

The journey to total hip or knee replacement

Julie Lynette Walters^{1,2} PhD, Lecturer

Shylie Mackintosh¹ PhD, Senior Lecturer

Lorraine Sheppard¹ PhD, Associate Professor

¹Division of Health Sciences, University of South Australia, North Terrace, Adelaide, SA 5000, Australia.

Email: shylie.mackintosh@unisa.edu.au, lorraine.sheppard@unisa.edu.au

²Corresponding author. Email: Julie.walters@unisa.edu.au

Abstract

Objectives. Despite the incidence of joint replacements in Australia, there is a paucity of information regarding how patients progress from their referral to their surgery. The aim of this study was to describe a patient pathway from referral to receipt of total hip replacement (THR) or total knee replacement (TKR) surgery in South Australian public hospitals.

Methods. Patient perspectives of the pathway to THR and TKR surgery were obtained via a postal survey ($n = 450$) and hospital employee perspectives were attained via semi-structured interviews ($n = 19$). Survey data were analysed using descriptive statistics and interview data were analysed thematically.

Results. A typical patient pathway to THR and TKR surgery can be divided into two distinct phases; referral-to-initial appointment (9–24 months), and initial appointment-to-surgery (12–15 months). This gives an overall waiting period between 2 and 3 years for THR or TKR surgery.

Conclusions. Waiting times for THR and TKR surgery reported in this study were longer than other reports in the literature. Current Australian health policy does not consider the first (and longest) phase of the patient pathway. Excluding this initial phase could be generating an erroneous perception of the patient pathway to THR or TKR surgery, possibly leading to poorly considered health reforms.

What is known about the topic? Meeting the demand for elective surgery services in public hospitals is an ongoing challenge for governments and health systems alike. The persistent mismatch between supply and demand has resulted in the development of waiting lists for elective total hip replacement (THR) and total knee (TKR) replacement surgery in Australia. Current state-level health policies such as the Policy Framework and Associated Procedural Guidelines for Elective Surgery Services in South Australia or the Elective Surgery Access Policy in Victoria, outline a generic pathway consisting of a few linear steps that occur immediately before receipt of surgery, without consideration of the early stages of the journey. Aside from these types of policies, we were unable to identify any published literature outlining the patient journey from referral to receipt of THR or TKR surgery. As such, our understanding of the issue is inadequate due to the paucity of existing research evidence.

What does this paper add? Our current understanding of the patient journey to THR and TKR surgery is limited to the perspective of the policy-makers, whose focus is the organisation of waiting lists and the systematic progression of an individual through the elective surgery system. This perspective reinforces the assumption that it is a simple, linear process and may lead to erroneous judgements regarding the impact that the patient pathway has on an individual and the time it takes to progress along that pathway. This study presents the patient pathway from the perspective of individuals working within the systems responsible for delivering THR and TKR surgery and from patients who have received a joint replacement in a South Australian public hospital. As such, this paper provides new insight into the length, impact and features of the entire patient journey, rather than a snap-shot of the final stages.

What are the implications for practitioners? This study is the first step towards better understanding of the patient pathway to joint replacement surgery in Australian public hospitals. Greater understanding of the complete pathway and identification of areas of congestion within the pathway, as evidenced by longer waiting periods, offers insight into areas with the potential for effective reforms. Should the patient pathway be significantly altered, the experience of practitioners responsible for the interim and postoperative management of patients undergoing THR and TKR surgery will also be changed. Additionally, practitioners currently frustrated by the long delays experienced by their patients who are in need of elective surgery in Australian public hospitals, could have that frustration abated by system improvements that reduce the length and complexity of the pathway to joint replacement surgery.

Additional keywords: orthopaedics, total hip replacement, total knee replacement, waiting time.

Received 24 May 2011, accepted 12 October 2011, published online 25 May 2012

Introduction

In Australia in 2007–08, there were 7688 admissions to public hospitals for elective total hip replacement (THR) surgery and 10947 admissions for elective total knee replacement (TKR) surgery.¹ Despite this, we were unable to locate any published data outlining how patients progressed from the time of their referral to a public hospital, to the time they received joint replacement surgery.

