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8-10-2022

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#### Recommended Citation

Day CS, Goldfarb CA, Lattanza LL, Yoshida MT, and Levin LS. Strategies for Deficit Recovery for the Orthopaedic Service Line: Lessons Learned from the COVID-19 Pandemic: AOA Critical Issues Symposium. J Bone Joint Surg Am 2022.

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## AOA Critical Issues

# Strategies for Deficit Recovery for the Orthopaedic Service Line: Lessons Learned from the COVID-19 Pandemic

### AOA Critical Issues Symposium

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*Investigation performed at Henry Ford Health, Detroit, Michigan*

**Abstract:** The COVID-19 pandemic and the mandated cessation of surgical procedures for a substantial portion of the 2020 year placed tremendous strain, both clinically and financially, on the health-care system in the United States. As a surgical specialty that accounts for nearly a quarter of all hospital net income, the revenue recovery of orthopaedic service lines (OSLs) is of particular importance to the financial recovery of their broader health-care institutions. In this American Orthopaedic Association (AOA) symposium report, the OSL leaders from 4 major academic medical institutions explain and reflect on their approaches to address their revenue deficits. Cost-reduction strategies, such as tightening budgets, adopting remote-work models, and limiting costs of human capital, were vital to stabilizing departmental finances at the onset of the pandemic, while strategies that focused on expanding surgical volume, such as those that improve efficiency in clinical and surgical settings, were important in growing revenue once elective procedures resumed. Institutional policy, payer administrative procedures, and the overall context of an ongoing public health crisis all placed limitations on recovery efforts, but engaging relevant stakeholders and working with available resources helped OSLs overcome these limitations. Due to clear strategic actions that were taken to address their deficits, each OSL represented in this AOA symposium saw substantial improvement in its year-end financial performance compared with its financial status at the end of the period of mandatory cessation of elective surgical cases.

In March 2020, prompted by the call for a complete cessation of elective surgical procedures from the U.S. Surgeon General, state governments issued specific restrictions on surgical activity while hospitals adopted their own operating room (OR) shutdown policies in order to focus health-care resources on the rising number of coronavirus disease 2019 (COVID-19)

cases<sup>1-3</sup>. These restrictions lasted anywhere between 6 and 10 weeks before elective procedures were permitted to resume, severely limiting surgical activity for nearly a fifth of the year<sup>4,5</sup>. Elective surgeries make up a considerable portion of annual hospital reimbursements (approximately \$200 billion) in the United States<sup>2</sup>. Elective orthopaedic procedures are among the

**Disclosure:** The **Disclosure of Potential Conflicts of Interest** forms are provided with the online version of the article (<http://links.lww.com/JBJS/H171>).

most profitable hospital services, accounting for nearly 25% of net income from all hospital encounters<sup>6,7</sup>. As a surgery-driven specialty, orthopaedics was particularly susceptible to the economic impact of the shutdown period, with estimated losses of >\$10 billion nationally<sup>6,7</sup>. Given their position as major revenue sources for hospitals, the deficit recovery of orthopaedic service lines (OSLs) has important implications for the financial stability of the U.S. hospital system.

Revenue fluctuation is an ever-present threat in today's economy, and non-health-care industries have developed and employed many tactics to address financial deficits. These tactics can be divided into 2 categories: strategies for cost reduction and strategies to enhance revenue generation. Cost reduction strategies include measures such as streamlining operations and optimizing time and space efficiencies<sup>8,9</sup>. In 1908, the Ford Motor Company leveraged the time and space efficiencies of the assembly line to produce automobiles at half the cost compared with its competitors<sup>8</sup>. After the 2008 recession, Starbucks saved an estimated \$500 million by simplifying and streamlining its supply and production network<sup>9</sup>. With respect to revenue generation, investment in manufacturing capacity and shifting paradigms in business can expand productive capacity and grow sales<sup>10-12</sup>. Tesla saw its sales grow by 82.5% in 2018, just as its investments in manufacturing made its Gigafactory the highest-volume battery plant in the world<sup>10,11</sup>. At the onset of the COVID-19 pandemic, the Target retail corporation quickly shifted resources into its existing e-commerce and no-contact pickup services, increasing overall sales by 24% during the second quarter of 2020, a period when many other retailers were filing for bankruptcy<sup>12</sup>.

