future transportation

MDPI

Review

Free, Available or Equitable? Hospital Car Parking as Healthcare Access Infrastructure: A Critical Narrative Review with a Four-Nation UK Policy Analysis

Muhammad Hossain

Department of Life and Sports Sciences, School of Life and Health Sciences, Birmingham City University, Birmingham B15 3TN, UK; muhammad.hossain@bcu.ac.uk

Abstract

Hospital car parking is usually managed as an estates or revenue matter, yet it can shape whether and how people reach care. Evidence is dispersed across oncology, disability, transport and policy literatures. This review examined what burdens hospital parking imposes, who bears them, how parking relates to patient experience, attendance and quality, and how the four UK nations respond. A critical narrative review with a four-nation policy analysis was conducted by a single author. PubMed (two search rounds), Scopus, Web of Science, PsycINFO, CINAHL and OpenAlex were searched on 29 October 2026, with semantic searches, citation tracking and official policy sources. Records from 2000 onward were screened against PICOS criteria, and 52 studies with parking-specific findings were charted and informally appraised by directness, design and setting. Evidence is concentrated in cancer care (23 of 52 studies) and high-income countries and is mostly cross-sectional and self-reported. Parking was the most frequently selected service-improvement priority in two Australian surveys (56% and 60.3%), and accounted for 60% of drivers' travel costs in one single-centre Australian neurology study (n = 155), a figure that should not be generalised. Findings on satisfaction were inconsistent, and a randomised trial of free parking in a neonatal unit found no improvement in visitation. No evaluation of abolishing parking charges in Scotland or Wales was identified. England mandates free parking for defined groups through the NHS Standard Contract; Wales and Scotland have removed charges; Northern Ireland has deferred abolition to no later than 12 May 2029. Free, available and equitable parking are distinct objectives. Parking should be managed as access infrastructure, with targeted relief, accessible capacity, clear information, transport integration and evaluation of reforms.

Keywords: hospital parking; healthcare access; health equity; transport accessibility; patient experience; financial burden; NHS; health policy

Check for updates

Academic Editor: Denis Borenstein

Received: 11 September 2026
Revised: 30 October 2026
Accepted: 7 November 2026
Published: 13 November 2026

Copyright: © 2026 by the author. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license.

1. Introduction

Access to healthcare is not exhausted by the availability of a service or the offer of an appointment. It also concerns whether people can identify, seek, reach, obtain and engage with care under conditions that are practically and financially feasible. Levesque and colleagues conceptualise access as an interaction between health-system characteristics and population abilities, including availability and accommodation, affordability, the ability to reach and the ability to pay [1]. Subsequent empirical use of this framework confirms its value for analysing access as a multilevel process rather than a single measure of service supply [2].

Earlier, Penchansky and Thomas defined access as the degree of fit between patients and the health-care system across five dimensions: availability, accessibility, accommodation, affordability and acceptability [3].

Parking sits within this access interface. Although parking is ubiquitous within the built environment, its public-health implications have only recently received sustained scholarly attention [4]. In hospitals, the issue is especially consequential because parking is not discretionary for many users: it may be the final link in a journey undertaken because of illness, disability, caregiving or repeated treatment. Mason's 2010 economic review of hospital car parking described both monetary and time costs associated with reaching secondary care and highlighted substantial burdens among people requiring repeated attendance [5]. Gilbert subsequently argued that car parking can become a clinical quality issue when stress and delay generated before an appointment influence the patient's readiness to participate in care [6]. The broader transport literature supports the underlying concern: systematic reviews link transportation barriers with rescheduled or missed appointments and delayed care [7], and travel time or distance with less favourable health or utilisation outcomes in high-income countries [8], although neither isolates parking.

Parking-specific evidence has expanded since Mason's review. It is concentrated in oncology, where parking cost and availability recur as unmet needs and improvement priorities [9–13], and in studies of disabled patients, which show that availability alone is insufficient [14]. Parking fees also accumulate with repeated attendance alongside fuel, fares, childcare and lost working time [15,16], so that care can be free at the point of clinical delivery while still imposing costs at the point of access. Those costs are unlikely to have equal consequences across populations because the ability to absorb them differs by income, mobility, geography, treatment frequency and access to alternative transport.

Three problems nevertheless limit the usefulness of this literature. First, it is dispersed: parking is studied as an estates problem, a financial burden, a patient-experience complaint, a transport barrier or a disability-access issue, and these strands are rarely brought together. Second, the evidence is concentrated in oncology and in high-income countries and is mostly observational and self-reported, so its transferability to other specialties, settings and populations is uncertain. Third, UK policy on hospital parking now diverges across the four nations, yet the search reported below identified no published evaluation of what those differences have achieved for patients. The central challenge is therefore to distinguish three objectives that policy and public debate often conflate, namely free parking, available parking and equitable parking, and to establish what the evidence can and cannot support about each.

This review adopts a transport-accessibility lens alongside two health-access frameworks, for a specific reason. The Penchansky and Thomas dimensions describe attributes of the service that can be observed and managed, such as the capacity of a car park (availability), its distance from the entrance (accessibility), its payment and opening arrangements (accommodation), its price (affordability) and its acceptability to users, and they map directly onto parking features. The Levesque framework adds the abilities of the population to reach, to pay and to engage, which are needed to explain why the same arrangement is experienced unequally. Where the two overlap, they are treated as the same dimension (Section 2.6). Donabedian's structure, process and outcome model is used separately to locate parking within organisational quality.

The issue is also timely in the United Kingdom because policy is not uniform. England mandates free parking for specified high-need groups through the NHS Standard Contract but otherwise retains local charging and management arrangements [17]. Wales has provided free parking across NHS hospital sites, with the last externally contracted sites transitioning by 2018 [18]. Scotland introduced free hospital parking in 2008, with three

sites held under private finance contracts as exceptions until charges there were bought out or removed in the early 2020s [19,20]. Northern Ireland has legislated for abolition but has deferred implementation, most recently to a date to be set no later than 12 May 2029, because of the financial cost to the health and social care system [21,22]. These contrasting approaches create a useful policy lens through which to examine the tension between affordability for users, operational capacity, sustainability and opportunity cost for health services.

The aim of this review is therefore to critically synthesise evidence on hospital car parking as healthcare access infrastructure and to examine how current UK policy responds to the problems identified. The review question is: to what extent does the available evidence support treating hospital parking as a determinant of healthcare access, equity and quality, and how do the four UK nations address its financial, capacity and accessibility dimensions? Each of four sub-questions responds to one of the gaps above. The first two address the dispersed evidence: (1) what burdens are associated with hospital parking, and (2) which populations are disproportionately affected and through what mechanisms. The third addresses the limited and observational evidence: (3) how do parking conditions relate to patient and carer experience, attendance and the wider quality of care. The fourth addresses policy divergence: (4) what organisational and policy responses are most defensible given the current evidence?

2. Methods

2.1. Review Design and Scope

A structured critical narrative review was used because the relevant evidence spans health services research, health economics, oncology, disability, patient experience, transport, parking operations and public policy. Narrative reviews are appropriate when heterogeneous forms of evidence need to be integrated, interpreted and critiqued rather than pooled into a single effect estimate [23,24]. The review was conducted by a single author and was not designed or reported as a systematic review or meta-analysis. The purpose of the search was therefore to identify a sufficiently broad and methodologically informative evidence base for critical synthesis rather than to estimate a pooled intervention effect or to provide an exhaustive census of the literature.

2.2. Search Strategy

The evidence base was first assembled between August and September 2026 using semantic literature-search tools, the author's own search notes and citation tracking. Because those initial searches were not archived in reproducible form, structured searches were run on 29 October 2026 to document and update the evidence base. The strings and counts reported here are those of the update.

PubMed was searched from inception to 29 October 2026. The broad string (S1) combined parking terms with healthcare-setting terms: (parking[tiab] OR "car park"[tiab] OR "car parks"[tiab] OR "car parking"[tiab]) AND (hospital*[tiab] OR outpatient*[tiab] OR clinic*[tiab] OR "health care"[tiab] OR healthcare[tiab]), which retrieved 570 records. A second string (S2) restricted S1 with an access block: AND (cost[tiab] OR charge*[tiab] OR fee[tiab] OR fees[tiab] OR access[tiab] OR barrier*[tiab] OR attendance[tiab] OR satisfaction[tiab] OR equity[tiab]), which retrieved 277 records. A third string (S3) restricted parking terms to titles: (parking[ti] OR "car park"[ti] OR "car parks"[ti] OR "car parking"[ti]) AND (hospital*[tiab] OR outpatient*[tiab] OR clinic*[tiab] OR patient*[tiab] OR healthcare[tiab] OR "health care"[tiab]), which retrieved 117 records. S2 and S3 together yielded 370 unique records, which were screened in full. S1 was used to size the literature and was not screened separately. Because these strings required a healthcare-setting term

and, for S2, an access term, a fourth string (S4) without a context block was run to test their sensitivity: ("hospital parking"[tiab] OR "parking fee"[tiab] OR "parking fees"[tiab] OR "parking charge"[tiab] OR "parking charges"[tiab] OR "parking cost"[tiab] OR "parking costs"[tiab] OR "free parking"[tiab] OR "car parking"[tiab] OR "car park"[tiab] OR "car parks"[tiab] OR "parking availability"[tiab] OR "parking space"[tiab] OR "parking spaces"[tiab]) AND 2000:2026[dp] AND English[la]. S4 retrieved 462 records, of which 81 had already been screened. The other 381 were screened in the same way, so that 751 unique PubMed records were screened in total. S4 identified 30 further eligible records, including six studies already in the evidence base [12,13,15,16,25,26] that S2 and S3 had missed, which shows that the first strings were not fully sensitive. Because the strings search titles and abstracts, studies in which parking was reported only in the full text are likely to have been missed.

OpenAlex (https://openalex.org) was searched on the same date for works since 1990 about (parking OR "car park" OR "car parks" OR "car parking") AND (hospital* OR outpatient* OR "health facilit*" OR healthcare OR "health care" OR clinic*), excluding retracted works, which returned 4362 records. This count is dominated by engineering and urban-planning literature and was not screened exhaustively. To explore evidence from low- and middle-income settings, a more specific OpenAlex search (hospital parking AND Africa OR India OR China OR "low-income" OR "middle-income" OR "developing countries", since 2000) returned 190 records, of which the 15 most relevant by ranking were screened. Three semantic searches in Consensus (https://consensus.app; UK nations and abolition of parking charges; non-cancer and caregiver access; low- and middle-income settings and missed appointments), each limited to the first 20 results, and targeted searches in Scite (https://scite.ai) were used to identify further candidates, giving 60 Consensus records for screening. Backward and forward citation tracking from key reviews and highly relevant empirical studies supplemented the database searches. Scopus (Elsevier, Amsterdam, The Netherlands), Web of Science Core Collection (Clarivate, London, UK), APA PsycInfo and PsycArticles, and CINAHL Ultimate (both via EBSCOhost; EBSCO Information Services, Ipswich, MA, USA) were also searched on 29 October 2026 using the same parking phrases combined with healthcare-setting terms (full strings in Supplementary Tables S4–S7). After restriction to health, social-science and economics subject areas and to English-language records from 2000 onward where the platform allowed, Scopus returned 185 records, Web of Science 70, PsycINFO 49 (with no date or language limits) and CINAHL 139. These databases return many engineering, planning and trade-press records and apply word stemming, so their results were screened by the author at title level, and potentially relevant health records were checked against the PubMed screening set and, where necessary, in PubMed. Searches of other databases (for example Embase) and hand-searching of journals were not undertaken, and this is acknowledged as a limitation in Section 4.6.

2.3. Eligibility Criteria

Eligibility was defined using the PICOS elements in Table 1. Studies were eligible when they reported a finding about hospital or clinic parking (cost, availability, accessibility, management or policy) in relation to healthcare access, affordability, attendance, utilisation, equity, patient, carer or staff experience, or patient-relevant outcomes. Quantitative, qualitative, mixed-methods, economic, operational and policy studies and reviews were eligible. Commentary and editorial pieces were not used as evidence but were retained as context where they documented policy developments. Records were excluded when parking was not related to healthcare, when parking was mentioned only incidentally without a reported finding, when the record was not in English, or, for the updated search, when

it was published before 2000. Seminal earlier sources retained from the original evidence base, including Penchansky and Thomas [3], were not excluded on date.

Table 1. PICOS framework and eligibility criteria used for the evidence component.

Element	Criteria
Population	Patients, carers, visitors and (secondarily) staff attending hospitals, outpatient clinics or other health facilities; any age; any country.
Exposure/intervention	Hospital or clinic parking: cost, charges and concessions; availability and capacity; accessibility (including accessible bays and distance to entrances); payment and information processes; management, policy and operational interventions (including shuttles, park-and-ride and digital guidance).
Comparison	No parking intervention, a different parking arrangement or another access barrier; descriptive studies without a comparator were also eligible.
Outcomes	Financial burden; time and search effort; accessibility; satisfaction and patient, carer or staff experience; unmet need; lateness, attendance and utilisation; operational and policy outcomes; clinical outcomes where reported.
Study design	Quantitative (cross-sectional, cohort, trial, economic and operational), qualitative and mixed-methods studies; systematic, scoping and narrative reviews; official policy documents. Commentary and editorials were used as context only.
Limits	English language. Records from 2000 onward in the updated search; earlier seminal sources retained from the original evidence base. Excluded: parking unrelated to healthcare, parking mentioned only incidentally without a reported finding, non-English records.

2.4. Screening and Selection

Titles and abstracts of the 751 PubMed records, the 15 OpenAlex records and the 60 Consensus records were screened against the criteria in Table 1, and the titles returned by the four additional databases were scanned as described in Section 2.2. Screening was conducted by the author with the assistance of generative artificial intelligence, which applied the written criteria to each record and recorded a code and reason; the author remained responsible for the criteria, for reviewing decisions on the records used in this review and for all inclusion decisions. There was no independent second human reviewer, and agreement between reviewers could not be assessed. Records meeting the criteria at abstract level were then prioritised for inclusion where parking was a reported finding rather than a peripheral item, where the design or setting added information not provided by a stronger or more direct source, or where the record filled a gap identified in the evidence map (for example non-oncology populations, middle-income settings or staff). Because selection was purposive, not every eligible record is cited, and the codes and reasons for every screened PubMed record are available in Supplementary Table S2. For studies added during the update, data were charted from abstracts and bibliographic records, and findings are reported only at the level of detail those sources support; full-text appraisal of every cited study was not undertaken.

2.5. Policy Documents and Grey Literature

For the UK policy component, official documents and webpages from the Department of Health and Social Care and NHS England, the Welsh Government, the Scottish Government and Scottish Parliament, the Northern Ireland Assembly and the Department of Health in Northern Ireland were identified through targeted searches and reference chaining. Grey literature was restricted to authoritative government, NHS, parliamentary

and public-interest sources (including Healthwatch England); commercial commentary and press articles were used only to locate primary documents and are not cited as evidence. Documents were included when they described current or historically important hospital parking charging arrangements, entitlements or concessions, accessibility requirements, responsibility for local management, patient information, financial considerations, or the relationship between parking and wider transport policy. Primary documents for England, Wales, Scotland and Northern Ireland, and the supporting NHS England, Scottish Government, Northern Ireland and Healthwatch England sources, were re-accessed on 29 October 2026, and the access dates in the reference list show this. One long document (the Scottish cancer strategy evaluation [27]) could not be re-fetched and retains its earlier access date. The primary legislation itself was not consulted; the Northern Ireland position is taken from the Assembly's explanatory and financial memorandum and the Department's statement.

