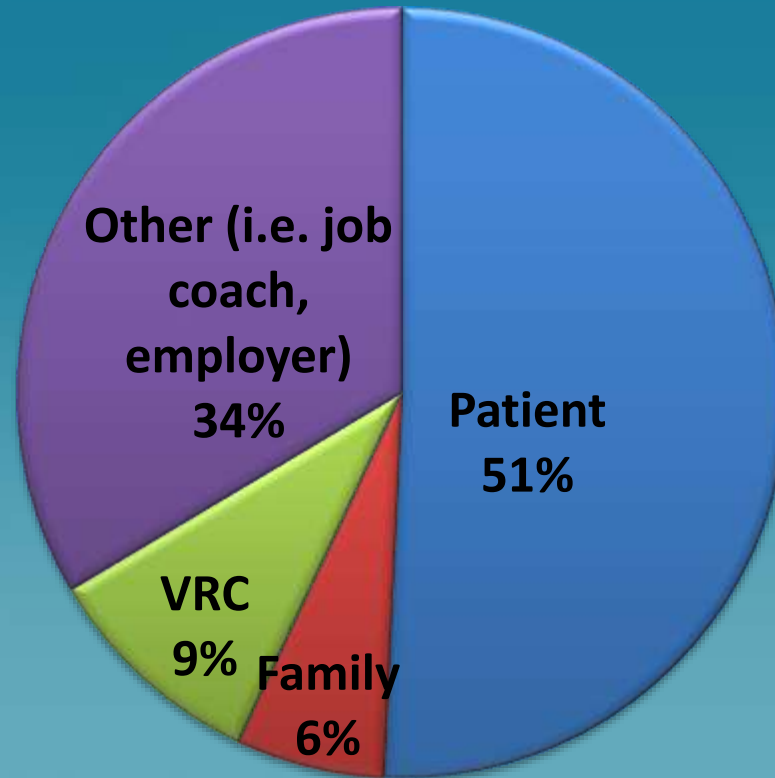
Brain-Injury Specific Examples

- Strategies for Managing Cognitive/Behavioral Impairments
- Patient-Family Education about Brain Injury
- Consulting with other Providers about how to modify services for Brain Injury