When examining health care as a business enterprise, additional factors must be taken into consideration. First, health care is widely considered to be a human right in the developed world, and, therefore, consistent access to care must be ensured. Second, the "consumer" is highly inelastic given that the prevalence of disease states is often not predictable nor influenceable by marketing. Pricing of the rendered service is also relatively inelastic (determined chiefly by payers). Therefore, revenue is primarily volume and rate-driven. Third, cost reduction decisions can potentially impact patient morbidity and mortality, so proper considerations should be made to ensure patient safety. Finally, health systems need to be able to provide 24/7 care, so limiting hours of operation is not an option for cost reduction.

This American Orthopaedic Association (AOA) symposium report investigates the different strategies employed by OSLs to facilitate financial recovery, and seeks to evaluate the effectiveness and limitations of these strategies. To do so, we examine the cost reduction strategies and revenue generation utilized by OSLs from 4 major academic medical institutions in the United States: Henry Ford Health (HF; Detroit, Michigan), Penn Medicine (PM; Philadelphia, Pennsylvania), Washington University School of Medicine in St. Louis (WU; St. Louis, Missouri), and Yale School of Medicine (Y; New Haven, Connecticut). We also reflect on how these strategies played out at year end after the resumption of elective procedures. Throughout this paper, the specific OSLs will be referenced by noting the abbreviation of the institution in parentheses.

## Cost Reduction Strategies

### *Expense Mitigation and Reducing Operational Costs*

Given the immediate impact on the department, costs that are not vital for day-to-day clinical operations (i.e., discretionary spending) were addressed first. Deferring annual faculty infrastructure purchases, such as those for new computers and telephones, as well as restricting travel, helped tighten discretionary spending by as much as 30%, accounting for savings of nearly \$120,000 (Y). Establishing more stringent spending approval processes further aided expense mitigation. Unfortunately, the financial disruption also forced the postponement of capital spending projects, many of which involved years of preparation to initiate the work (PM).

COVID-19 also forced health-care institutions to rethink administrative work. The adoption of remote work provided the opportunity to reduce overhead costs by consolidating and centralizing administrative operations and thereby reducing the space utilized by the department (WU and Y). While this transition did not immediately affect operational costs, the shift to remote work should decrease rent payments over time and allow for a leaner model moving forward. Remote work may also have improved employee job satisfaction since commuting costs were eliminated and demands for childcare were greatly reduced.

### *Managing Human Capital Costs*

In addition to hiring freezes, which acted as an early measure to prevent a rise in labor costs, furloughs, defined as "a temporary leave from work that is not paid and is often for a set period of time," were commonly employed by health-care institutions to accommodate the substantial drop in clinical demand at the onset of the pandemic<sup>13</sup>. Leveraging this practice helped reduce labor costs proportionally to the drop in clinical service demand but kept clinical staff and advanced practice providers (APPs) employed in the short term while enabling them to qualify for unemployment benefits<sup>14,15</sup> (HF, PM, WU, and Y). Permanent staff reductions were instituted in some cases as clinical work models were reevaluated and clinical needs were reassessed. Most OSLs learned how to do more with less and engaged in the sharing of personnel, such as having administrative assistants work with a greater number of faculty and with other departments (WU and Y).

The implementation of compensation and benefits changes varied across the 4 OSLs. When utilized, reductions in base salaries served as another cost-saving measure to manage the short-term financial impact of COVID-19 and could be reversed quickly as department finances stabilized (WU). Even when salaries were maintained, restructuring bonus incentives from quarterly or biannual calculations to an annual calculation allowed a department to delay a payout cost until the end of the year (HF and Y). These compensation reductions were not uniform across departments, and the most highly compensated physicians and staff were more affected by the withholding of bonuses and with salary reductions of higher percentages than their respective colleagues who had lower salaries. This decision also aligned the financial incentives of providers with the surgical volume recovery goals of the department by providing the opportunity for providers to

make up for lost performance time and potentially earn a similar bonus pay compared with 2019. Some health system administrations made decisions at the institutional level to maintain salaries or benefits by committing funds to supplement department reserves in covering these continuing costs (HF and Y). At OSLs where provider compensation was more tied to performance, base salaries, in addition to benefits and matching contributions to retirement, were able to be maintained due to this preexisting flexible compensation model (PM). Crucially, the Coronavirus Aid, Relief, and Economic Security (CARES) Act (March 2020), which allocated over \$175 billion in relief funds for health-care providers, served as an important buffer to the initial deficits, helping to facilitate this institutional support<sup>16,17</sup>. However, because these funds were not sufficient to cover all hospital losses, OSLs needed to adopt many of the cost reduction strategies outlined above<sup>17</sup>.