2.6. Data Charting, Theme Derivation and Framework Mapping

For each included study, information was charted on setting and population, design, the parking exposure examined, outcomes, principal findings and relevance to the review questions. Themes were derived iteratively. Charted findings were first grouped deductively under the Levesque and Penchansky and Thomas dimensions and the Donabedian categories using the mapping in Table 2, and additional themes that did not fit those frameworks (staff parking, sustainability and digital or virtual care) were then added inductively. The themes correspond to the subsections of the Results: affordability, accessibility and equity (research questions 1 and 2), experience, attendance and quality (question 3), and policy and action (question 4).

Table 2. Mapping of parking attributes to access and quality frameworks used in the synthesis.

Parking Attribute	Penchansky and Thomas [3]	Levesque et al. [1]	Donabedian [28]
Capacity and number of spaces	Availability	Availability and accommodation	Structure
Location, distance to entrances, accessible bays, mobility	Accessibility	Ability to reach	Structure
Hours, payment method, pay-on-exit, validation and information	Accommodation	Availability and accommodation; ability to engage	Process
Charges, concessions and cost to the user	Affordability	Affordability; ability to pay	Process
Stress, satisfaction and perceived fairness	Acceptability	Acceptability	Outcome (patient experience)
Lateness, non-attendance and unmet need	Not applicable (consequence of the five dimensions)	Ability to seek and to reach	Outcome (intermediate)

Study-level appraisal was informal and is not a formal risk-of-bias assessment. Each study was classified by the role of parking in the study (the primary exposure or outcome, one item among several in a broader survey, or contextual evidence) and by design, sample, setting and transparency of reporting, and interpretive weight in the synthesis followed directness to hospital parking, consistency with other evidence and relevance to UK hospital access. No pooled estimate was generated. Particular care was taken not to infer causality from studies in which parking was one element of a broader transport or financial burden. The synthesis therefore distinguishes evidence that parking is associated with cost, stress,

unmet need or satisfaction from more tentative pathways involving lateness, non-attendance and downstream clinical outcomes.

3. Results

3.1. Study Selection and Characteristics of the Evidence

The searches described in Section 2.2 identified 751 unique PubMed records, 15 screened OpenAlex records and 60 Consensus records. Of the 751 PubMed records, 126 met the eligibility criteria at abstract level because they reported a parking-specific finding, 46 were commentary, news or staff-parking items retained as context, 362 did not concern healthcare parking, 124 mentioned parking only incidentally, 82 were published before 2000 (an exclusion applied only to the first 370 records), four were not in English, five had no abstract and two could not be retrieved (Supplementary Table S2). Scopus, Web of Science, PsycINFO and CINAHL identified no further eligible patient or visitor study beyond those already retrieved from PubMed or already in the evidence base (Supplementary Tables S4–S7). OpenAlex, Consensus, Scite and citation tracking added five further sources that are cited here [29–33]. Sixty-nine of the 126 eligible PubMed records are cited in this review, including six that the first search strings had missed. The remaining 57, listed with their findings in Supplementary Table S3, mostly reported parking costs combined with other travel costs, estimated savings from virtual or remote care (more than a dozen records), or parking satisfaction as one item within a general survey; two concerned settings outside routine healthcare (an emergency mass-prophylaxis simulation and a community-pharmacy survey). None contradicted the patterns described below.

Fifty-two sources with parking-specific findings are charted in Table 3: 51 primary studies and one systematic review. They comprise studies from the USA (13), the UK (11), Australia (nine), Canada (six), other European countries (four), the Middle East (four), Asia (three, from Malaysia and China) and Africa (one, from South Africa); one did not state a country in the abstract. Six were from upper-middle-income countries (Jordan, Malaysia, China and South Africa). No study from a low-income country was identified. Twenty-three of the 52 (44%) concerned cancer care, survivorship, carers or cancer screening. Thirty-eight used cross-sectional or other observational quantitative designs, eleven were qualitative, one was mixed-methods, one was a systematic review and one was a randomised trial. Parking was the primary exposure or cost examined in only five studies, one of several themes in 11 qualitative studies, and one item among several in the remaining 36 studies. This distribution should be borne in mind throughout: the evidence is concentrated in particular specialties and settings, and parking is more often reported as one finding within a broader study than tested as an exposure.

Several methodological limitations recur across these studies and qualify how far they can support policy conclusions. Most were cross-sectional, self-reported and unadjusted or minimally adjusted, so they are exposed to recall and social-desirability bias and to confounding by income, distance, diagnosis and treatment intensity. Many were single-centre convenience samples, from as few as 11 participants in qualitative work to 1144 in the largest survey, so representativeness is uncertain. Parking was usually one item among many, with no prespecified parking hypothesis, which raises the possibility that parking findings were reported selectively, and satisfaction was commonly measured with single, unvalidated items at one time point. Costs were reported in different currencies and years, and proportions were rarely accompanied by confidence intervals. Only one randomised trial was identified. These studies are therefore best read as consistent signals about the salience and cost of parking rather than as estimates of effect, and they cannot by themselves show that a change in parking would change attendance or outcomes.

Table 3. Selected evidence directly informing hospital parking, access, equity and patient/carer experience.

Study	Setting and Design	Parking-Related Finding	Role of Parking *	Interpretive Relevance
Arachige et al. [9]	Australia; neurology outpatients; observational survey, $n = 155$	Parking comprised 60% of driver travel costs; greater distance associated with higher cost and lower socioeconomic status.	Primary	Direct evidence for affordability and socioeconomic burden.
Grant et al. [10]	USA; multiple myeloma patient-caregiver dyads; qualitative, $n = 42$	High parking costs, limited parking and accessibility concerns emerged as organisational access barriers.	Theme	Direct access and equity evidence.
Hall et al. [11]	Australia; six oncology units; cross-sectional survey, $n = 879$	Car parking was the most frequently selected service improvement (56%).	Item	Strong patient-priority signal.
Lisy et al. [12]	Australia; cancer survivors; systematic review, 17 studies	Affordable hospital parking recurred among unmet supportive-care needs.	Item	Shows consistency across cancer studies.
Mirosevic et al. [13]	Slovenia; breast cancer survivors; cross-sectional, $n = 430$	Lack of accessible hospital parking was reported by 43% and was the most frequent unmet need.	Item	Accessibility and survivorship burden.
Lee et al. [15]	USA; 63 NCI-designated cancer centres; cross-sectional policy/cost study	Large variation in fees and information; cumulative treatment-course costs could reach hundreds of dollars.	Primary	Direct evidence for recurring cost exposure.
Longo et al. [16]	Canada; 20 cancer centres; national survey, $n = 901$	Mean 28-day parking cost CAD 84; financial burden greater among lower-income households.	Item	Parking within financial toxicity.
Alkawai and Alowayyed [14]	Saudi Arabia; physical disability; cross-sectional, $n = 235$	More than half were dissatisfied with parking; wheelchair users reported poorer access-related satisfaction.	Item	Direct disability-equity evidence.
Kagalwalla et al. [34]	USA; ambulatory cancer care; time-motion/location data, $n = 435$	Median parking time 14 min; total care-day time burden approached 200 min.	Item	Temporal burden and time toxicity.
Al Balushi et al. [35]	Canada; 115 cancer centres; cross-sectional cost study	Median daily parking CAD 9.50; charges varied with local context.	Primary	Parking-related financial toxicity.
Htet et al. [36]	USA; phototherapy centres; cross-sectional cost study	Frequent phototherapy can generate substantial recurring parking costs.	Primary	Highlights high-frequency treatment burden.
Costa et al. [37]	UK; carers of critically ill children; survey, $n = 71$	Parking formed part of weekly direct non-medical expenditure alongside travel, food, accommodation and childcare.	Item	UK caregiver economic burden.

Table 3. *Cont.*

Study	Setting and Design	Parking-Related Finding	Role of Parking *	Interpretive Relevance
Alibrandi et al. [38]	Italy; hospital patients; satisfaction study, >350 observations	Parking availability was associated with higher patient satisfaction.	Item	Direct quality/experience evidence.
Bridge et al. [39]	Canada; ambulatory cancer care; qualitative content analysis	Parking emerged as a distinct patient-experience theme.	Theme	Qualitative experience evidence.
Kulnik et al. [25]	UK; long-distance ICU visitors; survey	Car parking was identified among areas for improvement.	Item	Visitor and caregiver access.
Mehta et al. [40]	Canada; adult ICU visitors; cross-sectional, $n = 224$	Convenient and discounted parking were each rated very/extremely important by 80%.	Item	Visitor priority and affordability.
Northrup et al. [26]	USA; NICU families; randomised trial, $n = 138$	Free parking did not significantly improve visitation, involvement, satisfaction or infant length of stay.	Primary	Important counter-evidence: fee relief alone is insufficient.
Kelly et al. [41]	USA; sleep clinic patients; survey of preferences about telemedicine	Parking cost was the most commonly reported barrier to in-person visits (44%).	Item	Cost barrier outside oncology.
Dang et al. [42]	USA; HIV primary care; cross-sectional survey, $n = 489$	Parking and wait time were rated low but did not correlate with overall satisfaction.	Item	Counter-evidence on satisfaction.
Land et al. [43]	UK; three long-term-condition clinics; patient survey, $n = 147$	Cheaper car parking was among the most frequent sources of dissatisfaction.	Item	UK patient-experience evidence.
Twiddy et al. [44]	UK (northern England); OPAT patients; qualitative interviews	Expensive car parking frustrated patients.	Theme	UK qualitative evidence from a non-cancer service.
Pather et al. [45]	Australia; gynaecological oncology and dysplasia unit; prospective questionnaire, $n = 187$	Lack of parking was an area for improvement although 96% were satisfied overall.	Item	Parking as a non-clinical source of dissatisfaction.
Fradgley et al. [46]	Australia; chronic disease outpatients; cross-sectional survey	Improved parking was the initiative most often selected (60.3%).	Item	Priority signal beyond oncology; a different measure from cost share.
Patel and Cabana [47]	USA; paediatric clinic; parental satisfaction survey	Parking difficulty was associated with dissatisfaction (odds ratio 0.38, 95% CI 0.26 to 0.57, as reported).	Item	Association with experience in paediatric care.

Table 3. *Cont.*

Study	Setting and Design	Parking-Related Finding	Role of Parking *	Interpretive Relevance
Bible et al. [48]	USA; spine clinic; patient survey	Parking satisfaction was significantly associated with overall visit satisfaction ($p < 0.0001$).	Item	Association with global satisfaction.
Al Saif et al. [49]	Bahrain; caregivers of adolescents with sickle cell disease; mixed methods, $n = 101$ survey and 18 interviews	Lack of parking was the most common challenge in seeking hospital care (52.5%).	Item	Caregiver evidence from the Middle East.
Haywood et al. [50]	UK; acute care for older people; interviews and focus groups	Visitors stressed the importance of access and parking.	Theme	Older people and visitors.
Giannopoulos et al. [51]	Canada; prostate cancer survivors; cross-sectional survey, $n = 206$	More accessible parking was the greatest unmet quality-of-life need (34/57, 60%).	Item	Survivorship unmet need; proportion relates to those reporting the domain.
Parker et al. [52]	Australia; adults in remission from acute myeloid leukaemia; qualitative, $n = 11$	Out-of-pocket parking costs formed part of financial strain; the authors suggested reducing or abolishing oncology parking fees.	Theme	Financial toxicity in a rare cancer.
Alshatrat et al. [53]	Jordan; people with and without hearing impairment; cross-sectional survey, $n = 289$	Inaccessible parking was reported by 14.3% of people with hearing impairment and 6.0% of controls ($p = 0.020$).	Item	Disability equity in a middle-income setting.
Alburmawi et al. [54]	Jordan; primary health care users; cross-sectional satisfaction survey	Satisfaction differed significantly by parking availability.	Item	Evidence from a middle-income setting.
Hamilton et al. [55]	UK (Warwickshire, Solihull and Coventry); women attending breast screening; four focus groups, $n = 27$	Women wanted a local, easily accessible screening unit with free car park facilities.	Theme	Early qualitative evidence from screening rather than treatment.
Mahmood [56]	UK; emergency assessment unit patients; questionnaire study	More than half of patients considered ample hospital parking an important aspect of the unit.	Item	Importance rating among ward attributes.
Turner et al. [57]	UK; partners and close family members of long-term cancer survivors; postal survey	Hospital parking was among the most frequently cited unmet needs (respondents reported a mean of 2.7 unmet needs from 34 options).	Item	Carer unmet need.

Table 3. *Cont.*

Study	Setting and Design	Parking-Related Finding	Role of Parking *	Interpretive Relevance
Elskamp et al. [58]	Netherlands; older people who had fallen and declined a falls prevention trial; qualitative interviews, $n = 15$	Transport problems, including distance to the hospital, parking facilities and travel expenses, were reasons for refusing participation.	Theme	Barrier to research participation rather than care.
Girgis et al. [59]	Australia; cancer caregivers; longitudinal survey, $n = 547$, 519 and 443 at 6, 12 and 24 months	Accessible hospital parking was among the top-ranking unmet needs across time.	Item	Persistence of the need over two years.
Gupta et al. [60]	USA; women considering retail-venue screening mammography; survey, $n = 386$	Free parking was an appealing factor for 62%, after proximity to home (90%).	Item	Parking as an attribute of an alternative site.
Huynh et al. [61]	USA; dermatology clinic patients; online satisfaction survey, $n = 148$	Among 52 surveys (35%) indicating areas for improvement, parking availability was one of the most common issues.	Item	Outpatient satisfaction beyond oncology.
Mitchell [62]	UK; chemotherapy patients; qualitative interpretative phenomenological study, $n = 20$	Available car parking and travelling affected quality of life; a mobile unit saved travel time and fuel costs.	Theme	Service redesign as a response to access burden.
Paul et al. [63]	Australia; metropolitan and regional haematological cancer survivors; postal survey, $n = 268$	Free parking for tests or treatment was the most preferred solution to financial and social impacts (37%).	Item	Solution preference.
Ejaz et al. [64]	USA; patients choosing a cancer surgeon; best-worst scaling survey, $n = 214$	Parking availability was the lowest-rated factor in choosing a surgeon (coefficient −2.81).	Item	Parking mattered least for choice of surgeon, a different question from its effect on the experience of attending.
Long et al. [65]	Australia (Western Australia); carers of patients with high-grade glioma; cross-sectional survey	Accessible hospital parking was among the top five moderate or high unmet needs.	Item	Carer unmet need in neuro-oncology.
Kusambiza-Kiingi et al. [66]	South Africa (Johannesburg); stroke survivors at community health centres; cross-sectional survey	Survivors were satisfied with physiotherapy but not with parking availability and the cost of services.	Item	Upper-middle-income setting.

