Resource Facilitation for Return to Work following Brain Injury: Evidence to Practice

Lance E. Trexler, PhD, FACRM
Rehabilitation Hospital of Indiana
Indiana University School of Medicine
Systematic Review

• 40.8% of the participants with traumatic brain injury were able to return to work two years post-injury
• 39.3% of the participants with non-traumatic brain injury were able to return to work two years post-injury
Systematic Review

- This study however was not able to separate outcomes by severity
  - One study\(^1\) with a 12 year follow-up found 84% RTW rate which included mild head injury
  - One study\(^2\) 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

• 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
• 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
Indiana Vocational Rehabilitation Services successful closure (return to work) rate for brain injury = 18% in 2009

• VRS gets the most complex cases:
  – Were not able to return to work
  – Brain damage was sustained early in life
  – Psychiatric co-morbidities
  – Diminished family support
  – Increased involvement with the criminal justice system
  – Loss of social supports
Why, at best, do only 40% of people with brain injury 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

• Social - 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?

- **Systemic:**
  - **Fragmentation and gaps between systems:**
    - Medical
    - Rehabilitation
    - Vocational Services
  - **Different Funding Mechanisms**
    - About which awareness is limited
    - That are hard to understand and access
What are the Barriers to Return to Work?

• System:
  – Fragmentation and gaps between systems:
What are the Consequences?

- Loss of pre-injury vocational skills, relationships and networks
- Increased risk for co-morbidities (e.g., depression, anxiety)
- 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)
What is Resource Facilitation?
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.
First Randomized Controlled Trial of Resource Facilitation
(Trexler, Trexler, Malec et al., (2010) JHTR, 25; 440-446)

• 23 people with acquired brain injury recruited from RHI (12 RF, 11 Con)
• Six months of Resource Facilitation (Connors, 2001)
• Team = Neuropsychologist, VR TBI Specialist, Resource Facilitator, BI Therapist
### Table 3: Diagnoses by groups

<table>
<thead>
<tr>
<th></th>
<th>TBI</th>
<th>ICH</th>
<th>Stroke</th>
<th>Other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Treatment</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>7</td>
<td>7</td>
<td>6</td>
<td>2</td>
<td>22</td>
</tr>
</tbody>
</table>
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, $p < .0001$)

• Participation increased significantly for both groups (F = 60.65, $p < .0001$), but the interaction between groups and time demonstrated greater improvement for the RF group relative to controls (F = 9.11, $p < .007$).
Results

- Participation increased significantly for both groups \( (F = 60.65, \ p < .0001) \)
- Interaction between groups and time demonstrated greater improvement for the RF group relative to controls \( (F = 9.11, \ p < .007) \).
Participation Index
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
research note

Potential Economic Impact of Resource Facilitation for Post-Traumatic Brain Injury Workforce Re-Assimilation
Economic Impact Study  
(Reid, McGearly & Hicks, 2011)

• Total Economic Impact in Lost Wages (Annual)  
  – $31,017,775

• Does not include annual losses  
  – to business ($10 million)  
  – personal tax revenues ($4.8 million)  
  – Fringe benefits, Medicare, Medicaid, Disability

• Based on 64% RTW
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, Devan R. Parrott, MS, James F. Malec, PhD
Randomized Controlled Trial 2
(Trexler, Parrott and Malec, Archives of PMR, 2016)

- 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

- **TBI**
- **ICH**
- **Stroke**
- **Other**

**Resource Facilitation**

**Control**
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 (e.g., job coach, reduced hours) fewer than 15 hours/week. *School enrollment with temporary supports or less than full-time student course load.*


2. Sheltered: Work in a sheltered workshop

1. Unemployed/not in school
• 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: 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.
Types of Jobs by Group

- Executive
- Professional Specialty
- Technicians
- Administrative Support
- Service
- Precision Production
- Handlers, Equipment Cleaners

Legend:
- Resource Facilitation
- Control
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

Begin State-wide Roll-Out Early 2014

2013 Clinical Trial

2009 RCT’s

Late 2014
New Prospective Clinical Cohort (June, 2016; n = 141)
## Results

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (sd)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>38.97 (13.87)</td>
</tr>
<tr>
<td>MPAI Participation Index</td>
<td>43.71 (7.88) [moderate disability]</td>
</tr>
<tr>
<td>Time Since Injury (Years)</td>
<td>10.10 (11.25)</td>
</tr>
<tr>
<td>% Male</td>
<td>63.8%</td>
</tr>
<tr>
<td>Years of Education</td>
<td>13.34 (2.34)</td>
</tr>
</tbody>
</table>
70% Successfully Placed in Competitive Employment
Mean hours per week = 25
Results demonstrated a statistically significant decrease in the reported amount of assistance required to complete activities of daily living after RF (t=5.35, p=.000).

Survey of Unmet Needs and Service Use

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

<table>
<thead>
<tr>
<th>Receive help now</th>
<th>Need/want help</th>
</tr>
</thead>
<tbody>
<tr>
<td>________ traveling in my community</td>
<td>________</td>
</tr>
<tr>
<td>________ finding housing that is affordable and accessible</td>
<td>________</td>
</tr>
<tr>
<td>________ controlling alcohol and/or drug use</td>
<td>________</td>
</tr>
<tr>
<td>________ improving my memory, solving problems better</td>
<td>________</td>
</tr>
<tr>
<td>________ controlling my temper</td>
<td>________</td>
</tr>
</tbody>
</table>
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.
MPAI-4 results show a significant decline in level of disability across all subscales:

- abilities (e.g., mobility, memory),
- adjustment (e.g., depression social interaction), and
- participation (e.g., managing money, transportation) after RF ($t=4.07$, $p=.000$).
Results Across RCT’s and Prospective Clinical Cohorts