### Strategies to Enhance Revenue Generation

#### *Adapting to a New Normal*

When the main tertiary care hospitals were inundated with COVID-19 cases, intrasystem cooperation was vital to maintaining surgical care capabilities by facilitating the shifting of patients (e.g., primary arthroplasty and spine patients) to hospitals within the system that experienced lower case burdens from COVID-19 (HF, WU, and Y). Obtaining the necessary emergency privileges and transferring equipment placed a substantial administrative strain on OSLs. The increased travel times and adjustments to unfamiliar hospital environments and staff placed a burden on physicians. Recently reopened ambulatory surgery centers (ASCs) served as alternative sites for outpatient procedures. To combat reduced inpatient bed capacity at the main hospitals, some OSLs developed short extended-stay capacity at ASCs to accommodate total joint procedures (HF and Y). Patients recovered in the post-anesthesia care units (PACUs) of the ASCs, were managed by orthopaedic nursing staff, had access to physical therapy and other services related to their recovery, and had curtain dividers for privacy. The utilization of the ASCs for recovery lowered the burden on hospital sites and provided OSLs with options to maintain clinical operations as the main hospitals dealt with successive waves of COVID-19 cases.

The pandemic also forced providers to adopt new modes of patient interaction that minimized social contact, most notably by use of virtual visits. While some of the OSLs had preexisting infrastructure from ongoing pilot programs (HF and PM), all of the represented institutions pivoted to telehealth at the onset of the pandemic (HF, PM, WU, and Y). Despite earning less revenue per visit than in-person appointments, virtual visits were vital in supplementing the drop in clinical volume, eventually accounting for 45% of all clinical visits at 1 OSL and providing a 25% yield in new patients (PM). As procedures resumed, remote administrative innovations, including the use of telephone calls, email, and digital platforms (e.g., patient portals), facilitated the transition of screening, check-in, consent collection, triage, and checkout processes off-site, thus minimizing social contact while enabling patients to navigate the system efficiently. Following the shutdown, telehealth appoint-

ments have continued to make up around 5% to 10% of clinical visits (HF, PM, and Y).

#### *Engaging Patients*

To promote patient retention, many OSLs had providers contact patients individually during the shutdown period to provide clarity and assurance of safety surrounding their care. These communications were conducted by care providers directly, either the APPs or the physicians, emphasizing the provider-patient relationship to develop trust with patients (HF, PM, and Y). During these interactions, some OSLs collected data to inform systematic approaches to rescheduling cancelled surgeries. Other OSLs stratified patients based on medical need by using established prioritization metrics such as the medically necessary, time-sensitive (MeNTS) procedure scores, which take into account patient morbidity, length of the case, intensive care unit or rehabilitation requirements, and urgency (HF and PM). Some OSLs also engaged patients regarding their rescheduling timeline preferences, taking into account patient hesitations related to the pandemic (HF and Y). Both of these approaches were effective in rescheduling cancelled surgical cases, achieving patient retention rates between 80% and 85% by the end of the year (HF and PM). Finally, many institutions participated in extensive marketing campaigns in their communities to spread the news of the safe resumption of surgery. These efforts consisted of televised commercials, virtual town halls, and webinars that educated referring providers and prospective patients on the return of operations and the safety measures that were put in place to protect patients, including regular COVID testing of faculty and staff (HF and Y).

#### *Engaging Provider Teams*

All of the OSLs represented in this symposium actively engaged providers during their recovery planning phases. One OSL surveyed its providers on their recovery approach preferences, specifically asking whether they were willing to take a pay cut or work extra hours and when they would prefer to work extra hours (in the evenings or on weekends) (HF). Physicians greatly favored expanding surgical case volumes, specifically on weekdays, over strategies that involved a pay cut. This information was then used to inform the system leadership that they would have provider buy-in for extended clinical and surgical operations on weekends (HF).

The same OSLs also used performance targets to help direct case volume recovery efforts. Specific and individualized weekly clinical and surgical volume targets were developed for each OSL physician (HF). Prepandemic, current, and target clinical performance were calculated for each individual provider. Target performance was calculated by applying predictive analytics to the practice of each provider. This information provided clear and achievable weekly targets for each physician; physicians were incentivized by the opportunity to recover loss of income that had been incurred earlier in the year. By the end of the year, one-third of the department was operating at target volumes, with another third constrained only by OR capacity (HF).

