

## How To Become A Model Center of Medical Rehabilitation ——The Experience of the Kessler Institute for Rehabilitation

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In this article I will describe a model medical rehabilitation center in the United States based on my experience as the Medical Director of the Kessler Institute for Rehabilitation (KIR) located in West Orange, New Jersey. KIR has three integrated distinct missions: patient care, education, and research. It is a 336-inpatient bed facility (three separate locations) that runs at approximately 95% occupancy. In 2012, 6896 individuals were admitted for care. The patient ages are from 18 to 109 with an average age of 69. Forty five percent of the patients were male and 55% were female. KIR, West Orange, is a freestanding hospital that owns and operates its own X-ray and laboratory facilities.

KIR practices the team approach and embraces the best practices concept/model. Patients are typically admitted to Kessler about eleven days post injury. The case mix index (CMI), a standard measure of the medical complexity of patients upon admission, is higher at Kessler than at most centers. The average length of stay is approximately 17 days, however this varies by diagnosis (29 days for SCI; 21 days for traumatic brain injury; 19 days for stroke; 15 days for amputee; 17 days for neurological disorders; 12 days for orthopedic cases). Approximately 83% of these individuals are discharged to home and the community, not to nursing homes. In the United States, all rehabilitation inpatients must receive at least three hours of therapy (physical, occupational, and/or speech therapy) per day for at least five days per week. Many facilities have added a sixth day. Psychology/neuropsychology, vocational, and recreational rehabilitation are also provided as needed. The percent volume of inpatients treated is listed in Table 1.

**Table 1 Inpatients Treated at KIR by Diagnosis**

Orthopedics	45%
Stroke	19%
Brain Injury	15%
General Rehabilitation	8%
Neurological	5%
Spinal Cord Injury <sup>①</sup>	5%
Amputee	3%

①Ventilation Unit

### Measuring Patient Outcomes

Functional Improvement Measures (FIM) reflect both overall and specific improvement in ADL's, such as bathing, dressing, feeding, ambulation and motor function, discharge disposition, and patient satisfaction from the time of admission to discharge. The Kessler scores usually exceed national benchmarks. The system does not use the International Classification of Function (ICF.) Patient satisfaction surveys at KIR indicate a high level of satisfaction with their care. 91% of the patients achieved their predicted outcome and 96% indicated they would recommend Kessler to others.

Kessler also has a large ambulatory care service. In 2012, 6003 people in the KIR system received ambulatory care. 49% were males and 51% females with an average age of 57 years. Outpatient Services are noted in Table 2.

### Education and Training

KIR is a training site for medical students, PM&R residents, clinical fellows, post-doctoral fellows, physical and occupational therapists, speech pathologists, nurses, and others.

The PM&R residency is three years after the comple-

**Table 2 Kessler Outpatient Services**

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ALS Management
Balance and Vestibular Rehabilitation
Cognitive Rehabilitation
Driver Training
Hand Therapy and Upper Extremity Rehabilitation
Locomotor Training
Lymphedema Management
Neuro-rehabilitation
Multiple Sclerosis
Parkinson's Disease Management
Occupational Therapy
Orthotic and Prosthetic Services
Osteoporosis Management
Pain Management
Physical Therapy
Physician's Services
Psychology and Neuropsychology
Spasticity Management
Speech Services
Spina Bifida Management
Swallowing Dysfunction Therapy
Urology Services
Vision Therapy
Vocational Rehabilitation & Career Guidance
Wheelchair Seating Services
Women's Health Services
Work Strategies

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tion of a general year following medical school. This is a New Jersey Medical School program and KIR is an affiliated training site, along with Children's Specialized Hospital, the Veterans Administration Hospital and community hospitals. In the PM&R residency, the trainees must have 12 to 18 months of inpatient training and 12 to 18 months of outpatient experience. The residents are exposed to all ages, and all socioeconomic groups. Each rotation is two months. The residents are given required didactic lectures every Wednesday from 8:00 AM until noon, and the first Friday of each month from 8:00 until noon. The lectures are in a modular curriculum format (SCI, TBI, CVA, EMG, etc.). There is an examination after each module. The trainees are also observed and evaluated during and at the end of each clinical rotation. The inpatient rotations are diagnostic specific (SCI, TBI, CVA, Orthopedics, etc.). The residents are instructed in procedures such as EMG's, Botox injection, etc. during their training.

The program also has a number of one-year fellow-

ships upon completion of the residency. These are in SCI Medicine, TBI, Stroke, Musculoskeletal/Pain Medicine, and Pediatric Rehabilitation Medicine.

### Research Agenda

Research is a vital component of the KIR Hospital. There is dedicated space, equipment, personnel, and budget allocated to research. It is expected that the dedicated researchers compete and obtain external research grant funding.

The Kessler Research Foundation has the following specific laboratories:

- Human Performance and Movement;
- Neuropsychology and Neuroscience;
- Outcome Research;
- Rehabilitation Engineering;
- Spinal Cord Injury;
- Stroke;
- Traumatic Brain Injury

The research is clinical and translational, not animal labs. There is a dedicated MRI machine for cognitive research. Currently there is about 35000 square feet of research space and has about 80 employees, including 14 full-time PhD researchers, 2 full-time MD researchers, and 3 part-time MD researchers and three to ten post-doctoral students in training.

Some generic research areas that need to be studied are: epidemiology of disability; clinical studies such as pharmacological and exercise interventions; social determinants of disability; outcome research with respect to various interventions, instruments, and techniques to evaluate function; and specific type, dose, and durations of therapies.

One of the keys to research is collaboration and partnerships, and also to develop metrics to evaluate the research program.

I hope this integrated model of clinical care (inpatient, outpatient, community) as well as the education and training of future health care providers and the emphasis on research to improve the outcomes and quality of life of individuals with disabilities is helpful as China builds its rehabilitation care models.