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Coronavirus disease 2019 pandemic: staged management of surgical services for gynecology and obstetrics

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The global, national, and local healthcare response to the novel coronavirus disease 2019 (COVID-19) provides an opportunity to share best practices for managing surgical services during a health-related crisis. A response to any health emergency must be tailored to the specific threat, be it infectious (such as COVID-19 or influenza), a natural weather event, bioterrorism, or an active shooter. The role of surgical services in a health-related emergency is important and has potentially modifiable components related to healthcare delivery. Variables to be considered when determining how surgical services might be adjusted must factor in the anticipated impact and duration of the event, the reliance on perioperative and institutional resources, and the impact of adjusting routine operations on both affected and unaffected patient populations. Decisions regarding the cancellation, postponement, and prioritization of surgical services are frequently dictated by the specific threat, but the timing of making changes can present the most difficult challenge. Importantly, the principles that guide decisions are similar regardless of the emergency. We present principles of management of surgical services during a health emergency and provide specific guidance to help with decision making to help institutions or clinical practices considering changes to surgical services because of the COVID-19 pandemic.

Planning considerations

The World Health Organization (WHO) provides an all-hazards list of key actions to be considered by hospitals in response to any disaster event.1 This tool provides guidance on establishing a command center, consistent and effective communication, prioritization of safety and security, the logistics of triage and supply management in light of surge capacity while maintaining essential services, and postdisaster recovery planning. In 2014, the WHO hospital emergency response checklist was used as an evaluation tool kit in a cross-sectional study to assess the preparedness of 15 hospitals in Italy. It showed that most had adequate command and control response operations but had insufficient communication systems for potential disaster.2 Although there is some correlation between the level of hospital care and preparedness, there was a poor level of readiness to implement strategic and logistical plans. In fact, some hospitals successfully anticipated infrastructure needs, such as water, sanitation, and electricity, but failed to demonstrate a coordinated and strategic plan for surge capacity.

Inpatient surge capacity is the ability to generate staffed beds in response to a surge in demand for inpatient healthcare services. In times of emergent increase in healthcare demand, the goal is to increase capacity between 10% and 20%, although the target may vary based on specific circumstances.2,3 Financial demands have traditionally prompted hospitals to maintain a high inpatient census to meet tighter budgets. Naturally, this limits their ability to respond to a sudden large surge in demand over the typical occupancy of 90%–95%.4 This is particularly true for times of high occupancy during natural surge cycles as can be seen with the influenza or respiratory syncytial virus. These large (sometimes academic), nonprofit, and safety-net hospitals with level I trauma centers depend on the financial security of maintaining a high patient census and large surgical volumes. These sites will also be relied on for expertise in caring for nonsurgical patients with critical illness resulting from an emerging pathogen, in addition to the ongoing demands of high-level surgical services.

Adjustment of surgical services

Despite these conflicts, 1 strategy to free up capacity within a hospital system is through cancellation of nonessential surgical cases that most commonly occurs in an unstructured and decentralized manner.5 As seen previously, nonsystematic modifications of procedural schedules and adjusting admission and discharges were shown to reduce occupancy and demand of nonurgent hospital resources after the New York attacks in 2001 and after the severe acute respiratory syndrome Toronto outbreak in 2003 by 9% and 12%, respectively.6 In 2016, researchers reported a structured system of categorizing surgical procedures based on the potential impact on inpatient surge capacity if a procedure was to be canceled or delayed.3 Using chart review, all planned procedures over a 4-week period (n=2821) were categorized based on their impact on inpatient capacity and the safety of their delay into 1 of 4 groups: (A) procedures with no impact on inpatient capacity, (B) procedures that could be delayed indefinitely, (C) procedures that could be delayed by 1 week,
and (D) procedures that could not be delayed. This strategy of delaying scheduled cases in categories B and C most effectively (especially on Mondays) led to a reduction of inpatient occupancy by 8% (65 beds). Although category A cases, such as outpatient procedures and same-day procedures, do not impact inpatient occupancy, they do require other equipment and staffing resources, thus limiting potential surge capacity during a healthcare crisis requiring intensive patient care.

An important element of managing surgical services in the setting of a healthcare emergency is planned coordination throughout the hospital system, including various surgical departments, anesthesia, and nursing services. In the current COVID-19 crisis, the American College of Surgeons issued the following recommendation: “Each health system and surgeon should thoughtfully review all scheduled elective procedures with a plan to minimize, postpone or cancel elective [cases] until we can be confident that our health care infrastructure can support [an increase] in critical patient care needs.” A joint statement from leading societies in gynecologic surgery and the US Surgeon General encouraged hospitals to consider modifying surgical scheduling in areas where COVID-19 is prevalent. Effective rescheduling of surgeries should involve engagement of the entire hospital system with specific attention to the unique demands of the crisis at hand. Also of importance, many surgeries are performed in settings outside of hospital systems through either free-standing outpatient surgical centers or clinical offices. These entities are usually excluded from planning considerations since they are often removed, both operationally and financially, from the larger hospital systems. This creates a potential conflict of interest when making decisions about surgery reductions. Communication during a healthcare emergency is critical, and differences in the management of elective cases can interfere with consistent messaging across an institution and to the public. Community practices and nonaffiliated surgical facilities should be included in this process and have similar expectations for adjusting care. In the event of widespread COVID-19 infection, all resources may be severely strained and should be conserved to care for life-threatening infections rather than elective surgical procedures.

The wide spectrum of clinical manifestations seen in COVID-19 complicates predictions of the impact on healthcare. Therefore, it is difficult to anticipate when the epidemic will peak and introduce further difficulty in the detection of cases. Current data suggest that the risk for developing acute respiratory distress syndrome (ARDS, 17%–29%) and death (1%) are most commonly seen in the elderly (older than 70 years) and those with underlying respiratory illness. Clinically recognized infection in children seems less frequent (2%), and limited data suggest that pregnant women are not particularly vulnerable to contracting the illness and have similar maternal complications to other populations. There appears to be an increased risk for preterm birth, fetal distress, and cesarean delivery with infection. Nevertheless, 1:1 obstetric and pediatric staffing and the resultant personal protective equipment (PPE) needs offer additional strains on resources.

