Supplementary material

Supplementary Table 1. Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	Page 1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	Pages 2-3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	Pages 4-6
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	Page 6
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	Page 6
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	Pages 7-8
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	Page 7
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	Supplementary Table 2
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	Pages 7-8
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	Page 9
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	Page 9

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SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	Not applicable
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	Pages 9-10
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Page 11, Flow diagram in figure 1
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Pages 10-11
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Not applicable
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Pages 37-62 (tables)
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	Pages 11-17
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	Pages 18-21
Limitations	20	Discuss the limitations of the scoping review process.	Page 23
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Page 24
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	Page 25

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.
* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.
† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).
‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.
§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

Supplementary Table 2. Medline Search Strategy

#	Search Term	Results (# of articles)
1	(alternat* level* adj2 care).tw,kf	74
2	(bed adj2 (block* or occup* or delay* or capacit* or over?crowd*)).tw,kf	1756
3	Bed Occupancy/	2468
4	((delay* or late* or defer* or post?pon*) adj2 (discharg* or transfer* or handoff* or handover* or releas*)).tw,kf	10642
5	(delay* or late* or defer* or post?pon*).tw,kf	1759017
6	Patient Discharge/	27462
7	5 and 6	1847
8	(stranded patient).tw,kf	2
9	1 or 2 or 3 or 4 or 7 or 8	**15908**
10	Health Plan Implementation/ or delivery of health care/ or health care reform/ or patient care management/ or critical pathways/ or guideline/ or practice guideline/ or health policy/	215111
11	(strateg* or intervention* or program* or service* or model* or initiative* or polic* or plan* or re?design* or design* or tool* or system* or guideline* or practice guideline* or best practice*).tw,kf	9434922
12	("health plan implementation" or "health?care delivery" or "health?care reform*" or "patient care management" or "critical pathway*").tw,kf	8472
13	10 or 11 or 12	**9526394**
14	9 and 13	8141
15	**Limit 14 to (case reports or comment or editorial or letter)**	**238**
16	**14 not 15**	**7903**
17	**limit 16 to yr="2004-Current"**	**5519**

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Supplementary Table 3. Definitions and Characteristics of Delayed Discharges from Database Searches

Author	**Definition of ALC/ Delayed Discharge**	**Reason for Hospitalization**	**Reason for Delayed Discharge**	**Length of Delayed Discharge**
Adlington et al. (2018) [40]	• NR	Psychiatric condition	NR	NR
Ardagh et al. (2011) [41]	• NR	NR	Limited access to aged care beds	NR
Arendts et al. (2013) [42]	• NR	Cerebrovascular insufficiency, fractured neck of femur, cardiac failure, myocardial ischaemia, respiratory tract infection, chronic airway disease exacerbation	NR	NR
Baumann et al. (2007) [43]	• Waiting longer in hospital than necessary	NR	NR	NR
Behan (2005) [44]	• Staying in hospital because community care arrangements have not been made	NR	No arrangements for community care	NR
Béland et al. (2006) [45]	• Waiting in hospital for a nursing home placement • Referred to as bed-blockers	NR	NR	NR
Blecker et al. (2015) [46]	• NR	Medical, surgical or other services	Delays in care on the weekend	NR
Boutette et al. (2018) [47]	• Patients who are medically stable or stabilizing and are no longer acutely ill	NR	NR	NR
Bowen et al. (2014) [48]	• Remaining in hospital after the patient was considered ready for discharge	NR	Not completing take home prescriptions on time	NR
Boyd (2017) [49]	• Increasing length of stay because hospital staff does not discharge patient when once they are identified as medically ready for discharge	NR	Lack of coordination and communication between physicians and other staff	NR
Brankline (2009) [50]	• NR	NR	Social workers were without access to the patients' chart, nurses were not available, fax was not received by the care facility	NR

