

Appendix A. Methods

Resources Searched

ECRI Institute information specialists searched the following bibliographic databases and websites for relevant information. Detailed search strategies for each bibliographic database appear below.

Bibliographic Databases

Name	Date Limits	Platform/Provider
Cochrane Database of Systematic Reviews (Cochrane Reviews)	January 1, 2010 through May 12, 2020	Wiley
Cumulative Index of Nursing and Allied Health Literature (CINAHL)	January 1, 2010 through April 28, 2020	EBSCOhost
EMBASE.com (Excerpta Medica)	January 1, 2010 through April 23, 2020	Embase.com
MEDLINE (via Embase.com)	January 1, 2010 through April 23, 2020	Embase.com
PubMed (publisher supplied/in process citations)	January 1, 2010 through April 23, 2020	NLM

Grey Literature Resources

Name	Date Limits	Platform/Provider
Agency for Healthcare Research and Quality (AHRQ)	January 1, 2010 through May 15, 2020	Department of Health and Human Services - Web
American Hospital Association	January 1, 2010 through May 18, 2020	Web
The Camden Coalition	January 1, 2020 through May 15, 2020	Web
Clinicaltrials.gov	January 1, 2010 through May 18, 2020	National Library of Medicine - Web
Centers for Medicare and Medicaid	January 1, 2010 through May 18, 2020	Web
Institute for Healthcare Improvement	January 1, 2020 through May 18, 2020	Web
The Joint Commission	January 1, 2020 through May 18, 2020	Web
Root Cause Coalition	January 1, 2020 through May 15, 2020	Web
Social Interventions Research and Evaluation Network (SIGN)	January 1, 2020 through May 15, 2020	Web
Socially Determined	January 1, 2020 through May 15, 2020	Web

Grey Literature

Websites from professional organizations and government agencies were also screened for relevant grey literature. (Grey literature consists of reports, educational materials, promotional documents, and articles produced by government agencies, professional associations and educational facilities. These documents do not appear in the peer-reviewed journal literature.)

Search Strategies

EMBASE/MEDLINE (searched via Embase.com)

Set Number	Concept	Search Statement
#1	Length of stay - highly specific search (controlled terms searched as major concepts and keywords searched in the title only)	'length of stay'/exp/mj OR ('hospital discharge'/exp/mj AND 'time factor'/exp/mj) OR 'los':ti OR (((length OR duration) NEXT/3 stay):ti) OR 'bed days':ti OR (((length OR duration OR days) NEAR/3 hospital*):ti) OR (((inpatient OR patient OR short) NEAR/1 (stay* OR throughput OR flow* OR days)):ti) OR (((discharge* OR stay) NEAR/4 (delay* OR timely OR timeliness OR fast OR faster OR sooner OR quick* OR haste* OR rapid* OR early OR earlier OR reduc* OR decrease OR lessen OR speed*)):ti) OR ((fast NEXT/1 track):ti)
#2	Length of stay – less specific search (controlled terms searches as both major and minor concepts and keywords searched in title and abstract)	'length of stay'/exp OR ('hospital discharge'/exp AND 'time factor'/exp) OR ('los':ti,ab OR (((length OR duration) NEXT/3 stay):ti,ab) OR 'bed days':ti,ab OR (((length OR duration OR days) NEAR/3 hospital*):ti,ab) OR (((inpatient OR patient OR short) NEAR/1 (stay* OR throughput OR flow* OR days)):ti,ab) OR (((discharge* OR stay) NEAR/4 (delay* OR timely OR timeliness OR fast OR faster OR sooner OR quick* OR haste* OR rapid* OR early OR earlier OR reduc* OR decrease OR lessen OR speed*)):ti,ab) OR ((fast NEXT/1 track):ti,ab))
#3	Socially vulnerable populations – controlled terms	'vulnerable population'/exp OR 'frail elderly'/exp OR 'homelessness'/exp OR 'homeless person'/exp OR 'poverty'/exp OR 'sexual and gender minority'/exp OR 'minority group'/exp OR 'household economic status'/exp OR 'lowest income group'/exp OR 'social status'/exp OR 'health disparity'/exp OR 'health equity'/exp OR 'income group'/exp OR 'safety net hospital'/exp OR 'medically uninsured'/exp OR 'health literacy'/exp OR 'educational status'/exp OR 'literacy'/exp OR 'employment'/exp OR 'employment status'/exp OR 'veteran'/exp OR 'veterans health'/exp OR 'migrant'/exp OR 'English as a second language'/exp OR 'limited English proficiency'/exp OR 'language ability'/exp OR 'prisoner'/exp OR 'social environment'/exp OR 'health care access'/exp OR 'socioeconomics'/de OR 'social isolation'/exp
#4	Socially vulnerable populations - keywords	((vulnerable OR marginalized) NEAR/2 (population* OR patient* OR person*)):ti,ab) OR homeless*:ti,ab OR poverty*:ti,ab OR impoverished:ti,ab OR indigent:ti,ab OR ((poor NEAR/3 (people OR persons)):ti,ab) OR 'low income':ti,ab OR (((sexual OR gender OR ethnic OR racial) NEAR/3 minorit*):ti,ab) OR socioeconomic*:ti,ab OR ((social NEAR/2 (class* OR health* OR status OR support OR mobility OR isolation)):ti,ab) OR ((health* NEAR/4 (disparit* OR equit* OR inequalit* OR literacy OR illiteracy OR literate OR illiterate* OR inequit* OR access*)):ti,ab) OR (((safety net' OR 'safety-net' OR tertiary OR quaternary) NEAR/3 (provider* OR hospital*)):ti,ab) OR uninsured:ti,ab OR 'un insured':ti,ab OR 'under insured':ti,ab OR 'under-insured':ti,ab OR underinsured:ti,ab OR ((without NEXT/3 insurance):ti,ab) OR unemploy*:ti,ab OR underemploy*:ti,ab OR 'working poor':ti,ab OR veteran*:ti,ab OR immigrant*:ti,ab OR migrant*:ti,ab OR refugee*:ti,ab OR ((english NEAR/3 (proficien* OR second)):ti,ab) OR (non NEXT/1 english):ti,ab OR (((language OR communication) NEAR/3 barrier*)):ti,ab) OR prison*:ti,ab OR incarcerat*:ti,ab OR jail*:ti,ab
#5	Medically vulnerable populations – controlled terms	'disabled person'/exp OR 'disability'/exp OR 'developmental disorder'/exp OR 'mental disease'/exp OR 'communication barrier'/exp OR 'drug dependence'/exp OR 'multiple chronic conditions'/exp OR 'rare disease'/exp OR 'chronic disease'/exp OR 'substance use'/de OR 'alcohol consumption'/exp OR 'cannabis use'/exp OR 'addiction'/de OR 'chronic obstructive lung disease'/exp OR 'heart failure'/exp OR 'dementia'/exp OR 'diabetes mellitus'/exp OR 'chronic kidney failure'/exp OR comorbidity/exp/mj

Set Number	Concept	Search Statement
#6	Medically vulnerable populations - keywords	frail:ti,ab OR frailty:ti,ab OR disabilities:ti,ab OR disabled:ti,ab OR multimorbid*:ti,ab OR ((multi* NEXT/1 morbid*):ti,ab) OR alcoholic*:ti,ab OR (((alcohol OR substance* OR drug OR drugs OR opiate* OR opioid* OR narcotic*) NEAR/3 (abuse OR misuse OR addict* OR disorder* OR users OR dependen*)):ti,ab) OR ((rare OR chronic) NEAR/2 (disease* OR disorder* OR condition*)):ti,ab) OR ((chronic* NEAR/2 (multisymptom OR 'multi symptom')):ti,ab) OR ((multiple NEAR/3 (comorbid* OR morbid*)):ti,ab) OR (((mental OR developmental OR behavioral OR psychiatric) NEAR/3 (illness* OR disorder* OR delay* OR comorbid*)):ti,ab) OR ((chronic NEXT/1 obstruct* NEXT/2 (lung* OR pulmonary* OR respirat*)):ti,ab) OR copd*:ti,ab OR (((heart OR cardio* OR cardiac OR cardiogen* OR coronary) NEAR/2 (failure OR shock OR death OR infarct* OR arrest*)):ti,ab) OR dementia*:ti,ab OR alzheimer*:ti,ab OR diabetes:ti,ab OR diabetic:ti,ab OR chronic:ti,ab OR ('end stage' NEAR/3 (kidney OR renal)):ti,ab OR esrd:ti,ab OR ckd:ti,ab OR (complex* NEAR/2 patient*)
#7	Combine sets –	#1 OR (#2 AND (#3 OR #4 OR #5 OR #6))
Add on search for organizational interventions to decrease length of stay		
#8	Length of Stay -	'length of stay'/exp/mj OR 'los':ti,ab OR ((length OR duration) NEXT/3 stay):ti,ab OR 'bed days':ti,ab OR ((length OR duration OR days) NEAR/3 hospital*):ti,ab
#9	Organizational interventions	'health program'/exp/mj OR 'care coordination'/exp/mj OR 'case management'/exp/mj OR 'interdisciplinary communication'/exp/mj OR 'hospital policy'/exp/mj OR 'clinical decision making'/exp/mj OR 'hospital readmission reduction program'/exp/mj OR 'clinical pathway'/exp/mj OR 'personnel management'/exp/mj OR 'hospital personnel'/exp/mj OR 'care bundle'/exp/mj OR 'health care quality'/exp/mj OR 'multidisciplinary team'/exp/mj OR 'patient care'/exp/mj OR (((case NEXT/1 manag*):ti,ab) OR (((interdisciplin* OR multidisciplin*) NEAR/3 (rounds OR rounding OR communicat*)):ti,ab) OR (((organizat* OR organisat* OR hospital*) NEAR/5 (policy OR policies OR program* OR intervention*)):ti,ab) OR staff:ti,ab OR staffing:ti,ab OR bundl*:ti,ab OR model*:ti,ab OR pathway*:ti,ab OR personnel:ti,ab OR 'system level':ti,ab OR 'hospital wide':ti,ab OR ('lean process' OR 'eras' OR ((enhanced NEXT/1 recovery):ti,ab) OR 'hospital elder life program' OR 'goal-directed achievement through geographic location' OR gagl OR 'older people assessment liason' OR opal OR 'early supported discharge' OR 'early home supported discharge'):ti,ab OR (six NEXT/1 sigma):ti,ab OR (OASIS NEXT/4 framework*):ti,ab)
#10	Combine sets – organizational interventions	#8 AND #9
#11	Combine sets	#7 OR #10
#12	Remove unwanted publication types	#11 NOT (abstract:nc OR annual:nc OR book/de OR 'case report'/de OR 'case study'/de OR conference:nc OR 'conference abstract':it OR 'conference paper'/de OR 'conference paper':it OR 'conference proceeding':pt OR 'conference review':it OR congress:nc OR editorial/de OR editorial:it OR erratum/de OR letter:it OR note/de OR note:it OR meeting:nc OR sessions:nc OR 'short survey'/de OR symposium:nc)
#13	Limit to systematic reviews and meta-analyses	#12 AND ('systematic review'/de OR 'meta analysis'/de OR (systematic* NEAR/2 review*) OR metaanalysis OR metaanalyses OR (meta NEXT/1 (analysis OR analyses)) OR Cochrane)
#14	Limit to English, Human studies	Limit #13 to English, Human, py:01/01/2010-04/24/2020

EMBASE.com Syntax:

- * = truncation character (wildcard)
- /exp = denotes a subject heading that has been searched to include narrower terms/concepts
- /mj = denotes a term that has been searched as a major subject heading
- /py = limit to publication year(s)
- :ti = limit to title
- :ti,ab = limit to title and abstract

CINAHL

Set Number	Concept	Search Statement
#1	Length of stay – highly specific search (controlled terms searched as major concepts and keywords searched in the title only)	((MM "Length of Stay") OR (MM "Patient Discharge+") AND (MM "Time Factors")) OR (TI ((length OR duration OR days) W3 (stay OR hospital*))) OR (TI "bed days") OR (TI ((inpatient OR patient OR short) N1 (stay* OR throughput OR flow* OR days))) OR (TI ((Discharge* OR stay) N3 (delay* OR timely OR timeliness OR fast OR faster OR sooner OR quick* OR haste* OR rapid* OR early OR earlier OR reduc* OR decrease OR lessen))) OR (TI (fast N1 track))
#2	Length of stay – less specific (controlled terms searches as both major and minor concepts and keywords searched in title)	(MH "Length of Stay") OR (TI ((length OR duration OR days) W3 (stay OR hospital*))) OR (TI "bed days") OR (TI ((inpatient OR patient OR short) N1 (stay* OR throughput OR flow* OR days))) OR (TI ((Discharge* OR stay) N3 (delay* OR timely OR timeliness OR fast OR faster OR sooner OR quick* OR haste* OR rapid* OR early OR earlier OR reduc* OR decrease OR lessen))) OR (TI (fast N1 track))
#3	Socially vulnerable populations – controlled terms	(MH "Special Populations") OR (MH "Sex Factors") OR (MH "Race Factors") OR (MH "Homeless Persons") OR (MH "Homelessness") OR (MH "Frail Elderly") OR (MH "Poverty") OR (MH "Poverty Areas") OR (MH "Health Services for the Indigent") OR (MH "Indigent Persons") OR (MH "Minority Groups") OR (MH "Social Isolation") OR (MH "Social Environment") OR (MH "Socioeconomic Factors") OR (MH "Illiteracy") OR (MH "Substance Abusers") OR (MH "Veterans") OR (MH "Health Status Disparities") OR (MH "Safety-Net Providers") OR (MH "Medically Uninsured") OR (MH "Health Literacy") OR (MH "Educational Status") OR (MH "Transients and Migrants") OR (MH "Immigrants+") OR (MH "English as a Second Language") OR (MH "Articulation Disorders") OR (MH "Prisoners") OR (MH "Healthcare Disparities") OR (MH "Tertiary Health Care")
#4	Socially vulnerable populations – keywords	(TI ((vulnerable OR marginalized) N2 (population* OR patient* OR person*))) OR (TI (homeless* OR poverty*)) OR (TI (poor N3 (people OR persons))) OR (TI "low income") OR (TI ((sexual OR gender OR ethnic OR racial) N3 minorit*)) OR (TI socioeconomic*) OR (TI (social N2 (class* OR health* OR status OR support OR mobility OR isolation))) OR (TI (health* N4 (disparit* OR equit* OR inequalit* OR literacy OR illiteracy OR literate OR illiterate* OR inequit* OR access*))) OR (TI (('safety net' OR 'safety-net' OR tertiary OR quaternary) N4 (provider* OR hospital*))) OR (TI (uninsured OR 'un insured' OR 'under insured' OR 'under-insured' OR underinsured)) OR (TI (without N3 insurance)) OR unemploy* OR (TI underemploy* OR "working poor" OR veteran* OR immigrant* OR migrant* OR refugee*) OR (TI (english N3 (proficien* OR second))) OR (TI (non W1 english)) OR (TI ((language OR communication) N3 barrier*)) OR (TI (prison* OR incarcerat* OR jail* OR indigent* OR impoverished))