Gynecologic and obstetric surgery
Preparing for COVID-19 community spread requires emergency response planning as outlined by the WHO. Additional preparedness actions can be elucidated from the Italian experience, which provides guidance on forecasting ICU surge capacity and promoting containment measures once the outbreak has begun. However, there is little guidance for managing scheduled, elective surgical services while awaiting the onslaught of COVID-19 cases. While hospital leadership is engaged in logistical planning, the maintenance of some limited surgical services may provide a financial balance to hospitals and allow physicians and staff to remain focused on providing high-quality care. Utilizing the principles from Soremekun et al, it is possible to develop specialty-specific case categories and establish a schedule for tiered, coordinated case cancellation/postponement.

Table 1 shows the staged reduction considerations for gynecologic and obstetric surgeries used at the University of Florida to guide decision making. Category I includes elective cases of any type performed on a patient at high risk of complications associated with COVID-19 infection. In the setting of COVID-19, category I was designed to identify all patients across all services whose mere presence in a densely populated hospital with COVID-19 community transmission would pose a greater risk to the patient than to postpone their surgery. For example, urogynecology largely serves older patients who are also at high risk of morbidity and mortality resulting from COVID-19 infection but whose surgical treatment can usually be delayed for patient protection.

Categories II and IV are similar except for the postoperative hospital-care burden. Category II cases require overnight hospitalization or potential intensive care and can be postponed if the hospital resources are overstretched. In contrast, category IV cases occur in an off-site or independent ambulatory care center and therefore could continue without straining hospital-based resources (since some health systems do not maintain separate locations or surgical environments, categories II and IV may not be distinct for those centers). Although individuals in categories II and IV may be at lower risk for viral morbidity (such as most patients with benign and pediatric gynecology needs), consideration should be given to postponement if their surgery is nonessential and their potential exposure places the community at greater risk. In contrast, before the evidence of COVID-19 community spread, early completion of category IV cases will serve the low-risk population without expending significant resources and reduce additional hospital burden once the crisis resolves. Thus, both the specific community environment and COVID-19 risk must be considered.

Category III describes urgent procedures (or cases) that need to be performed within the next 7–14 days, but which can be scheduled strategically on the basis of hospital resources. In the COVID-19 setting, terminal cleaning of an
TABLE 1
General guidance to assist gynecologists and obstetricians with staged cancellation or postponement of surgical cases in response to the COVID-19 pandemic. Individual case-specific characteristics may modify category assignment for a given patient.

| Category: | I | II | III | IV | V |
|-----------|---|----|-----|----|---|
| Trigger(s) to cancel or delay | - Community transmission | - Community transmission | - Community transmission | - Community transmission | Never canceled |
| | - Inpatient bed availability limited | - Inpatient bed availability limited | - Case-by-case basis with team review | - PPE supply limited | |
| COVID-19 morbidity and mortality risk | High | Vulnerable population | Average | Average | Average | All risk levels |
| Urgency level | Low | Low | Moderate (can delay up to 14 d) | Low | High |
| Impact on bed capacity | Variable by procedure (possible inpatient) | Variable by procedure (possible inpatient) | Variable by procedure (possible inpatient) | No impact (same-day surgery) | High (inpatient, emergency department) |
| Examples of patient characteristics and/or surgical case types |
| Benign gynecology | For all surgical groups |
| | - Immunocompromised |
| | - Elderly (older than 70 y) |
| | - Respiratory disease |
| | - Other comorbidities |
| | - Excision of pelvic masses without high suspicion of malignancy |
| | - Hysterectomy for benign disease |
| | - Major minimally invasive surgery (excision of advanced endometriosis or adhesions) |
| | - Excision of benign mass affecting health (causing ureteral obstruction) |
| | - Missed abortion |
| | - Interval tubal ligation |
| | - Hysteroscopy |
| | - D&C |
| | - Minor adnexal surgery |
| | - Minor laparoscopy |
| | - Minor vaginal surgery |
| | - Ecstatic pregnancy |
| | - Ovarian torsion |
| | - Tuboovarian abscess requiring surgery |
| | - Uncontrollable uterine bleeding; no cancer |
| | - Incomplete abortion |
| Urogynecology | |
| | - Hysterectomy (with overnight stay) |
| | - Major pelvic floor repairs |
| | - Sacral colpopexy |
| | - Mass resulting in urinary obstruction |
| | - Minor pelvic floor repairs |
| | - Minimally invasive surgery |
| | - Hysterectomy (same-day discharge) |
| | - Irreducible procidentia resulting in acute urinary retention |

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| Category: | I | II | III | IV | V |
|-----------|---|----|-----|----|---|
| Gynecologic oncology | Hysterectomy for complex benign disease | Excision of malignant mass | Surgery for preinvasive disease: EIN, VIN, VAIN, CIN | Bowel obstruction | Uncontrollable uterine bleeding from cancer |
| | Prophylactic surgery heritable cancer risk | Hysterectomy for early endometrial cancer | | Pelvic mass causing severe symptoms | |
| | Cysts followed for long periods without change and negative serum markers (Benign Gyn or Gyn Onc) | | | | |
| Reproductive endocrinology and infertility | Abdominal myomectomy | Hysteroscopy, D&C | | Ectopic pregnancy | |
| | | Septoplasty | Adnexal surgery | Ovarian torsion | |
| | | Minor laparoscopy | IVF retrievals and transfers | Treatment of ovarian hyperstimulation | |
| Obstetrics | Considered a vulnerable population and should only have indicated procedures to preserve maternal and fetal health | Delayed postpartum tubal ligation (separate anesthesia episode) | Scheduled cesarean | Emergent cesarean | |
| | Ovarian cystectomy | Scheduled labor induction | History-induced cerclage | Emergent cesarean hysterectomy | |
| | | | Amniocentesis | Rescue cerclage | |
| | | | Chorionic villous sampling | Incarcerated uterus | |
| | | | | Ovarian torsion | |
| | | | | Intrauterine transfusion | |
| | | | | Tubal ligation at cesarean or with delivery | |

CIN, cervical intraepithelial neoplasia; COVID-19, coronavirus disease 2019; D&C, dilation and curettage; EIN, endometrial intraepithelial neoplasia; IU, intrauterine insemination; IVF, in vitro fertilization; N/A, not applicable; PPE, personal protective equipment; VIN, vulvar intraepithelial neoplasia; VAIN, vaginal intraepithelial neoplasia.

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operating room, preparation of adequate PPE, or mobilization of staff may be prioritized to strategically delay a category III case. For example, surgical oncology cares for patients at the highest risk for contracting COVID-19 and, simultaneously, for experiencing devastating outcomes with a delay in cancer care. These cases best fit into category III, prompting a case review and individualized risk assessment. Finally, category V cases are emergent and should not be delayed for any reason. Emergent cases such as ovarian torsion and ectopic pregnancies fall into category V, for which a careful risk assessment is undertaken and the case performed urgently with mobilization of available resources.

