

Spinal Cord Medicine Program – Scope of Services

Inpatient Spinal Cord Injury Rehabilitation

Patients may be candidates for inpatient rehabilitation according to the Patient Care Manual:

Etiology of Spinal Cord Dysfunction

- Includes traumatic or non-traumatic etiology such as trauma, infarct, infection, tumors or lesion. Injury or disease must be located in the spinal cord, not in the brain.

Levels of Spinal Cord Injury

- Injury level C1-C7 complete or incomplete. Including central cord syndrome & Brown Sequard syndrome.
- Injury level T1-T12 complete or incomplete. Including Brown Sequard syndrome.
- Injury level L1-L5 complete or incomplete. Including conus medullaris & cauda equina syndromes.
- Injury level S1-S5 complete or incomplete. Including cauda equina syndrome.

Completeness of Spinal Cord Dysfunction

- C1-S5 complete or incomplete ASIA A, B, C, D, or E.

Co-morbidities

- No exclusion due to age, date of injury, or co-morbidities as long as patient can tolerate therapy regime and patient/family/support systems participate actively in educational programming.

Transition Criteria

Transition Criteria from Frazier Rehab Institute includes but is not limited to:

- Change in medical stability, which requires more intense medical treatment in an acute inpatient hospital setting.
- Patient requires persistent one-on-one care by a nurse and/or constant medical monitoring.
- Suicidal behavior or other uncompensated psychiatric condition.
- Goals can be adequately addressed in a lesser level of care setting.
- Patient no longer requires 24-hour medical or nursing supervision/treatment.
- Patient is unable to actively participate in an intense inpatient rehabilitation program of at least 3 hours of therapy a minimum of 5 days per week.
- Change in the patient's social/support network, which requires placement in an alternate setting upon discharge.

Criteria for Discharge

Criteria for Discharge from Frazier Rehab Institute include but are not limited to:

- Achievement of functional inpatient rehabilitation goals.
- Absence of progress toward achievement of functional goals.
- Patient is unwilling to actively participate in an intense inpatient rehabilitation program (3-hour rule).
- Disruptive or continued non-compliant behavior that interferes with the programs of the Institute and/or creates patient safety issues.
- Apparent economic hardship for the patient and/or family.

Within Frazier Institute's System of Care, all clinical activity is initiated, coordinated, and overseen by the attending physiatrist. Attending physiatrists are responsible for: screening, documenting histories and physicals of patients with potential spinal cord injury in acute care hospitals; as well as initiating rehabilitative procedures. Once the patient is admitted to Frazier Rehab Institute, the attending physiatrist is responsible for appropriate assessment, medical management (medication, spasticity, bowel/bladder, and pain management), oversight of the rehabilitative process (goal setting, education, equipment procurement, discharge planning, and life-long care planning), and referral generation (for the treatment of auto-immune disorders and immune suppression, circulatory disorders, infectious diseases, demyelinating disorders, pain management, visual dysfunction, spasticity, fertility and sexual function, respiration and pulmonary function, neurological changes and musculoskeletal complications). When indicated, some cases are referred to a consulting neuropsychiatrist. Pharmacists assist the attending physiatrist with the medication management specific to the needs of the patients admitted to Frazier, including but not limited to the Spinal Cord Program.

The attending physiatrist assesses patient needs and orders specific treatment discipline(s) within Frazier Rehab Institute to provide and monitor appropriate patient care; develop and initiate patient and family education; and to report on patient and family progress at least weekly in Team Rounds or more frequently, if needed. Nursing is the primary lead in such areas as bowel and bladder management/training, skin care and autonomic dysreflexia. However, education, training, and functional skills (such as pressure relief techniques) to manage skin care and physiologic complication of SCI (autonomic dysreflexia, orthostatic hypotension, etc.) are also a treatment goal in physical therapy and occupational therapy. Beyond immediate medical concerns related to SCI, physiatrist, therapists, and nursing provide information related to sexuality, and men's and women's health issues. Therapists may also address adaptive training with/without equipment or alternative positioning to allow patients to more independently manage his/her bowels or bladder. An Activities Therapist may address these issues during community reintegration or during instruction in a recreational or athletic activity.

Patients in the Spinal Cord Program and their support systems attend a Spinal Cord Education Group where a variety of topics relative to spinal cord injury are addressed. (A patient may not be involved in the Spinal Cord Educational Group due to cognitive deficits, age and/or other medical issues. However, family members/caregivers are strongly encouraged to attend.) All staff is to provide the physiatrist information about patient spasticity, pain, and other medical issues that arise to ensure timely and appropriate medical management.

The International Standards for Neurological Classification of Spinal Cord Injury Exam (ISNCSCI Exam) is completed at admission and discharge for every patient admitted to the spinal cord injury (unless unable to complete due in ability to follow instructions). The ISNCSCI exam is administered by one member of our ASIA team. This ASIA team is composed of physical therapists and a physiatrist that have completed the online certification course (InStep)

on the American Spinal Injury Association website (AsiaLearningCenter.org). The results of the ISNCSCI exam are reported in team rounds and documented in the medical record.

