1.0 Introduction:

Purpose:

This pathway is developed by an interdisciplinary clinical team at SickKids using research, clinical experience and consensus agreement. It is a general guideline and does not represent a professional care standard governing providers' obligations to patients. Care may be revised to meet individual patient needs.

At this time, due to limited published research evidence, all recommendations are considered Level C: Expert Opinion, except when noted otherwise.

Target Population:

- **Inclusion:**
  - Children aged 3 – 18 years old requiring surgery by an orthopaedic surgeon for a spinal deformity such as scoliosis or kyphosis. These deformities may be idiopathic, congenital or neuromuscular in nature or from a secondary cause such as Marfan's.
  - Surgery will generally consist of surgical correction of the spinal deformity using metal implants which are attached to the spine, and then connected to a single rod or two rods. Implants are used to correct the spine and hold the spine in the corrected position until the spine segments which have been operated on are fused as one bone.
  - All patients will undergo Intraoperative neurophysiological monitoring (IONM) throughout the surgical procedure.
  - In some cases, a spinal orthosis (e.g. Cheneau or Milwaukee Brace) may be required post-operatively for a specified time or for an ongoing basis.

- **Exclusion:**
  - Patients may be removed from this pathway if there are significant postoperative complications (e.g. wound infection, changes to spinal cord/neuromonitoring, difficulty with extubation).

Target Users:

- Surgeons, residents, fellows, nurses, physiotherapists, and orthotists.
2.0 Definitions

Definitions are from the Scoliosis Research Society [www.srs.org], unless otherwise stated

- **Scoliosis** - a lateral curvature of the spine
- **Idiopathic Scoliosis** - defined radiographically as a lateral curvature of the spine greater than or equal to 10° Cobb with rotation or unknown etiology
- **Congenital Scoliosis** - scoliosis due to congenitally anomalous vertebral development
- **Neuromuscular Scoliosis** (NM) - a scoliosis due to either a neurologic or muscular disorder
- **Early Onset Scoliosis** - lateral (side to side) curve of the spine that is diagnosed at ages 0 - 9 years; includes infantile and juvenile idiopathic scoliosis and congenital scoliosis
- **Late Onset Scoliosis** - lateral (side to side) curve of the spine that is diagnosed at age greater or equal to 10 years
- **Kyphosis** - a posterior convex angulation of the spine
- **EOS 2D/3D imaging system** - digital radiography system that performs "uninterrupted full-body, weight bearing digital 2D and 3D imaging in a single scan with a low radiation dose" (National Institute for Health and Clinical Excellence, 2011, p.3)
- **Intraoperative Neurophysiological Monitoring (IONM)** is the use of physiological techniques 1) to assess neural integrity and/or 2) to map or neuro-navigate within at-risk neural structures during surgical procedures.
3.0 Clinical Practice Recommendations

Pre-Operative Management

**Radiographs of the entire thoracic and lumbar spine and the iliac crests should be taken with patients standing erect with elbows fully flexed and relaxed fists on clavicles (fists-on-clavicles position), and holding their breath. [Grade B] In general PA radiographs are more valid and reliable than lateral radiographs.**

**Blood work, CBC, Ferritin, Cross & Type**

**Focused Physical Exam: height & weight, musculoskeletal assessment if necessary to determine baseline**

**Spine X-rays EOS 3ft PA & LATERAL***(& possibly side benders)**

**Clinical photos (Pre-op & 6 months Post-op)**

**Pre-Anaesthesia Consult and ICU consult as indicated**

**Determination of Post-op bed placement including recommendations from pre-anaesthesia clinic (ie children with co-morbid conditions, established on BIPAP, will require PICU/PICU bed post-op)**

**Patient/family advised of pre-op BATH. Wipes to be used upon arrival. Refer to standard work document**

**Questions**

- How can I ensure that my patient receives the best possible care before surgery?
- What are the key components of pre-operative care that should be included in the patient's preparation?
- How can I optimize pre-operative nutrition for patients who are below the 3rd percentile or have a BMI ≤10%?
- What are the indications for blood testing and transfusion in the context of spinal surgery?
- How should I manage patients with co-morbid conditions, such as obesity or spinal cord injury, regarding post-operative bed placement?

**Post-Operative Management**

Refer to: Care Pathway
4.0 Implementation Plan

- Education and awareness building by Orthopaedic Surgery program (surgeons, NPs, Fellows, Nurse educator) at: resident/fellow orientation and nursing staff orientation.
- Surgeons to communicate any updates in practice to Divisional colleagues.

5.0 Evaluation Plan

- Ortho Spinal Surgery Post-op order set utilization
- Length of Stay
- Correlation between Length of Stay and order set utilization

6.0 References


Guideline Group Membership:

- Janet Ahier, Nurse Practitioner Paediatrics, 5A Ward – Orthopaedics
- Jeannette So, Evidence Analyst, Surgery
- Reinhard Zeller, MD
- Stephen Lewis, MD
- Fatma Rajwani, PT, Quality Management, Clinical Practice Guideline Coordinator

Internal Reviewers:

- Cristina Franco, RN, 5A Clinical Support Nurse
- Braden Fielding, RN 5A, Staff Nurse
- Sabrina Boodham, Pharmacist
- Catharine Bradley, Physiotherapy Practitioner, Orthopaedic Clinic

External Reviewers:

- Mike Dodds, Orthopaedic Surgeon, Dublin Ireland (former Sickkids Spine fellow)

Attachments:

Scoliosis CPG Daily Care Goals.pdf
Ortho Spinal Surgery July 18.pdf
pre_op care pathway July 20.pdf