This categorization strategy depends heavily on surgeons to fairly identify several key factors about the patient and the planned surgery, to weigh the relative impacts of those factors on the overall health of the patient, and to seek peer review when confounding factors are involved. When considering symptomatic or COVID-19-positive surgical patients, we suggest that a multidisciplinary team must balance the various risks and benefits to the patient and to the entire healthcare system.

There are a number of considerations for triggering a staged reduction in surgical services (Table 2). Nevertheless, for COVID-19, the emergence of local or regional community transmission is the most important. Because pregnancy care (antenatal, intrapartum, and postpartum) is not optional, it is particularly important to conserve and protect this highly specialized workforce and assigned PPE resources to safely ensure the ability to provide services during the outbreak. This may mean an earlier reduction of benign gynecologic surgeries than in other specialties.

Although each hospital or healthcare system must evaluate their own capabilities and surge capacity, this approach can be applied across all surgical departments allowing for a consistent and measured management of resources. We have provided an expanded table with additional categorized examples from other procedural specialties that might be useful for guiding decisions including general surgery, pediatric surgery, neurosurgery, otolaryngology, and psychiatry (Appendix).

### Summary

The widespread COVID-19 epidemic in China showed a high rate of infection in healthcare personnel, up to 63% in Wuhan (1080 of 1716), with 14.8% cases classified as severe or critical (247 of 1668) and 5 deaths. This can quickly overwhelm resources and make it very challenging to provide adequate care for ill COVID-19 patients. Minimizing all unnecessary patient contact through proactive systematic postponement of elective surgical cases and all nonessential outpatient visits is key to channeling all healthcare resources to overcoming this COVID-19 pandemic.

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ABSTRACT

Coronavirus disease 2019 pandemic: staged management of surgical services for gynecology and obstetrics

The coronavirus disease 2019 pandemic warrants an unprecedented global healthcare response requiring maintenance of existing hospital-based services while simultaneously preparing for high-acuity care for infected and sick individuals. Hospitals must protect patients and the diverse healthcare workforce by conserving personal protective equipment and redeployment of facility resources. While each hospital or health system must evaluate their own capabilities and surge capacity, we present principles of management of surgical services during a health emergency and provide specific guidance to help with decision making. We review the limited evidence from past hospital and community responses to various health emergencies and focus on systematic methods for adjusting surgical services to create capacity, addressing the specific risks of coronavirus disease 2019. Successful strategies for tiered reduction of surgical cases involve multidisciplinary engagement of the entire healthcare system and use of a structured risk-assessment categorization scheme that can be applied across the institution. Our institution developed and operationalized this approach over 3 working days, indicating that immediate implementation is feasible in response to an unforeseen healthcare emergency.

Key words: case cancellations, coronavirus, COVID-19, emergency response, gynecology, obstetrics, SARS-CoV-2, staged management, surgery, surgical subspecialties
| Category | I                | II          | III                      | IV                         | V          |
|----------|-----------------|-------------|--------------------------|----------------------------|------------|
| Trigger(s) to cancel or delay | Community transmission | Community transmission | Community transmission | Community transmission | Never canceled |
| | | Inpatient bed availability limited | Inpatient bed availability limited | PPE supply limited | |
| | | | | | |
| COVID-19 morbidity and mortality risk | High | Average | Average | Average | All risk levels |
| Urgency level | Low | Low | Moderate (can delay up to 14 d) | Low | High |
| Impact on bed capacity | Variable by procedure (possible inpatient) | Variable by procedure (possible inpatient) | Variable by procedure (possible inpatient) | No impact (same-day surgery) | High (inpatient, emergency department) |

Examples of patient characteristics and/or surgical case types

- **General surgery**
  - For all surgical groups
  - Immunocompromised
  - Elderly (older than 70 y)
  - Respiratory disease
  - Other comorbidities (as specifically listed)
  - Excision of benign mass
  - Joint replacement
  - Cosmetic procedures
  - Excision of malignant mass
  - Cardiac catheterization for stable angina
  - Fixation of closed orthopedic injury
  - Day-stay surgeries
  - Surgical centers
  - Procedures on patients already admitted, allowing for immediate discharge
  - Emergent trauma or acute abdomen (hemorrhage)
  - Required surgical intervention for infection
  - Spinal cord decompression
  - Transplants
  - Cardiac catheterization for acute myocardial infarction
  - Procedures on ICU patients (open abdomen, PEG, tracheostomy)
| Category | I | II | III | IV | V |
|----------|---|----|-----|----|---|
| Burn surgery | - Release of burn scar contractures in cases without impending functional compromise from contracture | - Release of burn scar contractures in cases with impending functional compromise from contracture | - Laser-based fractional ablation of hypertrophic scars | - Scar revision and release of burn scar contractures (when deemed feasible as an outpatient surgery) | - Excision/debridement, preparation, and coverage of burns or wound beds | - Amputation | - Tracheostomy for high-risk airways or to facilitate wound treatment |
| Breast, melanoma | - Excision/debridement, preparation, and coverage of burns or wound beds | - Amputation | - Tracheostomy for high-risk airways or to facilitate wound treatment |
| Colorectal | - AIN/condyloma cases (impacts N95 mask supply) | - Nonurgent benign anorectal cases requiring inpatient stay | - Intestinal resection for cancer, diverticulitis, and inflammatory bowel disease | - Nonurgent benign anorectal cases usually treated as outpatient (excluding AIN/condyloma) | - Urgent/emergent intestinal surgery for perforation or obstruction |
| Minimally invasive | - Antireflux procedures in lung transplant patients | - Elective incisional hernia repair | - Repair of symptomatic hernias | - Groin hernia repair | - Urgent/emergent intestinal surgery for perforation, obstruction |
| Pancreas, biliary | - Symptomatic incisional hernia | - Chronic pancreatitis | - Pancreas cancer | - Biliary colic | - Patients with cancer receiving neoadjuvant therapy where surgical timing is driven by radiation treatment |

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### SUPPLEMENTARY TABLE

General guidance to assist surgeons and hospital leaders with staged cancellation or postponement of surgical cases in response to the COVID-19 pandemic. Individual case-specific characteristics may modify category assignment for a given patient. The surgical services available at any individual health center will vary. This table is intended as a guide and could be expanded or modified for use in any individual hospital.