Author	Definition of ALC/ Delayed Discharge	Reason for Hospitalization	Reason for Delayed Discharge	Length of Delayed Discharge
Brown et al. (2008) [51]	• NR	NR	Doctor's order delay, nurse unavailable, bed unavailable, transportation unavailable, waiting for radiography, medical, inadequate pain management, uncontrolled nausea/ vomiting, other	NR
Burr et al. (2017) [52]	• Occupying an acute hospital bed, but not requiring the level of resources or services provided in the acute setting	NR	NR	NR
Caminiti et al. (2013) [53]	• Patients who had an unnecessary hospital stay (so signs, symptoms or diagnoses)	NR	Waiting for tests, lab results, consultations, surgery, transfer to another unit, IV antibiotic treatment not completed, home care services not arranged, lack of transportation, other	NR
Chidwick et al. (2017) [54]	• Occupying a hospital bed when acute care treatment has completed or the patient no longer requires the intensity of hospital resources	NR	NR	NR
El-Eid et al. (2015) [55]	• NR	NR	NR	NR
Gaughan et al. (2015) [56]	• Occurring when a patient is medically ready for hospital discharge to be cared for in an alternative setting	NR	Unclear	Days of delay over 5 years (monthly average) = 784.9 Delayed patients over 5 years (monthly average) = 28.4
Graham et al. (2012) [57]	• Patients with morning operations who were not discharged the same day • Patients with afternoon operations who were not discharged within 24 hours	Laparoscopic cholecystectomy or laparoscopic inguinal hernia repair	Post-operative nausea and vomiting, pain, difficulty voiding, urinary retention, wound haematoma, post-operative hypotension and social reasons	NR

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Author	Definition of ALC/ Delayed Discharge	Reason for Hospitalization	Reason for Delayed Discharge	Length of Delayed Discharge
Gutmanis et al. (2016) [58]	• NR	NR	Responsive behaviours	NR
Henwood (2006) [59]	• Delayed discharges (still often referred to by the pejorative term 'bed blocking')	NR	NR	NR
Holland et al. (2016) [60]	• Discharge occurring beyond the time determined by the provider and patient	NR	Incomplete dismissal summary, unavailability of discharge prescriptions and miscommunication among team members about discharge plans	Delay time = 23.6 days
Katsaliaki et al. (2005) [61]	• NR	NR	NR	NR
Lees-Deutsch et al. (2019) [62]	• NR	NR	Delays in medications being prescribed, outstanding investigations, transportation delays, general practitioner note	Mean = 4 hours 51 minutes Range = 50 minutes to 10 hours 22 minutes
Levin et al. (2019) [63]	• Remaining in hospital after the patient was considered medically ready for discharge	NR	Lack of appropriate community care or support	Intervention: 2013 = 8262 days; 2016 = 3499 days Control: 2013 = 1354 days; 2016 = 993 days
Lian et al. (2008) [64]	• Delaying discharge for a reason that is not related to the infant's illness following discharge clearance from the medical team	Premature infant	Minimum weight not achieved, delayed planning or delivery of discharge plan to parents, lack of ownership over discharge planning	257 discharge delay days, mean = 7 days/ infant
Maessen et al. (2008) [65]	• Meeting all discharge criteria (tolerance to food, good pain control, defecation and independence in activities of daily living to preoperative level), but not being discharged at the moment the patient was ready	Elective colorectal resection	Additional wound care, symptoms of an anastomotic leakage	Pre: Median = 2, range = 0–17 days Post: median = 1, range = 0–9 days

Author	Definition of ALC/ Delayed Discharge	Reason for Hospitalization	Reason for Delayed Discharge	Length of Delayed Discharge
Mahant et al. (2008) [66]	• Non-qualified hospital days occur when the Medical Care Appropriateness Protocol tool is applied to a patient and the criteria has not been met	NR - general pediatric inpatient unit	Waiting for tests, IV antibiotics not completed, receiving nutrition, still under observation/ investigation, waiting for rehabilitation/ long-term care bed, treatment tapering not complete, needs education, psychosocial/ economic, administrative delays/ documents not complete, waiting for consult	Non-qualified days: Preintervention – 3859 of 8228 days Intervention – 2413 of 7246 days
Mahto et al. (2009) [67]	• Involving the diabetes team late, resulting in a prolonged length of stay	Diabetes or other general medicine admission	NR	NR
Maloney et al. (2007) [68]	• NR	NR	NR	NR
Manville et al. (2014) [69]	• Needing more supports before discharge or delayed recovery of elderly hospitalized patients	Dementia, delirium, confusion, fall, fracture, injury, frailty or failure to thrive, infection, cardiac condition, psychiatric or neurological condition	Dementia, immobility, falls or fractures post-rehabilitation, fragility, caregiver burden, cancer	NR
Meehan et al. (2018) [70]	• Requiring additional supports for care needs after patients are identified as 'clinically optimized'	NR	NR	NR
Moeller et al. (2006) [71]	• Discharge that occurs after a patient has been identified as ready for discharge (normalized vital signs, baseline status of lung function and oxygenation, negative blood culture, appropriate blood cell count, stabilization of comorbid illnesses)	Community acquired pneumonia	Additional tests required, patients felt unready for discharge, delay in acquiring home support, nausea, concerns with treatment compliance	Discharged at time of stability: mean LoS = 6.7 days median LoS = 5.5 Increased LoS: mean LoS = 7.9 days median LoS = 7.5