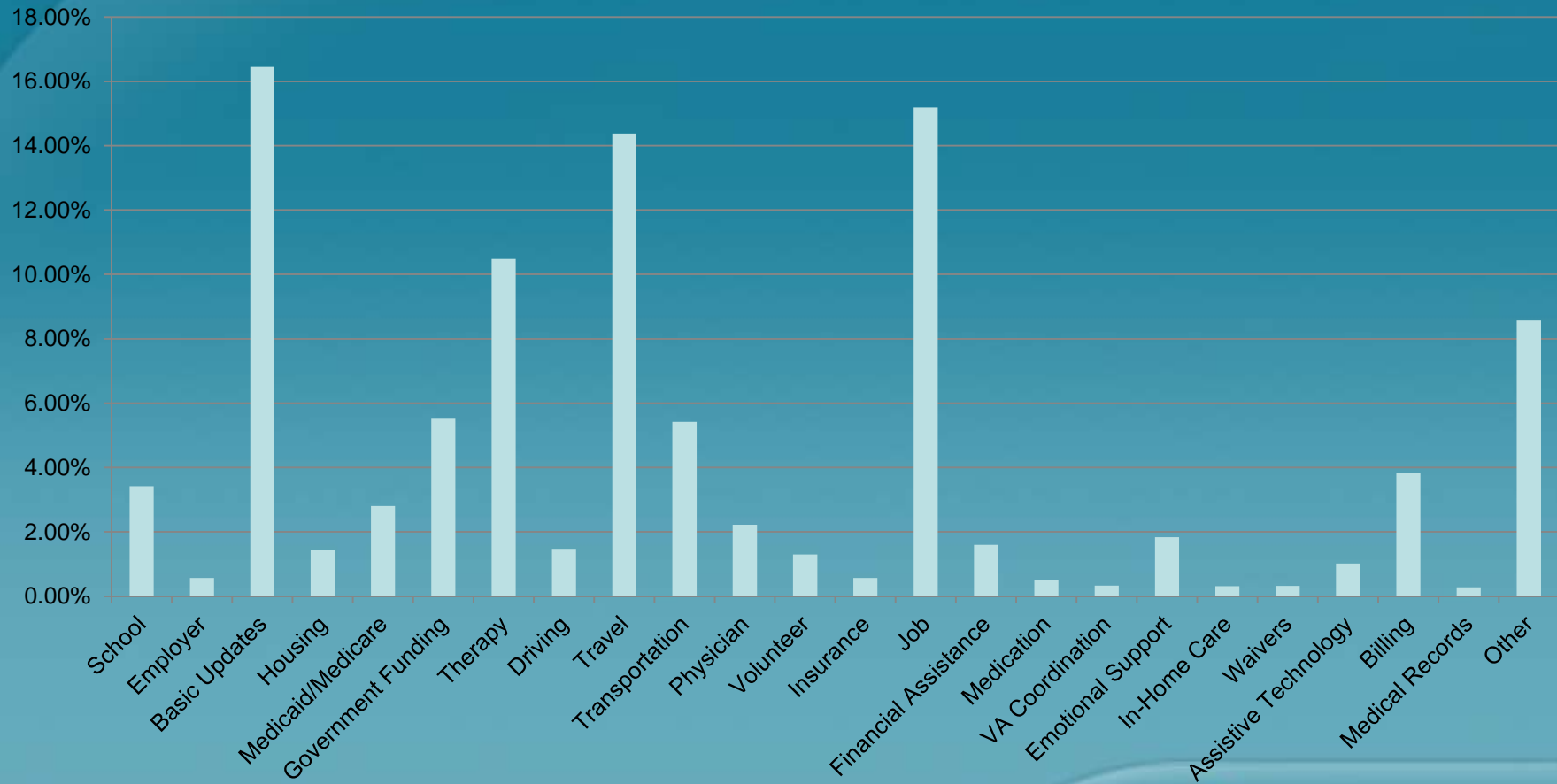
Resource Facilitator Contact Methods



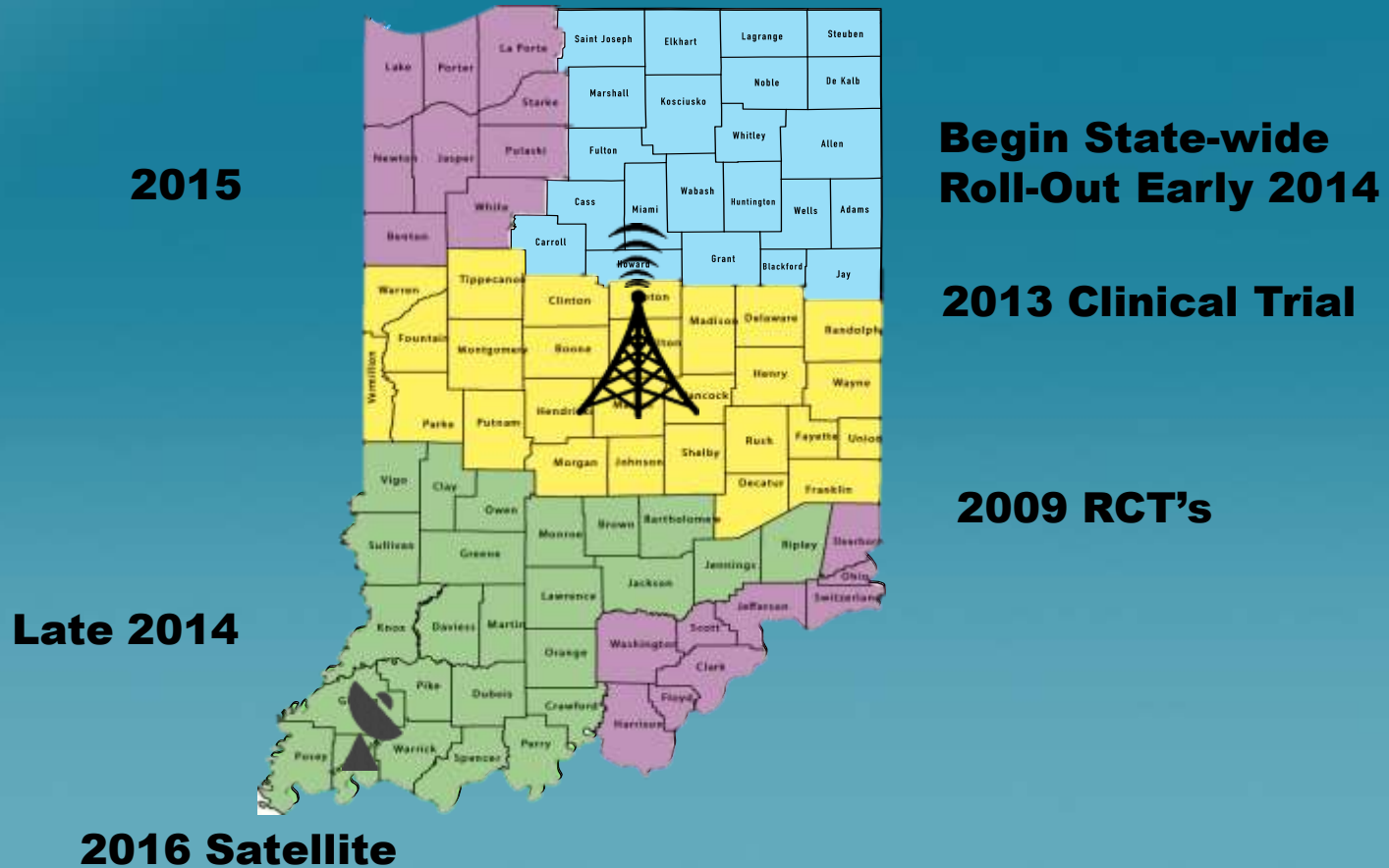
Contact with Whom



Percent of Total RF Time by Activity



Resource Facilitation Growth: 2009 – 2017



RHI Research in Resource Facilitation: What is the Evidence?

