

Selective centralized booking as a low-cost alternative to centralized referral

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Accepted Mar. 25, 2024

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Cite as: *Can J Surg* 2024 August 1;67(4).
doi: 10.1503/cjs.002622

SUMMARY

Centralized referral systems have been successfully implemented to shorten and equalize surgical wait times; however, ongoing expenses make sustaining these projects challenging. We trialed a low-cost centralized booking project for hernia surgery in a community hospital from July to November 2019. Eligible patients (i.e., those with visible or palpable inguinal or umbilical hernias who were agreeable to an open mesh repair) were booked with the first available surgeon after initial consultation. Centrally booked patients with either inguinal or umbilical hernias waited a mean of 82 (standard deviation [SD] 32) and 80 (SD 66) days, respectively, while those who did not use the centralized system waited 137 (SD 89) and 181 (SD 92) days, respectively. Centralized booking increased operating room utilization as a larger pool of patients was available to call when last-minute cancellation occurred; centralized booking also effectively equalized wait-lists among 6 surgeons. Selective centralized booking is a promising concept that led to more efficient utilization of available operating room time with a significant decrease in wait times; this system could potentially improve access for all patients awaiting general surgery without requiring additional funding.

Surgical wait-lists result from a mismatch between supply and demand. This issue is not unique to Canada. The cancellation of scheduled procedures during the COVID-19 pandemic further increased this imbalance.

Wait times for elective surgery reflect 2 components, namely the time between referral and initial consult (wait 1) and the time between consult and surgery (wait 2).^{1,2} Interventions to address wait-lists aim to target one or both components. Single-entry models target the first wait as referrals are pooled, and the first available surgeon sees the patient in consult.^{1,2} Used in isolation, these approaches may not address the second wait.³

In a traditional referral model, the primary care physician refers the patient to their surgeon of choice. The patient is then assessed by that surgeon and booked for surgery in the operating room (OR) time allotted to that surgeon, often leading to uneven wait-lists among surgeons (Figure 1). In comparison, single-entry models involve the referral being sent to a central intake system, which then assigns the patient to the surgeon with the shortest wait-list (Figure 2). Not only does this require ongoing funding to staff the referral intake system, but surgeons with longer wait-lists will receive fewer new referrals until wait-lists have equalized between surgeons, leading to potential loss of office productivity, which may paradoxically increase the wait from referral to initial consult.

In contrast, our quality-improvement project focused on trying to decrease the second wait by developing a centralized booking system. In this system, the patient sees the surgeon to whom they were referred, like a traditional referral. If the patient meets criteria for surgery, they are offered the option of centralized booking, whereby they are added to a collective wait-list and have their procedure performed by the first available surgeon, who they meet on the day of the procedure (Figure 3). When a surgeon has a last-minute opening in their OR slate, the OR booking staff can pull from the pool of available patients who have opted for the centralized booking process.

The project goal was to reduce the waste of valuable OR time and decrease wait 2 without requiring additional funding or resources to staff a referral intake system, as is required for single-entry models.

We piloted our project at a community hospital, Vernon Jubilee Hospital (VJH) in British Columbia, which involved all 6 of the general surgeons on staff. We chose

open inguinal and umbilical hernia repairs for the pilot project as these procedures are high volume, relatively standardized, and day care surgeries. Inclusion and exclusion criteria are shown in Table 1.

The OR booking staff recorded wait 2 for patients in the centralized booking pilot project from July to November 2019 and for patients awaiting hernia repair