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Author	Definition of ALC/ Delayed Discharge	Reason for Hospitalization	Reason for Delayed Discharge	Length of Delayed Discharge
Mur-Veeman et al. (2011) [72]	• Waiting to be admitted to next care setting (nursing home or home care) after completing treatment in current setting	NR	NR	NR
Niemeijer et al. (2010) [73]	• NR	Trauma, surgery, other	Waiting for rehabilitation facility or nursing home, delays in discharge planning, waiting for an operation or diagnostic result, other factors	NR
Panis et al. (2004) [74]	• Occurring from inappropriate hospital stays (when there is no medical indication for a hospital stay to continue)	Childbirth	Insurance companies not covering maternity care at home	Inappropriate days of stay: 2000: 72 (13.3%) 2001: 64 (14.7%) 2002: 30 (7.2%)
Patel et al. (2019) [75]	• Discharging patients when it is medically safe to do so	NR	Lack of communication between the multidisciplinary team members, incomplete discharge plans	NR
Pirani (2010) [76]	• Waiting for discharge process after identified as medically and physically ready for discharge	NR	Individual factors (personal choice, age, emotional disposition, support from family/ friends), medical factors (new medical problems), organizational factors (lack of home support, unavailability of nursing or rehabilitation facilities)	NR
Qin et al. (2017) [77]	• Occupying a hospital bed for non-medical reasons after being identified as medically stable	NR	NR	NR
Rae et al. (2007) [78]	• NR	NR – acute general medicine	Lack of early family consultation, family refusal to take patient home, inadequate discharge planning, no discharge on Fridays or the weekend, staff	NR

Author	Definition of ALC/ Delayed Discharge	Reason for Hospitalization	Reason for Delayed Discharge	Length of Delayed Discharge
			too busy to discharge all patients, adverse events, miscommunication across disciplines, too many patients on staffs' care, not all conditions dealt with, IV medications not transferred to oral, lack of diagnosis, waiting for rehabilitation services/ consultations, waiting for bed	
Roberts et al. (2013) [79]	• NR	Stroke, brain dysfunction, major multiple trauma, spinal cord dysfunction, other neurological condition or impairment	Cognitive/ psychological issues, waiting for home modifications, waiting for community services, lack of accommodation, waiting for nursing home placement, waiting for additional medication or surgical procedure	Stroke Unit: Total additional days = 1821, range = 1-330 Brain Injury Unit: Total additional days = 4490, range = 1-673
Sampson et al. (2006) [80]	• NR	NR	NR	NR
Shah (2007) [81]	• NR	NR	Community services not arranged, patient's needs not assessed	NR
Sobotka et al. (2017) [82]	• Remaining in hospital after reaching medical stability because of social or resource complications	Ventilator and tracheostomy management	NR	NR
Starr-Hemburrow et al. (2011) [83]	• Waiting in a care setting for the appropriate level of care	NR	NR	NR
Sutherland et al. (2013) [84]	• Waiting for the appropriate post-acute care setting after being identified as ready for discharge	NR	NR	NR
Taber et al. (2013) [85]	• NR	Kidney transplant	Lack of medication education	NR

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Author	Definition of ALC/ Delayed Discharge	Reason for Hospitalization	Reason for Delayed Discharge	Length of Delayed Discharge
Udayai et al. (2012) [86]	• NR	NR	Lack of nurses or housekeepers, delayed manual delivery of papers, communication barriers, unavailability of wheelchairs	NR
Williams et al. (2010) [87]	• Relocating the patient after 8 hours of being identified as ready for discharge from the ICU	Cardiac surgery, trauma, sepsis, other medical condition or surgery	No available bed, medical concern, lack of suitable accommodation, staff shortage, poor skill mix	2001: median delay time = 29 hours (max=26 days) 2008: median delay time = 25 hours (max=8 days)
Younis et al. (2011) [88]	• Remaining in hospital for longer than 5 days	Stoma formation following colorectal surgery	Delayed independent management of ileostomy	Greater than 5 days