### SPINE DEFORMITY SURGERY PATHWAY

**HIGH RISK PRE-OPERATIVE REFERRAL RECOMMENDATIONS**  
*Physician Owner(s): Dr. Brian Hasley*

<table>
<thead>
<tr>
<th>Service Line</th>
<th>Gastroenterology</th>
<th>Cardiology</th>
<th>Pulmonology/ Sleep Medicine</th>
<th>Neurology</th>
<th>Neurosurgery</th>
<th>Orthotics/Prosthetics/ Seating &amp; Mobility/ PT/OT</th>
<th>Child Life/Social Work</th>
</tr>
</thead>
</table>
| Referral indications: | Malnutrition or Aspiration based on any of the following:  
- BMI <5th percentile or a BMI z-score less than -1 (patient can proceed with surgery once they gain 5-10% of their body or BMI z-score improves to less than -2)  
- Unintentional weight loss in the last 3 months  
- MUAC z-score is less than -3 (Accurate height, weight, and MUAC to be taken during each preoperative visit)  
- Enteral tube feed Based on the following:  
- Observed or reported choking, gagging, or coughing during or after eating orally or via tube  
- Observed or reported shortness of breath or wheezing (not associated with asthma) present during or after eating orally or via a tube  
- Hospitalized with aspiration pneumonia in the last 2 years  
- Abnormal prior deglutition study without resolution  
- GI referral not indicated for obesity | Any of the following:  
- Any patient with known history of a cardiac issue  
- Known personal history of a condition that has cardiac involvement, including connective tissue disorders or neuromuscular disease  
- Family history of aortic disease, cardiomyopathy, or sudden death before the age of 40 years  
- If on anthracycline for chemotherapy (consideration: active treatment vs post therapy; total life dose >75mg/m2) | All established pulmonology or sleep medicine patients 3 to 6 months prior to surgery by primary pulmonologist (obtain recommendations if from OSH).  
- New referral indicated for patients with SMA or Duchenne’s. If new referrals unable to be seen within 2 months Dr. Rhodes can help coordinate earlier appt. | For the following:  
- Controlled seizures who have not been seen by neurology within 1 year.  
- Any patients with questions or concerns regarding seizure medications  
- Uncontrolled seizures:  
- Neurologist should be notified for all patients with uncontrolled seizures for perioperative recommendations, especially if not seen in last 6 months  
- For patients on Depakote first obtain TEG and EPI platelet function studies:  
- Normal results, proceed with spinal fusion surgery  
- Abnormal results, refer to neurology to discuss risk/benefits of stopping prior to surgery  
- Do NOT need evaluation prior to surgery: DMD and other muscular dystrophies, SMA, Rett Syndrome | Any of the following:  
- Shunt not evaluated in >1 year or not had imaging within last 12 months  
- Symptoms of shunt malfunction like, nausea, headache, seizures, or vomiting; obtain head MRI or CT at time of referral.  
- Myelomeningocele with progressive curve/large curve to assess for detethering prior to fusion surgery  
- Fatty tumour and low-lying conus  
- Small syrinx – consider NSGY at minimum  
- Indwelling baclofen pump – consider letting NSGY know beforehand | Any of the following:  
- Call for Halo Consults & Halo Fittings  
- * Notify if Post-Op TLSO is known to be needed  
- Seating and Mobility Clinic:  
- If needing a new custom molded back, parents to contact vendor when surgery is scheduled.  
- If adjustments needed immediately post-op, parents and/or PT to contact vendor to schedule on POD #3/4  
- Parents to call vendor for appointment for wheelchair adjustment 2 - 3 weeks post-operatively.  
- PT/OT:  
- Dependent patients (GMFCS level 4 or 5, sometimes 3) with underlying neuro diagnosis that is progressive (SMA, MD): Arrange custom molded back and cushion prior to surgery, with goal being immediately when surgery is scheduled  
- Minimal to no assistance patients (GMFCS levels 1, 2, or 3) with myelomeningocele, spina bifida or other neuro disorders though not dependent on caregiver: Arrange for | Child Life:  
- Offer family Operation  
- Learn through Child life- give handout if interested  
- Patients are seen by Social Work and at 2-week preoperative visit- once figure out role of social work |

