Supplementary Table 1: All surgical procedures by type

| Type of Surgery                                                                 | Total | Neostigmine | Sugammadex |
|--------------------------------------------------------------------------------|-------|-------------|------------|
| Anesthesia for Thoracotomy with Decortication                                  | 1     | 1           | 0          |
| Ankle ORIF, Debridement Soft Tissue Extremity                                  | 1     | 1           | 0          |
| Aortic Aneurysm Stent Graft                                                    | 1     | 0           | 1          |
| Appendectomy                                                                    | 2     | 2           | 0          |
| Arterio-Venous Graft                                                           | 1     | 1           | 0          |
| Bilateral Inguinal Hemiorraphy with mesh                                        | 1     | 0           | 1          |
| Bilateral Inguinal Hernia Repair                                               | 1     | 0           | 1          |
| Bilateral Tubal Ligation                                                       | 2     | 2           | 0          |
| C Section                                                                       | 1     | 0           | 1          |
| Carotid Endarterectomy – Right                                                 | 1     | 0           | 1          |
| Cerebral Aneurysm Stent                                                        | 1     | 0           | 1          |
| Cholecystectomy                                                                | 3     | 2           | 1          |
| Crani for Chiari Malformation                                                  | 1     | 0           | 1          |
| Craniotomy for Meningioma                                                      | 1     | 0           | 1          |
| Craniotomy for Tumor Excision                                                  | 1     | 0           | 1          |
| Cysto                                                                           | 3     | 1           | 2          |
| Cystoscopy                                                                      | 1     | 0           | 1          |
| Cystoscopy and Retrograde Pylogram and Basket Retrieval of Stone Left Ureter and Placement of Stent | 1     | 0           | 1          |
| Cystoscopy and Retrograde Pylogram and Basket Retrieval of Stone Left Ureter and Placement of Stent | 1     | 0           | 1          |
| Cystoscopy w/ Right Retrograde Pylogram Diagnostic Ureteroscopy w/ Renal Pelvic Biopsies and Washing Skin and Stent Exchange | 1     | 0           | 1          |
| D&C Diagnostic, Hysteroscopy W/Video                                            | 1     | 1           | 0          |
| Debridement and Wound VAC change, Left Leg                                     | 1     | 1           | 0          |
| Medical Procedure                                                                 | Y  | N  | C  |
|----------------------------------------------------------------------------------|----|----|----|
| Debridement Scalp Wound with Rotational Flap                                     | 1  | 1  | 0  |
| Diagnostic Laparoscopy                                                           | 2  | 0  | 2  |
| Diagnostic, Hysteroscopy w/ Video                                                | 1  | 0  | 1  |
| Discectomy Anterior Cervical With Fusion - 2 Level                               | 1  | 0  | 1  |
| Endoscopic Control of Epistaxis                                                  | 1  | 0  | 1  |
| Exam Under Anesthesia with Open Hemorroidectomy                                  | 1  | 0  | 1  |
| Excision of Back Melenaoma                                                       | 1  | 0  | 1  |
| Excision of Benign Lesion of Trunk                                               | 1  | 1  | 0  |
| Excision of Pilonidal Cyst                                                       | 1  | 0  | 1  |
| Exploration of Femoral Artery                                                    | 1  | 0  | 1  |
| Exploratory Laparotomy                                                           | 1  | 1  | 0  |
| Exploratory Laparotomy Adult                                                     | 1  | 1  | 0  |
| Exploratory Laparotomy with Lysis of Adhesions                                  | 1  | 0  | 1  |
| Exploratory Laparotomy, gastrostomy tube, sigmoidectomy with colostomy           | 1  | 0  | 1  |
| Exploratory Laparotomy/Sigmoid Colon Resection with Colostomy Creation and Appendix | 1  | 0  | 1  |
| Femoral Artery Exploration/Repair, Femoral Popliteal Bypass Graft                 | 1  | 1  | 0  |
| Femoral Head Sub Zimmer Versys                                                    | 1  | 1  | 0  |
| Femoral Popliteal Bypass Graft                                                    | 1  | 1  | 0  |
| Functional Endoscopic Sinus Surgery                                              | 1  | 0  | 1  |
| Hemiarthroplasty of Glenohumeral Joint                                            | 1  | 0  | 1  |
| Hernia Repair                                                                    | 1  | 0  | 1  |
| Hernia Repair Inguinal Adult Unilateral                                           | 2  | 1  | 1  |
| Hernia Repair Umbilical Adult                                                    | 1  | 1  | 0  |
| Hip Total Joint Smith & Nephew Echelon                                            | 1  | 1  | 0  |
| Hip Total Joint Zimmer Versys                                                     | 4  | 3  | 1  |