First Randomized Controlled Trial of Resource Facilitation

(Trexler, Trexler, Malec et al., (2010) JHTR, 25; 440-446)

- 22 people with acquired brain injury recruited from RHI (11 RF, 11 Con)
- Six months of Resource Facilitation (Conners, 2001)
- Team= Neuropsychologist, VR TBI Specialist, Resource Facilitator, BI Therapist

Table 3: Diagnoses by groups

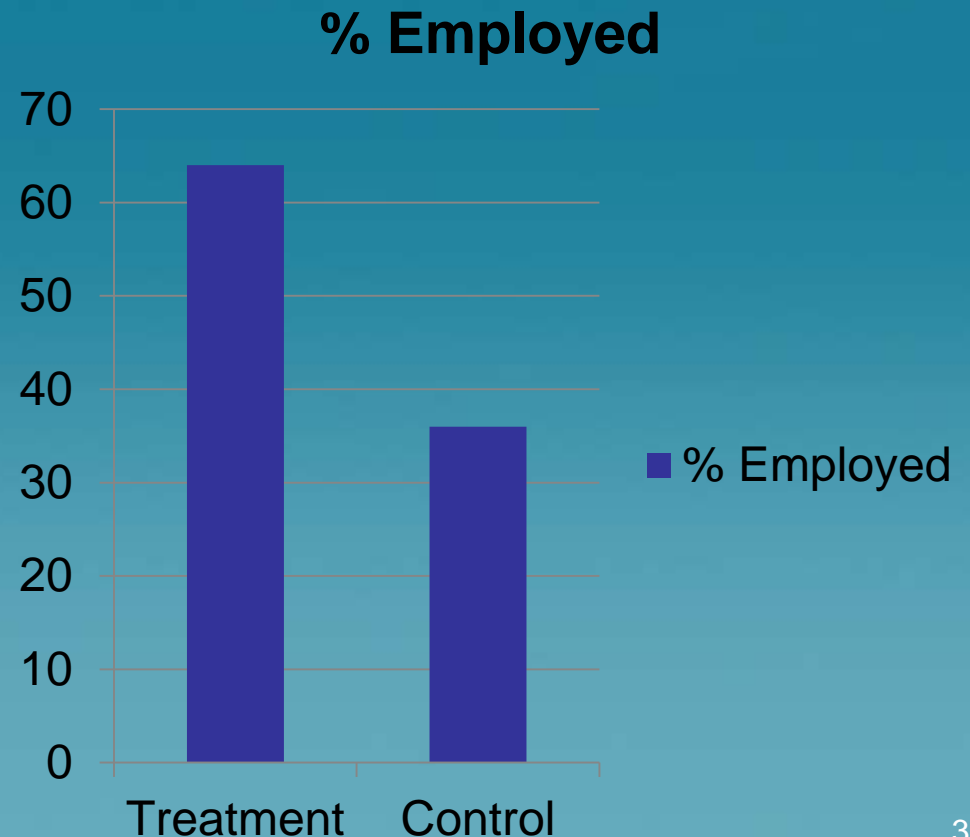
	Diagnosis				
	TBI	ICH	Stroke	Other	Total
Control	4	3	3	1	11
Treatment	3	4	3	1	11
Total	7	7	6	2	22

Results

- No differences between RF and Control groups for:
 - Age
 - Sex
 - Education
 - Severity of cognitive impairment
 - Diagnosis (TBI, stroke, etc.)

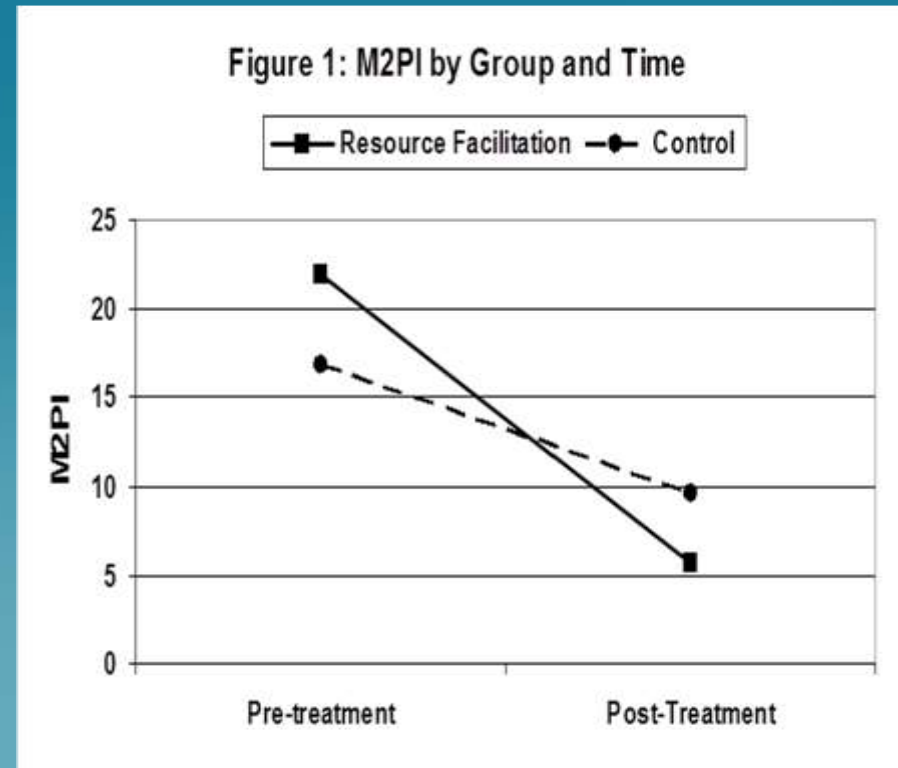
Results

- 64% of the RF group was employed at follow-up compared to 36% of the control group (Wald-Wolfkowitz $Z = -3.277$, $p < .0001$)



Results

Interaction between groups and time demonstrated greater improvement for the RF group relative to controls ($F = 9.11, p < .007$).



