How long do patients wait for elective general surgery?

David W. Olson, MD; Christopher J. de Gara, MB MS

Objective: Because data published on waiting times are largely determined from questionnaire-type surveys, which generate inconclusive opinion-based results, the objective of this study was to provide a quantitative measure of the extent and variance of waiting times among 3 elective general surgery procedures **Design:** A prospective case study. **Setting:** The Royal Alexandra Hospital, Edmonton. **Patients:** From Feb. 1 to Mar. 15, 1999, all cases (90 patients) for each designated procedure — open or laparoscopic cholecystectomy for biliary colic or cholelithiasis, segmental resection or modified radical mastectomy for breast carcinoma and colon or rectal resection for colorectal carcinoma — were tabulated daily from the hospital elective operating lists. Data were prospectively acquired from individual surgeon offices (11 surgeons). Sixteen of the 90 patients were excluded, leaving 74 for analysis. **Outcome measures:** Time in days from initial referral by the general practitioner to the surgeon (T1), time in days from the initial visit with the surgeon to operation for patients requiring no further diagnostic work-up by the surgeon (T2A), and time in days from the initial visit with the surgeon to operation for patients requiring further diagnostic work-up (T2B). **Results:** The waiting period for patients who underwent non-cancer-related procedures (cholecystectomy) ranged from 83 to 106 days; patients with breast cancer waited an average of 24 (T1 + T2A) to 66 (T1 + T2B) days from the day of referral to the date of surgery and those with colorectal cancer waited an average of 32 (T1 + T2A) to 51 (T1 + T2B) days from the time of referral to operation ($p < 0.05$). **Conclusion:** This preliminary report aimed at quantitative measurement of time spent waiting for elective general surgery indicates that patients who underwent non-cancer-related procedures waited significantly longer for their surgery than patients who required procedures for cancer.

Objectif : Cette étude visait à présenter une mesure quantitative des périodes d'attente et des écarts entre elles pour trois interventions électives en chirurgie générale, car les données publiées portant sur les périodes d'attente sont, pour la plupart, établies à partir d'enquêtes faisant appel à un questionnaire, qui produisent des résultats subjectifs et non concluants. **Conception :** Étude de cas prospective. **Contexte :** Hôpital Royal Alexandra (Edmonton). **Patients :** Du 1er février au 15 mars 1999, on a compilé quotidiennement, à partir des listes de chirurgie de l'hôpital, tous les cas (90 patients) retenus pour chacune des interventions désignées : la cholécystectomie effractive ou par laparoscopie contre la colique hépatique ou la cholélithiase, la chirurgie mammaire conservatrice ou la mastectomie radicale modifiée contre le cancer du sein et la résection du côlon ou du rectum contre le cancer colorectal. Les données ont été recueillies de façon prospective auprès de chaque bureau de chirurgien (11 chirurgiens). On a exclu 16 des 90 patients, conservant ainsi 74 cas pour l'analyse. **Mesures de résultats :** La période en jours qui s'est écoulée entre la référence par l'omnipraticien et la consultation du chirurgien (T1), la période en jours qui s'est écoulée entre la première consultation du chirurgien et l'intervention chirurgicale pour les patients chez qui il ne fallait pas pratiquer d'autres examens de diagnostic (T2A), et la période en jours qui s'est écoulée entre la première consultation du chirurgien et l'intervention chirurgicale pour les patients chez qui il fallait pratiquer d'autres examens de diagnostic (T2B). **Résultats :** Chez les patients qui ont subi une intervention n'étant pas liée au cancer (la cholécystectomie), la période d'attente variait de 83 à 106 jours. En moyenne, les patientes atteintes de cancer du sein ont attendu de 24 (T1 + T2A) à 66 (T1 + T2B) jours entre la référence et la chirurgie, et les patients atteints de cancer colorectal ont attendu de 32 (T1 + T2A) à 51 (T1 + T2B) jours entre la référence et la chirurgie ($p < 0,05$). **Conclusion :** Ce rapport préliminaire, qui visait à établir une mesure quantitative des périodes d'attente pour les interventions électives en chirurgie générale, indique que les patients qui ont subi des interventions n'étant pas liées au cancer ont dû attendre beaucoup plus longtemps avant la chirurgie que ceux ayant besoin d'une intervention contre le cancer.

From the Department of Surgery, University of Alberta, Edmonton, Alta.

Presented at the annual meeting of the Canadian Association of General Surgeons , Montreal , Que., Sept. 24, 1999.

Accepted for publication July 6, 2001.

