

Sitting Protocols: Post-Surgical Interventions

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Objectives & Notes

- SCI (Spinal Cord Injury) highest risk population
 - musculocutaneous or fasciocutaneous flaps
- Describe principles of post-flap management
 - Progressive sitting protocol
 - Equipment needs
 - Medical considerations of SCI as related to wound management
- Disclosure: Non-financial relationship with the Ryan Shazier Fund for Spinal Rehabilitation

Epidemiology & Costs

- 50-80% of persons with SCI will develop a pressure injury at some time
Arch Phys Med Rehabil 2000;81:465-71
- 25% of pressure injuries are stage III or IV
Arch Phys Med Rehabil 1993;74:1172-7
- Pressure injuries account for $\frac{1}{4}$ total cost of care for persons with SCI
Top Spinal Cord Med 2001;24(suppl1):S40-101
- Annual cost for pressure injury care estimated to be millions to billions

To Flap or Not To Flap...

Benefits

- Faster definitive healing
- Improved quality of life
- Better participation
- Potentially cost savings

Risks

- High rates of dehiscence, reoperation, and recurrence
 - 40-80% recurrence from the 1990's data
- Is it futile?

Regardless, the best chance of post-op success is thought to be use of a sitting protocol

Results of 268 Pressure Sores in 158 Patients
Managed Jointly by Plastic Surgery and
Rehabilitation Medicine

Philip C. Kierney, M.D., Loren H. Engrav, M.D., F. Frank Isik, M.D., Peter C. Esselman, M.D.,
Diana D. Cardenas, M.D., and Richard P. Rand, M.D.

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Immediate Post-Surgical Management

- Strict bed rest
 - Air-fluidized bed
- Positioning
 - Supine preferred to prone
- 2-8 weeks (avg 4)
 - Surgeon preference
 - Outcomes the same when comparing a 4 week and 6 week protocol
 - J Spinal Cord Med 2021 44(3);392-8
 - Allows for development of adequate tensile strength for the wound



Post-Flap Management

- Limit leg range of motion
 - May initiate Passive Range of Motion once healed
 - Goal ROM 90 degrees without stress to surgical site
- Limit head elevation
 - 15-30 degrees max
- Treat spasticity, avoid incontinence, push nutrition

Disposition Options

- Immediately Post-flap
 - Remain in acute care hospital
 - Discharge home
 - **Discharge to skilled nursing facility**

Progressive Sitting Protocol

- Inpatient rehabilitation setting
- Considered standard of care
 - Supported by SCI Clinical Practice Guidelines
 - Little evidence to support a particular protocol
- General concept is progressive mobilization after flap site is well healed
- Must include
 - education to **prevent recurrence**
 - evaluation **for modifiable factors** that contributed to initial breakdown

Inpatient Rehab Admission

- Strict criteria for inpatient rehab admissions
 - Often require prior authorization and many times peer-to-peer
- Easier to obtain rehab admission for sitting protocol if appropriate documentation is done in the initial post-op period
 - Consider PM&R consult or use of standardized dot phrase to justify need for admission
 - UPMC shared dot phrase in Cerner: flapconsult
- Transport via stretcher / ambulance to follow-up appointments and rehab

Progressive Sitting Protocol

- The flap site is examined before and after each period of sitting to monitor integrity of the flap
 - Looking for dehiscence, erythema, bruising
- If at any point, there is concern for breakdown of flap site, the sitting protocol is put on hold for at least one day
 - If held, the protocol will resume at the previous time increment
- Entire protocol takes approximately 12-14 days

Initial sitting protocol



- Power wheelchair
- Recline to 70 degrees
- Hoyer lift for all transfers
 - Rectangular sling
- Air-filled villous cushion
- Air-fluidized bed