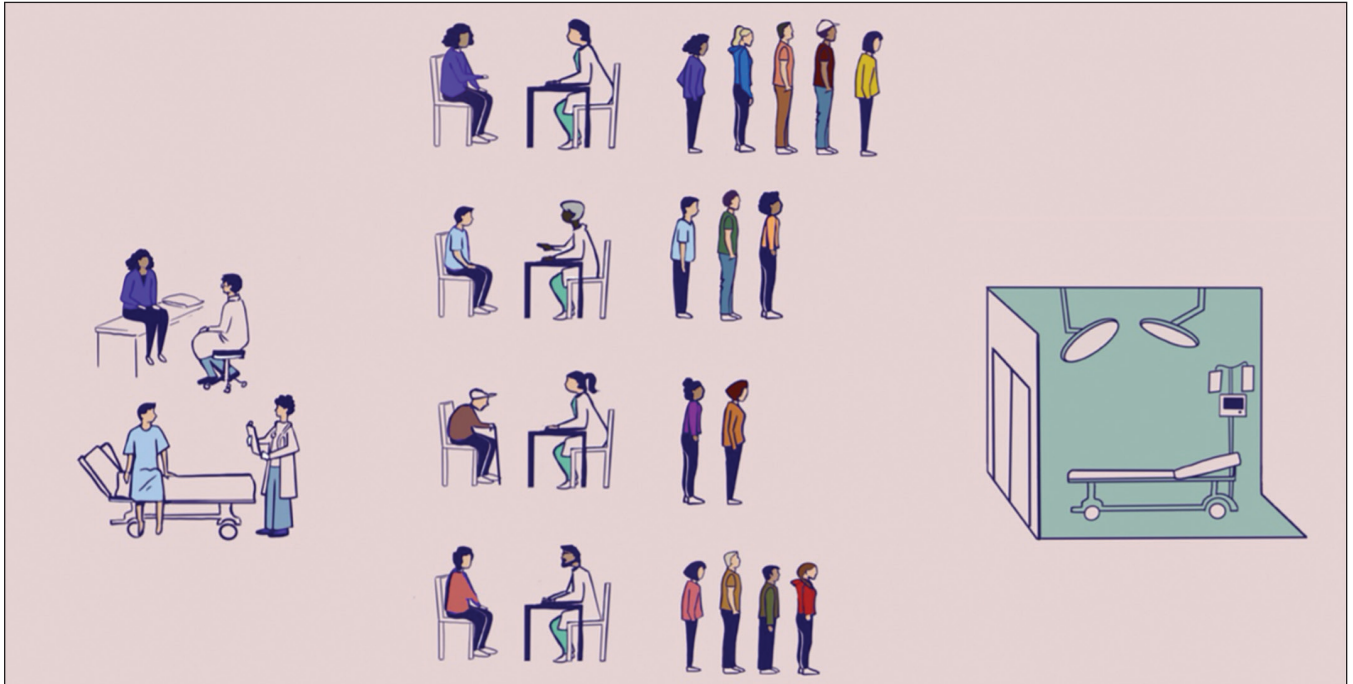


Fig. 1. Traditional referral system. The primary care physician refers the patient to a specific surgeon for an initial consultation. If booked for surgery, the patient goes on that specific surgeon’s wait-list. Illustration by Avikali Lomavatu.