Specific pulmonary concerns of this patient population are typically addressed by a consulting pulmonologist and the Pulmonary Rehab Department at Frazier. Breathing tests are performed on admission and again weekly to measure status and progress. Education is provided to patients and family on suctioning, tracheostomy care, and specialized treatments including inspiratory and expiratory muscle training, Acapella, Inexsufflator Cough Assist machine, Vest for percussion, assistive/quad coughing, and post discharge pulmonary care and hygiene. Counseling on smoking cessation and avoidance of environmental irritants is also provided. Frazier's Pulmonary Rehab Department has the primary responsibility for patient and family training on ventilator care. Nursing and staff from the Respiratory Department at Jewish Hospital monitor breathing status including ventilator function around the clock, 7 days a week and assist in providing patient and family training. Many members of the treatment staff at are cross trained in other areas of care at Frazier Rehab, which is especially important in management and transition of care for patients with complex spinal cord injury.

Speech and language pathology is consulted when dysphagia is suspected. Speech and language pathologists, in coordination with the Radiology Department at Jewish Hospital, provide assessment, treatment and make recommendations regarding oral/nutritional intake. The speech language pathologist will follow a patient identified to have dysphagia until the patient demonstrates safety and the highest level of function with the least restrictive diet necessary to meet adequate nutritional and caloric needs. The speech language pathologist will also address impairments associated with vocal cord paralysis and voice projection, as well as provide care for patients with dual brain injury and spinal cord injury diagnoses.

A dietitian assesses energy, protein and fluid needs for the patient and recommends to the physician various interventions to help attain goals related to body composition and wound management. The dietitian also meets with individual patients and family members to discuss nutritional status and recommended intake considerations. Nutritional issues including weight gain/loss; ideal body weight post injury; foods that facilitate good bowel, bladder, GI, bone, cardiac, and skin health; healthful eating and long-term wellness are discussed in Spinal Cord Education Group.

The spinal cord medicine physician and psychologists meet with patients and significant other/spouses individually to discuss fertility and sexual function following spinal cord injury. Additionally, the psychology staff and case management present material on healthy relationships, communication, and sexual functioning in the Spinal Cord Education Group. Written and video material and internet sites are also made available to patient and appropriate family member(s).

Outpatient Spinal Cord Injury Rehabilitation

Patients may be candidates for outpatient admission if:

- They have a rehab diagnosis such as, but not limited to residual deficits of stroke, spinal cord injury, congenital deformity, amputation, major multiple trauma, fractures, brain injury, polyarthritis, burns, or other neurological disorders such as multiple sclerosis, motor neuron disease, polyneuropathy, muscular dystrophy, Parkinson's' disease, cardiovascular, pulmonary, etc.
- Note: Patients admitted to the Outpatient Spinal Cord Program follow the same admission criteria with regard to etiology, injury level and co-morbidities. Patients with non-SCI diagnoses are admitted to outpatient therapy at another Frazier location.

- They have reasonable expectation that a rehabilitation program will improve functional ability or slow the rate of deterioration of a progressive disabling disease or illness; or that a rehabilitation program will provide family and/or caregiver with the necessary education to manage the patient in a home-like setting.
- They have a written plan of treatment established by their physician.

The Frazier Rehab Institute Patient Care Manual states:

Frazier Rehab Institute has designated the main Frazier downtown building as the setting for outpatient services for patients with spinal cord injury. The building houses Frazier's Spinal Cord inpatient and outpatient units, The University of Louisville Physician Clinic, the Community Fitness and Wellness Center, hospital administration, and more. Advantages for patients and families receiving services in this setting include:

(1) Proximity of inpatient and outpatient staff to consult freely about patient goals, treatment procedures and progress, i.e., staff can observe/consult about any patient when he/she is an inpatient or outpatient.

(2) Since rehab physiatrists are in the downtown facility almost daily, they can see a patient in outpatient therapy to quickly address an arising issue.

(3) Equipment in the inpatient and outpatient gyms can be used by patients as needed.

(4) The Activities Therapist may access inpatients and outpatients allowing staff to continue patient involvement in structured and non-structured community activities.

(5) Psychology staff familiar with patient/family during inpatient hospital stays can maintain formal and informal contact with patient/family/outpatient staff to monitor progress and plan interventions as needed including outpatient psychology services via a formalized physician referral.

(6) Though traveling to the downtown location may increase a patient travel distance from home, the patient's medical needs are better served via access to the entire downtown Louisville medical campus comprising several hospital/specialties.

(7) Patients using public transportation are better served, as routes are better organized to get people into and out of downtown rather than from one area of town to another.

