

The effect of location on postoperative follow-up in paediatric surgery patients: a retrospective study

Anna E Shawyer

Section of Pediatric General Surgery, Department of Surgery, Children's Hospital Research Institute of Manitoba, University of Manitoba, Winnipeg, Manitoba, Canada

Corresponding Author:

Anna E Shawyer; Section of Pediatric General Surgery, Department of Surgery, Children's Hospital Research Institute of Manitoba, University of Manitoba, Winnipeg, Manitoba, Canada;

Email : anna25@myumanitoba.ca

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Abstract

Objective : Because of the centralization of medical services in Canada, patients must travel great distances for healthcare, which may jeopardise their health. We hypothesised that children who lived further away from a children's hospital would be given and attend fewer follow-up appointments.

Methods : During a 2-year period, we examined children under the age of 17 who were referred to the general surgery clinic at a tertiary children's hospital and received surgery. We used descriptive data.

Results : The number of patients found was 723. The bulk (61%) were male, had a median age of 7 years (range 18 days to 16 years), and were from a major urban centre (MUC) (56.3%). The median distance travelled to hospital by MUC patients was 8.9 km (range 0.9-22 km) compared to 119.5 km (range 20.3-1950 km) by non-MUC patients. Children with MUC received more follow-up visits (72.7% vs 60.8%,

p0.05). There were no notable differences in postoperative complications (9.8% vs 9.2%, p=0.78) or follow-up attendance rates (MUC 88.5% vs non-MUC 89.1%, p=0.84). There were no fatalities.

Conclusions : Patients who lived further away from a hospital were given fewer follow-up appointments, but they attended at the same rate when offered one. Telemedicine and remote follow-up are underutilised methods for scheduling follow-up meetings.

Introduction

Since the 1990s, Canadian healthcare has been centralised in order to better outcomes and reduce costs to the healthcare system. 1 For paediatric surgical patients, centralization allows for specialisation of care, close proximity to prenatal diagnosis facilities, and the development of multidisciplinary links for investigating foetal and neonatal surgical outcomes research.

Despite these benefits, regionalization of care causes some patients to live further away from paediatric hospitals and travel longer distances for medical treatment.

Canada has 9.985 million km² of land space and 16 urban tertiary paediatric hospitals. 4 5 Over 40% of Canada's population of roughly 36 million people live in rural or small-town areas with longer distances to tertiary medical treatment. 6 There are disparities in healthcare utilisation depending on one's proximity to services; peopleFurthermore, distance to healthcare has a substantial effect on healthcare-related costs due to increased travel and parking costs, as well as missed days at work and school.

The Winnipeg Children's Hospital (WCH), in Winnipeg, Manitoba, Canada, is one of the country's 16 paediatric surgery facilities.

It serves patients from Manitoba, northwestern Ontario, and southeastern Saskatchewan, as well as the region of Nunavut, with a patient catchment area of more than 1.5 million people spread across more than 2.58 million km² (figure 1). 9-11 Patients must travel great distances for appointments, and some reside in remote areas (eg, ice roads, boat, or float plane access only).The goal of this research is to see if children under the age of 17 who are referred to the WCH's

paediatric general surgery clinic and undergo an elective surgical procedure are given and attend fewer postoperative follow-up appointments if they reside further away from the hospital. Some patients may have additional requirements that have a negative impact on the quality of care they receive, such as the need for additional personal protection equipment, a language barrier, or the distance travelled to a medical appointment. We hypothesise that patients who live further away are assigned and attend fewer appointments.

Methods

Study design

Following ethics clearance, a retrospective chart review was conducted. We examined all children under the age of 17 who were referred as outpatients to the paediatric general surgery department at the WCH in Winnipeg, Manitoba, Canada, between 1 January 2016 and 31 December 2017. This included patients undergoing surgery with a shorter duration of stay (48 hours). Patients with severe neonatal surgical conditions and congenital malformations were removed.

Observed outcome factors

To retrieve deidentified variables such as demographics, diagnostic findings, surgical procedure done, follow-up invitation and attendance, and postoperative complications, a prepiloted data collection tool was used. Distance was measured in kilometres from the first three numbers of the patient's home postal code to the WCH using the Google Maps website (Google Maps JavaScript API V.3.37). The geographical area refers to the Manitoba Regional Health Authority in which the patient lives. The data were divided into two categories for comparison: patients from Winnipeg (major urban centre (MUC)) and patients from outside of Winnipeg (non-MUC). People from MUC included everyone from the Winnipeg Regional Health Authority, while non-MUC patients included people from other Manitoba Regional Health Authorities as well as people from outside of Manitoba. For statistical reasons, the non-MUC group was further subdivided into a Northern and out-of-province group because the non-MUC area was quite large. As a result, three groups were used in some analyses. There were MUC, Northern and out-of-province, and non-MUC. This distinction was made because Northern and out-of-province patients receive travel grants for medical costs, whereas the rest of non-MUC patients do not. 12–14 WCH has six paediatric doctors on staff. All six surgeons performed surgery on patients from both treatment categories.