Set Number	Concept	Search Statement
#5	Medically vulnerable populations – controlled terms	(MH "Mentally Disabled Persons") OR (MH "Intellectual Disability+") OR (MH "Developmental Disabilities") OR (MH "Mental Disorders") OR (MH "Behavioral and Mental Disorders+") OR (MH "Communication Barriers") OR (MH "Communicative Disorders") OR (MH "Substance Use Disorders+") OR (MH "Rare Diseases") OR (MH "Chronic Disease+") OR (MH "Substance Dependence+") OR (MH "Pulmonary Disease, Chronic Obstructive+") OR (MH "Heart Failure+") OR (MH "Dementia+") OR (MH "Diabetes Mellitus+") OR (MH "Kidney Failure, Chronic+") OR (MH "Comorbidity")
#6	Medically vulnerable populations – keywords	(TI (frail OR frailty OR disabilities OR disabled OR multimorbid*)) OR (TI (multi* W1 morbid*)) OR (TI alcoholic*) OR (TI ((alcohol OR substance* OR drug OR drugs OR opiate* OR opioid* OR narcotic*) N3 (abuse OR misuse OR addict* OR disorder* OR users OR dependen*))) OR (TI ((rare OR chronic) N2 (disease* OR disorder* OR condition*))) OR (TI (chronic* N2 (multisymptom OR 'multi symptom')))) OR (TI (multiple N3 (comorbid* OR morbid*))) OR (TI ((mental OR developmental OR behavioral OR psychiatric) N3 (illness* OR disorder* OR delay* OR comorbid*))) OR (TI (chronic W1 obstruct* W2 (lung* OR pulmonary* OR respiratory))) OR (TI copd*) OR (TI ((heart OR cardio* OR cardiac OR cardiogen* OR coronary) N2 (failure OR shock OR death OR infarct* OR arrest*))) OR (TI dementia* OR alzheimer* OR diabetes OR diabetic)) OR (TI ('end stage' N3 (kidney OR renal))) OR (TI (esrd OR ckd)) OR (TI (complex* N2 patient*)) OR (TI "chf")
#7	Combine sets	#1 OR (#2 AND (#3 OR #4 OR #5 OR #6))
Add on search for organizational interventions to decrease length of stay		
#8	Length of Stay	(MM "Length of Stay") OR (TI ((length OR duration) W3 stay)) OR (TI 'bed days') OR (TI (length OR days) N3 hospital*)
#9	Organizational interventions	(MM "Case Management") OR (MM "Case Managers") OR (MM "Multidisciplinary Care Team+") OR (MM "Patient Centered Care") OR (MM "Hospital Policies+") OR (MM "Organizational Policies+") OR (MM "Decision Making, Clinical") OR (MM "Decision Making, Shared") OR (MM "Personnel Management+") OR (MM "Personnel Staffing and Scheduling+") OR (MM "Nursing Care Plans+") OR (MM "Quality of Health Care+") OR (MM "Patient Care Plans+") OR (MM "Patient Care+") OR (TI (case W1 manag*)) OR (TI ((interdisciplin* OR multidisciplin*) N3 (rounds OR rounding OR communicat*))) OR (TI ((organization* OR hospital*) N3 (policy OR policies OR program* OR intervention*))) OR (TI (staff OR staffing OR bundl* OR model* OR pathway* OR personnel)) OR (TI ("system level" OR "hospital wide")) OR (TI ('lean process' OR 'eras')) OR (TI (enhanced W1 recovery)) OR (TI 'hospital elder life program') OR (TI ('goal-directed achievement through geographic location' OR gagl OR 'older people assessment liason' OR opal OR 'early supported discharge' OR 'early home supported discharge')) OR (TI (six W1 sigma)) OR (TI (OASIS N4 framework*))
#10	Combine sets – organizational interventions	#8 AND #9
#11	Combine sets	#7 OR #10
#12	Limit to systematic reviews and meta-analyses	#11 AND ((MH "Systematic Review") OR (MH "Cochrane Library") OR (systematic* N2 review*) OR metaanalysis OR 'meta analysis' OR Cochrane) OR (MH "Meta Analysis")
#13	Exclude MEDLINE records; limit to academic journals and publication date 2010-2020	Exclude MEDLINE records; Published Date: 20100101-20201231; Limit to: Academic journals

CINAHL Syntax

- * = truncation character (wildcard)
- + = denotes a subject heading that has been searched to include narrower terms/concepts
- MH = denotes a term that has been searched as a subject heading
- MM = denotes a term that has been searched as a major subject heading
- TI = limit to title
- :ti,ab = limit to title and abstract* = truncation character (wildcard)

PubMed Publisher-Supplied/In-Process Citations

Set Number	Concept	Search Statement
#1	Length of stay – highly specific search	((length[ti] OR duration[ti]) AND stay[ti]) OR "LOS"[ti]
#2	Length of stay – less specific search	"length of stay"[tiab] OR "length of hospital stay"[tiab] OR "LOS"[tiab] OR "duration of stay"[tiab] OR "duration of hospital stay"[tiab] OR "hospital days"[tiab] OR "hospitalization days"[tiab] OR "days of hospitalization"[tiab] OR "days in the hospital"[tiab]
#3	Socially vulnerable populations	((vulnerable[tiab] OR marginalized[tiab]) AND (population*[tiab] OR patient*[tiab] OR person*[tiab])) OR homeless*[tiab] OR poverty*[tiab] OR impoverished[tiab] OR "poor person"[tiab] OR "poor people"[tiab] OR "low income"[tiab] OR ((sexual[tiab] OR gender[tiab] OR ethnic[tiab] OR racial[tiab]) AND minorit*[tiab]) OR socioeconomic*[tiab] OR "social class"[tiab] OR "social support"[tiab] OR "social mobility"[tiab] OR "social isolation"[tiab] OR ((health[tiab] OR healthcare[tiab]) AND (disparit*[tiab] OR equit*[tiab] OR inequalit*[tiab] OR literacy[tiab] OR illiteracy[tiab] OR literate[tiab] OR illiterate*[tiab] OR inequit*[tiab] OR access*[tiab])) OR (('safety net'[tiab] OR 'safety-net'[tiab] OR tertiary[tiab] OR quaternary[tiab]) AND (provider*[tiab] OR hospital*[tiab])) OR uninsured[tiab] OR 'un insured'[tiab] OR 'under insured'[tiab] OR underinsured[tiab] OR unemploy*[tiab] OR underemploy*[tiab] OR 'working poor'[tiab] OR veteran*[tiab] OR immigrant*[tiab] OR migrant*[tiab] OR refugee*[tiab] OR "language barrier"[tiab] OR "language barriers"[tiab] OR "communication barrier"[tiab] OR "communication barriers"[tiab] OR Non-English[tiab] OR English[tiab] AND language[tiab] AND (proficien* OR speak*[tiab] OR second[tiab])) OR prison* [tiab] OR incarcerat*[tiab] OR jail*[tiab]
#4	Medically vulnerable populations	Frail[tiab] OR frailty[tiab] OR disabilities[tiab] OR disabled[tiab] OR multimorbid*[tiab] OR "multi morbidity"[tiab] OR "multi morbidities"[tiab] OR alcoholic*[tiab] OR ((alcohol[tiab] OR substance*[tiab] OR drug[tiab] OR drugs[tiab] OR opiate*[tiab] OR opioid* OR narcotic*[tiab]) AND (abuse[tiab] OR misuse[tiab] OR addict*[tiab] OR disorder*[tiab] OR users[tiab] OR dependen*[tiab])) OR "rare disease"[tiab] OR "rare disorder"[tiab] OR "chronic multisymptom"[tiab] OR "chronic multi symptom"[tiab] OR "chronic condition"[tiab] OR "chronic conditions"[tiab] OR "chronic disease"[tiab] OR "chronic diseases"[tiab] OR "chronic disorder"[tiab] OR "chronic disorders"[tiab] OR comorbidities[tiab] OR "mental illness"[tiab] OR "mental disorder"[tiab] OR "developmental disorder"[tiab] OR "mental illness"[tiab] OR ((psychiatric[tiab] OR behavioral[tiab]) AND (illness*[tiab] OR disorder*[tiab] OR comorbid*[tiab])) OR "chronic obstructive pulmonary disease"[tiab] OR copd[tiab] OR "heart failure"[tiab] OR "cardiogenic shock"[tiab] OR "heart arrest"[tiab] OR "cardiac arrest"[tiab] OR dementia*[tiab] OR alzheimer*[tiab] OR diabetes[tiab] OR diabetic[tiab] OR "chronic kidney disease"[tiab] OR "end stage renal disease"[tiab] OR "end stage kidney disease"[tiab] OR esrd[tiab] OR ckd[tiab] OR chf[tiab] OR "complex patient"[tiab] OR "complex patients"[tiab]

Set Number	Concept	Search Statement
#5	Organizational interventions	"health program"[tiab] OR "care coordination"[tiab] OR "case management"[tiab] OR "interdisciplinary communication"[tiab] OR "hospital policy"[tiab] OR "clinical decision making"[tiab] OR "hospital readmission reduction program"[tiab] OR "clinical pathway"[tiab] OR "personnel management"[tiab] OR "hospital personnel"[tiab] OR "care bundle"[tiab] OR "health care quality"[tiab] OR "multidisciplinary team"[tiab] OR "patient care"[tiab] OR (case[tiab] AND manag*[tiab]) OR ((interdisciplin*[tiab] OR multidisciplin*[tiab]) AND (rounds[tiab] OR rounding OR communicat*[tiab])) OR ((organizat*[tiab] OR organisat*[tiab] OR hospital*[tiab]) AND (policy[tiab] OR policies[tiab] OR program*[tiab] OR intervention*[tiab])) OR staff[tiab] OR staffing[tiab] OR bundl*[tiab] OR model*[tiab] OR pathway*[tiab] OR personnel[tiab] OR "system level"[tiab] OR "hospital wide"[tiab] OR "lean process"[tiab] OR "eras"[tiab] OR "enhanced recovery"[tiab] OR "hospital elder life program"[tiab] OR "goal-directed achievement through geographic location"[tiab] OR gagl[tiab] OR "older people assessment liason"[tiab] OR opal[tiab] OR "early supported discharge"[tiab] OR "early home supported discharge"[tiab] OR "six sigma"[tiab] OR "OASIS framework"[tiab]
#6	Combine sets	#1 OR (#2 AND (#3 OR #4 OR #5))
#7	Remove unwanted publication types	#6 NOT (case reports[pt] OR comment[pt] OR editorial[pt] OR letter[pt] OR news[pt] OR Textbooks[pt] OR "Book Reviews"[pt] OR "Book Illustrations"[pt] OR book OR books OR textbook* OR meeting* OR conference* OR symposia OR symposium*)
#8	Limit to systematic reviews and meta-analyses	#7 AND (meta-analysis OR meta-analysis[pt] OR meta-analyses OR metaanalysis OR metaanalyses OR "Systematic Review"[pt] OR (systematic*[tiab] AND review*[tiab]))
#9	Limit to in-process citations	#8 AND ("inprocess"[sb] OR publisher[sb] OR pubmednotmedline[sb])

PubMed Syntax

- * = truncation character (wildcard)
- [edat] = entrez date (date added to database)
- [sb] = subset
- [ti] = limit to title field
- [tiab] = limit to title and abstract fields

Appendix B. List of Excluded Studies

Not U.S.-based

1. Abdelaal E, Rao SV, Gilchrist IC, Bernat I, Shroff A, Caputo R, Costerousse O, Pancholy SB, Bertrand OF. Same-day discharge compared with overnight hospitalization after uncomplicated percutaneous coronary intervention: a systematic review and meta-analysis. *Jacc. Cardiovascular Interventions*. Feb 2013. 6:99-112
2. Abraha I, Trotta F, Rimland JM, Cruz-Jentoft A, Lozano-Montoya I, Soiza RL, Pierini V, Fulgheri PD, Lattanzio F, O'Mahony D, Cherubini A. Efficacy of non-pharmacological interventions to prevent and treat delirium in older patients: A systematic overview. The SENATOR project ONTOP series. *Plos One*. 10 Jun 2015. 10
3. Adam Camila Thaís, Teixeira Vieira Cintia, da Costa Aguiar Susana, Bündchen Daiana, Soares Rocha Vieira Danielle. Non-invasive mechanical ventilation weaning protocols: a systematic review. *Fisioterapia E Pesquisa*. Oct 2017. 24:453-461.
4. Alam N, Hobbelink EL, van Tienhoven AJ, van de Ven PM, Jansma EP, Nanayakkara PWB. The impact of the use of the Early Warning Score (EWS) on patient outcomes: A systematic review. *Resuscitation*. May 2014. 85:587-594
5. Allen J, Hutchinson AM, Brown R, Livingston PM. Quality care outcomes following transitional care interventions for older people from hospital to home: a systematic review. *Bmc Health Services Research*. 2014
6. Auger KA, Kenyon CC, Feudtner C, Davis MM. Pediatric hospital discharge interventions to reduce subsequent utilization: A systematic review. *Journal Of Hospital Medicine*. April 2014. 9:251-260
7. Bettger JP, Alexander KP, Dolor RJ, Olson DM, Kendrick AS, Wing L, Coeytaux RR, Graffagnino C, Duncan PW. Transitional care after hospitalization for acute stroke or myocardial infarction: A systematic review. *Annals Of Internal Medicine*. 18 Sep 2012. 157:407-416
8. Biesty LM, Egan AM, Dunne F, Dempsey E, Meskell P, Smith V, Ni Bhuinneain GM, Devane D. Planned birth at or near term for improving health outcomes for pregnant women with gestational diabetes and their infants. *Cochrane Database Of Systematic Reviews*. 5 Jan 2018. 2018
9. Bond-Smith G, Belgaumkar AP, Davidson BR, Gurusamy KS. Enhanced recovery protocols for major upper gastrointestinal, liver and pancreatic surgery. *The Cochrane Database Of Systematic Reviews*. 1 Feb 2016. 2016
10. Brooke Joanne, Pendlebury Sarah T, Jackson Debra, Hall Claire L. What is the Impact of Volunteers Providing Care and Support for People with Dementia in Acute Hospitals? A Systematic Review. *Dementia*. May 2019. 18:1410-1427
11. Bruns ERJ, van den Heuvel B, Buskens CJ, van Duijvendijk P, Festen S, Wassenaar EB, van der Zaag ES, Bemelman WA, van Munster BC. The effects of physical prehabilitation in elderly patients undergoing colorectal surgery: a systematic review. *Colorectal Disease*. 1 Aug 2016. 18
12. Buecking B, Timmesfeld N, Riem S, Bliemel C, Hartwig E, Friess T, Liener U, Ruchholtz S, Eschbach D. Early orthogeriatric treatment of trauma in the elderly: A systematic review and metaanalysis. *Deutsches Arzteblatt International*. 12 Apr 2013. 110:255-262
13. Buggy A. The impact of the multidisciplinary team in the management of individuals with diabetic foot ulcers: a systematic review. *Journal Of Wound Care*. Jun 2017. 26:324-338
14. Burlet KJDE, Ing AJ, Larsen PD, Dennett ER. Systematic review of diagnostic pathways for patients presenting with acute abdominal pain. *International Journal For Quality In Health Care*. 2018. 30:678-683
15. Butler M, Schultz TJ, Halligan P, Sheridan A, Kinsman L, Rotter T, Beaumier J, Kelly RG, Drennan J. Hospital nurse-staffing models and patient-and staff-related outcomes. *Cochrane Database Of Systematic Reviews*. 2019 Apr 23:CD007019.