Indiana Vocational Rehabilitation Services authorized a Prospective Clinical Trial in 2011

Prospective Clinical Cohort Study of Resource Facilitation

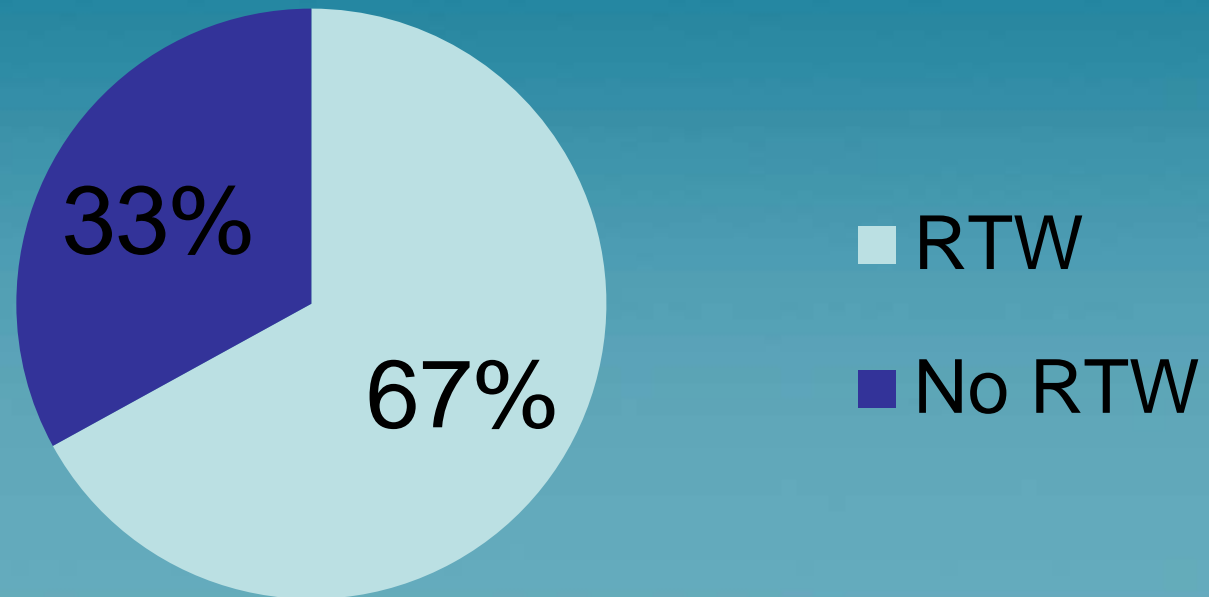
- 161 patients initiated services
 - 25 never started services
 - 10 did not finish services (moved, expired, changing goals)
 - 57 cases are still active (at time of analyses)
- 69 cases analyzed

Sample Demographics

- Time since injury was on average 9.28 years
- Average age for this sample was 38 years
- 78% male
- 53.8% of the sample had greater than a high school level of education
- Predominantly white

Results

- 67% returned to work or school



ORIGINAL RESEARCH

Replication of a Prospective Randomized Controlled Trial of Resource Facilitation to Improve Return to Work and School After Brain Injury



Lance E. Trexler, PhD,^{a,b} Devan R. Parrott, MS,^a James F. Malec, PhD^{a,b}

- Replication Study with larger sample size and longer treatment duration
 - 44 people with acquired brain injury recruited from RHI (22 RF treatment, 22 Control)
 - 15 months of Resource Facilitation Services

