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Orbiter

Attn: Mr. Claude Rogers

In regard to your FAX of November 15, I think your key points are correct. The Orbiter rehabilitation protocols basically are unchanged from 1993. The five most common procedures that we use for rehabilitation on the Orbiter are:

1. Arthroscopic meniscectomy or minor articular shaving.
2. Lumbar surgery patients—discectomy/laminectomy.
3. Anterior cruciate ligament reconstruction with interference screw fixation—bone to bone.
4. Extensive arthroscopic chondroplasties for chondromalacia or arthritis.
5. Metatarsal and stable mid-foot fractures.

I continue to believe that the most valuable utilization is in knee rehabilitation, although just based on the frequency of back injuries and/or surgeries it is used there quite extensively.

I do not have specific dollar data, but it is the impression of our group that patients rehabilitated on the Orbiter return to functional utilization of their lower extremity anywhere from twenty five to fifty percent sooner, and I would expect that not only would their rehabilitation cost be twenty five to fifty percent less but the earning capacity and return to the work force obviously would be an additional cash benefit.

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Updated Orthopaedic Injury

ORBITER REHABILITATION PROTOCOLS

ARTHROSCOPIC MENISCECTOMY OR MINOR ARTICULAR SHAVING - KNEE

- Day 1-2 - Isometric exercise - no weight bearing crutches.
- Day 3-5 - Progressive weight bearing and active range of motion on exercycle - low resistance.
- Day 5-7 - Walk on Orbiter 10-15 minutes at 2.5% grade. Exercycle 10 minutes - low resistance. Elite athletes jog 10-15 minutes with sprint surges at 30 seconds.
- Day 8-14 - Walk/jog on Orbiter 15-30 minutes - 3-5mph at 2.5% grade. Exercycle 15 minutes - full resistance. Elite athletes run 30 minutes - internal sprints 60 seconds.
- Day 15-28 - Jog/sprint alternately on Orbiter 4-7mph at 2.5% grade - may use power or manual. Elite athletes full use non contact.
- Day 29-42 - Alternate Orbiter - jog/sprint and track jog/sprint 30-45 minutes at 2.5% to 5% grade - jump rope - begin cutting on track. Elite athletes return to competition.
- Day 43 - Release to sports in recreational athlete.

EXTENSIVE ARTHROSCOPIC KNEE - CHONDROPLASTY (arthritis)

- Day 1-2 - Isometrics - non-weight bearing on crutches.
- Day 3-14 - Isometrics - progress to partial weight bearing, but still on crutches.
- Day 14-28 - Progress to Orbiter walking and start daily exercycle - 10 minutes - no resistance. Orbiter 5-10 minutes at 1.0% grade - 2-3mph.

EXTENSIVE ARTHROSCOPIC KNEE - CHONDROPLASTY (arthritis) cont:

- Day 28-42 - Exercycle - light to medium resistance. Orbiter 15 minutes - 3-5mph at 2.5% grade. Exercycle 30 minutes - medium resistance.
- Day 42-70 - Continue exercycle 30 minutes - medium resistance. Orbiter - 4-7mph at 2.5% grade - may start manual gradually - no track workouts - continue daily exercycle.
- Day 70-90 - Recreational or professional athlete only. Start one track workout/week - 15-20 minutes (jog). Two Orbiter workouts/week - 5-7 minutes - power/manual - jog/sprint at 2.5%-5% grade. Continue daily exercycle.
- Day 90-120 - Convert totally to track workouts - jog only no sprints or speed workouts, except on Orbiter. Continue daily exercycle.
- Day 120-+ - Return to full track workouts to individual patient tolerance. May cycle and track alternatively, if long term Orbiter not available.

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION - RIGID BONE TO BONE INTERNAL FIXATION

- Day 1-7 - Splint - crutches - touchdown x 3 days only - passive range of motion and isometric exercises. Progressive walking in crutches days 4-7.
- Day 8-15 - Start Isokinetic exercise on cycle and walk on Orbiter 30 minutes - 2.5-3.5mph at 2.5% grade.
- Day 16-28 - Walk/jog - 30 minutes - 2.5-5mph at 2.5%-5% grade.
- Day 29-45 - Jog and surges, but no sprint 30+ minutes at 5% grade.
- Day 45-70 - Jog/sprint 30-45 minutes at 5% grade - alternate Orbiter and track workouts. No cutting.
- Day 70+ - Track workouts - initiate gentle cuts - No contact sports for 12 months. Elite athletes to sports at 9 months. Brace for recreational sports for 12 months.

