POST OP CARE OF THE PEDIATRIC SPINE PATIENT
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WE HAVE NO DISCLOSURES OR CONFLICT OF INTEREST

OBJECTIVES
The participant will be able to:
 Describe scoliosis and the various treatment options
 Identify the differences between, spinal fusion, anterior body tethering and the various types of growing rods
 Learn the nursing care of the post-op spine patient and apply the knowledge to their practice
 List the restrictions and possible complications associated with spinal surgeries for scoliosis
 Identify appropriate pain distractors and relievers

DEFINITION OF SCOLIOSIS
Scoliosis is a condition that causes the spine or backbone to curve abnormally.

TYPES
Infantile- birth to 3 months
Juvenile- 3-9 years of age
Adolescent- 10-18 years of age

CAUSES
Congenital
 Develops in utero that might result in the vertebra being fused or absent
Secondary
 This is a result of a neuromuscular disorder
Idiopathic
 There is no known cause (80% of patients)
Degenerative
 The joints in the spine degenerate (adult scoliosis)
SIGNS AND SYMPTOMS

- Shoulder - one side maybe higher than the other
- Hips - maybe higher than other or seem to be protruding in appearance
- Legs - one may be shorter than the other
- Body - leans towards one side
- Waist - appears unequal

SIGNS AND SYMPTOMS CONTINUED

- Pain
- Depression
- Lower Quality of life
- Restricted Breathing
- Limited Physical Activity
- Decreased social functioning

PROGNOSIS

- MILD (less than 20 degrees) - Requires no treatment other than monitoring
- MODERATE (25-70 degrees) - Uncertain whether untreated moderate scoliosis causes significant health problems later in life
- SEVERE (more than 70 degrees) - Severe twisting of the spine which can cause the ribs to press against the lungs. This can restrict breathing, reduce O2 levels and cause dangerous changes in the heart.

PROGNOSIS CONTINUED

- VERY SEvere (More than 100 degrees) - Patients are susceptible to lung infections, injury to the heart and lungs, and mortality rates increase.
- This is very uncommon in America

CHOOSING A TREATMENT

- BRACES
- CASTING
- VERTEBRAL BODY STAPLING
- SPINAL FUSIONS
- VARIOUS TYPES OF GROWING RODS (TRADITIONAL, VEPTR, MAGEC)
- ANTERIOR VERTEBRAL BODY TETHERING

BRACES

- The only non surgical treatment for idiopathic scoliosis
- May be used in conjunction with exercise
- Can be effective in stopping the progression of the curve
- The schedule and type of brace will depend on the location and degree of the curve
- Compliance with wearing the brace is vital to the success of the bracing treatment
WHEN IS BRACING USED?

• The child must be still growing and has to have an idiopathic curve greater than 25 degrees
• If the child happens to be female, she must have the brace in place prior to her first menstrual cycle.

BRACING OPTIONS

MILWAUKEE BRACE (CTLSO)
• Is a full torso brace that extends from the pelvis to the base of the skull to correct or prevent an curve

BOSTON BRACE (TLSO)
• Usually prescribed for curves in the lumbar or thoracic-lumbar section of the spine

PROVIDENCE BRACE (ATLSO)
• Is used for night time only and can worn up to 8 hours while the patient is asleep

**PATIENTS MAY BE ASKED TO WEAR ONE TYPE OF BRACE DURING THE DAYTIME AND THE ATLSO BRACE AT NIGHT.

BRACES

CASTING

• Serial casting is used for infantile scoliosis when the curve is progressive
• It can straighten the spine through the continuous application of external force

CASTING VERTEBRAL BODY STAPLING

• Fusionless
• Surgical application of staples to the front of the spine
• Both thoracic and lumbar curves can be stapled
• Staples are inserted between two vertebral bodies
• The effect of the staple is to reduce the rate of growth
• Can be equally effective as bracing
• This procedure is seldom used anymore
VERTEBRAL BODY STAPLING INDICATIONS

- Idiopathic scoliosis
- Child older than 8 years
- Boys up to 16
- Girls up to 14
- Curve less than 45 degrees
- Spine flexibility

SPINAL FUSIONS

- The goal of spinal fusion surgery for scoliosis is to fuse the vertebrae so that the spine cannot bend and to correct deformity.

In a spinal fusion for scoliosis, rods, hooks, wires, or screws are attached to the curved part of the backbone and the spine is straightened. Small pieces of bone are then put over the spine. The bone pieces will grow together with the spinal bone, fusing it into the proper position.

POSTERIOR SPINAL FUSION:
- The incision is down the middle of the back. The length depends on the number of vertebrae needing to be fused.
- The majority of spinal fusion incisions are made this way.

ANTERIOR SPINAL FUSION:
- The incision will be on your side near your rib cage.