**Expanding Service Capacity**

To increase weekly OR capacity, some OSLs made Saturday OR hours available and staffed and ran the ORs in exactly the same manner as on weekdays (i.e., how rooms were flipped and the availability of APPs, anesthesia blocks, residents, etc.) (Y). However, the use of extended operating hours was not supported at every institution. Implementation was carefully considered, including frank discussions with surgeons and anesthesiologists who were asked about working on nights and weekends (WU). Other OSLs approached the health-system administration directly in order to advocate and negotiate for increased OR block allocations. Data on patient willingness to reschedule surgeries, provider willingness to increase OR volume, and provider target volumes helped to communicate the exact needs of the department and reassured administrators that the increased OR allocations would be utilized efficiently (HF). Finally, all of the OSLs leaned into the existing trends in value-based health-care metrics that decreased lengths of stay, increased discharge to home, and decreased discharge to skilled nursing facilities to help increase the weekly throughput of surgical cases. Specifically, optimizing parameters to better identify low-risk patients who could be safely discharged to home or have reduced lengths of stay enabled case volumes to return and expand without overwhelming department resources in the face of staff shortages and decreased revenues (PM). Additionally, Saturday operating hours offered the best load management strategy by more evenly dispersing hospital stays across the week, further alleviating strain on inpatient resources (WU). However, interest among surgeons for weekend surgical procedures was not overwhelming. Ultimately, the use of ORs on the weekends has not persisted beyond the immediate aftermath of the COVID-19 pandemic as many surgeons found it to be too disruptive to be maintained in the long term.

**Roadblocks to Success**

An important factor related to the successful recovery of OSLs was their ability to tailor their strategies within the broader context of decisions made by the health-system administration. The surgical capacity of the OSLs is dependent on system deci-

sions regarding OR hours of operation with respect to nursing and anesthesia providers, as well as the availability of other support staff. Similarly, clinical volume capacity in a health system is influenced by the hours of operation at the facilities that house clinical sites. Some institutions underwent a tiered reopening that occurred over the first 2 months once surgery restrictions had been lifted, which limited the initial recovery of surgical volumes (HF and Y). At 1 institution, a decision was made to close a busy outpatient center toward the end of 2020 (during a large surge in COVID-19 cases) in order to reassign clinical staff to COVID-19 duties at the main hospital (WU). Finally, system-wide mandates, such as those to maintain salaries or benefits for faculty, limited the cost-saving options available to OSLs. Faced with these challenges, OSL leadership found success by leveraging other means to reduce costs, finding creative ways to establish new OR capacity, and directly advocating with the health-system leadership for the resources needed to support financial recovery.

The COVID-19 public health crisis, itself, served as a barrier to financial recovery. While social distancing measures were necessary to ensure the safety of patients and providers, the associated reduction in patient capacities in clinical settings placed substantial throughput limitations on departments. As OSLs learned to provide care during a pandemic, they had to bear the costs associated with converting and staffing new sites of care, implementing telehealth capabilities, hiring the staff needed to run these new systems, obtaining personal protective equipment (PPE), and running regular COVID testing. Many of these costs were covered by department cash reserves and financial relief that was received through the CARES Act. Moreover, many hospitals faced continued strains as the pandemic extended, and priority of care was given to many nonorthopaedic patients who had higher-acuity pathologies requiring longer length of stays. Thus, the return to orthopaedic floors at main hospitals was further delayed due to challenges with bed capacity (Y).

As the rescheduling of cancelled surgical procedures began, the administrative policies of insurers became a particularly noteworthy barrier. The reapproval process for patients with cases that had been cancelled was much longer than

**TABLE I Department Statistics and Financial Performance\***

	HF	PM	WU	Y
Institutional annual revenue ( <i>billions</i> )	\$7.0	\$8.9	\$5.7	\$5.0
OSL size: no. of surgeons (total no. of employed physicians)	55 (75)	44 (53)	59 (73)	34 (47)
OSL prepandemic clinical volume (2019)	187,000	135,000	180,000	84,000
OSL prepandemic surgical volume (2019)	21,000	13,000	17,000	7,500
No. of cancelled surgical cases during initial shutdown	2,100	1,000	1,500	650
Revenue deficit by end of shutdown (Jan 2020-May 2020) compared with same time frame in 2019 (%)	-32	-30	-13	-20
Revenue deficit by FYE 2020 (Jan 2020-Dec 2020) compared with 2019 (%)	-14	-10	-9	-13

\*OSL = orthopaedic service line, HF = Henry Ford Health, PM = Penn Medicine, WU = Washington University School of Medicine in St. Louis, Y = Yale School of Medicine, and FYE = fiscal year-end.



