APPENDIX A. INTERVENTION STRATEGIES AND COMPONENTS

For full study citations in this appendix, please refer to the report's main reference list.

INTERVENTION STRATEGIES

Strategy	Description
Discharge planning	Discharge planning involves the process of thinking about and formalizing a plan of care prior to a patient's discharge from the ED. In this instance, discharge planning is defined as being *time-limited, taking place fully within the ED (prior to discharge*). Discharge planning may incorporate 1 or more of the following: geriatric consultation or geriatric assessment in the ED, written information provided to the patient/caregiver, patient/caregiver education, and/or a follow-up plan. Although not required for discharge planning, the geriatric assessment is a multidimensional, multidisciplinary assessment designed to evaluate an older person's functional ability, physical health, cognition and mental health, and socioenvironmental circumstances. The geriatric assessment may include a geriatrician or geriatric trained nurse practitioner or physician assistant and may be a focused assessment that is customized for ED settings. Although 1 or more providers may conduct an assessment and make recommendations, the responsibility to initiate, coordinate, and secure any post-ED services or recommendations typically rests with the patient and/or caregiver.
Case management	Case management *occurs over time* and helps to support successful transition of care from the ED to the post-ED settings. *Case management activities often take place across settings*, initially beginning in the ED and continuing after discharge. Case management may incorporate all the activities which a physician or other health care professional performs to insure the coordination of the medical services required by a patient to successfully transition from the ED setting to home (or other residential facility). In this instance, we defined case management more narrowly to require a non-physician, either onsite in the ED or offsite, who is involved in coordinating follow-up care that is related to an ED visit. This may include home-based services and/or referral to primary care providers, specialists, or other community-based resources and services. Unlike discharge planning in which the patient or caregiver may be responsible for identifying and securing services, in case management, the *major responsibility and coordination rests with the provider* (*eg*, an order for physical therapy).
Medication safety or management	These are interventions that assist patients or caregivers in reviewing, managing, and monitoring drug therapy for older adults with chronic conditions. More basic interventions may include a simple review or reconciliation of medications. More involved interventions may incorporate a clinical pharmacist or other expert in drug therapy, and/or computerized interventions so long as they are conducted in real time (during patient's ED admission). Interventions may be targeted to the clinician, patient and/or the family as long as they focus on the proper selection of medications, reduction in polypharmacy or medication errors, or use of medications. These interventions would not include shared decision-making approaches to choosing 1 treatment versus another.
Geriatric Emergency Departments	These are EDs designed or adapted to conform to 2014 American College of Emergency Physicians Guidelines.[18]

PATIENT-FOCUSED INTERVENTION COMPONENTS

PATIENT-FOCUSED INTERVENTION COMPONENTS ***(Information is collected from or provided to the patient or caregiver)***	
Assessment and screening	
Geriatric assessment	A multidimensional interdisciplinary evaluation to ensure that problems are identified, quantified, and managed appropriately. Common elements include assessment of medical, psychological, biopsychosocial, functional, cognitive, and environmental capacity. Results from the assessment may be used to inform other elements of discharge planning.
High-risk screening	Use of 1 or more risk-screening tool(s) to evaluate a specific risk factor, condition, or potential outcome. Risk screening tools are typically brief and shorter in nature than a comprehensive, multidimensional assessment.
Patient and/or caregiver education or support	
Patient education	Key information provided in writing or explained to patient and/or caregiver. The information provided is related to diagnosis or treatment but does not encourage specific behavior change.
Self-management	Patient-directed education or coaching that focuses on enhancing the patient's ability to self-manage care needs. This may include education or coaching around specific behavior(s) (*eg*, weight control action plan) and/or disease specific information (*eg*, congestive heart failure action plan).
Caregiver education	Education directed toward the caregiver, which may include any of the following: basic disease education, behavior management strategies, guidance on how to support the patient in self-care, or information on how to provide direct care, including information related to condition, symptoms, treatment, or medication management.
Caregiver support	Supportive counseling or guidance focused on self-care, coping skills to manage caregiver burden and expectations, tips on identifying local resources, communication skills, etc.
Shared decision-making	Decision-making around testing, treatment, and/or discharge are shared between different individuals, potentially including the patient and/or caregiver. May include use of a decision aid.[29]

Intervention	
Medication intervention	Medication reconciliation or special education aimed at improving medication understanding or adherence.[26]
Rehabilitation intervention	Patient receives occupational and/or physical therapy aimed at improving functional status.
Telemonitoring	Use of remote technology designed for the patient to transmit objective measures of health status with or without connected subjective assessment (*eg*, health buddy).[26]

PROVIDER- OR SERVICE-FOCUSED INTERVENTION COMPONENTS

PROVIDER AND/OR SYSTEM-FOCUSED INTERVENTION COMPONENTS ***(related to care delivery or care process)***	
Follow-up call or visit	
Patient hotline and/or patient-initiated appointment systems	An open line for patient-initiated communication.[26] Systems that enable patients to make urgent appointments when they feel they cannot manage their condition or where something has changed unexpectedly.[29]
Follow-up visit scheduled	A follow-up visit is scheduled prior to discharge from ED and/or prior to the end of the intervention period.
Follow-up communication	ED provider or intervention staff initiate telephone follow-up communication after discharge from the ED.
Follow-up visit completed	In-person follow-up visit completed during the course of the intervention period.
Home visit	In-person visit to patient's place of residence by 1 or more intervention providers.
Referral to services	
Referral(s) to primary care	ED provider initiates and/or recommends referral to primary care.
Referral(s) to medical specialist(s)	ED provider initiatives and/or recommends referral to medical specialist(s).
Referral(s) to home or community-based services	ED provider initiates and/or recommends referral to 1 or more home or community-based services. Examples include physical/occupational therapy, meal delivery, home-based primary care, or adult day health care.
Continuity of care/care coordination	
Communication between providers ("clinician continuity")	Processes that ensure the responsibility of care is passed from 1 provider to another. This may include increased provider presence before and after ED discharge, verbal or written communication between providers, strategic follow-up with primary clinician after discharge, or the involvement of a "bridging" clinician. Increased provider presence before and after ED discharge; may include involvement of PCP in patient care or strategic follow-up with inpatient clinician after discharge or "bridging" clinician.[26]
Interdisciplinary care team meeting	Team meeting as part of discharge planning or ongoing case management.

EMERGENCY DEPARTMENT STRUCTURE AND PROCEDURES

EMERGENCY DEPARTMENT STRUCTURE AND PROCEDURES ***Components designed and delivered to be in accordance with 2014 Geriatric Emergency Department Guidelines[18]***	
Staffing/administration	Presence of Geriatric Emergency Department Medical Director or Nurse Manager.
Follow-up and transition of care	Detailed procedures on how to provide age-friendly discharge planning within ED and appropriate referrals to post-ED services in the community.
Provider education	A formal, competency-based educational program designed to educate staff on the needs of older adults.
Quality improvement	Implementation of a formal quality improvement (QI) program designed to collect and monitor data related to program success.
Equipment and supplies	Structural and/or physical modifications to best support unique functional, clinical, and behavioral needs of older adults.

EMERGENCY DEPARTMENT STRUCTURE AND PROCEDURES *Components designed and delivered to be in accordance with 2014 Geriatric Emergency Department Guidelines*[18]	
	Improvements may include furniture, special equipment, visual orientation improvements, lighting, acoustic orientation.
Policies, procedures, and protocols	Changes to local policies and procedures.

OTHER CHARACTERISTICS OF THE INTERVENTION STRUCTURE

Timing and setting	
Pre-discharge (within ED)	Intervention is intentionally designed to be initiated and completed within the ED, prior to patient's discharge.
Post-discharge (after leaving ED)	Patient is identified while in the ED (or immediately after discharge) but intervention is initiated and completed after patient is discharged from ED. Patient may or may not have face-to-face contact with the provider or interventionist.
Both pre- and post-discharge ("bridge")	The intervention is intentionally designed so that elements take place both before *and* after discharge from the ED. The intervention is designed to have multiple points of contact.

Target of the intervention	
Patient	The patient is the main recipient of any assessment or intervention.
Caregiver/family member	One or more caregivers are actively addressed in the intervention as a part of specified caregiver education or support.
Provider	Intervention is focused on training the provider and/or making adjustments to provider's workflow or responsibilities. This does NOT refer to simply involving provider(s) to deliver intervention components.

How were intervention sessions delivered?	
Mode of delivery	Intervention sessions were delivered via phone or in-person.
Planned contacts/sessions	The number of contacts/sessions the authors planned, or intended to happen, in the study.
Actual contacts/sessions	The number of contacts/sessions actually delivered in the study.
Type(s) of providers	The type(s) of provider(s) to deliver the intervention (*eg*, physician, nurse, social worker, case manager, physical or occupational therapist)