Outpatient Spinal Cord Program rehabilitation services offered at Frazier include physical therapy (PT), occupational therapy (OT) and speech-language pathology (SLP), therapeutic recreation, and exercise physiologists. The outpatient therapists meet weekly with the spinal cord physician or his extender for rounds to facilitate integration of services and medical follow-up needs. Our Spinal Cord Medicine Program Nurse Navigator assists with patient education regarding bowel/bladder management, skin management, and other secondary issues rapidly both during the inpatient and outpatient episode of care. The nurse navigator also serves as linkage to patients and the physiatrist as indicated.

Physical Therapy addresses bed mobility, transfers, gait, wheelchair mobility, positioning, pressure relief, and ongoing assessment of musculoskeletal and neurologic function. The PT assesses the need for custom wheelchair, lift devices, ambulatory devices, and ramps, and then makes recommendations to patient and caregiver. If deemed appropriate, patient evaluation for complex wheelchair and seating needs, as well as medical justification letters are also addressed in physical therapy through collaboration with the ATP certified therapist on staff in the Assistive Technology Resource Center. Through strength training, range of motion (ROM) exercises, the use of various treatment modalities, equipment and patient/caregiver education, the patient is progressed toward functional goals to maximize independence and transition

home. The topics covered by physical therapy in Spinal Cord Education Group are: Importance of ROM and Stretching, Neuroanatomy and Plasticity, Utilization of Power/Manual Wheelchairs and Pressure Relief Techniques.

Occupational Therapy focuses on increasing functional performance in activities of daily living (ADLs) as well as increasing strength and ROM to improve function. The OT assesses the need for assistive technology, adaptive equipment, splinting/positioning, and DME throughout the patient's stay to maximize the patient's independence with ADLs. The OT also provides patient and caregiver education on adaptive techniques for bowel/bladder management, ADLs, and skin inspection/positioning in order to prepare both patient and family for transition home. Driver evaluations and return to school/work are also addressed during outpatient OT.

Speech-Language Pathology can be involved in the care of patients with spinal cord injuries in the following ways. If the patient is ventilator dependent, the speech-language pathologist assists with the implementation of an alternative communication system. This is often in the form of placement of a Passy-Muir tracheostomy speaking valve to allow for speech production but can also be in the form of communication boards or other technologically advanced systems. A speech-language pathologist may also assist the patient with a spinal cord injury who has difficulty swallowing. The patient with dysphagia may undergo objective testing to determine the safest and least restrictive diet. Exercises, compensations, interventions to improve swallow function are practiced during treatment. Finally, if the spinal cord injury occurred in conjunction with a brain injury, the patient may participate in speech therapy to address cognitive deficits, such as problem solving, memory, behavior/judgment, and abstract reasoning.

Pulmonary Rehab therapists are involved when there are respiratory dysfunction/issues. Outpatient therapy focuses on performing and teaching the use of the Inexsufflator/Cough assist machine, Acapella, assistive/quad coughing and adequate suctioning for tracheostomy patients. Initially breathing tests are performed to assess function and help monitor progress of the patient. When needed, inspiratory and expiratory muscle training can be initiated.

Psychology referrals are generated for individual, marital and family therapy as needed post injury. These assessments are completed by the outpatient social worker who meets with each patient as they begin outpatient therapy and ongoing on an as needed basis. As appropriate, the individual's family and/or support system may be involved in psychology services as well. Peer mentor relationships may be established through the peer mentorship program and through the Spinal Cord Medicine Program support group, which is facilitated by the program coordinator, nurse navigator, and chaplain.

The Assistive Technology Resource Center is designed to provide inpatients and outpatients comprehensive evaluation for wheelchairs and cushions, adaptive computer and telephone access, control of devices in the environment and motor vehicle modifications.

Outpatient nutritional counseling is available upon physician referral through various local and regional health departments.

Community Fitness & Wellness offers accessible gym access for ongoing health, wellness, and leisure activities in a supportive environment for individuals with SCI. The Community Connections Discussion Group meets weekly in CFW to discuss a variety of topics relevant to those living in the community with a disabling condition, such as SCI.

Functional

The System of Care is designed and functions in an interdisciplinary manner. This is to say that an activity of daily living is frequently a designated responsibility of many disciplines

working in a coordinated manner. For example, an established rehab goal for a patient with C-5 tetraplegia may be self-feeding. Treatment components would likely include physical therapy and/or an assistive technology specialist securing proper seating for the patient, maintaining proper range of motion and building strength/endurance possibly through the use of electrical stimulation. Occupational therapy would be responsible for generating appropriate orthoses, providing adaptive utensils, developing appropriate self-feeding set-up, and practicing specific techniques with the patient while in daily therapy. Speech therapy would assess swallow safety and provide treatment as needed. This treatment process is facilitated by the fact that the physical therapists, occupational therapists and speech therapists share common office space and treat spinal cord patients in the same therapy area. Thus, each discipline can observe the patient in treatments throughout the therapeutic day. Such proximity also facilitates communication, mutual goal setting and co-treatments. These functional goals and patient progress toward goals are also reviewed by the treatment team during weekly team rounds.