<table>
<thead>
<tr>
<th></th>
<th>Present Sample</th>
<th>RCT 1 (Treatment Group Only)</th>
<th>RCT 2 (Treatment Group Only)</th>
<th>Prospective Clinical Cohort</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample Size</td>
<td>137</td>
<td>12</td>
<td>22</td>
<td>69</td>
</tr>
<tr>
<td>Age</td>
<td>37.27 (15.43)</td>
<td>43.18 (11.97)</td>
<td>33.00 (10.83)</td>
<td>37.46 (15.86)</td>
</tr>
<tr>
<td>% Non-White</td>
<td>12</td>
<td>0</td>
<td>5</td>
<td>5.6</td>
</tr>
<tr>
<td>% Male</td>
<td>64</td>
<td>55</td>
<td>62</td>
<td>78</td>
</tr>
<tr>
<td>Years of Education</td>
<td>13.19 (2.14)</td>
<td>13.27 (2.10)</td>
<td>13.75 (1.94)</td>
<td>14.89 (15.86)</td>
</tr>
<tr>
<td>Time Since Injury (days)</td>
<td>3482 (4055)</td>
<td>64.50 (46.93)</td>
<td>63.21 (19.59)</td>
<td>3388 (3369)</td>
</tr>
<tr>
<td></td>
<td>[years: 9.54 (11.11)]</td>
<td></td>
<td>[years: 9.28 (9.23)]</td>
<td></td>
</tr>
<tr>
<td>% Employed Pre-Injury</td>
<td>67</td>
<td>100</td>
<td>100</td>
<td>59</td>
</tr>
<tr>
<td>MPAI Participation Index (T-Scores)</td>
<td>51.0 (10.57) (moderate)</td>
<td>63.90 (5.20) (severe)</td>
<td>52.59 (8.74) (moderate to severe)</td>
<td>49.28 (5.92) (moderate)</td>
</tr>
<tr>
<td>Employment/School Outcomes</td>
<td>70%</td>
<td>64%</td>
<td>69%</td>
<td>67%</td>
</tr>
</tbody>
</table>
RHI Resource Facilitation: Structure and Program Model
What is Resource Facilitation?

• To provide brain injury specific education and promote awareness of resources to individuals with brain injury, their families, other providers and the community
• To proactively navigate the person and their family to needed instrumental, brain injury-specific, community and vocational supports and services
• To ensure collaboration, integration and coordination between providers and community-based resources
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
Percent of Total RF Time by Activity
Resource Facilitation Clinical Timeline

- Resource Facilitation Assessment
  - Contact with client every two weeks
  - Monthly team conferences

Resource Facilitation Services

Placement and 90 Follow-up

- Resource Facilitator
- Local Support Network Leader
- Rehabilitation Neuropsychologist
- Clinical Therapist
Resource Facilitation and the Post-Acute Continuum

- Vocational and Community-Based
- Acute and Clinical

- Follow-Up
  - E.G., Employment Services
  - E.G., Neuropsychological Treatment
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
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, brain injury-specific, and vocational needs
  – Ongoing assessment of progress towards goals
  – Monthly team conferences
Resource Facilitation Initial Assessment

• Resource Facilitation Intake
• NeuroVocational Evaluation
• Community Resources Assessment
• Initial Team Conference
Contact Methods

- In-Person: 57%
- Telephone: 30%
- Email: 13%
Contact with Whom

Survivor/Client 51%

Other (i.e. job coach, employer) 34%

VRC 9%

Family 6%
Vocational Placement

- Follow up LSN/RF services for 3 months post-employment or academic placement
- Employer/educator contact/consultation every 2 weeks
- Sustain/revise community supports and family stability
- Sustain cognitive or behavioral strategies to maintain work/school performance
- Collection of Quality Assurance/Program Evaluation Data
- 90-day Employment Final Report
Brain Injury Takes an Integrated Village

- Physical Medicine and Rehabilitation
- Neuropsychology
- Rehabilitation Therapists
- Employment Specialists
- Vocational Rehabilitation Counselors
- Mental Health / Substance Abuse
- Primary Care
- Other
Brain Injury Village

- Resource Facilitation
  - NVE recommends finds decreased attention and memory skills and reduced vocational readiness;
  - The RF is helping to connect the pieces

- VRS
  - Development of IPE and ensures plan is followed / revised as needed

- Employment Specialist
  - Helps client in completing job applications and practicing interview skills

- Rehabilitation Services
  - Speech therapist teaches compensatory strategies for attention & memory
Why is it important to collaborate as a team when working with individuals with brain injury?
Working as a Team

• **Because...**
  – Brain Injury is a complex condition
  – Every brain injury is different
  – The client may have difficulties generalizing from one setting to another
  – Each provider offers a unique contribution
  – Each provider has a specialization that cannot be fully addressed by another team member
  – Each provider relies on the others to enhance their own interventions and efforts
Working as a Team

VRS
Counseling & access to resources

RF
Specialty BI knowledge

ES
Vocational readiness training

MH
Counseling and medications

VRS

RF

ES

MH

STRESS

Counseling
and
edications
Working as a Team

- Each provider brings unique contributions to the team
  - Expertise / specialized knowledge
  - Provider resource network

- Each provider needs the other team members in order to do their jobs well
  - E.g., MH provides treatment for active substance abuse issue which is interfering with the client’s ability to attend appointments with ES and VRC
  - E.g., RF team conducts an NVE which then provides objective evidence of functional deficits and how those may pose barriers to vocational goals
Brain Injury takes a Village