| Category   | I                                      | II                                      | III                                      | IV                                      | V                                      |
|------------|----------------------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------|-----------------------------------------|
| Plastics   | - Reconstruction of existent, nonfunctional conditions: delayed breast reconstruction, chronic wounds, and facial palsy free flaps | - Cleft palate surgery | - Breast reduction | - Acute traumatic reconstruction: facial fractures, long-bone fractures, and acute soft tissue reconstruction |                                      |
|            |                                        | - Craniosynostosis                     | - Aesthetic/cosmetic surgery             | - Reconstruction for acutely created cancer defects |                                      |
|            |                                        |                                        | - Hand/upper extremity outpatient surgery | - Aggressive cutaneous cancer resections (melanoma, Merkel cell) |                                      |
|            |                                        |                                        | - Lipomas and other outpatient skin/soft tissue benign tumors |                                      |                                      |
|            |                                        |                                        | - Migraine surgery                      |                                        |                                      |
| Vascular   | - Severe COPD                           | - Elective venous cases interventions for claudication | - <6 cm AAA                             | - New hemodialysis access creation       | - CLI and ALI procedures               |
|            |                                        | - Asymptomatic carotid procedures      |                                        |                                        | >6 cm AAA or TAAA                      |
|            |                                        |                                        |                                        |                                        | - Symptomatic carotid                   |
|            |                                        |                                        |                                        |                                        | - Ruptured or infected procedures       |
|            |                                        |                                        |                                        |                                        | (vascular surgery emergencies)         |
|            |                                        |                                        |                                        |                                        | - Aortic dissections                    |
|            |                                        |                                        |                                        |                                        | - Acute mesenteric ischemia             |
| Cardiac    |                                        | - CABG stable CAD                      | - N/A                                   | - Acute aortic dissection               | - Transplants                           |
|            |                                        | - TAVR/valve nonurgent                  |                                        | - Transplants                           | - Left main coronary artery disease/CABG |
|            |                                        | - TEVAR nonurgent                       |                                        |                                        | - Post-MI VSD, Mitral                   |
|            |                                        | - Aneurysm nonurgent                    |                                        |                                        |                                        |
|            |                                        | - VAD                                   |                                        |                                        |                                        |
| Thoracic   | - Surgical lung biopsy                  | - Diaphragmatic plication               | - Lung cancer surgery                   | - Lung transplant patients admitted to TVICU | - ECMO cannulation and initiation      |
|            |                                        | - Decortication for stable trapped lung | - Esophageal cancer surgery              | - Lung transplant patients awaiting at home or floor | - Thymectomy on patients with unstable myasthenia |
|            |                                        |                                        | - Mediastinal tumor                      | - Empyema thoracoscopy                  |                                        |
|            |                                        |                                        | - Lung transplant patients               |                                        |                                        |
|            |                                        |                                        | awaiting at home or floor                |                                        |                                        |

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| Category                  | I                                      | II                                      | III                                      | IV                                      | V                                      |
|---------------------------|----------------------------------------|----------------------------------------|------------------------------------------|-----------------------------------------|----------------------------------------|
| Congenital heart surgery  | - Elective heart defects               | - Some single ventricular patients      | - Single ventricles that are hypoxemic   | - Single ventricles that are hypoxemic   | - Single ventricles that are hypoxemic   |
|                           | - Chronic heart defects                | - Some patients with shunt lesions      | - Transplants                           | - Transplants                           | - Transplants                           |
|                           | with ASD, sinus venous                 |                                        | - VADs for sick patients with heart failure | - VADs for sick patients with heart failure | - VADs for sick patients with heart failure |
|                           | ASD with PAPVR                        |                                        | - Infected endocarditis                  | - Infected endocarditis                  | - Infected endocarditis                  |
|                           | Elective VSD in older patients         |                                        | - Kids with acute heart failure          | - Kids with acute heart failure          | - Kids with acute heart failure          |
|                           |                                        |                                        | - Infections requiring urgent surgery    | - Infections requiring urgent surgery    | - Infections requiring urgent surgery    |
| Congenital heart cath      | - Transplant (surveillance cath)       | - Elective device closures              | - Routine diagnostic cath without planned intervention | - Routine diagnostic cath without planned intervention | - Routine diagnostic cath without planned intervention |
|                           | - Chronic lung disease                 | - Noncritical valve interventions and stents | - Transplant patients with concern for rejection | - Transplant patients with concern for rejection | - Transplant patients with concern for rejection |
|                           | - Trach/vent dependent                 | - Asymptomatic outpatient transcatheter valve implantation | - Symptomatic patients requiring valve intervention/implantation, stent placement, or device closure | - Symptomatic patients requiring valve intervention/implantation, stent placement, or device closure | - Symptomatic patients requiring valve intervention/implantation, stent placement, or device closure |
|                           | - Other comorbidities involving CV/pulmonary system (mainly ACHD) |                                        | - Routine diagnostic cath without planned intervention | - Routine diagnostic cath without planned intervention | - Routine diagnostic cath without planned intervention |
| Congenital Heart EP        | - Transplant                           | - Implantable loop recorder implant     | - EPS/ablation of VT                     | - EPS/ablation of VT                     | - EPS/ablation of VT                     |
|                           | - Chronic lung disease                 | - Diagnostic EPS only                   | - Pacemaker or ICD generator replacement | - Pacemaker implant (new)                | - Pacemaker implant (new)                |
|                           | - Trach/vent dependent                 |                                        | - Device upgrade +/− extraction (elective) | - Primary prevention ICD implant        | - Primary prevention ICD implant        |
|                           | - Other comorbidities involving CV/pulmonary systems (mainly ACHD) |                                      |                                         |                                         |                                         |

