Use of the Knowledge-to-Action Framework to Increase Cardiovascular Activity Among Patients with Stroke, Spinal Cord Injury, or Traumatic Brain Injury in an Inpatient Rehabilitation Facility

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Background

- Patients with stroke[1], spinal cord injury (SCI)[2], and traumatic brain injury (TBI)[3,4] are known to have impairments in cardiovascular health
- Inpatient Rehabilitation provides an opportunity to start to address impairments in cardiovascular health while under professional supervision
- Patients with stroke, SCI, and TBI do not appear to engage in cardiovascular activity at sufficient frequency or intensity to expect improvements while in inpatient rehabilitation[5-9]

Objective

To use the Knowledge to Action Framework to implement a supplemental exercise group that promotes increased activity and effective cardiovascular exercise during inpatient rehabilitation

Identify the Problem

Therapist Identified
Limited Activity
Exercise Dosage?

Literature
Limited Activity
Insufficient Dosage

→ Supplemental Exercise Group → Limited Participation Exercise Dosage?

Identify, Review, and Select Knowledge

Literature Review: Recommendations for Exercise Prescription for patients with stroke, SCI and TBI

Knowledge Creation	Stroke	SCI	TBI	General
Synthesis		X	X	
Tools/Products	X			X

2-3 times per week
20-30 minutes
40-60% Max (HRR or VO2 Max)

References

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8. MacKay-Lyons MJ, Makrides L. Cardiovascular stress during a contemporary stroke rehabilitation program: is the intensity adequate to induce a training effect? *Arch Phys Med Rehabil.* 2002;83(10):1378-1383.
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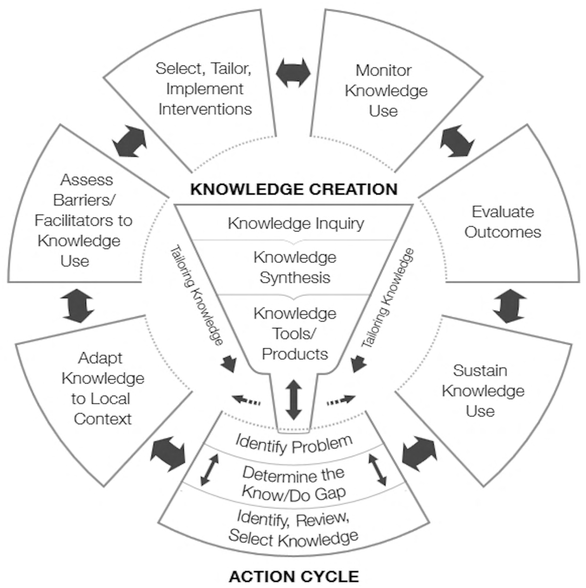
The Knowledge to Action Cycle



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The Know /Do Gap

Methods

Review Existing Practice
- Referral Forms (2 years)
- Handwritten Notes (4 months)
- *EMR Documentation*

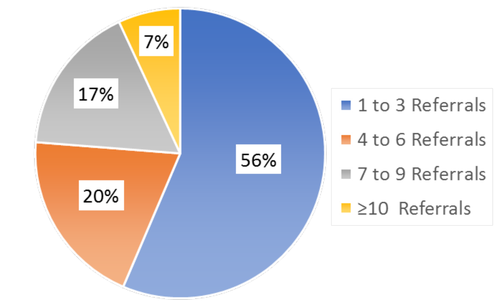
Survey
- *Therapists*
- *Physicians*

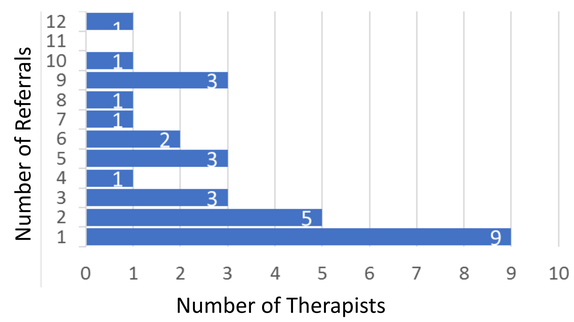
Results

Referred Patient Characteristics	
n	139
Diagnosis, %	
Stroke	35%
SCI	26%
TBI or Acquired Brain injury	16%
Other	23%
Requires Assistive Device, %	71%
Transfers, %	
Indep/Supervision	15%
CTG/Min A	44%
Mod/Max A	22%
Max x2/Dep	12%
Equipment, %	
FES Cycle	12%
MOTOmed (Lower)	63%
NuStep	43%
Recumbent Bicycle	10%
MOTOmed (Upper)	13%
Other	2%

Referrals

Therapists who referred to exercise group by number of referrals





Attendance

	4th floor (Stroke)	6th floor (SCI)	7th floor (TBI/ABI)	Total
Attended (n=335), %	42%	51%	31%	45%
Reasons for Non- attendance* (n=73), %				
• Changed Medical Status	12%	7%	21%	11%
• Symptom Complaints	29%	43%	29%	37%
• Family/Visitors	0%	2%	7%	3%
• Bed/Meal/Out	35%	19%	21%	23%
• Appointment	12%	26%	14%	21%
• Discharged	12%	0%	7%	4%
Scheduled (n=50)*	59%	54%	0%	54%
Non-Scheduled (n=32)*	67%	56%	27%	47%

* Limited Sample

Performance

	4th floor (Stroke)	6th floor (SCI)	7th floor (TBI/ABI)	Total
Duration				
• Less than 20 min	33%	18%	80%	30%
• 20-30 min	56%	50%	10%	47%
• Over 30 minutes	8%	17%	0%	12%
• Unknown	0%	16%	10%	11%
Intensity (RPE 10)				
• 0-2 (Very light-light)	23%	6%	10%	11%
• 3-6 (Moderate)	54%	40%	60%	46%
• 7-10 (High to Maximal)	3%	4%	10%	5%
• Unknown	21%	50%	20%	38%

Conclusions and Next Steps

- Many patients who attend exercise group are engaging in cardiovascular activity at the recommended intensity and duration, but this varies by diagnosis group
- Referral rates are generally low, but vary by therapist
- Attendance rates are low, but may be impacted by modifiable factors
- Survey Therapists and Physicians-Barriers and facilitators
- Adapt exercise guidelines base on feedback from Exercise Group Leaders
- Plan intervention (training, scheduling process)

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