| Hysterectomy Laparoscopic Total                                                   | 1  | 1  | 0  |
| Hysterectomy laparoscopic Total with BSO                                          | 1  | 1  | 0  |
| Hysterectomy Vaginal A & P Repair                                                | 1  | 1  | 0  |
| Hysterectomy Vaginal with A & P Repair with BSO                                  | 1  | 1  | 0  |
| Description                                                                 | Count 1 | Count 2 | Count 3 |
|----------------------------------------------------------------------------|----------|----------|----------|
| I & D Wound Vac                                                            | 1        | 0        | 1        |
| I&D Abdominal Incision Wound                                               | 1        | 0        | 1        |
| Ileostomy Closure                                                          | 1        | 0        | 1        |
| Incision and Drainage and Debridement of Abscess and Gangrene             | 1        | 0        | 1        |
| Knee Total Joint Replacement Legion Right Knee                             | 1        | 1        | 0        |
| Knee Total Joint Revision                                                  | 1        | 0        | 1        |
| Knee total joint zim NEXGEN                                                | 10       | 6        | 4        |
| Knee Total Joint ZIM NEXGEN (Right)                                        | 1        | 0        | 1        |
| Knee Total Joint Zimmer Nexgen Bilateral                                   | 1        | 1        | 0        |
| Knee Total Joint Zimmer, Nexgen Bilateral                                  | 1        | 1        | 0        |
| L 3 4 5 Laminectomy                                                        | 1        | 1        | 0        |
| L Thoracotomy, Wedge Excision                                              | 1        | 0        | 1        |
| I&D Eternal Wound                                                          | 1        | 0        | 1        |
| I&D Right Open Tibia Fracture, ORIF Right Fibula, Ex-Fix Right Tibia, ORIF Left Femur | 1        | 0        | 1        |
| L3-L4; L5-S1 Decompression Laminectomy, L4-L5 Fusion                       | 1        | 0        | 1        |
| L4-5 Decompression, Laminectomy                                            | 1        | 0        | 1        |
| Laminectomy Lumbar - 1 Level                                               | 2        | 1        | 1        |
| Laminectomy Lumbar - 2 Level                                               | 2        | 1        | 1        |
| Laminectomy Lumbar - 2 Level, Microdisectomy                               | 2        | 0        | 2        |
| Lap Appendectomy                                                           | 1        | 0        | 1        |
| Lap Appy                                                                   | 8        | 6        | 2        |
| Lap Assisted Robotic Ventral Hernia Repair                                 | 1        | 0        | 1        |
| Lap Chole                                                                  | 4        | 2        | 2        |
| Lap Chole IOC                                                              | 1        | 0        | 1        |
| Lap cholecystectomy                                                        | 1        | 1        | 0        |
| Lap diverting loop colostomy                                               | 1        | 1        | 0        |
| Laparoscopic Appendectomy                                                  | 2        | 2        | 0        |
| Laparoscopic Bilateral Inguinal Herniorrhaphy                              | 1        | 1        | 0        |
| Laparoscopic Procedure                                      | Count 1 | Count 2 | Count 3 |
|-------------------------------------------------------------|----------|----------|----------|
| Laparoscopic Cholecystectomy                                | 9        | 9        | 0        |
| Laparoscopic Cholecystectomy W IOC                          | 1        | 1        | 0        |
| Laparoscopic Cholecystectomy w/ IOC                         | 1        | 1        | 0        |
| Laparoscopic Cholecystectomy w/ IOC, Possible Open Cholecystectomy with IOC | 1        | 1        | 0        |
| Laparoscopic Cholecystectomy/IOC                           | 1        | 1        | 0        |
| Laparoscopic Hernia Repair Inguinal                         | 2        | 2        | 0        |
| Laparoscopic Loop Colostomy                                | 1        | 1        | 0        |
| Laparoscopic Lysis of Adhesions, Possible Ex Lap            | 1        | 1        | 0        |
| Laparoscopy Diagnostic                                     | 2        | 2        | 0        |
| Laparoscopy Diagnostic, D&C Suction Curettage of the Uterus| 1        | 1        | 0        |
| Laparoscopy procedure on appendix                           | 1        | 1        | 0        |
| Laparoscopy Tubal, Hernia Repair Umbilical Adult           | 1        | 1        | 0        |
| Laparoscopic Appendectomy                                  | 1        | 0        | 1        |
| Laparoscopic Bilateral Hernia Repair Inguinal              | 1        | 0        | 1        |
| Laparoscopic Cholecystectomy                               | 8        | 2        | 6        |
| Laparoscopic Cholecystectomy w IOC                          | 1        | 0        | 1        |
| Laparoscopic Cholecystectomy, Cholecystectomy Open No IOC  | 1        | 0        | 1        |
| Laparoscopic Colostomy Closure                             | 1        | 0        | 1        |