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| Category                        | I                                                                 | II                                                                 | III                                                                 | IV                                                                 | V                                                                 |
|--------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------------------------|
| Pediatric surgery              | - Cystic fibrosis                                                | - Stoma reversals                                                 | - Bowel resections (nonobstructive)                                 | - Inguinal hernia repair                                           | - All emergent procedures (eg, appendicitis, choledocystitis, trauma, burn debridement, bowel obstructions, GI bleeding) |
|                                | - Respiratory illness/vent dependent                             | - Outpatient gastrosotomy tubes (with temporary tube in place)     | - Symptomatic gallbladder disease                                   | - Orchiopexy                                                       | - Malignancies requiring biopsy or resection to start therapy        |
|                                | - Large burns (immune issues)                                     | - Congenital lung lesions                                          | - Need for feeding access (especially inpatients to facilitate discharge) | - Circumcision                                                    | - Empyema not responding to medical management                     |
|                                |                                                                  | - Benign masses                                                    | - Some malignancy-associated procedures (central access, resections) | - Umbilical hernia                                                | - Newborn surgical procedures                                       |
|                                |                                                                  | - Outpatient cholecystectomy                                       |                                                                    | - Integumentary surgery (skin lesions, nail lesions, etc)        | - ECMO                                                              |
|                                |                                                                  | - Interval appendectomy                                            |                                                                    | - EGD/colonoscopy                                                 | - Incarcerated hernia                                               |
|                                |                                                                  | - Neck masses (eg, thyroid)                                        |                                                                    | - Breast masses                                                   | - Esophageal/airway foreign bodies                                  |
|                                |                                                                  | - Small burns (outpatient)                                         |                                                                    | - Neck masses (superficial)                                       | - Gonadal torsion (testicular, ovarian)                             |
|                                |                                                                  |                                                                    |                                                                    | - Awaiting surgery for discharge (hernia, g-tube, etc)            |                                                                     |
| Abdominal transplant surgery    | - Elderly (older than 70 y) unless need for urgent dialysis access | - Excision of benign mass                                          | - Excision of some malignant masses                                 | - Day-stay surgeries                                               | - Acute abdomen or surgical equivalent                              |
|                                | - Pancreas transplants                                           |                                                                    | - Living donor kidney transplants (being delayed until at least April 28, 2020, as of March, 17, 2020; will then be reassessed) | - Procedures on patients already admitted, allowing for immediate discharge | - Required surgical intervention for infection                     |
|                                |                                                                  |                                                                    |                                                                    |                                                                    | - Liver transplants MELD over 25 years old or ill                  |
| Neurosurgery Vascular          | - Any open surgical or endovascular elective aneurysm, any open surgical or endovascular elective AVM | - Open surgical elective aneurysm, open surgical elective AVM, open surgical carotid in patient of any age | - Endovascular elective aneurysm, endovascular elective AVM, endovascular elective carotid in patient of any age | - Diagnostic cerebral angiograms                                   | - Detailed acceptance criteria for deceased donor kidney transplants created based on both recipient and donor graft risk criteria |
|                                |                                                                  |                                                                    |                                                                    |                                                                    | - Ruptured aneurysm, ruptured AVM, acute stroke, ICH              |

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### General guidance to assist surgeons and hospital leaders with staged cancellation or postponement of surgical cases in response to the COVID-19 pandemic.

Individual case-specific characteristics may modify category assignment for a given patient. The surgical services available at any individual health center will vary. This table is intended as a guide and could be expanded or modified for use in any individual hospital (continued)

| Category                      | I                                      | II                                      | III                                      | IV                                      | V                                      |
|-------------------------------|----------------------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------|-----------------------------------------|
| Neosurgery Spine              |  - Elective degenerative spine surgery without motor deficit, or stable motor deficit >3 mo |  - Resection of benign spinal mass, for example, meningioma, schwannoma without motor deficit or stable motor deficit >3 mo |  - Spinal condition with a stable motor deficit >72 h |  - Level 1 or 2 lumbar decompression |  - Spinal cord/nerve compression or spinal instability with <72 h motor deficit or progressive motor deficit within 72 h |
|                               |                                        |  - Spinal instability that can be managed indefinitely with a brace |  - Any spinal condition that is not emergent but requires inpatient management until definitively treated (eg, unstable thoracic fracture on bed rest until surgery) |  - Level 1 anterior cervical surgery or level 1–2 posterior cervical decompression |  - Spine fracture, spine pathology with an acute severe neurologic deficit (ie, tumor, abscess/osteo, cauda equina) |
|                               |                                        |  - Elective spinal procedure requiring multilevel spinal instrumentation (cervical, thoracic, or lumbar) |  - Malignant primary or secondary spinal tumor |  - Single level ACDF, microdiscectomy, single level laminectomy | |
| Neurosurgery Stereotactic/radiosurgery/brain tumors, trigeminal neuralgia |  - Benign, minimally symptomatic tumor |  - Benign brain tumors, elective cervical/lumbar stenosis cases |  - MVD cases where patients are in a lot of pain, symptomatic benign posterior fossa lesions |  - Outpatient radiosurgery and RFL cases | - Intracranial bleeding, symptomatic large brain tumors, symptomatic spinal cord lesions, trauma |
|                               |                                        |  - Benign minimally symptomatic tumor of any age |  - Benign tumor of any age with moderate neurologic symptoms |  - Malignant brain tumor of any age |  - Hospitalized benign brain tumor patient with significant neurologic symptoms or hospitalized malignant brain tumor |
**SUPPLEMENTARY TABLE**

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| Category | I | II | III | IV | V |
|----------|---|----|-----|----|---|
| Pediatric neurosurgery | - Respiratory illness/vent dependent | - Chiari decompression (most) | - Cranioplasty after decompressive craniectomy | - Scalp dermoid | - Shunt placement/revision |
| | | - Craniosynostosis (most) | - Cranial/spinal tumor biopsies/resections (most) | - Cranial spring removal | - Spinal instability/trauma |
| | | - Spinal cord detethering (most) | - Discectomy/laminectomy without acute neurodeficit | - Muscle/nerve biopsy | - Endoscopic hydrocephalus surgery |
| | | - Craniotomy for epilepsy focus, nontumor | - Pseudomeningocele repair (most) | - Vagus nerve stimulator battery replacement | - Evacuation of intracranial/ intraspinal hematoma or empyema |
| | | - Vagus nerve stimulator new implant | - Moyamoya bypass | | - Myelomeningocele closure |
| | | - Baclofen pump new implant | - Baclofen pump replacement | | - Congenital encephalocele repair |
| | | - Dorsal rhizotomy | | | - CSF leak repair |
| | | - Scalp dermoid | | | - Discectomy/laminectomy with acute neurodeficit |
| | | - Stere EEG | | | - Decompressive craniectomy |
| | | - Scoliosis or other spinal deformity repair (1- to 3-mo delay) | | | - Repair of open or depressed skull fracture |
| | Neurosurgery, epilepsy surgery, pituitary tumors | - Any elective epilepsy or pituitary case in patient aged 70 y or older or with pulmonary disease | - RNS for epilepsy, transsphenoidal surgery for pituitary tumor, stereo EEG for epilepsy, anterior temporal lobectomy for epilepsy | - VP shunt for pseudotumor pituitary tumor with visual field defect | - Sural nerve biopsy | - Transsphenoidal surgery for pituitary apoplexy |
| Neurosurgery, DBS | Any elective DBS or battery change procedure in patient 70 years or older, immunocompromised, or with respiratory disease | Elective DBS surgery in patients <70 years old | Battery change procedures in patients <70 years old | Infected DBS or infected battery |