APPENDIX B. SEARCH STRATEGIES

Search date: December 4, 2017

#1	"Geriatrics"[Mesh] OR "Geriatric Nursing"[Mesh] OR "Geriatricians"[Mesh] OR "Geriatric Assessment"[Mesh] OR "Health Services for the Aged"[Mesh] OR gerontology[tiab] OR geriatric[tiab] OR geriatrics[tiab] OR gerontologist[tiab] OR gerontologists[tiab] OR geriatrician[tiab] OR geriatricians[tiab] OR elderly[tiab] OR elder[tiab] OR elders[tiab] OR "older adult"[tiab] OR "older adults"[tiab] OR "older patient"[tiab] OR "older patients"[tiab] OR senior[tiab] OR seniors[tiab] OR senium[tiab] OR "aged care"[tiab] OR "Aged"[Mesh]	2,871,510
#2	"Emergency Service, Hospital"[Mesh] OR "Emergency Medicine"[Mesh] OR "Emergency Nursing"[Mesh] OR "emergency medicine"[tiab] OR "emergency nursing"[tiab] OR "Hospital Emergency Service"[tiab] OR "Hospital Emergency Services"[tiab] OR "Emergency Hospital Service"[tiab] OR "Emergency Hospital Services"[tiab] OR "Emergency Department"[ti] OR "Emergency Departments"[ti] OR "Emergency Unit"[ti] OR "Emergency Units"[ti] OR "Emergency Ward"[ti] OR "Emergency Wards"[ti] OR "Emergency Room"[ti] OR "Emergency Rooms"[ti] OR "trauma center"[ti] OR "trauma centers"[ti] OR "trauma unit"[ti] OR "trauma units"[ti] OR (emergency[ti] AND hospital[ti])	91,901
#3	(#1 AND #2) AND English[lang]	17,218
#4	#3 NOT (("Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh]) NOT "Adult"[Mesh])	17,142
#5	#4 AND ("Patient Care Management"[Mesh] OR "Medication Errors"[Mesh] OR "Polypharmacy"[Mesh] OR "transitional care"[tiab] OR "transition care"[tiab] OR "case management"[tiab] OR "critical pathway"[tiab] OR "critical pathways"[tiab] OR "clinical pathway"[tiab] OR "clinical pathways"[tiab] OR "critical path"[tiab] OR "critical paths"[tiab] OR "clinical path"[tiab] OR "clinical paths"[tiab] OR "healthcare team"[tiab] OR "patient care team"[tiab] OR "patient management"[tiab] OR "medication management"[tiab] OR "drug therapy management"[tiab] OR "discharge planning"[tiab] OR "patient discharge"[tiab] OR "Outcome and Process Assessment (Health Care)"[Mesh] OR "Treatment Outcome"[Mesh] OR "Program Evaluation"[Mesh] OR "Patient Compliance"[Mesh] OR "Patient Satisfaction"[Mesh])	6,321
#6	#5 AND ("randomized controlled trial"[ptyp] OR "controlled clinical trial"[ptyp] OR randomized[tiab] OR randomised[tiab] OR randomization[tiab] OR randomisation[tiab] OR placebo[tiab] OR randomly[tiab] OR trial[tiab] OR groups[tiab] OR "Comparative Study"[ptyp] OR "clinical trial"[pt] OR "clinical trial"[tiab] OR "clinical trials"[tiab] OR "evaluation studies"[ptyp] OR "evaluation studies as topic"[MeSH] OR "evaluation study"[tiab] OR "evaluation studies"[tiab] OR drug therapy[sh] OR "intervention study"[tiab] OR "intervention studies"[tiab] OR "case-control studies"[MeSH] OR "case-control"[tiab] OR "cohort studies"[MeSH] OR cohort[tiab] OR "longitudinal studies"[MeSH] OR longitudinal[tiab] OR longitudinally[tiab] OR prospective[tiab] OR prospectively[tiab] OR "retrospective studies"[MeSH] OR retrospective[tiab] OR "follow up"[tiab] OR "comparative study"[pt] OR "comparative studies"[tiab] OR nonrandom[tiab] OR "non-random"[tiab] OR nonrandomized[tiab] OR "non-randomized"[tiab] OR nonrandomised[tiab] OR "non-randomised"[tiab] OR quasi-experiment*[tiab] OR quasiexperiment*[tiab] OR quasirandom*[tiab] OR quasi-random*[tiab] OR quasi-control*[tiab] OR quasicontrol*[tiab] OR (controlled[tiab] AND (trial[tiab] OR study[tiab])) OR "pre-post"[tiab] OR "posttest"[tiab] OR "post-test"[tiab] OR pretest[tiab] OR pre-test[tiab] OR ("time series"[tiab] AND interrupt[tiab]) OR ("time points"[tiab] AND (multiple[tiab] OR one[tiab] OR two[tiab] OR three[tiab] OR four[tiab] OR five[tiab] OR six[tiab] OR seven[tiab] OR eight[tiab] OR nine[tiab] OR ten[tiab] OR month[tiab] OR monthly[tiab] OR day[tiab] OR daily[tiab] OR week[tiab] OR weekly[tiab] OR hour[tiab] OR	4,930

	hourly[tiab])) OR (before[tiab] AND after[tiab]) OR (before[tiab] AND during[tiab])) NOT (Editorial[ptyp] OR Letter[ptyp] OR Comment[ptyp]) NOT (animals[mh] NOT humans[mh])	
#7	#6 AND ("2016/01/01"[Date - Publication] : "3000"[Date - Publication])	785

CINAHL

S1	(MH "Geriatrics") OR (MH "Gerontologic Nursing+") OR (MH "Gerontologic Nurse Practitioners") OR (MH "Geriatricians") OR (MH "Geriatric Assessment+") OR (MH "Health Services for the Aged") OR (MH "Gerontologic Care") OR TI (gerontology OR geriatric OR geriatrics OR gerontologist OR gerontologists OR geriatrician OR geriatricians OR elderly OR elder OR elders OR "older adult" OR "older adults" OR "older patient" OR "older patients" OR senior OR seniors OR senium OR "aged care")	170,880
S2	(MH "Emergency Service+") OR (MH "Triage") OR (MH "Physicians, Emergency") OR (MH "Emergency Nurse Practitioners") OR (MH "Emergency Medicine") OR (MH "Emergency Patients") OR TI ("emergency medicine" OR "emergency nursing" OR "Hospital Emergency Service" OR "Hospital Emergency Services" OR "Emergency Hospital Service" OR "Emergency Hospital Services" OR "Emergency Department" OR "Emergency Departments" OR "Emergency Unit" OR "Emergency Units" OR "Emergency Ward" OR "Emergency Wards" OR "Emergency Room" OR "Emergency Rooms" OR "trauma center" OR "trauma centers" OR "trauma unit" OR "trauma units") OR AB ("emergency medicine" OR "emergency nursing" OR "Hospital Emergency Service" OR "Hospital Emergency Services" OR "Emergency Hospital Service" OR "Emergency Hospital Services")	67,453
S3	(S1 AND S2) Limiters - English Language; Age Groups: Middle Aged: 45-64 years, Aged: 65+ years, Aged, 80 and over; Publication Type: Journal Article	1,606
S4	(MH "Continuity of Patient Care+") OR (MM "Continuity of Patient Care In Old Age") OR (MH "Age Specific Care") OR (MH "Multidisciplinary Care Team+") OR (MH "Patient Care Plans+") OR (MH "Transitional Care") OR (MH "Critical Path") OR (MH "Medication Errors+") OR (MH "Polypharmacy") OR (MH "Outcomes (Health Care)+") OR (MH "Program Evaluation") OR (MH "Patient Compliance+") OR (MH "Medication Compliance") OR (MH "Organizational Compliance") OR (MH "Case Management") OR (MH "Patient Satisfaction") OR TI ("transitional care" OR "transition care" OR "case management" OR "critical pathway" OR "critical pathways" OR "clinical pathway" OR "clinical pathways" OR "critical path" OR "critical paths" OR "clinical path" OR "clinical paths" OR "healthcare team" OR "patient care team" OR "patient management" OR "medication management" OR "drug therapy management" OR "discharge planning" OR "patient discharge") OR AB ("transitional care" OR "transition care" OR "case management" OR "critical pathway" OR "critical pathways" OR "clinical pathway" OR "clinical pathways" OR "critical path" OR "critical paths" OR "clinical path" OR "clinical paths" OR "healthcare team" OR "patient care team" OR "patient management" OR "medication management" OR "drug therapy management" OR "discharge planning" OR "patient discharge")	525,454
S5	S3 AND S4 Limiters - Publication Type: Journal Article; Published Date: 20160101-20171231	41

EMBASE

#1	'geriatrics'/exp OR 'elderly care'/de OR 'geriatric care'/exp OR 'geriatrician'/exp OR 'geriatric assessment'/exp OR 'geriatric patient'/exp OR gerontology:ti,ab OR geriatric:ti,ab OR geriatrics:ti,ab OR gerontologist:ti,ab OR gerontologists:ti,ab OR geriatrician:ti,ab OR geriatricians:ti,ab OR elderly:ti,ab OR elder:ti,ab OR elders:ti,ab OR 'older adult':ti,ab OR 'older adults':ti,ab OR 'older patient':ti,ab OR 'older patients':ti,ab OR senior:ti,ab OR seniors:ti,ab OR senium:ti,ab OR 'aged care':ti,ab OR 'aged'/exp	2,851,327
#2	'emergency health service'/exp OR 'emergency ward'/exp OR 'emergency treatment'/exp OR 'emergency medicine'/exp OR 'emergency nursing'/exp OR 'emergency medicine':ti,ab OR 'emergency nursing':ti,ab OR 'Hospital Emergency Service':ti,ab OR 'Hospital Emergency Services':ti,ab OR 'Emergency Hospital Service':ti,ab OR 'Emergency Hospital Services':ti,ab OR 'Emergency Department':ti OR 'Emergency Departments':ti OR 'Emergency Unit':ti OR 'Emergency Units':ti OR 'Emergency Ward':ti OR 'Emergency Wards':ti OR 'Emergency Room':ti OR 'Emergency Rooms':ti OR 'trauma center':ti OR 'trauma centers':ti OR 'trauma unit':ti OR 'trauma units':ti OR ((emergency NEAR/3 hospital):ti)	218,949
#3	#1 AND #2 AND [humans]/lim AND [english]/lim	28,538
#4	'patient care'/exp OR 'clinical pathway'/exp OR 'medication error'/exp OR 'polypharmacy'/exp OR 'treatment outcome'/exp OR 'program evaluation'/exp OR 'patient satisfaction'/exp OR 'hospital discharge'/exp OR 'patient compliance'/exp OR 'transitional care':ti,ab OR 'transition care':ti,ab OR 'case management':ti,ab OR 'critical pathway':ti,ab OR 'critical pathways':ti,ab OR 'clinical pathway':ti,ab OR 'clinical pathways':ti,ab OR 'critical path':ti,ab OR 'critical paths':ti,ab OR 'clinical path':ti,ab OR 'clinical paths':ti,ab OR 'healthcare team':ti,ab OR 'patient care team':ti,ab OR 'patient management':ti,ab OR 'medication management':ti,ab OR 'drug therapy management':ti,ab OR 'discharge planning':ti,ab OR 'patient discharge':ti,ab	2,174,829
#5	#3 AND #4	9,717
#6	#5 AND [2016-2017]/py AND ([aged]/lim OR [very elderly]/lim)	1,920
#7	('randomized controlled trial'/exp OR 'crossover procedure'/exp OR 'double blind procedure'/exp OR 'single blind procedure'/exp OR random*:ti,ab OR factorial*:ti,ab OR crossover*:ti,ab OR ((cross NEAR/1 over*):ti,ab) OR placebo*:ti,ab OR ((doubl* NEAR/1 blind*):ti,ab) OR ((singl* NEAR/1 blind*):ti,ab) OR assign*:ti,ab OR allocat*:ti,ab OR volunteer*:ti,ab OR 'clinical study'/exp OR 'clinical trial':ti,ab OR 'clinical trials':ti,ab OR 'controlled study'/exp OR 'evaluation'/exp OR 'evaluation study':ti,ab OR 'evaluation studies':ti,ab OR 'intervention study':ti,ab OR 'intervention studies':ti,ab OR 'case control':ti,ab OR 'cohort analysis'/exp OR cohort:ti,ab OR longitudinal*:ti,ab OR prospective:ti,ab OR prospectively:ti,ab OR retrospective:ti,ab OR 'follow up'/exp OR 'follow up':ti,ab OR 'comparative effectiveness'/exp OR 'comparative study'/exp OR 'comparative study':ti,ab OR 'comparative studies':ti,ab OR 'evidence based medicine'/exp) NOT ('case report'/exp OR 'a case report':ti OR ': case report':ti OR 'case study'/exp OR 'editorial'/exp OR 'letter'/exp OR 'note'/exp OR [editorial]/lim OR [letter]/lim OR [note]/lim OR [conference abstract]/lim)	10,270,358
#8	#6 AND #7	1,309