NON-SURGICALLY TREATED "ISOLATED" ANTERIOR CRUCIATE LIGAMENT RUPTURE

- Day 1-5 - Crutches - ice wrap - isometric exercises.
 - Day 5-15 - Cycle - low resistance - isokinetic exercises. Orbiter - walk/jog 30 minutes - 2.5-5mph at 2.5%-5% grade. Cycle 30 minutes - medium resistance.
 - Day 16-28 - Orbiter - jog 30-45 minutes - 4-7mph at 2.5%-5% grade. Cycle 30 minutes - moderate resistance.
 - Day 29-45 - Orbiter - jog/surge/sprint 45 minutes - 4-9mph at 5%-7% grade. One track workout per week.
 - Day 70+ - Release to full track and sports training if clinically stable.
- Brace for contact sports for 12 months if any symptoms of instability.

ANKLE SPRAINS - MODERATE TO SEVERE

- Day 1-2 - Crutches - ice - elevate.
- Day 3-5 - If stable, walk and progress to jogging on Orbiter 15-30 minutes - 3-5mph at 2.5% grade. Ice after workouts. May wear shoe or jog in sock if too swollen. Walk full weight bearing in high top shoes or brace.
- Day 6-10 - Jog - sprint alternately, preferably in high top shoe, but all right in sock if still swollen. Orbiter 30 minutes - 3-5mph at 5% grade. Can usually return to sports in brace in about 10-12 days.
- Day 11-18 - May start running on track, wooden floor, or grass (in brace) - alternate with jog - sprint on Orbiter 3-45 minutes - 5-7mph at 5% grade.

ANKLE FRACTURES - LATERAL MALLEOLUS OR STABLE BIMALLEOLAR

- Day 1-9 - Cast or short leg brace for 3 weeks.
- Day 10-21 - Full weight bearing. May walk/jog on Orbiter in cast shoe at 10-12 days - 2-3mph at 1% grade.

ANKLE FRACTURES - LATERAL MALLEOLUS OR STABLE BIMALLEOLAR cont:

- Day 21-28 - Whirlpool - walk/jog -15-30 minutes in Swede-O or air ankle brace and shoes. Ice after jogging 4mph at 2.5% grade.
- Day 29-35 - Jog in brace and shoe 30 minutes - 3-6mph at 2.5%-5% grade.
- Day 36-42 - Jog/sprint - 2 times a week - 30-45 minutes - 4-7mph at 2.5%-5% grade. Track jog 2 days a week up to 30 minutes - 3-4mph. Cycle 2 times a week for 30 minutes.
- Day 43-70 - Convert to track, grass or wooden floor running (in brace) and wear from Orbiter. Gradually add rope jumping, cutting and full sports activities.

ANKLE FRACTURES - MALLEOLAR - STABLE/A.O. TYPE FIXATION (Rigid)
(No plafond or comminuted articular fractures)

- Day 1-6 - Fixation - no cast or briefly in cast or splint - active and passive range of motion.
- Day 7-14 - Start cycle - 15 minutes - no resistance - ice after exercise.
- Day 15-21 - Start walking on Orbiter 15 minutes - 2.5-4mph at 2.5%-5% grade in Swede-O or air brace. Cycle 15-20 minutes - moderate resistance.
- Day 29-36 - Jog/sprint -30 minutes - 3-7mph at 2.5%-5% grade in Swede-O or air brace. Cycle - unlimited.
- Day 37-45 - Jog/sprint same program, except not in brace.
- Day 45-70 - Gradually wean from Orbiter to track.

FOOT FRACTURES - OS CALCIS (HEEL) UNDISPLACED OR STABLE WITH
SCREWS AND PLATE

- Day 1-7 - Non-weight bearing for one week in cast or on crutches.
- Day 7-28 - Non-weight bearing on crutches. Begin active and passive range of motion.

FOOT FRACTURES - OS CALCIS (HEEL) UNDISPLACED OR STABLE WITH SCREWS AND PLATE cont:

- Day 29-42 - Off crutches, possibly on cane. Walk on Orbiter 15-30 minutes - 2-3mph at 2.5% grade.
- Day 43-70 - Orbiter - walk/jog 30 minute - 3-5mph at 2.5%-5% grade in socks or shoes with flexible sole.
- Day 71-90 - Jog/sprint 30 minutes - 4-7mph at 2.5%-5% grade in running shoes.
- Day 91+ - Release to track in running shoes.