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| Category             | I                          | II                                      | III                                    | IV                                      | V                                      |
|----------------------|----------------------------|-----------------------------------------|----------------------------------------|-----------------------------------------|----------------------------------------|
| **Otolaryngology**   | - Immunocompromised         | - Most tonsil/adenoid removals          | - Malignancy of upper aerodigestive tract or salivary glands | Cases occurred at an ambulatory surgical center | - Emergent airway                      |
|                      | - Elderly (older than 70 y) | - Benign thyroid and parotid masses     | - CSF leaks                            |                                         | - Neck abscesses                       |
|                      | - Chronic respiratory disease | - Tymanoplasties and mastoidectomies    | - Sinonasal tumors                     |                                         | - Orbital or intracranial complications of otitis media or sinusitis |
|                      | - Cystic fibrosis           | - Cochlear implants                     | - Facial trauma                         |                                         | - Invasive fungal sinusitis            |
|                      | - Elective aerosol-generating procedures, such as endoscopy, bronchoscopy | - Chronic inflammatory endoscopic sinus surgery | - Laryngotracheal stenosis, especially if not tracheostomized |                                         |                                        |
|                      | - Tracheotomy dependent     | - Septorhinoplasty                     | *These cases could wait a short duration, but not $>3$–$4$ wk |                                         |                                        |
|                      |                            |                                         |                                        |                                         |                                        |
| **Psychiatry, ECT**  | - Immunocompromised         | - Maintenance ECT for prevention of relapse | - Post-ECT taper                       | High acuity in mid-ECT series           | - Catatonia with severe malnourishment |
|                      | - Elderly (older than 70 y) |                                        | - Nonsuicidal in ECT treatment series  |                                         | - Suicidal inpatients in mid-ECT series |
|                      | - Respiratory disease       |                                        |                                        |                                         |                                        |
|                      | - Cardiac disease           |                                        |                                        |                                         |                                        |
|                      | - Other comorbidity         |                                        |                                        |                                         |                                        |
| **Trauma orthopedics** |                            | - Malunion                              | - Some fractures                        | - Minor hardware removal                | - Acute fractures                      |
|                      |                            | - Some nonunion with intact hardware   |                                        | - Manipulation under anesthesia         | - Infection                            |
|                      |                            | - Posttraumatic fusion/archiopasty      |                                        | - Some fractures                        | - Polytrauma                           |
|                      |                            |                                        |                                        |                                         |                                        |
| **Foot and ankle**   |                            | - Mostly elective                       | - Some elective partial foot amputation | Mostly elective sports, arthritis, outpatient trauma, reconstructive foot and ankle surgery | - Acute or acute on chronic infections |
|                      |                            | - Below-knee amputation                 | - Some elective below-knee amputation   | - All digit amputations                 | - Polytrauma with foot fracture as main orthopedic injury |
|                      |                            | - Most Charcot reconstruction           |                                        |                                        |                                        |
|                      |                            | - Ankle replacements or similar reconstruction |                                        |                                        |                                        |
| **Orthopedic, spine** |                            | - Resection of benign spinal mass without motor deficit or stable motor deficit $>3$ mo | - Spinal condition with a stable motor deficit $>72$ h | - Level 1 or 2 lumbar decompression or microdiscectomy | - Spinal cord/nerve compression or spinal instability with $<72$ h motor deficit or progressive motor deficit within $72$ h |
|                      |                            | - Spinal instability that can be managed indefinitely with a brace. | - Malignant primary or secondary spinal tumor | - Level 1 anterior cervical surgery |                                         |
|                      |                            |                                        | - Any spinal condition that is not emergent but requires inpatient management until definitively treated (eg, unstable thoracic fracture) | - Level 1–2 posterior cervical decompression |                                         |