16. Cao SJ, Chen D, Yang L, Zhu T. Effects of an abnormal mini-mental state examination score on postoperative outcomes in geriatric surgical patients: A meta-analysis. *Bmc Anesthesiology*. 15 May 2019. 19.
17. Collins CT, Makrides M, Mcphee AJ. Early discharge with home support of gavage feeding for stable preterm infants who have not established full oral feeds. *Cochrane Database Of Systematic Reviews*. 8 Jul 2015
18. Connell CJ, Endacott R, Jackman JA, Kiprillis NR, Sparkes LM, Cooper SJ. The effectiveness of education in the recognition and management of deteriorating patients: A systematic review. *Nurse Education Today*. 1 Sep 2016:133-145
19. Cuevas-Lara C, Izquierdo M, Gutiérrez-Valencia M, Marín-Epelde I, Zambom-Ferraresi F, Contreras-Escámez B, Martínez-Velilla N. Effectiveness of occupational therapy interventions in acute geriatric wards: A systematic review. *Maturitas*. 1 Sep 2019:43-50
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Narrative Review or No Risk of Bias Assessment

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No Outcomes of Interest

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Appendix C. Evidence Tables

Table C-1. Characteristics of Systematic Reviews on Reducing Length of Hospital Stay

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Austin et al. 2020 ²⁴	Examine which electronic medical record interventions have improved safety and quality of therapeutic anticoagulation in an inpatient hospital setting	27 total studies: 3 RCTs, 4 cohort studies, 20 pre/post observational studies (N=not reported)	Inception to September 2018	<u>Included:</u> Studies published in English with pediatric and adult inpatients; EMR compared to routine care; reporting at least one outcome of interest	Yes, EPOC for RCTs and cohort studies	No	Yes	No
Agarwal et al. 2018 ³⁴	Examine the effect and quality of evidence for hospital-based HF quality improvement interventions on process of care measures and clinical outcomes among patients with acute HF	14 RCTs (N=96,913) *(N=75,664 for 6 US RCTs) reporting outcomes of interest	Inception to February 6, 2017	<u>Included:</u> RCTs or quasi-randomized trials of HF quality improvement interventions testing effect of individual or combined interventions (e.g., audit and feedback reporting systems, admission and discharge checklists, chart case management, patient educational or behavioral change materials, healthcare quality training that was directed at the hospital system, doctors, nurses or allied health professionals or information management systems	Yes, Cochrane ROB	No (due to substantial unexplained heterogeneity, differences in presentation of intervention effects)	Yes	Yes, GRADE (For the most part, outcomes from specific RCTs of interest for this report were not graded separately)

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Baratloo et al. 2018 ²⁵	Examine effects of telemedicine on treatment times and clinical outcomes of acute stroke care	26 total studies: 2 RCTs, 8 prospective observational studies, 16 retrospective observational studies (N=6,605)	May 2017	<u>Included:</u> Original prospective and retrospective studies, individuals with AIS, telestroke-based systems, bedside (face to face) care as a comparator, studies investigating outcomes of interest <u>Excluded:</u> Single-arm studies, studies reporting irrelevant outcomes, conference abstracts	Yes, Cochrane (RCTs), Newcastle-Ottawa scale (observational studies)	Yes	No	No
Bryant-Lukosius et al. 2015 ³⁵	Examine the clinical effectiveness and cost-effectiveness of clinical nurse specialists transitional care	13 RCTs (N=2,463)	1980 to July 31, 2013	<u>Included:</u> Published and unpublished RCTs comparing CNS-led transitional care to usual care. Intervention was delivered by a master's prepared CNS <u>Excluded:</u> Studies of outcomes that could not be solely attributed to the CNS; the control group was exposed to a CNS; or did not include a measure of health system utilization	Yes, Cochrane ROB	Yes	Yes	Yes, GRADE

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Bakker et al. 2011 ²⁶	Examine effectiveness of geriatric care teams and units	17 total studies; 6 reported LOS: 4 RCTs, 2 observational	1980 – May 2009	<u>Included:</u> RCTs and observational studies; patients at least 65 years old; multicomponent interventions <u>Excluded:</u> Non-English studies; single-disease or single-component interventions	EPOC tool	No	Yes	No
Eagles et al. 2020 ⁴¹	Examine impact of a geriatric assessment on mortality, hospital length of stay, discharge destination, and delirium incidence in patients 65 years and older admitted to a trauma center	8 retrospective cohort studies (N=122 to 4,534)	April 26, 2019	<u>Included:</u> Peer-reviewed studies describing impact of geriatric trauma consultation (GTC) in adults 65 years and older admitted to a trauma center compared with standard trauma care alone <u>Excluded:</u> Case reports, SRs, and commentaries	Yes, Newcastle-Ottawa Quality Assessment Scale	Yes	Yes	No formal analysis. Authors reported strength of findings are limited by study design, confounding, meta-analysis results based on few studies
Ellis et al. 2017 ³⁶	Examine effectiveness and resource use of comprehensive geriatric assessment (CGA) for older adults admitted to hospital, and to use these data to estimate its cost-effectiveness	29 RCTs (N=13,766)	Inception to October 5, 2016	<u>Included:</u> RCTs comparing inpatient CGA versus usual care on a general medical ward or on a ward for older people, usually admitted to hospital for acute care or for inpatient rehabilitation after an acute admission	Yes, using guidance for EPOC reviews	Yes	Yes	Yes, GRADE

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Frazer et al. 2019 ³⁷	Examine interventions intended to improve safety or quality anticoagulant prescribing	19 RCTs (N=12,742)	Inception to March 24, 2018	<p><u>Included:</u> RCTs, non-RCTs, controlled before-after, interrupted time-series in economically developed countries assessing system-level interventions for any indication in adult inpatients aged 18 years or older</p> <p><u>Excluded:</u> Interventions targeting prophylactic (low-dose) anticoagulant use, evaluating intra-operative anticoagulation, delivered in the outpatient setting or at transition to outpatient care, or compared with interventions not in current practice. Cross-sectional, uncontrolled cohort, review articles, unpublished, opinion pieces, conference abstracts/proceedings</p>	Yes, Cochrane EPOC criteria	Yes	Yes	No

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Gonçalves-Bradley et al. 2016 ³⁸	Examine effectiveness of planning the discharge of individual patients moving from hospital	30 RCTs (N=11,964)	1946 to October 2015	<u>Included:</u> RCTs; participants were hospital inpatients <u>Excluded:</u> Studies of discharge planning part of a broader package of inpatient care, did not describe study design or report control group results	Yes, Cochrane ROB	Yes	Yes	GRADE (Moderate to very low)
Gillaizeau et al. 2013 ²⁷	Examine effectiveness of computerized advice on drug dosing	42 total studies; 9 reported LOS: 8 RCTs, 1 observational	Through January 2012	<u>Included:</u> RCTs and observational studies; interventions using computerized advice to guide drug dosing tailored to individual patient <u>Excluded:</u> Studies of equations or algorithms not supported by a computerized device; popups or dosing advice that was not patient-specific	EPOC tool	Yes	Yes	Very Low
Huntley et al. 2016 ²⁸	Examine effectiveness and cost of case management for patients with heart failure	22 total studies; 9 reported LOS: 8 RCTs, 1 observational; 13 reported readmissions: 12 RCTs, 1 observational	1985 – November 2015	<u>Included:</u> RCTs and observational studies; adult studies only; all languages	Cochrane risk of bias tool for RCTs; EPOC tool for observational studies	Yes	Yes	No

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Kul et al. 2012 ²⁹	Examine effectiveness of clinical pathways for patients with heart failure	7 total studies: 3 RCTs, 1 cohort, 3 pre-post	1985 – 2011	<u>Included:</u> RCTs and observational studies; all languages	Jadad tool for RCTs; Newcastle-Ottawa Scale for observational studies	Yes	No	No
Mabire et al 2017 ^{15,30}	Examine effectiveness of nursing discharge planning interventions on health-related outcomes for older inpatients discharged home	13 total studies: 11 RCTs, 1 pilot cohort, 1 pre-post study (N=3,964)	2000 to 2015	<u>Included:</u> Studies published in English of older patients (≥65 years) discharged home from an acute care or post-acute care rehabilitation setting, i.e., skilled nursing facility. Interventions had to be provided by at least one nurse and involve a multidisciplinary and/or interdisciplinary model of care	Yes, JBI-MAStARI assessment of methodological quality	Yes	Yes	Yes, GRADE
Patel et al. 2020 ³¹	Examine treatment of geriatric hip fractures by a multidisciplinary hip fracture service and what impact this has on patient outcomes	17 total studies: 9 retrospective studies, 6 prospective studies, 1 RCT, 1 non-RCT (N=146 to 23,973)	January 1, 2012 to November 12, 2017	<u>Included:</u> Indexed in the databases searched, full-text comparative studies published in English that studied at least one of the four main outcome measures of interest	Yes, Oxford quality-scoring system (Jadad) for RCTs and Newcastle Ottawa grading system for non-RCTs	No	Yes	Tool used not reported 16 of 17 studies receive an evidence grade of good, 1 of 17 received an evidence grade of fair

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Pannick et al. 2015 ³²	Examine the range of objective patient outcomes used in studies of general medical ward interdisciplinary team care, and to evaluate the performance of interdisciplinary interventions against them	30 total studies: 8 RCTs, 9 cluster-RCTs, 8 non-RCT cluster, 4 before-after, 1 interrupted time series (N=66,548)	January 1, 1998, January 29, 2014	<u>Included:</u> Primary reports of interdisciplinary team care interventions in adult general medical wards using an objective patient outcome measure <u>Excluded:</u> Patients <18 years in intensive care unit, operating rooms, stroke units, coronary care, pharmacotherapy; interventions relying solely on a staff member taking dedicated coordinating or facilitating role (e.g., case management); interventions targeting continuation of care by a similar group during the following shift (e.g., handoff processes)	Yes, Cochrane ROB	Yes	Yes	No
Van Craen et al. 2010 ³⁹	Examine effectiveness of geriatric evaluation units	7 RCTs	Through October 2007	<u>Included:</u> RCTs and cohort studies; patients at least 65 years old; published in English, French, or Dutch <u>Excluded:</u> Studies of single-disease management programs and geriatric consultation services	Delphi list for RCTs	Yes	No	No

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
White et al. 2011 ³³	Examine the effectiveness of hospitalists on the quality of inpatient care	65 total studies; 1 RCT, 8 non-randomized controlled trials, 1 interrupted time series, 37 cohort, 18 pre-post	1996 – December 2010	<u>Included:</u> All study designs, ages, languages	Modified Downs and Black checklist, 32 items	No	Yes	No
Zhu et al. 2015 ¹²	Examine effectiveness of nurse-led early discharge planning program (DPP) to standard care for in-patients with chronic disease or rehabilitation needs	10 RCTs (N=3,438)	1946 to March 29, 2014	<u>Included:</u> RCTs; general hospital setting; include at least one primary or secondary outcome <u>Excluded:</u> Non-English studies, assessing patients with acute, critical illness, or social admissions; programs was directed by non-nursing staff; assessing post-discharge care of patients transferred to nursing home or long-term care facility; intervention initiated at discharge; post-discharge care	Yes, Cochrane ROB	Yes	Yes	No

Author Year	Objective	Primary Studies: N, Design	Search Timeframe	Inclusion/Exclusion Criteria	Risk of Bias Assessment	Meta-analysis	Qualitative or Narrative Synthesis	GRADE or Similar Analysis
Zhang et al. 2013 ⁴⁰	Examine effectiveness of interventions to prevent postoperative delirium in elderly patients	38 total RCTs; 10 studies reported LOS, only 2 used a systemic intervention (others were pharmacologic)	Through July 2012	Included: RCTs only; adult patients Excluded: Non-English studies; patients with delirium prior to surgery; non-surgical patients; patients with alcohol withdrawal syndrome; studies of homogenous populations of patients with central nervous diseases or mental disorders	Modified Jadad tool	Not for the 2 studies of systemic interventions reporting LOS; meta-analysis performed for all studies reporting LOS	Yes	No

AIS: acute ischemic stroke; CGA: comprehensive geriatric assessment; CNS: clinical nurse specialists; EMR: electronic medical record; EPOC: effective practice and organization of care; GRADE: Grading of Recommendations Assessment, Development and Evaluation; GTC: geriatric trauma consultation; HF: heart failure; JBI-MAStARI: Joanna Briggs Institute Meta-analysis Statistics Assessment and Review Instrument; LOS: length of stay; RCT: randomized controlled trial; ROB: risk of bias; US: United States