Table 3. *Cont.*

Study	Setting and Design	Parking-Related Finding	Role of Parking *	Interpretive Relevance
Kong et al. [67]	Malaysia; women with breast cancer; 12 focus groups, $n = 64$	Patients from low-income households reported transport and parking costs as troublesome, and some struggled to afford basic necessities.	Theme	Upper-middle-income setting with universal coverage.
Usman et al. [68]	Ireland; rural older-adult psychiatry service; repeated audit of service-user experience	Limited access to disabled parking spaces was a negative response; the issue was resolved.	Item	Remediable accessibility problem.
Swift et al. [69]	UK (Stoke-on-Trent); parents of children undergoing flexible bronchoscopy; semi-structured interviews, $n = 25$	Parents reported additional costs for sibling childcare, travel and car parking.	Theme	Paediatric carers.
Subramaniam Kalianan et al. [70]	Malaysia; public perspective on appointment structure; web survey, $n = 1144$	70.2% would arrive earlier than their appointment slot because parking availability was their utmost concern.	Item	Intended behaviour rather than observed attendance.
Gil-Zaragozano and Marriage [71]	UK (Bristol); families of children attending a pop-up paediatric day care unit; online feedback survey, 72 respondents	Families valued the availability of close, free parking.	Item	Positive value of proximity and free parking.
Xiong et al. [72]	China; tertiary hospital; risk assessment using the Kaiser model with a staff questionnaire	In-hospital parking ranked among the top five risks of negative online public opinion.	Item	Reputational signal rather than patient-level evidence.
Huynh et al. [73]	Country not stated in abstract; pancreatic cancer patient–carer dyads, $n = 84$; cross-sectional survey	One item related to hospital parking was among the top ten moderate-to-high unmet carer needs (at least 28% of carers).	Item	Carer unmet need.
Still et al. [74]	USA (author affiliations); large academic hospital; observation plus interviews with 23 clinicians and administrators and 15 care partners of people with dementia	Parking accessibility affected care partner inclusion; dementia-friendly parking spaces were recommended.	Theme	Dementia care.
Biondo et al. [75]	Canada (Alberta); advanced colorectal cancer; cross-sectional questionnaire, $n = 56$	Average CAD 249 per 28 days for travel and parking combined (median CAD 80, range CAD 0 to CAD 2680).	Item	Parking cannot be separated from travel.

* Primary, parking was the primary exposure or cost examined; Theme, parking was one theme within a qualitative study; Item, parking was one item among several in a broader survey or study. This classification is informal and is not a risk-of-bias rating. OPAT, outpatient parenteral antimicrobial therapy.

3.2. Hospital Parking as Healthcare Access Infrastructure

3.2.1. Availability, Accommodation and the Ability to Reach Care

The strongest conceptual case for treating parking as healthcare infrastructure is that the parking system determines whether a person arriving by car can complete the final stage of reaching care. Within Levesque's framework, this aligns most clearly with availability and accommodation on the service side and the ability to reach on the population side [1,2], and with the availability, accessibility and accommodation dimensions described by Penchansky and Thomas [3]. Nominal supply—the existence of a car park—is therefore an incomplete measure. Effective access depends on whether a suitable space is available at the required time, whether it is close enough for the user's mobility, whether the route from vehicle to clinic is navigable, and whether the process can be completed without excessive delay.

The time burden can be substantial. In a study quantifying ambulatory cancer-care time, 435 patients spent a median of 14 min parking, while total time devoted to a care episode, including clinic, travel and parking, approached 200 min [34]. This matters because the burden of an appointment is not limited to face-to-face clinical time. Search time, uncertainty and the need to arrive early to protect against parking scarcity effectively lengthen the care episode and can create opportunity costs for employment, childcare and caregiving.

Parking also interacts with the broader geography of care. Reviews of transportation and travel distance show that greater access friction is associated with missed or delayed care in many settings [7,8]. A systematic review of no-shows identified lower socioeconomic position and travel distance among recurrent predictors of non-attendance, although effects varied by setting and service [76]. Thus, parking should not be treated as an independent exposure detached from travel; rather, it forms part of a bundle of mesolevel access conditions that shape realised utilisation.

3.2.2. Income, Distance and the Accumulation of Access Friction

Socioeconomic disadvantage and distance often interact rather than simply add. A scoping review of 158 studies concluded that both socioeconomic position and mesolevel healthcare-system characteristics, including distance and provider availability, shape healthcare use; limited moderation analyses generally suggested that improved accessibility can reduce socioeconomic inequalities in utilisation [77]. In Danish mental healthcare, increasing distance was associated with a larger reduction in specialist contact among the lowest-income group than among the highest-income group [78]. Analysis of more than three million outpatient imaging visits similarly found that lower neighbourhood income and greater commute distance predicted no-shows, with the distance effect stronger in lower-income groups [79].

These studies do not establish a parking-fee effect, but they clarify the mechanism through which parking can widen gradients. If a low-income patient already travels farther, has fewer flexible transport options and faces greater opportunity costs, an additional parking charge or prolonged search time may have a larger marginal effect than the same burden would have for a better-resourced patient. The relevant equity question is therefore not whether everyone faces the same tariff, but whether the cumulative access burden is proportionate to resources and clinical need.

3.3. Affordability and the Financial Burden of Hospital Parking

3.3.1. Parking as a Non-Medical Cost of Care

Parking costs are sometimes described as small in relation to clinical expenditure, but this perspective can be misleading because the relevant denominator for patients is household resources, not the hospital budget. In the 2024 single-centre neurology outpatient study, drivers ($n = 155$) spent an average of A$16.70 to attend hospital and parking

represented 60% of their travel cost [9]. This share reflects one Australian centre and one specialty, and it should not be read as a general estimate. It is also a different measure from the proportion of respondents who selected parking as their preferred service improvement in Australian surveys (56% and 60.3%) [11,46]. The same study found an inverse association between travel distance and socioeconomic status, suggesting that people living farther from the hospital may face both higher transport costs and fewer financial resources.

Repeated treatment magnifies this burden. Across National Cancer Institute-designated centres in the United States, parking charges varied markedly and only a minority offered completely free parking to all patients; projected parking costs over a course of treatment could reach hundreds of dollars [15]. In Western Canada, a survey of 115 cancer centres found a median daily parking cost of CAD 9.50, with higher costs in locations with higher costs of living and stronger public transport provision [35]. Phototherapy provides another example: frequent treatment schedules can turn modest per-visit charges into substantial cumulative annual expenditure [36]. In Canadian prostate radiotherapy, parking would have cost an estimated CAD 38 per patient under a five-fraction schedule against CAD 293 under a 39-fraction schedule [80], which shows how treatment frequency rather than tariff alone drives exposure. Costs are not confined to patients: in an Australian acute hospital, estimated average parking costs for visitors were A$18.10 per day, or A$11.85 for concession users [81], and the cost of food and parking for one accompanying parent of a hospitalised child was estimated to exceed A$200 per week [82].

Canadian data show how much reported cost can vary even within one country: in a provincial analysis of the national survey of 901 patients with cancer [16], parking costs were highest in Ontario (CAD 103) and lowest in Manitoba (CAD 53) [83], and patients with advanced colorectal cancer in Alberta reported an average of CAD 249 per 28 days for travel and parking combined (median CAD 80, range CAD 0 to CAD 2680), although parking could not be separated from travel [75]. The burden is not confined to systems without universal coverage or to high-income countries: in Malaysia, breast cancer patients from low-income households described transport and parking costs as troublesome, and some struggled to afford basic necessities [67].

3.3.2. Financial Toxicity and Hidden Costs

Parking rarely operates in isolation. A national Canadian study of 901 people with cancer recorded mean 28-day parking costs of CAD 84 in addition to travel and other out-of-pocket expenditure; one-third of respondents reported high financial burden, and lower-income households were disproportionately affected [16]. In northern England, qualitative research with low-income families identified hidden healthcare costs—including transport, parking, food, childcare and lost work—as interacting barriers despite the NHS being free at the point of delivery [84]. Among UK carers of critically ill children, direct non-medical expenditure averaged GBP 164 per week and productivity losses were also substantial; parking was a smaller component than travel or food but formed part of the cumulative burden [37]. In a US radiation oncology cohort, parking and transportation costs influenced medical decisions more often among patients with high financial toxicity than among others (24% versus 6%) [85], and Australian patients in remission from acute myeloid leukaemia described out-of-pocket parking costs as part of their financial strain and suggested that fees for oncology patients be reduced or abolished [52]. A scoping review of travel burdens and financial hardship in cancer care points in the same direction [31].

The policy implication is not that all parking charges are automatically inequitable. Charges may finance maintenance, security, enforcement or demand management, and removal of charges may increase demand where capacity is fixed. The equity problem arises when the financial design is insensitive to clinical frequency, disability, household resources

or the absence of realistic alternatives. Recurrent treatment makes this particularly salient because identical tariffs generate very different total exposures for a person attending once and a person attending several times each week.

3.4. Equity and Differential Burden

3.4.1. Disability, Mobility and Proximity

For disabled and mobility-limited patients, the issue is not simply price. It is the availability of a space with appropriate dimensions and proximity, a safe route from the vehicle to the hospital, and a process that does not require prolonged standing, walking or repeated journeys to validate a permit. In a study of 235 people with physical disabilities, more than half were dissatisfied with parking; wheelchair users reported significantly poorer satisfaction with several accessibility-related hospital facilities [14]. This evidence underscores why free parking entitlement cannot be equated with accessible parking in practice. Related evidence is consistent with this. Among adults with physical disabilities in Saudi Arabia, anxiety was significantly associated with parking availability [86]; in Jordan, inaccessible parking was reported as a barrier to dental care by 14.3% of people with hearing impairment compared with 6.0% of controls [53]; and in on-site reviews of 2389 primary care facilities in California, parking generally met access criteria except for van-accessible parking [87], the provision on which many wheelchair users depend.

Mobility-related disadvantage may also interact with treatment side-effects and age. A patient who could ordinarily walk from a remote overflow car park may be unable to do so during chemotherapy, after surgery or during an exacerbation of chronic disease. Similarly, a carer may need to leave a patient at an entrance and then search for parking alone. These scenarios transfer time and physical burden onto patients and informal caregivers even when no fee is charged.

Qualitative and audit evidence adds to this picture. In a study at a large academic hospital, parking accessibility influenced how far care partners of people living with dementia could be included in hospital care, and dementia-friendly parking spaces were recommended [74]. In a repeated audit of a rural older-adult psychiatry service in Ireland, limited access to disabled parking spaces was among the negative responses and was resolved [68], which suggests that some accessibility problems are readily remediable once they are identified.

3.4.2. Frequent Attenders, Cancer Patients and Caregivers

Oncology provides the clearest body of parking-specific evidence because treatment is often frequent, prolonged and centralised. A systematic review of 17 Australian cancer-survivorship studies found affordable hospital parking among recurrent unmet supportive-care needs [12]. In a study of 430 breast cancer survivors, lack of accessible hospital parking was reported by 43%, making it the most frequently reported unmet need in that sample [13]. Single-centre studies of prostate, gynaecological and other cancer patients report the same signal: more accessible parking was the greatest unmet need in the quality-of-life domain for 60% of prostate cancer survivors in that domain ($n = 34/57$) [51], and lack of parking was identified as an area for improvement in a gynaecological oncology unit in which 96% of patients were otherwise satisfied [45]. In the UK, parking near treatment centres was among the least met needs of cancer outpatients [88], and 22.5% of melanoma follow-up respondents reported that attendance was difficult, mainly because of logistics such as hospital car parking [89]. Hall et al. likewise found parking to be the most commonly requested service improvement among oncology patients [11].

Caregiver evidence broadens the equity lens. In qualitative research on multiple myeloma, patients and caregivers described transportation barriers at individual, inter-

personal and organisational levels, including parking cost and availability [10]. UK long-distance visitors to a regional major trauma centre described emotional, physical and financial pressures and identified car parking among areas requiring improvement [25]. Among ICU visitors in Canada, convenient parking and discounted parking were each rated very or extremely important by 80% of respondents [40]. These findings show that parking policy can affect not only the patient but also the informal care network on which healthcare often depends.

Carers report similar unmet needs. Accessible hospital parking was among the most frequently cited unmet needs of partners and family members of long-term cancer survivors in the UK [57], a top-ranking unmet need among Australian cancer caregivers at 6, 12 and 24 months [59], one of the top five moderate or high unmet needs of carers of patients with high-grade glioma [65], and one of the most frequent unmet carer needs in a study of 84 pancreatic cancer patient–carer dyads [73]. Among Australian haematological cancer survivors, free parking for tests or treatment was the most preferred solution to the financial and social effects of the disease (37%) [63]. The persistence of the need over time in the longitudinal study is notable [59], although these studies measure unmet need rather than harm.

3.4.3. Equality of Rules Versus Equity of Access

A uniform parking rule can be administratively simple yet distributively unequal. The same charge represents a larger share of disposable income for a poorer household; the same walking distance creates a different physical burden for a wheelchair user; and the same daily tariff accumulates differently for a one-off visitor and a dialysis or cancer patient attending repeatedly. Equity therefore requires attention to differential need and ability to absorb burden, not merely identical treatment of all users.

3.5. Patient and Carer Experience, Satisfaction and Quality

3.5.1. The Care Journey Begins Before the Clinical Encounter

Patient experience is shaped by the whole service journey rather than only the consultation. Parking can generate stress through uncertainty, congestion, inability to find a space, payment rules, fear of lateness and concern about penalties. Gilbert's framing of parking as a clinical quality issue is therefore conceptually important: a difficult access journey may leave patients distressed before discussion of diagnosis, treatment or self-management begins [6].

Empirical evidence supports parking as a salient component of perceived service quality. In an Italian hospital study, parking availability was among the factors associated with higher patient satisfaction, alongside facility and clinician-related variables [38]. Qualitative analysis of more than 5000 ambulatory cancer survey respondents identified parking as a distinct patient-experience theme [39]. The strength of the oncology signal is illustrated by Hall et al., where parking was selected as a desired improvement by more patients than updated treatment information or catering [11].

Findings on satisfaction are not uniform, which is an important qualification. Parking difficulty was associated with parental dissatisfaction in a US paediatric clinic (odds ratio 0.38) [47], and parking satisfaction was significantly associated with overall visit satisfaction in a US spine clinic [48]. In UK clinics managing long-term conditions, cheaper car parking was among the most frequent sources of dissatisfaction [43], and expensive car parking frustrated patients receiving outpatient parenteral antimicrobial therapy [44]. By contrast, in a US HIV primary care clinic, wait time and parking received low ratings but did not correlate with overall satisfaction [42]. Parking also featured among the lower-rated domains in emergency department satisfaction in Saudi Arabia [90], and satisfaction with

a new children's hospital improved significantly, especially for parking, after occupancy of a new children's hospital [91]. Together these studies show that parking is a visible and frequently criticised part of the service, but that its weight in global satisfaction varies with setting, population and what else is going wrong, and that satisfaction surveys often measure a single time point without adjusting for confounders.

Further studies show parking as a recurring but usually secondary source of dissatisfaction or value. Parking availability was among the most common improvement areas in a US dermatology resident clinic survey [61], more than half of patients regarded ample parking as an important aspect of a UK emergency assessment unit [56], and women attending UK breast screening focus groups asked for a local, accessible unit with free car park facilities [55]. Patients receiving chemotherapy described available car parking and travel as affecting their quality of life, and a mobile unit saved them travel time and fuel [62], while families valued close, free parking at a pop-up day care unit [71]. Free parking was an appealing factor for 62% of women considering retail-venue screening mammography, second to proximity to home [60]. Not all signals point the same way. Parking availability was the lowest-rated factor in patients' choice of a cancer surgeon [64], which suggests that parking may shape the experience of attending more than the decision about where to be treated. A risk assessment in a Chinese tertiary hospital ranked in-hospital parking among the top five risks of negative online public opinion [72], and stroke survivors attending community health centres in Johannesburg were satisfied with physiotherapy but not with parking availability and the cost of services [66].