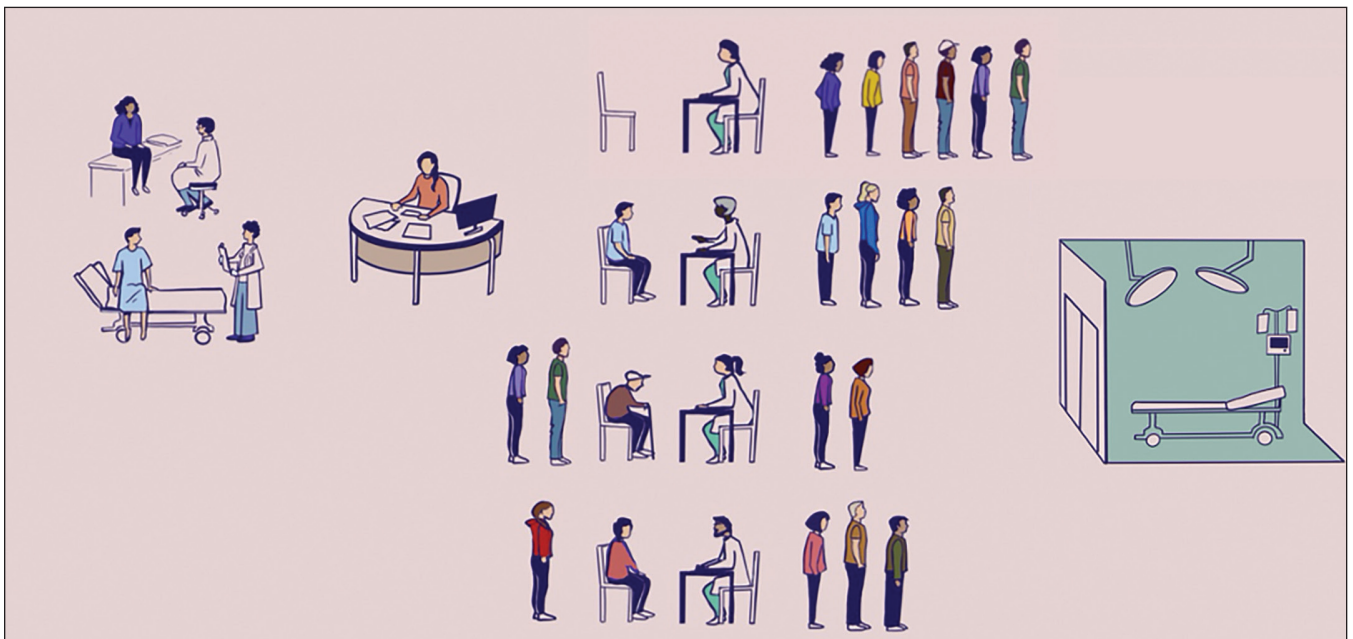


Fig. 2. Centralized referral system. The primary care physician refers the patient to a central intake system, which then assigns the patient to the surgeon with the shortest wait-list. Surgeons with longer wait-lists receive fewer new referrals until wait-lists are equalized among all surgeons. Illustration by Avikali Lomavatu.

in the 6 months before the pilot project (January 2019–June 2019). We compared the wait times using the Student *t* test ($p < 0.05$ considered significant). In addition, we looked at the surgeon-specific wait-times both pre- and post-implementation of our project.

The project was implemented permanently at VJH in January 2020 and was expanded to include elective laparoscopic cholecystectomies as, together with inguinal and umbilical hernias, these surgeries comprise 50% of elective general surgery procedures at VJH. The inclusion and exclusion criteria are shown in Table 2.

A total of 18 centralized booking cases were performed in the first 5 months of the pilot project from July to November 2019. Centrally booked patients with either inguinal or umbilical hernias waited an average of 82 (SD 32) days ($n = 13$, range 34–124 d) and 80 (SD 66) days ($n = 5$, range 17–160 d), respectively, while those booked through the noncentralized system waited 137 (SD 89) days ($n = 202$, range 9–439 d) and 181 (SD 92) days ($n = 90$, range 13–483 d), as seen in Figure 4. Centrally

booked patients with both types of hernia repairs had significantly shorter wait times ($p < 0.05$). In addition, as seen in Figure 5, the surgeon-specific wait times equalized among the group of 6 general surgeons by July 2020.

This pilot protocol was simple, quick to implement, adaptable to include various procedures and restrictions, and, most of all, financially sustainable, as the protocol involved using existing resources, with no additional funding required to initiate or sustain the project. Maintaining a list of the centralized booking patients and distributing them to the OR slates of the surgeons was easily incorporated by the OR booking staff without having to hire extra staff.

In essence, we implemented a hybrid shared-care model that applied to specific procedures, thereby making it more attractive to our surgical colleagues than other universal team-based models. It enabled us to include only operations associated with a shorter patient relationship without compromising longer therapeutic relationships, as with those established with cancer-related care. In addition, we