Table C-2. Hospital and Patient Characteristics of Systematic Reviews on Reducing Length of Hospital Stay

Author Year	Hospital Characteristics					Patient Characteristics			
	<i>Pt age cohort</i>	<i>Location, No. of studies</i>	<i>Bed size, No. of studies</i>	<i>Type of hospital, No. of studies</i>	<i>Health system affiliation, No. of studies</i>	<i>Age, No. of studies</i>	<i>Primary dx & comorbidity, No. of studies</i>	<i>Medical insurance, No. of studies</i>	<i>Vulnerability/ social isolation measures, No. of studies</i>
Austin et al. 2020 ²⁴	Adults	Not reported	Not reported	Not reported	Not reported	>18 years	Types of anticoagulants assessed: Unfractionated heparin: 9 Vitamin K antagonists: 8 Combination of anticoagulants: 8 studies	Not reported	Not reported

Author Year	Hospital Characteristics					Patient Characteristics			
	<i>Pt age cohort</i>	<i>Location, No. of studies</i>	<i>Bed size, No. of studies</i>	<i>Type of hospital, No. of studies</i>	<i>Health system affiliation, No. of studies</i>	<i>Age, No. of studies</i>	<i>Primary dx & comorbidity, No. of studies</i>	<i>Medical insurance, No. of studies</i>	<i>Vulnerability/ social isolation measures, No. of studies</i>
							Low molecular weight heparins: 2		
Agarwal et al. 2018 ³⁴	Adults	Urban, rural	Not reported	Academic centers: 2 Community hospital: 2	Not reported	67.5 to 79.3 years	Heart failure	Not reported	Not reported
Baratloo et al. 2018 ²⁵	Adult	Rural and remote areas	Not reported	Not reported	Not reported	Mean range: 60.1 to 80 years	Tissue plasminogen activator treated patients with acute ischemic stroke	Not reported	Not reported
Bryant-Lukosius et al. 2015 ³⁵	Adults and infants	Urban and rural	Few studies reported bed size 500 to 550 bed: 2	Academic medical centers, community hospitals, non-profit acute care teaching hospital	Systems in Pennsylvania and Vermont	Patients with heart failure: mean range: 70.7 to 76 years Elderly hospitalized patients: mean range: 74.4 to 80.3 years High-risk pregnant women and infants: mean range: 23.5 to 28.5	Patients with heart failure: 3 Elderly hospitalized patients: 5 High-risk pregnant women and infants: 3	Patients with heart failure: authors reported no baseline group differences in health resource use or costs Elderly hospitalized patients: 97.5% received Medicare and 7.5% received Medicaid (1 RCT)	Patients with heart failure: 1 RCT: 43.2% <\$15,000 annual income; 41.8% \$15–50,000; 7.7% >\$50,000 1 RCT: 33.1% <\$10,000 annual income; 26.8% \$10,000 to \$19,999; 15.9% ≥\$20,000 Elderly hospitalized patients: 1 RCT: 35% <\$10,000 annual income

Author Year	Hospital Characteristics					Patient Characteristics			
	<i>Pt age cohort</i>	<i>Location, No. of studies</i>	<i>Bed size, No. of studies</i>	<i>Type of hospital, No. of studies</i>	<i>Health system affiliation, No. of studies</i>	<i>Age, No. of studies</i>	<i>Primary dx & comorbidity, No. of studies</i>	<i>Medical insurance, No. of studies</i>	<i>Vulnerability/ social isolation measures, No. of studies</i>
								<p>High-risk pregnant women and infants: 65% Medicaid (1 RCT), 36.5% Medicaid (1 RCT), 65% public health insurance (1 RCT)</p>	<p>1 RCT: 64% (intervention) and 46% (control) <\$20,000 annual income; 36% (intervention) and 46% (control) >\$20,000 annual income</p> <p>1 RCT: 72% <\$19,000 annual income; 28% ≥\$20,000</p> <p>High-risk pregnant women and infants:</p> <p>1 RCT: 68% <\$9999; 21% \$10,000 to \$49,000, 11% >\$50,000</p> <p>1 RCT: 31% <\$9999 annual income; 25.5% \$10,000 to \$24,999; 43.5% ≥\$25,000</p> <p>1 RCT: 62% below poverty-level income</p>

Author Year	Hospital Characteristics					Patient Characteristics			
	<i>Pt age cohort</i>	<i>Location, No. of studies</i>	<i>Bed size, No. of studies</i>	<i>Type of hospital, No. of studies</i>	<i>Health system affiliation, No. of studies</i>	<i>Age, No. of studies</i>	<i>Primary dx & comorbidity, No. of studies</i>	<i>Medical insurance, No. of studies</i>	<i>Vulnerability/ social isolation measures, No. of studies</i>
Bakker et al. 2011 ²⁶	Adult	Not reported	Not reported	AMC: 2 Community: 2 VA: 1 Not reported: 1	Not reported	65+ years	Frail elderly	Not reported	Not reported
Eagles et al. 2020 ⁴¹	Adults	Not reported	Not reported	Level 2 trauma center: 2 (US) Level 1 trauma center: 5 (US), 1 (Canada)	Not reported	Range: 60 to 70 years	Older adults admitted to trauma center	Not reported	Not reported
Ellis et al. 2017 ³⁶	Adults	Mostly urban	Few studies reported bed size. 60 beds: 1 1500 beds: 1	University/teaching; VA; Community; Multi-center	Yes	Mean range: 74 to 85 years	Frail or at-risk participants: 11 Older participants: 11	Not reported	Not reported
Frazer et al. 2019 ³⁷	Adults	Not reported	Not reported	Single hospital: 10 Multiple centers: 9	Not reported	Mean range: 46 to 77 years	History of AF, ACS, VTE, stroke/TIA, valve replacement, severe heart failure, PVD, ARDS, bridge to lung transplant, valve disease, systemic arterial embolism, left ventricular thrombus, cardiac prophylaxis	Not reported	Not reported

Author Year	Hospital Characteristics					Patient Characteristics			
	<i>Pt age cohort</i>	<i>Location, No. of studies</i>	<i>Bed size, No. of studies</i>	<i>Type of hospital, No. of studies</i>	<i>Health system affiliation, No. of studies</i>	<i>Age, No. of studies</i>	<i>Primary dx & comorbidity, No. of studies</i>	<i>Medical insurance, No. of studies</i>	<i>Vulnerability/ social isolation measures, No. of studies</i>
Gonçalves-Bradley et al. 2016 ³⁸	Adult	Urban, rural	Few studies reported bed size. Minimum bed size reported: 100 beds	US studies: Academic/teaching: 9 VA: 2 Safety-net: 2	Most reported health system affiliation	75 years: 10 70 to 75 years: 7 <70 years: 13	Older participant: 21 Mix of medical and surgical conditions including heart failure: 5 Psychiatric hospital or general ward: 2 Admitted following fall: 2 Note: some trials included multiple population types	Not reported	Language and health literacy: 4 *Mixed evidence for non-English speakers, and evidence does not seem to support an increased or decreased effect of discharge planning for patients with low health literacy.
Gillaizeau et al. 2013 ²⁷	Adult	4 urban, 6 not reported	4 studies reported: range 288 to 1400	AMC: 4 VA: 2 Community: 3	Not reported	Not reported	Mix includes diabetes, COPD, renal disease, etc.	Not reported	Not reported
Huntley et al. 2016 ²⁸	Adult	For LOS: Urban: 5 Not reported: 4	Not reported	For LOS: AMC: 2 Community: 5 Not reported: 2	For LOS: Yes: 2 Not reported: 7	65+ years	Congestive heart failure	Not reported	3 studies have >20% of patients with first language other than English; in 2 studies, >50% of patients are Black, other non-white, or Hispanic
Kul et al. 2012 ²⁹	Adult	1 urban, 1 suburban, 1 rural, 4 not reported	Not reported	Not reported	Not reported	Mean: >65 years	Congestive heart failure	Not reported	Not reported

Author Year	Hospital Characteristics					Patient Characteristics			
	<i>Pt age cohort</i>	<i>Location, No. of studies</i>	<i>Bed size, No. of studies</i>	<i>Type of hospital, No. of studies</i>	<i>Health system affiliation, No. of studies</i>	<i>Age, No. of studies</i>	<i>Primary dx & comorbidity, No. of studies</i>	<i>Medical insurance, No. of studies</i>	<i>Vulnerability/ social isolation measures, No. of studies</i>
Mabire et al 2017 ^{15,30}	Adults	Not reported	Not reported	University hospitals: 11 City hospitals: 2	Not reported	Median: 77 years	Older patients: With severe comorbidities: 1 With moderate comorbidities: 5 With low morbidities: 5	Not reported	Not reported
Patel et al. 2020 ³¹	Adults	Not reported	Not reported	Not reported	Not reported	>60 years	Older patients with hip fracture	Not reported	Not reported
Pannick et al. 2015 ³²	Adults	Not reported	Not reported	Safety-net hospitals, large academic facilities	Yes	Mean: 63 years	Variety of primary diagnoses: delirium, community-acquired pneumonia, acute stroke, advanced liver disease, patients taking anticoagulant medication	Not reported	Not reported
Van Craen et al. 2010 ³⁹	Adult	Not reported	Not reported	AMC: 2 Community: 1 VA: 2 Not reported: 2	Not reported	65+ years	Frail elderly	Not reported	Not reported
White et al. 2011 ³³	Adult only: 25 studies Pediatric only: 10 studies All ages: 30 studies	Not reported	Not reported	AMC: 54 Community: 11	Not reported	All ages	Mix includes heart failure, COPD, psychiatric illness, substance use disorder, etc.	Not reported	Not reported

Author Year	Hospital Characteristics					Patient Characteristics			
	<i>Pt age cohort</i>	<i>Location, No. of studies</i>	<i>Bed size, No. of studies</i>	<i>Type of hospital, No. of studies</i>	<i>Health system affiliation, No. of studies</i>	<i>Age, No. of studies</i>	<i>Primary dx & comorbidity, No. of studies</i>	<i>Medical insurance, No. of studies</i>	<i>Vulnerability/ social isolation measures, No. of studies</i>
Zhu et al. 2015 ¹²	Adults	Not reported	Not reported	Not reported	Not reported	Mean range: 36.4 to 94 years	Older hospitalized adults: 5 Decompensated HF: 1 Hip fracture patients: 1 Rehab patients: 1 CHD: 1 Hospitalized psychiatric patients: 1	Medicare: 1	Not reported
Zhang et al. 2013 ⁴⁰	Adult	Not reported	Not reported	Not reported	Not reported	Mean age: 80+ years	Frail elderly undergoing orthopedic surgery	Not reported	Not reported

ACS: acute coronary syndrome; AF: atrial fibrillation; AMC: academic medical center; ARDS: acute respiratory distress syndrome; CHD: congenital heart disease; COPD: chronic obstructive pulmonary disease; PVD: peripheral vascular disease; RCT: randomized controlled trial; TIA: transient ischemic attack; VA: Veteran Affairs; VTE: venous thromboembolism

Table C-3. Interventions to Reduce Length of Hospital Stay

Author Year	Type of Intervention	Description of Intervention	Comparator	Resources	Implementation Features
Austin et al. 2020 ²⁴	Computerized physician order entry (CPOE): 4 Clinical decision support system (CDSS): 21 Dashboard utilization: 1 EMR implementation in general: 1	CPOE: Providers used computer assistance to directly enter medication orders from a computer or mobile device. 2 studies focused on discharge reconciliation process (warfarin prescribing), 1 study assessed impact of CPOE on medication errors and preventable adverse events, and 1 study assessed appropriateness of CPOE on pathology information. CDSS: Majority of methods assessed impact of CDSS alerts (14 studies). Additional strategies or functionality of the EMR utilized were classified according to type of CDSS.	Routine care	Providers	Not reported
Agarwal et al. 2018 ³⁴	Clinical pathway: Multi-component interventions (5 RCTs) Education at discharge (1 RCT)	5 RCTs assessed a variety of multi-component interventions: In 2 trials these were quality improvement initiatives including inpatient critical pathway for HF management, standardized admissions orders, staff and patient HF education, home care pathway for after hospital discharge, and tailored performance reports; 3 other trials assessed multi-component interventions including components such as use of case manager, HF education, medication review, and telephone surveillance post-discharge; 1 RCT assessed 1 hour educational session at discharge.	Usual care	1 intervention included experienced consulting form assisted in implementation of the pathways and other pathway components	Not reported
Baratloo et al. 2018 ²⁵	Telestroke-based systems	Telephone, videoconferencing, or tele radiology used to deliver intervention.	Bedside (face to face) acute stroke care at comprehensive stroke center with 24 hour access to thrombolysis and specialized stroke expertise	Not reported	Not reported

Author Year	Type of Intervention	Description of Intervention	Comparator	Resources	Implementation Features
Bryant-Lukosius et al. 2015 ³⁵	Clinical nurse specialists (CNS) transitional care	<p>Early discharge interventions: 3 studies of patients with heart failure, CNSs visited patients while in hospital, had regular post-discharge contact via telephone, home visits, or home and heart failure clinic.</p> <p>Early discharge interventions: 3 studies of high-risk pregnant women and infants, CNSs provided direct care to hospitalized women and infants, assessed their suitability for early discharge and provided post-discharge care via home visits, telephone calls, and on-call services over several weeks.</p> <p>Post-discharge intervention: 5 studies of elderly hospitalized patients, CNSs and/or nurse practitioners visited patients in hospital to prepare individualized discharge plans and provide regular post-discharge follow-up home visits or telephone calls. Patients had telephone access to CNS as needed.</p>	Usual care	Master's prepared CNS, nurse practitioner	Not reported
Bakker et al. 2011 ²⁶	Geriatric specialty teams or units	3 studies used multidisciplinary geriatrics team to consult on patient management; 3 studies had separate geriatric unit.	Usual care	Not reported	Not reported
Eagles et al. 2020 ⁴¹	Geriatric trauma consultation	Mandatory element in all studies was an assessment by a geriatrician. Some studies reported participation in multidisciplinary rounds (3 studies) or compliance of trauma team to geriatric recommendations (2 studies).	Standard trauma care	Geriatrician, advanced practice nurse (2 studies), resident/fellows (2 studies)	Not reported
Ellis et al. 2017 ³⁶	Comprehensive geriatric assessment	Most common components included tailored treatment plans to the individual. 12 studies held multi-disciplinary team meetings; 11 studies included clinical leadership; 11 studies included specialty knowledge, experience, and competence; and 10 studies involved participants and carers in goal setting.	Usual care	Consultant geriatricians, healthcare assistants, junior doctors, nurses, occupational therapists, pharmacists, physiotherapists, psychiatric nurses, social workers, therapy assistants	Delivered in a dedicated geriatric ward (20 studies); mobile team on a general medical ward (8 studies)

