Session VI. (전공의/전문간호사)

Instructions on Postoperative Care in Spinal Surgery

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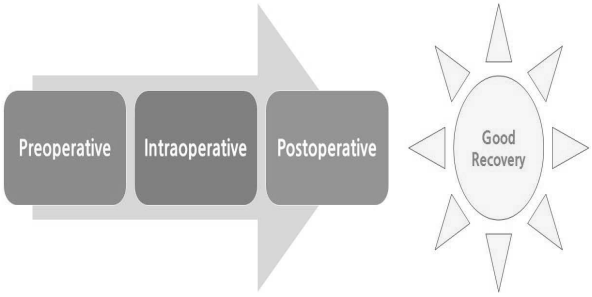
부산의대

Perioperative Care



Preop Consideration

Affecting Factors

- Systemic Consideration correlated to Morbidity/Mortality
  - Cardiac, Pulmonary, GI, Neurological, Hematological, Urological…
  - Age, DM (HbA1C > 7.0), Obesity , Revision, Level, ASA classification, GFR (<80), OP Time…
- Recent MI / CVA : Anti-PLT medication, Mortality
- Obesity : ↑ Intraabdominal Pr ≈ ↑ EBL
- Coagulation
  - Hypo-coagulation : VWD, Hemophilia, Anti-PLT drug, Vit E, Ginko biloba, Glucosamaine/Chondrotin Sulfate, Fish, Nuts
  - Hyper-coagulation : Anticoagulation Protein Deficiency (antithrombin III, protein C, protein S), Homocystinuria, Lupus, Pregnancy, Oral Contraceptives, Malignancy, Nephrotic syndrome, DM

Postop Assessment

Immediate Postop Assessment & Intervention

- Level of Consciousness & Emotional State
- Quick Assessment of ABC / Vital Sign
- Safety Measures
  - Side rails up
  - Fall down and Slip down Prevention
- Emotional Support
- Pain Assessment

TABLE 20-3 Initial Postanesthesia Care Unit Assessment

Airway
- Patency
- Oral or nasal airway
- Endotracheal tube

Breathing
- Respiratory rate and quality
- Auscultated breath sounds
- Pulse oximetry
- Supplemental oxygen

Circulation
- ECG monitoring—rate and rhythm
- Blood pressure
- Temperature and color of skin
- Peripheral pulses

Neurologic
- Level of consciousness
- Orientation
- Sensory and motor status

Genitourinary
- Intake (fluids, irrigations)
- Output (urine, drains)

Surgical Site
- Dressings/drainage

Pain
- Incision
- Other

ECG, Electrocardiogram.

Immediate Postop Assessment & Intervention

- Objective Data
  - Vital Sign, Neurologic Status, Respiratory Status, Circulatory Status
  - Dressing and Drain Tube : Type & Amount
  - Laboratory Study
  - Input & Output
  - Urination : Void within 8-10 hrs, 500-700cc within 24 hrs, Residual Vol
  - Patient Positioning and Comfort, Equipment
  - Assessment of Risk Factors for Postop Cx

Postop Complication

Morbidity/Cx/Mortality of Spine Surgery

- Hematological : Hemorrhage
- Respiratory
  - Atelectasis
  - Pneumonia
  - Pulmonary Embolism
- Cardiovascular
  - Hypotension
  - Cardiac Dysrhythmias
  - Venous Thrombosis
- Urinary
  - Urinary Retention
  - Low Urine Production
- Gastrointestinal
  - Paralytic ileus
  - Constipation
- Neurological
  - CVA/Stroke
- Immunological
  - Infection
- Wound Healing
  - Dehiscence
  - Eviseration
  - Infection
- Psychological
  - Body Image Problems