Once patient proficiency is achieved, occupational therapy would incorporate self-feeding activities at bedside, providing instruction to nursing staff and family members on proper set-up with the goal being for the patient to do more self-feeding. As appropriate, the patient may be included in the daily, noon-time feeding group led by occupational therapy and speech staff, who monitor, among other things, functional swallow/risk of aspiration and compensation/adapted techniques. With additional proficiency, the therapeutic recreation staff may include self-feeding as an individual patient goal for a community outing. The goal of self-feeding is evaluated weekly in Team Rounds and treatment steps organized/ implemented accordingly.

The issue of mobility also demonstrates the interdisciplinary approach within Frazier Rehab Institute's System of Care. Physical therapy and occupational therapy do the initial training and practice for proper transfer from bed to wheelchair, and training about wheelchair parts, safe operation and/or propulsion. Physical therapists, upon evaluation, post information regarding type of transfer in each patient's room and it is also documented in the electronic medical record. Proper seating is accomplished through collaboration of inpatient treatment staff, the physician, the professional staff in Frazier's Assistive Technology Resource Center/Seating Clinic (ATRC) and DME providers during daily rehab therapies or through service contracts. Such services also continue in the outpatient setting. As this process is initiated/continues, the case manager is in contact with the patient's insurance carrier and other funding sources regarding payment to oversee and facilitate maximum use of patient resources.

Frazier has coordinated efforts to secure appropriate assistive technologies for wheeled mobility, specialized seating, adaptive computer access, use of Wi-Fi devices, environmental controls, environmental modification, and adaptive driving. The professionals in the Assistive Technology Resource Center may work with the patient's insurance company, Worker's Compensation, the Kentucky Department of Vocational Rehabilitation, enTECH, the Bluegrass Technology Center, a patient's school system, rehabilitation engineers, Rehab Technology suppliers, and/or motorized vehicle modification specialists to secure funding for these technologies. The goal is to assemble an appropriate and integrated technology system to accommodate mobility, academic, vocational, and functional/leisure needs of the patient and family/caregivers. Frazier Rehab Institute maintains a Driver Evaluation and Training program at the NeuroRehab Program. Referrals are initiated via the attending physiatrist and occupational therapist. Additionally, patients are exposed to adapted sports equipment and appropriate funding sources necessary to participate fully and appropriately in athletic events/leisure activities.

During weekly Team Rounds, physical therapy, occupational therapy, nursing, pulmonary rehab, speech and language therapy, case management, therapeutic recreation, psychology,

physicians and others involved with the patient discuss current plan of care and the projected discharge needs for durable medical equipment. Dietitians attend rounds on an as needed basis, and provide documented updates on the patient status through the medical record and ITW messaging system. The interdisciplinary rehab team will also identify recommended equipment prior to discharge. The case manager discusses funding issues with insurance carrier(s) and other funding sources. To maximize resource utilization, some decisions about specific equipment to be ordered are made only days before discharge to integrate equipment needs with patient's most current function, gains or changes. Case managers coordinate the ordering and delivery of equipment with the physician, treatment team, patient and family, DME companies/orthotics companies, and insurance company(s). The transdisciplinary team comprised of the program coordinator, nurse navigator, spinal cord physician, lead therapist, and outpatient supervisor attend inpatient and outpatient team rounds, as well as weekly meetings together to problem solve specific patient issues. This core team follows the patient through the continuum of care and routinely rounds with each patient to educate and problem-solve. Through transdisciplinary team involvement, all biopsychosocial aspects of patient and support system care may be addressed.

When appropriate, patients and families are given written materials on ramp building and accessible housing specifications. This includes, but is not limited to, dimensions for doorways and bathroom grab bars. In the Spinal Cord Education Group, patients and families view the Adapting the Home slide show developed by the Frazier Rehab Institute, and relevant information in the SCI Patient and Family Handbook and the internet are referenced.

Home Assessments occur within a 30-mile radius of Frazier's downtown building as indicated. Frazier clinicians review Emergency Preparedness plans with patients on a 1:1 basis during therapies, however, this topic is also discussed in the Spinal Cord Education Group. Functional communication and issues of cognition/brain injury are addressed formally via occupational therapy, speech and language pathology and psychology departments. Patients are given basic screening evaluations, as indicated, or complete neurological psychological exams as appropriate. As deficiencies are identified, available within the System of Care are appropriate inpatient and outpatient therapy options. Issues of cognition also may be addressed via the outpatient NeuroRehab Program. This Program is equipped to assist patients with spinal cord injury in their advanced stages of community reintegration as the goals may include return to work, school, recreation, or independent living. Admission to this level of care would likely occur once participating in outpatient rehab.