The focus of the literature reporting patient pathways has predominantly been related to strategies for reducing length of stay in hospital,^{2–4} minimising readmission rates,² lowering cost,^{3,5} or improving postoperative outcomes,^{4,6,7} and most relates to disciplines other than orthopaedic surgery. Other associated studies have focussed on waiting lists and waiting time^{8–13} and no published literature could be identified reporting the patient pathway from referral to THR or TKR surgery with a focus on the public elective surgery system.

Current health policy in Australia includes the use of urgency categories for elective surgery procedures in public hospitals, which relate to the period between a patient's initial appointment with an orthopaedic surgeon and receipt of surgery. Categories one (urgent, admission within 30 days), two (semi-urgent, admission within 90 days), and three (non-urgent, admission within 12 months) are active categories, whereas categories four (medical deferred admission) and five (patient deferred admission) are deferred.¹⁴ The waiting time targets associated with urgency categories are quantifiable, and therefore, convenient measures of the success of a health service.¹⁵ An inability to meet targets could be viewed as evidence of the public health service failing to provide healthcare, challenging a major principle of the public health system in Australia – access to healthcare irrespective of one's ability to pay for it.¹⁶ Waiting times for public hospital services are therefore an important public policy issue in Australia.

A patient pathway represents one individual's journey to THR and TKR surgery and can be a useful representation of that person's experiences. The focus of this paper is to describe a patient pathway from referral to receipt of THR or TKR surgery in South Australian public hospitals.

Method

Patient perspectives of the pathway to THR and TKR surgery were obtained via a postal survey and hospital employee perspectives were attained via semi-structured, face-to-face interviews lasting between 30 and 90 min.

Ethics approval was obtained from the University of South Australia Human Research Ethics Committee and the ethics committees of the four participating hospitals.

The patient survey

Participants

In April 2009, all patients who had undergone elective primary THR or TKR surgery in 2008 in four South Australian public hospitals were identified. Patients were excluded if they had undergone revision THR or TKR ($n = 37$), uni-compartment knee replacement ($n = 31$) or THR or TKR due to trauma or emergency ($n = 142$). Individuals residing in residential care facilities or who

had poor cognition were excluded ($n = 16$), as were those who had undergone other types of orthopaedic surgery ($n = 46$).

The questionnaire

A questionnaire designed to examine patients' experiences of THR and TKR surgery was mailed to all potential participants ($n = 651$) with instructions and a reply paid envelope. Non-responders (identified via a participant code) were sent a reminder letter and a second copy of the questionnaire 3 weeks after the initial mail-out. The questionnaire consisted of closed-ended questions relating to respondent's characteristics, waiting time for THR or TKR surgery, the provision of preoperative information and individual's expectations and experiences of the elective surgery system. These topics were selected to generate an overall picture of the patient pathway to THR or TKR surgery within the hospitals under examination. Responses to closed-ended questions involved a combination of 5-point Likert scales, dichotomous yes/no answers and questions requiring respondents to rank a series of predetermined factors.

Survey data analysis

To determine if data could be pooled from all hospitals, data from each hospital were compared by chi-square analysis for categorical data and *t*-tests (two tailed, unequal variances assumed, Bonferroni adjustment to *P* value for multiple comparisons) for continuous variables. As no significant differences existed between hospitals, data were pooled for subsequent analyses. Data were analysed using descriptive statistics for each question through Excel (Microsoft) and PASW (version 18.0, IBM) software. Missing data for each question were accounted for by using the total number of responses for individual questions for analysis.

Hospital employee interviews

Interviews with hospital employees working within the elective surgery system were undertaken at four major South Australian public hospitals between January and December 2008. Information-rich participants were initially recruited via convenience sampling and subsequently, by a snowball sampling strategy.¹⁷ Recruitment continued until data saturation – defined as the point at which participants offered no new information, or were unable to suggest any original interview participants – was achieved at all four hospitals.

Interview process

Written consent was gained from each participant before starting and each interview was audio-taped and transcribed verbatim. Field notes taken during and immediately after the interview supplemented the transcription data¹⁷ and were used in place of the transcription where individuals did not consent to being audio-taped ($n = 2$).

Interview data analysis

Thematic analysis was conducted using a pragmatic, six-step approach – data familiarisation, code generation, search for themes, review of themes, refining and naming of themes, reporting and interpreting the results.¹⁸ In addition to ongoing discussion, codes generated by the authors from the first two

interviews were compared and discrepancies addressed to ensure trustworthiness of the data.^{19–21}

Results

Participants

Twenty-eight hospital employees were identified as 'information-rich'. Nineteen agreed to participate, three declined and six did not respond to the researchers' invitation and were unable to be contacted. The 19 participants held a variety of clinical and administrative positions within the elective orthopaedic waiting list systems in the four hospitals and are described as 'administrative' or 'clinical' staff to maintain confidentiality.

