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| Appendix 1: Modified Clavien-Dindo System for Children with Cerebral Palsy | | | | |
| Grade | **Definition** | **Specific Complications** | **Treatment Required** | **Outcome** |
| I | A complication that requires no new treatments apart from those planned and charted. There is no deviation from routine follow up during the post-operative period. | Constipation; post-operative pain, muscle spasm; fever, nausea; wound problems not requiring a change in post-operative care, skin redness from a cast or splint without skin breakdown; basal atelectasis; asymptomatic Grade I or II HO, Grade 1 femoral head AVN. | Minor adjustment of *pre-existing* treatments. Examples: increased observation; dose adjustments of pre-charted oral medications or infusions including aperients, analgesics, antispasmodics, antipyretics, antiemetics, antibiotics (not *new* medications); minor adjustment of a splint or brace by an orthotist routinely visiting the ward or clinic; increased frequency of chest physical therapy. | Full recovery, following more of the *same* medical or nursing treatment |
| II | A deviation from the normal post-operative course, including new medications, additional nursing or physical therapy regimens. Unplanned clinic visits for additional monitoring are also included. | Enemas for constipation; significant pain requiring introduction of new analgesics; new medications to treat muscular spasms, spasticity or dystonia; pressure sores from casts or splints, superficial wound infection requiring additional clinic visits, antibiotics and/or dressings; chest infection requiring antibiotics; transient neuropraxia from positioning or surgical retraction that resolves under close observation; transient nerve palsy requiring bracing and observation; delayed union requiring increased observation; anaemia requiring iron or blood transfusion. | *New* non-operative inpatient or outpatient treatment. Examples: new aperients; new pain medications (e.g. Ketamine or Morphine infusions, Clonidine, Gabapentin, Baclofen), adjustment of epidural catheter position; cast removal for paresthesia or inability to move toes on the ward or clinic (not routine cast split in operating theatre), complete cast change, major adjustment or replacement of a brace or splint by an orthotist; blood transfusion for anaemia, new antibiotic prescription for UTI or chest infection. | Full recovery, following *new* medical treatment, non-medical treatment or observation. |
| III | A complication that is treatable but requires surgical, endoscopic, or radiographic interventions or an unplanned hospital admission. | Manual evacuation for faecal impaction under GA; unplanned epidural for pain or Botulinum toxin-A injections for increased spasticity; change of cast under GA; Deep infection requiring drainage; surgical haematoma requiring evacuation; compartment syndrome or neurovascular injury requiring surgical treatment; endoscopy for gastric bleeding; significant HO requiring excision | Treatment requiring *unplanned* GA and/or surgical intervention. Examples: manual faecal disimpaction under GA; re-positioning of epidural catheters; Botulinum toxin-A injections; bronchoscopy for mucus plug evacuation; urinary catheter insertion; fasciotomies; abscess or haematoma evacuation; revision surgical fixation | Full recovery, following treatment or surgical intervention under GA. No long-term sequelae. |
| IV | A complication that is life threatening, requiring an ICU admission, or is not treatable with potential for permanent disability; a complication that requires organ resection. | Organ dysfunction; Bowel obstruction or perforation requiring ICU; severe respiratory disease (e.g. aspiration pneumonia) requiring ICU, intubation, bronchoscopy or tracheostomy; pulmonary embolism requiring ICU; permanent nerve injury; ischaemic contracture; major vascular injury; CNS complications (e.g. encephalopathy after hypoxic episode, prolonged seizures or a blocked shunt); severe femoral head AVN | Life threatening. Examples: *unplanned* ICU admission, tracheostomy, prolonged hospitalisation for haemodynamic or respiratory support  Permanent organ damage or disability. Examples: bowel perforation requiring resection and stomal therapy, long-term analgesia for CRPS type II; contracture release; long-term antibiotic for chronic infection which cannot be eradicated; arthroplasty for femoral head AVN23 | Life threatening with or without full recovery  OR  Permanent disability, chronic pain, or deterioration in GMFCS level |
| V | Death within three months of surgery, that can in any way be linked to the index surgery | Organ failure; sepsis; recurrent respiratory disease; pulmonary embolism | **Exclusions**: Death following an event that cannot be plausibly linked to surgery e.g. motor vehicle accident  Independent verification by a colleague is advised | |

In this Appendix, we provide a significantly greater amount of information than that in Table 1. The Appendix gives a definition for each Grade, examples of the complications, examples of the treatment required and the anticipated outcomes. This information may be helpful to researchers who wish to use the modified Clavien-Dindo System for audit, research or clinical outcome studies. HO, heterotopic ossification; AVN, avascular necrosis; UTI, urinary tract infection; GA, general anaesthesia; ICU, intensive care unit; CNS, central nervous system; CRPS, chronic regional pain syndrome; GMFCS, Gross Motor Function Classification System