APPENDIX C. STUDY SELECTION

STUDY ELIGIBILITY CRITERIA

Study Characteristic	Inclusion Criteria	Exclusion Criteria
Population	Adults aged ≥65 who present to an emergency department (ED) for acute, urgent, or emergency care	· Studies enrolling mixed samples with <70% of participants aged ³ 65 · Studies enrolling condition-specific subgroups of older adults (*eg,* with a single presenting condition such as "falls" or "dementia")
Interventions	4 intervention strategies (including those that use 1 or more strategies or are "multi-strategy") (see Appendix A for full definitions) · Discharge planning · Case management/transition of care · Medication safety/medication review · Strategies designed or guided by the 2014 Geriatric Emergency Department Guidelines[16-18]	· Interventions focused exclusively on risk or functional assessment instruments; otherwise-eligible interventions may utilize risk or functional assessment instruments to identify patients · Transition planning for patients who reside in nursing homes or involving transfers to other hospitals or hospital settings · Interventions focused on a single condition (*eg,* dementia) instead of general care of older adults in ED · Interventions focused on shared decision-making, including related to medication selection and management · Interventions performed after the final decision to admit the older adult to hospital or after discharge had been made
Comparator	Usual or enhanced ED care (*eg*, information or educational control)	No comparator
Outcomes	· **Clinical outcomes:** Overall functional status (or subdomains of physical or mental functioning), health-related quality of life, mortality[a] · **Patient satisfaction/experience:** Any validated measure of patient satisfaction/experience · **Care utilization:** ED readmission; hospitalization related to index ED visit; hospital admission rates (following ED discharge)	· Laboratory parameters (*eg*, A1c, cholesterol levels) · Disease-specific symptoms (*eg*, depressive symptoms, shortness of breath) · Guideline adherence · Prescribing behaviors · Patient/caregiver knowledge
Timing	· Time points that are logically affected by the intervention and are clinically relevant, prioritizing short (*eg*, 30 days) and longer (*eg*, 90 days) time points · For patient satisfaction, within 30 days of admission/discharge	None
Setting	Emergency departments	
Study design	· Randomized controlled trials	· Retrospective studies

Study Characteristic	Inclusion Criteria	Exclusion Criteria
	· Quasi-experimental studies (prospective controlled designs: controlled nonrandomized trial, before-after cohort study, case-matched controlled; interrupted time-series designs) · All studies must include an eligible comparator per EPOC criteria[29]	· Cross-sectional designed studies · Cost-effectiveness analyses · Program descriptions
Publication type	· English-language publications · 1990 to current date · OECD countries (North America, Australia, New Zealand, Japan, South Korea, Israel, Chile, Turkey, and Europe)	· Non-English language · Not a full publication in a peer-reviewed journal · Meeting abstracts, letters, editorials, and dissertations. · Pilot studies or sample sizes <20

[a] Given the potential array of conditions, disease-specific measures of severity and symptoms are not particularly practical or helpful to decision making; therefore we chose concepts that cut across conditions.
Abbreviations: A1c=glycosylated hemoglobin; ED=emergency department; EPOC=Effective Practice and Organisation of Care; OECD=Organisation for Economic Co-operation and Development

APPENDIX D. STUDY RISK OF BIAS ASSESSMENT

For full study citations, please refer to the report's main reference list.

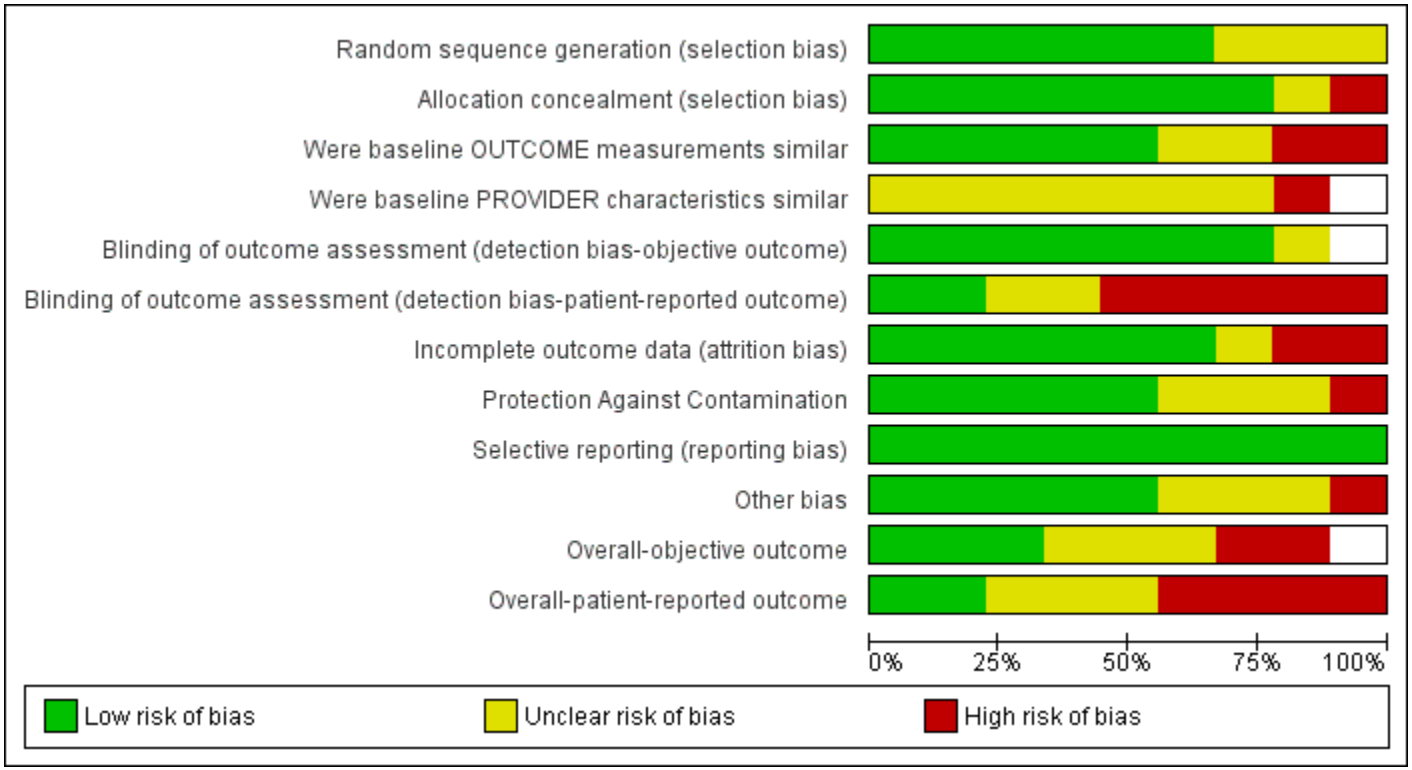
The following abbreviations are used in the risk of bias tables in this appendix:

1=Randomization adequate
2=Allocation concealment
3=Baseline measure similar
4=Baseline-provider contamination
5=Detection bias (objective outcome)
6=Detection bias (patient-reported outcome)
7= Incomplete outcome
8=Protection against contamination
9=Selective outcomes reporting
10=Other bias
11=Overall objective outcome
12=Overall patient-reported outcome
LR=low risk of bias; HR=high risk of bias; NR=not reported; NA=not applicable; UR=Unclear risk of bias

RANDOMIZED STUDIES

Study	1	2	3	4	5	6	7	8	9	10	11	12
Basic, 2005[34]	LR	LR	HR	UR	LR	HR	HR	LR	LR	LR	HR	HR
Biese, 2014[35]	UR	HR	UR	HR	LR	HR	HR	UR	LR	HR	HR	HR
Biese, 2017[36]	LR	LR	UR	UR	LR	HR	LR	UR	LR	UR	UR	HR
Caplan, 2004[37]	LR	LR	LR	UR	LR	HR	LR	LR	LR	LR	LR	UR
Eklund, 2013[38]	UR	LR	LR	UR	NR	HR	LR	UR	LR	LR	NA	HR
Gagnon, 1999[39]	LR	LR	LR	NR	LR	UR	LR	HR	LR	UR	UR	UR
McCusker, 2001[40]	LR	LR	LR	UR	LR	LR	LR	LR	LR	UR	LR	LR
Mion, 2003[41]	LR	LR	LR	UR	LR	LR	LR	LR	LR	LR	LR	LR
Runciman, 1996[42]	UR	UR	HR	UR	UR	UR	UR	LR	LR	LR	UR	UR

Summary Ratings Across Randomized Studies for Each Risk of Bias Domain

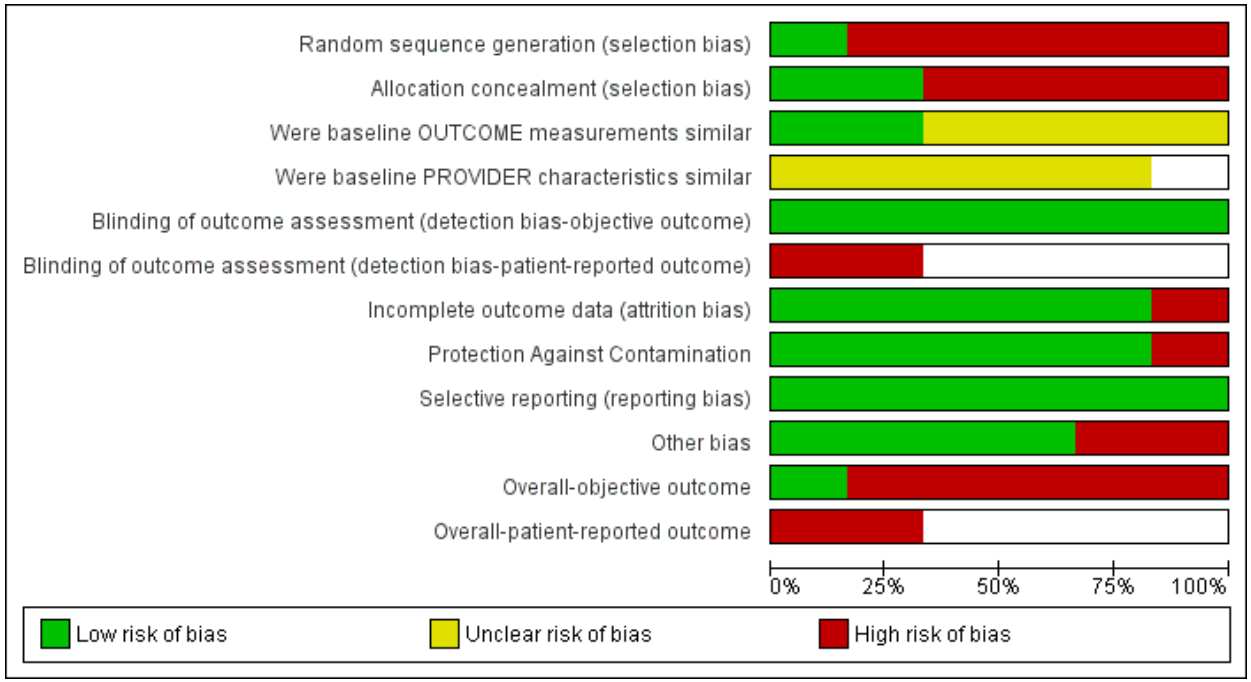


[a]White space indicates items that were not applicable.