Of the 465 patient questionnaires returned (RR = 71.4%), 15 were excluded (surgery in 2009 [6]; posttrauma THR [2]; revision THR/TKR [6]; duplicate [1]), leaving 450 questionnaires for analysis. Sample characteristics are outlined in Table 1.

The patient pathway

The patient pathway to joint replacement surgery in South Australian public hospitals was divided into two phases; the referral-to-outpatient department appointment phase (phase 1), and the outpatient department appointment-to-surgery phase (phase 2) (Fig. 1). Phase 1 included; referral, triage of referral, placement onto orthopaedic outpatient department waiting list, and initial appointment, which occurred over a 9–24 month period. The remaining nine steps of the pathway occurred during phase 2, typically over a 12–15 month period.

Patients began their journey to THR and TKR surgery by being referred into the system from some external location, most commonly their general practitioner (91.5%). Once their referral was received by the hospital, it was triaged by an orthopaedic surgeon or nurse based on the apparent urgency with which the patient required attention and the patient was placed on a waiting

list for an outpatient department appointment. The minimum delay an individual could expect during phase 1 was 9 months, whereas others (7.2%) waited longer than 2 years to see a surgeon (Table 2). A patient's initial appointment in the orthopaedic outpatient department signalled their transition into phase 2 of their pathway.

Hospital employees reported that phase 2 lasted anywhere from 3–15 months and most patients (64%) did report a waiting time of less than 12 months. However, a small number (10%) of respondents reported waiting longer than 2 years in phase 2. Following their first appointment, patients for whom surgery was considered inappropriate or unnecessary, were referred back to their general practitioner for further management. Those deemed suitable for surgery and considered healthy enough to undergo THR or TKR were assigned an urgency category (most commonly into the non- or semi-urgent categories)²² and placed on a waiting list for surgery. Approximately two-thirds (65.8%) of the sample reported at least one subsequent appointment in the orthopaedic outpatient department before surgery.

Patients were informed of the date of their surgery 6–12 weeks before and attended a preadmission clinic appointment approximately 6 weeks before undergoing THR or TKR surgery. During this appointment, patients underwent a final health check and those who were unwell were removed from the schedule to be rebooked at a later date. Others proceeded to admission to hospital on the morning of their surgery. Although phase 2 finished at the point of admission for surgery, it is important to note that patients returned to the hospital outpatient department for postoperative reviews for varying periods (in some instances, up to 15 years following THR or TKR surgery). More than three-quarters of the sample reported having had at least two postoperative appointments in the first 12 months following THR and TKR surgery.

Although this is a typical pathway from referral to THR or TKR surgery in South Australian public hospitals, there are other

Table 1. Characteristics of survey respondents

Characteristic	Frequency	%
Sex (n = 406)		
Female/Male	248/158	61.1/38.9
Employment status (n = 446)		
Employed/Retired or Pensioner/Unemployed/Home duties/Not disclosed/Other	42/298/3/85/22	9.3/66/2/0.7/18.9/6.0
Joint replaced (n = 450)		
Hip/Knee	209/241	46.4/53.6
Relative socioeconomic disadvantage (based on suburb of residence; n = 434)		
Decile 1–5 (most disadvantaged)/Decile 6–10 (least disadvantaged)	319/117	73.50/26.9

Table 2. Reported expected, actual and maximum acceptable waiting time for initial consultation and surgery

Length of wait (months)	Expected		Actual		Maximum (acceptable)	
	Initial consult n [%]	Surgery n [%]	Initial consult n [%]	Surgery n [%]	Initial consult n [%]	Surgery n [%]
1–6	197 [46.0]	138 [32.6]	267 [62.0]	173 [40.7]	361 [84.5]	298 [73.7]
6–12	103 [24.1]	130 [30.7]	70 [16.2]	99 [23.3]	55 [12.9]	97 [24.0]
12–18	77 [18.0]	83 [19.6]	63 [14.6]	77 [18.1]	8 [1.9]	7 [1.7]
18–24	0 [0]	41 [9.7]	0 [0]	32 [7.5]	2 [0.5]	1 [0.2]
>24	51 [11.9]	31 [7.3]	31 [7.2]	44 [10.4]	1 [0.2]	1 [0.2]