Author Year	Type of Intervention	Description of Intervention	Comparator	Resources	Implementation Features
Frazer et al. 2019 ³⁷	Anticoagulation consultation services Decision supported warfarin dosing Heparin monitoring systems Other CDSS Systematic education and feedback programs	Anticoagulation consultation services: Pharmacist-led anticoagulation service. Decision supported warfarin dosing: Computer dosing-algorithm, linear regression dosing algorithm, genotype and clinical information dosing algorithm, mathematical formula dosing algorithm. Heparin monitoring systems: Point of care coagulation monitoring, thromboelastography, heparin assay. Other CDSS: Computerized electronic alert system requiring active response or with hard-stop alert, computer based decision support system. Systematic education and feedback programs: Multifaceted safety program, enhanced feedback intervention	Physician-led anticoagulation service, usual physician care, standard physician-led dose adjustment, clinical information dosing algorithm, standard activated partial thromboplastin time monitoring, computerized alert system, written feedback intervention	Pharmacist, physician	Not reported
Gonçalves-Bradley et al. 2016 ³⁸	Discharge planning	Studies included assessment, planning, implementation and monitoring (e.g., telephone, PCP appointments) phases. 7 studies evaluated a pharmacy discharge plan implemented by a hospital pharmacy. 12 studies provided post-discharge phone call, four a visit, two a phone call and visit. Most studies included a patient education component and 7 studies reported place of discharge (e.g., home residential care).	Standard care with no individualized discharge plan	Healthcare professional coordinated plan	Implemented from admission to three days prior to discharge
Gillaizeau et al. 2013 ²⁷	Computerized decision support	All studies used real-time computer support to guide drug dosing; drugs included: theophylline (3 studies), aminoglycoside (2 studies), oral anticoagulants (2 studies), insulin (1 study), cyclosporine (1 study); 3 studies supported computerized physician order entry.	Usual care	Not reported	Not reported
Huntley et al. 2016 ²⁸	Case management	Studies included various strategies, usually directed by a nurse case manager, including: medication review, family conferencing, education, home environment assessment, referral to other services or medical specialties.	Usual care	Case managers	Not reported

Author Year	Type of Intervention	Description of Intervention	Comparator	Resources	Implementation Features
Kul et al. 2012 ²⁹	Clinical pathways	Descriptions of each study not given. All studies had to include pathways that met the definition of a pathway according to the European Pathway Association.	Usual care	Not reported	Not reported
Mabire et al 2017 ^{15,30}	Nursing discharge planning interventions	All interventions comprised nurse assessment and follow-up. Some interventions continued post-discharge in the home setting (i.e. telephone contact, visits, combination); number of contacts varied widely (2 to 10+) and timing varied. Follow-up contacts were within 24 hours post discharge, others persisted up to 9 months. 5 studies included geriatric assessment; 6 studies considered discharge preparation interventions as either effective communication/information regarding the discharge care plan; 1 study examined patient participation.	Usual care	Registered nurses and cardiac nurses (4 studies); Case managers (3 studies); Advance practice nurses (2 studies); Community nurse (1 study)	Not reported
Patel et al. 2020 ³¹	Orthopedic-led care (13 studies) Geriatrics-led care (4 studies)	Interventions included co-management between orthopedic service and geriatrics/medicine service. Example of components include prompt admission with surgical optimization, fast-tracking hip fractures from ED to inpatient unit, surgeon availability, case management evaluation of patient's social dynamics/needs and anticipate discharge needs starting day of admission, brief meeting/discussion between management team, continued medical optimization (i.e. coordinating postoperative follow-up for comorbidities).	Coordinated ortho-geriatrics care model (13 studies) or orthopedic-led care model (4 studies)	Not reported	Not reported

Author Year	Type of Intervention	Description of Intervention	Comparator	Resources	Implementation Features
Pannick et al. 2015 ³²	Interdisciplinary team care 8 studies involved low-intensity interventions and remainder were of medium or high intensity	Interdisciplinary team care with altered composition: 15 studies required additional specialists or professionals to provide advice. Consultants specialized in geriatrics, infectious diseases, intravenous therapy, stroke, pharmacotherapy, or psychiatry. 4 studies assessed effect of embedding additional health care professionals in rounding teams, incorporating pharmacists, medical librarians, supervising medical subspecialists. Interdisciplinary team care addressing team practice: 10 studies addressed the logistics of when, where, and how team members would work together. 2 studies assessed team localization, with medical and nursing staff co positioned in same geographic area in hospital. 1 study described teamwork and communication program.	Usual, routine, or standard care	Interdisciplinary teams including specialists and subspecialists, physicians, nurses, pharmacists, medical librarians	Not reported
Van Craen et al. 2010 ³⁹	Geriatric evaluation unit	Geriatric units included many or most of the following: Assessment of medical, functional, nutritional cognitive, and psychiatric status, social situation, and quality of life; Development of individual care plans; Initiation of early discharge planning; Ensuring rehabilitation services were available; Arranging post-discharge follow-up plan.	Usual care	Interdisciplinary teams including physicians, nurses, and/or social workers, dietitians, psychologists, physical/ occupational therapists	5 studies admitted patients directly to geriatric unit from home or emergency department; 2 studies admitted patients from other hospitals 4 studies specifically targeted frail patients, while 3 studies included all elderly patients Patient management teams met daily (2 studies), twice weekly (2 studies), or weekly (3 studies)

Author Year	Type of Intervention	Description of Intervention	Comparator	Resources	Implementation Features
White et al. 2011 ³³	Hospitalist service	All studies used hospitalist physician structures.	Traditional attending physician structures	Not reported	Not reported
Zhu et al. 2015 ¹²	Nurse-led early discharge planning	Interventions included telephone-based programs, biopsychosocial assessment and individualized plans to address transitional care needs, comprehensive program for a specific condition of interest (i.e. decompensated heart failure) providing easy availability for consults and close follow-up at clinic. Nurse advocates work with patients during stay to arrange follow-up appointments, confirm medication reconciliation; discharge planning needs assessment, individualized nursing instruction, monitoring services, coordinated resources, arranging referrals and home or nursing visits (e.g., within first 48 hours of admission).	Usual care	Nurse, nurse case manager, volunteers supported by social workers	Nurse-led with or without additional support from hospital staff, family member or caregiver, or volunteers supported by social workers
Zhang et al. 2013 ⁴⁰	Multicomponent interventions	1 study used geriatrics consultation service, and implementation of targeted recommendations; 1 study used staff education, team-based approach, individual care planning.	Usual care	Not reported	Not reported

CDSS: clinical decision support system; CPOE: computerized physician order entry; EMR: electronic medical record; HF: heart failure; RCT: randomized controlled trial

Table C-4. Outcomes of Interventions to Reduce Length of Hospital Stay

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Austin et al. 2020 ²⁴	<p><u>CDSS (heparin-induced thrombocytopenia alerts)</u> (1 US RCT, n=2086)</p> <p>Median LOS: 49.7% vs. 50.3%, p=0.94, no difference</p> <p><u>CDSS (order sets)</u> (1 US retrospective study, n=5,879)</p> <p>Median LOS (hours): 68.3 hours vs. 68.9 hours, p=0.2615, no difference</p> <p><u>CDSS (general acute myocardial infarction order set)</u> (1 US retrospective study, n=5,879), no significant difference in reduction of LOS</p> <p><u>Multiple CDSS/CPOE interventions</u> (1 US pre-post study, n=190), no significant improvement in LOS (study reported LOS days differently for intervention and comparator, i.e., mean vs. median)</p>	Not reported	<p><u>All-cause hospitalization after 30 days</u> (1 US retrospective study, n=5,879)</p> <p>16.3% vs. 17.1%, p=0.4398, no difference</p>	<p>Adverse drug events (ADEs)</p> <p><u>CPOE</u> (1 US pre-post study, N=NR)</p> <p>Significant reduction in adverse drug events (ADEs) per 1000 patient-days post CPOE implementation, 0.18 vs. 0, p=0.01, favors intervention</p> <p>90-day mortality</p> <p><u>CDSS (heparin-induced thrombocytopenia alerts)</u> (1 US RCT, n=2,086)</p> <p>29.% vs. 34.2%, OR: 1.0, 95% CI: 0.8 to 1.2, p=0.98, no difference</p> <p><u>CDSS Other alerts (effectiveness on antithrombotic medication ordering with severe CKD and ACS)</u> (1 US prospective study, n=80)</p> <p>15% vs. 12%, p=0.5, no difference</p> <p>In-hospital bleeding</p> <p><u>CDSS Other alerts (effectiveness on antithrombotic</u></p>	Not reported	<p><u>User satisfaction scale of 1 to 5 (how user friendly & accessible is new warfarin order)</u> (1 study, n=28)</p> <p>1=4%; 2=7%; 3=29%; 4=54%; 5=7%</p> <p><u>User acceptance/satisfaction survey</u> (1 study, 87 of 207 responded)</p> <p>58% viewed safe transitions anticoagulation report (STAR), of these, 67% found it helpful, 58% improved workflow, 77% improved patient safety</p> <p><u>Pharmacist survey</u> (1 study, 56 of 96 responded)</p> <p>80% reported it improved documentation of Heparin-induced</p>	Not reported

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
				<p><u>medication ordering with severe CKD and ACS</u> (1 US prospective study, n=80) 21% vs. 9%, p=0.12, no difference</p> <p>Reduction in inpatient mortality <u>CDSS (general acute myocardial infarction order set)</u> (1 US retrospective study, n=5,879) 6.5% vs. 3.5%, p<0.0001, favors intervention</p> <p><u>Multiple CDSS/CPOE interventions</u> 1 US pre-post study (n=190) found no significant improvement in mortality (study reported data differently for intervention and comparator groups, i.e. mean vs. median)</p> <p>EMR (patients with NSTEMI) Mortality (1 US retrospective study, n=NR): OR: 0.82, 95% CI: 0.69 to 0.97, favors intervention</p>		<p>thrombocytopenia</p> <p><u>Overall satisfaction</u> (1 study, 7-point Likert scale, n=NR)</p> <p>Development phase: Median: 2 (Agree), IQR: 2 to 4</p> <p>Validation phase: Median: 3 (Somewhat agree), IQR: 2 to 4 (p=0.29), inconclusive</p>	

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				<p>Major bleeding (1 US retrospective study): OR: 0.78, 95% CI: 0.67 to 0.91, favors intervention if admitted to a fully implemented EMR site</p> <p>A slightly lower risk of bleeding in partially implemented sites (OR: 0.81, 95% CI: 0.70 to 0.94), favors intervention</p> <p>Authors report no significant difference in adjusted risk of mortality or major bleeding for patients admitted with STEMI in 1 US retrospective study</p>			

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Agarwal et al. 2018 ³⁴ *Note: Laramee 2003 and Rich 1995 are also reported in Goncalves-Bradley et al. 2016 ³⁸ and Bryant-Lukosius et al. 2015 ³⁵	1 RCT (n=2906), compared to usual care, intervention was associated with a -1.1 days, 95% CI: -2.9 to 0.7 change in LOS, favors intervention	1 RCT found that compared to usual care, the intervention was not associated with a statistically significant change in NYHA class: 0, 95% CI: -0.4 to 0.3, p=0.88, no difference	<u>Hospital readmission (up to 90 days after discharge)</u> (3 RCTs [2 of 3 US], n=706 2 studies (419 combined patients) reported intervention was associated with decreased hospital readmissions up to 90 days after discharge 37% (intervention) vs. 67% (comparator), p=-0.02, favors intervention 7% (intervention) vs. 19% (comparator), absolute risk reduction: 12%, p=0.04, favors intervention 1 study (n=287), found no difference 37% (intervention) vs. 37% (comparator), p>0.99	<u>In-hospital mortality</u> 2 RCTs (n=74,735) reported in-hospital mortality; neither study found a statistically significant change in in-hospital mortality. <u>All-cause mortality (30 days)</u> 1 RCT (Sales 2013) found no statistically significant change in mortality: Absolute risk reduction 0.4% (p=1.00)	3 RCTs reported on QOL (n=3,411) 1 RCT found intervention improved QOL, while 2 RCTs found no statistically significant change <u>Ladder of Life:</u> -0.3, 95% CI: -1.6 to 1.0 higher scores reflect better quality of life <u>Minnesota Living with Heart Failure Questionnaire:</u> p=0.049 <u>Chronic Heart Failure Questionnaire (CFHQ):</u> Mean: 22.1 (intervention) vs. 11.3 (comparator), p=0.001	Not reported	Not reported

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Baratloo et al. 2018 ²⁵	9 trials (6 of 9 US), n=2,850 MD: -0.55 days, 95% CI: -1.02 to -0.07, p=0.02, I ² =38%, favors intervention	Not reported	Not reported	<u>In-hospital mortality</u> (18 trials [10 of 18 US], n=4,907) OR: 1.21, 95% CI: 0.98 to 1.49, p=0.08, I ² =0%, no difference <u>Symptomatic Intracranial Hemorrhage</u> (21 trials [10 of 21 US], n=4,022) OR: 1.10, 95% CI: 0.79 to 1.53, p=0.58, I ² =0%, no difference	Not reported	Not reported	Not reported
Bryant-Lukosius et al. 2015 ³⁵ *Some studies in this SR overlap with Goncalves-Bradley et al. 2016 ³⁸ , Zhu et al. 2015 ¹² , and Mabire et al. 2017 ³⁰ data reported here is not reported by the other SRs.	<u>Elderly hospitalized patients</u> (3 US RCTs, n=396) MD: -0.69 days, 95% CI: -1.95 to 0.56, p=0.28, no difference (SOE: Low) <u>Very-low birth weight infants</u> (1 US RCT, n=79) MD: -11.2 days, 95% CI: -17.8 to -4.6, p <0.05, favors intervention (SOE: Low) <u>Infants</u> (1 US RCT, n=93) MD: -2.7 days, 95% CI: -6.67 to 1.27, p=0.45, no difference (SOE: Low)	Not reported	<u>Re-hospitalization more than once for any reason at 90 days and 52 weeks patients with heart failure</u> (2 US RCTs, n=495) RR: 0.81, 95% CI: 0.57 to 1.13, p=0.21, no difference (SOE: Low) <u>Maternal re-hospitalizations high-risk pregnant women</u> (1 US RCT, n=122) RR: 0.14, 95% CI: 0.01 to 2.71, p=0.19, no difference (SOE: Low)	<u>Mortality at 6 months and 52 weeks of follow-up patients with heart failure</u> (2 RCTs [1 of 2 US], n=345) RR: 0.76, 95% CI: 0.41 to 1.42, p=0.40, no difference (SOE: Low) <u>Mortality during index hospitalization and 6 and 8 weeks post-discharge elderly hospitalized patients</u> (2 US RCTs, n=443) RR: 1.05, 95% CI: 0.48 to 2.28, p=0.90, no difference (SOE: Low)	<u>Patient satisfaction with care at 4 and 6 weeks (5-point scales converted to 100-point scales) patients with heart failure</u> (2 US RCTs, n=403) MD: 6.09, 95% CI: 3.55 to 8.63, p<0.00001, favors intervention (SOE: Moderate) <u>Maternal satisfaction with care at discharge and 8 weeks post-partum high-risk pregnancy</u>	Not reported	Authors reported that none of the studies assessed costs and outcomes jointly. There was no instance when resource use or costs were higher with CNS care but often instances when the CNS reduced resource use and costs, despite the fact that the CNS was an 'add-on' cost.