NONRANDOMIZED STUDIES

Study	1	2	3	4	5	6	7	8	9	10	11	12
Arendts, 2012[43]	HR	HR	LR	UR	LR	NR	LR	LR	LR	LR	HR	NA
Arendts, 2013[44]	HR	HR	UR	UR	LR	NR	LR	LR	LR	HR	HR	NA
Bond, 2014[45]	HR	LR	UR	UR	LR	NR	LR	LR	LR	LR	HR	NA
Miller, 1996[46]	HR	HR	UR	NR	LR	HR	HR	LR	LR	HR	HR	HR
Mortimer, 2011[47]	HR	HR	UR	UR	LR	HR	LR	HR	LR	LR	HR	HR
Pedersen, 2016[48]	LR	LR	LR	UR	LR	NR	LR	LR	LR	LR	LR	NA

Summary Ratings for Nonrandomized Studies Across Each Risk of Bias Domain



[a]White space indicates items that were not applicable.

APPENDIX E. PEER REVIEW COMMENTS

Question Text	Reviewer Number	Comment	Response
Are the objectives, scope, and methods for this review clearly described?	1	Yes	Acknowledged
	2	Yes	Acknowledged
	3	Yes	Acknowledged
	4	Yes	Acknowledged
	7	Yes	Acknowledged
	8	Yes	Acknowledged
Is there any indication of bias in our synthesis of the evidence?	1	No	Acknowledged
	2	No	Acknowledged
	3	Yes - Reads as biased against studies that do not use the previously published 2014 guidelines or do not use conceptual model.	We respectfully disagree with this comment. In systematic reviews, bias is most likely to be introduced through study selection (search, eligibility criteria), or synthesis. Our search and eligibility criteria did not preferentially select for studies that used a conceptual model. Similarly, studies were included in syntheses of results without regard to the presence of a conceptual model. We have also added a note to the Research Gaps/Future Research section that there has not been sufficient time since publication of the 2014 Guidelines for hospitals to implement changes, evaluate the effects, and disseminate findings.
	4	No	Acknowledged
	7	No	Acknowledged
	8	No	Acknowledged
Are there any published or unpublished studies that we may have overlooked?	1	No	Acknowledged
	2	No	Acknowledged
	3	No	Acknowledged
	4	Yes - As described more fully in "additional comments" below, there may be a limitation with the Search Strategy defined in Appendix B. Search term #1 required a study that defined itself as geriatric or a "aged care " study may have reduced the yield in the literature search as some controlled studies that compare emergency department management for medical conditions of	We thank the reviewer for this observation. It is possible that studies conducted on a particular condition (*eg,* delirium, falls) that disproportionately affect older adults could be missed if they were not coded as geriatric or aged care. However, the reviewer raises this as a hypothetical, without identifying any missed studies. We repeated the search using terms for delirium and falls. Only 2 unique citations were identified that were not captured by our original search strategy, suggesting that relevant studies are indexed (MeSH terms) using “aged

Question Text	Reviewer Number	Comment	Response
		aging do not necessarily define themselves as geriatric or "older adult" studies.	care" terms. Neither citation met eligibility criteria. This test of our search strategy along with other methods to identify relevant studies (review of scoping and other reviews for relevant studies) give us confidence that we identified the eligible literature. Finally, as noted elsewhere in our response, our search strategy was discussed in collaboration with our operations partners. This report was commissioned to identify ED interventions that would be broadly applicable to older adults as opposed to focus on particular conditions or events.
	7	No	Acknowledged
	8	No	Acknowledged
Additional suggestions or comments can be provided below. If applicable, please indicate the page and line numbers from the draft report.	1	Very informative and excellent report summarizing ED interventions on improving patient care, experience, and utilization outcomes for older adults. A report like this is much needed and if (shortened and) reframed as a journal manuscript, will likely be of high interest by emergency medicine and geriatrics journals and their readers.	Acknowledged
	1	Major recommendations: Greater clarification in the methods section of how the review was conducted of each study – what was extracted and then "synthesized" would strengthen the paper and allow readers to understand how the review was conducted. Many of the categorizations, ratings (e.g., risk of bias) only come out in the results section and were not clarified in the methods for how these scores were generated (i.e., were these totally subjective in rating by reviewers?)	The Data Abstraction section of the Methods describes the major categories of data abstracted. In addition, Appendix A gives detailed definitions of the intervention elements abstracted and their definitions. We revised the report to consistently refer to risk of bias (elements described in the methods and Appendixes D and I), whereas the draft report described these elements inconsistently as risk of bias or study quality.
	1	Minor concerns: Pg. 1. GED Guidelines citation that this was issued by ACEP does not acknowledge the guidelines were also endorsed and issued by the American Geriatrics Society, Society for Academic Emergency Medicine, and Emergency Nurses Association. (1-3)	Thank you. These citations have been added to the background section.

Question Text	Reviewer Number	Comment	Response
	1	1. Carpenter CR, Bromley M, Caterino JM, et al. Optimal older adults emergency care: introducing multidisciplinary geriatric emergency department guidelines from the american college of emergency physicians, american geriatrics society, emergency nurses association, and society for academic emergency medicine. J Am Geriatr Soc. 2014;62(7):1360-1363.	This citation has been added to the background section.
	1	2. Carpenter CR, Bromley M, Caterino JM, et al. Optimal older adults emergency care: Introducing multidisciplinary geriatric emergency department guidelines from the American College of Emergency Physicians, American Geriatrics Society, Emergency Nurses Association, and Society for Academic Emergency Medicine. Acad Emerg Med. 2014;21(7):806-809.	This citation has been added to the background section.
	1	3. Carpenter CR, Bromley M, Caterino JM, et al. Optimal older adults emergency care: Introducing multidisciplinary geriatric emergency department guidelines from the American College of Emergency Physicians, American Geriatrics Society, Emergency Nurses Association, and Society for Academic Emergency Medicine. Ann Emerg Med. 2014;63(5):e1-3.	This citation has been added to the background section.
	1	Was a strategy or framework for assessing interventions and programs developed prior to data abstraction from the eligible studies? (aside from patient characteristics, intervention structure, comparator, and outcomes? And aggregating outcomes for at least 3 studies?) (i.e., overall conceptual model the motivated the intervention – was this defined before or during the study reviews?)	Thank you for this comment. We have clarified that our conceptual framework was developed *a priori* and that our intervention strategies and components were also developed prior to data abstraction, in collaboration with our stakeholders and technical expert panel.
	1	The conceptual framework for geriatric emergency patient care (Figure 1) predisposing factors and outcomes for older adults that utilize the ED is excellent.	Acknowledged

Question Text	Reviewer Number	Comment	Response
	1	How was risk of bias (ROB) measured? (Strength of Evidence is based on an AHRQ Methods Guide for Effectiveness and Comparative Effectiveness Reviews, but not there is no info for how ROB criteria were ascertained to give scores of low, unclear, vs. high ratings in the methods section).	In the draft report, ROB was referred to variably as study quality or ROB. We revised the report to consistently use the term "risk of bias." The approach (EPOC criteria) is described in the Methods section ("Risk of Bias" subsection), and further details are given in Appendix D).
	1	Decision to examine effects of intervention on patients, clinicians, policymakers determined a priori? Tying these effects to the conceptual model proposed by the ESP around geriatric emergency patient care would be helpful.	Thank you for this comment. In our methods section, we have clarified that our conceptual framework was determined *a priori*. We have also added language to our Limitations section in which we note that the limited information reported by many studies prevented us from exploring the effects of patient- and provider-level intervention components on our chosen outcomes.
	1	Were the 4 ED intervention strategies (pg.10) determined a priori to the review, or after the paper abstraction process?	Thank you for this comment. We have added language to clarify that intervention strategies were determined *a priori*.
	1	Were ED intervention components determined a priori or during abstraction?	Thank you for this comment. We have added language to clarify that intervention components were determined *a priori*.
	1	Figure 6 and 7 should include a legend describing the colored circles in the table.	We have added clarification describing the colored circles in the footer.
	1	Is there a reference for the PICOTS framework? (pg. 33)	We added the following citation which describes the use of PICOTS framework for identifying research gaps. Robinson KA, Akinyede O, Dutta T, Sawin VI, Li T, Spencer MR, Turkelson CM, Weston C. Framework for Determining Research Gaps During Systematic Review: Evaluation. Methods Research Report. (Prepared by Johns Hopkins University Evidence-based Practice Center under Contract No. 290-2007-10061-I.) AHRQ Publication No. 13-EHC019-EF. Rockville, MD: Agency for Health care Research and Quality. February 2013. www.effectivehealthcare.ahrq.gov/reports/final.cfm.
	2		
	3	Congratulations to the research team on a tremendous accomplishment completing this review. There are many strengths: rigorous methodology, great conceptual model proposed.	Acknowledged

Question Text	Reviewer Number	Comment	Response
	3	Tremendous redundancy. I think I read 6 times that the papers evaluated did not refer to the 2014 published guidelines (and this is just one example).	Thank you. We edited carefully to streamline the report and reduce redundancy.
	3	Lack of reported racial/ethnic/socioeconomic information in most papers is a bigger issue than the authors make it seem given the demographics of our VA population.	Thank you for this comment. We acknowledge that only 4 of 15 studies reported race for study participants. As noted in the PICOTS table of our Future Research section, the lack of this information limits the number of subgroup analyses that can be conducted. As noted, we believe the use of a comprehensive conceptual framework may encourage more complete reporting of participant characteristics, including race and other sociodemographic characteristics (*ie*, income, education) that may influence medical events and ED utilization.
	3	Conclusions do not always line up with reported results. Needs to be exact alignment between reported findings and results, for example is it only bridge interventions that were successful or not?	Thank you for this comment. We have revised our Conclusion section to be more consistent with the reported results.
	3	Should explicitly state which outcomes were primary outcomes for which the studies were designed with adequate statistical power to reject the null hypothesis versus those which measured the outcome as a secondary (exploratory) outcome.	Appendix F (Study Characteristics Tables) identifies the primary outcome for each study. For individual studies, we note when effects were imprecise. When grading the strength of evidence, we note when summary estimates of effect were imprecise and judged to cross decisional thresholds. We updated the key points to reflect this detail.
	3	Paper would be stronger summarizing the previous reviews in the intro not at the end.	Thank you for this comment. We selected to highlight gaps of previous reviews in the Introduction and address our findings in context of these reviews later in the paper. As highlighted in the Introduction, no prior reviews examined multi-strategy interventions and/or attempted to identify intervention components.
	3	Specific suggestions for improvement (some of these are big issues related to the above points and some are small points): Page 1: Study selection – why “in brief”? This should be more detailed. RE enrolling older adults: did studies have to enroll ONLY older adults? What about interventions that included	Detailed eligibility criteria are given in the body of the report and in Appendix C. No studies enrolled mixed samples of older and younger patients. In the description of included studies (Results Section, Detailed Findings), we clarified that only older adults were enrolled.