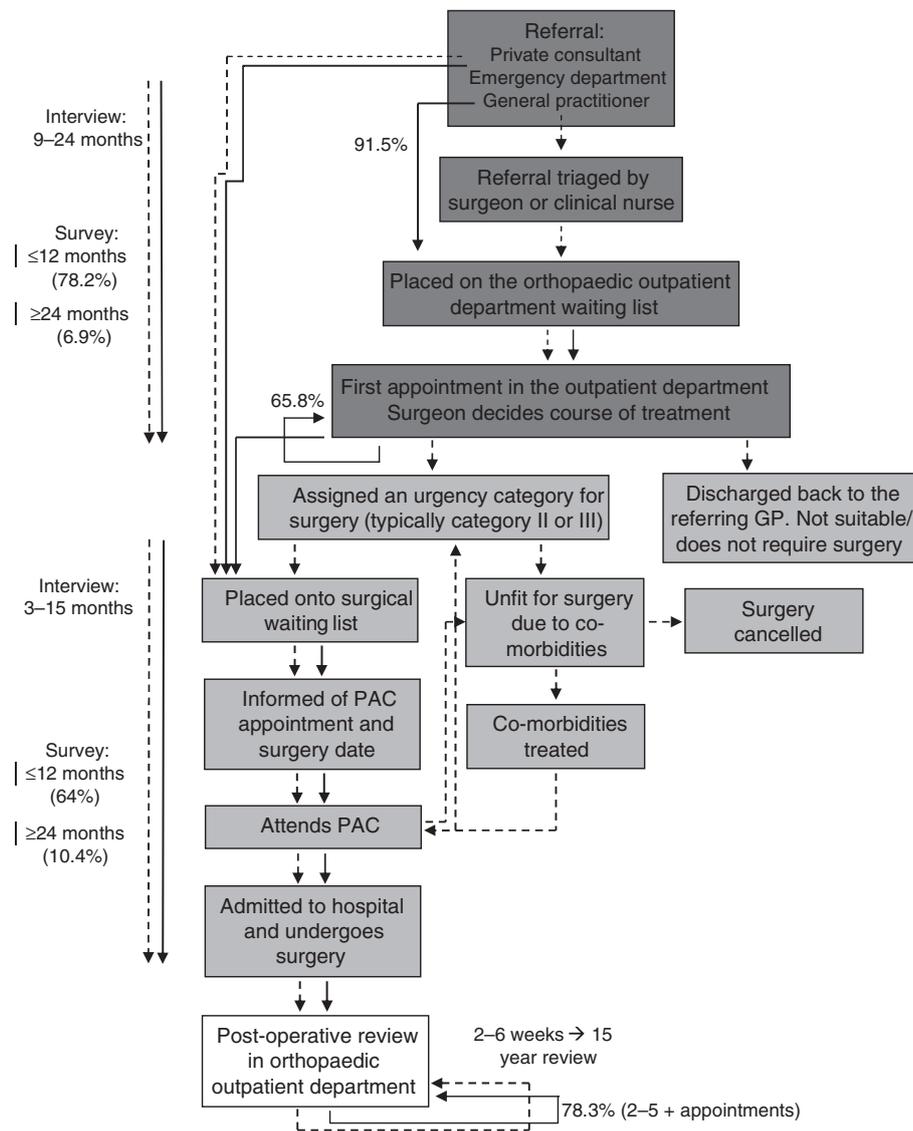


Fig. 1. Patient pathway to THR and TKR in South Australian public hospitals (hospital employee perspective, patient perspective).

variations that occur. For example, patients, on occasion, changed their mind about having surgery or were repeatedly unfit for surgery, thus becoming stuck at the pre-admission appointment step of their pathway. Other issues, such as bed shortages or lack of theatre time, also caused blockages at different stages.