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	<p><u>Maternal post-partum (high-risk pregnant women)</u> (2 US RCTs, n=215)</p> <p>MD: -1.19 days, 95% CI: -1.55 to -0.83, p <0.00001, favors intervention (reduces maternal post-partum LOS) (SOE: Moderate)</p>		<p><u>Maternal re-hospitalizations before delivery high-risk pregnant women</u> (1 US RCT, n=55)</p> <p>RR: 0.7, 95% CI: 0.33 to 1.47, p=0.34, no difference (SOE: Low)</p> <p><u>Infant re-hospitalizations at 2 and 8 weeks post-discharge</u> (2 US RCTs, n=202)</p> <p>RR: 0.56, 95% CI: 0.21 to 1.44, p=0.23, no difference (SOE: Low)</p>		<p>(2 US RCTs, n=218)</p> <p>MD: 18.15, 95% CI: 11.9 to 24.4, p <0.00001, favors intervention (SOE: Low)</p> <p>Authors noted considerable heterogeneity for this outcome.</p>		
Bakker et al. 2011 ²⁶	<p>6 studies, n=1660 patients</p> <p>3 studies found no difference; 3 studies did not provide statistical analysis of results.</p>	<p><u>Multiple function measures</u> (4 studies, n=833)</p> <p>Most measures found no difference; 1 study favors intervention for Self Rating Depression Scale; 1 study favors intervention for Mini-Mental State Examination</p>	<p>2 studies, n=252 patients</p> <p>1 study favors intervention; 1 study did not provide statistical analysis of results</p>	<p><u>Mortality</u></p> <p>1 study (N=197) found no difference</p> <p><u>Complications</u> (type not specified): 1 study (N=695) found no difference</p>	Not reported	Not reported	1 study found reduced costs

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Eagles et al. 2020 ⁴¹	2 US retrospective cohort studies, n=5,414 MD: -1.11 days, 95% CI: -1.43 to : -0.79, I ² =0%, favors intervention (post implementation)	Not reported	Not reported	<p><u>In-hospital mortality after vs. before implementation of GTC service</u> (6 retrospective cohort studies [5 of 6 US], n=7,408) Unadjusted OR: 0.91, 95% CI: 0.70 to 1.18, I²=18%, no difference Intervention: 276 events Usual care: 200 events</p> <p><u>In-hospital mortality with GTC vs. without GTC service</u> (2 US retrospective cohort studies, n=482) Unadjusted OR: 0.24, 95% CI: 0.12 to 0.52, I²=0%, favors intervention Intervention: 9 events Usual care: 44 events</p> <p><u>Delirium occurrence</u> (1 US retrospective cohort study, n=59) Unadjusted OR: 6.30, 95% CI: 1.80 to 21.99, favors pre-intervention (pre GTC implementation)</p>	Not reported	Not reported	Not reported

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
				Post-intervention: 34 events Pre-intervention: 6 events			
Ellis et al. 2017 ³⁶	Note: <50% of studies reporting readmissions were US based, therefore data is not reported. Authors did not retain meta-analysis due to high levels of heterogeneity. Trials showed inconsistency.	Not reported	Note: <50% of studies reporting readmissions were US based, therefore data is not reported	<u>Mortality at discharge</u> (11 RCTs [7 of 11 US], n=4346) RR: 1.04, 95% CI: 0.82 to 1.32, I ² =16%, no difference (SOE: high-certainty evidence) Intervention: 130 events Usual care: 138 events <u>Mortality at 3 to 12 months' follow-up</u> (21 RCTs [12 of 21 US, n=10,023) RR: 1.00, 95% CI: 0.93 to 1.07, I ² =0%, no difference (SOE: high-certainty evidence) Intervention: 1195 events Usual care: 1089 events	Not reported	Not reported	Note: Summary of costs reported in non-US currency. Therefore, cost data not reported here.

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Frazer et al. 2019 ³⁷	<p><u>Anticoagulation consultation service (physician-led)</u> (1 US RCT, n=101)</p> <p>Mean (days): 12.9 vs. 13.4, $p \geq 0.2$, no difference</p> <p><u>Decision supported warfarin dosing</u> (1 RCT, n=75)</p> <p>Mean (days): 13 vs. 20, $p=0.01$, favors intervention</p>	Not reported	<p><u>% Unplanned readmission</u> (1 US RCT, n=101)</p> <p>19% vs. 29%</p>	<p><u>Anticoagulation consultation service (physician-led)</u></p> <p>In-hospital bleeding rates (1 US RCT, n=101): 58% lower in physician-led group, 95% CI: 2% to 82%, $p=0.03$, favors intervention</p> <p>Number of in-hospital deaths (%; 1 US RCT, n=101): 9% vs. 5%, $p \geq 0.2$, no difference</p> <p>Intervention: 4 events</p> <p>Usual care: 3 events</p> <p><u>Decision supported warfarin dosing vs. control</u> (1 US RCT, n=1,015)</p> <p>Number of deaths: 0.4% vs. 0.2%, $p=0.55$, no difference</p> <p>Intervention: 2 events</p> <p>Usual care: 1 event</p>	Not reported	Not reported	<p><u>Costs of protocol (per patient per day)</u></p> <p>1 US study (n=268): \$31.46 vs. \$27.10</p>

<p>Gonçalves-Bradley et al. 2016³⁸</p>	<p><u>Older patients with medical condition</u> (12 trials [6 of 12 US], n=2,193)</p> <p>MD: -0.73 days, 95% CI: -1.33 to -0.12, I²=9.44%, favors intervention (SOE: moderate certainty of evidence)</p> <p><u>Older surgical patients</u> (2 trials [1 of 2 US], n=184)</p> <p>MD: -0.06, 95% CI: -1.23 to 1.11, I²=0%, no difference</p>	<p>Not reported</p>	<p><u>Unscheduled readmission within 3 months for patients with medical condition</u> (15 trials [9 of 15 US], n=4,743)</p> <p>RR: 0.87, 95% CI: 0.79 to 0.97, I²=28.26%, favors intervention (SOE: moderate certainty of evidence)</p> <p>Intervention: 525 events</p> <p>Usual care: 605 events</p> <p>*Lin 2009 and Jack 2009 (US) also included in Zhu SR meta-analysis for readmissions</p>	<p>Note: <50% of studies reporting harms were US based, therefore data is not reported</p>	<p>May lead to increased satisfaction for patients and healthcare professionals. Satisfaction was measured in different ways and findings were inconsistent across studies (low certainty evidence, six trials but not specified, n=NR).</p>	<p>May lead to increased satisfaction for patients and healthcare professionals (low certainty evidence, six trials but not specified, n=NR)</p>	<p>A lower readmission rate for those receiving discharge planning may be associated with lower health service costs in the short term. Differences in use of primary care varied. (SOE: very low certainty evidence, five trials but not specified, n=NR).</p> <p>Findings were inconsistent. Healthcare resources that were assessed varied among studies, e.g., primary care visits, readmission, length of stay, laboratory services, medication, diagnostic imaging. The charges used to cost the healthcare resources also varied.</p>
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Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Gillaizeau et al. 2013 ²⁷	9 studies, n=18507 patients SMD: -0.15 days, 95% CI: -0.33 to 0.02, I ² =57%, no difference, but leans towards favoring intervention	Not reported	Not reported	Not reported	Not reported	Not reported	1 study found reduced costs of \$7103 per patient vs. \$13759; 1 study found no difference
Huntley et al. 2016 ²⁸	9 studies, n=1765 patients Mean reduction: 1.28 days, 95% CI: 0.52 to 2.04, I ² =63%, favors intervention <u>Subgroup analysis</u> , excluding studies at high risk of bias: Mean reduction: 1.76 days, 95% CI: 1.23 to 2.29, I ² =14%, favors intervention	Not reported	13 studies, n=3346 patients RR: 0.74, 95% CI: 0.60 to 0.92, I ² =69%, favors intervention <u>Subgroup analysis</u> , excluding studies at high risk of bias: RR: 0.77, 95% CI: 0.61 to 0.96, I ² =68%, favors intervention	Not reported	Not reported	Not reported	1 study found reduced costs but details not reported; 1 study found hospital saved \$227 per Medicare patient; 1 study found overall savings after 18 months of \$1.6 million; 6 studies found no difference in costs
Kul et al. 2012 ²⁹	5 studies, n=2095 patients Mean reduction: 1.89 days, 95% CI: 1.33 to 2.44, I ² =42%, favors intervention	Not reported	5 studies, N=3006 patients RR: 0.81, 95% CI: 0.66 to 0.99, I ² =16%, favors intervention	<u>Hospital Mortality</u> 5 studies N=2343 patients RR: 0.45, 0.21 to 0.94, I ² =73%, favors intervention	Not reported	Not reported	3 studies found no difference in costs

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Mabire et al 2017 ^{15,30}	<p><u>Initial (index) hospitalization</u> (6 studies, [3 of 6 US] n=2,370)</p> <p>WMD: 0.29 days, 95% CI: 0.24 to 0.35, I²=0%, intervention increases LOS (SOE: Low)</p>	Not reported	<p><u>Readmission rates</u> (3 US RCTs/pre-post studies, n=465)</p> <p>OR: 0.57, 95% CI: 0.40 to 0.81, p=0.01, I²=0%, favors intervention</p> <p>Intervention: 84 events Usual care: 131 events</p> <p><u>Readmission rates (transitional care intervention)</u> (4 RCTs [3 of 4 US], n=1,030)</p> <p>OR: 0.70, 95% CI: 0.38 to 1.27, I²=69.2%, no difference</p> <p>Intervention: 117 events Usual care: 157 events</p>	Not reported	Note: <50% of studies reporting QoL were US based, therefore data is not reported	Not reported	Not reported

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Patel et al. 2020 ³¹	10 studies showed a notable decrease in hospital length of stay when patients were admitted to either an ortho-geriatrics unit or a geriatrics unit compared with being admitted to an orthopedic unit. 2 studies found no notable difference or improvement with no statistical significance. 1 study found a notable increase.	Not reported	3 studies showed no notable difference in readmission rates when hip fracture patients were admitted to an ortho-geriatrics unit or geriatrics unit versus being admitted to an orthopedic unit. 1 study showed a notable increase in readmission rates when patients were admitted to an orthopedic unit; 1 study showed a notable decrease in readmission rates when patients were admitted to a geriatrics unit.	<u>Post-operative mortality (in-hospital mortality and 1 year mortality rates)</u> Five studies showed a notable decrease in postoperative mortality rates when hip fracture patients were admitted to an orthogeriatrics unit or a geriatrics unit. 11 studies showed no notable difference in mortality rates.	Not reported	Not reported	Not reported
Pannick et al. 2015 ³²	<u>Interventions altering interdisciplinary team composition (ITC-C)</u> (6 studies [4 of 6 US], n=NR, mixed patient population – geriatric, liver transplant, psychiatric, delirium, infectious diseases) WMD: 0.087 days, 95%CI: -0.083 to 0.257, no difference <u>Interventions altering interdisciplinary team practice (ITC-P)</u>	Not reported	Early readmissions <u>ITC-C</u> (3 US studies, n=NR, mixed patient population – infectious diseases, pneumonia, or not specified) RR: 1.341, 95% CI: 1.120 to 1.607, ITC-C tended to increase early readmissions (authors noted)	Early mortality <u>ITC-C</u> (7 studies [4 of 7 US], n=NR, mixed patient population – delirium, infectious diseases) RR: 0.925, 95% CI: 0.816 to 1.049, no difference <u>ITC-P</u> 2 studies [1 of 2 US], n=NR, population not specified)	Not reported	Not reported	Not reported

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
	(7 studies [6 of 7 US], n=NR, most studies did not specify patient population, 1 study include geriatric patients and 1 study's setting VA hospital) WMD: 0.001 days, 95% CI: -0.035 to 0.037, no difference		there were important confounding factors, factors not specified) <u>ITC-P</u> (5 US studies, n=NR, mixed patient population – geriatric, VA hospital, or not specified) RR: 0.995, 95% CI: 0.912 to 1.085, no difference (ITC-P did not significantly reduce early readmissions)	RR: 0.665, 95% CI: 0.449 to 0.986, ITC-P tended to reduce early mortality			
Van Craen et al. 2010 ³⁹	7 studies, n=4759 patients Mean reduction measured by Hedges g 0.07 days, 95% CI: -0.11 to 0.26, no difference	<u>Functional decline at discharge</u> 2 studies, n=2182 RR: 0.87, 95% CI: 0.77 to 0.99, favors intervention <u>Functional decline at 12 months</u> 2 studies, n=1654 RR: 0.84, 95% CI: 0.69 to 1.03, no difference	2 studies, n=668 patients RR: 0.85, 95% CI: 0.65 to 1.11, no difference	<u>Hospital Mortality at 12 months</u> 6 studies, n=4108 RR: 0.97, 95% CI: 0.88 to 1.08, no difference	Not reported	Not reported	Not reported