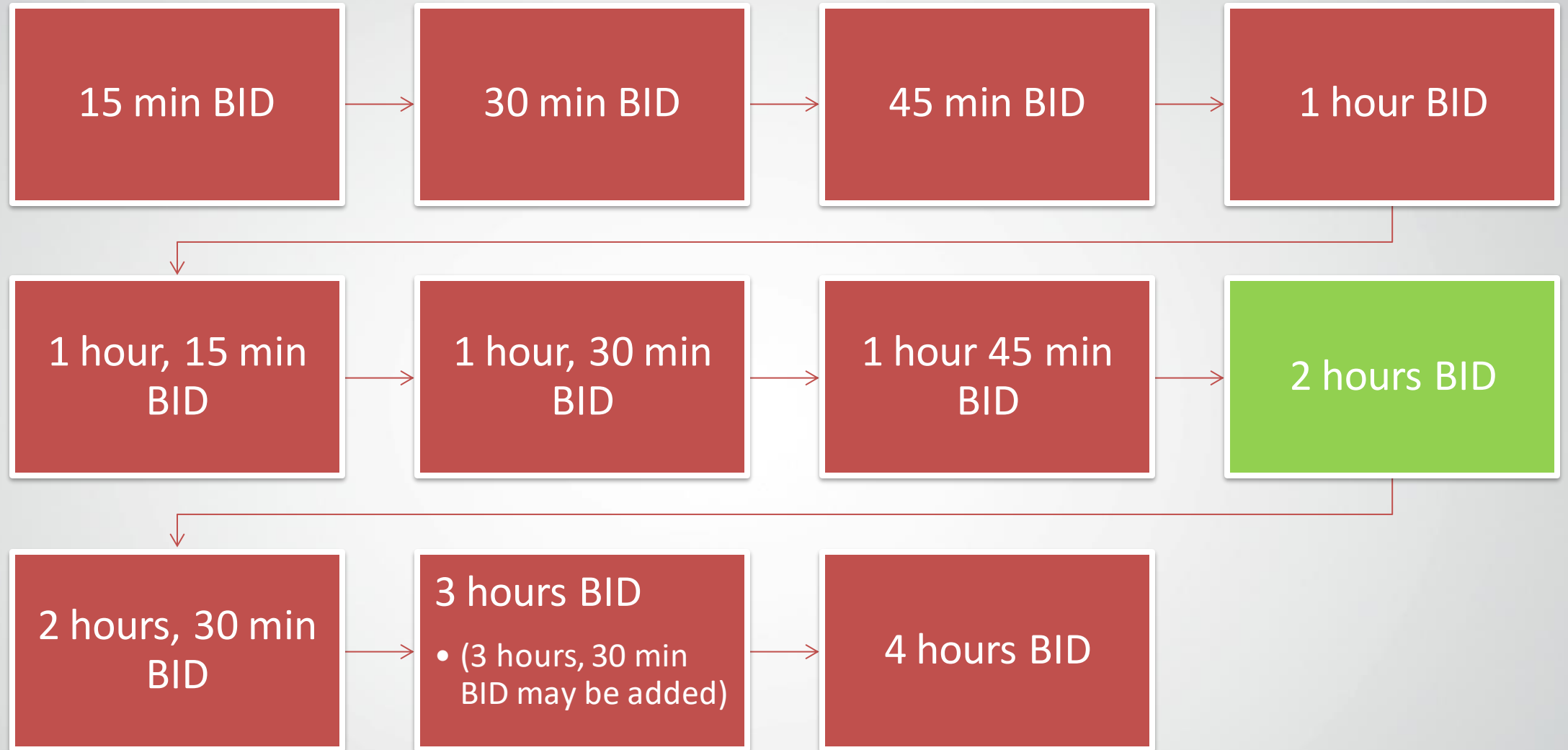
Divided leg sling – contraindicated post-op



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Daily Progression of Sitting

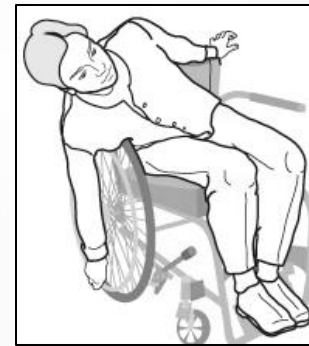
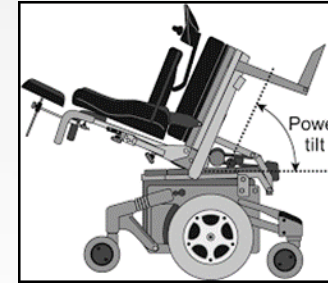


At 2 hours BID...