Author	% Deaths (total patients)	% Complications
Lee Spine 2011[44]	1.8% (767 Patients)	13% Cardiac 7% Pulmonary 8.2% Neurological 17.5% Hematological 6.7% Gastric 10.3% Urological
Fu[45]	0.12% (10,329 Patients)	0.04% Cardiac 0.09% Pulmonary 0.02% Pulmonary Embolism 1% Sepsis
Sansur[46]	0.1% (10,242 Patients)	0.7%- 2.1% Dural Tears Wound Infections Implant Complications
Street[47]	1.5% (942 Patients)	66% 1 Complication 28% Increased Hospitalization 7% Pneumonia 3% Neurological 2.2% Estimated Blood Loss over 2L 10.5% Intraoperative Complications 4.9% CSF leak 1.9% Instrumentation Failure
Schoenfeld[48]	0.3% (3475 Patients)	7.9% (283 patients)
Acosta[5]	0% (29 patients)	38% Major 62% At Least 1 Complication 52% Long term Complications 14% Reoperations
Cho[49]	NA* (166 Patients)	34.4% Major Complications 19.3% Perioperative 18.7% Follow Up

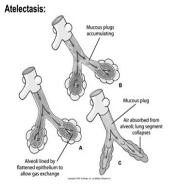
NA*: Not available

Pulmonary Disease

- Asthma, COPD
  - 1 wk prior to OP : Pulmonary assessment(spirometry)
  - Optimization : Bronchodilators, Inhaled steroids, Cromalyn Sodium
- Cessation of Smoking
  - > 4-8 wks prior to OP : benefit (2-4 wks : no effect)

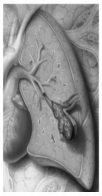
Pulmonary Disease

- Atelectasis
  - Common Cause of Postop Hypoxemia
  - Retained Secretions & Decreased Respiratory Excursion
  - Encourage Deep Breathing, Incentive Spirometry, Coughing, Early Mobilization
  - Can be cause of Pneumonia



Pulmonary Embolism, Deep Vein Thrombosis

- Thrombus from Peripheral Circulation
  → Lodge in Pulmonary artery
- Acute Tachypnea, Dyspnea, Tachycardia, Hypotension, ↓ SpO_2
- m/c Elective Surgery : Discectomy, Laminectomy = Low Risk
- Mechanical Prophylaxis
  - Pneumatic Sequential Compression Device
  - Compression Stocking
  - Before to Fully Ambulation State (Geerts et al., 2004)

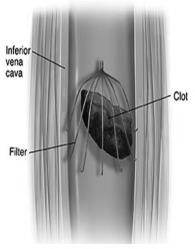


Pulmonary Embolism, Deep Vein Thrombosis

- Low-Molecular-Weight Heparin (LMWH) or Low-Dose Warfarin
  - Elective Combined Ant-Post (Circumferential) Surgery
  - High-Risk for Thromboembolic Disease
    - Multiple trauma, Malignancy, Hypercoagulable State (NASS, 2009)
    - LMWH prophylaxis, beginning with a half dose administered 6 h postoperatively followed by full dose once a day, reduced DVT/PE to 0, while only 2 patients exhibited minor bleeding complications (78 lumbar decompression, Zhi-Jian, 2011)
  - Duration : based on the underlying pathological condition & risk of hematoma
    - no available literature to support an ideal duration

Pulmonary Embolism, Deep Vein Thrombosis

- Prophylactic Inferior Vena Cava (IVC) Filter
  - History of DVT/PE
  - Hypercoagulation
  - Malignancy
  - Prolonged Immobilization
  - Long level (> 5 levels)
  - 360°± staged operations over 8 hrs,
  - 8.7% incidence of DVT, and 3.7% frequency of PE (compared to 13% PE)



Warfarin

- Chronic Anticoagulation Tx : Afib, DVT, MVR
- Transient Cessation + LMWH bridging Tx (Tafur, 2012)
  - At 3 months f/u
  - 5.1% bleeding rate (2.1% major bleeding)
    - Major Bleeding Factors
      - Mechanical MVR
      - Active Cancer
      - Prior Bleeding Hx
      - Re-initiation of heparin Tx within 24 hrs after surgery
- Restart Warfarin : not known (Cheng, 2010)

