Time to wait: a systematic review of strategies that affect out-patient waiting times

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Abstract

Objective. Out-patient waiting times pose a significant challenge for public patients in need of specialist evaluation and intervention. The aim of the present study was to identify and categorise effective strategies to reduce waiting times for specialist out-patient services with a focus on the Australian healthcare system.

Methods. A systematic review of major health databases was conducted using the key terms 'outpatient*' AND 'waiting time', 'process*' AND 'improvement in outpatient clinics'. Identified articles were assessed for their relevance by sequential review of the title, abstract and full text. References of the selected manuscripts were scanned for additional relevant articles. Selected articles were evaluated for consistent and emerging themes.

Results. In all, 152 articles were screened, of which 38 were included in the present review. Numerous strategies identified in the articles were consolidated into 26 consistent approaches. Three overarching themes were identified as significantly affecting waiting times: resource realignment, operational efficiency and process improvement.

Conclusions. Strategies to align resources, increase operational efficiency and improve processes provide a comprehensive approach that may reduce out-patient waiting times.

What is known about the topic? Out-patient waiting times are a challenge in most countries that seek to provide universal access to health care for all citizens. Although there has been extensive research in this area, many patients still experience extensive delays accessing specialist care, particularly in the public health sector. The multiple factors that contribute to bottlenecks and inefficiencies in the referral process and affect patient waiting times are often poorly understood.
What does this paper add? This paper reviews the published healthcare literature to identify strategies that affect specialist out-patient waiting times for patients. The findings suggest that there are numerous operational strategies that affect waiting times. These strategies may be categorised into three overarching themes (resource alignment, operational efficiencies and out-patient processes) that, when actioned in a coordinated approach, have the potential to significantly reduce out-patient waiting times.
What are the implications for practitioners? This paper identifies evidence-based strategies for aligning resources, improving operational efficiency and streamlining processes, which may provide improvements to specialist out-patient waiting times for patients. Addressing the identified organisational, person-related, cultural and attitudinal factors will assist health system managers and health practitioners target the most appropriate improvement activities to reduce waiting times.

Introduction

Out-patient waiting times are a challenge in most countries that seek to provide universal access to health care for all citizens. Although there has been considerable research in this area, many patients still experience extensive delays accessing specialist care, particularly in the public health sector. There are multiple

factors that affect patient waiting times and contribute to bottle-necks and inefficiencies in the referral process.

In the presence of constraints on the capacity of public health systems, demand for treatment is likely to exceed supply, so that not all patients can be treated immediately. Therefore, patients are added to a wait list for public treatment unless they are willing and able to pay for private care.[1] Long waiting times for non-emergency services are a feature of several publicly funded health systems. A key policy concern is that long waiting times may worsen health outcomes or reduce expected health gains compared with timely treatment.[2]

In Australia, patients are not permitted direct access to specialist care, apart from access via the emergency department for acute care needs. The role of out-patient clinics is to provide access to public specialist care for diagnosis and treatment, and for review following in-patient care. In addition, in the public sector in Australia, private bulk-billing clinics are provided in some public hospitals. This increases the ability for these hospitals to earn additional revenue from the national healthcare provider, Medicare.

Out-patient services in the public sector are provided by staff specialists and visiting medical officers. In addition, the out-patient clinic is a valuable teaching and training environment in which medical students and junior medical staff contribute to services while receiving supervision and instruction by specialists.

To access out-patient specialist clinics, patients must obtain a referral from a general practitioner (GP), which is sent to the hospital, where the referral is triaged before arranging an appointment. Triage categories based on the severity of illness and other factors determine the priority of access to specialist care and therefore the length of wait time for the patient. In Queensland, patients are assigned to one of three triage categories (1, urgent; 2, non-urgent; and 3, routine) with system performance expectations assigned to these categories (Category 1 = 30 days; Category 2 = 90 days; and Category 3 = 365 days). However, these recommended waiting times are not based on sound evidence related to deteriorating health outcomes or increased clinical risk. They are also not consistent across Australia.[3]

The rise in health care funding and the increase in provision of health care services may not be sufficient to accommodate the growing population and an increase in life expectancy and chronic disease.[4,5] Although the evidence that waiting times directly affect patient long-term outcomes is mixed,[2,6–8] there is acceptance that waiting times affect physical and emotional well-being.[6,7] Therefore, it is prudent that efficiencies are found within the current structure of the publicly funded healthcare system in order to improve access for patients. The objective of the present system review was to identify and categorise strategies associated with performance improvement from published literature.