Discussion

Length of waiting time was the area of greatest discrepancy between patients and hospital employees. Employees described longer waiting periods than those reported by patients during both phase 1 (9-24 months reported by employees versus less than 12 months reported by patients [78.2%]) and phase 2 (3-15 months reported by employees versus less than 12 months reported by patients [64%]) of the patient pathway. Both groups agreed, however, that the longest waiting period occurred in phase

1, before a patient's initial appointment in the orthopaedic outpatient department, a finding consistent with other reported research.²³

The difference in patient and employee reported waiting times may be partially accounted for by the practice of placing THR and TKR patients into Australian urgency categories 2 and 3, suggesting that they should be admitted for surgery within 3-12 months. The phase 2 waiting period of 3-15 months reported by hospital employees and approximately two-thirds of patients (64%), is largely consistent with this. Given that the phase 2 waiting period is linked to formal waiting time targets in Australian health policy, this consistency is expected. Phase 1 of the patient pathway reported by both THR and TKR recipients and hospital employees – the longest part of the patient journey to THR and TKR in South Australian public hospitals – does not figure in current health policy, therefore greater variability during

this phase is also not surprising as there are no established targets to be met.

Combining the phase 1 and phase 2 waiting periods reported in this study indicates that many patients are in fact waiting nearly double the 3–12 months recommended by current Australian health policy.^{14,24} Whether this discrepancy indicates a need to alter policy, or whether the system should be altered in order to reduce combined waiting time to 3–12 months, remains unclear. However, these results do highlight a discrepancy requiring attention and suggest that existing Australian health policy does not accurately reflect the patient experience waiting for THR or TKR.

Waiting times for THR and TKR surgery reported by hospital employees and patients, were longer than other reports in the literature [mean 2.62 (s.d. 1.57) months referral-to-first appointment and mean 8.93 (s.d. 3.50) months first appointment-to-surgery;²⁵ median 5 (IQR 3–9) months referral-to-first appointment and median 7 (IQR 4–12) months first appointment-to-surgery²⁶], none of which included Australian samples. As with current Australian health policy, the gap in the literature appears to be the lack of consideration of the first phase of the patient pathway, a gap that was recognised in the mid-1990s²³ but has had limited integration since.²⁵ It is clear from Fig. 1 that excluding this initial phase presents an erroneous perception of a patient pathway to THR or TKR surgery, once again limiting our understanding of a patient's experience and possibly, leading to poorly considered health reforms.

Waiting lists for public hospital admission are a contemporary issue of importance. This study highlights some major disconnects between the patient experience and current Australian health policy which require investigation. For example, closer attention to the total patient pathway and even why and when the decision to undergo THR or TKR surgery is made. The gap could also be narrowed through investigation of the rate of deterioration experienced by patients immediately preceding joint replacement, as well as at earlier stages of joint disease.

Given the gap in the literature regarding the patient pathway to THR and TKR surgery, it was difficult to determine the generalisability the results of this study. However, unpublished conference presentations (available on the internet) indicated similar patient pathways to surgery in other parts of Australia,^{27,28} suggesting that these findings may be applicable in other public health services. In conclusion, the patient pathway to elective THR and TKR surgery demonstrates two distinct phases; one from referral to first orthopaedic outpatient department appointment and one from the first appointment to receipt of surgery. Although it is surprising that the pathway as a whole has been largely overlooked in the literature to date, the greater concern is the inattention paid by Australian health policy to the first and longest phase of the pathway to THR and TKR surgery.

Competing interests

The authors declare there are no competing interests.

Acknowledgements

The authors would like to acknowledge the contribution of Associate Professor Marie Williams, Mrs Wendy Dolejs and Ms Kae Martin, to this study. This research was funded by the Central Northern Adelaide Health Service.