Paralytic Ileus, Constipation

- Cause : Bowel Manipulation, Anesthesia, Immobility, Pain medicines
- Tx of Ileus : Maintain NPO, Ambulation, Laxative

Infection

- Related to the altered skin integrity, inadequate nutrition and fluid balance, presence of environmental pathogens, invasive instrumentation, and immobility
- Prevention
  - Clean and Aseptic Wound Care
  - Good Pulmonary Toilet
  - Optimal Nutrition
- Old, Obesity, Malnutrition, DM, Higher ASA score, Post approach, Long-term Steroid

Infection

- Prophylactic Antibiotics
  - Evidence-based Guidelines (NASS, 2007)
  - Recommendations for Spine Surgery (Shaffer, Baisden, Fernand & Matz, 2013)
- Chorhexidine Bathing
  - Night prior to and Morning of Surgery : reduce Surgical Site Infection
- Silver Impregnated Dressings
  - ↓ Deep and Superficial Wound Infections following Instrumented Fusion

Rare Cx

- Unintended Durotomy, CSF leak
  - Bed Rest with Flat Posture
  - Lumbar Drain
- Esophageal Perforation (Ant Cervical OP)
  - Continued Drainage, Fever, Infection, Dysphagia 1 week following OP

Postop Management

General Consideration

- POD # 1 week : Need Assistance for Activity of Daily Living
- POD 4 - 6 weeks : Off of Work
- Analgesic : enhance postoperative physical functioning
  - Titrating off of Opioid medications by weeks 2-6 postoperatively (until 3 months)

General Consideration

- Smoking Cessation
  - Decreased Pseudoarthrosis : 10 or more cigarettes per day
  - Nicotine Screening before Surgery

  (Andersen et al., 2001; Glassman et al., 1998; Whitesides et al., 1994)
- Nutrition
  - approximately 6-12 weeks for nutritional parameters to return to baseline after spinal reconstructive surgery (Lenke, Bridwell, Blanke, & Baldus, 1995)
  - If preoperative malnourishment is suspected, albumin, prealbumin levels, and total lymphocyte count should be tested (Halpin et al., 2010)

General Consideration

- Weight Control
  - Weight loss should be encouraged for obese patients because those who are obese are at increased risk for perioperative complications (Pull ter Gunne, van Laarhove, & Cohen, 2010)
- Bone Health
  - Weight-bearing exercise is important for patients at risk for further osteoporotic compression fractures and can improve strength and balance (Dusdal et al., 2011)

General Consideration

- Multilevel Fusion
  - ↓ Flexibility depending on the levels
  - ↓ Simple Hygiene Tasks & Activities of Daily Living

Nutrition

- Early Oral Feedings ± Supplements
  - ↓ Duration of post-operative ileus & length of stay
  - Diet should include adequate fresh fruits, vegetables, and fiber
- Glucose Control ≈ ↓ Postsurgical Cx
  - Wound Infection, Pneumonia
- TPN in Same-day or Staged Fusion of 10 or more levels
  - Safe and Rapid Nutritional Normalization

Pain Management

- Preemptive Oxycodone + PCA for elective lumbar discectomy
  - ↓ Pain Scores, N/V,
  - Earlier Recovery of Bowel Function
  - ↑ Patient satisfaction

  (Blumenthal, Min, Marquardt, & Borgeat, 2007)

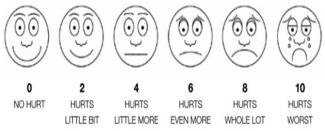
- Continuous Subcutaneous Morphine in PLIF
  - ↓ Pain Scores & Side Effect compared with continuous epidural morphine and diclofenac sodium (Voltaren ® ; Yukawa, Kato, Ito, Terashima, & Horie, 2005)