ANTERIOR/POSTERIOR SPINAL FUSION:
- Incision will be both on your back and on your side.

SPINAL FUSIONS

GROWING RODS

1. Traditional Growing rods
2. Vertical Expandable Prosthetic Titanium Rib (VEPTR)
3. Magnetic Expansion Control (MAGEC)
TRADITIONAL GROWING ROD

- Metal rod attached to the spine that is periodically lengthened by a simple procedure
- This allowed continued growth of the spine
- No casting or bracing post op
- Patients can usually return to full sports after about 6 months

TRADITIONAL GROWING ROD

- Rods are generally lengthened every 6-9 months depending on the age of the child
- Lengthening takes place under general anesthesia
- Many patients go home the same day as the lengthening procedure depending on the circumstances
- Most patients are able to return to school a couple days after procedure

VEPTR

- VERTICAL EXPANDABLE PROSTHETIC TITANIUM RIB
- This titanium device is surgically implanted
- The VEPTR is expandable
- This device treats children who have chest wall deformities
- This device should not be used in children who have stopped growing

VEPTR

- The VEPTR is surgically attached to the patients ribs near the spine
- It is lengthened or replaced at specific times to allow for patients growth
- Adjustments are made through small incisions in the OR
- Patient must stay in the PICU during each recovery after lengthening

VEPTR

GOALS INCLUDE THE FOLLOWING:

- Normal growth pattern
- Decrease chest, spine and rib deformities
- Decrease need for supplemental O2
- Increases expanded lung volume
- Increase lifespan
- Increase physical activity
- Improve psychosocial health and self image

MAGEC RODS

- MAGEC ROD IS COMPOSED OF A MAGNETIC SYSTEM WHERE IS PLACED AND EXTERNALLY A MAGNETIC REMOTE CONTROL IS PLACE ON THE OUTSIDE OF THE SPINE WHERE THE ROD IS PLACED AND ALLOWS FOR LENGTHENING AS THE CHILD GROWS, WITHOUT REQUIRING ANESTHESIA OR SURGERY
- THIS DEVICE IS USED TO PREVENT WORSENING IN CHILDREN WHO HAVE FAILED OTHER TREATMENTS.
- MAGEC ROD PROCEDURE IS COST EFFECTIVE, SIMPLY BECAUSE THE CHILD CAN BE LENGTHENING IN A EXAM ROOM WITHOUT THE NEED FOR ANESTHESIA OR SURGERY
MAGEC

HOW IT WORKS:
- It is composed of two magnetic, telescoping rods that can be gradually lengthened from the outside of the skin, guiding the curved spine, straight.
- Patient can have non invasive multiple lengthening/shortening without the need for anesthesia and open surgery
- Unlike other rods, repeated surgeries are not required

ANTERIOR VERTEBRAL BODY TETHERING
- New fusionless surgery option that involves placing a screw in each vertebral body of the scoliotic curve and then attaching each screw head to a flexible cord with the spine in a straighter position. Scoliosis progression is stopped, the spine is realigned and can continue to grow and flexibility is maintained.

INDICATIONS
- Idiopathic scoliosis (adolescent or juvenile)
- Less than 10 years old with remaining spine growth
- Risser 0-2
- [Risser Classification is used to grade skeletal maturity based on the level of ossification and fusion of the iliac crest.]
- Sanders stage greater than or equal to 4
- Thoracic Curve 35 degrees - 60 degrees
- Flexible below 30 degrees

EDUCATION
- POST OP NURSING CARE
- RESTRICTIONS POST OP
- POSSIBLE COMPLICATIONS
- PAIN CONTROL
POST OP CARE OF THE PEDIATRIC PATIENT

- Maintain hemodynamic stability
- Pain Management
- Skin/Wound Care
- Respiratory Management
- PT
- Bowel Function
- Log Rolling

RESTRICTIONS

- Bedrest
- Mechanical compression device
- Compression socks
- Spinal precautions “log roll”
- Turn patient Q 2 hours
- NPO on IVF

POSSIBLE COMPLICATIONS

- Hemodynamic
- Neurological
- Gastrointestinal
- Infections
- Failure of instrumentation union
- Deformity
- Vascular and visceral injuries

GOALS POST OP

- Patient normally requires a 24 hour stay in PICU
- Patients are encouraged OOB the morning after surgery
- Walking at least three laps around the first day
- Remind patients no bending, lifting, or twisting (BLT as we call it)
- Continued incentive spirometer
- The more they move the faster the recovery will be
- PT and OT consult also to help with activity restrictions and daily ADL's

PAIN CONTROL

- Morphine PCA
- Valium PRN
- Tylenol IV Q 6 hrs
- Toradol
- Distraction

QUESTIONS OR COMMENTS?

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THE END
REFERENCES