Based on documentation in the electronic patient record, a patient was recorded to have had a postoperative complication. Minor problems may go undetected if they are handled locally. Any reference of alternative follow-up modalities, such as telehealth or phone calls, was taken notice of. Furthermore, the reasons for not providing a follow-up appointment were recorded. These explanations were analysed qualitatively and categorised by theme.

Geolocation and statistical analysis

We used descriptive data. On categorical factors, two tests were run. For statistical research, Microsoft Excel for Mac 2011 (V.14.7.3, 2010 Microsoft) was used. Statistical significance was defined as a p value of 0.05. The data collection was geomapped using R Graphics software and Google Maps by plotting each patient by postal code onto a map of Manitoba and its neighbouring provinces and territories.

RESULTS

Between 1 January 2016 and 31 December 2017, a total of 1506 patients under the age of 17 were found and referred as outpatients to the WCH's paediatric general surgery clinic. Following their initial clinic visit, 723 (48.0%) of these patients received an elective surgical procedure. During the study's timeframe, no eligible patients were excluded. There were no incomplete data points.

Demographic information as well as the typical distance travelled to clinic in kilometres by patient group. Figure 1 shows the patient population's geographic distribution using geomapping. The MUC and its surrounding areas have a dense patient population, with the rest of the patient population dispersed across a large area.

DISCUSSION

Because of the recent centralised nature of healthcare in Canada, many patients and their families must travel long distances to obtain specialised treatment. Our findings support the enormous journey travelled by some patients and their families. What was unknown was whether out-of-town families were given the same rates of follow-up and if they were able to attend their appointments. Non-MUC patients were given fewer follow-up appointments, but their attendance percentages remained the same. There was no difference in complications observed, implying that decreased follow-up may not have

harmed patient care. The severity of the illness was not recorded during data gathering.

As a result, it was unclear whether or not follow-up differed based on the severity of the condition for which the patient was referred. Our research concentrated on patients who were scheduled to have surgery within 48 hours. It excluded patients with severe neonatal surgical conditions and congenital malformations who would normally be followed up on. We wanted to see if there was a difference in complications and follow-up compliance between patients from close and far away who had smaller procedures. The surgeon's follow-up for these conditions/procedures could be eliminated, saving the healthcare system, as well as patients and their families, precious time and money.

In our cohort, the reason for giving patients a follow-up appointment was not documented in the medical records. There are presently no routine criteria for determining the need for a follow-up visit (see table 3). The choice to offer a follow-up appointment is dependent on the surgeon's preference and experience, as well as the complexity of the procedure and individual patient factors. In reality, follow-up may not be necessary for routine operations. Furthermore, doctors do not require follow-up. As a result, they are willing to take lower personal remuneration in exchange for patient inconvenience while ensuring patient safety. Patients who were determined not to need a follow-up at WCH were told to contact their referring physician or a local healthcare provider as required. However, it is presently unknown whether the majority of referring physicians are comfortable managing postoperative follow-up for simple paediatric surgical conditions when provided suitable instructions. According to a study conducted in Alberta, Canada, 58% of paediatric general surgery patients made a postoperative follow-up appointment. 15 Patients who lived closer to the hospital had a roughly twofold higher chance of attending follow-up, while those who lived farther away had a 60% lower chance of attending, which contradicts our results. As observed in our research and the Alberta study, postoperative complication rates are often low and can be managed by local primary healthcare providers without the need for specialist assessment. 15

Paediatric urology patients in Quebec, Canada, travel an average of 70 kilometres one way for clinic visits, but those from further away can travel more than 1000 kilometres. 16 Traveling more than 200 kilometres for medical treatment is eligible for provincial monetary reimbursement. Our patient group can

also receive subsidised medical transportation for care that is unavailable in their neighbourhood or is not available within 100 kilometres of their home. 12–14 The number of patients in our cohort who use available provincial monetary assistance for medical travel is unclear from our records, but it is likely to include all of our non-MUC patients from Nunavut, Northern Ontario, Northern Manitoba, and some from Manitoba's Interlake-Eastern geographic area. However, costs exceed the amount funded and do not cover days missed from education or employment.

According to a recent Canadian research, 75% of families had one or more parents miss half a day or more of work to attend their child's surgical appointment. 8 Gimon et al discovered that postoperative follow-up appointments for paediatric surgery patients following routine surgeries were likely unnecessary and imposed significant financial burdens on patients, families, and the system. 15

Other techniques of follow-up could be used by surgeons and their patients to document complications and track patient outcomes. Telemedicine or e-medicine follow-up options are one possible solution for reducing financial costs and school and work absenteeism, 8 16-18 though there is little study on telemedicine in paediatric surgery. 16 Patients' families and surgeons have expressed happiness with the method in other surgical specialties that use telemedicine.