3.5.2. Quality: What Can and Cannot Be Claimed

The term quality requires precision. Donabedian's structure-process-outcome model is useful here: parking capacity, accessible bays and transport links are structural features; information, allocation, payment, concessions and enforcement are processes; and timeliness, stress, affordability, experience and satisfaction are plausible patient-centred outcomes [28]. The evidence is sufficient to position parking within organisational quality and patient experience, but not to claim that parking independently determines mortality, morbidity or clinical effectiveness.

This distinction is important for a critical review. Parking may contribute to lateness or non-attendance through financial and transport pathways, but most no-show studies do not isolate parking from distance, income, scheduling and other access factors [76–79]. Similarly, improved parking may reduce avoidable stress without necessarily changing clinical outcomes. The appropriate conclusion is therefore that parking is a modifiable component of the healthcare access environment whose consequences are most clearly demonstrated in experience, affordability and access, while downstream clinical effects remain an important research gap.

3.6. Attendance, Delay and Downstream Consequences

The broader literature consistently links transport difficulty with rescheduled appointments, missed care and delay [7,76]. Income and distance interactions further suggest that access frictions can concentrate among disadvantaged populations [77–79]. Research in the United States has associated transportation barriers with emergency department use and mortality risk among adults with and without a cancer history [32], and transportation barriers have also been documented among frequent health care users [33]. These studies concern transport in general rather than parking, and they are observational. Parking is plausibly one of these frictions, particularly where most patients drive or where public transport is unsuitable, but the current literature contains relatively few studies that identify parking cost or scarcity as an independent predictor of non-attendance. Evidence on virtual

care points the same way indirectly: in a US cohort of patients who used only telemedicine, such use was higher among patients whose clinic charged a parking fee and among those with longer drive times [92], which suggests that some patients substitute remote contact for travel when parking is costly, although the direction of causation cannot be established.

Two further studies suggest behavioural effects. In a Malaysian web survey of 1144 members of the public, 70.2% said they would arrive earlier than a specific appointment slot at a public healthcare facility because parking availability was their utmost concern [70]. This concerns intended behaviour rather than observed attendance, but it indicates how parking scarcity may lengthen the time spent attending and move waiting from the car park to the clinic. Older people who had fallen and declined a hospital-based falls prevention trial gave transport problems, including distance to the hospital, parking facilities and travel expenses, among their reasons [58], which suggests that parking and travel may also affect participation in research.

This limitation should temper causal claims. The 2024 outpatient cost study [9] suggested that more affordable parking and shuttle access might reduce failure to attend, but it did not test this as an intervention. Conversely, one of the few randomised parking-specific trials assigned parents of extremely low birth weight infants to free parking or usual care and found no significant improvement in visitation, parental involvement, satisfaction or infant length of stay [26]. Post hoc analyses showed that income, car ownership and family circumstances continued to predict visitation, demonstrating that parking relief can remove one barrier while leaving others intact.

The most defensible inference is therefore a pathway rather than a deterministic effect: parking burden can add to travel cost, time pressure and uncertainty; those burdens can contribute to lateness, cancellation or reduced visiting; and these access disruptions may have downstream consequences depending on the clinical context. Testing each link directly should be a priority for future research.

No study identified in this review examined parking-specific effects on attendance in emergency or obstetric care, and the evidence on delay in emergency settings is indirect. A review of hospital infrastructure in Indian cities argued that inadequate parking delays patients, visitors and emergency responders, but it proposed technological solutions rather than reporting outcome data [93].

3.7. Boundary Conditions: Settings, Populations and Models of Care

The evidence summarised above is dominated by oncology and high-income settings. This section reports what the review identified outside that core, to indicate where findings may and may not transfer.

3.7.1. Beyond Oncology: Chronic Disease, Paediatric and Older People's Care

Outside oncology, parking appears chiefly as a priority or irritant within general surveys. Among Australian outpatients attending chronic disease clinics, improved parking was the initiative selected by most respondents (60.3%) [46], and in a US sleep clinic parking cost was the most commonly reported barrier to in-person visits (44%) [41]. Carers of children are affected as well as adults: parents of critically ill children in the UK reported parking within a wider burden of non-medical costs [37], and parents of children undergoing flexible bronchoscopy in a UK centre described additional costs for sibling childcare, travel and car parking [69], and Australian estimates put food and parking costs for one accompanying parent of a hospitalised child above A$200 per week [82]. Among women with access to a car who were invited to NHS breast screening, 80% regarded the availability of parking as important, compared with 40% who regarded the cost of car travel as important [94], which is a reminder that availability can matter more to users than

price. For older people receiving acute care in the UK, visitors stressed the importance of access and parking [50]. These studies broaden the picture beyond cancer but add little on mechanisms, and most do not report income or disability, so the equity questions raised earlier cannot be answered from them.

3.7.2. Middle-Income Settings

Evidence from middle-income settings is sparse. In Bahrain, lack of parking was the most common challenge reported by caregivers of adolescents with sickle cell disease (52.5% of 101 respondents) and, together with prolonged emergency waiting, discouraged more than half of caregivers, who preferred smaller centres [49]. In Jordan, satisfaction with primary health care differed significantly by parking availability [54], and inaccessible parking was reported more often by people with hearing impairment than by controls [53]. In Malaysia and South Africa, low-income breast cancer patients described parking costs as troublesome [67] and stroke survivors were dissatisfied with parking availability and cost at community health centres [66]; the Malaysian survey of intended arrival times is described in Section 3.6 [70]. Parking-demand modelling for a private hospital in Indonesia [29] and a review of smart parking in India [93] address capacity rather than patient burden. No study from a low-income country was found, and the paucity of evidence should not be read as absence of an effect: in settings where a larger proportion of patients travel on foot or by public or informal transport, the relevance of hospital parking will differ and may relate more to emergency vehicle access than to patient cost.

3.7.3. Staff, Visitors and Competition for Capacity

Staff use of parking competes with patient use. In Greater Western Sydney, 72.8% of healthcare workers drove to work, usually parking on site [95], and the BMJ has reported both concern that charging risks demoralising the NHS workforce [96] and the end of free hospital parking for English NHS staff in 2022 [30]. No study identified examined the effect of parking costs on low-income staff specifically. Staff were not the focus of this review, but any policy that changes charges for patients should be assessed alongside its implications for staff demand and for spill-over parking.

3.7.4. Hospital Type and Specialty

The review did not identify studies comparing specialist with general hospitals, or private with public hospitals, in terms of parking burden. Oncology and radiotherapy centres are often regional and attract long journeys and frequent attendance, which plausibly explains the concentration of evidence there. The single private-hospital study identified modelled parking demand rather than patient experience [29]. Whether specialist centres, with concentrated caseloads and long travel distances, differ from district hospitals in the burden and the remedies required remains an open question.

3.7.5. Digital and Virtual Care as Demand Management

In a US survey of apps owned by large paediatric hospitals, parking information was the least common feature (27%) [97], which suggests that digital parking guidance is rarely provided. Virtual and remote clinics have been evaluated, mostly as service evaluations, as a way to avoid travel and parking. Estimated savings that combine fuel and parking include a median of A$10 for parking alone per telehealth visit in a general medical clinic in Australia [98], CAD 47.60 per patient with travel in a Canadian lung cancer outreach clinic [99], and GBP 11.78 per patient with fuel in UK virtual arthroplasty follow-up [100]. In a Canadian paediatric airway programme, travel cost savings from consolidated clinics varied with the parking fee level assumed [101]. These figures are small

per visit but accumulate across repeated attendance, and they suggest that appointment design and virtual contact are a form of parking demand management. They also come from convenience evaluations by the services concerned, are limited to patients able to use remote care, and should not be taken to show that remote care is equitable for those without digital access.

3.7.6. Variation Within Nations and Sustainability

Within a single nation, burdens are unlikely to be uniform. The Scottish cancer strategy evaluation found larger travel burdens and parking stress among patients in rural, island and more deprived areas [27], and distance was associated with higher cost and lower socioeconomic status in the Australian neurology study [9]. No study compared urban and rural hospitals directly on parking-specific outcomes. Sustainability is an additional consideration: NHS guidance links parking management to environment and sustainability [102], and the shuttle, park-and-ride and virtual-care options discussed in Section 3.9 are also means of reducing car travel, although no study identified here estimated the health or carbon effects of parking policy.

3.8. UK Policy Analysis

3.8.1. England: Targeted Entitlement Within a Locally Managed System

England retains a mixed model. The status of these arrangements is contractual rather than statutory. The Department of Health and Social Care guidance, updated in March 2022, states that the NHS Standard Contract (Service Condition 17.10) requires NHS trusts and foundation trusts to comply, where applicable, with the guidance and to provide free parking to specified groups considered in greatest need: valid Blue Badge holders attending as patients or visitors (and disabled employees while at work), frequent outpatients attending at least three times within a 30-day period for an overall period of at least three months, parents or guardians of children staying in hospital overnight during defined night-time hours, and qualifying night-shift staff [17]. Because the mechanism is a commissioning contract, it binds the providers to which the contract applies and is not a legal entitlement that patients can enforce through legislation. Beyond these mandatory entitlements, the guidance encourages reasonable local charges, concessions for carers and relatives of people who are gravely ill or have extended stays, pay-on-exit arrangements, waiver of unavoidable overstays and clear publication of policies, charges and complaints information.

NHS England's Health Technical Memorandum 07-03 explicitly states that parking has a large bearing on people's experience of the NHS and advises organisations to work with patients, staff, local authorities and transport providers so users can reach sites safely, conveniently and economically [102]. This is important because it places parking within the patient journey and sustainable transport rather than treating it solely as revenue collection.

Implementation remains a challenge. Healthwatch England reported in June 2026 that expensive parking and lack of availability can make hospital attendance difficult, with patients describing lengthy searches for spaces, arriving very early to manage uncertainty, and difficulties for disabled users despite entitlement to free parking [103]. The policy gap is therefore partly one of conversion: an entitlement to free parking does not guarantee that an appropriate space exists or that the registration and payment process is understandable.

3.8.2. Wales: Universal Free Parking with Active Demand Management

Wales introduced free parking at NHS hospital sites from 1 April 2008. The only exceptions were sites where health boards held external contracts, which the 2018 guidance records as three hospitals, all with contracts expiring in 2018, after which parking was to be free everywhere [18]. The guidance does not assume that free parking solves access. It

anticipates that free parking may increase site traffic flow and access problems and emphasises protection of disabled spaces, safe traffic flow, emergency access and sustainable travel planning. The Welsh model therefore separates affordability from capacity management: price is removed as a barrier, but scarcity and congestion still require governance. The guidance contains no quantified evaluation of the effects of abolition on access or attendance, and no before-and-after evaluation was identified in this review.

3.8.3. Scotland: Free Parking as Access Policy, but Availability Still Matters

Scotland abolished parking charges at NHS-owned car parks in 2008 but retained charges at three hospitals held under private finance contracts: Glasgow Royal Infirmary, Ninewells Hospital and the Royal Infirmary of Edinburgh [20]. A Freedom of Information release of August 2022 records that the Scottish Government bought out the Ninewells and Glasgow Royal Infirmary car parks in 2020–21, that a buy-out for Edinburgh was still being negotiated, and that Ministers judged the cost of fully implementing the policy worthwhile in order to remove barriers to accessing hospital sites [19]. In a letter to the Parliament's petitions committee dated 20 February 2024, the Cabinet Secretary for NHS Recovery, Health and Social Care stated that charges at these sites were removed in 2020, so that no NHS facility in Scotland now charges for parking, and that the 2008 policy was estimated to have saved patients, visitors and staff GBP 54 million [20]. The two documents differ slightly in their account of the timing of the Edinburgh arrangement, and the later statement is used here for the current position. The method behind the GBP 54 million estimate is not given, it is expressed as a saving to users rather than a cost to the NHS, and neither document reports an evaluation of effects on access or attendance. The explicit access rationale is notable because it frames parking charges as a potential barrier rather than only a transport-management instrument.

Recent Scottish cancer-policy evaluation shows, however, that free parking is not equivalent to available or accessible parking. Patients in rural, island and more deprived areas reported substantial travel burdens, and limited parking availability caused stress; the evaluation recommended exploring improvements to free hospital parking, including designated spaces, alongside appointment scheduling, transport partnerships and travel-expense policies [27]. Scotland therefore provides a useful natural policy lesson, although a lesson from policy design rather than from evaluated outcomes: eliminating price can reduce one dimension of burden while leaving capacity, geography and transport integration unresolved.

3.8.4. Northern Ireland: Affordability Versus Health-System Opportunity Cost

Northern Ireland illustrates the financial trade-off most explicitly. The Hospital Parking Charges Act 2022 legislated for abolition, commencement was postponed by a 2024 Act to 12 May 2026, and a further Act received Royal Assent on 8 May 2026, allowing the Department to set a new commencement date by regulations no later than 12 May 2029 [21,22]. The Health Minister stated that removing charges would have stripped GBP 7 million from the health and social care system [21]. The explanatory and financial memorandum gives the underlying figures: Health and Social Care Trust car parks generated about GBP 6.8 million from charges in 2024/25, against about GBP 10.3 million to operate them [22]. The ministerial figure therefore corresponds to gross income from charges that would be forgone, not to a net cost after operating costs. The memorandum does not state whether its figures are gross or net and does not estimate the cost of abolition. Because the operating cost would continue after abolition, the full GBP 10.3 million would have to be met from other budgets, compared with about GBP 3.5 million net of charge income at present (the author's calculation from the memorandum). During the deferral period, patients in Northern Ireland without a

concession continue to pay, and the policy question has shifted from whether to abolish charges to how abolition would be funded. This creates a direct tension between reducing patient access costs and protecting resources for frontline services.

The UK comparison therefore cautions against a binary debate between paid and free parking. England prioritises targeted financial protection; Wales and Scotland remove most or all direct charges but still face capacity and transport problems; Northern Ireland foregrounds opportunity cost. Across all four systems, the unresolved policy question is how to combine affordability, accessible capacity, operational efficiency and sustainability in a way that protects those with greatest clinical and socioeconomic need.

The political and economic implications differ by approach. England's contractual model preserves charging income for trusts but makes patients' exposure beyond the four mandated groups depend on local policy, and therefore on the trust they attend, and on their awareness of an entitlement [103]. Wales and Scotland have removed a direct cost for users, but the cost is carried within health-board budgets; the Scottish figures describe the saving to users and do not report what was forgone or how it was funded [20]. Northern Ireland has preserved income that offsets most of its car park operating costs, at the price of continued charges for patients, and has not yet shown how it will fund abolition [22]. Each approach therefore redistributes cost between patients and health systems differently, and none of the four has been evaluated for effects on access, attendance or equity.

Table 4 summarises the four systems. Two limits to this policy analysis should be stated. First, it describes written policy; apart from the Scottish cancer-strategy evaluation [27] and Healthwatch England feedback [103], no study evaluating implementation, patient outcomes or cost-effectiveness of any nation's parking policy was identified, so conclusions about which model works best cannot be drawn from the UK comparison. Second, parking policy is dynamic, and the analysis reflects documents re-accessed on 29 October 2026.