| Laparoscopic Colostomy Creation                            | 1        | 0        | 1        |
| Laparoscopic Hernia Repair Inguinal                         | 1        | 0        | 1        |
| Laparoscopic Tubal Ligation                                | 1        | 0        | 1        |
| Laparoscopy Tubal                                          | 1        | 1        | 0        |
| Laparoscopic Tubal Ligation Bilateral                      | 1        | 0        | 1        |
| Lapsoscopic Creation of Loop Colostomy                     | 1        | 0        | 1        |
| Laparoscopic Appendectomy                                  | 1        | 0        | 1        |
| Laryngoscopy CO2 Laser                                     | 1        | 0        | 1        |
| LAVH                                                        | 1        | 1        | 0        |
| Left Craniotomy                                            | 1        | 1        | 0        |
| Left Hip Closed Reduction                                  | 1        | 1        | 0        |
| Left hip total joint revision                              | 1        | 1        | 0        |
| Procedure                                                   | Count 1 | Count 2 | Count 3 |
|--------------------------------------------------------------|---------|---------|---------|
| Left laparoscopic Ovarian Cyst                              | 1       | 1       | 0       |
| Left Total Knee Replacement                                  | 2       | 0       | 2       |
| Left Total Shoulder Replacement                              | 1       | 0       | 1       |
| Lumbar 4 Laminectomy                                         | 1       | 0       | 1       |
| Lumbar Decompression                                         | 1       | 1       | 0       |
| Lumbar Five-Sacral One Microdisectomy Revision               | 1       | 0       | 1       |
| Lumbar Laminectomy                                           | 5       | 2       | 3       |
| Lumbar three-five Laminectomy Decompression                  | 2       | 2       | 0       |
| Mamoplasty Reduction Bilateral                               | 1       | 0       | 1       |
| Masectomy Simple, Sentinel Node Biopsy                       | 1       | 1       | 0       |
| Mass Resection                                               | 1       | 1       | 0       |
| Microdiscectomy Minimally Invasive                           | 1       | 0       | 1       |
| Microdisectomy                                               | 1       | 0       | 1       |
| Microdiscectomy Minimally Invasive                           | 4       | 1       | 3       |
| Minimally Invasive Left L4-L5 Microdisectomy                 | 1       | 0       | 1       |
| Minimally Invasive Left Lumbar Five-Sacral One Microdisectomy| 1       | 0       | 1       |
| Minimally Invasive Right Lumbar5-Sacral1 Decompression Laminectomy | 1   | 0       | 1       |
| Nasal Rhinoplasty w/wo Implant                               | 1       | 1       | 0       |
| Open Gastrostomy Tube Placement                              | 1       | 1       | 0       |
| Open Incisional Hernia Repair                                | 1       | 1       | 0       |
| Open Inguinal Hernia Repair                                  | 1       | 1       | 0       |
| Orif Clavicle Left                                           | 1       | 1       | 0       |
| Orif left ankle                                              | 1       | 1       | 0       |
| ORIF Left Hip                                                | 1       | 0       | 1       |
| ORIF Left Olecranon                                          | 1       | 0       | 1       |
| ORIF Left Supracondylar Femur Fracture                       | 1       | 0       | 1       |
| ORIF Right Femur                                             | 1       | 1       | 0       |
| Orif Right Hip                                               | 1       | 1       | 0       |
| ORIF Right Humerus                                           | 1       | 0       | 1       |
| Orif Right Proximal Humerus fx                               | 1       | 1       | 0       |
| Procedure                                              | Count 1 | Count 2 | Count 3 |
|--------------------------------------------------------|---------|---------|---------|
| Palindrome Cath Placement                              | 1       | 1       | 0       |
| Partial Excision of Lamina of Lumbar Vertebra          | 1       | 0       | 1       |
| Partial Gastrectomy                                    | 1       | 1       | 0       |
| R Carotid Endarterectomy                               | 1       | 0       | 1       |
| R Shoulder Scope                                       | 1       | 0       | 1       |
| R Shoulder Surgery                                     | 1       | 0       | 1       |
| Removal Femoral Loop Graft                             | 1       | 1       | 0       |
| Removal of Spinal Cord Stimulator Electrodes           | 1       | 0       | 1       |
| Reverse Total Shoulder Arthroplasty                    | 1       | 1       | 0       |
| Revision Bilateral Breast Reconstruction               | 1       | 1       | 0       |
| Revision L4-L5 Decompression                           | 1       | 0       | 1       |
| Right Carotid Edarterectomy                            | 1       | 0       | 1       |
| Right Hydrocelectomy                                   | 1       | 0       | 1       |
| Right Shoulder Arthroscopy                             | 1       | 0       | 1       |
| Right TKR                                              | 2       | 0       | 2       |
| Right Total Knee                                       | 1       | 0       | 1       |