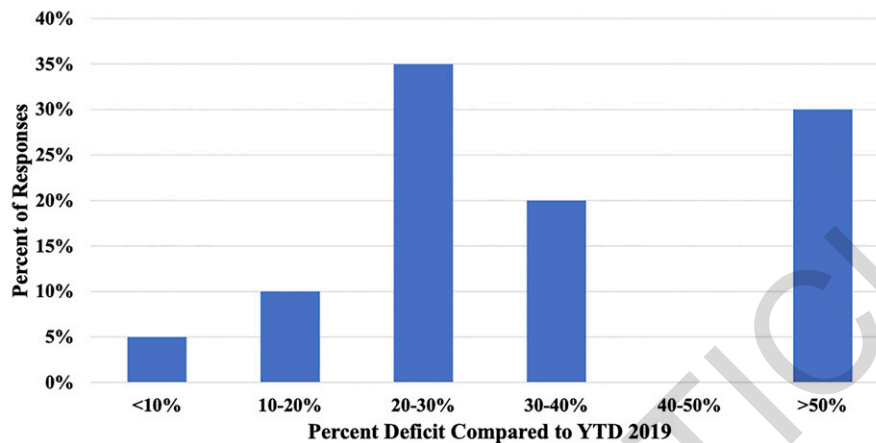
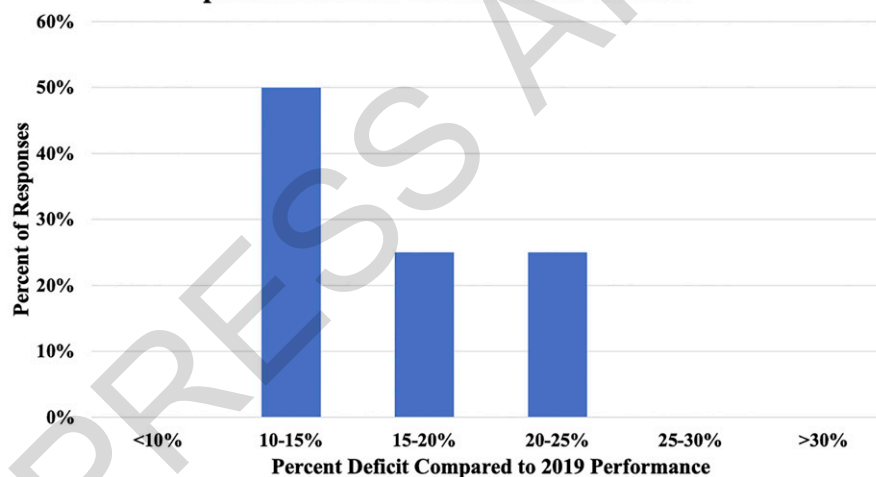
**(A) Audience Response: What was your approximate percent revenue deficit by end of 2020 shutdown period compared to 2019 Year-to-Date?****(B) Audience Response: What was your End-of-Year 2020 percent revenue deficit relative to 2019?**

Fig. 1

**Figs. 1-A and 1-B** AOA symposium audience responses. Audience members, made up of orthopaedic leadership from across the United States, were polled on the initial percent revenue deficit incurred by their OSL by the end of the shutdown period (**Fig. 1-A**) and the end of 2020 (**Fig. 1-B**) as compared with department performance over the same period from the previous year. **Fig. 1-A** The initial deficits incurred by the OSLs represented in the audience varied considerably, with 55% of responses reporting revenue deficits between 20% and 40% compared with year-to-date (YTD) performance in 2019. Notably, an additional 30% of responses reported deficits that were >50%. **Fig. 1-B** Reports on end-of-year performance by the OSLs represented in the audience demonstrated a reduction in revenue deficits in orthopaedic services overall, with 50% of responses reporting revenue deficits between 10% and 15%.

anticipated, lasting up to 21 business days. This delay in re-approval drastically impeded efforts to work through the backlog of cancelled cases rapidly and conveniently, further prolonging the recovery of OR volume (HF). OSL leadership was limited in their ability to expedite this process; however, this experience highlights the importance of engaging all stakeholders in health care, including insurers, during the planning stages of recovery.

Lastly, the increased workloads brought on by COVID-19 have also taken a toll on the morale of orthopaedic workforces.

