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Addressing postpandemic disruption in a safety net endoscopy unit

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The coronavirus pandemic has disrupted American healthcare delivery, particularly in situations with high baseline demand such as systems caring for underserved patients and high-throughput procedural areas. Although the impact in the northeastern United States was greatest in spring 2020, the peak of the COVID-19 pandemic in southern California was between January 2021 and February 2021. During this time nonurgent endoscopic care was suspended at the Los Angeles County + University of Southern California Medical Center (LAC+USC) as staff were redeployed to inpatient units. Despite the resumption of full operation in March 2021, the number of patients awaiting endoscopy continued to increase and exceeded 1000 patients by June 2021. Before the pandemic, the procedure backlog ranged from 100 to 200 procedures; thus, this represented a 5- to 10-fold increase from baseline. This “post-Covid” crisis of deferred and routine care required identification of barriers, development of novel interventions, and rapid implementation of changes to our healthcare delivery system. The work is generalizable because an unintended consequence of the pandemic has been the enormous amount of deferred care that has challenged nearly every healthcare system in the nation.

NEEDS ASSESSMENT

In June 2021, we performed a granular assessment of the causes of the persistent backlog for GI endoscopy. Among patients scheduled for endoscopy, only 55% completed the procedure. Additionally, attempts to perform preprocedure telephone counseling and remote

evaluation for primarily non-English-speaking patients with limited access to information technology required diversion of extensive nursing resources from direct patient care. Before the pandemic, our unit used a brief in-person nurse visit 2 weeks before endoscopy, with favorable compliance: 85% of patients completed their endoscopic procedures. We identified that 12% of patients referred for endoscopy were diverted for preprocedure cardiac clearance. Although this was consistent with our prepandemic referral pattern, as a consequence of severe backlogs in the cardiology clinic the entire preprocedure process was delayed. At 3 months of follow-up, the conditions of only 14% had been evaluated, and “cardiology clearance” visits had resulted in no management changes. Universal preprocedure COVID-19 testing also resulted in delays or cancellations for 20% of patients. During high-demand periods, the median time from testing to results was ≥ 8 days, which exceeded our required window of testing within 5 days of the procedure. Referral to the anticoagulation clinic for preprocedure adjustment also resulted in significant delays. On the basis of our needs assessment, we developed several targeted strategies to address the procedure backlog.

EXPECTED PRACTICE FOR PREPROCEDURE CARDIOLOGY CLEARANCE AND ELECTRONIC CONSULTATION SYSTEM

A team composed of senior anesthesiologists, cardiologists, and gastroenterologists at our center reviewed the literature pertaining to preendoscopy cardiology clearance. Through an iterative process, our multidisciplinary team developed an evidence-based algorithm to develop for patients with heart failure, coronary artery disease, valvular dysfunction, and arrhythmia before GI endoscopy (Appendix 1, available online at www.giejournal.org). It was recognized that the most frequent concern not to be resolved by use of the algorithm was management of secondary antiplatelet agents after recent percutaneous coronary intervention. The team determined that this issue could be rapidly addressed on a per-patient basis with the use of our established electronic consultation platform.¹