Pain Management

- Preemptive Gabapentin (Neurontin ®)
  - ≥ 600 mg : significantly lower pain scores than patients receiving 300 mg
  - No differences in pain scores between groups receiving at least 600 mg
  - 600 mg = Optimal Dose
- Celecoxib (Celebrex) ± Pregabalin (Lyrica ®)
  - 1 hour preoperatively and 12 hours after 1-2-level spinal fusion with harvest of iliac crest bone graft was effective at significantly reducing pain at rest and with activity
  - decreased opioid use and less postoperative sedation and nausea than the placebo group, which received PCA morphine alone

Pain Management

- High-dose NSAIDs
  - Should be avoided for the first several months after spinal fusion (Dahners & Mullis, 2004; Li, Zhang, & Cai, 2011)
  - PCA continuous infusions of ketorolac and morphine vs morphine alone for the first 3 days postoperatively : 6 times nonunion



Mobility

- Early Mobility (Take Pain Medicine at least 30 min prior to activity)
- Roll to the side and bring their legs down while simultaneously rising up with the torso from the bed
  - Minimizes twisting at the waist
- Rise from a chair using their legs rather than pushing off with their back
- Walker or other assistive devices

Mobility

- Evaluate patients for inpatient PT referral needs for gait training and a walker evaluation
- Instruct patients to take short walks to avoid excessive fatigue
  - note their preoperative walking endurance
- Prescribing an exercise program starting 4-6 weeks postop may lead to a more rapid reduction in pain and disability than no treatment

Mobility

- Exercise is more effective for functional status at short-term follow-up (Ostelo, Costa, Maher, de Vet, & van Tulder, 2008, 2009)
- None of the studies reported that exercise increased the reoperation rate
- No significant differences between supervised and home exercises and their effects on short-term pain relief or functional status

Other Concerns

- Antispasmodics : Muscle Spasms
- Heat : Spasms and Muscular tension
- Ice : Radicular Pain
- Gentle Massage may be used away from the incision
- Frequently Change Positions ≈ 45 min
- Pressure Sore Prevention
- Osteoporosis Management including Vit D deficiency (< 20ng/mL)
- Brace

Psychologic Support

Fear of Patient

- Fear of death
- Fear of pain and discomfort
- Fear of mutilation or alteration in body image
- Fear of anesthesia
- Fear of disruption of life functioning or patterns
- Fear due to lack of knowledge regarding the proposed surgery
- Fear related to previous surgical experiences
- Fear due to the influence of significant others

Psychological Issues

- Easily Tired
- Inability to Concentrate
- Memory Dysfunction
- Confusion, Hallucination, Behavioral Problem
- Self-esteem Issues
- Body image Issues
- Depression
- Sexuality Issues

Psychologic Support

- Body Image Problem
- Psychosocial Factors ≈〉 Surgical Outcome
  - Optimizing Social Support & Mental Health : imperative (Laxton & Perrin, 2003)
  - Screening Tools : identify psychosocial risk factors of chronic low back pain and disability are available (Chou, Atlas, Stanos, & Rosenquist, 2009)
- Delirium in Old Age