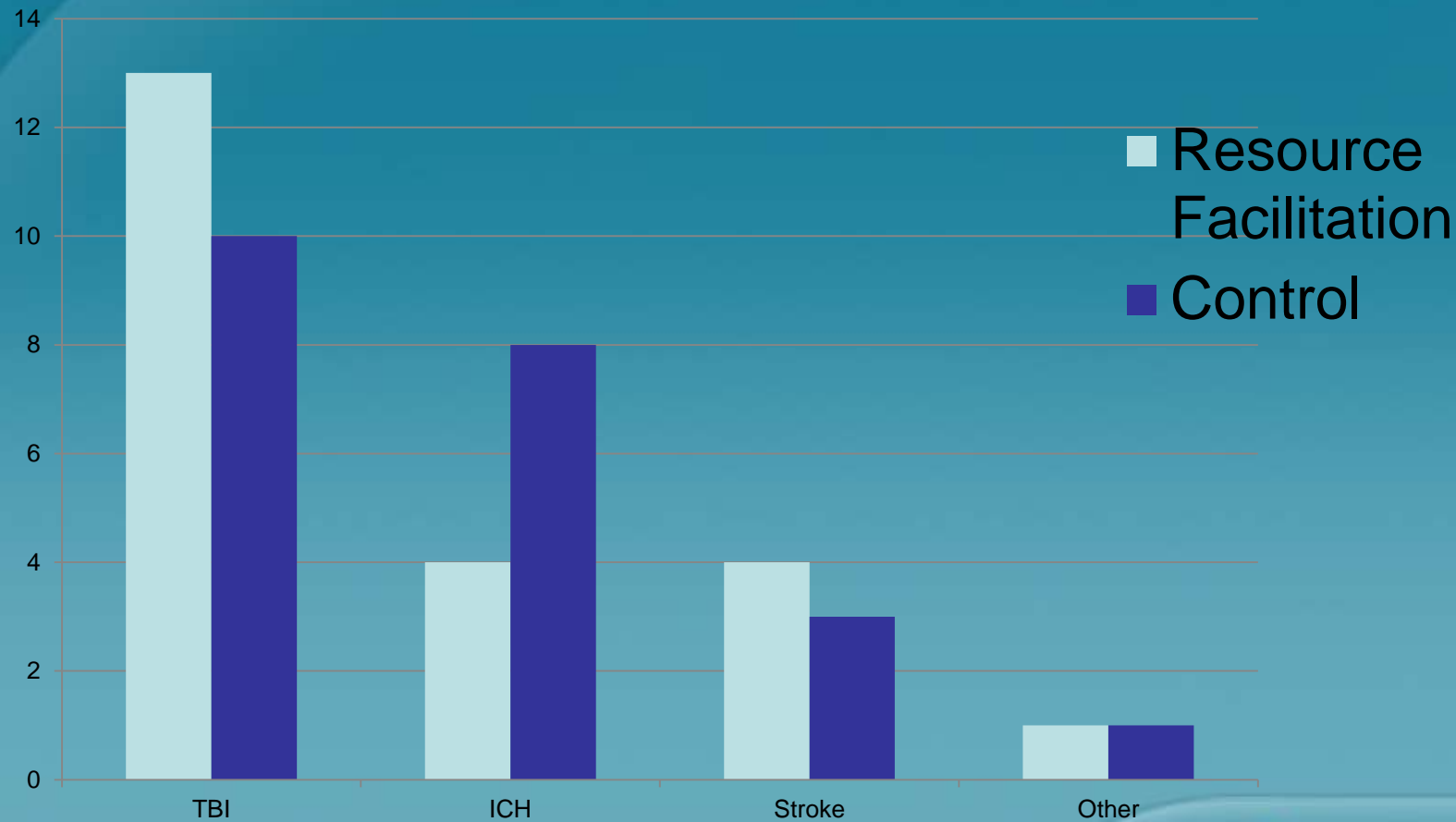
Sample Demographics

- On average, patients were 64 days post injury
- Average age was 37 years
- 62% Male
- 13.62 average years of education
- Predominantly white

Results

- Similar to RF 1, no differences between RF and Control groups on demographic variables
 - Age
 - Sex
 - Education
 - Time since injury
 - Diagnosis
- Significant group differences were found on VIQ WAIS III.

Diagnoses by Group

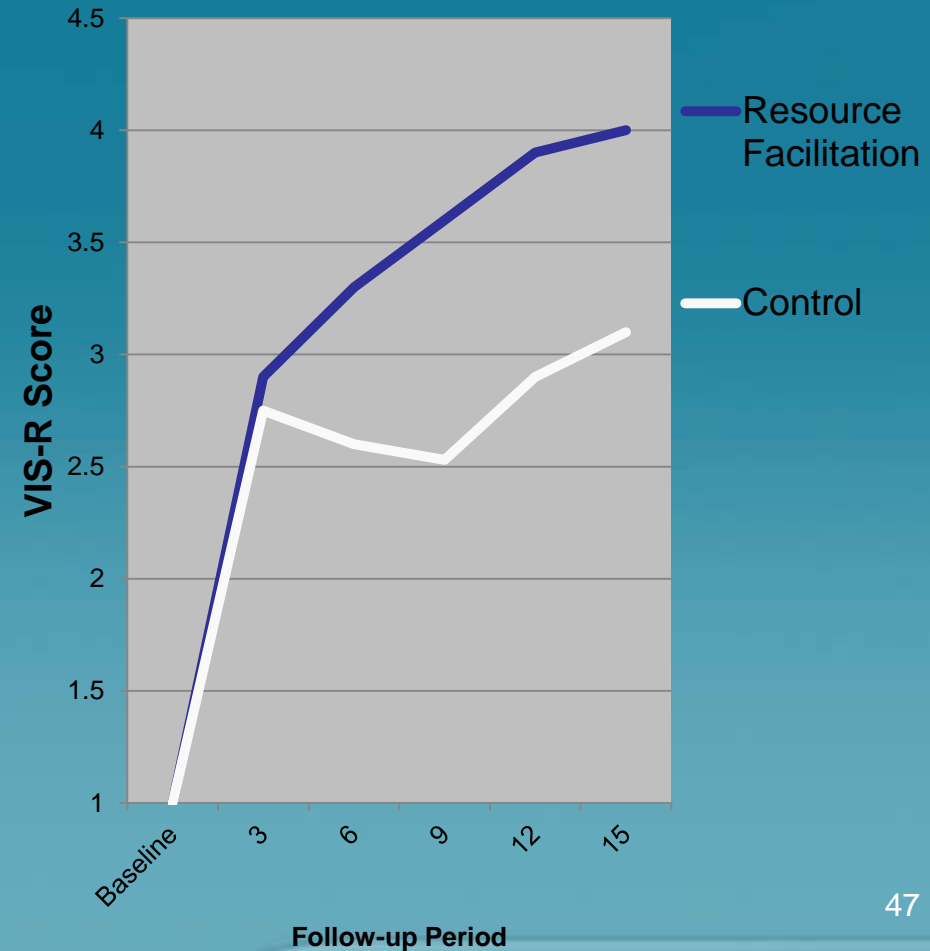


Vocational Independence Scale-R

5. Competitive: Community-based work without external supports for more than 15 hours/week. *Full-time school enrollment without external supports.*
4. Transitional: Community-based work with temporary supports (eg. job coach, reduced hours) fewer than 15 hours/week. *School enrollment with temporary supports or less than full-time student course load.*
3. Supported: Community-based work, *including volunteering*, with permanent supports. *School enrollment with permanent supports.*
2. Sheltered: Work in a sheltered workshop
1. Unemployed/*not in school*