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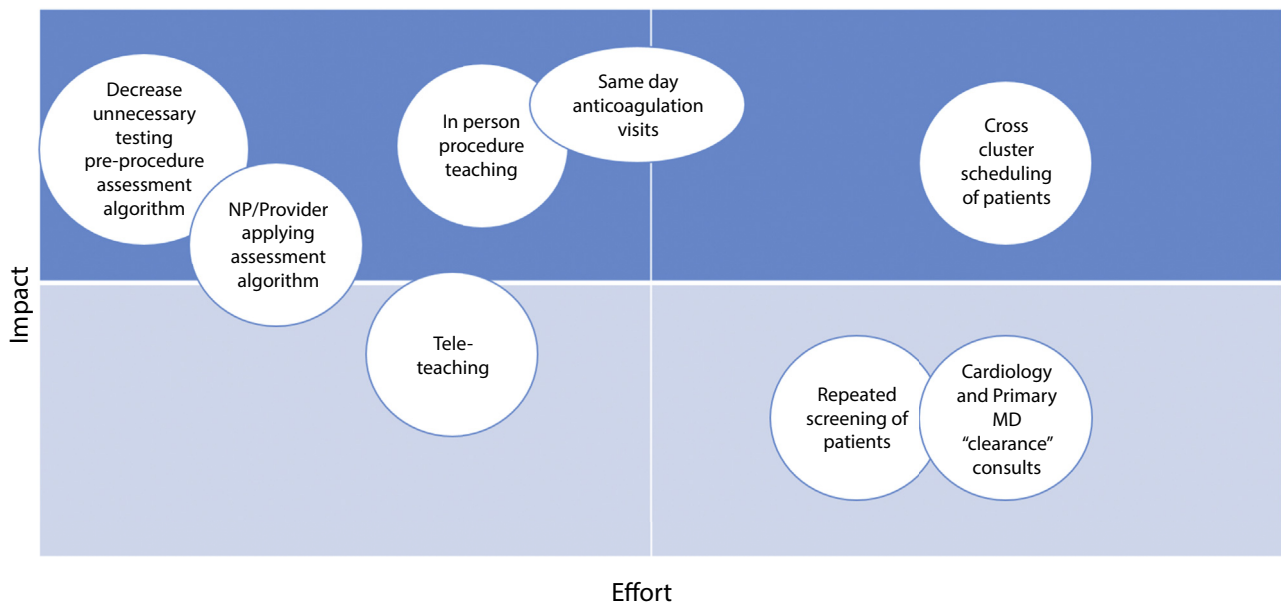


Figure 1. Impact-effort matrix of interventions utilized to address the post-COVID backlog in the Los Angeles County + University of Southern California Medical Center Endoscopy Unit. NP, Nurse practitioner.

INTEGRATED PREPROCEDURE TEACHING VISIT

Given the language barriers and limited access to technology in our population, we again initiated our in-person nurse teaching visit 2 weeks before endoscopy. To enhance the impact of the visit, we leveraged the resources of the medical center to create a same-day anticoagulation clinic visit in an adjacent building. In addition to the bilingual teaching nurse, we trained a nurse practitioner to apply the cardiology clearance expected practice under faculty supervision during these visits.

REDUCTION OF UNNECESSARY TESTING

Multicenter studies have demonstrated that the transmission of SarsCov2 to patients and providers of GI endoscopy is extremely low (<1%).² As part of an evidence-based Los Angeles County Department of Health Services (DHS)-wide expected practice, we stopped preprocedure COVID testing for colonoscopy. This approach is now codified as an American Gastroenterology Association Guideline.³

FLEXIBLE CONTRACTING AND LEVERAGE OF ACADEMIC PARTNERSHIPS

As part of the Los Angeles County DHS we developed a pathway to refer overflow procedures to other centers in our health system and academic partners. We also used flexible contracting with the University of Southern California (USC) to contract additional faculty to perform

procedures in the Los Angeles County Hospital endoscopy unit.

IMPLEMENTATION OF INTERVENTIONS

We used an impact-effort matrix to time the rollout of these interventions (Fig. 1). Unnecessary testing was halted by June 15. We next developed our multidisciplinary algorithm for cardiology clearance and fully integrated it into our pathway on June 23. By July 7 we implemented the enhanced in-person visit, including same-day anticoagulation appointments, and on July 9 we initiated additional direct endoscopy by USC faculty. Simultaneously, we phased out teleteaching.

PATIENTS AWAITING ENDOSCOPY

As part of a system-wide initiative, we converted all tracking and scheduling to an electronic queue system. This enabled a real-time dashboard of core metrics that included the number of patients awaiting procedures and their time on the queue. After the implementation of interventions, the number of patients awaiting endoscopy decreased from 1011 on June 15 to 453 by October 8 (Fig. 2), and the median queue time decreased from 69 days (interquartile range [IQR] 37-83) to 51 days (IQR 25-93). Finally, the preprocedure clearance/teaching team was reduced by 50% (from 4 to 2 nurses). Referrals for cardiac clearance were reduced by >80% between July 1 and October 1, 2021, and E-consultations for antiplatelet management were addressed in no more than 5 days.