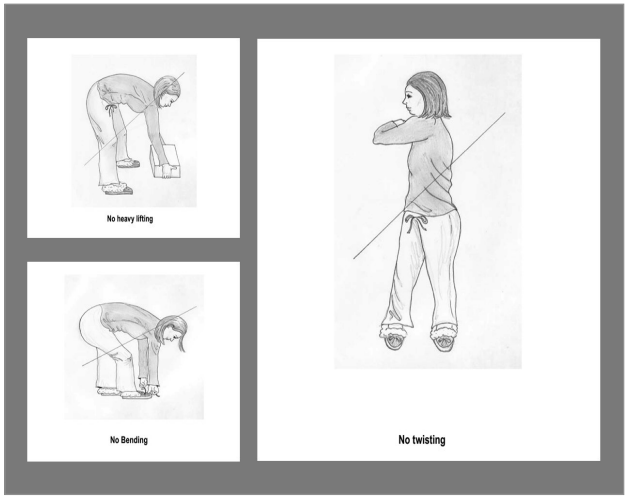
Take Home Message

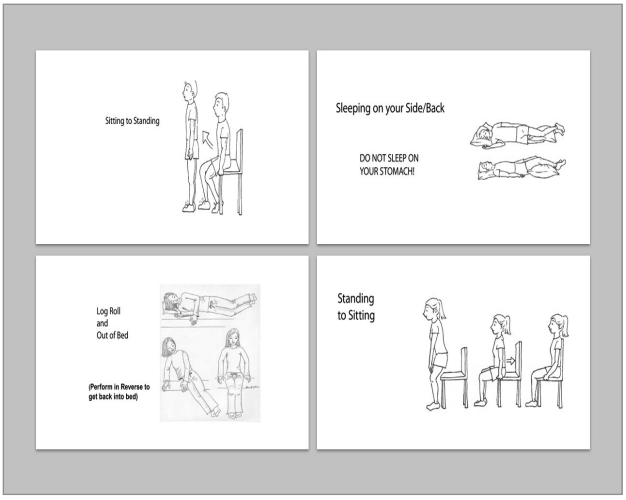
- Spine Surgeons Should have Medical and Psychological knowledge including Risk Factors and Commodities for Proper Postoperative Care.
- Postoperative Care have to be started from Preoperative Preparation.
- Do not ignore Patient's Speaking.
- Touch both of Patient's Body and Mind

