

**Salazar AM, Warden DL, Schwab K, Spector J, et al. Cognitive Rehabilitation for Traumatic Brain Injury [TBI]: A Randomized Trial. JAMA 2000; 283:3075-3081.**

Design: Randomized Clinical Trial

Population/sample size/setting:

- 120 active duty military personnel (113 men, 7 women, mean age 25) with moderate-severe closed head injury in military referral medical center (Walter Reed)
- Eligible if admission Glasgow Coma Scale score 13 or less, or posttraumatic amnesia 24 hours or more, or focal brain contusion/hemorrhage on CT/MRI
- All were randomized within 3 months of injury, were cognitively oriented and appropriate, not pending medical discharge, had at least 1 responsible adult in home, no prior severe TBI
- All had received standardized TBI counseling & education, multidisciplinary evaluation, and 1/3 had received brief, unstructured rehab services prior to randomization

Main outcome measures:

- Block randomization to 8 week inpatient standardized interdisciplinary rehab program modified for military setting (n=67) or home rehab (n=53) with weekly 30 min phone calls from psych nurse, self-paced exercises, and TBI education
  - o Inpatient program was conducted by a psychiatrist and a neuropsychologist working with an occupational therapist, a speech pathologist, and 2 rehab assistants
  - o Inpatient program was done on a minimum care hospital ward with daily physical fitness training and with cognitive therapies done both individually and in groups
  - o Home rehab group resumed daily physical exercise at their own pace, and were encouraged to watch news programs and to read magazines and books
- At the end of 8 weeks, a repeat evaluation was done, and patients were returned to a 6 month trial of limited active military duty
- Primary outcome was return to work at 12 mo follow-up (military *or* civilian sector); this was achieved by 90% of the hospital rehab group and by 94% of the home rehab groups (no significant difference)
- Fitness for active military duty at 12 mo follow-up was 73% in hospital rehab and 66% in home rehab (no significant difference)
- Cognitive/behavioral scores and quality of life scores similar in both groups at 1 year follow-up
- Subgroup analysis of patients with more than 1 hour initial loss of consciousness showed advantage in hospital group with 80% fit for active military duty vs. 58% in home rehab group
- Self-reported aggression (mostly verbal) increased in both groups during the 12 months of follow-up (numerical data not provided)

- Equal proportions of patients had one or more unscheduled inpatient or outpatient visits in the 12 months of the study (41% for hospital group, 42% for home rehab group)
- Nearly all patients had axonal shear on MRI (95% inpatient group, 92% of home rehab group); cerebral contusions were present in 51% and 54%; post-traumatic amnesia of 7 days or more was present in 41% and 42% of patients

#### Authors' conclusions:

- Outcomes do not differ between inpatient and home rehab but cost differences are large (\$51,840 for inpatient rehab and \$ 540 for home rehab)
- High preinjury education and function in military make results most applicable to civilian populations with high preinjury function
- Homogeneous military population minimizes confounding variables
- Inpatient therapy may benefit selected patients with severe TBI, but the numbers for analysis were small
- Decisions regarding medical discharge from the military could not be blinded, but the risk of bias is reduced by the specificity of Army Regulations and various levels of review

#### Comments:

- Comparison is between two settings for rehab rather than between rehab and no rehab
- High participation in home setting may be related to high motivation in military population and reduce differences between rehab settings, since the two groups had less exposure difference than would have been the case with a control group which had no therapy program
- High RTW in both groups may be from selection of participants who were at least considered to be potentially able to return to active military duty
- Inpatient programs standardized and may not apply to programs with individualized rehab measures
- Subgroup analysis showing advantage in hospital group with more than 1hour loss of consciousness is interesting, but appears not to have been part of original study protocol and is a post hoc finding
- Intervention began average of 38 days after injury; this may be earlier than most subacute care generally begins
- Prior substance abuse in 40% of hospital group and 34% of home group; this not defined or discussed further, but would be expected to reduce likelihood of RTW, and the high rate of RTW suggests further differences between a young military population and an older civilian population
- The injuries were sustained between 1992 and 1997; motor vehicle crashes and assaults accounted for a majority of injuries (and alcohol was involved in 30%); more recent military TBI studies will be composed of mostly battlefield injuries, but these commonly involve axonal injury

Assessment: Adequate for evidence that for young and previously healthy patients with moderate to severe TBI, home rehabilitation with a supportive environment may be as effective as inpatient rehabilitation