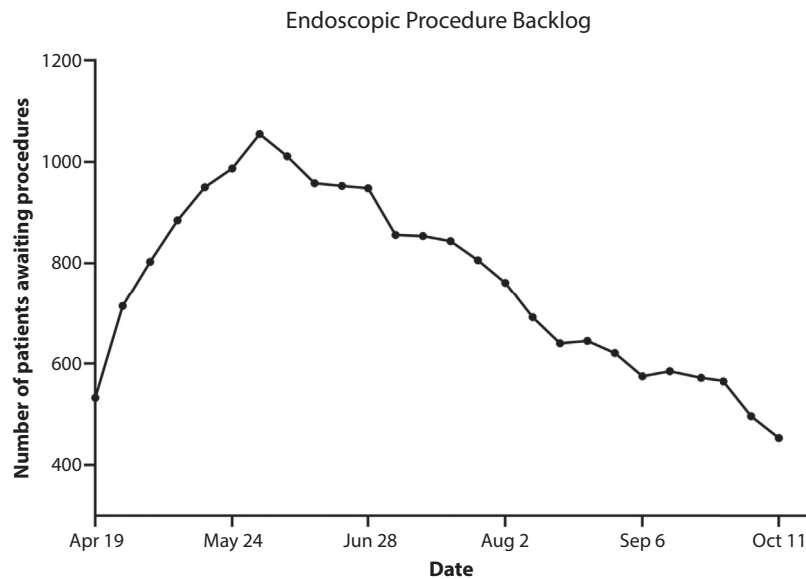


Figure 2. Number of patients awaiting procedures in the Los Angeles County + University of Southern California Medical Center Endoscopy Unit in 2021.

Cross-cluster scheduling to other medical centers was implemented on an as-needed basis in late July.

INSIGHTS

At the LAC+USC Medical Center we learned that the disruption of COVID-19 on patient care lasted long after the surge but can be overcome by targeted interventions. Processes that enable remote care of patients in an emergency may be suboptimal in the longer term for a population with limited language and technical proficiency. We found that resumption and enhancement of in-person teaching visits enabled a full resumption of our endoscopy unit. Patient feedback indicates that the opportunity to review diagrams of the preparation processes with the bilingual nurse, particularly if literacy is limited, to ask questions face-to-face, and to see the endoscopy unit empowers these patients to follow through. Although COVID-19 has increased the use of remote healthcare, its impact on patient health and overall well-being of vulnerable (socioeconomic challenges, chronic illness) populations requires more investigation.⁴ Elimination of unnecessary preprocedure consultations and testing using evidence-based expected practices and an electronic consultation system allowed us to increase throughput and efficiency, as has been demonstrated in other areas.⁵ Additionally, the use of flexible contracting and longstanding academic partnerships enabled targeted adjustment in faculty staffing to optimize volume. To address psychosocial stressors related to the pandemic, staff at LAC+USC also had access to a university-based care-for-the-care-giver program, which provided resources (ie, child care), quarantine accommodations, and counseling. The entire care team was involved at

each step of these targeted changes to maintain motivation and engagement. Consequently, the number of patients waiting for endoscopy and delays in care markedly reduced.

There are several important limitations to our experience. LAC+USC represents a safety net hospital with an at-risk population. Nevertheless, given the baseline operational challenges, the impact of major crises and their aftermath may be seen earlier and to a greater extent in safety net hospitals, which may provide insight for the broader healthcare delivery system. Although studies in the context of the alpha variant support reduction of preprocedure testing, evidence is lacking for immunocompromised populations. Furthermore, COVID-19 is an ever-changing menace, and as the virus mutates into new variants (ie, delta, omicron) its risk to the safety of healthcare workers and the need for preprocedure testing must be continuously reevaluated. Our ability to use flexible contracting with academic partners may also not be broadly applicable, although the use of locum tenens gastroenterologists is a comparable mechanism, which has been used successfully in other healthcare systems.