Question Text	Reviewer Number	Comment	Response
		older adults but also included middle aged patients?	
	3	Page 2 (and page 17): Term “best practices” not mentioned in the intro. Should either be mentioned in methods/part of “key question” (that currently only talks about interventions not “best practices”, or not included in top bullet.	Thank you for this comment. We have replaced the phrase “best practices” with “ED interventions.”
	3	Bullet 3 and 4 seem to contradict each other. Bullet 3 says only “bridge” interventions work, but bullet 4 talks about “ED” interventions possibly benefiting functional status. Does “ED” include “bridge” or mean ED only? Clarity of terminology in the bullets (and throughout) should be improved.	Thank you. We have reorganized the key points, adding greater specificity on potential benefits and using consistent language throughout the report.
	3	Bullet 6 (and this applies to Page 22): were any of these studies actually designed with enough statistical power to look at mortality as an outcome? If not, would just say that, rather than say the interventions did not affect mortality. Should be very clear whether these studies were designed with adequate power versus looking at mortality as a secondary outcome.(Comments for these bullets also apply to page 17 where the bullets are repeated).	We modified this key point to specify that no study selected mortality as the primary outcome. We are unable to address whether studies were designed with sufficient statistical power to address each outcome. This would require specification of a clinically important difference and a power calculation for each outcome.
	3	Page 4-5. What does “precise” mean? What does “indirect” mean? How was SOE and ROB determined?	By design, the Executive Summary does not give detailed definitions of terms. However, we have added a glossary that defines key terms. Details on the assessment of SOE and ROB are given in the Methods section of the main report.
	3	Page 5, line 24. What other reviews? References here would improve this para. I don’t see how this first sentence in this para is supported by the results of the presented analyses (it may be true but I don’t see this as a logical conclusion from the results). Seems like first implication (based on what I have read so far up to this para) should be that ED-focused interventions have been mostly unsuccessful.	Thank you for this comment. Prior research has suggested that bridge interventions, or those with planned contacts taking place both pre- and post-ED discharge, may be more effective. We have added a citation here to reflect this recommendation.

Question Text	Reviewer Number	Comment	Response
	3	Related in same para (and on page 32): "improving outcomes for older ED users will be challenging" is a statement of the obvious and has nothing to do with the results of the analyses.	Thank you for this comment. We have removed this statement entirely from the Executive Summary and revised our language in the Discussion to suggest that future work should be longitudinal and transdisciplinary.
	3	Page 5 – Research Gaps. One big gap that is not mentioned here is identifying an intervention that has a big meaningful effect size.	We agree and have outlined a future research agenda that we believe could contribute to identifying highly effective strategies.
	3	Page 5. What basis do the authors have for concluding that using a conceptual model will improve the science? (As a health services researcher I completely agree that conceptual models are important, but I don't see how this is a "conclusion" from the results.). Suggest reframing this as a suggestion/opinion on how to improve the state of the science moving forward.	We have added more information highlighting the potential value of a conceptual model in regards to its ability to depict hypothesized relationships between intervention strategies and outcomes of interest (*ie*, mechanisms of action).
	3	Page 6 line 22. "signal" is jargon (this comes up again at the end of the paper also).	Merriam-Webster defines "signal" as a *sign* or *indication.* Although accurate, we dropped this term.
	3	Page 10 line 34. "Best practices" comes up again – what does this mean and how does it fit with the rest of the methods?	Thank you for this comment. As address earlier, we have replaced "best practices" with "intervention strategies" throughout the report.
	3	Page 12, line 9. Should reference and describe findings from ED geriatrics assessment/discharge planning intervention reviews.	Thank you for this comment. We have elected to focus this paragraph on the conceptual model and its potential to help tease apart intervention strategies and components not previously addressed in prior reports. Results from prior reviews, including those examining geriatric assessments and discharge planning interventions, are addressed in the Introduction and Discussion sections of the report.
	3	Figure 1/Conceptual model is a strength of this review.	Acknowledged
	3	Page 13, line 12. What is a "scoping" review?	Scoping reviews are used to identify knowledge gaps, set research agendas, and identify implications for decision-making. Scoping studies differ from systematic reviews because authors do not typically assess the quality of included studies.
	3	Page 14. Now I see where the terms "directness" and "precision" come from (AHRQ publication) but I still don't know what these actually mean. Paper	We added a glossary that defines key terms.

Question Text	Reviewer Number	Comment	Response
		would be stronger with explanation/definition of each of these terms.	
	3	Pages 17-18: No studies with Veterans is stated twice in these 2 pages (and other times).	Thank you. We have addressed this redundancy.
	3	Table 5, row 1 (study design). Not clear whether the 2nd line of text is a subset or an additional study. Is the cluster-randomized trial also considered one of the 8 randomized trials or is it a 9th RCT? Same with the non-randomized – is the pre-post considered one of the 5 non-randomized?	The total number of studies is given in the column header. Except where noted in a footnote, all counts of studies are independent and sum to the total given in the column header.
	3	The finding that so many studies do not report race deserves more attention.	We thank the reviewer for this comment. We have added a statement to the PICOTS table of our Future Research section stating that the lack of this information prevented us from conducting subgroup analyses. We have also elaborated on the benefit of a conceptual model to take a more comprehensive view of ED use and explore how, if at all, sociodemographic factors, including race, income, and education, may impact ED use and outcomes.
	3	Page 22, line 52 (and many other places throughout the manuscript): suggest replacing the word “evaluated” or “examined” with “measured” ie the study MEASURED the effect of the ED intervention (not evaluated or examined).	We considered these terms and edited the manuscript to consistently use the term “evaluated” as we think this best describes the goal of studies designed to determine the effects of ED strategies on the selected outcomes.
	3	Figure 4 and 5. Clarify that column header R=randomized	The figures have been changed to clarify the column header.
	3	Figure 6 and 7 are confusing for several reasons. Since the title has “bias” in the title it would seem that a plus sign would indicate more bias but at the same time more bias is undesirable so would that be red (bad)or green (good)? At a minimum need a legend/color scheme but also would be good if direction of bias and plus sign went same direction. “Objective” outcome is not correct term for non patient-reported outcomes. Suggest “administrative” or non-patient-reported. It is not clear how the summary “objective” and patient-reported outcomes ROB scores were calculated.	Thank you for this comment. These figures were created in Cochrane software using their standard visual approaches which are well understood in the SR community. We have added a footer to define the color/symbol scheme. We agree that “non-patient reported” is a better term than “objective” but it is a noun-string that decreases readability. We now describe these as non-patient-reported outcomes but tell the reader we will use objective outcomes for readability. Summary ROB ratings are not calculated. They are based on judgments after considering each of the items in the ROB

Question Text	Reviewer Number	Comment	Response
			assessment. We have added the definitions for low, unclear and high ROB.
	3	Page 30, lines 13-14. Patients may be similar in level of acuity but likely to be dissimilar in terms of race/ethnicity/socioeconomic status.	Thank you for this comment. We have clarified that the patients in the identified studies may be medically similar to Veterans. We have expanded our section on "Applicability to Veterans" to highlight potential differences in race, ethnicity, and socioeconomic status.
	3	Page 30, lines 26-27. I don't understand what is meant here about low-intensity interventions having limited applicability? Are you trying to say that higher intensity interventions might have bigger impacts?	Thank you for this comment. We have clarified that low-intensity interventions were classified as being short in duration and having a limited number of patient contacts. We have also clarified that most studies examined low intensity interventions, thus limiting our results to our low intensity interventions in the ED.
	3	Thank you for the opportunity to participate in the review of this interesting project.	Acknowledged
	4	This VA ESP is an exceptionally well-written document that addresses a critical problem of great interest to the VHA, i.e., the need to provide high quality care to the many elderly individuals who use emergency services. The emergency department (ED) is a critical access point that offers important opportunities to improve care and avoid deleterious outcomes. The document was developed using a standardized protocol to conduct the literature synthesis, which is a strength. The mission of this ESP review is reported as follows: To build on the ACEP Geriatric Emergency Department Guidelines published in 2014 that provides a template for many aspects to ER practice, education and assessment and evaluation to improve care for older adults. It is additionally stated that this document is intended to be used by the VHA Offices of Geriatrics and Extended Care Operations and Emergency Medicine to evaluate best practices in emergency care.	Thank you for this feedback.

Question Text	Reviewer Number	Comment	Response
	4	As noted below, the results from this synthesis may be somewhat limited in their ability to meet the goals stated above, and this may be related to the search design for the literature review. The search terms selected for this synthesis, as outlined in excellent detail in Appendix B, might be unable to capture all relevant papers. Review of these search terms suggests that they captured the constructs of 1) geriatric focused study 2) ED service examined in the study 3) Absence of a focus on children or adolescents and 4) Presence of clinical trial/clinical intervention comparison methods. Including these four features resulted in only nine randomized trials and six non-randomized trials. This very small number of studies greatly reduced the authors' ability to derive helpful conclusions for future guidelines. A possible source of this small yield could be the requirement for explicit "geriatric" terms in the search – for example, the vast majority of ED visits are related to the top contributors to aging complications: Falls/syncope, heart failure, delirium. While these conditions occur almost exclusively in the elderly, a comparative study of best practices for their ED treatment may or may not define itself as "geriatric." For example, there is a superb conceptual model from the Society of Academic Emergency Medicine and the Heart Failure Society to guide ED management of heart failure in the paper: Collins S. Journal of Cardiac Failure Vol. 21 No. 1 2015. Despite the paper noting that this is addressing a critical need for the growing population of older adults, the paper does not identify itself as geriatric per se. Since heart failure occurs almost entirely in the geriatric population, this paper is one example of a study	The comment regarding the "small yield" resulting from our search strategy was addressed above. This evidence synthesis was requested by our operational partners to evaluate strategies that would apply generally to older adults presenting to VA EDs, rather than older adults with specific conditions. Older Veterans have, on average, 4 chronic conditions, lower physical and mental health-related quality-of-life, and higher rates of functional impairment compared to non-Veterans. In an effort to meet the needs of a highly complex patient population, our operational partners commissioned this report to evaluate general strategies that would be applicable to the VA's patient population. Our description of studies table (Appendix F) describes the 3 most frequent conditions/presenting symptoms reported in each study. We summarize this information in the results subsection "Description of Included Studies for ED Interventions for Older Adults." We agree that evidence syntheses on strategies to address specific conditions in older adults would be valuable, but this would have been inconsistent with our operational partners' guidance.