Correspondence to: *Dr. Christopher J. de Gara, Cross Cancer Institute, 11560 University Ave., Edmonton AB T6G 1Z2; fax 780 432-8333, chrisdeg@cancerboard.ab.ca*

Multiple factors — institutional resources, availability of operating time and individual surgeon practices[1] — contribute to the waiting time for elective surgery. Patient and surgeon expectations further compound this issue. To date, physsician[2] and patient surveys,[3] which have provided a significant pool of data on the subject, remain largely inconclusive as they are generally opinion based. A more scientific approach has been the study of disease-specific complications incurred while waiting.[4] Although specialties such as cardiac[5] and vascular[6] surgery have documented positive relationships between increased waiting time and adverse outcomes, little quantitative evidence exists that documents similar relationships in general surgery. We wished to develop an objective measure of waiting times for selected general surgery procedures being performed electively.

Methods

All patients scheduled to undergo 1 of 3 elective procedures (cholecystectomy for cholelithiasis or biliary colic, colorectal resection for colon or rectal carcinoma, segmental resection or modified radical mastectomy for breast carcinoma) at the Royal Alexandra Hospital in Edmonton were noted from elective operating lists during a 6-week period (Feb. 1–Mar. 15, 1999). No bed closures or national or provincial holidays occurred during the study period. Data were collected prospectively from the offices of 11 surgeons. Patients were excluded if either of the following criteria were met: absence of data for set time points (no chart recorded date of referral) and if urgent or emergent operation was required (i.e., for intestinal obstruction or acute cholecystitis).

Chart review and waiting time data were then collected from individual surgeon and referring practitioner offices as follows:

- T1 — time in days from date of referral (i.e., date on the referral letter or date of appointment made by phone) from the referring physician to the date of initial assessment by a general surgeon.
- T2 — time in days from the date of initial assessment by the general surgeon to the date of operation, where
- T2A refers to patients requiring no additional preoperative diagnostic work-up by the surgeon (excluding hospital required preoperative chest radiography, electrocardiography, and routine blood work (e.g., complete blood count)
- T2B refers to patients requiring additional preoperative diagnostic work-up by the surgeon before operation (e.g., ultrasonography, colonoscopy, mammography, breast biopsy).

Statistical analysis

Significance was assessed using analysis of variance followed by post-hoc analysis by the Student–Newman–Keuls test; $p < 0.05$ was considered significant.

Results

Ninety patients were identified. Four were excluded due to failure of surgeon charts or referral physician offices to provide a definitive referral date (T1). Twelve patients, originally booked for an elective procedure, underwent urgent or emergent operation for disease-specific complications before elective operation (8 because of acute cholecystitis, 4 because of large-bowel obstruction). There remained 74 cases for analysis: 25 scheduled for open or laparoscopic cholecystectomy, 28 for segmental breast resection or mastectomy and 21 for colon or rectal resection.

Time required to see general surgeon: T1

The average times from referral to initial assessment for patients who underwent cholecystectomy, segmental resection or modified radical mastectomy, and colon or rectal resection were 28, 11 and 17 days respectively (Table 1). Patients requiring cholecystectomy waited significantly ($p < 0.05$) longer than those with either suspected or diagnosed breast or colorectal carcinoma. However, no significant difference existed between patients with suspected or diagnosed breast or colorectal cancer.

Time from initial assessment by the surgeon to operation with no additional work-up: T2A

Fifty-nine of the 74 patients underwent operation with no additional preoperative work-up by the surgeon. Of the 25 patients scheduled for elective cholecystectomy, 24 had received all necessary preoperative testing by their referring physician. However, patients required an additional 55 days' waiting time before operation, which was significantly longer (13, 15 days respec-

Table 1

Waiting Times for Elective General Surgery (Cholecystectomy, Breast Cancer and Colorectal Cancer Resections)

	Mean (± SD) waiting time, d		
Procedure	T1	T2A	T2B
Cholecystectomy	28.4 (5.3)	55.2 (10.5)	78
Breast cancer resection	10.9 (1.9)*	13.1 (1.6)*	54.9 (19.5)†
Colorectal cancer resection	16.7 (3.4)*	15.0 (2.6)*	34.0 (12.4)†

T1 = time from date of referral to initial surgical consultation, T2A = time from initial surgical consultation to operation without additional work-up, T2B = time from initial surgical consultation to operation with additional work-up.
*Significantly ($p < 0.05$) different from cholecystectomy values.
†Not significantly different from cholecystectomy values.

tively, $p < 0.05$) than for either breast or colorectal cancer patients.

Time from initial assessment by surgeon to operation with additional work-up: T2B

Fifteen patients required further work-up after initial assessment by the surgeon. Only 1 patient who underwent cholecystectomy required ultrasonography and liver-directed blood tests. Seven patients with breast cancer required additional investigation (4 needed fine-needle aspiration biopsy, 2 required mammography, and 1 needed preoperative chemotherapy and radiotherapy for locally advanced breast carcinoma). All 7 patients with colorectal cancer who required additional work-up by the surgeon underwent colonoscopy. No significant difference was noted in the total number of days spent waiting for additional preoperative investigation by the surgeon in any of the 3 groups (cholecystectomy 78 d, breast cancer 55 d, colorectal cancer 34 d).