References

- 1 Australian Government Department of Health and Ageing. The state of our public hospitals: June 2009. Canberra: Australian Government Department of Health and Ageing; 2009.
- 2 Pearson S, Moraw I, Maddern GJ. Clinical pathway management of total knee arthroplasty: a retrospective comparative study. *Aust N Z J Surg* 2000; 70: 351–4. doi:10.1046/j.1440-1622.2000.01819.x
- 3 Muñoz ABJ. Clinical pathway for hip arthroplasty six years after introduction. *Int J Health Care Qual Assur* 2006; 19(3): 237–45. doi:10.1108/09526860610661455
- 4 Lemmens L, van Zelm R, Rinkes IB, van Hillegersberg R, Kerckamp H. Clinical and organizational content of clinical pathways for digestive surgery: a systematic review. *Dig Surg* 2009; 26: 91–9. doi:10.1159/000206142
- 5 Macario A, Horne M, Goodman S, Vitez T, Dexter F, Heinen R, *et al.* The effect of a perioperative clinical pathway for knee replacement surgery on hospital costs. *Anesth Analg* 1998; 86: 978–84.
- 6 Tan JJY, Foo AYZ, Cheong DMO. Colorectal clinical pathways: a method of improving clinical outcome? *Asian J Surg* 2005; 28(4): 252–6. doi:10.1016/S1015-9584(09)60355-9
- 7 Basse L, Jakobsen DH, Billesbolle P, Werner M, Kehlet H. A clinical pathway to accelerate recovery after colonic resection. *Ann Surg* 2000; 232(1): 51–7. doi:10.1097/0000658-200007000-00008
- 8 Black N. Surgical waiting lists are inevitable: time to focus on work undertaken. *J R Soc Med* 2004; 97(4): 159–60. doi:10.1258/jrsm.97.4.159
- 9 Cipriano LE, Chesworth BM, Anderson CK, Zaric GS. Predicting joint replacement waiting times. *Health Care Manag Sci* 2007; 10(2): 195–215. doi:10.1007/s10729-007-9013-z
- 10 Cromwell DA, Griffiths DA. Waiting time information services: how well do different statistics forecast a patient's wait? *Aust Health Rev* 2002; 25(6): 75–85. doi:10.1071/AH020075
- 11 Gross M. Waiting times for knee arthroplasty. *Can J Surg* 2002; 45(4): 247.
- 12 Roitstein DL, Alter DA. Where does the waiting list begin? A short review of the dynamics and organization of modern waiting lists. *Soc Sci Med* 2006; 62: 3157–60. doi:10.1016/j.socscimed.2005.11.030
- 13 Sanmartin C. A study of surgical waiting lists and waiting times for selected procedures in British Columbia. Vancouver: The University of British Columbia; 2000.
- 14 Welfare AIOHa. Australian trends in life expectancy. Canberra: Australian Institute of Health and Welfare; 2006 [updated 12/10/2010 cited 2010 July 4].
- 15 Stoop AP, Vrangbæk K, Berg M. Theory and practice of waiting time data as a performance indicator in health care: a case study from The Netherlands. *Health Policy* 2005; 73(1): 41–51. doi:10.1016/j.healthpol.2004.10.002
- 16 Healy J, Sharman E, Lokuge B. Australia: health system review. *Health Systems in Review* 2006; 8(5): 1–158.
- 17 Grbich C, editor. Qualitative research in health. An introduction. Sydney: Sage Publications; 1999.
- 18 Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006; 3: 77–101. doi:10.1191/1478088706qp0630a
- 19 Morse JM, Barrett M, Mayan M, Olson K, Spiers J. Verification of strategies for establishing reliability and validity in qualitative research. *Int J Qual Meth* 2002; 1(2): 1–19.
- 20 Patton MQ, editor. Qualitative research and evaluation methods. 3rd ed. California: Sage Publications; 2002.
- 21 Patton MQ. Enhancing the quality and credibility of qualitative analysis. *Health Serv Res* 1999; 34(5 Part II): 1189–208.
- 22 Welfare AIOHa. Arthritis and musculoskeletal conditions. Canberra: Australian Institute of Health and Welfare; 2005.
- 23 Smith T. Monitoring the total post-referral wait. *BMJ* 1994; 309: 593–6. doi:10.1136/bmj.309.6954.593

- 24 Welfare AIoHa. Australian hospital statistics 2005–2006. Canberra: Australian Institute of Health and Welfare; 2007.
- 25 Snider MG, MacDonald SJ, Pototschnik R. Waiting times and patient perspectives for total hip and knee arthroplasty in rural and urban Ontario. *Can J Surg* 2005; 48(5): 355–360.
- 26 Löfvendahl S, Eckerlund I, Hansagi H, Malmqvist B, Resch S, Hanning M. Waiting for orthopaedic surgery: factors associated with waiting times and patients' opinion. *Int J Qual Health Care* 2005; 17(2): 133–40. doi:[10.1093/intqhc/mzi012](https://doi.org/10.1093/intqhc/mzi012)
- 27 Buchanan-Welch S. The patient journey. Presented at: Change champions. Improving patient flows: elective surgery. Bay of Plenty, New Zealand, 2008.
- 28 Dart C. Elective orthopaedic patient pathways. Melbourne, Australia, 2009.