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		that may offer insights to the topic at hand that could have been confirmed as a study of older adults in the literature review while not noting itself as a “geriatric” or "older adult" study. The main issue at hand is that ED services are invariably applied and studied to diseases of aging, but the denotation of “geriatric” is a subspecialty designation that is not available in all ED settings. Despite this, a full synthesis to understand best practices in the ED for older adults should at least be aware of this limitation, even if the ultimate decision is to focus only on “geriatric” specialty services. It is very understandable that the authors do not want to limit the ESP to specific medical conditions and the authors are absolutely correct that an over-focus on only medical signs and diagnostic tests without a full conceptual model that includes social factors can lead to major failures to address critical needs. On the other hand, the acute medical diagnosis has such a great effect on the nature of the ED service and follow-up quality that the medical condition cannot be excluded entirely. For this reason, the ACEP Guidelines do specifically provide guidance on some of the top ED conditions that are intervenable. That is, the ACEP specifically addresses falls, urinary catheters/UTI, complex medication use/polypharmacy, delirium and palliative care needs. While this submitted ESP does take a broad-spectrum approach with good reason to avoid specific conditions, unfortunately the outcome obtained by the ESP avoiding overly medically-focused studies, was that the results were very small. This occurrence is important to note since it is meaningful that some bit of medical need must be in the model, since it accounts for	

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		variance both in seeking care and after-care needs.	
	4	The current yield in this synthesis does not give the field good fodder to grow into evidence-based practices for the VHA emergency services. To be truly patient-centered and provide precision care, EBPs must at least address the medical needs of the specific patient somewhat. Consequently, this ESP unfortunately does not meet its goal of expanding upon the ACEP document. So the happy medium may most likely be achieved by taking a similar approach to the ACEP and at least examine the most common and intervenable conditions that are likely to bring Veterans to the ED. For example, the ACEP has a well-crafted series of potential interventions for patients who have suffered a fall, this includes equipment, care strategies, interdisciplinary interventions and quality measures related to care for older patients with falls who have been in the ED. Following this lead, this ESP analysis could have provided a literature synthesis (presently absent for the ACEP report) regarding the literature on randomized trials comparing ED interventions for patients with falls. For the search terms in the literature synthesis, this would involve adding (instead of the geriatric terms in #1), the presence of hip fracture, other fracture, syncope, falls, dizziness, unsteady gait, other injury including head injury from falls, etc. This type of ESP approach may lead to more operational outcomes. Without more to offer from this ESP, is does not provide a substantial advancement over the ACEP guidelines	The goal of this review was to review the evidence to determine the effectiveness of emergency department (ED) interventions for improving clinical, patient experience, and utilization outcomes in older adults (age ≥65). We did not have a goal of "expanding upon the ACEP document." Although the ACEP guidelines provide practical consensus-based recommendations, we agree that evidence syntheses that summarize the evidence for common geriatric conditions could be of great value. However, our review was not commissioned for this purpose. We have strived to make it clear that our findings apply only to strategies that are not condition-specific.
	4	This is not to say that this ESP information is not useful, it is good information to see what was found. But the results did not lead to any definitive	We thank the reviewer for this comment and agree that critical steps in the care process are not depicted in our model. However, conceptual models within systematic reviews are

Question Text	Reviewer Number	Comment	Response
		steps for evidence based practice as there is no clear signal reported other than multi-strategy or case-management type interventions may reduce ED re-admissions. Unfortunately, this finding does not give compelling support to next steps as there is no clear operational strategy derivable from this finding. The authors mention a number of times that a clear conceptual model is needed to conduct better research, but the framework proposed in Figure 1 on page 12 is challenging to interpret regarding how it may work as it jumps from "older adults presenting to ED" directly to three different intervention components, it is missing the information gathering, interview, examination and diagnostic piece in the middle. It is commendable that the model includes the socio-demographic and other preexisting factors the patient brings to the ED, but it is missing the fact that the patient's clinical reason for presenting does matter in the model. Establishing a clinical/medical understanding of the individual patient cannot be skipped over – and consequently it is difficult to determine how this model can be applied as it appears to lack specificity that is essential for the patient centered and precision-care world that we live in.	not meant to be all-encompassing. The model shown in our paper was a purposeful simplification of what we believe all causal pathways to be. We agree that a more robust model should be developed prior to intervention design and dissemination.
	4	Another comment may be helpful regarding the use of conceptual frameworks (generally speaking) in research: It may be useful to appreciate that the emphasis on conceptual models as a requisite for research is largely unique to the VHA in current times. Outside DOD and VHA services research, other funding agencies evaluate research based on scientific premise and rationale, while conceptual framework language is more often reserved for studies that are speculative - or preliminary work based on theory such as projects for career	Thank you for this comment. We believe that conceptual models provide tremendous value in identifying causal processes, including mediating mechanisms and moderating effects, particularly in areas of research where such information has not been well-established. We have revised our language to better emphasize that the presence of a conceptual model was not a requirement for inclusion into our study and did not suggest a deficiency when not present.

Question Text	Reviewer Number	Comment	Response
		awards, pilot grants and preliminary research awards. Consequently, it may not always be a deficiency in a research study not to begin with a conceptual model diagram, but rather just a difference in approach between different funding sources for research.	
	7		
	8	Appreciate the opportunity to read this.	Acknowledged

APPENDIX F. STUDY CHARACTERISTICS TABLES

For full study citations in this appendix, please refer to the report's main reference list.

RANDOMIZED STUDIES

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient- Reported Outcomes[b]
Single-Strategy Interventions					
Case Management/Transition of Care					
Basic, 2005[34] Australia 224 2	Comprehensive assessment Referral to specialist, no follow-up Intervention delivered within ED	Inclusion: "Older adult" functional impairment; psychological disability; social disability; active multisystem disease Exclusion[c]: Medically unstable; living in nursing home	High risk: Yes, based on functional status or other Age: 78.7 (6.4) Female: 60% Race: NR Living alone: 39% Top 3: Musculoskeletal, cardiovascular, neurological	Functional status: Modified Barthel index Hospitalization: At index[d] visit Timing: Index visit Primary: Index hospital admission, length of inpatient stay, functional decline	Objective: High Patient: High
Caplan, 2004[37] Australia 739 2	Semi-structured assessment Referral plus follow-up Intervention delivered both within and after discharge from ED ("bridge")	Inclusion: Aged ≥75 Exclusion: Lived in a nursing home; previously enrolled in this study	High risk: No Age: 82.2 (6.0) Female: 61% Race: NR Living alone: 39% Top 3: Ischemic heart disease, falls, diabetes mellitus	Functional status: Composite Mortality Hospitalization: After index visit ED readmit Timing: 30 days; 3, 6, 12, 18 months Primary: All hospital admissions within 30 days of ED visit	Objective: Low Patient: Unclear

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient-Reported Outcomes[b]
Gagnon, 1999[39] Canada 427 2	Comprehensive Assessment No referral, only follow-up Intervention delivered only after discharge from ED	Inclusion: Aged ≥70 with cardiac disease (part of risk assessment) Exclusion: Admitted to ED from long-term care facility or nursing home; currently in another research study or followed by a geriatric team; hospitalized; partner already enrolled	High risk: Yes, based on ADL and Boult assessment tool Age: 81.6 (6.4) Female: 58% Race: NR Living alone: 61% Top 3: Diabetes, cardiac	Functional Status: ADL, IADL Quality of life: SF-36 Mortality Patient experience Hospitalization: follow-up ED readmit Timing: 10 months Primary: Quality of life, satisfaction with care, functional status, admission to hospital, length of hospital stay, or readmission to ED	Objective: Unclear Patient: Unclear
Runciman, 1996[42] Europe 424 2	Comprehensive assessment No referral or follow-up Intervention delivered only after discharge from ED	Inclusion: Aged ≥75; accident Exclusion: NR	High risk: No Age: 81 (NR) Female: NR Race: NR Living alone: NR Top 3: Fall and soft-tissue injury	Functional Status: SF-36 Patient experience: Informal ED readmit Timing: 4 weeks Primary: Patient satisfaction, ED readmission rate, dependency, functional outcome	Objective: Unclear Patient: Unclear

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient-Reported Outcomes[b]
Multi-Strategy Interventions					
Discharge Planning PLUS Case Management/Transition of Care					
Eklund, 2013[38] Europe 181 2	Geriatric assessment Referral plus follow-up Intervention delivered both within and after discharge from ED ("bridge")	Inclusion: Aged 65-79 with 1 or more chronic disease and dependent in 1 or more ADLs, or ≥ age 80 Exclusion: Dementia; palliative care; and acute severe illness with immediate need of assessment and treatment by physician	High risk: Yes, based on ADL and diagnosis Age: NR Female: 55% Race: NR Living alone: NR Top 3: Frail, visual impairment	Functional status Timing: 3, 6, 9, 12 months Primary: Frailty (Berg Balance scale)	Objective: NA Patient: High
McCusker, 2001[40] Canada 388 2	Brief nursing assessment Referral plus follow-up Intervention delivered both within and after discharge from ED ("bridge")	Inclusion: Aged ≥65 Exclusion: Referred from nursing home or chronic disease hospital; patient expected by ED staff to be admitted; medically unstable or cognitively impaired with no family as proxy; already seen by a member of the hospital's geriatric staff prior to enrollment	High risk: Yes, based on ISAR score Age: 76.6 (7.0) Female: 61% Race: NR Living alone: 40% Top 3: Cardiorespiratory, musculoskeletal, digestive	Functional status: ADL Patient experience Hospitalization: At index visit ED readmit Costs Timing: 1, 4 months Primary: functional status and depression, change in caregiver physical and mental health status, patient and caregiver satisfaction with care	Objective: Low Patient: Low