Methods

Literature search protocol

The aim of the literature search was to identify the key strategies that affect out-patient waiting times. The databases searched were PubMed, Scopus, Embase, Web of Science, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Medline via EBSCO host, Cochrane and Google Scholar alerts. Searches were conducted with search terms in the title, abstract and keywords. No date limitations were imposed. Searches of the title, abstract and keywords were conducted with the search terms 'outpatient*' AND 'waiting time', 'process*' AND 'improvement in outpatient clinics'. These searches were initially conducted in 2013 and updated continuously with the final search conducted in February 2015. Because the present review focused on improvements in the out-patient setting, all publications included in the study were limited to primary research (interventional and observational studies) on waiting times in the out-patient setting.

The key search terms outlined in Table 1 were used as a basis for determining the relevance of identified papers to the research question. After review of the title, abstracts and keywords, the full texts of articles relevant to the scope of the present study were retrieved. Articles were assessed by the principal investigator (UN) on the basis of the significant effect on out-patient waiting times. In this context, statistically significant effect was determined by a demonstrated reduction in waiting time measures (quantitative studies) and/or researchers' observations of a significant reduction in these areas (qualitative studies). Scanning the reference lists of key studies identified additional articles of relevance. The articles that were selected were confined to the English language. Only studies in peer-reviewed journals were sourced to ensure a high level of quality and support for the validity of the findings and conclusions.[9] Publications that were not available in full text were excluded from the review. Reporting guidelines for systematic reviews were followed.[10] The hierarchy of evidence was assessed using the Centre for Reviews and Dissemination guidelines on assessment of study design.[11]

Analysis protocol

Qualitative methods were used for analysing the results obtained from the publications. The qualitative analysis began with the exploration of the publications and collection of a list of descriptive codes from the aims and objectives, which were related to the outcomes of the review. Coding was conducted by a process of grouping evidence and labelling ideas in order to reflect increasingly broader perspectives. Codes were grouped

Table 1.   **Summary of search results by database before scanning for relevance**
CINAHL, Cumulative Index to Nursing and Allied Health Literature

	Search A	Search B
Keywords	outpatient* AND 'waiting time'	process* AND improvement in 'outpatient clinics'
Database		
PubMed	884	162
Scopus	1651	1347
Embase	722	392
Web of Science	1501	446
CINAHL	142	50
Medline via EBSCO host	674	200
Cochrane	20	38
Google Scholar alerts	25	0

into broader themes that provided answers to the research question.[12,13]

Results

The results of the search protocol are summarised in Table 1. In all, 151 manuscripts were identified for review, with 12 additional articles sourced following reference checks and 10 articles from Google scholar alerts; 21 duplicate articles were removed (Fig. 1). Following an abstract review of the remaining 152 papers, 95 studies were excluded because these were related to other forms of waiting time experienced by patients. Fifty-seven articles were assessed for eligibility, of which 14 were excluded: 11 explored the association with in-patient stay and three focused on patient experience alone. The remaining 43 publications were further assessed to identify primary research studies; five articles that synthesised work in the form of reviews or editorials were excluded. This resulted in 38 studies that were included in the qualitative analysis. More than 60% of the studies conducted were from the US ($n = 12$)[14,15,24,25,29,32,33,36,38,45,47,48] and the UK ($n = 11$).[18,19,23,26–28,30,31,43,49,51] There were four studies from Australia,[16,17,21,50] five from various countries in Europe,[20,39,41,42,44] one from Canada[37] and five from other countries.[22,34,35,40,46]

The final articles included in the review and their recommendations are detailed in Table 2. The publications identified comprised two randomised trials, two case control studies, six case reports, 17 case studies, six cohort studies, four action research studies and one case series. From the assessment of the study designs used in these publications as per Centre for

Fig. 1. Flow diagram of studies identified, screened and included in the present systematic review.

Reviews and Dissemination guidelines, 71% of publications were graded at Level 4, 21% were at Level 3 and 8% were at Level 1 on the hierarchy of evidence, where 1 is the highest level of evidence. Although the quality of the evidence is important, for the purposes of the present qualitative study all articles were included and relative weight was given to them on the basis of the quality of the evidence. For example, randomised controlled experiments (Level 1) will be more informative than case studies (Level 3).