Each aspect of functional mobility and discharge planning is addressed individually based on his/her needs and factors (social support, funding source, etc.), function is also addressed collectively throughout the Spinal Cord Education Group, the patient is educated on aspects of mobility and function in preparation for discharge from the inpatient Spinal Cord Program. An example of this would be general education and resource provision for patients regarding personal care assistants or return to work. The case managers, therapists, and psychologists may all work with the patient on vocational rehab related goals and referrals specific to the individual, these concepts are introduced, and resources provided to any patient that enters the program.

Psychosocial

Orders for psychology staff involvement with this population is standard procedure and is initiated via the SCI Admission Order Checklist. Each patient is screened based on mental health history, psychotropic medications, current biopsychosocial status, and participation in the rehab plan of care. Psychological assessment findings are reported individually to the physician or in Team Rounds regarding individual and family system functioning, coping skills,

academic/vocational training and history, and motivation for rehabilitation. The psychology team communicates with the treatment team outside of Team Rounds to discuss patient status, participation, and psychosocial concerns. The need for referral to other psychiatric consultants is determined as is the need for appropriate medications for depression, sleep dysfunction, substance abuse, anxiety, and/or pain. Additionally, mental health and relevant spinal cord issues are addressed in the Spinal Cord Education Group.

Patients are routinely told during the assessment process that families are an important part of the rehabilitation process. That message is also delivered by the admissions coordinator to patient and families prior to rehabilitation admission and once admitted, by the admission nurse and/or case manager who communicates with the family regarding basic orientation, family teaching schedules, plan of care, length of stay, insurance coverage/on-going benefits and preparations for discharge.

To address psychosocial support needs, the System of Care introduces newly injured spinal cord patients to peer support if appropriate. This is completed by the nurse navigator, program coordinator, or case manager. (1) A trained peer mentor, who is spinal cord injured, can be invited to accompany staff during support group meetings or in the on-site wellness facility. (2) Peer mentors trained through the Trauma Support Network (TSN) and routinely speak in the Spinal Cord Education Group discussing spinal cord injury issues of concern and answering patient/family questions. (3) As appropriate and managed by the program coordinator, peer mentors meet with patient(s) in their hospital rooms. (4) Information is provided encouraging patients and family members to participate in: (a) adapted sports and leisure program/events, (b) the Kentucky Wheelchair Athletics Association (KWAA), and (c) Ms. Wheelchair Kentucky Program. (5) Persons served are encouraged to participate in the Community Fitness & Wellness Program and (6) the weekly Community Connections Discussion Group hosted by Frazier Rehab.

Education and Training

Patients/Families/Support Systems

The Inpatient Spinal Cord Education Group provides a formal and integrated system of patient and family education. Over the course of 2 weeks, patients and their families participate in a group education class for 60 minutes on Monday through Thursday covering a multitude of topics relevant to SCI management. These daily education classes are taught by members of our interdisciplinary treatment teams and is scheduled each day by our inpatient scheduling team to ensure patients participate in discussion of all topics.

Criteria for admission to the Spinal Cord Education Group center upon the patient exhibiting sequelae of spinal cord injury such as impairment of motor or sensory functioning, and bowel and/or bladder dysfunction. Patients must be medically stable sufficient to tolerate the physical demands of each session and not have cognitive deficits where participation would not be beneficial to the patient and/or disruptive to others. Regardless of patient participation, family members are encouraged to attend, e.g., parents of small children attend the group for formalized care training and for mutual support about their psychosocial adjustment issues. Topics presented in the group change daily and presentations are made by various disciplines. There is a designated staff member that maintains the ongoing class calendar.

During Team Rounds - which includes: the physician, treatment staff, nursing, dietary, the patient and family-the case manager communicates to the patient and family team goals and discusses the need for family teaching. Schedules and dates are formalized for such training. During formal family teaching days, therapists are prepared to teach and advance patient and family to hands on care with bathing and dressing, bowel and bladder management,

medications, transfers, and pressure relief to name but a few. However, families are encouraged to come to Frazier as frequently as their schedules allow to maximize of family training. The progression of patient and family skills and knowledge level achieved is monitored in Team Rounds weekly. All patients in the Spinal Cord Program are taught the importance of being able to independently instruct all aspects of their care (when assistance is required) for his/her safety and well-being upon discharge.

Each spinal cord injured patient and family are given the following educational/resource materials:

- Frazier Rehab Institute's Patient and Family Handbook for SCI
- A packet of educational materials regarding to healthy relationships and sexuality following spinal cord injury
- The Paralysis Resource Guide published by the Christopher and Dana Reeve Foundation.
- NSCIA – New Beginnings Backpacks containing resource materials (Local, State, regional and National)
- Facing Disability, ABLE Thrive, Trauma Support Network, selecting primary care physicians, discharge checklist, research opportunities.

These publications are presented as learning and reference tools for patients and families following onset of injury throughout the life cycle.

The Consumer Community

In 2015, a virtual library was established on the Michael Brent Resource Center Website where patients/caregivers can now access resources, including but not limited to electronic versions of the hard-copy resources available in the physical library and routinely provided to patients. Frazier continues to support access to the Michael Brent Resource Center Website.