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient-Reported Outcomes[b]
Mion, 2003[41] USA 650 2	Comprehensive assessment Referral plus follow-up Intervention delivered both within and after discharge from ED ("bridge")	Inclusion: Aged ≥65 Exclusion: Not expected to discharge from ED; impaired hearing; no family caregiver as proxy for cognitively impaired	High risk: No Age: 74.4 (6.9) Female: 59% Race: White (39%), other categories (NR) Living alone: NR Top 3: NR	Functional status: SF36 Mortality Patient experience Hospitalization: After index visit ED readmit Costs Timing: 30, 120 days Primary: Health care service use (defined as ED, hospital, nursing home, health care costs)	Objective: Low Patient: Low
Case Management/Transition of Care PLUS Medication Management					
Biese, 2014[35] USA 178 3	No assessment Referral to community services plus follow-up Intervention delivered after discharge from ED	Inclusion: Aged ≥65 Exclusion: Admitted to hospital; discharged to setting other than home; not referred to outpatient follow-up; cognitively impaired; patient excluded from primary outcome ONLY if returned to ED or was hospitalized within 5 days of index ED visit	High risk: No Age: 75 (7.58) Female: 60% Race: White (67%-74%), Black (23%-31%) Living alone: NR Top 3: NR	Hospitalization: After index visit ED readmit Costs Timing: 35 days Primary: Post-ED discharge measured by expedited outpatient follow-up and/or increased compliance with medication changes	Objective: High Patient: High

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient-Reported Outcomes[b]
Biese, 2017[36] USA 2000 2	No assessment Referral, no follow-up Intervention delivered post ED discharge	Inclusion: Aged ≥65 Exclusion: discharged to hospice or skilled care facility or correctional institution; failed cognitive test; no phone; no ER note; psychiatric reason for ER visit; left ER against medical advice prior enrollment or refusal	High risk: No Age: 74 (7.1) Female: 60% Race: White (77%), Black (19%) Living alone: NR Top 3: Traumatic injury, pain (any), cardiac symptoms	Mortality Hospitalization: After index visit ED readmit Timing: 30 days Primary: Composite of # days from ED discharge to return to ED, hospitalization, or death	Objective: Unclear Patient: High

[a] Outcomes limited to those prioritized for this review.
[b] Objective outcomes (*ie*, non–patient-reported outcomes): mortality, hospitalization, ED readmission. Patient-reported outcomes; health-related quality of life, functional status, patient experience.
[c] Exclusion criteria shown are limited to those relevant to this review.
[d] Index refers to the ED visit during which study enrolment occurred.
Abbreviations: ADL=activities of daily living; ED=emergency department; IADL=independent activities of daily living; ISAR=identification of seniors at risk; NA=not applicable; NR=not reported; SD=standard deviation; SF-36=short-form health assessment questionnaire

NONRANDOMIZED STUDIES

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient-Reported Outcomes[b]
Single-Strategy Interventions					
Discharge Planning					
Arendts, 2012[43] Australia 5265 2	Comprehensive assessment No referral or follow-up Intervention delivered within ED	Inclusion: Aged ≥65;10 conditions including UTI, respiratory infection, fall with minor injury, hip or knee pain, back pain, cardiac failure, angina pectoris, syncope, TIA, new onset confusion or delirium Exclusion[c]: Need for immediate resuscitation; triage to critical care bay in ED or other urgent medical input needed	High risk: Yes, diagnosis Age: 79.6 (8.0) Female: 55% Race: NR Living alone: 30% Top 3: Angina, cardiac failure, respiratory infection	Hospitalization: At index[d] visit Timing: At index visit Primary outcome: Proportion of hospital admissions from ED	Objective: High Patient: NA
Arendts, 2013[44] Australia 2196 2	Comprehensive assessment (only high-risk group) Referrals only, no follow-up Intervention delivered within ED	Inclusion: Aged ≥65 Exclusion: cognitively impaired without surrogate; ED arrival and discharge between 21:00 and 7:00	High risk: Yes, admitted Age: 77.5 (8.0) Female: 56% Race: NR Living alone: 31% Top 3: Fall (no injury or minor injury), ischemic chest pain, non-traumatic musculoskeletal pain	Mortality Hospitalization: After index visit ED readmission Timing: 28 days Primary outcome: ED visit within 28 days	Objective: High Patient: NA

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient-Reported Outcomes[b]
Case Management/Transition of Care					
Pedersen, 2016[48] Europe 1330 2	Assessment part of routine care Referral plus follow-up Intervention delivered after discharge from ED	Inclusion: Aged ≥70; pneumonia, COPD, delirium, dehydration, UTI, constipation, anemia, heart failure, other infections Exclusion: Terminal at admission; already in a follow-up program with the geriatric team; living out of the municipality; transferred to another hospital department	High risk: Yes, diagnosis Age 86.4 (6.2) Female: 62% Race: NR Living alone: 52% Top 3: Urinary tract infection, other infections, pneumonia	Mortality ED readmit Timing: 30 days Primary outcome: ED Readmission rate	Objective: Low Patient: NA
Medication Management					
Mortimer, 2011[47] Australia 199 2	No assessment of risk Referral only, no follow-up Intervention delivered within ED	Inclusion: Aged ≥65 with chronic condition; aged ≥70 without chronic condition; Australasian triage category 2 Exclusion: Australasian triage category 1 (requiring immediate attention)	High risk: No Age: 77.3 (NR) Female: 54% Race: NR Living alone: NR Top 3: "Medical" patient, "surgical" patient, third condition NR	Patient experience ED readmission Timing: Index, 14 & 28 days Primary outcome: NR but power calculation for ED length of stay and ED readmission	Objective: High Patient: High

Study Country # Enrolled # of Arms	Key Intervention Components	Eligibility	Population High Risk? Mean Age (SD) Female % Race % Living Alone % Top 3 Conditions	Outcomes Reported[a] Outcome Timing Primary Outcome	Risk of Bias for Objective and Patient-Reported Outcomes[b]
Multi-Strategy Interventions					
Discharge Planning PLUS Case Management/Transition of Care					
Bond, 2014[45] Canada 1820 2	Assessment by care coordinator Referral only, no follow-up Intervention delivered within ED	Inclusion: Aged ≥65; ICD-10 discharge diagnosis of fall, fracture, sprain, strain, laceration, contusion, superficial injury, or bursitis Exclusion: Discharge diagnosis of hip fracture or trimalleolar ankle fracture; patients who presented to ED for a musculoskeletal complaint within previous 30 days	High risk: Yes, diagnosis and falls Age: 80.5 (8.0) Female: 70% Race: NR Living alone: NR Top 3: NR	Hospitalization: At index visit Hospitalization: After index visit ED readmission Timing: 30 days Primary outcome: Hospital admission rate at index visit	Objective: High Patient: NA
Miller, 1996[46] USA 770 2	Assessment of risk Referral and follow-up Intervention delivered both within and after discharge from ED (“bridge”)	Inclusion: Aged ≥65 Exclusion: Acute illness too severe to permit participation; having <1 hour stay/departure without being seen; revisit by a previously included patient; lack of proxy for patients who did not appear to understand informed consent	High risk: No Age 75.0 (7.0) Female: 60% Race: White (67%), Black/Other (32%) Living alone: 35% (only for intervention group; control data not provided) Top 3: Delirium, depression and undernutrition	Functional status: ADL/IADL, quality of life Mortality Hospitalization: After index visit (# nights) ED readmission Costs Timing: 3 months Primary outcome: NR	Objective: High Patient: High

[a] Outcomes limited to those prioritized for this review.
[b] Objective outcomes (*ie*, non–patient-reported outcomes): mortality, hospitalization, ED readmission. Patient-reported outcomes: health-related quality of life, functional status, patient experience.
[c] Exclusion criteria shown are limited to those relevant to this review.
[d] Index refers to the emergency department visit during which study enrolment occurred.
Abbreviations: ADL=activities of daily living; COPD=chronic obstructive pulmonary disease; ED=emergency department; IADL=independent activities of daily living; ISAR=identification of seniors at risk; NA=not applicable; NR=not reported; SD=standard deviation; SF-36=short-form health assessment questionnaire; TIA=transient ischemic attack; UTI=urinary tract infection

APPENDIX G. INTERVENTION CHARACTERISTICS TABLES

For full study citations in this appendix, please refer to the report's main reference list.

RANDOMIZED STUDIES

Study	Intervention Setting/Timing Intervention Target	# of Providers Type of Provider(s) Geriatrics Trained?	Patient-focused Intervention Components[a]	Provider- or System-focused Intervention Components[a]	Mode of Delivery # Planned Contacts
Single-Strategy Interventions					
Case Management/Transition of Care					
Basic, 2005[34]	Pre-ED discharge Patient	Single provider RN Yes	· **Comprehensive assessment** · **Caregiver support** · *No medication review or rehabilitation intervention* · *No intervention*	· **Referral to specialists** · **Communication between providers** · *No follow-up*	In-person 1
Caplan, 2004[37]	Before and after ED discharge (Bridge)[b] Patient	Multiple providers MD, RN, PT Yes	· **Semi-structured assessment of function & cognition** · *No education/support* · *No medication review or rehabilitation intervention*	· **Follow-up communication** · **Referrals to specialists, community services** · **Interdisciplinary team meeting**	In-person 1
Gagnon, 1999[39]	Post-ED Patient	Single provider RN Yes	· **Comprehensive assessment** · *No education/support* · *No medication review or rehabilitation intervention*	· **Follow-up visit scheduled** · **Interdisciplinary team meeting** · *No referrals to specialist*	In-person NR
Runciman, 1996[42]	Post-ED Patient	Multiple providers PT NR	· **Comprehensive in-home assessment** · *No education/support* · *No medication review or rehabilitation intervention*	· **Referrals to community services** · *No follow-up* · *No continuity of care*	In-person NR

Study	Intervention Setting/Timing Intervention Target	# of Providers Type of Provider(s) Geriatrics Trained?	Patient-focused Intervention Components[a]	Provider- or System-focused Intervention Components[a]	Mode of Delivery # Planned Contacts
Multi-Strategy Interventions					
Discharge Planning PLUS Case Management/Transition of Care					
Eklund, 2013[38]	Before and after ED discharge (Bridge)[b] Patient	Multiple providers RN Yes	· **Frailty screening & geriatric assessment** · *No education/support* · *No medication review or rehabilitation intervention*	· **Follow-up visit scheduled** · **Interdisciplinary team meeting** · *No referrals*	In-person, telephone NR
McCusker, 2001[40]	Before and after ED discharge (Bridge)[b] Patient	Multiple providers MD, RN, SW Yes	· **Brief standardized geriatric nursing assessment** · *No education/support* · *No medication review or rehabilitation intervention*	· **Follow-up communication** · **Referral to primary care provider, specialists** · *No continuity of care*	In-person, telephone NR
Mion, 2003[41]	Before and after ED discharge (Bridge)[b] Patient, caregiver	Multiple providers RN, SW Yes	· **Comprehensive geriatric assessment** · **Caregiver support** · *No medication review or rehabilitation intervention*	· **Follow-up communication** · **Referrals to community services** · **Communication between providers**	In-person, telephone NR
Case Management/Transition of Care PLUS Medication Management					
Biese, 2014[35]	Post-ED Patient	Single provider RN NR	· **Medication review** · *No assessment/ screening* · *No education/support* · *No rehabilitation intervention*	· **Follow-up visits scheduled** · **Referrals to community services** · *No continuity of care*	Telephone NR
Biese, 2017[36]	Post-ED Patient	Single provider RN NR	· **Medication review** · *No assessment screening* · *No education/support* · *No rehabilitation intervention*	· **Referrals to community services** · *No follow-up* · *No continuity of care*	Telephone 1

[a] Bolded text indicates intervention components that were present in the study. Italicized text indicates intervention components were not present in the study.