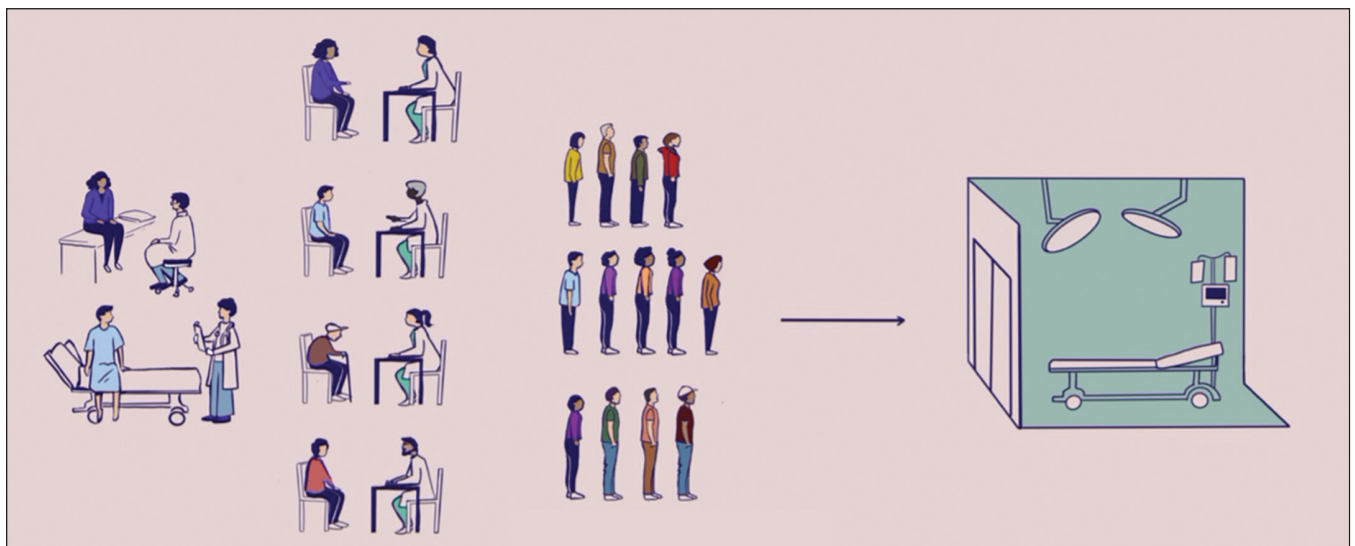


Fig. 3. Centralized booking system. The patient is referred for a consult with a specific surgeon. If they meet the criteria, the patient is added to a collective wait-list and their surgery performed by the first available surgeon. Illustration by Avikali Lomavatu.

Table 1. Inclusion and exclusion criteria for centralized booking pilot project

Type of criteria	Criterion
Inclusion criteria	Umbilical or inguinal hernia
	Age 12–75 yr
	Obvious, visible, or palpable hernia
	Opts for centralized booking
	Planned open mesh repair
Exclusion criteria	Requires a preoperative anesthetic appointment
	Recurrent hernia
	BMI > 35 kg/m ²
	Non-mesh repair
	Laparoscopic hernia repair

BMI = body mass index.

were able to apply this model despite surgeons' offices being spread across the city, with different medical office assistants.

Although many elective surgeries were stopped during the COVID-19 pandemic, which hindered further data collection because of redeployment of booking staff, the success of the centralized booking pilot led to the permanent implementation of the protocol, with the addition of elective cholecystectomies. The new protocol equalized the wait-lists among surgeons, highlighting the adaptability of the model as well as its impact.

Selective centralized booking is a promising concept that led to a significant decrease in wait times for certain elective procedures, improving access for all patients undergoing general surgery without needing any additional funding.

This successful pilot project and subsequent long-term implementation at a community hospital has demonstrated a need for further study and application of this low-cost model at other sites.

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Competing interests: None declared.

Contributors: All of the authors contributed to the conception and design of the work, drafted the manuscript, revised it critically for important intellectual content, gave final approval of the version to be published, and agreed to be accountable for all aspects of the work.

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Table 2. Inclusion and exclusion criteria for cholecystectomy

Type of criteria	Criterion
Inclusion criteria	Laparoscopic cholecystectomy for biliary colic
	Confirmed gallstones on ultrasonography
	No wall thickening or duct dilation
	No history of acute cholecystitis or multiple presentations to the ED
	Opts for centralized booking
Exclusion criteria	Requires a preoperative anesthetic appointment
	BMI > 35 kg/m ²
	Persistently elevated bilirubin or substantially increased liver enzymes
	Previous open bowel resection or other upper abdominal surgery
	Gallbladder polyps or biliary dyskinesia
	Gallstone pancreatitis

BMI = body mass index; ED = emergency department.