| Right Total Knee Replacement                           | 2       | 1       | 1       |
| Right Total Shoulder                                   | 1       | 0       | 1       |
| Robotic Cholecystectomy                                | 1       | 0       | 1       |
| Robotic Cholecystectomy w/ Firefly                     | 1       | 0       | 1       |
| Robotic Cholecystectomy with Firefly                   | 4       | 4       | 0       |
| Robotic Incisional Hernia Repair                       | 2       | 2       | 0       |
| Robotic Inguinal Hernia Repair                         | 1       | 1       | 0       |
| Robotic Left Sigmoidectomy w/ Omental Flap             | 1       | 0       | 1       |
| Robotic Nephrectomy                                    | 1       | 1       | 0       |
| Robotic Partial Nephrectomy                            | 1       | 1       | 0       |
| Robotic Radical Prostatectomy                          | 1       | 1       | 0       |
| Robotic Total Colectomy                                | 1       | 0       | 1       |
| Robotic Total Hysterectomy                             | 3       | 3       | 0       |
| Robotic Total Hysterectomy                             | 1       | 0       | 1       |
| Procedure                                                                 | Code | Code | Code | Code | Code |
|---------------------------------------------------------------------------|------|------|------|------|------|
| Robotic Umbilical Hernia Repair                                           | 1    | 0    | 1    |      |      |
| Rt Needle Localization Breast Biopsy; Frozen Section                      | 1    | 0    | 1    |      |      |
| Sacral/Buttock Decubitus Debridement/Closed                               | 1    | 0    | 1    |      |      |
| Second Surgeon, Laparoscopic Cholecystectomy w/ IOC                       | 1    | 1    | 0    |      |      |
| Shoulder Arthroscopy, Shoulder Rotator Cuff Expl/Repair, Carpal Tunnel    | 1    | 1    | 0    |      |      |
| Release/Decompression                                                    |      |      |      |      |      |
| Sacral/Buttock Decubitus Debridement/Close                                |      |      |      |      |      |
| Shoulder Arthroscopy Left                                                | 1    | 0    | 1    |      |      |
| Shoulder Arthroscopy with RCP                                            | 2    | 2    | 0    |      |      |
| Shoulder Reverse Total Zimmer                                            | 3    | 3    | 0    |      |      |
| Shoulder Scope sad tendodesis rcr                                        | 1    | 1    | 0    |      |      |
| Shunt VP/LP Removal                                                       | 1    | 0    | 1    |      |      |
| Sigmoidectomy with End Colostomy                                          | 1    | 0    | 1    |      |      |
| Skin Graft                                                                | 1    | 0    | 1    |      |      |
| Surgical Laparoscopy with Appendectomy                                   | 1    | 1    | 0    |      |      |
| Surgical Laparoscopy with Appendectomy                                   | 1    | 1    | 0    |      |      |
| Surgical Laparoscopy with Cholecystectomy                                 | 1    | 1    | 0    |      |      |
| Surgical Laparoscopy w/ Appendectomy                                     | 1    | 1    | 0    |      |      |
| Surgical Laparoscopy with Appendectomy                                   |      |      | 2    | 0    | 2    |
| Surgical Laparoscopy with Cholecystectomy                                 | 1    | 0    | 1    |      |      |
| TAH/BSO                                                                   |      |      |      |      |      |
| Tenck cath placement                                                      | 1    | 1    | 0    |      |      |
| Thoracic Laminectomy/Removal of Stimulator/Leads, Flap Reconstruction Trunk | 1    | 0    | 1    |      |      |
| Thoracotomy; Thoracotomy Right                                            | 1    | 0    | 1    |      |      |
| Thoracotomy Left, Wedge Excision Left Lower Lobe                          | 1    | 0    | 1    |      |      |
| Thoracotomy                                                               | 1    | 1    | 0    |      |      |
| Thyroidectomy                                                             | 2    | 2    | 0    |      |      |
| Tonsillectomy                                                             | 1    | 0    | 1    |      |      |
| Total Abdominal Hysterectomy w/ Bilat                                      | 1    | 1    | 0    |      |      |
| Total Hip Replacement                                                     | 1    | 0    | 1    |      |      |
| Total Shoulder                                                            | 1    | 1    | 0    |      |      |
| Procedure                                             | Count 1 | Count 2 | Count 3 |
|-------------------------------------------------------|---------|---------|---------|
| Total Thyroidectomy                                    | 1       | 0       | 1       |
| Total Vaginal Hystectomy                               | 1       | 1       | 0       |
| Transurethral Resection Bladder Tumors                 | 1       | 1       | 0       |
| Transurethral Resection Prostate                       | 1       | 1       | 0       |
| TURBT                                                  | 3       | 0       | 3       |
| Umbilical Hernia Repair                                | 1       | 1       | 0       |