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| Category                  | I                        | II                        | III                        | IV                        | V                        |
|--------------------------|--------------------------|--------------------------|---------------------------|---------------------------|--------------------------|
| Orthopedic oncology      | - Benign bone            | - Benign soft tissue     | - Malignant bone          | - Rare                    | - Acute fractures        |
|                          | - Benign soft tissue     | - Soft tissue            |                           | - Benign soft tissue or bone | - Infection              |
|                          | - Hardware removal       |                           |                           |                           | - Pathologic fractures    |
|                          | - Hardware revision      |                           |                           |                           | - Malignant tumors with   |
|                          |                          |                           |                           |                           | window for care (eg, RT,  |
|                          |                          |                           |                           |                           | chemotherapy)            |
| Pediatric orthopedics    | - Elective spine deformity | - Some fractures can be delayed 7—10 d | - Elective LE and foot deformity surgery (ambulatory surgery only) | - SCFE from ED | - Septic arthritis/osteomyelitis/abscess |
|                          | - Hip/LE surgery for CP, neuromuscular |                          | - Arthroscopy/peds sports | - Fracture fixation or casting | - Spine trauma requiring fixation |
| Orthopedic sports med    | - Knee                   | - Should be done within 7—14 d: | - Elective LE and foot deformity surgery (ambulatory surgery only) | - Irreducible dislocations/ unstable dislocations | - Native or prosthetic |
|                          | - Arthroscopic meniscectomy, debridement, microfracture, plica excision | - Acute shoulder instability | - Arthroscopy/peds sports | - Septic joint | - Infection |
|                          | - ACL reconstruction     | - Patella instability with osteochondral fragment | - Clubfoot tenotomy | - Native or surgical site | - Open fracture |
|                          | - Shoulder              | - Acute displaced/ unstable chondral fragment |                           | - ACL with bucket handle meniscal tear | - Displaced bucket handle meniscal tear |
|                          | - Arthroscopic debridement, degenerative rotator cuff repair, biceps tenodesis/tenotomy, slap repair, subacromial decompression, distal clavicle excision | - Closed fracture fixation | - Subacute/chronic periprosthetic joint infection without systemic symptoms (ie, sepsis) | - Periprosthetic fracture fixation | - Acute periprosthetic joint infection |
|                          | - Hip                   | - Subacute/chronic periprosthetic joint infection | - Major tendon/ligament tear | - Subacute/chronic periprosthetic joint infection with systemic symptoms, ie, sepsis | - Subacute/chronic periprosthetic joint infection |
|                          | - Arthroscopic hip surgery | - Acute rotator cuff tear | - Pectoralis              | - Fractures with neurovascular compromise | - Locked elbow or knee |
|                          | - Elbow                 | - Surgery that would result in loss of athletic season if not performed | - Biceps                  | - Current matched fresh allografts | - |
|                          | - Arthroscopic and open elbow surgery (excluding fracture/dislocation) | - Major tendon/ligament tear | - Achilles               |                           | |
|                          |                          |                           | - Quad/patella            |                           | |
|                          |                          |                           | - Hamstring               |                           | |
|                          |                          |                           | - Triceps                |                           | |
|                          |                          |                           | - Collateral ligament repair |                           | |
|                          |                          |                           | - ACL repair              |                           | |
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| Category          | I                        | II                                      | III                                      | IV                                      | V                                      |
|-------------------|--------------------------|-----------------------------------------|------------------------------------------|-----------------------------------------|-----------------------------------------|
| Arthroplasty      | - SNF bound              | - Elective inpatient                    | - Same as level 2 except for severe limitation, pain, or immobility | - Outpatient healthy total joint arthroplasty | - Fractures, acute prosthetic joint infection |
|                   | - Primary and revision   | - PCNL for asymptomatic stone without tubes | - Excision of malignant mass (prostate, kidney, bladder, tests, and penis) | - Urethral stent change | - Testicular torsion |
|                   |                          | - Pelvic floor repairs                  | - Excision of benign mass affecting health | - Minor pelvic floor repairs | - Urinary tract infections associated with obstruction |
|                   |                          | - Fistula case                          | - PCNL for symptomatic stones or drainage tubes in place | - Anti-incontinence procedures | - Acute urinary tract obstruction associated with decline in renal function |
|                   |                          | - Benign urinary diversion              | - Ureteroscopy for symptomatic stones or drainage tubes in place | - Sacral neuromodulation | - Priapism |
|                   |                          | - Bladder diverticulum                  | - Pyeloplasty                            | - Cysto/RUG/SPT | - Fournier’s gangrene |
|                   |                          | - Outlet reduction procedure            | - Urethroplasty                          | - ProAct placement | - Cystoscopy with clot evacuation |
|                   |                          | - Penile prosthesis                    | - Ileal ureter                           | - Male sling placement | - Explant infected prosthetic device |
|                   |                          | - Penile plication                     | - Ureterolysis                           | - DVIU/urethral dilation | - Pediatric malignancy not testis |
|                   |                          | - Hidden penis repair                   | - Pediatric benign nephrectomy           | - Excision/ablation condyloma |                                |
|                   |                          | - TURP/PVP                              |                                          | - UroLift                      |                                |
|                   |                          | - Excision of benign adrenal tumor      |                                          | - Penile abnormality surgery (circumcision, penile adhesion, hypoplasia) |                                |
|                   |                          | - Bladder and bowel reconstruction: bladder augment, bladder catheterizable channel, cecal catheterizable channel, ureteral reimplant |                                          | - Inguinal hernia |                                |
|                   |                          |                                          |                                          | - Undescended testis |                                |
| Urology           | - Reconstructive surgery for transplant clearance | - PCNL for asymptomatic stone without tubes | - Excision of malignant mass (prostate, kidney, bladder, tests, and penis) | - Urethral stent change | - Testicular torsion |
|                   |                          | - Pelvic floor repairs                  | - Excision of benign mass affecting health | - Minor pelvic floor repairs | - Urinary tract infections associated with obstruction |
|                   |                          | - Fistula case                          | - PCNL for symptomatic stones or drainage tubes in place | - Anti-incontinence procedures | - Acute urinary tract obstruction associated with decline in renal function |
|                   |                          | - Benign urinary diversion              | - Ureteroscopy for symptomatic stones or drainage tubes in place | - Sacral neuromodulation | - Priapism |
|                   |                          | - Bladder diverticulum                  | - Pyeloplasty                            | - Cysto/RUG/SPT | - Fournier’s gangrene |
|                   |                          | - Outlet reduction procedure            | - Urethroplasty                          | - ProAct placement | - Cystoscopy with clot evacuation |
|                   |                          | - Penile prosthesis                    | - Ileal ureter                           | - Male sling placement | - Explant infected prosthetic device |
|                   |                          | - Penile plication                     | - Ureterolysis                           | - DVIU/urethral dilation | - Pediatric malignancy not testis |
|                   |                          | - Hidden penis repair                   | - Pediatric benign nephrectomy           | - Excision/ablation condyloma |                                |
|                   |                          | - TURP/PVP                              |                                          | - UroLift                      |                                |
|                   |                          | - Excision of benign adrenal tumor      |                                          | - Penile abnormality surgery (circumcision, penile adhesion, hypoplasia) |                                |
|                   |                          | - Bladder and bowel reconstruction: bladder augment, bladder catheterizable channel, cecal catheterizable channel, ureteral reimplant |                                          | - Inguinal hernia |                                |
|                   |                          |                                          |                                          | - Undescended testis |                                |