The strategies identified in the final articles were compiled into consistent approaches. In all, 26 separate approaches were identified from analysis of the content of the 38 articles. These 26 approaches were grouped into three consistent themes: resource realignment, operational efficiencies and process improvement (Table 2).

Most of the publications included in the present review included two or more of the themes mentioned and were coded as such. Twenty-one per cent of the publications were primarily concerned with resource alignment,[14–21] 18% were concerned with operational efficiency[22–28] and 61% were concerned with process improvement.[29–51]

Resource alignment

The major strategies involving resource alignment included: (1) limiting the number of referrals to specialists either absolutely or through the use of incentives to limit referrals; (2) wait list audits; (3) discharging patients into GP care; and (4) triaging patients by another health care professional rather than simply administrative processing. Managing demand through limiting the number of referrals, incentives and triaging patients by other health care professionals may benefit patients indirectly by ensuring that only the most appropriate patients are referred, which, in turn, should result in a shorter wait time for these patients and better patient outcomes.

Operational efficiency

Operational efficiency with time management strategies maximises capacity within the clinics and may have a significant effect on the overall waiting times for patients. The strategies highlighted within operational efficiency included: (1) clinics starting promptly; (2) improved allocation of appointment slots; (3) avoiding large blocks of patients (congestion); (4) advanced access (offering patients same-day appointments); (5) advanced access at provider, clinic and network levels; (6) a single queue for all patients and a one-stop diagnostic clinic; (7) appropriate time allocation for new and follow-up patients; and (8) strategies aligning supply with demand for services.

Process improvement

At a tactical and strategic level, process improvement strategies included: (1) aligning processes with organisational priorities, assessment and benchmarking; (2) capacity planning, new resources and efficient use of existing resources; (3) control and reduction of variation in demand and capacity; (4) no-show modelling; (5) computer simulations (to predict doctor idle time, day-dependent no-show predictions, patient arrival time to match demand and capacity); (6) appointment scheduling of patients (to predict routine vs urgent patients; scheduled and
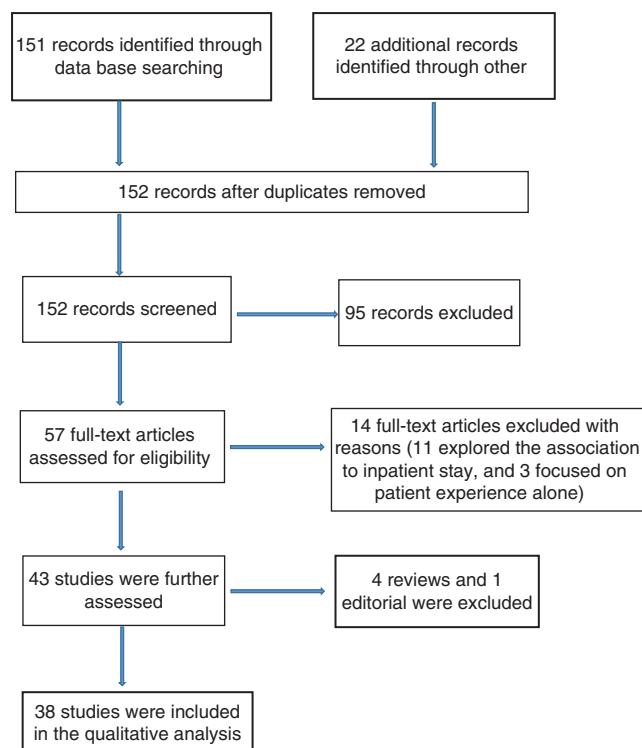
Table 2.   Summary of recommendations to improve out-patient waiting times by theme

GP, general practitioner; HCP, health care professional; RCT, randomised control trial