Table 4. Contemporary hospital parking policy across the four UK nations.

Nation	Charging Position	Priority Groups/ Entitlement	Management Emphasis	Equity Interpretation	Evaluation Evidence Identified
England	Local charging remains possible; free parking for specified high-need groups is required through the NHS Standard Contract (Service Condition 17.10), not by statute [17].	Blue Badge holders; frequent outpatients; parents/guardians of children staying overnight during defined hours; qualifying night-shift staff.	Reasonable charges, concessions, pay-on-exit, waiver of unavoidable overstays, publication of policy and complaints; integration with wider transport [17,102].	Targeted protection can reduce recurrent burden but depends on awareness, eligibility and actual space availability [103].	Patient feedback on implementation [103]; no outcome evaluation identified.
Wales	Free parking at NHS hospital sites from April 2008; the three hospitals with external contracts became free as those contracts expired in 2018 [18].	Universal rather than means/need-tested price relief.	Protect disabled bays and emergency access; manage traffic and demand; link to sustainable travel planning [18].	Removes price barrier but may increase demand pressure where capacity is fixed.	None identified.

Table 4. *Cont.*

Nation	Charging Position	Priority Groups/ Entitlement	Management Emphasis	Equity Interpretation	Evaluation Evidence Identified
Scotland	Charges abolished at NHS-owned car parks in 2008; charges at three private finance sites (Glasgow Royal Infirmary, Ninewells, Royal Infirmary of Edinburgh) bought out or removed in the early 2020s [19,20].	Universal price relief at NHS hospital sites.	Local capacity management and safety; recent cancer evaluation recommends better designated spaces and transport integration [27].	Demonstrates that free parking does not by itself ensure availability or accessibility.	Government savings estimate (GBP 54 million since 2008, method not stated) [20]; FOI release [19]; cancer strategy evaluation [27]; no evaluation of access or attendance effects identified.
Northern Ireland	Abolition legislated but implementation deferred; new date to be set by regulations and no later than 12 May 2029 [21,22].	Future universal abolition envisaged.	2024/25 charge income about GBP 6.8 million (the Minister's GBP 7 million [21]) against about GBP 10.3 million operating cost; the memorandum gives no estimate of the cost of abolition [22].	Makes the patient-affordability versus health-system opportunity-cost trade-off explicit.	None identified.

3.9. From Evidence to Action

The following subsections set out the actions most consistent with the evidence. They are proposals based on the synthesis, not evaluated interventions, and where an implementation cost is unknown this is stated. Table 5 summarises the actions, rationale, indicators and implementation considerations.

Table 5. Evidence-informed action domains for patient-centred hospital parking.

Domain	Recommended Action	Evidence/Rationale	Suggested Evaluation Indicators	Implementation Considerations
Affordability	Targeted free parking, caps or validation for frequent/high-burden users, applied automatically from appointment records where feasible; hardship mechanisms.	Repeated-treatment and financial-toxicity evidence [9,15,16,35–37,52,63,75,80,83–85].	User cost; uptake of concessions; financial hardship; attendance by deprivation.	Forgone income (gross charge income was about GBP 6.8 million across Northern Ireland Trusts in 2024/25 [22]); administrative cost not evaluated.
Accessible capacity	Protect and monitor accessible bays; appropriate proximity; drop-off assistance; service-specific allocation where justified.	Disability and patient-experience evidence [13,14,53,68,74,86,87,103].	Accessible-bay occupancy; search time; walking/transfer distance; complaints.	Bay audit is low cost; expansion needs land and capital; van-accessible provision was the exception in one audit [87].

Table 5. *Cont.*

Domain	Recommended Action	Evidence/Rationale	Suggested Evaluation Indicators	Implementation Considerations
Information	Include parking location, likely constraints, charges/concessions and alternatives in appointment communications.	Policy guidance and implementation gap [17,102,103].	Awareness of concessions; wrong-car-park events; payment/registration complaints.	Low cost; needs integration with booking and messaging systems.
Payment/process	Prefer pay-on-exit or equivalent; grace periods; waive unavoidable overstays; simple validation.	England guidance and patient stress evidence [17,102].	Penalty notices; appeals; overpayment; patient-reported stress.	May need equipment or contract changes; depends on contractor arrangements.
Transport integration	Shuttles, park-and-ride, public/community transport partnerships and transport support.	Transport intervention review and UK guidance [102,104].	Mode share; missed appointments; transfer reliability; user cost.	Revenue cost and partnership working; reliability determines benefit.
Capacity/technology	Use occupancy data, real-time guidance, shared capacity and targeted infrastructure expansion where needed.	Operational studies [29,93,105–107].	Occupancy; search time; queueing; spillover parking; emergency access.	Capital cost; studies report capacity or flow rather than patient outcomes.
Appointment design	Cluster repeat appointments where feasible; offer remote contact where clinically appropriate; consider travel needs in scheduling.	Time-burden, access and virtual-care evidence [27,34,92,98–100].	Number of trips; total care-day time; lateness; patient-reported burden.	Per-visit savings are small; not suitable for all patients; risk of digital exclusion.
Governance and equity	Make parking a joint estates, patient-experience, equality and sustainability responsibility with a named owner; co-design changes.	Cross-cutting synthesis [1,14,27,102,103].	Equity dashboard by disability, deprivation and treatment frequency; complaints; experience.	Staff time for data collection; requires routine monitoring.

3.9.1. Target Financial Relief to Cumulative Need

The evidence most strongly supports protecting users whose exposure is recurrent or whose capacity to absorb costs is limited. Frequent oncology, dialysis, radiotherapy, phototherapy and other repeated-treatment populations are obvious candidates for capped charges, validation or free parking where charges remain. Income-sensitive support may also be justified, but means-testing can create administrative burden and stigma; a clinically defined frequent-attender model, as used in England, is simpler but will not capture all low-income users. Policy design should therefore combine clinical-frequency criteria with flexible hardship mechanisms rather than relying on a single universal rule. In practice, frequency-based eligibility such as the English criterion of at least three attendances in 30 days over at least three months [17] could be applied automatically from appointment records, rather than requiring patients to apply, which would reduce reliance on awareness and on repeated validation. A daily cap or a treatment-course cap would give a predictable ceiling for people on multi-week programmes, and hardship funds could cover those outside the frequency criteria. The administrative cost of these measures has not been evaluated; in

Northern Ireland charge income was about GBP 6.8 million across all Trusts in 2024/25 [22], which indicates the scale of the revenue involved.

3.9.2. Treat Accessible Capacity as Different from Nominal Capacity

Hospitals should distinguish total spaces from spaces that are usable by people with mobility limitations, carers who need to escort a patient, and users attending high-frequency or time-critical services. Monitoring should include occupancy by time of day, search time, accessible-bay availability, distance to relevant entrances, drop-off performance and complaints. The disability evidence [14] and the Scottish implementation experience [27] indicate that an entitlement without an appropriate space does not deliver equitable access. Auditing van-accessible and wheelchair-accessible bays, which were the exception to otherwise adequate parking in a Californian primary care audit [87], is a low-cost first step.

3.9.3. Reduce Uncertainty Through Information and Simple Processes

Parking information should be incorporated into appointment communications rather than left for patients to discover on arrival. Information should explain location, likely capacity constraints, charges, concessions, validation steps, accessible bays, drop-off zones and transport alternatives. NHS England guidance already recommends clear publication of charges and concessions [17,102], yet current patient feedback suggests that confusing registration and availability remain problems [103]. Pay-on-exit or equivalent systems can also reduce anxiety about treatment overrunning a prepaid period.

3.9.4. Integrate Parking with Transport and Appointment Design

Parking reform should not be equated with encouraging universal car use. Wider transport interventions—shuttle services, transport vouchers, coordinated community transport, park-and-ride and improved public transport—can reduce access barriers when they are reliable and matched to clinical schedules. A systematic review of transportation interventions for chronic disease found promising effects from bus passes, vouchers, reimbursement, arranged transport and shuttle services, although many interventions were multicomponent and independent effects were difficult to isolate [104].

Operational research also suggests that coordination matters. Shared-parking models can improve utilisation of scarce capacity [105], while simulation of on-site paid parking combined with free off-site parking and shuttle services suggests that tariff and shuttle scheduling can be jointly optimised [106]. A recent hospital parking-capacity study similarly recommended multilevel parking, digital guidance and smart-parking approaches where supply is structurally inadequate [107]. These studies are useful for design but should not be overinterpreted: most optimise capacity, revenue or flow rather than patient equity or clinical outcomes.

Appointment design is itself a parking intervention. Clustering visits, offering remote contact where clinically appropriate and avoiding peak arrival times can reduce the number of trips and the pressure on capacity, with estimated per-visit savings in the studies reviewed in Section 3.7.5 [98–100]. These approaches should be offered as options rather than defaults for patients without digital access.

3.9.5. Co-Design and Evaluate Parking as a Quality Improvement Intervention

Hospitals should involve patients, carers, disabled users, staff and local transport partners in parking redesign. Patient experience data can identify stress points that conventional occupancy statistics miss, such as uncertainty, fear of penalties, long walking distances or difficulty validating concessions. Interventions should then be evaluated against a balanced set of outcomes: time to park, lateness, non-attendance, parking expenditure, use of conces-

sions, patient/carer experience, accessible-bay availability, complaints, congestion, revenue and carbon implications. This would move parking policy from assumption to testable quality improvement.

4. Discussion

4.1. Reframing Parking as Access Infrastructure

The central finding of this review is conceptual as much as empirical. Hospital parking is best understood as access infrastructure positioned between the transport system and the clinical service (Figure 1). This reframing helps reconcile literatures that have often treated the same phenomenon separately as an estates problem, a financial burden, a patient-experience complaint, a transport barrier or a disability-access issue. Once integrated, these strands show that parking arrangements can alter the monetary, temporal, physical and psychological cost of reaching care.

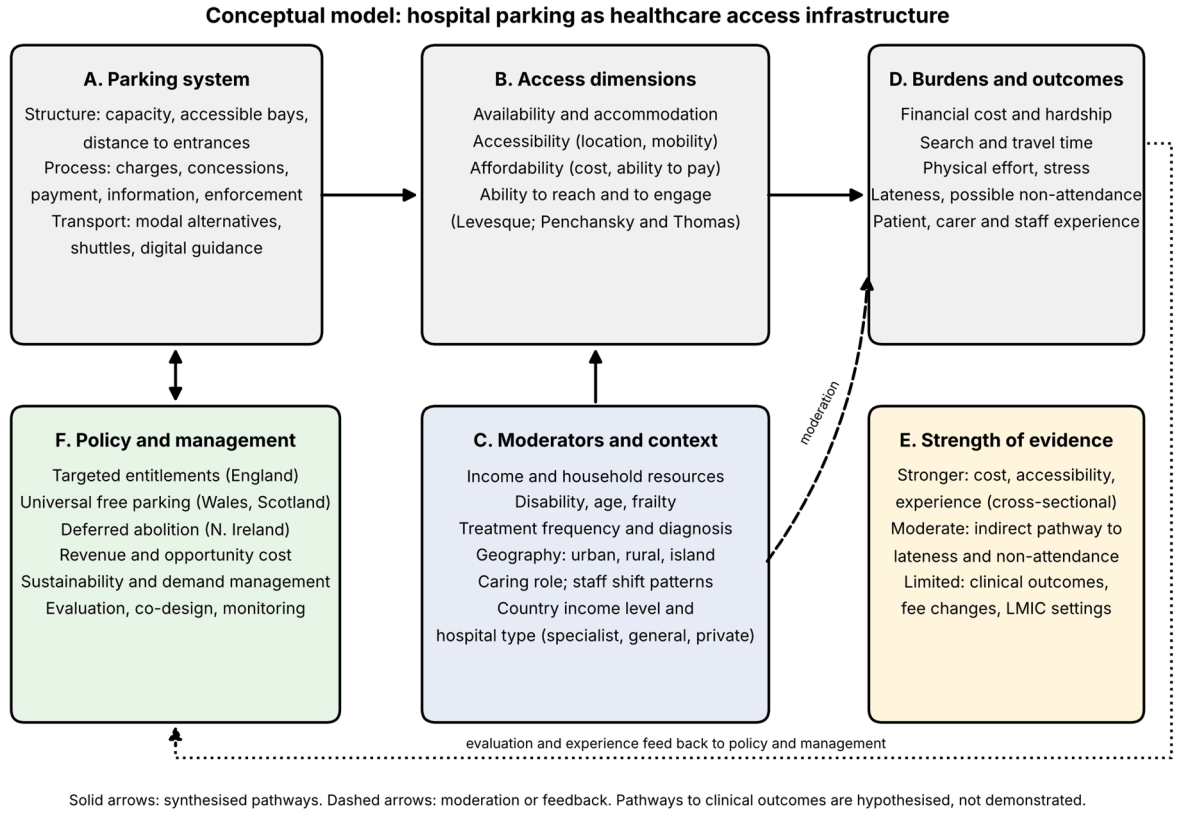


Figure 1. Conceptual model linking hospital parking arrangements to healthcare access, burdens and outcomes. The model distinguishes the parking system (structure, process and transport links), the access dimensions through which it operates, moderating context, burdens and outcomes, the strength of evidence for each link, and the feedback from evaluation to policy. Solid arrows represent synthesised pathways, dashed arrows moderation, and the dotted line feedback; pathways to clinical outcomes are hypothesised rather than demonstrated.

The Levesque framework clarifies why this matters for equity. Parking capacity and organisation reflect availability and accommodation; parking charges reflect affordability; location and accessible design affect ability to reach; and payment or concession processes can affect ability to pay and engage [1,2]. The Penchansky and Thomas dimensions add a service-side vocabulary for the same features, with parking location corresponding to accessibility, hours and payment arrangements to accommodation, and acceptability to the stress and satisfaction findings [3]. A transport-accessibility lens adds the question

of which alternatives to driving exist, which is why the policy discussion below concerns modal alternatives, shuttle services and appointment design as well as tariffs. The burden is therefore relational. A parking system is not intrinsically accessible because it has spaces, nor intrinsically equitable because everyone pays the same price. Its effects depend on the interaction between organisational design and the resources, health status and circumstances of users.

Unlike a linear pathway from parking conditions to outcomes, the model in Figure 1 includes moderators, a statement of the strength of evidence for each link and feedback from evaluation to policy. It combines Levesque's population abilities, the service-side dimensions of Penchansky and Thomas and Donabedian's classification, and it is a conceptual synthesis that has not been empirically tested.

The international studies identified describe charging set at institutional level, with wide variation between US cancer centres [15], Canadian cancer centres [35] and, for visitors, an Australian acute hospital [81], rather than national policy comparable to the UK arrangements. The review did not search for national policies outside the UK, and cross-national comparison of policy is therefore not attempted. What the international evidence does show is that the same concerns recur in different systems: cost and availability emerge as priorities in Australia [11,46], Canada [51], the USA [41,85], the UK [43,44] and the Middle East [49], which supports the view that these are features of hospital access rather than of one health system. The studies come almost entirely from high-income countries, and their transferability to settings where patients rarely drive is uncertain.