VIS-R by Group

- Significant group by time interaction ($p = .027$)
- On average, the treatment group was 0.13 points higher than the control group on the VIS-R
- On average, the treatment group improved 0.17 points at each measurement while the control group only improved by 0.10 points



Results: Employment

- 87.5% of the 16 participants in the treatment group with a goal of RTW or volunteer activities were successful:
 - 11 returned to paid employment (69%)
 - 3 became volunteers (21%)
- 50% of the 20 participants in the control group with a RTW goal were successful.
 - 10 returned to paid employment (50%)
 - No volunteers

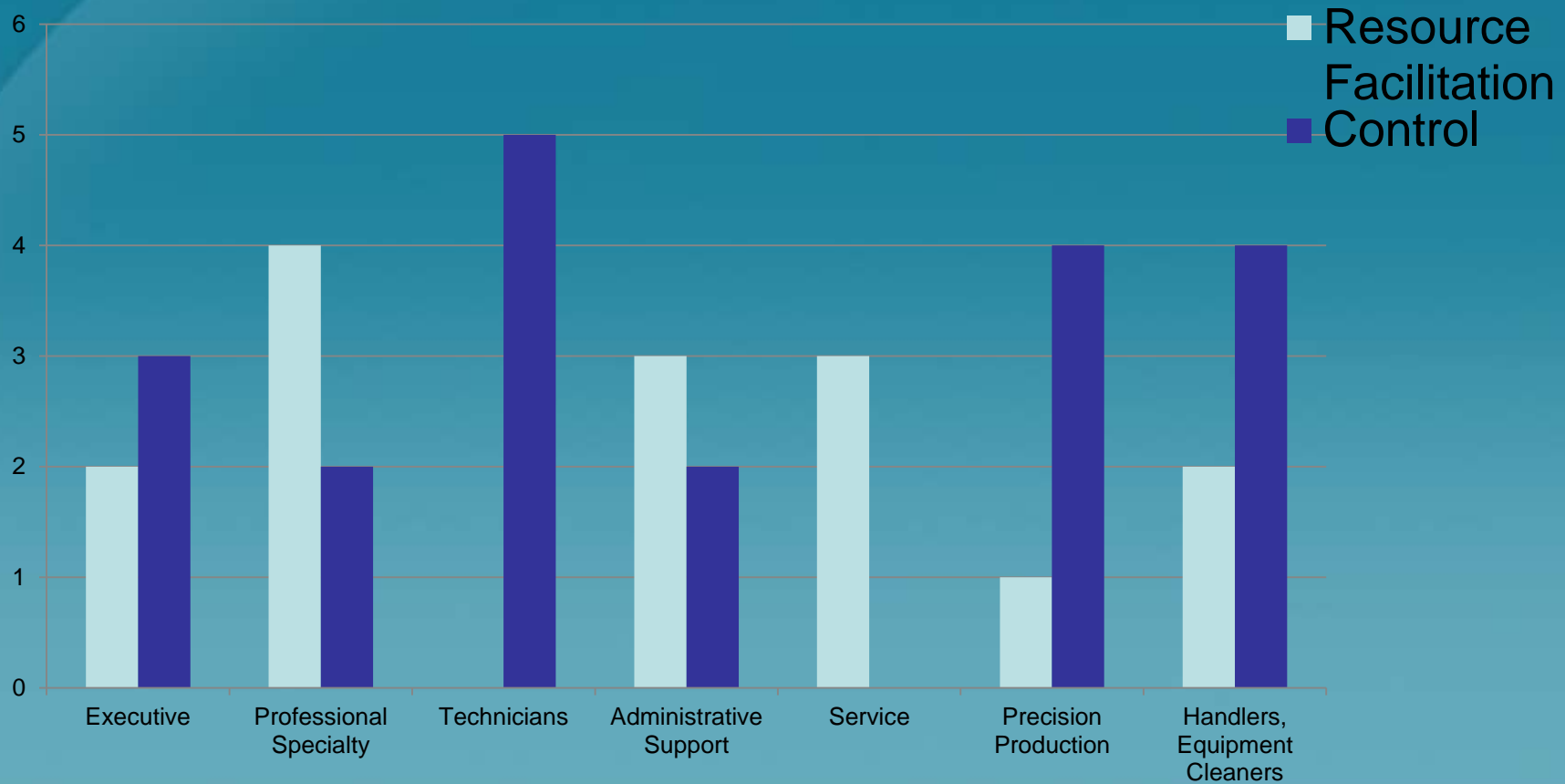
Results: Community-Based Work

- The odds ratio from the logistic regression found that RF participants were 7.0 times more likely to participate in productive community-based work than the control group.
- Relative risk analysis showed that the risk of no productive community-based work was 75% higher in the control group than the treatment group