Summary of recommendations	Authors	Type of study (level of evidence[A])	No. patients	Duration of study	Country
Resource alignment					
Limiting the number of referrals to specialists	Baker et al.[14]	Case report (4)	250 000–300 000 (different cases)	8 months–8 years	USA
and incentives to limit referrals to speciality services	Schillinger et al.[15]	Randomised intervention (1)	2293	1 year	USA
Wait list audits	Stainkey et al.[16]	Action research (4)	6885	2 years	Australia
	Schoch and Adair[17]	Case study (4)	1100	5 years	Australia
Discharging patients into GP care	Burkey et al.[18]	Case study (4)	1072	9 weeks	UK
Patient triaged by other HCP	Georgiuo et al.[19]	Cohort study (3a)	177	15 months	UK
	Mariotti et al.[20]	Case study (4)	84 000–147 000 (varying numbers)	11 years	Italy
	Walsh et al.[21]	Case study (4)	49	6 months	Australia
Operational efficiency					
Clinics starting promptly	Zhu et al.[22]	Case study (4)	Simulated numbers of 18–21 patients per clinic	2 weeks	Singapore
	Harper and Gamlin[23]	Cohort study (3a)	400 patients per week	1 year	UK
Spread out appointment slots	Harper and Gamlin[23]	Cohort study (3a)	400 patients per week	1 year	UK
Avoiding large blocks of patients	Harper and Gamlin[23]	Cohort study (3a)	400 patients per week	1 year	UK
Advanced access	Murray and Berwick[24]	Case series (3b)	Not stated	Not stated	US
Advanced access at provider, clinic and network levels	Gupta et al.[25]	Cohort study (3a)	42 674	19 months	US
	Willis et al.[26]	Action research (4)	12 000	1 year	UK
A single queue for all patients and one-stop diagnostic clinic	Willis et al.[26]	Action research (4)	12 000	1 year	UK
	Laing and Shiroyama[27]	Case study (4)	2200	1 year	UK
More time for new patients than follow-up patients	Willis et al.[26]	Action research (4)	12 000	1 year	UK
	Barrass and Wood[28]	Cohort study (3a)	200	2 years	UK
Supply versus demand strategies	Willis et al.[26]	Action research (4)	12 000	1 year	UK
Process improvement					
Aligning processes with organisational priorities, assessment and benchmarking	Chyna[29]	Case report (4)	Not stated	Not stated	US
Capacity planning, new resources, efficient use of existing resources	Bowers[30]	Cohort study (3a)	Not stated	3 years	UK
Control and reduce variation in demand and capacity	Silvester et al.[31]	Case report (4)	Not stated	Not stated	UK
No-show modelling	Daggy et al.[32]	Case study (4)	5446	3 years	US
Computer simulations to predict: doctor idle time, day-dependent no-show predictions and patient arrival time to match demand and capacity	Huang et al.[33]	Case study (4)	Not stated	3 months	US
	Shakoor[34]	Case study (4)	23 000 (annually)	1 year	Saudi Arabia
	Aeenparast et al.[35]	Case study (4)	357	Not stated	Iran
	Rohleder et al.[36]	Cohort study (3a)	207	2 months	US
	Samorani and LaGanga[37]	Case study (4)	6700	Not stated	Canada
	Liang et al.[38]	Case study (4)	Simulations of 80, 100 or 120 patients per day	Not stated	US
Appointment scheduling of patients to predict: routine versus urgent patients, scheduled and unscheduled patients	De Vuyst et al.[39]	Case study (4)	Not stated	Not stated	Belgium
	Tang et al.[40]	Case study (4)	Not stated	Not stated	China
	Kortbeek et al.[41]	Case report (4)	Not stated	Not stated	The Netherlands

Table 2.   (*continued*)

Summary of recommendations	Authors	Type of study (level of evidence[A])	No. patients	Duration of study	Country
Clinical staff improving processes, decreased production variation and patient optimisation by GP guidelines	Eriksson *et al.*[42]	Action research (4)	17 000 or 33 000 annually	4 years	Sweden
Elimination of waste related to delays, repeated encounters and errors	Young *et al.*[43]	Case report (4)	Not stated	Not stated	UK
Preparation times and referral management	Kollberg and Dahlgaard[44]	Case report (4)	Not stated	30 days to 3 years	Sweden
Booking procedures, consumer engagement, overbooking and flexible capacity	Silvester *et al.*[31] LaGanga[45] Gijo and Anthony[46] Lin *et al.*[47]	Case report (4) Action research (4) Case study (4) Case control study (3b)	Not stated 1726 700–800 daily 188 144	Not stated 2 years Not stated 5 days 5 months follow-up	UK US India US
Automation of scheduling times	Weiner *et al.*[48]	Case control study (3b)	40 487	6 months	US
eReferrals	Khan *et al.*[49]	Case study (4)	346	18 months	UK
Telemedicine	Sabesan *et al.*[50]	Case study (4)	70	2 years	Australia
Patient text messaging	Corrigan *et al.*[51]	RCT (1)	55	4 months	UK