- Switch patient to their regular wheelchair
 - at their regular angle
- Switch patient to low air loss mattress, or equivalent to the mattress they will use at home
- Remove sutures from flap site (per surgeon preference)
 - may be gradual over a period of 1-3 days
- Perform pressure mapping and consider alternative wheelchair cushions

Patient Education

- Goal is to prevent recurrence
 - Etiology and risk factor education
 - Basics of prevention and treatment
 - Bed repositioning
 - Safe transfer techniques
 - Wheelchair weight shifts
 - Daily skin inspection
- Tobacco Cessation & Nutrition

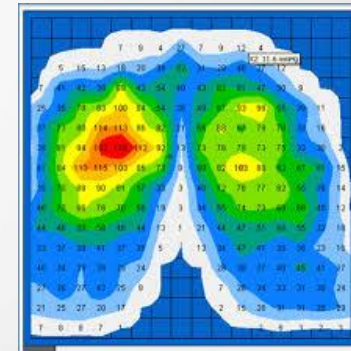


Seating Considerations

- Customized wheelchairs are preferred
- Correction of poor positioning can prevent pressure ulcer formation
 - Common positioning problems: scoliosis, pelvic obliquity, sacral sitting
 - Back support system can reduce pelvic obliquity and kyphosis
 - Foot plate position affects positioning of pelvis
- Cushions
 - Should be individualized for each person based on pressure mapping and patient characteristics
 - Risk of overinflation or underinflation of air-filled cushion

Seating Assessment

- Specialized team of providers
 - Physiatrists, therapists, vendor
 - Rehabilitation Engineering and Assistive Technology Society (RESNA) certifications
- Pressure mapping
 - Helps quantify risk
 - Analyze sitting postures
 - Evaluate various cushions
 - Provide education



Medical Considerations

- Immobility of bed rest → loss of bone and muscle mass
 - Weakness affects transfers and wheelchair propulsion
- Deconditioning
 - Poor endurance for mobility and self-care
- Rehabilitation Program
 - Strengthening
 - Conditioning
 - Sitting tolerance
- Availability of psychology, peer mentoring, support groups

Orthostatic Hypotension

- Common in all SCI (higher incidence with higher injury level)
- Increased risk after prolonged bedrest
- Management
 - Gradual position changes
 - Compression when out of bed
 - Medications if needed (midodrine, flornidol, salt tabs)

Neurogenic bowel and bladder

- Bowel

- Prevent incontinence
- May require ostomy pre-op
- Formal bowel program
- Considerations
 - Dietary changes
 - Mobility changes
 - Commode use

- Bladder

- Prevent incontinence
- Permanent or temporary indwelling catheter vs intermittent catheterization
- Considerations
 - Frequency of cathing
 - Difficulty in cathing while supine

Spasticity

- May be worsened by presence of wound/surgery
- Can negatively impact skin integrity/pressure/wound healing
- Requires aggressive management
 - Prevent flap dehiscence/formation of new wounds
 - Facilitate appropriate positioning
- Management
 - medications
 - neurotoxin injections
 - intrathecal baclofen
 - surgical contracture release



Discharge considerations

- Patient/family education
- Potential changes in functional level, transfer technique, pressure relief technique
- Equipment ordering
 - Bed, wheelchair, cushion
- Follow-up plans
 - Plastics, PM&R, Dietician, SCI support group