Persons served are encouraged to participate in the Community Connections Discussion Group hosted at the Community Fitness & Wellness Center of Frazier Rehab Institute. Frazier Rehab maintains a partnership with local non-profits Gathering Strength and Pushing Forward to support ongoing community wellness, educational, and resource opportunities. Partnerships with the University of Louisville of Louisville and the Kentucky Spinal Cord Injury Research Center promote the advancement of translational research and clinical care for individuals living with SCI.

The Professional Community

Administrators, clinicians and researchers in the Spinal Cord Program at Frazier Rehab Institute participate in opportunities to education the professional and non-professional community regarding spinal cord injury research and rehabilitation. Terri Oxender OTR/L, ATP attended the International Seating Symposium and serves as a chair on the clinical taskforce and clinician advisory board. Several clinicians within the Spinal Cord Medicine Program serve as adjunct faculty for various therapy and graduate school programs. Frazier clinicians and collaborating researchers from the University of Louisville have attended and presented at numerous professional conferences over the past three years, including but not limited to the Academy of Spinal cord Injury Professionals annual conferences and the Annual Scientific Meeting of the American Spinal Injury Association.

Frazier hosts annual trainings for the NeuroRecovery Network, including National Summit and serves as a host site for numerous NeuroRecovery Learning Courses specific to activity-based rehabilitation interventions following SCI, such as Introduction to Locomotor Training,

Introduction to Pediatric Locomotor Training, Activity Based Therapy, and Neuromuscular Electrical Stimulation for the Upper/Lower Extremities and Trunk.

Frazier hosts a variety of clinical interns from undergraduate, graduate and professional/clinical programs annually, including but not limited to nursing, physical therapy, occupational therapy, speech therapy, social work, and therapeutic recreation.

Research Capability

Frazier Rehab Institute works collaboratively with the Kentucky Spinal Cord Injury Research Center in advancing spinal cord injury knowledge, translation of research, and overall patient care. Both organizations support that latest works by key leaders in the field of spinal cord injury research, specifically epidural stimulation. Frazier also supports clinicians engaging in research projects to represent Frazier Rehab's spinal cord program on the national stage.

1.) Aquatic Restorative Therapy to Enhance Functional Mobility in Individuals with Spinal Cord Injury: A Case Series presented at the 2021 Annual Scientific Meeting of the American Spinal Injury Association.

2.) Treating the Chronic Tetraplegic Upper Extremity: A Transdisciplinary Approach Case Study presented at the 2021 Annual Scientific Meeting of the American Spinal Injury Association.

3.) Activity-Based Therapy Based on Spinal Cord Network Neural Mechanisms to Rehabilitate a Peripheral Nerve Injury: A Case Report presented at the 2022 Annual Scientific Meeting of the American Spinal Injury Association.

4.) Effects of Wide Pulse Width Neuromuscular Electrical Stimulation on Peripheral Nerve Damage Post Shingles presented at the 2022 Annual Scientific Meeting of the American Spinal Injury Association.

5.) Return to Running after Incomplete Cervical Spinal Cord Injury: A Case Series presented at the 2022 Annual Scientific Meeting of the American Spinal Injury Association.

6.) Therapeutic Experience Guides Development in a 15-month-old with Spinal Cord Injury Since Birth presented at the STEEL Conference in 2021 and published in 2022.

7.) Applying a Standardized Process Flow to Outpatient Rehabilitation Fall Reduction in Patients with Spinal Cord Injuries presented at the 2022 Academy of Spinal Cord Injury Professionals Annual Conference.

8.) Optimizing Sustainability of an Accessible Community Fitness and Wellness Program: Lessons Learned During COVID 19 presented at the 2022 Academy of Spinal Cord Injury Professionals Annual Conference.

Transitions across the lifespan.

Aging is an issue covered in the Spinal Cord Education Group with emphasis on, but not limited to, skin protection, joint protection, nutritional needs, weight management, osteoporosis, emergency preparedness, need to change in equipment (such as the transition from manual to power wheelchair), and generalized fatigue.

On a practical basis, physical and occupational therapists teach and have patients and families demonstrate good technique for joint protection, posture/positioning and energy saving techniques for both. The Assistive Technology Resource Center, which often interacts with individuals over the lifecycle, is alert to address appropriate needs with an aging SCI population. The therapists in the wheelchair seating and mobility clinic often deal with these issues when outpatients report repetitive strain injuries, or the therapists note the consequences of years of

poor postural support or the onset of pressure ulcers due to the changes in skin resilience. These situations commonly arise as an individual ages with a spinal cord injury. These symptoms usually lead to changes in methods of transferring between sitting surfaces, the transition from manual to powered mobility devices along with resulting changes in transportation or the need for additional home modifications.