Although the individual interventions are not in themselves disruptive or especially novel, the overarching, coordinated, and bottleneck-focused use of multiple different interventions was effective at solving a complicated real-world challenge. Although the COVID-19 pandemic appears to be waning, our strategy may be applicable to address disruptions in care from future challenges.

Furthermore, the strain of the pandemic exposed several problems in our system and provided the energy and innovation to address them. A silver lining of this crisis is that the integration of these solutions into our workflow, such as the multidisciplinary preprocedure algorithm, will improve our efficiency and productivity after COVID-19.

Enhanced operational processes are complementary to technologic interventions, including new capsule-based systems to evaluate acute bleeding and to triage patients for colonoscopy, and novel airway devices that will likely be used long after the pandemic.⁶⁻⁸

DISCLOSURE

H.F. Yee: Advisor for RubiconMD. All other authors disclosed no financial relationships.

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APPENDIX 1

Cardiology Clearance Algorithm for LAC+USC Endoscopy Unit Version.6/21

In accordance with the American Board of Internal Medicine's choosing wisely policy the LAC+USC Gastroenterology Division in concert with the Division of Cardiology and Department of Anesthesiology has developed the following algorithm to identify patients in need of additional Cardiology clearance prior to endoscopic procedures.

HEART FAILURE

- Patients with NYHA Class I or II heart failure may proceed to endoscopy without additional testing regardless of ejection fraction.
- Repeat echocardiography is strongly discouraged.
- Patients with New York Heart Association III/IV will be referred to cardiology for clearance evaluation. These symptoms include orthopnea, paroxysmal nocturnal dyspnea, and reduced exercise tolerance (ie, unable to walk 1 flat city block or one flight of stairs).

CORONARY ARTERY DISEASE (CAD) AND PRIOR CAD INTERVENTION

- Patients with stable angina, NYHA I/II symptoms will proceed without further workup.
- Patients with stable angina, NYHA I/II symptoms who underwent cardiac bypass grafting (CABG) or percutaneous intervention with stent (>3 months ago) who are not on clopidogrel (Plavix) or another secondary antiplatelet agents (ie, prasugrel (Effient) or ticagrelor (Brillinta)) may proceed without further workup.
- For patients who underwent percutaneous intervention who are still on clopidogrel or secondary antiplatelet agents, an e-consult to cardiology will be submitted for the specific question of stopping the anti-platelet agent with the anticipation of a rapid electronic response <5 days. Aspirin will be continued.
- Patients with NYHA III/IV angina symptoms need cardiology.

- Aspirin will be CONTINUED in patients with CAD or CAD intervention
 - Rare exceptions are planned ampullectomy or endoscopic resection/dissection of large 2cm lesions, which prompts GI Clinic visit.

AORTIC STENOSIS AND VALVULAR DISEASE

- Patients with a history of mechanical valve replacement will be referred for same day anticoagulation appointment and endoscopy without further workup.
- Those with porcine valves will undergo no further workup.
- Patients with mild to moderate valvular disease (no replacement) with NYHA I/II symptoms without atrial fibrillation, ejection fraction <30%, or stroke history will be referred for procedure without further workup.
- Repeat echocardiography is strongly discouraged.
- Those with severe and critical valvular disease or valvular disease (no replacement) will be referred for cardiology consultation.

ARRHYTHMIA

- Patients with atrial fibrillation, atrial flutter, and supraventricular tachycardia who are stable should be maintained on rhythm control medication but do not require further cardiology evaluation.
- Those on anticoagulants will be referred to same day anticoagulation clinic.
- Those with pacemakers and automatic implantable cardioverter defibrillator (AICD) who have not had syncope or recent shocks (AICD) and have been interrogated in <6 months do not require cardiology evaluation.
- Repeat EKG or holter monitors are discouraged.
- Patients with pacemakers or AICD with recent AICD shock or syncope should be referred for cardiology evaluation. Patients with AICD who have not been interrogated in >6 months require cardiology evaluation.
- Additionally, those with NYHA III/IV symptoms potentially related to arrhythmia will be referred for cardiology evaluation.

If endoscopy or anesthesia providers have any remaining concerns about specific patients not addressed by this algorithm they are encouraged to obtain a cardiology consult