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
White et al. 2011 ³³	40 studies favor intervention with reduction in LOS; 13 studies found no difference; 5 studies found longer LOS	Not reported	6 studies favor intervention with reduction in readmissions; 34 studies found no difference; 3 studies found readmissions increased	<u>Mortality</u> 8 studies favor intervention with reduction in mortality; 29 studies found no difference <u>Complications</u> (type not specified) 2 studies favor intervention with reduction in complications; 5 studies found no difference; 1 study found complications increased	<u>Patient satisfaction</u> 1 study favors intervention with improved satisfaction; 7 studies found no difference	Not reported	30 studies found reduced costs or charges; 10 studies found no difference; 3 studies found higher costs or charges
Zhu et al. 2015 ¹²	5 trials (4 of 5 US), n=1,912 SMD: 0.03 days, 95% CI: -0.06 to 0.12, p=0.540, I ² =0%, no difference	Not reported	10 trials (5 of 10 US), n=3,376 RR: 0.72, 95% CI: 0.58 to 0.89, p=0.002, I ² =66%, favors intervention Intervention: 368 events Standard care: 533 events *2 studies (Lin 2009 and Jack 2009) also included in Goncalves SR meta-analysis for readmissions <u>Non-older adults (< 65 years)</u> (2 US trials, n=768)	<u>All-cause mortality (index admission to within 30 days)</u> (5 trials [3 of 5 US], n=2,729) RR: 0.70, 95% CI: 0.52 to 0.95, p=0.020, I ² =0%, favors intervention Intervention: 59 events Standard care: 87 events	1 US RCT (n=363): used mean scores and found little change over time and good rates of satisfaction with care in both nurse-led early DPP and control groups	Not reported	<u>Total cost</u> 1 US RCT measured total Medicare reimbursements for health services at 24 weeks: Intervention \$0.6 million vs. standard care \$1.2 million, p<0.001, favors intervention

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
			<p>RR: 0.69, 95% CI: 0.51 to 0.92, p=0.010, I²=0%, favors intervention</p> <p>Intervention: 60 events</p> <p>Standard care: 86 events</p> <p><u>Readmissions at 1 month</u> (3 trials [2 of 3 US], n=2,013)</p> <p>RR: 0.73, 95% CI: 0.46 to 1.15, p=0.170, I²=75%, no difference</p> <p>Intervention: 136 events</p> <p>Standard care: 171 events</p> <p><u>Readmissions at 6 months</u> (2 US trials, n=393)</p> <p>RR: 0.48, 95% CI: 0.37 to 0.63, p<0.001, I²=0%, favors intervention</p> <p>Intervention: 50 events</p> <p>Standard care: 109 events</p>				

Author Year	Length of Stay	Patient Functional Return	Readmissions	Patient Harms	Patient/Family Experience	Clinician/Staff Satisfaction	Resource Use
Zhang et al. 2013 ⁴⁰	2 studies, n=325 patients Study of geriatrics consultation service found no difference: Mean LOS 5 days in both groups; Study of staff education, team approach, care planning favors intervention: Mean LOS 28 vs. 38 days	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported

ACS: acute coronary syndrome; CDSS: clinical decision support system; CI: confidence interval; CKD: chronic kidney disease; CNS: clinical nurse specialists; CPOE: computerized physician order entry; EMR: electronic medical record; GTC: geriatric trauma consultation; HF: heart failure; IQR: interquartile range; LOS: length of stay; MD: mean difference; NR: not reported; NSTEMI: non-ST-elevation myocardial infarction; NYHA: New York Heart Association; OR: odds ratio; QoL: quality of life; RCT: randomized controlled trial; RR: risk ratio; SMD: standardized mean difference; SOE: strength of evidence; STEMI: ST-elevation myocardial infarction; US: United States; WMD: weighted mean difference

Table C-5. Risk of Bias Assessment Reported in Systematic Reviews

Author Year	Intervention	Comparator	Primary Studies: N, Design	Risk of Bias Assessment Tool	Detailed Risk of Bias Data
Austin et al. 2020 ²⁴	Anticoagulant prescribing	Routine care	27 total studies: 3 RCTs, 4 cohort studies, 20 pre/post observational studies (n=not reported)	EPOC for RCTs and cohort studies	RCTs: Low ROB due to allocation sequence and concealment, baseline comparability of characteristics, and selective outcome reporting. Either unclear or high ROB for potential of inadequately addressing incomplete outcome data or protecting against contamination. Cohort studies: Mostly at high or unclear ROB for adequate allocation sequence or concealment, potential of not adequately addressing incomplete outcome data, protecting against contamination or knowledge of the allocated intervention. Low ROB for selective outcome reporting.
Agarwal et al. 2018 ³⁴	Quality improvement (multi-component interventions)	Usual care	14 RCTs (n=96,913) *(N=75,664 for 6 US RCTs) reporting outcomes of interest	Cochrane ROB	Randomization: Low ROB (all 6 US RCTs) Adequate allocation concealment: Low ROB (3 US RCTs) Adequate blinding of outcome assessors: Low ROB (2 US RCTs) Attrition bias: Low ROB (4 US RCTs) Selective outcome reporting: High ROB (1 US RCT)
Baratloo et al. 2018 ²⁵	Telestroke-based systems	Bedside (face-to-face)	26 total studies: 2 RCTs, 8 prospective observational studies, 16 retrospective observational studies (N=6,605)	Cochrane (RCTs), Newcastle-Ottawa scale (observational studies)	RCTs: Low ROB for random sequence generation, incomplete outcome data, selective reporting. High ROB due to lack of blinding participants and personnel, 1 RCT reported blinding outcome evaluators. Observational studies: Low ROB (mean of 8 out of 9 points on Newcastle-Ottawa scale)
Bryant-Lukosius et al. 2015 ³⁵	Clinical nurse specialists transitional care	Usual care	13 RCTS (n=2,463)	Cochrane ROB	Low ROB (3 RCTs), moderate ROB (n=8) and high ROB (n=2) 16-item Quality of Health Economic Studies for economic analyses
Bakker et al. 2011 ²⁶	Geriatric specialty teams or units	Usual care	17 total studies; 6 reported LOS: 4 RCTs, 2 observational	EPOC tool	Most studies high risk of bias

Author Year	Intervention	Comparator	Primary Studies: N, Design	Risk of Bias Assessment Tool	Detailed Risk of Bias Data
Eagles et al. 2020 ⁴¹	Geriatric trauma consultation	Standard trauma care	8 retrospective cohort studies (n=122 to 4,534)	Newcastle-Ottawa Quality Assessment Scale	Main threat to study quality was a lack of controlling for study variables. 3 studies controlled for at least two factors in their analyses. Moderate to high ROB due to selection, comparability, and outcomes.
Ellis et al. 2017 ³⁶	Comprehensive geriatric assessment	Usual care	29 RCTs (n=13,766)	Used guidance for EPOC reviews	Random sequence generation: Low or unclear ROB (26 RCTs) Allocation concealment: High ROB (1 RCT) Blinding of participant or researchers: High ROB (all RCTs). Blinding of outcome assessors: Low ROB (most RCTs) Attrition bias: High ROB (3 RCTs), low ROB (6 RCTs), unclear ROB (18 RCTs) Selective reporting due to not publishing a protocol: Unclear ROB (25 RCTs) Other potential sources of bias: Unclear ROB (21 RCTs) Uncertainty about whether the study adequately protected against contamination (i.e. received the intervention): High ROB (6 RCTs)
Frazer et al. 2019 ³⁷	Anticoagulant prescribing	Physician-led usual care	19 RCTs (n=12,742)	Cochrane EPOC criteria	High ROB due to randomization not clearly defined (8 RCTs) or suboptimal (10 RCTs), lack of clarity surrounding allocation concealment (7 RCTs). 3 RCTs blinded outcome assessors; 4 RCTs describe independent review of subjective results, verification of data collection. 1 RCT funded by manufacturing company.
Gonçalves-Bradley et al. 2016 ³⁸	Discharge planning	Standard care with no individualized discharge plan	30 RCTs (n=11,964)	Cochrane ROB	Most trials low risk of Bias: 18 RCTs reported adequate allocation concealment, 28 RCTs collected data at baseline, 21 RCTs measured primary outcomes (LOS, readmissions)
Gillaizeau et al. 2013 ²⁷	Computerized decision support	Usual care	42 total studies; 9 reported LOS: 8 RCTs, 1 observational	EPOC tool	Studies varied in quality but GRADE was not lowered due to risk of bias

Author Year	Intervention	Comparator	Primary Studies: N, Design	Risk of Bias Assessment Tool	Detailed Risk of Bias Data
Huntley et al. 2016 ²⁸	Case management	Usual care	22 total studies; 9 reported LOS: 8 RCTs, 1 observational; 13 reported readmissions: 12 RCTs, 1 observational	Cochrane risk of bias tool for RCTs; EPOC tool for observational studies	Most RCTs low risk of bias; most observational studies high risk of bias
Kul et al. 2012 ²⁹	Clinical pathways	Usual care	7 total studies: 3 RCTs, 1 cohort, 3 pre-post	Jadad tool for RCTs; Newcastle-Ottawa Scale for observational studies	Sensitivity analyses performed for each outcome after removing respective study with highest risk of bias
Mabire et al. 2017 ^{15,30}	Nursing discharge planning interventions	Usual care	13 total studies: 11 RCTs, 1 pilot cohort, 1 pre-post study (n=3,964)	Yes, JBI-MAStARI assessment of methodological quality	12 studies considered truly random; 7 studies met applicable criteria for blinding of participants. 11 studies clearly described blinded allocation. 12 studies described outcomes for subjects who withdrew. 9 studies reported blinded assessment procedures and 4 studies were unclear. 12 studies demonstrated group equivalency at baseline. 10 studies adequately described both intervention and control groups. All studies met criteria for consistent and clear measurement of outcomes across groups and analyzed appropriately.
Patel et al. 2020 ³¹	Orthopedic-led care (13 studies) Geriatrics-led care (4 studies)	Ortho-geriatrics co-management or orthopedic care led model	17 total studies: 9 retrospective studies, 6 prospective studies, 1 RCT, 1 non-RCT (n=146 to 23,973)	Oxford quality-scoring system (Jadad) for RCTs and Newcastle Ottawa grading system for non-RCTs	
Pannick et al. 2015 ³²	Interdisciplinary team care	Usual, routine, or standard care	30 total studies: 8 RCTs, 9 cluster-RCTs, 8 non-RCT cluster, 4 before-after, 1 interrupted time series (n=66,548)	Cochrane ROB	No study had a low risk of bias, medium ROB (7 studies), high ROB (23 studies)

Author Year	Intervention	Comparator	Primary Studies: N, Design	Risk of Bias Assessment Tool	Detailed Risk of Bias Data
Van Craen et al. 2010 ³⁹	Geriatric evaluation unit	Usual care	7 RCTs	Delphi list for RCTs	Most studies low risk of bias
White et al. 2011 ³³	Hospitalist service	Traditional attending physician structures	65 total studies; 1 RCT, 8 non-randomized controlled trials, 1 interrupted time series, 37 cohort, 18 pre-post	Modified Downs and Black checklist, 32 items	Mean score across studies: 15; range: 5–26
Zhu et al. 2015 ¹²	Nurse-led early discharge planning	Usual care	10 RCTs (n=3,438)	Yes, Cochrane ROB	Sequence generation, selection bias due to failures of allocation concealment: Low ROB Performance bias related to blinding of participants and personnel: Low ROB (4 RCTs), unclear ROB (5 RCTs), high ROB (1 RCT) Detection bias: Low ROB (2 RCTs) Attrition: Low ROB (8 RCTs) Selective reporting: Low ROB (4 RCTs), high ROB (1 RCTs), unclear ROB (5 RCTs)
Zhang et al. 2013 ⁴⁰	Multicomponent interventions	Usual care	38 total RCTs; 10 studies reported LOS, only 2 used a systemic intervention (others were pharmacologic)	Modified Jadad tool	Both studies scored 9/12

EPOC: effective practice and organization of care; GRADE: Grading of Recommendations Assessment, Development and Evaluation; JBI-MAStARI: Joanna Briggs Institute Meta-analysis Statistics Assessment and Review Instrument; LOS: length of stay; RCT: randomized controlled trial; ROB: risk of bias; US: United States

Table C-6. Strength of Evidence for Quantitative Findings Not Assessed for Systematic Review Authors

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
LOS (Low)	Eagles et al. 2020 ⁴¹ 2 US retrospective cohort studies (n=5,414)	Medium (1 study scored all points for selection, comparability, and outcome domains. 1 study scored all points for only the selection and outcome domains.)	Direct	Consistent	Imprecise (wide CI)	Undetected	None	Geriatric trauma consultation vs. standard trauma care MD: -1.11 days, 95% CI: -1.43 to -0.79, I ² =0%, favors intervention
LOS (Low)	Baratloo et al. 2018 ²⁵ 6 retrospective controlled studies, 2 prospective controlled studies, 1 RCT (6 of 9 US) (n=2,850)	Medium (Retrospective and prospective studies low ROB on Newtowa scale. RCT low ROB for random sequence generation, incomplete outcome data, selective reporting, but high ROB for blinding participants and personnel.)	Direct	Consistent	Imprecise (wide CI)	Undetected	None	Telestroke-based systems vs. bedside (face-to-face) MD: -0.55 days, 95% CI: -1.02 to -0.07, p=0.02, I ² =38%, favors intervention
LOS (Low)	Gonçalves-Bradley et al. 2016 ³⁸ 2 RCTs (1 of 2 US) (n=184)	Medium (Both RCTs unclear ROB for random sequence generation, allocation concealment, and selective reporting. Low ROB for attrition and baseline data. 1 RCT unclear ROB and 1 RCT low ROB for blinding.)	Direct	Consistent	Imprecise (wide CI)	Undetected	None	Discharge planning vs. standard care (older surgical patients) MD: -0.06, 95% CI: -1.23 to 1.11, I ² =0%, no difference