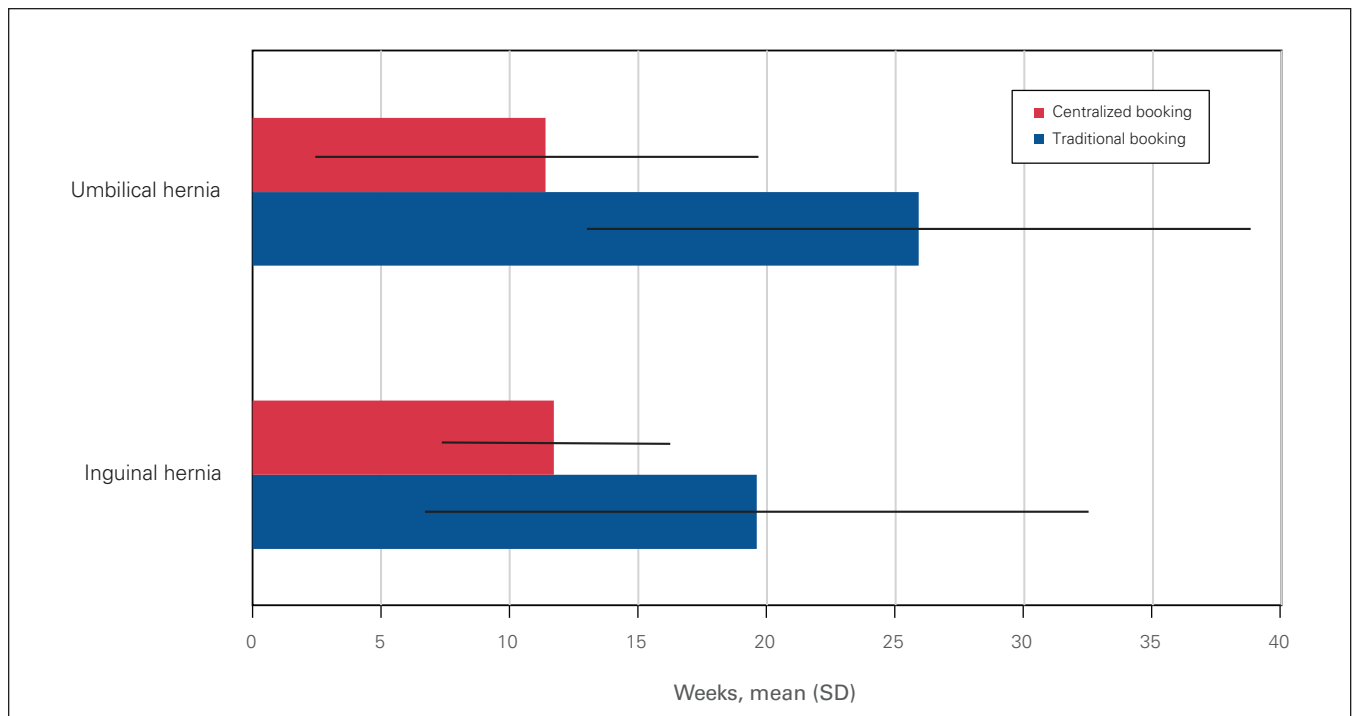


Fig. 4. Average wait time for inguinal and umbilical hernia repair for patients whose surgery was done under the traditional booking process versus patients booked through centralized booking. Standard deviations (SDs) expressed with error bars.