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| Category                                      | I                                  | II                                  | III                                 | IV                                 | V                                  |
|-----------------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| Interventional radiology                      | Visceral                           | Visceral                           | Visceral                           | Visceral                           | Visceral                           |
| Visceral                                      | Varicose veins                     | Embo: fibroid                      | Transjugular liver biopsy          | Embo: gonadal vein, liver          | Embo: gonadal vein, liver          |
|                                               | Hydrocele sclerosis                |                                   | PCN: new (low acuity)              | — tumor (TAE/TARE)                 | — tumor (TAE/TARE)                 |
|                                               | TIPS revision: ascites             |                                   | TIPS placement: ascites            | Dialysis procedures                | PCN: new (low acuity)              |
|                                               | Vertebral augmentation             |                                   | (possibly >14 d)                   | Varicose veins                     | — any hemorrhage                   |
|                                               | Embo: gonadal vein                 |                                   | Percutaneous ablation              | Hydrocele sclerosis                | Thrombolysis                       |
|                                               | Nerve injections                   |                                   | (possibly >14 d)                   | IVC filter placement/ removal      | TIPS placement: history of bleeding|
|                                               | IVC filter removal                 |                                   | Embo: pulmonary AVM (possibly >14 d)| Cholangiogram                      | Body                               |
|                                               | CVL/port removal (completion of therapy) | Feeding tube exchange (routine)   | TIPS revision: bleeding Body       | Feeding tube placement/ change     | Abdominal/pelvic abscess drainage  |
|                                               | Peds                               |                                   | Native kidney biopsy               | Tunneled ascites catheter          | Empyema                            |
|                                               | VCUGs                              |                                   | Lung mass biopsy                   | Catheter/CVL exchange or removal (any)| Peds                              |
|                                               | Renograms                          |                                   | Abdominal mass high-risk biopsy    | Port/tunneled CVL placement        | - Intussusception reduction        |
|                                               | - Barium GI series for chronic conditions | Neuro/spine                      | Neuro/spine                       | Vertebral augmentation, nerve injections | Body                               |
|                                               | MSK                                | - Imaging-guided soft tissue (trigger point) injection| Multilevel blood patch | - TIPS revision: ascites Body | Abdominal/pelvic abscess drainage |
|                                               |                                    | - Sclerotherapy and Botox injections | Multistaged sclerotherapy | - Breast mass biopsy | - Empyema |
|                                               |                                    |                                    |                                   | - Thyroid FNA                      | Peds                              |
| Body                                          |                                    |                                    |                                   | - Lymph node biopsy                | - Intussusception reduction        |
|                                               |                                    |                                    |                                   | - Paracentesis/thora              | for malrotation                    |
| Body                                          |                                    |                                    |                                   | - Seroma/superficial abscess drainage |                                   |
| Body                                          |                                    |                                    |                                   | - Low-risk abdominal mass          |                                   |
|                                               |                                    |                                    |                                   | or soft tissue biopsy              |                                   |
| Body                                          |                                    |                                    |                                   | Neuro/spine                        |                                   |
| Body                                          |                                    |                                    |                                   | LPs/Myelograms                     |                                   |
| Body                                          |                                    |                                    |                                   | FNA/biopsies of head, neck, or spine |                                   |
| Body                                          |                                    |                                    |                                   | Sclerotherapy and Botox injections |                                   |
| Body                                          |                                    |                                    |                                   | MSK                                |                                   |
| Body                                          |                                    |                                    |                                   | Arthrocentesis                     |                                   |
| Body                                          |                                    |                                    |                                   | Imaging-guided biopsy              |                                   |
| Body                                          |                                    |                                    |                                   | Imaging-guided soft tissue (trigger point) injection |                                   |

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| Category | I                                  | II                                | III                         | IV                                         | V                         |
|----------|-----------------------------------|----------------------------------|-----------------------------|-------------------------------------------|--------------------------|
| Ophthalmology | - Cataracts that impact legal driving standards | - Conjunctival or corneal neoplasm | - Pediatric cataracts | - Advanced TRD in monocular patient | - Cataracts >12 year old |
|          | - Blepharoplasty                  | - Chalazion                      | - Ectropion/entropion repair | - Nasal lacrimal duct probing            | - Blepharoplasty         |
|          | - Macular hole                    | - PPV/ERM peel                   | - Strabismus >10 year old   | - Strabismus with >135 degrees of binocular field | - Endophthalmitis       |
|          | - Globe rupture                   | - Bilateral vitreous hemorrhage   | - Mild/moderate glaucoma    | - PTK/Lasik/PRK                          | - Bilateral vitreous hemorrhage |
|          | - PAPVR                           | - Emergency transplant           | - Hyphema with high IOP    | - Routine transplants                    | - Emergency transplant   |
|          | - Phacomorphic angle closure      | - Rhagmatogenous RD              | - ROP                       | - Pterygium surgery                      | - Rhegmatogenous RD      |
|          | - IOP                             | - Advanced or neovascular glaucoma | - Phacomorphic angle closure | - Vitreous biopsy/FNA of choroidal mass   | - Hyphema with high IOP  |
|          | - Pinhole                         | - Hyphema                       | - Vitreous biopsy/FNA of choroidal mass | - Vitreous biopsy/FNA of choroidal mass   | - Vitreous biopsy/FNA of choroidal mass |

AAA, abdominal aortic aneurysm; ACDF, anterior cervical discectomy and fusion; ACHD, adult congenital heart disease; ACL, anterior cruciate ligament; AIN, anal intraepithelial neoplasia; ASD, atrial septal defect; AUS, artificial urinary sphincter; AVM, arteriovenous malformation; CABG, coronary artery bypass graft; CAO, coronary artery disease; COPD, chronic obstructive pulmonary disease; COVID-19, 2019 novel coronavirus; CP, cerebral palsy; CSF, cerebral spinal fluid; CV, cardiovascular; CVL, central venous line; DBS, deep brain stimulation; DVIU, direct vision internal urethrotomy; ECMO, extracorporeal membrane oxygenation; ECT, electroconvulsive therapy; EEG, electroencephalogram; EGD, esophagogastroduodenoscopy; EP, electrophysiology; EPS, electrophysiology studies; ER, extraperitoneal membranes; FNA, fine needle aspiration; GI, gastrointestinal; ICD, implantable cardioverter defibrillator; ICH, intracerebral hemorrhage; ICU, intensive care unit; IOP, intraocular pressure; IV, inferior vena cava; LE, lower extremity; Lp, lumbar puncture; MELD, model for end-stage liver disease; MI, myocardial infarction; MSK, musculoskeletal; MVD, microvascular decompression; N/A, not applicable; PAPVR, partial anomalous pulmonary venous return; PCNL, percutaneous nephrolithotomy; PEG, percutaneous endoscopic gastrostomy; PFE, personal protective equipment; PPV, pars plana vitrectomy; PPK, photorefractive keratectomy; PTK, phototherapeutic keratectomy; PVP, photovaporization of prostate; RT, radiation therapy; SAD, skilled nursing facility; SPT, suprapubic tube; SVT, supraventricular tachycardia; TAAA, thoracoabdominal aortic aneurysm; TAVR, transcatheter aortic valve replacement; TEVAR, thoracic endovascular aortic repair; TIPS, transjugular intrahepatic portosystemic shunt; TRD, tracheal retinal detachment; TURBT, transurethral resection of bladder tumor; TURP, transurethral resection of prostate; TVUH, thoracic/vascular intensive care unit; VAD, ventricular assist device; VCUG, voiding cystourethrogram; VP, ventriculoperitoneal; VSD, ventriculosectomy.