[A]Level of evidence in publications were graded from Level 1 to Level 4, where 1 is the highest level of evidence, using Centre for Reviews and Dissemination guidelines.[11]

unscheduled patients); (7) clinical staff improving processes, decreased production variation and patient care optimisation by GP guidelines; (8) elimination of waste related to delays, repeated encounters and errors; (9) preparation times and referral management; (10) booking procedures, consumer engagement, overbooking and flexible capacity; (11) automation of scheduling times; (12) eReferrals; (13) telemedicine; and (14) patient text messaging.

Discussion

A significant number of strategies to improve the management of out-patient waiting times was identified in the present review. When categorised according to operational areas of focus, this paper identified 26 consistent approaches grouped into three themes. These themes included resource realignment, operational efficiencies and process improvement. However, the research found that the area of most interest with positive results was process improvement, with more than 50% of the studies conducted in this area. The value of this finding for system improvement, and therefore reduction of waiting time, lies in a comprehensive approach incorporating a range of strategies.

Resource alignment

Resource alignment focuses on the internal alignment of resources to better manage out-patient waiting times. The strategies that had the most effect on waiting times were rationalising referrals, triaging of patients and wait list audits. One of the key areas of concern is the capacity of the primary care sector to manage patients in the community. There needs to be a concerted effort by both primary and secondary care stakeholders to manage care for patients by integrated care pathways, better

communication between care providers and encouraging patient participation in the management of their health.[14,15]

In order to facilitate a better transition from the out-patient clinic to primary care, discharge consultations in the out-patient clinic should be a high priority and allocated sufficient time. Patients should be prepared for discharge one visit in advance, and reasons for discharge should be made clear. Structured discharge criteria for the out-patient clinic may help improve discharge consultations. The transition to community care can be facilitated by a management plan for the GP, including arrangements for gaining further access to specialist care in the future and empowering patients to take responsibility for their care by sharing information.[14,15]

At an operational level, wait list audits provide important information on patients' ongoing needs and the accuracy of waiting times and demand for services. This may provide the most benefit for hospitals that are currently managing long wait lists and wait times for patients. Waiting time prioritisation policies are intended to improve the management of patients on the waiting list. They do not directly affect demand for or supply of services, just the timeliness of those services.[52]

Triaging of out-patient referrals is intended to prioritise urgent patients. However, this has the unintended effect of placing most patients at a disadvantage, because they are not deemed urgent. Team-based approaches to care in the out-patient setting have significantly improved waiting times.[19–21,53] Extending the scope of practice of non-medical health professionals with the proper training has contributed to patient satisfaction and the efficient use of resources without any notable adverse effect on patient outcomes. This offers an alternative for the management of out-patients. This needs to be managed in consultation and collaboration with clinicians and patients to ensure that quality of clinical care for patients is maintained.

The expectations of patients also need to be managed to ensure that there is no perception of compromise to quality of care delivered. Given the resources required for triaging patients, the results from a study by Harding *et al.*[54] question the value of the triage system in the out-patient setting.[4] An alternative to triaging may be a single queue with advanced access provided to patients as outlined below under operational efficiency.

Operational efficiency

This area is focused predominantly on improving productivity and internal efficiency at an operational level. The recommendations that had the most effect were scheduling initiatives, advanced access and aligning supply to demand. Appropriate scheduling initiatives (clinics starting promptly, allocation of appointments and time management) have a demonstrated effect on decreasing waiting times for patients. This has the further benefit of improving internal capacity, balancing supply and demand and seeing more patients to further affect the overall decline in waiting times. This enhanced access provides a same-day appointment for patients requesting access to services.