Results: Employment

- Full time employment:
- 78% were full time in the RF group
- 90% in the control group
- Return to previous occupation (not necessarily same employer):
 - 67% of the control group
 - 80% of the resource facilitation group

Types of Jobs by Group



2014 Policy Decision

Based on the 2 RCT's, Prospective Clinical Cohort, and the Economic Impact Study, Indiana Vocational Rehabilitation Services decides to provide resource facilitation services to all of Indiana for

- People with acquired brain injury and
- Who want to return to work or school that will lead to return work

New Prospective Clinical Cohort (June, 2016; n = 141)

Results

Variable	Mean (sd)
Age	38.97 (13.87)
MPAI Participation Index	43.71 (7.88) [moderate disability]
Time Since Injury (Years)	10.10 (11.25)
% Male	63.8%
Years of Education	13.34 (2.34)

Results

70% Successfully Placed in
Competitive Employment
Mean hours per week = 25

Resource Facilitation and Level of Disability Outcomes

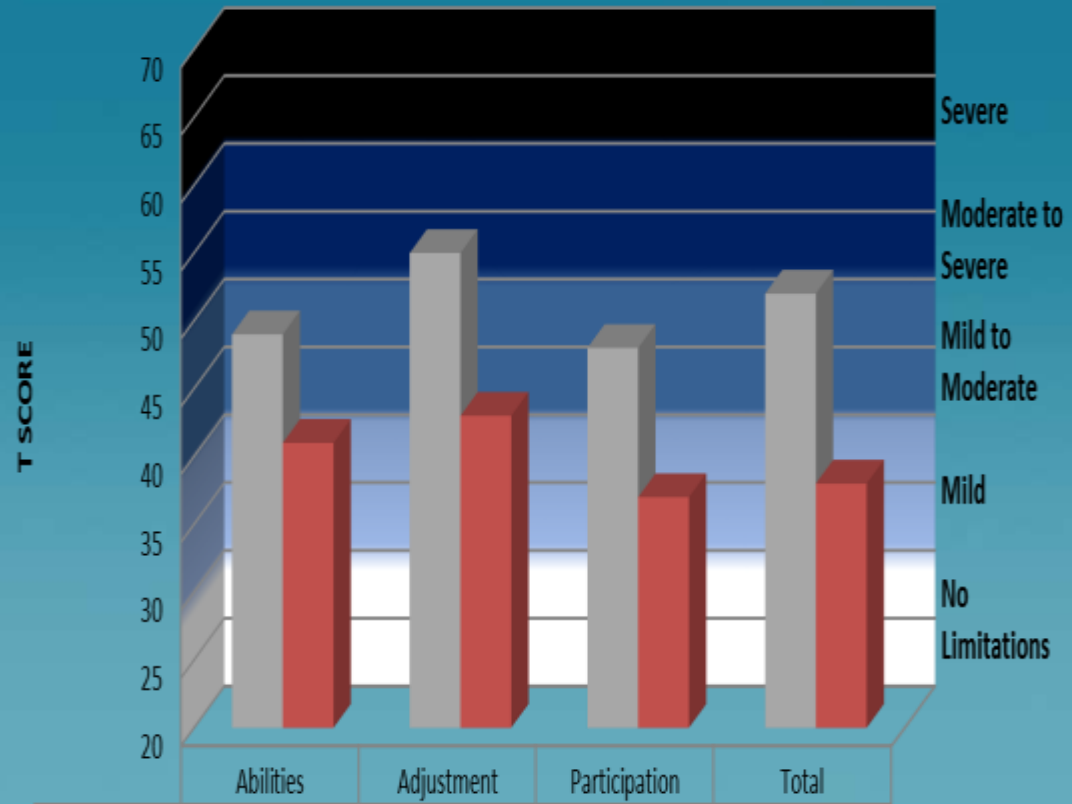
- Significant improvement ($p = .000$) in ADL's
 - self-care,
 - household care,
 - shopping and money management,
 - travel, and
 - communication pre-post comparison 10 years post-injury
- Significant ($p = .000$) reduction in level of disability after Resource Facilitation
 - abilities (e.g., mobility, memory),
 - adjustment (e.g., depression social interaction), and
 - participation (e.g., managing money, transportation)

Mayo-Portland Results

MPAI-4 results show a significant decline in level of disability across all subscales after RF:

- abilities (e.g., mobility, memory) ($t = 2.49$, $p=.014$),
- adjustment (e.g., depression social interaction) ($t= 3.47$, $p=.001$),
- participation (e.g., managing money, transportation) ($t= 3.54$, $p=.001$), and
- Total ($t=4.07$, $p=.000$)