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
LOS (Moderate)	Huntley et al. 2016 ²⁸ 8 RCTs, 1 non-randomized controlled study (6 of 9 US) (n=1,765)	Low	Direct	Inconsistent (>50% heterogeneity)	Precise	Undetected	None	Case management vs. usual care Mean reduction: 1.28 days, 95% CI: 0.52 to 2.04, I ² =63%, favors intervention
LOS (Low)	Pannick et al. 2015 ³² 2 RCTs, 2 non-RCT cluster studies, 2 before/after studies (4 of 6 US) (n=NR)	High (2 studies medium ROB, 4 studies high ROB)	Direct	Consistent	Imprecise (wide CI)	Undetected	None	Altering interdisciplinary team composition vs. usual care WMD: 0.087 days, 95%CI: -0.083 to 0.257, no difference
LOS (Low)	Pannick et al. 2015 ³² 2 cluster RCTs, 3 non RCT cluster studies, 2 interrupted time series (6 of 7 US) (n=NR)	High (2 studies medium ROB, 5 studies high ROB)	Direct	Consistent	Precise	Undetected	None	Altering interdisciplinary team practice vs. usual care WMD: 0.001 days, 95% CI: -0.035 to 0.037, no difference
LOS (Moderate)	Zhu et al. 2015 ¹² 5 RCTs (4 of 5 US) (n=1,912)	Medium (All studies low ROB for random sequence generation, allocation concealment, attrition bias. 2 studies each unclear ROB and low ROB for blinding, and 1 high ROB for blinding.)	Direct	Consistent	Precise	Undetected	None	Nurse-led early discharge planning vs. usual care SMD: 0.03 days, 95% CI: -0.06 to 0.12, p=0.540, I ² =0%, no difference

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
LOS (Very Low)	Gillaizeau et al. 2013 ²⁷ 8 RCTs, 1 alternating time series study (7 of 9 US) (n=18,507)	High	Direct	Inconsistent (>50% heterogeneity)	Imprecise	Undetected	None	Computerized decision support vs. usual care SMD: -0.15, 95% CI: -0.33 to 0.02, I ² =57%, no difference in reduction of LOS, but leans towards favoring intervention
LOS (Low)	Kul et al. 2012 ²⁹ 1 RCT, 1 interrupted times series, 3 non-randomized controlled studies (3 of 5 US) (n=2,095)	High	Direct	Consistent	Precise	Undetected	None	Clinical pathways vs. usual care Mean reduction: 1.89 days, 95% CI: 1.33 to 2.44, I ² =42%, favors intervention
LOS (High)	Van Craen et al. 2010 ³⁹ 7 RCTs (4 of 7 US) (n=4,759)	Low	Direct	Consistent	Precise	Undetected	None	Geriatric evaluation unit vs. usual care Mean reduction measured by Hedges g 0.07 days, 95% CI: -0.11 to 0.26, no difference

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
Readmissions (Moderate)	Mabire et al 2017 ^{15,30} 3 US RCTs/pre-post studies (n=465)	Medium (1 study answered yes to 6 of 10 questions, 1 study answered yes to 9 of 10, and 1 study answered yes to 8 of 10. All studies included in SR met criteria for consistent and clear measurement of outcomes across groups and analyzed appropriately.)	Direct	Consistent	Precise	Undetected	None	Nursing discharge planning intervention OR: 0.57, 95% CI: 0.40 to 0.81, p=0.01, I ² =0%, favors intervention
Readmissions (Low)	Mabire et al 2017 ^{15,30} 4 RCTs (3 of 4 US) (n=1,030)	Medium (1 study answered yes to 6 of 10 questions, 1 study answered yes to 8 of 10, 1 study answered yes to 9 of 10, and 1 study answered yes to all questions. All studies included in SR met criteria for consistent and clear measurement of outcomes across groups and analyzed appropriately.)	Direct	Inconsistent (>50% heterogeneity)	Imprecise (wide CI)	Undetected	None	Nursing discharge planning intervention (transitional care) vs. usual care OR: 0.70, 95% CI: 0.38 to 1.27, I ² =69.2%, no difference
Readmissions (Moderate)	Huntley et al. 2016 ²⁸ 12 RCTs, 1 non-randomized controlled study (8 or 13 US) (n=3,346)	Low	Direct		Precise	Undetected	None	Case management vs. usual care RR: 0.74, 95% CI: 0.60 to 0.92, I ² =69% favors intervention

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
Early Readmissions (Low)	Pannick et al. 2015 ³² 2 cluster RCTs, 1 non-RCT (all US) (n=NR)	High (All studies high ROB)	Direct	Consistent	Precise	Undetected	None	Altering interdisciplinary team composition vs. usual care RR: 1.341, 95% CI: 1.120 to 1.607, intervention tended to increase early readmissions (authors noted there were important confounding factors, factors not specified)
Early Readmissions (Low)	Pannick et al. 2015 ³² 2 non-RCT cluster studies, 2 interrupted time series, 1 before/after study (all US) (n=NR)	High (2 studies medium ROB, 3 studies high ROB)	Direct	Consistent	Precise	Undetected	None	Altering interdisciplinary team practice vs. usual care RR: 0.995, 95% CI: 0.912 to 1.085, no difference
Readmissions (Low)	Zhu et al. 2015 ¹² 10 RCTs (5 of 10 US) (n=3,376)	Medium (All studies low ROB for random sequence generation and allocation concealment. 5 studies unclear ROB for blinding of participants, personnel, and outcome assessors. 1 study high ROB and 4 studies low ROB for blinding of participants and personnel. 2 studies	Direct	Inconsistent (>50% heterogeneity)	Precise	Undetected	None	Nurse-led early discharge planning vs. usual care RR: 0.72, 95% CI: 0.58 to 0.89, p=0.002, I ² =66%, favors intervention

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
		low ROB and 3 studies unclear ROB for blinding of outcome assessors. 7 studies low ROB for attrition bias. 4 studies low ROB, 4 studies unclear ROB for selective reporting.)						
Readmissions (Moderate)	Zhu et al. 2015 ¹² 2 US RCTs (n=768)	Medium (Both studies low ROB random sequence generation and allocation concealment. 1 study high ROB for blinding participants and personnel and unclear ROB for blinding outcome assessors, unclear ROB for attrition bias and low ROB for selective reporting. 1 study unclear ROB for blinding of participants, personnel, and outcome assessors, low ROB for attrition bias, and unclear ROB for selective reporting.)	Direct	Consistent	Precise	Undetected	None	Nurse-led early discharge planning vs. usual care (Non-older adults <65 years) RR: 0.69, 95% CI: 0.51 to 0.92, p=0.010, I ² =0%, favors intervention
Readmissions at 1 month (Low)	Zhu et al. 2015 ¹² 3 RCTs (2 of 3 US) (n=2,013)	Medium (All studies low ROB random sequence generation, allocation concealment, and selective reporting. 1 study unclear ROB for blinding of participants,	Direct	Inconsistent (>50% heterogeneity)	Precise	Undetected	None	Nurse-led early discharge planning vs. usual care RR: 0.73, 95% CI: 0.46 to 1.15, p=0.170, I ² =75%, no difference

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
		personnel, and outcome assessors but low ROB attrition bias. 1 study high ROB for blinding participants and personnel and low ROB blinding outcome assessors and unclear ROB for attrition bias. 1 study low ROB for blinding participants and personnel, attrition bias, selective reporting and unclear ROB for blinding outcome assessors.)						
Readmissions at 6 months (Moderate)	Zhu et al. 2015 ¹² 2 US RCTs (n=393)	Medium (1 study low ROB for all domains. 1 study low ROB for random sequence generation, allocation concealment, and attrition bias and unclear ROB for blinding of participants, personnel, and outcome assessors and selective reporting.)	Direct	Consistent	Precise	Undetected	None	Nurse-led early discharge planning vs. usual care RR: 0.48, 95% CI: 0.37 to 0.63, p<0.001, I ² =0%, favors intervention
Readmissions (Moderate)	Kul et al. 2012 ²⁹ 2 RCTs, 1 interrupted time series, 2 non-randomized controlled studies (3 of 5 US) (n=3,006)	Medium	Direct	Consistent	Precise	Undetected	None	Clinical pathways vs. usual care RR: 0.81, 95% CI: 0.66 to 0.99, I ² =16%, favors intervention

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
Readmissions (Moderate)	Van Craen et al. 2010 ³⁹ 2 RCTs (1 of 2 US) (n=668)	Low	Direct	Consistent	Imprecise	Undetected	None	Geriatric evaluation unit vs. usual care RR: 0.85, 95% CI: 0.65 to 1.11, no difference
In-hospital Mortality (Low)	Eagles et al. 2020 ⁴¹ 6 retrospective cohort studies (5 of 6 US) (n=7,408)	Medium All 6 studies scored at 3 points for selection domain (max 4 pts.) or outcome domain (max 3 pts.). Only 2 studies scored a max of 2 points for the comparability domain.	Direct	Consistent	Imprecise (wide CI)	Undetected	None	After vs. before implementation of GTC service Unadjusted OR: 0.91, 95% CI: 0.70 to 1.18, I ² =18%, no difference
In-hospital Mortality (Low)	Eagles et al. 2020 ⁴¹ 2 US retrospective cohort studies (n=482)	High Both studies scored 3 out of 4 for selection domain, a max of 3 for the outcome domain, and 0 out of 2 for the comparability domain.	Direct	Consistent	Precise	Undetected	None	GTC vs. without GTC Unadjusted OR: 0.24, 95% CI: 0.12 to 0.52, I ² =0%, favors intervention
In-hospital Mortality (Low)	Baratloo et al. 2018 ²⁵ 15 retrospective controlled: studies, 2 prospective controlled studies, 1 RCT (10 of 18 US) (n=4,907)	Medium (Retrospective and prospective studies low ROB on Newtowa scale. RCT low ROB for random sequence generation, incomplete outcome data, selective reporting, but high ROB for blinding participants and personnel.)	Direct	Consistent	Imprecise (wide CI)	Undetected	None	Telestroke-based systems vs. bedside (face-to-face) OR: 1.21, 95% CI: 0.98 to 1.49, p=0.08, I ² =0%, no difference

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
Early Mortality (Low)	Pannick et al. 2015 ³² 4 cluster RCTs, 2 non-RCTs, 1 RCT (4 of 7 US) (n=NR)	High (1 study medium ROB, 6 studies high ROB)	Direct	Consistent	Precise	Undetected	None	Altering interdisciplinary team composition vs. usual care RR: 0.925, 95% CI: 0.816 to 1.049, no difference
Early Mortality (Low)	Pannick et al. 2015 ³² 2 non-RCT cluster studies (1 of 2 US) (n=NR)	High (Both studies high ROB)	Direct	Consistent	Precise	Undetected	None	Altering interdisciplinary team practice vs. usual care RR: 0.665, 95% CI: 0.449 to 0.986, intervention tended to reduce early mortality
All-cause Mortality (index admission to within 30 days) (Moderate)	Zhu et al. 2015 ¹² 5 RCTs (3 of 5 US) (n=2,729)	Medium (All studies low ROB random sequence generation and allocation concealment. 2 studies unclear ROB for blinding of participants, personnel, and outcome assessors. 1 study high ROB for blinding participants and personnel and low ROB for blinding outcome assessors. 1 study low ROB for blinding participants, personnel, and outcome assessors. 4 studies low ROB for attrition)	Direct	Consistent	Precise	Undetected	None	Nurse-led early discharge planning vs. usual care RR: 0.70, 95% CI: 0.52 to 0.95, p=0.020, I ² =0%, favors intervention

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
		bias, 3 studies low ROB for selective reporting.)						
In-hospital Mortality (Low)	Kul et al. 2012 ²⁹ 3 RCTs, 1 interrupted times series, 1 non-randomized controlled study (3 of 5 US) (n=2,343)	Medium	Direct	Inconsistent (>50% heterogeneity)	Precise	Undetected	None	Clinical pathways vs. usual care <u>Hospital mortality</u> RR: 0.45, 95% CI: 0.21 to 0.94, I ² =73%, favors intervention
In-hospital Mortality (High)	Van Craen et al. 2010 ³⁹ 6 RCTs (3 of 6 US) (n=4,108)	Low	Direct	Consistent	Precise	Undetected	None	Geriatric evaluation unit vs. usual care <u>Hospital Mortality at 12 months</u> RR: 0.97, 95% CI: 0.88 to 1.08, no difference
Symptomatic Intracranial Hemorrhage (Low)	Baratloo et al. 2018 ²⁵ 14 retrospective controlled studies, 6 prospective controlled studies, 1 RCT (10 of 21 US) (n=4,022)	Medium (Retrospective and prospective studies low ROB on Newottowa scale. RCT low ROB for random sequence generation, incomplete outcome data, selective reporting, but high ROB for blinding participants and personnel.)	Direct	Consistent	Imprecise (wide CI)	Undetected	None	Telestroke-based systems vs. bedside (face-to-face) OR: 1.10, 95% CI: 0.79 to 1.53, p=0.58, I ² =0%, no difference
Functional Decline at Discharge (High)	Van Craen et al. 2010 ³⁹ 2 US RCTs (n=2,182)	Low	Direct	Consistent	Precise	Undetected	None	Geriatric evaluation unit vs. usual care <u>Functional decline at discharge</u> RR: 0.87, 95% CI: 0.77 to 0.99, favors intervention

Outcome (Strength of Evidence Grade)	Author Study Design: No Studies (N)	Study Limitations	Directness	Consistency	Precision	Reporting Bias	Other Issues	Finding
Functional Decline at 12 months (Moderate)	Van Craen et al. 2010 ³⁹ 2 US RCTs (n=1,654)	Low	Direct	Consistent	Imprecise	Undetected	None	Geriatric evaluation unit vs. usual care <u>Functional decline at 12 months</u> RR: 0.84, 95% CI: 0.69 to 1.03, no difference

CI: confidence interval; GTC: geriatric trauma consultation; LOS: length of stay; MD: mean difference; OR: odds ratio; RCT: randomized controlled trial; ROB: risk of bias; RR: risk ratio; SMD: standardized mean difference; US: United States; WMD: weighted mean difference

Table C-7. Research In-Progress

Title	Intervention	Patient Population	Expected Completion Date	Source
Activity Monitor Feedback and Interactive Tours to Improve Postoperative Ambulation	Technologically-supported feedback	Older adults; patients not fluent in English	December 2019	ClinicalTrials.gov
The Effect of Standardizing the Definition of a Clinically Significant Cardiopulmonary Event on Length of Stay	Standardization of care	Premature infants	December 2020	ClinicalTrials.gov
Comparing Two Ways for Hospitals to Help Patients Recover During and After Stroke	Integrated stroke practice unit	Patients with socioeconomic vulnerability	February 2024	PCORI
Care in the CCP [Comprehensive Care Physician] Program versus Care in the C4P [Comprehensive Care, Community and Culture] Program versus Care in Traditional Care Coordinator Program	Care coordination	Chronic co-morbid illness; older adults	April 2024	PCORI

PCORI: Patient-Centered Outcomes Research Institute