Faculty and staff were initially understanding regarding many of the deficit mitigation strategies, including staff reductions, as leadership communicated the challenges and the decisions that were required to address them. While most OSLs made use of furloughs as the primary means to adjust staffing to match decreased clinical demands, some institutions also leveraged permanent staff reductions (WU). As clinical demand returned, staff rehiring processes trailed behind the return of patient volumes, which led departments to become short-staffed. This difficulty in rehiring was not predictable and continues to be a challenge

with the ongoing pandemic. Workforce challenges have contributed to a noticeable decrease in the morale of all providers as their clinical responsibilities have grown without additional support. As rehiring is underway, OSL leadership has committed to reestablishing a positive and healthy morale by emphasizing trust, empathetic listening, purpose-driven work, and values-driven decision-making (WU).

### OSL Year-End Performance

This AOA symposium article presents the deficit recovery strategies and experiences of 4 major academic medical institutions in the United States. The size of these departments ranged between 47 and 75 physicians, and prepandemic annual surgical volume ranged between 7,500 and 21,000 surgeries (Table I). The cancellation of cases during the shutdown period led to losses that accounted for between 7% and 10% of annual surgical volumes (Table I). The resulting year-to-date revenue deficits incurred at the end of the shutdown period varied considerably among OSLs, with reported deficits as low as 13% and as high as 32% compared with performance over

the same period in 2019 (Table I). This variability was also observed among the audience responses during the AOA symposium, with most respondents reporting deficits that centered around approximately 30%. However, nearly a third of respondents reported deficits of >50% by the end of the shutdown period (Fig. 1-A). While each OSL employed a unique combination of strategies to address these deficits, all departments reported that year-end revenue deficits had substantially improved (4% to 20% improvement) compared with those reported at the end of the shutdown period, even despite 1 OSL experiencing a second shutdown period late in 2020 (Tables I and II). Such improvements in revenue deficits by year end were also reflected in the OSLs that were represented in the audience. All respondents reported department year-end deficits of <25% compared with 2019 revenues, half of which were reported to be between 10% and 15% (Fig. 1-B).

### Summary

COVID-19 brought about a sudden and widespread disruption to the U.S. health-care system and has highlighted the real risk that pandemic-level health events pose. The experiences described

**TABLE II Cost Reduction and Revenue Generation Strategies Employed by Each OSL\***

Institution	Employed Strategies for Cost Reduction	Employed Strategies for Revenue Generation
HF	Benefits restructuring (biannual to annual bonus calculation) Furloughs to match drop in clinical demand	Telemedicine Provider engagement with patients during shutdown Patient rescheduling based on medical-need metrics Informing patient rescheduling with patient preferences data Community marketing of surgery resumption and safety measures in place Surveyed providers on willingness to engage in specific deficit recovery strategies Calculated provider-specific targets for weekly clinical and surgical volumes Leveraging of ASC settings for initial resumption of surgery Engaged system administration with patient and provider data to support requests for further OR block allocations
PM	Discretionary spending cuts Postponement of capital investment projects	Telemedicine Leveraging of value-based health-care metrics to increase surgical case throughput Provider engagement with patients during shutdown
WU	Furloughs to match drop in clinical demand Salary reductions Permanent staffing reductions Administrative work-from-home models	Telemedicine Leveraging of ASC settings for resumption of surgery Shifting cases away from main hospital, utilizing less- burdened hospitals
Y	Discretionary spending cuts Approval process for departmental expenses Administrative work-from-home models Administrative resource sharing among departments	Telemedicine Leveraging of ASC settings for resumption of surgery Shifting cases away from main hospital, utilizing less- burdened hospitals OR capacity on Saturdays

\*OSL = orthopaedic service line, ASC = ambulatory surgical center, OR = operating room, HF = Henry Ford Health, PM = Penn Medicine, WU = Washington University School of Medicine in St. Louis, and Y = Yale School of Medicine.

by the OSLs represented in this AOA symposium demonstrate the range of strategies that can be employed to stabilize operations and initiate recovery efforts during an ensuing financial crisis. While each OSL employed different combinations of recovery strategies, every represented OSL demonstrated improvement in revenue deficits by the end of 2020. Ultimately, the effective management of financial deficits required OSL leadership to employ multifaceted approaches that incorporated purposeful and uplifting strategies to minimize losses, encourage the expansion of productive capacity, and elevate the morale of health-care teams. ■

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