Mayo-Portland Adaptability Inventory



Resource Facilitation and Service Utilization

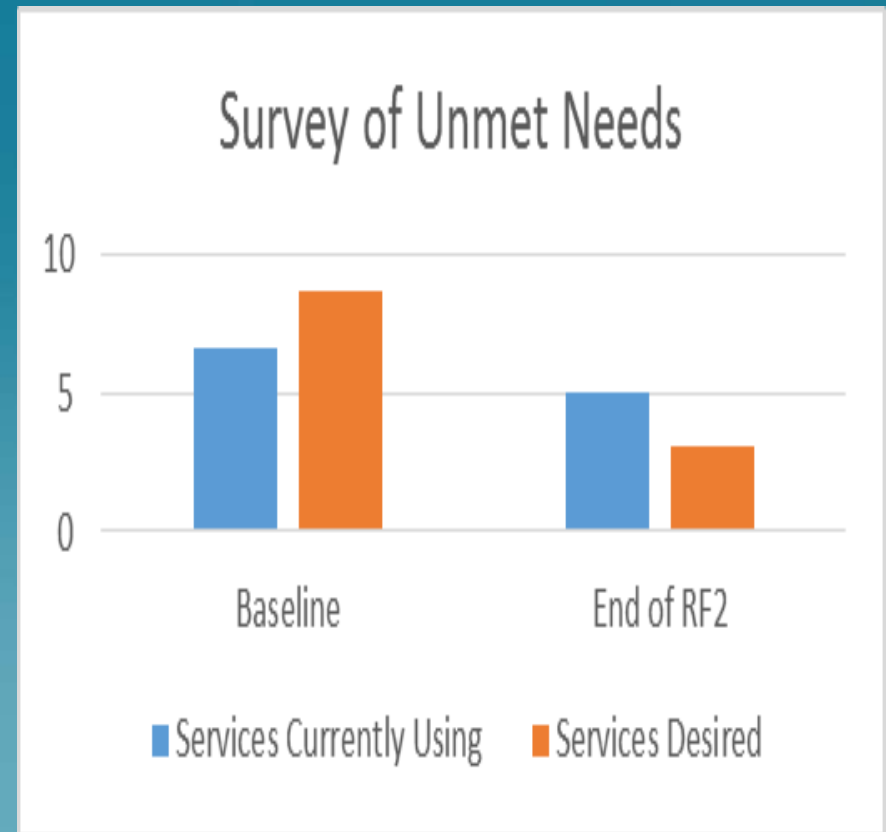
Heinemann, A.W. et al. (2002). Measuring unmet needs and services among persons with traumatic brain injury. *Archives of Physical Medicine and Rehabilitation*, 83, 2052-1059

- Developed specifically for brain injury
- Variety of instrumental and service needs
- Addresses both what they are receiving and perceived needs

Receive help now	Need/want help
_____ traveling in my community	_____
_____ finding housing that is affordable and accessible	_____
_____ controlling alcohol and/or drug use	_____
_____ improving my memory, solving problems better	_____
_____ controlling my temper	_____

Survey of Unmet Needs

- Number of services used declined significantly from baseline to discharge ($t=2.83$, $p=.005$).
- Desired services declined significantly from baseline to discharge ($t=13.53$, $p=.000$).
- Examples of needs that were met through RF:
 - controlling alcohol and/or drug use,
 - increasing independence in eating, dressing, and bathing, and
 - finding housing that is affordable and accessible.



Annual Aggregate Lifetime Economic Impact of Resource Facilitation

- Wages and benefits = \$249.1 million
- Revenue from taxes = \$30.97 million
- Savings to SSDI/private disability = \$80.1 million
- SNAP = \$6.6 million
- Total = \$366.77 million/year

Economic Impact of Resource Facilitation: Workforce Re-entry Following Traumatic Brain Injury.

Srikant Devaraj, PhD, Michael Hicks, PhD, Brandon Patterson
Graduate Research Assistant, Center for Business and
Economic Research, Miller College of Business, Ball State
University, February 21, 2017.

Results Across RCT's and Prospective Clinical Cohorts

	Prospective Clinical Cohort 2	RCT 1 (Treatment Group Only)	RCT 2 (Treatment Group Only)	Prospective Clinical Cohort 1
Sample Size	141	12	22	69
Age	38.79 (13.87)	43.18 (11.97)	33.00 (10.83)	37.46 (15.86)
% Non-White	11.3	0	5	5.6
% Male	63.8	55	62	78
% Employed Pre-Injury	67	100	100	59
Years of Education	13.34 (2.34)	13.27 (2.10)	13.75 (1.94)	14.89 (15.86)
Admit Time Since Injury	[years: 10.10 (11.25)]	[days: 64.50 (46.93)]	[days:63.21 (19.59)]	[years: 9.28 (9.23)]
Mean C-Log Score ¹	22.47 (5.59)	22.67 (6.26)	28.4 (2.80)	24.18 (3.76)
Admit MPAAI Participation Index ³	43.71 (7.88) (moderate)	63.90 (5.20) (severe)	52.59 (8.74) (moderate to severe)	49.28 (5.92) (moderate)
% Competitive Employment or School	70	64	69	65

Resource Facilitation RTC Overview



Research

- ISCBIRF Grant (2016-18) on Modeling Employment Outcome Six Months and One Year post Resource Facilitation: A Clinical Decision Support System
- HRSA Grant DOC (2013-17): Decreasing Recidivism and Improving RTW in Brain Injured Ex-offenders
 - Brain Injury in the Marion County Problem-Solving Courts
 - BI Screening, Testing, and Group Therapy in the Indiana Veterans Educational and Transition (INVET) Unit - Edinburgh Correctional Facility
- In development:
 - RF for Children

Training

- Annual Regional Brain Injury and Resource Facilitation Conferences
- Criminal Justice Conference
- Training for Indiana VRS
 - Brain Injury
 - Specialty topics (e.g., visual impairments and brain injury)
- Practicum and internships for RF related professions
- BI Education & Cognitive Rehabilitation Workshops
- BI Screening Tool Training

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Questions & Discussion