4.2. The Difference Between Free, Available and Equitable Parking

The UK comparison demonstrates that three different objectives are often conflated: free parking, available parking and equitable parking. Wales and Scotland show that removing charges can eliminate a direct cost while leaving scarcity, proximity and transport problems. England's targeted model can protect specified groups while leaving others exposed to charges and administrative eligibility processes. Northern Ireland highlights the opportunity cost of universal abolition. None of these approaches alone resolves all dimensions of access.

An equitable model is therefore likely to be differentiated rather than uniform. It would protect people with high cumulative need or limited ability to absorb cost, ensure genuinely accessible capacity, minimise avoidable uncertainty and offer viable alternatives to driving. At the same time, it would preserve mechanisms for managing scarce land and avoid encouraging unnecessary car travel where high-quality alternatives exist. This balance is more defensible than either treating parking purely as a revenue source or assuming that universally free parking is a complete solution.

These inferences should be read with caution. They concern policy design and are drawn from documents and from studies conducted largely outside the UK: only 11 of the 52 tabulated studies are from the UK, none evaluated a change in parking policy, and the UK policy evidence consists of official documents, patient feedback [103] and a cancer-strategy evaluation [27]. The review therefore supports the proposition that free, available and equitable parking are distinct, but not a ranking of the four UK models.

4.3. Quality Without Overclaiming Clinical Effects

The quality argument is strongest when framed around patient-centred organisational quality rather than direct clinical causation. Parking appears repeatedly in satisfaction studies, cancer supportive-care needs and caregiver research [11–13,25,38–40,43,48]. It also contributes to the time and stress of the care journey [34]. These are legitimate dimensions

of quality because healthcare organisations are responsible not only for technical clinical effectiveness but also for timely, accessible and person-centred delivery.

Satisfaction findings are also mixed. In a US HIV clinic, parking was rated low but did not correlate with overall satisfaction [42], while in a spine clinic and a paediatric clinic parking was associated with satisfaction or dissatisfaction [47,48]. A reasonable reading is that parking is a salient but not a dominant determinant of experience, whose weight depends on what else is going wrong during the visit and on how dependent the person is on driving.

However, the evidence does not justify a simple causal chain from parking difficulty to worse clinical outcomes. The randomised free-parking trial [26] is an important counterweight to policy enthusiasm: removing one financial barrier did not significantly change visitation or length of stay. This suggests that structural disadvantage is multicausal and that parking interventions should be embedded in wider access strategies. Future studies should therefore examine whether parking reforms change intermediate outcomes—search time, lateness, cancellation, financial burden and experience—before expecting effects on morbidity or mortality.

4.4. Implications for Healthcare Organisations and Policy Makers

Parking governance should span estates, patient experience, equality, finance and sustainability functions, with a named senior owner so that responsibility is not divided between estates and patient-experience teams. Decisions about tariffs or capacity should be informed by who uses the service, how often they attend, what alternatives exist and which groups report the greatest burden. Hospitals should publish not only parking income and tariffs but also concession uptake, accessible-space performance, complaints, search-time indicators and the distribution of burden across groups.

Implementation costs and trade-offs should be made explicit. Targeted concessions forgo income, and the Northern Ireland figures show the scale of what is at stake: charges generated about GBP 6.8 million in 2024/25, which is about two-thirds of the GBP 10.3 million operating cost [22], and abolition would leave the whole operating cost to be funded from other budgets. Concession design therefore involves a choice about what is cut or cross-subsidised. Conversely, the costs of not acting, including patient expenditure, missed or delayed care, complaints and staff time spent on enforcement and appeals, are not measured in any study identified here. Automatic eligibility from appointment records, pay-on-exit and cluster scheduling are plausible low-cost measures, but their costs and effects have not been evaluated and should not be presented as proven.

At national level, clearer minimum expectations could reduce unwarranted variation while retaining local flexibility. Targeted financial protections should be easy to understand and administer; exemptions should not require repeated complex validation by people already undergoing burdensome treatment. In practical terms, this means automatic eligibility checks from appointment data, a single registration rather than validation at every visit, and eligibility criteria published in plain language. Policy should also recognise carers and visitors where their presence is integral to care, particularly in paediatrics, critical care and disability contexts. Finally, sustainability objectives should be pursued through viable alternatives rather than by using high parking costs as a blunt deterrent for people who have no realistic transport choice.

Sustainability objectives and equity objectives can conflict. Using parking charges as a deterrent to car travel is defensible where good alternatives exist, but the studies reviewed here concern people who often travel because of illness, disability or caring duties, and for whom alternatives are limited. A defensible approach is to differentiate: price and manage capacity for staff and visitors with alternatives, protect patients with the least choice,

and invest in shuttles, community transport and virtual care where clinically appropriate. Hospitals should also plan for the demand effects of free parking, as the Welsh guidance anticipates [18], and for competition for scarce capacity between patients, visitors and staff [95].

Transferability should be considered before these recommendations are applied outside the UK or outside high-income settings. The actions in Table 5 assume a publicly funded system with national guidance, car-dependent patients, and hospitals that control access to their car parks. Recommendations on information, accessible bays and appointment design are likely to transfer, because they address features that recur across the settings studied. Concession design and charging policy may not, because they depend on how care is financed, on what share of patients drive, and on the availability of public or informal transport. In low- and middle-income countries, where the evidence identified was limited to middle-income settings, priorities such as emergency vehicle access and parking demand management may matter more than patient charges [29,93], and the transferability of UK-derived policy conclusions to those settings has not been tested.

4.5. Comparison with Earlier Reviews and Originality

Mason's economic review [5] described the monetary and time costs, including parking, that patients incur in reaching secondary care, but it predates most of the evidence synthesised here and did not address the four-nation policy divergence. The systematic reviews by Syed et al. [7] and Kelly et al. [8] show that transport barriers and travel distance are associated with missed care and with less favourable health or utilisation outcomes, but neither isolates parking and both treat the journey as the unit of analysis. The recent review of parking and public health [4] addresses the public-health implications of parking broadly rather than hospital parking specifically. The present review differs in three respects. It focuses on hospital parking as a component of healthcare access, it separates free, available and equitable parking as distinct policy objectives using two complementary access frameworks, and it combines the evidence synthesis with a verified analysis of current policy in all four UK nations. To the author's knowledge, no previous review has done all three. Its conclusions are consistent with Mason in emphasising repeated attendance and cumulative cost, extend Syed and Kelly by identifying which parts of their transport findings plausibly apply to parking, and qualify both by showing that parking-specific causal evidence is thin.

4.6. Strengths and Limitations

The review has several strengths. It reports reproducible search strings and counts for the structured update, separates direct parking evidence from indirect transport evidence, includes counter-evidence such as the randomised free-parking trial [26] and the HIV clinic study [42], and checks policy for all four UK nations against primary documents. It also draws attention to the limits of the evidence rather than overstating policy conclusions.

Several limitations are important. First, this was a single-author critical narrative review, not a systematic review. Study selection was purposive, there was no independent second reviewer, and screening was assisted by generative artificial intelligence under author oversight, so selection and interpretive bias cannot be excluded and agreement could not be tested. Second, the structured search covered PubMed (two rounds), OpenAlex, Scopus, Web of Science, PsycINFO and CINAHL, supplemented by semantic searches and citation tracking, but the four additional databases were screened at title level only, Embase and other databases were not searched, and the first PubMed strings proved not to be fully sensitive because a broader string identified six studies they had missed. Because the strings search titles and abstracts, studies in which parking was reported only in the full text are likely to be missing, so the evidence base is probably incomplete, especially

for qualitative and non-oncology studies. Third, the initial searches that assembled the evidence base were not archived, so only the update is fully reproducible. Fourth, for studies added in the update, data were charted from abstracts and bibliographic records, and full-text appraisal and formal risk-of-bias assessment were not undertaken. Fifth, no numerical flow diagram is presented because the review was not designed to PRISMA standards; the funnel in Section 3.1 is a partial equivalent. Sixth, the evidence is heterogeneous, concentrated in cancer care (23 of 52 studies) and high-income settings, and mostly cross-sectional and self-reported with convenience or single-centre samples, small samples, uncontrolled confounding, variable outcome definitions and costs in different currencies and years. Parking is usually one item among several, which means that parking-specific effects are difficult to isolate, and the studies identified through a parking search are likely to over-represent settings in which parking was a salient problem. Seventh, operational and policy studies often optimise capacity or revenue rather than patient-centred outcomes. Finally, UK parking policy is dynamic, and the analysis reflects documents re-accessed on 29 October 2026.

4.7. Research Priorities

Four priorities follow from these limitations. First, prospective natural experiments and controlled evaluations are needed of policy changes such as fee abolition, targeted exemptions, pay-on-exit systems, accessible-space redesign, real-time availability information and shuttle services. Scotland's removal of charges at the three remaining sites in the early 2020s and the forthcoming commencement of abolition in Northern Ireland offer opportunities for such evaluations, using routine attendance and complaints data with comparison sites. Second, outcomes should include attendance, lateness, patient and carer cost, experience, accessible-space use, congestion, revenue and carbon effects, with prespecified subgroup analyses by deprivation, disability, age, geography and treatment frequency; mixed-methods designs are also needed to capture uncertainty, dignity and the administrative friction of obtaining concessions. Third, evidence is needed from underrepresented settings and populations, including emergency and obstetric care, older people, rural and island hospitals, specialist and private hospitals, staff, and low- and middle-income countries. Fourth, equity-sensitive economic evaluation should compare the cost to hospitals of concessions or infrastructure with changes in patient expenditure, missed care, staff administration and transport-system effects, to help resolve the recurring tension between patient affordability and organisational sustainability.

5. Conclusions

Hospital car parking is not merely a peripheral facilities issue. It forms part of the infrastructure through which patients and carers reach healthcare, and the review's four questions can be answered as follows. First, hospital parking can add financial, temporal, physical and psychological burdens to the care journey. Second, these burdens fall most heavily on people who attend frequently, live on lower incomes, travel farther, have mobility limitations or depend on carers, although most evidence on these groups comes from oncology and high-income countries. Third, parking is a salient part of patient and carer experience, but its weight in overall satisfaction varies, a randomised trial of free parking found no improvement in visitation, and direct evidence for effects on attendance or clinical outcomes remains limited. Fourth, the most defensible responses combine proportionate financial relief, accessible and predictable capacity, transparent information, simple payment and concession processes, transport integration and evaluation.

The UK comparison shows why no single pricing model is sufficient. Free parking can remove a financial barrier without resolving scarcity or accessibility, targeted exemptions

can protect high-need groups but depend on awareness, eligibility and implementation, and universal abolition has a funding cost that Northern Ireland has so far deferred. No evaluation of what Scotland or Wales achieved by abolition was identified. Compared with earlier work, the review extends Mason's economic analysis [5] and the transport reviews of Syed et al. [7] and Kelly et al. [8] by isolating parking, distinguishing free, available and equitable parking, and verifying the four-nation policy position, while showing that parking-specific causal evidence remains thin. Treating parking as healthcare access infrastructure allows organisations to move beyond a narrow debate about charges towards a more balanced objective: reliable, affordable and equitable access to care.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/futuretransp6060267/s1, Table S1, search strings and counts; Table S2, screening codes and reasons for the 751 PubMed records; Table S3, the 126 PubMed records meeting eligibility criteria at abstract level, with country, design and parking-related finding; Table S4, Scopus search, with strings, counts and candidate records; Table S5, Web of Science search, with strings, counts and candidate records; Table S6, PsycINFO and PsycArticles search, with strings, counts and candidate records; Table S7, CINAHL search, with strings, counts and candidate records. The records listed in Tables S2 and S3 are screening records identified by PMID; those cited in this review are included in the References.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No new datasets were generated. All evidence analysed in this review is available in the cited publications and publicly accessible policy documents. The search strings, screening codes and charted evidence are provided in the Supplementary Materials.

Conflicts of Interest: The author declares no conflict of interest.

Abbreviations

The following abbreviations are used in this manuscript:

AML	acute myeloid leukaemia
A$	Australian dollars
CAD	Canadian dollars
DHSC	Department of Health and Social Care
EFM	explanatory and financial memorandum
GBP	pounds sterling
HTM	Health Technical Memorandum
ICU	intensive care unit
NHS	National Health Service
NCI	National Cancer Institute
OPAT	outpatient parenteral antimicrobial therapy
PFI	Private Finance Initiative
PICOS	population, intervention/exposure, comparison, outcomes, study design

References

1. Levesque, J.F.; Harris, M.F.; Russell, G. Patient-centred access to health care: Conceptualising access at the interface of health systems and populations. *Int. J. Equity Health* **2013**, *12*, 18. [CrossRef] [PubMed]
2. Cu, A.; Meister, S.; Lefebvre, B.; Ridde, V. Assessing healthcare access using the Levesque's conceptual framework: A scoping review. *Int. J. Equity Health* **2021**, *20*, 116. [CrossRef] [PubMed]
3. Penchansky, R.; Thomas, J.W. The Concept of Access: Definition and Relationship to Consumer Satisfaction. *Med. Care* **1981**, *19*, 127–140. [CrossRef] [PubMed]