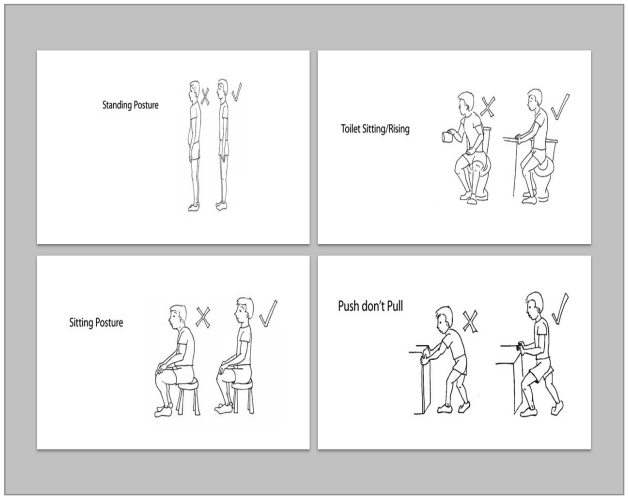
Appendix : Daily Activity Education

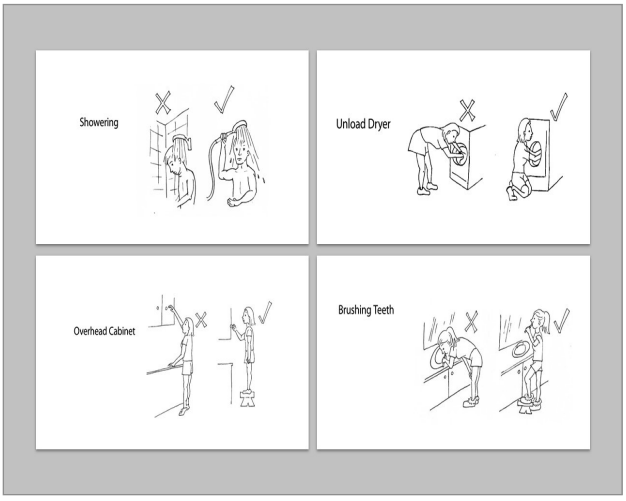
Caution

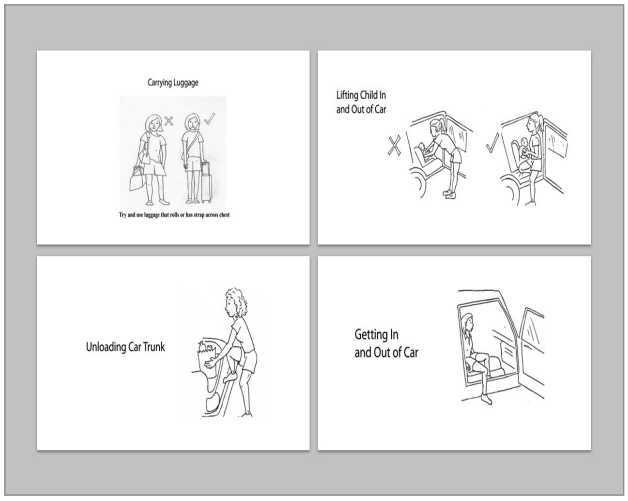
- No Lifting, Bending, Twisting
  - Avoid heavy lifting for the first 4-6 weeks
- Avoid Prolonged Sitting, Standing, Long Car Trips for the first 4-6 wks
- Remind patients to Frequently Change Positions
- Remind patients to Not Drive while using Opioids or other medications that may cause drowsiness
- Explain to patients that Sexual Activity may resume as indicated by the surgeon; generally this is 2-6 weeks after surgery

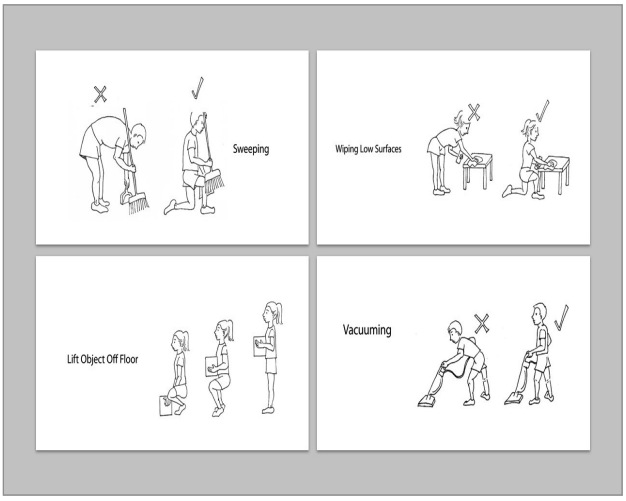


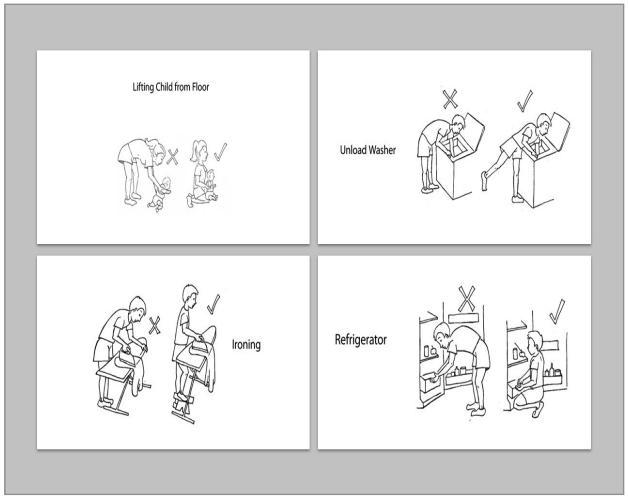



Standing Posture
Toilet Sitting/Rising
Sitting Posture
Push don't Pull


Showering
Unload Dryer
Overhead Cabinet
Brushing Teeth


Carrying Luggage
Try and use luggage that rolls or has strap across chest
Lifting Child In and Out of Car
Unloading Car Trunk
Getting In and Out of Car


Sweeping
Wiping Low Surfaces
Lift Object Off Floor
Vacuuming


Lifting Child from Floor
Unload Washer
Ironing
Refrigerator