In order to have a significant effect on waiting time and balancing demand and supply, where demand outstrips supply, advanced access needs to be operationalised at the provider, clinic and network levels.[25] By providing appropriate time for an appointment, operational efficiency can be maintained and waiting times continuously improved. Scheduling initiatives, as recommended by Stainkey *et al.*,[16] need to be conducted continuously in order to be efficient and effective. Performance measures to encourage operational improvements have proved to be mostly successful.[55,56]

However, there are challenges faced by implementing performance measures in healthcare, which include conflicting stakeholder priorities in relation to the use of capacity. Further, out-patient initiatives may have the unintended effect of increasing pressure on elective surgery waiting times.[17]

Process improvements

This theme is focused on tactical and strategic improvement in processes to gain efficiency and effectiveness in the out-patient referral process. The recommendations that had the most effect on waiting times were automation of processes like scheduling with eReferrals, telemedicine and patient text messaging. Simulations in healthcare have been explored and some implemented with varying levels of success.[33–38,57] These simulations provide health service managers with insight into capacity planning, aligning demand and supply and control of variation, which, in turn, may lead to inefficiency. However, computer-simulated recommendations may prove to be a challenge to implement operationally and sustain. Change management is key in the implementation of modelling approaches. Changes must be practical and implementable within the human activity system. Conflicting objectives of the various stakeholders need to be considered when recommending changes.[58] There also needs to be significant investment in building the capability of stakeholders for these changes to be successfully implemented and maintained long term.

Significant improvements in process performance may be achieved by systematically identifying the sources of variability at different stages in the process and taking steps that mitigate the undesirable effect of variability.[59] Waste is related to delays, preparation times and referral management and booking procedures. These can be waiting time delays, lead times, times for booking and referral management. By setting targets to these measures, process control and policy deployment can be implemented.[44] There needs to be continuous governance and management of these processes to ensure that they are implemented to minimise variation and maximise efficiency and effective performance.

Research in this area continues to be challenging because there are numerous factors that affect waiting times. Previous studies have focused on resource, operational and process areas. Implementing the changes recommended by computer simulation studies[33–38,57] and the challenges associated with ensuring the sustainability of these changes continue to evolve.

These strategies serve as a starting point for health service managers tasked with improving out-patient waiting times for their organisations. Qualitative strategies that address organisational culture and people-related factors such as capability, performance and attitudes remain areas for further exploration.

It is recommended that further research into organisational culture and person-centred and attitudinal factors affecting waiting times is conducted. Building the capability of caregivers and health service providers is essential to ensuring sustainable change. Further, the cultural change with implementing these strategies needs to be recognised and addressing concerns of different structural interest groups is imperative for these strategies to be successful. There needs to be comprehensive and coordinated collaboration by all stakeholders in order for implemented improvements to significantly affect waiting times for patients. The evidence generated through such research will be vital for improving patient access to care and achieving better health outcomes.

Limitations

The present systematic review has several limitations. A key limitation is that none of the studies reviewed demonstrated causation of waiting times and, at best, allude to associations between strategies and out-patient waiting times. The outcome measures in each study differed and it was therefore difficult to make direct comparisons on outcome efficacy. The assessment of the study design demonstrated that more than 80% of the publications included in this review were hierarchy Levels 3 and 4. This may be due to a combination of factors, including publication bias. Assessment of risk in individual studies was not conducted because the present review did not synthesise quantitative data at the study or outcome level. Strategies that had minimal or a negative effect on waiting times were not reported on and therefore there was no comment made on whether the positive strategies identified may be context specific. The process applied to developing these themes may contain the risk of bias across studies at the outcome level. The search was limited to English peer-reviewed publications. Therefore, the findings may not be comprehensive of all interventions that have been demonstrated to be effective. The time lag from when this research was conducted to when it is published may mean that newly reported interventions are not included, although no

new evidence related to this review was available at the time of submission of the article. Although significant efforts have been made to identify all relevant literature on the presented topics, it is possible that some material may have been overlooked or remain undiscovered.

No analysis has been made of the downstream effect of interventions aimed at reducing out-patient waiting times (e.g. elective surgery waiting times), which may be of relevance to clinicians, managers and patients.

Conclusions

Healthcare systems are complex structures and attempts to reform them pose significant challenges. In this context, the variations in referral pathways and the effects of external factors, including perverse financial incentives, may create variability that is difficult to change. However, research can help inform strategies that may address some of the issues. A comprehensive strategic approach involving resource realignment, operational efficiency and process improvement holds most promise for improving the efficiency and effectiveness of out-patient services and, in doing so, reducing waiting time and thus improving health outcomes. These three broad areas identified are complementary and provide a comprehensive approach to policy improvement in these domains. By identifying the evidence-based strategies that have had the most beneficial effect on waiting times, the present review provides an informed starting point for clinicians, policy makers and health services managers seeking to improve patient access to specialist out-patients in their organisations.

Competing interests

None declared.

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