4. Garber, M.D.; Benmarhnia, T.; Mason, J.; Morales-Zamora, E.; Rojas-Rueda, D. Parking and Public Health. *Curr. Environ. Health Rep.* **2025**, *12*, 2. [CrossRef] [PubMed]
5. Mason, A. *Hospital Car Parking: The Impact of Access Costs*; CHE Research Paper 59; Centre for Health Economics, University of York: York, UK, 2010. Available online: https://www.york.ac.uk/media/che/documents/papers/researchpapers/CHERP59_hospital_car_parking.pdf (accessed on 8 August 2026).
6. Gilbert, D. Car parking is a clinical quality issue. *BMJ* **2015**, *350*, h1312. [CrossRef] [PubMed]
7. Syed, S.T.; Gerber, B.S.; Sharp, L.K. Traveling towards disease: Transportation barriers to health care access. *J. Community Health* **2013**, *38*, 976–993. [CrossRef] [PubMed]
8. Kelly, C.; Hulme, C.; Farragher, T.; Clarke, G. Are differences in travel time or distance to healthcare for adults in global north countries associated with an impact on health outcomes? A systematic review. *BMJ Open* **2016**, *6*, e013059. [CrossRef] [PubMed]
9. Liyana Arachige, M.; Tse, W.C.; Zhang, R.; Ma, H.H.; Singhal, S.; Phan, T.G. Estimating the cost of visiting hospital outpatient. *BMJ Neurol. Open* **2024**, *6*, e000576. [CrossRef] [PubMed]
10. Grant, S.J.; Erisnor, G.; Mills, J.A.; Wang, E.; Bates-Fraser, L.C.; Adams, L.; Mihas, P. "Paying to Be a Patient in the Hospital and the Parking Lot": Patient-Caregiver Dyad Perspectives on Health-Related Transportation Access in Multiple Myeloma. *JCO Oncol. Pract.* **2025**, *21*, 1672–1680. [CrossRef] [PubMed]
11. Hall, A.; Bryant, J.; Sanson-Fisher, R.; Grady, A.; Proietto, A.; Doran, C.M. Top Priorities for Health Service Improvements Among Australian Oncology Patients. *Patient Relat. Outcome Meas.* **2021**, *12*, 83–95. [CrossRef] [PubMed]
12. Lisy, K.; Langdon, L.; Piper, A.; Jefford, M. Identifying the most prevalent unmet needs of cancer survivors in Australia: A systematic review. *Asia-Pac. J. Clin. Oncol.* **2019**, *15*, e68–e78. [CrossRef] [PubMed]
13. Miroševič, Š.; Prins, J.; Borštnar, S.; Besić, N.; Homar, V.; Selič-Zupančič, P.; Smrdel, A.C.Š.; Klemenc-Ketiš, Z. Factors associated with a high level of unmet needs and their prevalence in the breast cancer survivors 1–5 years after post local treatment and (neo)adjuvant chemotherapy during the COVID-19: A cross-sectional study. *Front. Psychol.* **2022**, *13*, 969918. [CrossRef] [PubMed]
14. Alkawai, F.M.; Alowayyed, A.S. Barriers in accessing care services for physically disabled in a hospital setting in Riyadh, Saudi Arabia, cross-sectional study. *J. Community Hosp. Intern. Med. Perspect.* **2017**, *7*, 82–86. [CrossRef] [PubMed]
15. Lee, A.; Shah, K.; Chino, F. Assessment of Parking Fees at National Cancer Institute-Designated Cancer Treatment Centers. *JAMA Oncol.* **2020**, *6*, 1295–1297. [CrossRef] [PubMed]
16. Longo, C.J.; Fitch, M.I.; Loree, J.M.; Carlson, L.E.; Turner, D.; Cheung, W.Y.; Gopaul, D.; Ellis, J.; Ringash, J.; Mathews, M.; et al. Patient and family financial burden associated with cancer treatment in Canada: A national study. *Support. Care Cancer* **2021**, *29*, 3377–3386. [CrossRef] [PubMed]
17. Department of Health and Social Care. NHS Car Parking Guidance 2022 for NHS Trusts and NHS Foundation Trusts. Available online: https://www.gov.uk/government/publications/nhs-patient-visitor-and-staff-car-parking-principles/nhs-patient-visitor-and-staff-car-parking-principles (accessed on 29 October 2026).
18. Welsh Government. *Car Parking Management: Guidance for NHS Wales (WHC/2018/010)*; Welsh Government: Cardiff, UK, 2018. Available online: https://senedd.cymru/media/cavhejvz/180426-76381-w.pdf (accessed on 29 October 2026).
19. Scottish Government. Parking at Hospitals: FOI Release (FOI/202200302753). Available online: https://www.gov.scot/publications/foi-202200302753/ (accessed on 29 October 2026).
20. Scottish Government. PE2079/A: Introduce Legislation to Provide for Exemptions in Paying Medical Facility Parking Charges and to Create a New Classification of Parking Badge for Care-Givers. Letter from the Cabinet Secretary for NHS Recovery, Health and Social Care to the Citizen Participation and Public Petitions Committee, 20 February 2024. Available online: https://www.parliament.scot/-/media/files/committees/citizen-participation-and-public-petitions-committee/correspondence/2023/pe2079/pe2079_a.pdf (accessed on 29 October 2026).
21. Department of Health Northern Ireland. Hospital Parking Charges Bill Passes into Law after Securing Royal Assent. 8 May 2026. Available online: https://www.health-ni.gov.uk/news/hospital-parking-charges-bill-passes-law-after-securing-royal-assent (accessed on 29 October 2026).
22. Northern Ireland Assembly. *Hospital Parking Charges Bill (NIA Bill 29/22-27): Explanatory and Financial Memorandum, as Amended at Consideration Stage*; Northern Ireland Assembly: Belfast, UK, 2026. Available online: https://www.niassembly.gov.uk/globalassets/documents/legislation/bills/executive-bills/mandate-2022-2027/hospital-parking-charges-2026/hospital-parking-charges-bill-efm—as-amended-at-consideration-stage-fpv.pdf (accessed on 29 October 2026).
23. Sukhera, J. Narrative Reviews: Flexible, Rigorous, and Practical. *J. Grad. Med. Educ.* **2022**, *14*, 414–417. [CrossRef] [PubMed]
24. Ferrari, R. Writing narrative style literature reviews. *Med. Writ.* **2015**, *24*, 230–235. [CrossRef]
25. Kulnik, S.T.; Wulf, A.K.; Brunker, C. Experiences of long-distance visitors to intensive care units at a regional major trauma centre in the United Kingdom: A cross-sectional survey. *Intensive Crit. Care Nurs.* **2019**, *55*, 102754. [CrossRef] [PubMed]
26. Northrup, T.F.; Evans, P.; Lillie, M.; Tyson, J. A Free Parking Trial to Increase Visitation and Improve Extremely Low Birth Weight Infant Outcomes. *J. Perinatol.* **2016**, *36*, 1112–1115. [CrossRef] [PubMed]

27. Scottish Government. *Scotland's Cancer Strategy Evaluation: Experiences of Patient Access and Engagement with Cancer Treatment and Support in Rural and Island Areas and Areas of Higher Deprivation*; Scottish Government: Edinburgh, UK, 2026. Available online: https://www.gov.scot/binaries/content/documents/govscot/publications/research-and-analysis/2026/06/scotlands-cancer-strategy-evaluation-experiences-patient-access-engagement-cancer-treatment-support-rural-island-areas-areas-higher-deprivation/documents/cancer-strategy-evaluation/cancer-strategy-evaluation/govscot:document/cancer-strategy-evaluation.pdf (accessed on 20 August 2026).
28. Donabedian, A. The Quality of Care: How Can It Be Assessed? *JAMA* **1988**, *260*, 1743–1748. [CrossRef]
29. Suthanaya, P.A. Development of Parking Demand Model for Private Hospital in Developing Country (Case Study of Denpasar City, Indonesia). *J. Sustain. Dev.* **2017**, *10*, 52. [CrossRef]
30. Waters, A. English NHS staff wave goodbye to free hospital car parking. *BMJ* **2022**, *376*, o861. [CrossRef]
31. Planey, A.M.; Spees, L.P.; Biddell, C.B.; Waters, A.; Jones, E.P.; Hecht, H.K.; Rosenstein, D.; Wheeler, S.B. The intersection of travel burdens and financial hardship in cancer care: A scoping review. *JNCI Cancer Spectr.* **2024**, *8*, pkae093. [CrossRef] [PubMed]
32. Jiang, C.; Yabroff, K.R.; Deng, L.; Wang, Q.; Perimbeti, S.; Shapiro, C.L.; Han, X. Transportation barriers, emergency room use, and mortality risk among US adults by cancer history. *J. Natl. Cancer Inst.* **2023**, *115*, 815–821. [CrossRef] [PubMed]
33. Cochran, A.L.; McDonald, N.C.; Prunkl, L.; Vinella-Brusher, E.; Wang, J.; Oluyede, L.; Wolfe, M. Transportation barriers to care among frequent health care users during the COVID pandemic. *BMC Public Health* **2022**, *22*, 1783. [CrossRef] [PubMed]
34. Kagalwalla, S.; Tsai, A.K.; George, M.; Waldock, A.; Davis, S.; Jewett, P.; Vogel, R.I.; Ganguli, I.; Booth, C.M.; Dusetzina, S.B.; et al. Consuming Patients' Days: Time Spent on Ambulatory Appointments by People With Cancer. *Oncologist* **2024**, *29*, 400–406. [CrossRef] [PubMed]
35. Al Balushi, M.; Zhu, M.Y.; Yang, F.; Nijjar, Y.; Hill, J.; Ghosh, S. Evaluation of Parking-Related Financial Toxicity Associated with Cancer Treatments in Western Canada. *J. Med. Imaging Radiat. Sci.* **2023**, *54*, 66–72. [CrossRef] [PubMed]
36. Htet, K.Z.; Bui, T.; Srivastav, A.; Murina, A.; Kuraitis, D. Financial Burden of Parking Fees for Phototherapy Patients: A Cross-Sectional Study. *SKIN J. Cutan. Med.* **2023**, *7*, 581–584. Available online: https://skin.dermsquared.com/skin/article/view/1759 (accessed on 20 September 2026). [CrossRef]
37. Costa, E.; Mateus, C.; Carter, B.; Siner, S.; Jones, D.; Evans, L.; Preston, J.; Mehta, F.; Lambert, C.; Hollingsworth, B.; et al. The economic burden experienced by carers of children who had a critical deterioration at a tertiary children's hospital in the United Kingdom (the DETECT study): An online survey. *BMC Pediatr.* **2023**, *23*, 436. [CrossRef] [PubMed]
38. Alibrandi, A.; Gitto, L.; Limosani, M.G.; Mustica, P.F. Patient satisfaction and quality of hospital care. *Eval. Program Plan.* **2023**, *97*, 102251. [CrossRef] [PubMed]
39. Bridge, E.; Gotlib Conn, L.; Dhanju, S.; Singh, S.; Moody, L. The patient experience of ambulatory cancer treatment: A descriptive study. *Curr. Oncol.* **2019**, *26*, e482–e493. [CrossRef] [PubMed]
40. Mehta, N.; Tsang, J.; Duan, E.; Rochwerg, B.; Burns, K.E.A.; Shah, S.; Ahluwalia, N.; Lau, J.; Mehta, S. Important features of hospitals, intensive care unit waiting rooms, and patient care rooms: Perspectives of intensive care unit visitors. *Can. J. Anaesth.* **2025**, *72*, 345–352. [CrossRef] [PubMed]
41. Kelly, J.M.; Schwamm, L.H.; Bianchi, M.T. Sleep Telemedicine: A Survey Study of Patient Preferences. *ISRN Neurol.* **2012**, *2012*, 135329. [CrossRef] [PubMed]
42. Dang, B.N.; Westbrook, R.A.; Rodriguez-Barradas, M.C.; Giordano, T.P. Identifying Drivers of Overall Satisfaction in Patients Receiving HIV Primary Care: A Cross-Sectional Study. *PLoS ONE* **2012**, *7*, e42980. [CrossRef] [PubMed]
43. Land, L.M.; Jobanputra, P.; Webber, J.; Ross, J.D.C. Patient satisfaction in three clinics managing long-term conditions. *Br. J. Nurs.* **2012**, *21*, 186–188. [CrossRef] [PubMed]
44. Twiddy, M.; Czoski Murray, C.J.; Mason, S.J.; Meads, D.; Wright, J.M.; Mitchell, E.D.; Minton, J. A qualitative study of patients' feedback about Outpatient Parenteral Antimicrobial Therapy (OPAT) services in Northern England: Implications for service improvement. *BMJ Open* **2018**, *8*, e019099. [CrossRef] [PubMed]
45. Pather, S.; Tai, D.; Philp, S.; Nattress, K.; Carter, J.; Dalrymple, C.; Atkinson, K. A prospective study assessing patient satisfaction at a large tertiary gynecologic oncology/dysplasia unit. *Patient Relat. Outcome Meas.* **2010**, *1*, 149–152. [CrossRef] [PubMed]
46. Fradgley, E.A.; Paul, C.L.; Bryant, J.; Oldmeadow, C. Getting right to the point: Identifying Australian outpatients' priorities and preferences for patient-centred quality improvement in chronic disease care. *Int. J. Qual. Health Care* **2016**, *28*, 470–477. [CrossRef] [PubMed]
47. Patel, M.R.; Cabana, M.D. Parental Satisfaction and the Ability to Recall the Physician's Name. *Clin. Pediatr.* **2010**, *49*, 525–529. [CrossRef] [PubMed]
48. Bible, J.E.; Shau, D.N.; Kay, H.F.; Cheng, J.S.; Aaronson, O.S.; Devin, C.J. Are Low Patient Satisfaction Scores Always Due to the Provider? Determinants of Patient Satisfaction Scores During Spine Clinic Visits. *Spine* **2018**, *43*, 58–64. [CrossRef] [PubMed]
49. Al Saif, K.; Abdulla, F.M.; Alrahim, A.; Abduljawad, S.; Matrook, Z.; Abdulla, J.J.; Bughamar, F.; Alasfoor, F.; Taqi, R.; Almarzooq, A.; et al. Caregivers' experience of seeking care for adolescents with sickle cell disease in a tertiary care hospital in Bahrain. *PLoS ONE* **2022**, *17*, e0266501. [CrossRef] [PubMed]