As a means of continuing to follow a patient throughout the lifespan, routine physical and occupational therapy evaluations are performed at regular intervals, typically 6 months to 1 year, and promote dialogue with the physiatrist to address changes in a patient's needs throughout the lifespan.

Case Management

The Department of Case Management provides services throughout the System of Care, i.e., while the patient is still in acute care, once admitted to acute rehabilitation and upon discharge from inpatient rehabilitation. Additionally, the outpatient SCI Case manager provides follow-up services to patients receiving therapies in the outpatient spinal cord clinic and continues to be a resource after discharge from therapy throughout the person's lifetime.

The Case Management Department is staffed by full time admission coordinators (RN's) and/or certified social workers who regularly visit area hospitals and manage admissions outside the immediate geographical area. Once spinal cord patients are admitted to Frazier Rehab Institute, case managers are assigned to each patient and coordinate the flow of information between components of the System of Care including but not limited to: physicians; rehab staff; patient and family; insurance carriers; community resources including community based funding sources, post discharge services such as outpatient services and home health services; Social Security, Medicare and Medicaid; and equipment vendors. Case managers review information obtained from the admission coordinators, meet with the patient and family to orient them to the rehab process, and assess family support systems and resources pertinent to discharge planning. This information is communicated to the team when the patient is first reviewed in Team Rounds. Any change to this information is presented in ongoing, weekly Team Rounds both inpatient and outpatient.

Resource Management

The case manager maintains open communication with the payer source providing treatment updates, typically on a weekly basis, and plans with the family, the rehab team and patient how best to allocate resources. For example, occupational therapy may recommend that a person with T-7 paraplegia with limited outpatient benefits not begin outpatient services post inpatient discharge until the thoracic lumbar-sacral orthosis (TLSO) brace which is typically worn for three months post-surgery, has been discharged by his surgeon. The therapist's assessment is that the patient would benefit most from outpatient services after discharge of the brace.

Case managers routinely provide benefits counseling in acute care, during inpatient and outpatient admissions, and post discharge. Frazier also has a full-time financial counselor available to address patient/family concerns, issues and needs for both inpatients and outpatients.

Transition Planning

Transition planning begins with the admission coordinator in acute care who makes the initial assessment of likely family and community support for the patient post discharge from either acute care or acute rehab. If the patient is admitted to acute rehab, such information is the foundation for all other transition planning. As stated above, the case manager has numerous responsibilities to collect and coordinate the flow of information between physician,

rehab staff, patient and family, and external stakeholders. Inpatient therapy staff regularly introduces patients to outpatient therapy staff and provide patients a tour of the 11th floor outpatient location, Community Fitness and Wellness space and Michael Brent Resource Center, assisting the patient to transition smoothly to the outpatient environment.

If the spinal cord patient is a child, a case manager/nurse navigator secures appropriate school records, works to implement tutoring while patient is in acute rehab and develops a plan of discharge for school reintegration. To facilitate communication and transition of the child/adolescent served to the community, information is exchanged between the program and school system at critical decision-making point in the rehabilitation process including but not limited to: (1) pre-onset school/work records (2) preparation of the school for transition of the child/adolescent to school (3) assessment of modifications and adaptations of the environment (4) preparation for transition from school or work and/or vocational training, and (5) involvement in planning for transitional of supported living programs.

At the time of discharge, an educational plan is established based on the input/recommendations of the physiatrist and rehabilitation team. This plan may include any of the following: return to school date with adaptations or recommendations, such as physical or cognitive modifications required/suggested, referral and date of neuropsychological evaluation to further inform school recommendations, begin homebound instruction through the child's/adolescent's local school system, and/or recommendations to refrain from any educational endeavors until it is determined that the child is ready based on his/her medical condition. The school and parents/guardians receive a letter articulating the dates of all hospitalizations and outlining the return to school recommendations.

Rehabilitation staff may consult with school personnel to help develop and implement Individualized Educational Treatment Plans and/or school transition plans based upon recommendations from various rehab disciplines. The case manager also coordinates the pediatric patient and family initiation of services with community resources such as, but not limited to, the Kentucky Commission for Children with Special Medical Needs and First Steps.

Life Long Follow-Up

Case managers provide patients with resources for lifelong follow-up at the time of discharge from the inpatient setting. Specifically SCI patients are scheduled a follow up appointment in the University of Louisville Physician Clinic with his/her psychiatrist who will continue to monitor the patient's medical status and address any medical issues that arise. This ensures that lifelong medical follow-up is available to the patients. Patients are typically seen in the Clinic two times a year, or more frequently, if needed. This follow-up may lead to additional inpatient admissions or outpatient therapy arrangements being made. There is an outpatient case manager who is available to discuss community resources on an outpatient basis for prospective, active, and discharged patients of Frazier' Outpatient Spinal Cord Medicine Program. The Program case manager also provides resources as requested for non-patients that contact Frazier via phone, website or email.