Discussion

Public funded health care systems are inevitably associated with waiting periods for elective surgical procedures. This is frequently criticized by third-party funded systems such as exist in the United States.[7] Patients, surgeons and hospitals view this issue from different perspectives. Patients who wait cite psychological impact[8,9] and quality-of-life issues.[10] Surgeons, on the other hand, look to minimize the potential for disease progression and the development of complications during the waiting period.

This study provides a quantitative measure of the waiting time incurred for selected general surgery procedures performed in the elective setting. Each portion of the waiting period was assessed to identify at what stage patients wait the longest. As expected, waiting does exist whether it be for non-cancer (cholecystectomy) or cancer-related (breast, colorectal) procedures. From the point of initial referral, significant variance in time spent waiting was noted among groups. Those with cancer-related disease processes waited significantly less time to see a surgeon (T1), suggesting a heightened degree of urgency. Patients having breast and colorectal cancer both reached the operating room in significantly less time than those requiring cholecystectomy, providing the diagnostic work-up had been performed by the referring physician (T2A). No significant difference was found among groups for time spent waiting for operation if additional work-up was required (T2B). This time point, however, would likely have shown similar significance if each group had greater numbers of patients.

Of note was the large proportion of patients in each of the 3 groups who had already undergone all necessary preoperative work-up before the initial surgical consultation (cholecystectomy 24/25, breast resection 21/28, colorectal resection 14/21). This is readily explicable in patients requiring cholecystectomy, as they generally require only ultrasonography and appropriate blood work, both of which can easily be completed before initial assessment by the surgeon. However, such a finding is likely coincidental in breast and colorectal cancer groups, as these patients typically require additional work-up (i.e., breast biopsy, endoscopy).

Although the majority of patients were able to wait for elective surgery, 14% (12/86) required urgent or emergent operation for disease-related complications. Such patients cannot be excluded when discussing waiting time. Although beyond the scope of this preliminary data, there is clearly a need for additional measures by which waiting time can be assessed. Groups such as the Western Canada Waiting List Project have recognized this and are attempting to approach the topic through surgical prioritization criteria.

Although our patient numbers are small and the data preliminary, we believe this study provides a usable quantitative benchmark of waiting time. A 6-week period cannot adequately take into consideration possible surgeon, hospital and seasonal variances. We plan to address these variables by lengthening the period of study, increasing the number of elective procedures and the number of hospitals included. Ultimately, we hope that validation of such measures of waiting time can provide a useful tool to assist in directing the allocation of health care dollars.

References

1. Nordberg M, Keskimaki I, Hemminki E. Is there a relation between waiting-list length and surgery rate? *Int J Health Plann Manage* 1994;9(3):259-65.
2. Walker M, Zelder M. *Critical issues bulletin — waiting your turn: hospital waiting lists in Canada*. Vancouver: The Fraser Institute; 1999. Available: www.fraserinstitute.ca/publications/critical_issues/1999/waiting_your_turn (accessed Nov. 22, 2001).
3. Martin S. Patients appear to be patient, survey finds. *CMAJ* 2000;162:1470.
4. Richards M, Westcombe A, Love S, Littlejohns P, Ramirez A. Influence of delay on survival in patients with breast cancer: a systematic review. *Lancet* 1999; 353(9159): 1119-26.
5. Morgan C, Sykora K, Naylor C. Analysis of deaths while waiting for cardiac surgery among 29,293 consecutive patients in Ontario, Canada. The Steering Committee of the Cardiac Care Network of Ontario. *Heart* 1998;79(4);345-9.
6. Turnbull RG, Taylor DC, Hsiang YN, Salvian AJ, Nanji S, O'Hanley G, et al. Assessment of patient waiting times for vascular surgery. *Can J Surg* 2000;43(2): 105-11.
7. Coyte P, Wright J, Hawker G, Bombardier C, Dittus R, Paul J, et al. Waiting times for knee-replacement surgery in the United States and Ontario. *N Engl J Med* 1994;331(16):1068-71.
8. Cimprich B. Pretreatment symptom distress in women newly diagnosed with breast cancer. *Cancer Nurs* 1999;22(3):185-94.
9. Romsaas E, Malec J, Javenkoski B, Trump D, Wolberg W. Psychological distress among women with breast problems. *Cancer* 1986;57(4):890-5.
10. Colbert K. The longer the delay, the greater the anxiety. Delay in treatment for breast cancer. *Prof Nurse* 1994;9(8):517-20.