Telehealth and e-consult are both available to doctors in Manitoba, but there is no mention of their use in our sample group. This is most likely due to patient preference for in-person follow-up visits, as well as the inconveniences associated with telehealth use in Manitoba, such as the need for a special room and equipment, as well as a lack of remuneration for surgeons. However, after reviewing our data, we discovered that there were no unexpected findings or anything else of intrinsic value to the patient or family that arose during our in-person follow-up appointments, calling into question the need for these appointments following an uncomplicated and brief surgery.

Another option is to establish 'outreach' clinics, in which the surgeon goes to remote communities to provide personal follow-up. 19 There is little Canadian research on surgical outreach clinics. Bernstein discusses his experience establishing and operating a rural neurosurgery outreach centre. Because of the long distances between surgical specialties and the communities they serve, he recognised a need. 19 Bernstein emphasises the benefits for the surgeon, patients, and local

physicians as follows: providing valuable care for underserved areas, networking in these areas, and avoiding long trips to appointments, which directly results in patient cost savings and allows local physicians to provide this group of patients with the specialist care they require. A British systematic review²⁰ focused on primary care outreach clinics, highlighting improved patient experiences and access to treatment, as well as a higher patient preference for outreach clinics over hospital-based equivalents. O'Brien et al conducted a randomised controlled study on expert outreach clinics in the field of orthodontics and discovered a higher patient preference for attending an outreach clinic appointment.²¹ Finally, Haynes et al discovered that providing an outreach clinic for cataract surgery provided patients with a shorter travel time and a less expensive voyage, as well as considerably higher satisfaction.²² These studies discovered similar benefits and highlights of outreach clinics in a variety of medical and surgical disciplines. Outreach clinics, on the other hand, may result in a rise. Remote follow-up, like telehealth and e-consult, was not used in our patient cohort. However, given their benefits and the desire of patients who must travel long distances for ongoing care, there are plans to implement them as follow-up modalities for our paediatric surgeons to use. Telemedicine and remote follow-up would also be suggested for chronically ill children in order to improve patient satisfaction and compliance. Notably, four of our patients (3.3%) got a phone call regarding their surgical pathology because an in-person follow-up was deemed unnecessary (table 3). Currently, phone calls are not frequently used as an additional means of follow-up for patients who live further away from our centre, nor are McVay et al research²³ at Arkansas Children's Hospital, on the other hand, showed that postoperative follow-up using a structured telephone protocol was a positive substitute for in-person follow-up.²³ Their protocol was used in a variety of paediatric surgical operations, including herniorrhaphy, non-perforated laparoscopic appendectomy, circumcision, dermatological excisions, laparoscopic cholecystectomy, and ingrown toenails. They noticed several benefits of this follow-up modality, including not having to miss school or work to travel for an appointment that was typically straightforward and did not yield anything significant, lower costs and use of healthcare services, and a decrease in clinic no-show rates. This enables for more time to be spent on new consults or complex cases.

Their phone follow-up was found to be preferred by 90% of the family, and none of them requested an in-person contact.²³ Telephone follow-up in paediatric inguinal hernia repair had previously been demonstrated to be both practical and effective.

24 Furthermore, Fischer et al compared postoperative follow-up rates between in-person visits and phone conversations following specific paediatric general surgery procedures and discovered higher rates in the phone call group, as well as 93% satisfaction.²⁵ There was a reduction in institutional expenses, as well as financial savings for families and patients.²⁵ Telephone follow-up calls are thus a successful alternative modality for providing family-centered patient care and appropriate follow-up attendance.

During the recent COVID-19 pandemic, telemedicine and remote postoperative follow-up have become critical tools. As a result, telemedicine is being used more frequently in our center and is probably going to continue to be used. This includes videoconference calls, which give the surgical provider the ability to conduct visual wound inspections.

This research has limitations due to its retrospective design and the incomplete documentation found in the pediatric surgical charts. There was no recorded correspondence for several patients' postoperative follow-up appointments, so their postoperative course and possible complications were unknown. Many patients who were not given the option of a postoperative follow-up appointment did not have any supporting paperwork. Therefore, it is unclear if this was caused by travel and distance, the patient's treatment, the surgeon's preferences, or something else.

CONCLUSIONS

Patients who live further away from a paediatric surgical centre are not given as many follow-up visits as their urban peers. Follow-up after routine operations should be evaluated further so that patients, families, and the system can save time and money if they are considered unnecessary. Based on our minimal complication rate, common paediatric surgeries may not require any follow-up, even in MUC patients. The total amount of follow-ups performed could be reduced.

Telemedicine and remote follow-up are underutilised methods that can be used to improve patient care, reduce costs, and reduce job and school absenteeism for patients and their families. Outreach clinics are another option, but keep physician availability in mind. Surveys are being conducted of patients, caretakers, primary care providers, and paediatric surgeons to assess their thoughts and opinions on paediatric surgery follow-up and the need for routine in-person follow-up. Their

willingness to reduce routine follow-ups, satisfaction with the current clinic follow-up format, and interest in alternative follow-up modalities will be evaluated and incorporated into postoperative care pathways.

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