METATARSAL FRACTURES AND STABLE MID FOOT FRACTURES

- Day 1-9 - Crutches and/or short leg walking cast depending on pain and level of fracture stability. Some patients may start Orbiter in 2-3 days.
- Day 10-21 - Walk in laced running shoes 15-30 minutes - 2-4mph at 1%-2.5% grade.
- Day 22-25 - Jog in laced running shoes - 3-6mph at 2.5%-5% grade.

UNSTABLE FRACTURES AND POST ORIF FRACTURES OF MID FOOT AND FOREFOOT

- Day 1-14 - Non-walking cast on crutches.
- Day 15-28 - Progressive weight bearing in walking cast or walk on Orbiter in cast shoe 15-30 minutes - 2-3mph at 2.5%-5% grade.
- Day 29-36 - Walk/jog in supportive running shoe 15-30 minutes - 2-5mph at 2.5%-5% grade.
- Day 37-54 - Jog/sprint in shoe 30 minutes - 4-7mph at 2.5%-5% grade.
- Day 55-70 - Gradually release to track.

BACK PATIENTS - ACUTE STRAINS

- Day 1-5 - Rest - anti-inflammatories, muscle relaxants - passive physical therapy - hot packs, ultrasound, and massage.
- Day 6-14 - Walk 15 minutes - 2-3mph at 1% grade. Heat before, ice packs afterward. Williams' flexion exercises. Emphasize posture and control in corset if necessary.
- Day 15-21 - Walk/jog 15-30 minutes - flexion exercises - McKenzie exercises - truncal and back strengthening. Cycling. Again proper upright posture is essential. Back pain will be aggravated if the patient flexes while walking or jogging.
- Day 22-28 - Progress to track running alternate days.
- Day 29+ - Release to full prior program.

BACK PATIENTS - CHRONIC STRAIN OR MECHANICAL BACK PAIN

- Day 1-14 - Walk 15-30 minutes - 2.5-3.5mph at 1%-2.5% grade. Cycle 15 minutes - low resistance. Truncal exercises in P.T. - Williams' flexion exercises at home. McKenzie exercises.
- Day 15-28 - Walk/jog 30 minutes - 3-5mph at 2.5% grade. Cycle 15 minutes - medium resistance. Truncal exercises progressive in P.T. Stress upright posture as hip flexion while exercising aggravates.
- Day 29-45 - Walk/jog 45 minutes - 3-6mph at 5% grade. Cycle 30 minutes - medium resistance.
- Day 46+ - Depending on age and sports preference, patient may now progress to track workouts and non-contact sports.

LUMBAR SURGERY PATIENTS - DISCECTOMY/LAMINECTOMY

- Day 1-7 - Hospital and limited home walking.
- Day 8-14 - Walk at home in walking shoes. Start gentle Williams' flexion exercises and McKenzie extension exercises.

LUMBAR SURGERY PATIENTS - DISCECTOMY/LAMINECTOMY cont:

- Day 15-28 - Orbiter - walk/slow jog 14-30 minutes - 2.5-3.5mph at 1%-2% grade. Cycle 14 minutes - low resistance. Truncal exercises.
- Day 29-42 - Jog 30 minutes - 3-5mph at 2.5%-5% grade. Cycle 15-30 minutes - medium resistance. Gradual progression of truncal exercises.
- Day 43-70 - Orbiter and cycle program continued. Add time and speed to tolerance. May start grass or track jogging, as tolerated.
- Day 70+ - Release to sports, as tolerated, depending on age and physical condition. No football for 6 months.

LUMBAR SURGERY PATIENTS - FUSIONS

- Day 1-14 - Limited walking, usually in a brace, in hospital and home.
- Day 15-28 - Start walking on Orbiter 15-30 minutes - 2-3mph at 1% grade.
- Day 29-42 - Progress walking to 30-45 minutes, if possible. No jogging.
- Day 43-70 - Walk/jog 30-45 minutes - 2.5-4mph up to 5% grade, as tolerated. Start truncal exercises. Stress McKenzie.
- Day 70-90 - Jog 30 minutes, if x-rays indicate fusion and if physiologic age and condition will allow - 4-5mph at 5% grade. No sprints.
- Day 92-120 - Gradually progress to grass and track workouts, if general condition allows and if athletically predisposed.
- Day 121-180 - Release to sports/exercises. Program of choice, including running. No competition contact sports for a minimum of one year.

All of the protocols are suggested guidelines and must be individually adjusted, based on fractures such as: patient motivation, patient tolerance, patient reliability, surgical technique, surgical complication, age, weight, and prior health conditions. Also, this is not an inclusive list of applications, but rather the more common usages.