50. Haywood, A.; Barnes, S.; Marsh, H.; Parker, S.G. Does the Design of Settings Where Acute Care Is Delivered Meet the Needs of Older People? Perspectives of Patients, Family Carers, and Staff. *HERD* **2018**, *11*, 177–188. [CrossRef] [PubMed]
51. Giannopoulos, E.; Catton, C.; Giuliani, M.E.; Kucharski, E.; Matthew, A.; Quartey, N.K.; Papadakos, J. Predictors of prostate cancer survivors' engagement in self-management behaviors. *Can. Urol. Assoc. J.* **2023**, *17*, 49–60. [CrossRef] [PubMed]
52. Parker, C.; Berkovic, D.; Wei, A.; Zomer, E.; Liew, D.; Ayton, D. 'If I don't work, I don't get paid': An Australian qualitative exploration of the financial impacts of acute myeloid leukaemia. *Health Soc. Care Community* **2022**, *30*, e2069–e2079. [CrossRef] [PubMed]
53. Alshatrat, S.M.; Al-Omari, W.M.; Tabnjh, A.K.; Alsaleh, M.M.; Selvaraj, S.; Alomari, Z.W. Oral health care access and utilization among people with hearing impairments: Evidence from a Jordanian comparative study. *Front. Rehabil. Sci.* **2026**, *7*, 1757495. [CrossRef] [PubMed]
54. Alburmawi, R.A.; Hamdan, K.; Shaheen, A.; Albqoor, M.A. Patient satisfaction with primary health care services and primary health care providers. *Public Health Nurs.* **2024**, *41*, 466–475. [CrossRef] [PubMed]
55. Hamilton, E.L.; Wallis, M.G.; Barlow, J.; Cullen, L.; Wright, C. Women's views of a breast screening service. *Health Care Women Int.* **2003**, *24*, 40–48. [CrossRef] [PubMed]
56. Mahmood, T. Patients' perception of physical aspects of an Emergency Assessment Unit: A questionnaire study. *Acute Med.* **2010**, *9*, 40–43. Available online: https://pubmed.ncbi.nlm.nih.gov/21597569/ (accessed on 19 October 2026). [CrossRef]
57. Turner, D.; Adams, E.; Boulton, M.; Harrison, S.; Khan, N.; Rose, P.; Ward, A.; Watson, E.K. Partners and close family members of long-term cancer survivors: Health status, psychosocial well-being and unmet supportive care needs. *Psychooncology* **2013**, *22*, 12–19. [CrossRef] [PubMed]
58. Elskamp, A.B.; Hartholt, K.A.; Patka, P.; van Beeck, E.F.; van der Cammen, T.J. Why older people refuse to participate in falls prevention trials: A qualitative study. *Exp. Gerontol.* **2012**, *47*, 342–345. [CrossRef] [PubMed]
59. Girgis, A.; Lambert, S.D.; McElduff, P.; Bonevski, B.; Lecathelinais, C.; Boyes, A.; Stacey, F. Some things change, some things stay the same: A longitudinal analysis of cancer caregivers' unmet supportive care needs. *Psychooncology* **2013**, *22*, 1557–1564. [CrossRef] [PubMed]
60. Gupta, S.; Vij, A.; Cafiero, E.; Bloom, D.; Agarwal, S.; Donelan, K.; Kopans, D.; Saini, S. Retail venue based screening mammography: Assessment of women's preferences. *Acad. Radiol.* **2012**, *19*, 1268–1272. [CrossRef] [PubMed]
61. Huynh, M.; Lee, A.D.; Miller, L.M.; Davis, S.; Feldman, S.R.; McMichael, A. Patients' satisfaction with dermatology residents. *South. Med. J.* **2012**, *105*, 520–523. [CrossRef] [PubMed]
62. Mitchell, T. Patients' experiences of receiving chemotherapy in outpatient clinic and/or onboard a unique nurse-led mobile chemotherapy unit: A qualitative study. *Eur. J. Cancer Care* **2013**, *22*, 430–439. [CrossRef] [PubMed]
63. Paul, C.L.; Hall, A.E.; Carey, M.L.; Cameron, E.C.; Clinton-McHarg, T. Access to care and impacts of cancer on daily life: Do they differ for metropolitan versus regional hematological cancer survivors? *J. Rural Health* **2013**, *29*, S43–S50. [CrossRef] [PubMed]
64. Ejaz, A.; Spolverato, G.; Bridges, J.F.; Amini, N.; Kim, Y.; Pawlik, T.M. Choosing a cancer surgeon: Analyzing factors in patient decision making using a best-worst scaling methodology. *Ann. Surg. Oncol.* **2014**, *21*, 3732–3738. [CrossRef] [PubMed]
65. Long, A.; Halkett, G.K.B.; Lobb, E.A.; Shaw, T.; Hovey, E.; Nowak, A.K. Carers of patients with high-grade glioma report high levels of distress, unmet needs, and psychological morbidity during patient chemoradiotherapy. *Neurooncol. Pract.* **2015**, *3*, 105–112. [CrossRef] [PubMed]
66. Kusambiza-Kiingi, A.; Maleka, D.; Ntsiea, V. Stroke survivors' levels of community reintegration, quality of life, satisfaction with the physiotherapy services and the level of caregiver strain at community health centres within the Johannesburg area. *Afr. J. Disabil.* **2017**, *6*, 296. [CrossRef] [PubMed]
67. Kong, Y.C.; Wong, L.P.; Ng, C.W.; Taib, N.A.; Bhoo-Pathy, N.T.; Yusof, M.M.; Aziz, A.F.; Yehgambaram, P.; Ishak, W.Z.W.; Yip, C.H.; et al. Understanding the Financial Needs Following Diagnosis of Breast Cancer in a Setting with Universal Health Coverage. *Oncologist* **2020**, *25*, 497–504. [CrossRef] [PubMed]
68. Usman, M.; Lally, L.; Costello, S.; Kiely, A.; Fahy, S. A decade of service development: Audit of service users' experience of a rural Psychiatry of Later Life (POLL) service. *Ir. J. Med. Sci.* **2021**, *191*, 347–354. [CrossRef] [PubMed]
69. Swift, J.A.; Carroll, W.D.; Gilchrist, F.J. Single-centre survey of parents regarding the hidden burden of paediatric flexible bronchoscopy. *BMJ Paediatr. Open* **2021**, *5*, e000991. [CrossRef] [PubMed]
70. Subramaniam Kalianan, R.; Woon, Y.L.; Hing, Y.L.; Leong, C.T.; Lim, W.Y.; Loo, C.E.; Low, L.L. Appointment structure in Malaysian healthcare system during the COVID-19 pandemic: The public perspective. *BMC Health Serv. Res.* **2022**, *22*, 141. [CrossRef] [PubMed]
71. Gil-Zaragozano, E.; Marriage, D. Increasing capacity in acute day care settings: Patients' experiences of a pop-up day care unit. *Br. J. Nurs.* **2023**, *32*, 216–219. [CrossRef] [PubMed]
72. Xiong, J.; Domnic Jacob, G.A.; Xiong, J.G. Risk Management of Negative Online Public Opinion in a Tertiary Hospital Based on the Kaiser Model. *Am. J. Health Behav.* **2023**, *47*, 165–172. [CrossRef] [PubMed]

73. Huynh, T.N.T.; Hartel, G.; Janda, M.; Wyld, D.; Merrett, N.; Gooden, H.; Neale, R.E.; Beesley, V.L. The Unmet Needs of Pancreatic Cancer Carers Are Associated with Anxiety and Depression in Patients and Carers. *Cancers* **2023**, *15*, 5307. [CrossRef] [PubMed]
74. Still, C.; Hoel, S.; Strayer, A.; Werner, N.E.; Fields, B. No Place to Go: The Relationship Between Care Partner Inclusion Practices and the Hospital Environment. *HERD* **2024**, *18*, 108–121. [CrossRef] [PubMed]
75. Biondo, P.; Kassam, S.; Beaumont, C.; Akude, P.; Silbernagel, P.; Earp, M.; Essue, B.M.; Longo, C.J.; Watanabe, S.M.; Simon, J.; et al. Financial burden in advanced cancer: Colorectal cancer data analysis. *BMJ Support. Palliat. Care* **2026**, *16*, 667–675. [CrossRef] [PubMed]
76. Dantas, L.F.; Fleck, J.L.; Oliveira, F.L.C.; Hamacher, S. No-shows in appointment scheduling: A systematic literature review. *Health Policy* **2018**, *122*, 412–421. [CrossRef] [PubMed]
77. Bammert, P.; Schuettig, W.; Novelli, A.; Iashchenko, I.; Spallek, J.; Blume, M.; Diehl, K.; Moor, I.; Dragano, N.; Sundmacher, L. The role of mesolevel characteristics of the health care system and socioeconomic factors on health care use: Results of a scoping review. *Int. J. Equity Health* **2024**, *23*, 37. [CrossRef] [PubMed]
78. Packness, A.; Waldorff, F.B.; Christensen, R.; Hastrup, L.H.; Simonsen, E.; Vestergaard, M.; Halling, A. Impact of socioeconomic position and distance on mental health care utilization: A nationwide Danish follow-up study. *Soc. Psychiatry Psychiatr. Epidemiol.* **2017**, *52*, 1405–1413. [CrossRef] [PubMed]
79. Mieloszyk, R.J.; Rosenbaum, J.I.; Hall, C.S.; Hippe, D.S.; Gunn, M.L.; Bhargava, P. Environmental Factors Predictive of No-Show Visits in Radiology: Observations of Three Million Outpatient Imaging Visits Over 16 Years. *J. Am. Coll. Radiol.* **2019**, *16*, 554–559. [CrossRef] [PubMed]
80. Sethukavalan, P.; Cheung, P.; Tang, C.I.; Quon, H.; Morton, G.; Nam, R.; Loblaw, A. Patient costs associated with external beam radiotherapy treatment for localized prostate cancer: The benefits of hypofractionated over conventionally fractionated radiotherapy. *Can. J. Urol.* **2012**, *19*, 6165–6169. Available online: https://pubmed.ncbi.nlm.nih.gov/22512958/ (accessed on 29 October 2026). [PubMed]
81. Forero, R.; Mohsin, M.; Singh, F.; Hunt, L.; Frost, S.; McDonnell, S.; Piya, M.; Verick, D.; Kohler, F.; Chow, J.S.F.; et al. Hospital visiting hours—Do they need to be revised? *Aust. Health Rev.* **2024**, *49*, AH24145. [CrossRef] [PubMed]
82. Shields, L.; Tanner, A. Costs of meals and parking for parents of hospitalised children in Australia. *Paediatr. Care* **2004**, *16*, 14–18. [CrossRef] [PubMed]
83. Longo, C.J.; Maity, T.; Fitch, M.I.; Young, J.T. Patient and Family Financial Burden in Cancer: A Focus on Differences across Four Provinces, and Reduced Spending Including Decisions to Forego Care in Canada. *Curr. Oncol.* **2024**, *31*, 2713–2726. [CrossRef] [PubMed]
84. Bidmead, E.; Hayes, L.; Mazzoli-Smith, L.; Wildman, J.; Rankin, J.; Leggott, E.; Todd, L.; Bramhall, L. Poverty proofing healthcare: A qualitative study of barriers to accessing healthcare for low-income families with children in northern England. *PLoS ONE* **2024**, *19*, e0292983. [CrossRef] [PubMed]
85. Hwang, C.; Reyes, D.; Sahani, K.; Koo, H.; Esselen, K.; Hacker, M.R.; Jang, J.W. Baseline Financial Toxicity and Cost-Coping Mechanisms Among Patients Presenting for Radiation Therapy. *Adv. Radiat. Oncol.* **2026**, *11*, 102106. [CrossRef] [PubMed]
86. Saleh, K.A.; Ahmed, W.A.M.; Alrashedi, H.; Alkubati, S.A.; Almoliky, M.A.; Alrubaiee, G.G.; Alqalah, T.A.H.; Albani, G.F.; Laradhi, A.O.; Altryfy, M.H. Prevalence and factors affecting anxiety and depression among adult people with physical disabilities in Saudi Arabia: A cross-sectional study. *Front. Psychol.* **2025**, *16*, 1517340. [CrossRef] [PubMed]
87. Mudrick, N.R.; Breslin, M.L.; Liang, M.; Yee, S. Physical accessibility in primary health care settings: Results from California on-site reviews. *Disabil. Health J.* **2012**, *5*, 159–167. [CrossRef] [PubMed]
88. Morrison, V.; Henderson, B.J.; Zinovieff, F.; Davies, G.; Cartmell, R.; Hall, A.; Gollins, S. Common, important, and unmet needs of cancer outpatients. *Eur. J. Oncol. Nurs.* **2012**, *16*, 115–123. [CrossRef] [PubMed]
89. Dancey, A.; Rayatt, S.; Courthold, J.; Roberts, J. Views of UK melanoma patients on routine follow-up care. *Br. J. Plast. Surg.* **2005**, *58*, 245–250. [CrossRef] [PubMed]
90. Shubayr, M.A.; Alamri, H.M.; Alrougi, H.M.; Almalki, H.H.; Sindi, N.A.; Aloraini, N.I.; Al-Adani, W.Y.; Sabr, A.S.; Aldossary, M.S. Patient satisfaction levels with the services provided by the Ministry of Health Emergency Departments in Saudi Arabia. *J. Public Health Res.* **2026**, *15*, 22799036261427946. [CrossRef] [PubMed]
91. Kotzer, A.M.; Zacharakis, S.K.; Raynolds, M.; Buenning, F. Evaluation of the Built Environment: Staff and Family Satisfaction Pre- and Post-Occupancy of the Children's Hospital. *HERD* **2011**, *4*, 60–78. [CrossRef] [PubMed]
92. Tierney, A.A.; Huang, J.; Gopalan, A.; Muelly, E.; Graetz, I.; Hsueh, L.; Reed, M.E. Telemedicine and Primary Care Access: A Cross-sectional Observational Study of Patients Using Only Telemedicine. *J. Gen. Intern. Med.* **2025**, *40*, 3363–3370. [CrossRef] [PubMed]
93. Tendolkar, K.B.; Kalia, R.; Charan, G.S. Smart Hospital Infrastructure: Enhancing Parking Management and Ambulance Accessibility in Urban Healthcare Systems. *Ann. Afr. Med.* **2025**, *25*, 764–769. [CrossRef] [PubMed]
94. Linsell, L.; Forbes, L.J.L.; Patnick, J.; Wardle, J.; Austoker, J.; Ramirez, A.J. Women's preferences for the delivery of the National Health Service Breast Screening Programme: A cross-sectional survey. *J. Med. Screen.* **2010**, *17*, 176–180. [CrossRef] [PubMed]

95. Mazumdar, S.; Jalaludin, B.; Surplice, D.; Conaty, S.; Jobburn, K.; Stanbury, L.; Ryan, H.; Chow, J.S.F. Private car travel is the dominant form of transport to work for healthcare workers across Greater Western Sydney: A short report on a large travel survey. *Aust. Health Rev.* **2025**, *49*, AH24229. [CrossRef] [PubMed]
96. Ridyard, E. Charging for hospital car parking risks demoralising the NHS workforce. *BMJ* **2018**, *363*, k4529. [CrossRef] [PubMed]
97. Lieser, T.; Huang, Y.; Sezgin, E. The Current State of Mobile Apps Owned by Large Pediatric Hospitals in the United States: Systematic Search and Analysis on Google Play and Apple App Stores. *JMIR Pediatr. Parent.* **2022**, *5*, e38940. [CrossRef] [PubMed]
98. Dao, T.; Long, K.; Maier, A.B. Characteristics and perceptions of utilising telehealth for predominantly middle-aged to older, metropolitan-based general medical patients. *Intern. Med. J.* **2023**, *53*, 2247–2256. [CrossRef] [PubMed]
99. Golemiec, B.; Robertson, M.; Poon, V.; Foley, M.; Parker, C.M.; McGann, C.; O'Callaghan, N.; Digby, G.C. Improving Access to Care, Patient Costs, and Environmental Impact Through a Community Outreach Lung Cancer Rapid Assessment Clinic. *JCO Oncol. Pract.* **2024**, *20*, 1123–1131. [CrossRef] [PubMed]
100. Platt, N.A.; Bolland, B. Virtual arthroplasty follow-up (VARF) in total hip replacement: A safe, effective, and sustainable model for post-operative care. *Eur. J. Orthop. Surg. Traumatol.* **2025**, *35*, 361. [CrossRef] [PubMed]
101. Zgardau, A.; Hathi, K.; Fowler, J.; Mullowney, T.; Price, A.; Husein, M.; Graham, M.E.; Dzioba, A.; Madou, E.; Strychowsky, J.E. Carbon Footprint Reduction Associated With Multidisciplinary Pediatric Airway Clinics: A Program Evaluation Study. *OTO Open* **2024**, *8*, e167. [CrossRef] [PubMed]
102. NHS England. *Health Technical Memorandum 07-03: NHS Car-Parking Management: Environment and Sustainability*; NHS England: London, UK, 2015. Available online: https://www.england.nhs.uk/wp-content/uploads/2021/05/HTM0703NovemberUpdated.pdf (accessed on 29 October 2026).
103. Healthwatch England. What Are People Telling Us about Car Parking at Hospitals? 30 June 2026. Available online: https://www.healthwatch.co.uk/blog/2026-06-30/what-are-people-telling-us-about-car-parking-hospitals (accessed on 29 October 2026).
104. Starbird, L.E.; DiMaina, C.; Sun, C.A.; Han, H.R. A Systematic Review of Interventions to Minimize Transportation Barriers Among People with Chronic Diseases. *J. Community Health* **2019**, *44*, 400–411. [CrossRef] [PubMed]
105. Ji, Y.; Dong, J.; Lai, Z.; Feng, Q. Optimal allocation of shared parking spaces for hospital parkers considering parking choice behavior under bounded rationality. *Transp. Lett.* **2023**, *15*, 242–253. [CrossRef]
106. Neustatel, D.; Schmid, T.; Zychlinski, N. Coordination of Hospital Parking and Transportation Services: A Simulation-Based Approach. In Proceedings of the 2023 Winter Simulation Conference, San Antonio, TX, USA, 10–13 December 2023; pp. 1724–1734. [CrossRef]
107. Demirtas, E.; Atalay, A. Parking Analysis for Hospitals: Ataturk University Research Hospital Example. *Int. J. Eng. Res. Dev.* **2025**, *17*, 449–464. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.