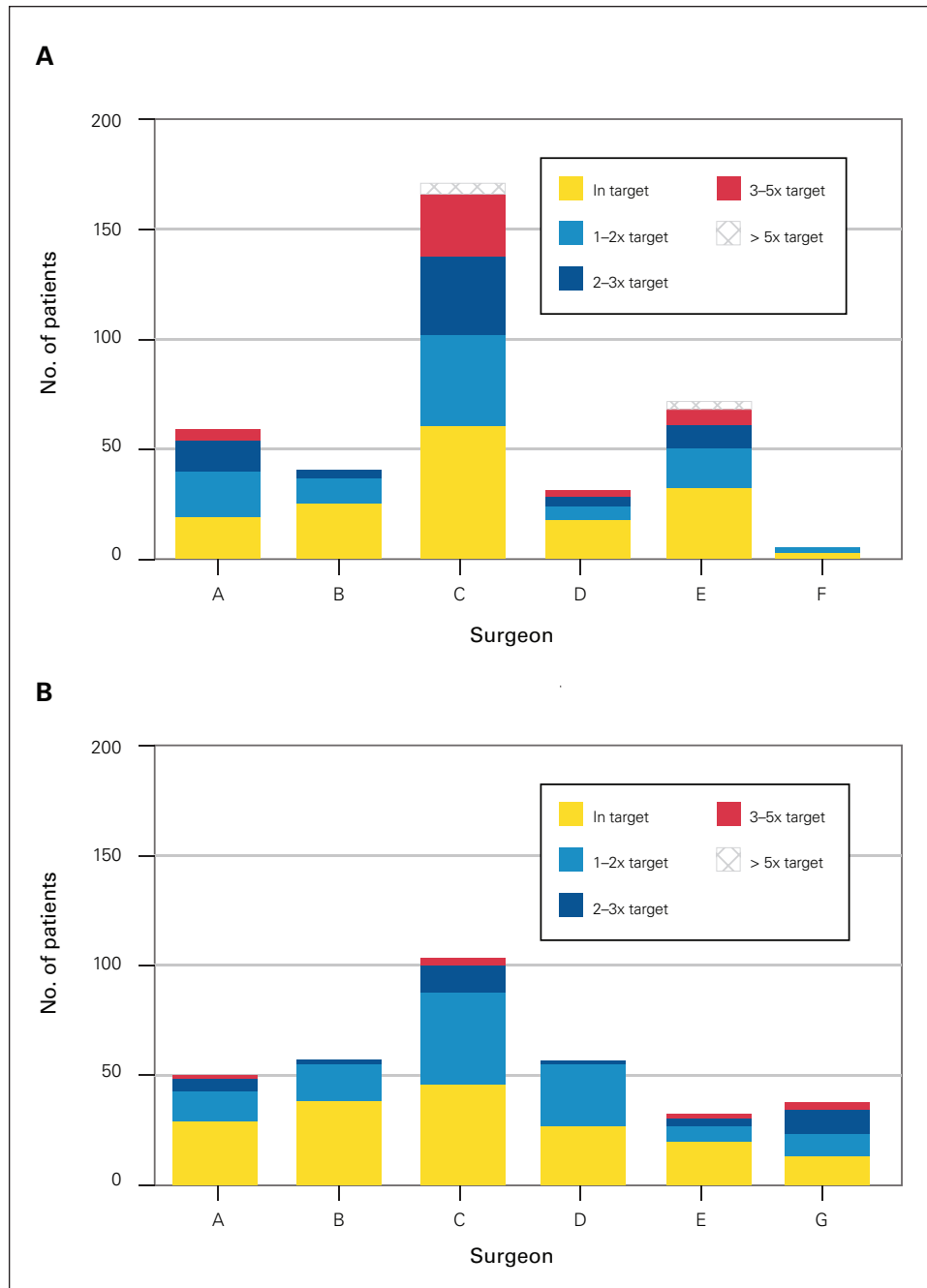


Fig. 5. Wait lists of 6 surgeons (identified by letters A through G) relative to target wait times before and after implementation of centralized booking protocol (images are scaled for purposes of comparison).

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Disclaimer: Hamish Hwang is an associate editor for *C7S* and was not involved with the editorial decision-making process for this article.

References

1. Priest A, Cohen M, Rachlis M. Vancouver: BC Health Coalition, Canadian Centre for Policy Alternatives, & BC Office; 2007. *Why wait?: Public solutions to cure surgical waitlists, a submission to the BC*

Government's Conversation on Health. Available: https://www.heu.org/sites/default/files/uploads/research_reports/why_wait_surgical_wait_lists.pdf (accessed 2020 May 24).

2. Damani Z, Bohm E, Quan H, et al. Improving the quality of care with a single-entry model of referral for total joint replacement: a pre-implementation/post-implementation evaluation. *BMJ Open* 2019;9:e028373.
3. *Future directions for surgical services in British Columbia*. Vancouver: Ministry of Health and the Provincial Surgical Executive Committee; 2015. Available: <http://www.health.gov.bc.ca/library/publications/year/2015/surgical-services-policy-paper.pdf> (accessed 2020 June 20).