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Childrens.org/clinical-pathways  
*Updated 12/2022*
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<tr>
<th>Labs/Tests</th>
<th>Prior to clinic appointment ONLY if labs are being obtained, results should be sent to Children's GI (402-955-5720):</th>
</tr>
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<tbody>
<tr>
<td>CBC, CMP, PTT/PT, UA</td>
<td>Coordinate ordering with cardiology: [ ] Echocardiogram – can use one completed in last 2 years, unless ECG changes or at provider’s discretion. [ ] ECG – can use one completed in the last year unless changes or at provider’s discretion. [ ] CBC [ ] PTT/PT</td>
</tr>
<tr>
<td>*Standard preoperative labs:</td>
<td>For patients on Depakote: [ ] Obtain TEG and EPI platelet function studies</td>
</tr>
<tr>
<td>*</td>
<td>Orthopedics: Patient is to have Type &amp; Screen pre-operatively – If don’t have antibodies then type and cross on day of surgery, if have antibodies crossed prior to day of surgery to ensure blood availability - Arrange for blood products to be ready before surgery</td>
</tr>
</tbody>
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<tr>
<th>Imaging</th>
<th>DMD (Duchenne Muscular Dystrophy)</th>
</tr>
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<tr>
<td>* EF &gt; 50% (echo within last 6 months)</td>
<td>Indication for rapid brain MRI/CT: [ ] CP – not indicated [ ] Myelomeningocele – indicated pre-op. [ ] Shunted for baseline ventricle size [ ] Syndromic – case by case [ ] VNS – do not image [ ] For the Order – designate “Pre-Op” and the date of surgery</td>
</tr>
<tr>
<td>* EF &lt; 50% (echo within last 3 months)</td>
<td>[ ] PFT’s If &gt; 5 years + can complete in last 6-12 months. When done recommend spirometry with MIP/MEP/PCF. [ ] Sleep study if indicated based on pulmonary or sleep provider evaluation or positive sleep questionnaire prior to evaluation. Especially consider with FVC &lt;50 (even if asymptomatic)</td>
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<tr>
<th>Admission unit &amp; pre-op needs</th>
<th>Cardiac Floor indications:</th>
<th>[ ] Expedited need – include reason on order</th>
<th>[ ] Consider Anesthesia need for MRI’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Consider Miralax or other laxative pre-operatively before day of surgery (parent education)</td>
<td>[ ] Residual disease – cardiac stepdown</td>
<td>[ ] Address CPAP compliance prior to surgery</td>
<td>[ ] Arrange admission with 6MS, PICU.</td>
</tr>
<tr>
<td></td>
<td>[ ] If Fontan, heart transplant, significant pulmonary HTN, severe ventricular dysfunction – use cardiac floor with cardiology as primary and involve Pulmonary service as needed</td>
<td>[ ] All patients need an airway clearance plan from pulmonology prior to and after surgery</td>
<td>[ ] Consider long term rehabilitation (Ambassador/Madonna) if anticipated decrease in function from baseline due to anticipated lengthy hospital stay/difficulty with pain tolerance in relation to mobility</td>
</tr>
<tr>
<td></td>
<td>[ ] Mechanical cardiac valve – admit for heparin transition per cardiology discretion</td>
<td>[ ] Pre - Operative admission if deemed necessary by pulmonology</td>
<td>[ ] To qualify for Inpatient rehab, requires patient to have significant decline in baseline function and PT/OT recommendation for IPR</td>
</tr>
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*Consideration: ACE inhibitor usage – hold for at least 24 hours preoperatively*

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<tr>
<th>Other consideration to surgery</th>
<th>Consider Cardiac Anesthesia if:</th>
<th>Combined Neurosurgery Cases</th>
<th>Parental Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Significant ventricular dysfunction &lt;30% EF based on most recent echocardiogram</td>
<td>[ ] Spinal Stenosis · Intra Dural</td>
<td>[ ] Bring wheelchair + orthotics to hospital</td>
<td></td>
</tr>
<tr>
<td>[ ] Severe aortic stenosis or pre-reviewed severe valvular pathology</td>
<td>[ ] Possibly Vertebrectomy with high risk of dural tear</td>
<td>[ ] Make post-op appointment with wheelchair vendor prior to the surgery</td>
<td></td>
</tr>
<tr>
<td>[ ] Any single ventricle physiology (includes Fontan)</td>
<td>[ ] Myelo with tether/need cord divided</td>
<td>[ ] No bending/twisting after surgery – so plan for daily routine &amp; challenges</td>
<td></td>
</tr>
<tr>
<td>[ ] Pulmonary hypertension &gt;2/3 of systemic pressure</td>
<td>[ ] With Myelomeningocele: consider resection of cord if placing MAGEC rods.</td>
<td>[ ] Caregiver present for transfer training</td>
<td></td>
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### Combined Neurosurgery Cases

- [ ] Spinal Stenosis · Intra Dural
- [ ] Possibly Vertebrectomy with high risk of dural tear
- [ ] Myelo with tether/need cord divided
- [ ] With Myelomeningocele: consider resection of cord if placing MAGEC rods.
- [ ] Consider notifying Plastic Surgery for

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<th>Pre-plan for Hospitalist</th>
<th>[ ] Heart transplant &lt;1 year out</th>
<th>[ ] All patients with LVEF &lt; 35% - consult cardiology for risk vs benefit discussion and preoperative plan)</th>
<th>closure and close monitoring. [ ] Consider notifying neurosurgery if any surgery is around the Dura (such as Myelomeningocele)</th>
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<tr>
<td></td>
<td>Patient will be admitted to orthopedics, and hospitalists will be consulted for co-management on all patients.</td>
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