Health Promotion & Wellness

All patients at Frazier Rehab Institute can maintain lifelong health through the Community Fitness and Wellness (CFW) program, located on the downtown medical campus. The mission of CFW is to provide people with SCI and other physical disabilities the opportunity to improve their lifelong health and fitness through regular exercise and activity-based interventions including locomotor training, electrical stimulation cycling, and strength and cardiovascular training. This program is introduced to patients while they are receiving inpatient services and becomes available to them during and/or after their outpatient program is completed. Individuals

living outside of the Louisville area have the option to meet with a member of the CFW team to develop an exercise plan that can be done at home or a fitness/rehab center. In collaboration with the therapy team, CFW staff may provide information on how to locate and/or purchase adaptive equipment they will need to meet their specific fitness needs.

Resources for Independent Living and Community Integration

Case managers provide referrals and information to patients on vocational rehab services (return to work/school), Center for Accessible Living (Personal Care Attendant Program), and transportation services in order to encourage independent living and community integration. These topics are also addressed in the Spinal Cord Education Group.

Prevention Related to Potential Risk and Complications due to Impairments, Activity Limitations, Participation Restrictions, and the Environment.

Potential risks of complications due to impairments are identified by all staff and specifically the Admission Coordinator and communicated through electronic medical records to inpatient team members. Issues are monitored and addressed through the interdisciplinary Plan of Care and discussed in weekly team and family rounds. Prevention and adaptations are further addressed in Spinal Cord Educational Group meetings and by each relevant discipline.

Pulmonary Rehab educates the patient and caregiver in the importance of smoking cessation. Second hand smoke and other environmental irritants can also be detrimental to the patient and cause increased congestion. Patients are also encouraged to receive proper vaccinations to prevent flu and other seasonal diseases. A pneumococcal vaccine is also recommended every five years.

The dietitian addresses issues including but not limited to therapeutic diet counseling, metabolic syndrome, skin integrity, bone health, weight management, bowel function, bladder function, and GI disorders in order to maximize function and promote health.

Psychology discusses long-term mental health issues and concerns with the patient/family individually and in the Spinal Cord Education Group including but not limited to anxiety/depression, substance abuse, healthy/dysfunctional relationships and integration into society.

Through participation in the Community Fitness and Wellness program at Frazier Rehab, patients with SCI develop the knowledge and skills they need to be successful in overcoming barriers related to maintaining a healthy and active lifestyle. They are exposed to and educated about equipment that is fully accessible and designed to assist them in completing an activity safely and effectively.

Safety for Person Served and the Environments in which They Participate

Primary Prevention

Safety and prevention are taught throughout the System of Care. From the day of admission, patients and families are exposed to the importance of wearing prescribed bracing to stabilize spinal cord/column; how to don and doff brace appropriately; proper transfer techniques from bed to all surfaces to prevent injury; impact of sensory deficits on skin integrity; muscular skeletal injury; burns; and wheelchair management, including procedures for van lifts and tie downs. Patient and family member(s) are told to get clearance from their physician prior to any sexual activity; and the dangerous effects of mixing medications typical of spinal cord injury care and alcohol/substance abuse. These issues are addressed in treatment sessions, discussed in the Spinal Cord Education Group and/or presented in written materials given patients/families.

Secondary Prevention

Therapists, physicians, nurses, psychologists, and others on the treatment team address the need for skin protection. As an example, in the Spinal Cord Education Group, presentations stop routinely after 30 minutes to do pressure relief for all patients with spinal cord injury. The inpatient therapy and Assistive Technology Resource Center have pressure mapping tools which are commonly used for patient education on effective strategies for pressure relief and the selection of appropriate pressure relieving cushions.

The Assistive Technology Resource Center/Wheelchair Seating and Mobility Clinic is focused on shoulder preservation and the prevention of secondary disability. Every effort is made to educate patients using manual wheelchairs and their families about proper axle position, lumbar support, propulsion patterns and push-rim biomechanics. Staff also encourages the use of push-rim activated power assist wheels to prevent the overuse injuries that come from attempting to propel a manual wheelchair with low cervical injuries. Individuals with higher-level injuries are instructed in the use of tilt in space wheelchair seating to prevent pressure ulcers and compensate for their inability to shift body weight.

It is documented and described elsewhere that patients are instructed in health promotion/injury-sickness prevention with regard to pulmonary care; bowel and bladder management; weight management and joint protection; prevention of deep vein thrombosis; urinary tract infections; autonomic dysreflexia; spasticity; orthostatic hypotension; and the importance of performing daily range of motion exercises to prevent contractures, ossification and loss of function.

Frazier demonstrates a commitment to patient safety by incorporating evidence-based safety practices into our clinical programs and staff competency. We are well equipped to safely deliver therapy services across the continuum, but also emphasize this as a component of successful community re-entry within patient and family training sessions. Some examples of our safety initiatives include Safe Patient Handling, Casa Colina Falls Risk Assessment, Braden Scale Assessment (i.e., for skin integrity), Bedside Shift report, and Patient Safety Rounding.