[b] Bridge setting refers to interventions conducted both before ED discharge and after ED discharge.
Patient-focused intervention components include comprehensive assessment and/or risk screening, patient and/or caregiver education and/or support, intervention (medication, rehabilitation). See Appendix A for more detail.
Provider or systems-focused intervention components include planned follow-up communication or visit, referral to provider, specialist or community resource, continuity of care/care coordination, and changes to ED environment and/or procedures. See Appendix A for more detail.
Abbreviations: ED=emergency department; NR=not reported; MD=physician; RN=nurse; SW=social worker; PT=physical therapist; OT=occupational therapist.

NONRANDOMIZED STUDIES

Study	Setting Intervention Target	# of Providers Type of Provider(s) Geriatrics Trained?	Patient-focused Intervention Components[a]	Provider- or System-directed Intervention Components[a]	Mode # Planned Contacts
Single-Strategy Interventions					
Discharge Planning					
Arendts, 2012[43]	Pre-ED discharge Patient	Multiple providers SW, PT Yes	· **Comprehensive functional assessment** · *No education/support* · *No medication review or rehabilitation intervention*	· **Interdisciplinary team meeting** · *No follow-up* · *No referral*	In-person 1
Arendts, 2013[44]	Pre-ED Patient	Multiple providers MD, RN, SW, PT Yes	· **High-risk screening; comprehensive functional & needs assessment** · *No education/support* · *No medication review or rehabilitation intervention*	· **Referrals made (no details provided)** · *No follow-up* · *No continuity of care*	In-person 1
Case Management/Transition of Care					
Pedersen, 2016[48]	Post-ED Patient	Multiple providers MD, RN Yes	· **Assessment part of routine ED care** · *No education/support* · *No medication review or rehabilitation intervention*	· **Home visit scheduled** · **Patient-initiated follow-up communication** · **Referrals to primary care provider, community services**	In-person 1

Study	Setting Intervention Target	# of Providers Type of Provider(s) Geriatrics Trained?	Patient-focused Intervention Components[a]	Provider- or System-directed Intervention Components[a]	Mode # Planned Contacts
				· *No continuity of care*	
Medication Management					
Mortimer, 2011[47]	Pre-ED discharge Patient	Single providers NR Yes	· **Patient education** · **Medication review & reconciliation** · *No assessment/ screening* · *No rehabilitation intervention*	· **Referrals to other health services** · *No follow-up* · *No continuity of care*	In-person NR
Multi-Strategy Interventions					
Discharge Planning PLUS Case Management/Transition of Care					
Bond, 2014[45]	Pre-ED discharge Patient, caregiver	Single provider RN Yes	· **Assessment performed by ED care coordinator** · **Caregiver education & support** · *No medication review or rehabilitation intervention*	· **Referral to community services** · *No follow-up* · *No continuity of care*	In-person NR
Miller, 1996[46]	Before and after ED discharge (Bridge)[b] Patient	Multiple providers MD, RN Yes	· **Caregiver support** · *No assessment/ screening* · *No medication review or rehabilitation intervention*	· **Follow-up communication/visit** · **Referral to provider, community services** · **Interdisciplinary team meeting**	In-person 1

[a] Bolded text indicates intervention components that were present in the study. Italicized text indicates intervention components not present in the study.
[b] Bridge setting refers to interventions conducted both before ED discharge and after ED discharge.
Patient-focused intervention elements include comprehensive assessment and/or risk screening, patient and/or caregiver education and/or support, intervention (medication, rehabilitation). See Appendix A for more detail.
Provider or systems-focused intervention elements include planned follow-up communication or visit, referral to provider, specialist or community resource, continuity of care/care coordination, and changes to ED environment and/or procedures. See Appendix A for more detail.
Abbreviations: ED=emergency department; NR=not reported; MD=physician; RN=nurse; SW=social worker; PT=physical therapist; OT=occupational therapist.

APPENDIX H. EXCLUDED STUDIES

Exclusion reason Study	Not full publication	Not eligible country	Not population of interest	Not eligible setting	Not eligible intervention	Not eligible design	Not eligible outcome
Adedipe, 2006[1]				X			
Aldeen, 2014[2]						X	
Aldeen, 2014[3]	X						
Anonymous, 2010[4]	X						
Anonymous, 2011[5]	X						
Anonymous, 2012[6]	X						
Anonymous, 2012[7]	X						
Anonymous, 2013[8]	X						
Anonymous, 2014[9]	X						
Anonymous, 2015[10]	X						
Arendts,2013[11]					X		
Arendts, 2017[12]					X		
Argento, 2010[13]	X						
Ballham, 2017[14]	X						
Bell, 2014[15]	X						
Brymer, 2001[16]					X		
Chou, 2015[17]	X						
Chui, 2013[18]	X						
Clegg, 2013[19]				X			
Close, 1999[20]			X				
Conroy, 2014[21]			X				
Corbett, 2005[22]						X	
Davison, 2005[23]			X				
deClifford, 2016[24]			X				
Edgren, 2016[25]			X				
Ellis, 2012[26]						X	
Ellis, 2014[27]	X						
Fallon, 2015[28]						X	
Foo, 2014[29]		X					
Foo, 2012[30]		X					
Fox, 2016[31]						X	
Grudzen,2015[32]						X	
Gutteridge, 2014[33]					X		

Exclusion reason Study	Not full publication	Not eligible country	Not population of interest	Not eligible setting	Not eligible intervention	Not eligible design	Not eligible outcome
Guttman, 2004[34]						X	
Haag, 2016[35]				X			
Harper, 2013[36]						X	
Hegney,2006[37]					X		
Hughes, 2014[38]	X						
Hullick, 2016[39]				X			
Ismail, 2014[40]	X						
Jin, 2016[41]			X				
Jones, 2013[42]						X	
Keelan, 2016[43]	X						
Keyes, 2014[44]						X	
Knowles, 2016[45]			X				
Launay, 2013[46]						X	
Launay, 2013[47]	X						
Launay, 2016[48]				X			
Leah, 2010[49]						X	
Leung, 2016[50]		X					
Liao, 2012[51]						X	
Mahony, 2008[52]					X		
Marsden, 2017[53]							X
Moss, 2016[54]					X		
Ngian, 2008[55]						X	
Nguyen, 2014[56]						X	
Olufajo, 2016[57]				X			
O'Reilly, 2016[58]	X						
Pareja, 2008[59]	X						
Pareja-Sierra, 2013[60]						X	
Polinder, 2016[61]					X		
Rosenberg, 2016[62]						X	
Sahota, 2017[63]				X			
Salvi, 2008[64]						X	
Santolaya-Perrin, 2016[65]							X
Schubert, 2016[66]				X			
Scott, 2014[67]	X						
Shaw, 2016[68]						X	

Exclusion reason Study	Not full publication	Not eligible country	Not population of interest	Not eligible setting	Not eligible intervention	Not eligible design	Not eligible outcome
Silvester, 2014[69]					X		
Sophia, 2014[70]	X						
Stergiopoulos, 2016[71]	X						
Tan, 2012[72]						X	
Tang, 2016[73]	X						
Terrell, 2009[74]			X				
Waldron, 2011[75]					X		
Warburton, 2005[76]						X	
Weir, 1999[77]							X
Weng, 2017[78]		X					
Wentworth, 2015[79]	X						
Wilber, 2013[80]	X						
Wright, 2014[81]						X	
Yim, 2011[82]							X
Yuen, 2013[83]		X					

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APPENDIX I. GLOSSARY

Term	Definition
Assessment	A structured and/or targeted assessment performed as a part of the intervention. A structured assessment may include a comprehensive geriatric assessment or biopsychosocial assessment covering common domains including cognitive performance, functional status, social status and living environment, health behaviors, and psychosocial factors. Brief or targeted assessments may include 1 or more specific domains, such as cognitive performance or functional status.
Bridge	An intervention that takes place across settings, including 1 or more planned contacts before discharge from the ED and again after discharge.
Case management	Case management takes place over time and across settings, initially beginning within the ED and continuing after discharge, and includes the activities that a physician or other health care professional performs to ensure coordination of medical services needed by the patient. The ultimate goal of case management is to help support successful transition from the ED to post-ED settings. Unlike discharge planning in which the patient or caregiver may be responsible for identifying and securing services, in case management, the major responsibility and coordination rests with 1 or more providers.
Discharge planning	Discharge planning is time-limited, taking place fully within the ED, and encompassing the process of thinking about and formalizing a plan of care prior to a patient's discharge from the ED. Discharge planning may incorporate 1 or more of the following: geriatric consultation or geriatric assessment in the ED, patient/caregiver education, or a follow-up plan. Although the initial assessment and discharge planning take place within the ED, the responsibility for coordinating and obtaining follow-up care rests with the patient or caregiver.
Geriatric EDs	EDs designed or guided by the 2014 Geriatric ED Guidelines.[16-18]
Medication safety or management	Interventions that assist patients or caregivers in managing and monitoring drug therapy for older adults with chronic conditions.
Objective outcomes (*ie*, non–patient-reported outcomes)	Objective outcomes are measures that are not subject to a large degree of individual interpretation and are likely to be reliably measured across patients in a study, by different health care providers, and over time.[51]
Patient-reported outcomes	Patient-reported outcomes are directly reported by the patient without interpretation of the patient's response by a clinician or anyone else and pertains to the patient's health, quality of life, or functional status associated with health care or treatment.[52]
Referral plus follow-up	Referral to 1 or more of the following: primary care provider, specialty provider, or community resource or services plus planned communication or visit(s) with intent of following up on referral.
Risk of bias (ROB)	We used the key ROB criteria described in the Cochrane Effective Practice and Organization of Care (EPOC) guidance[29]: · Randomization and allocation concealment · Comparability of groups at baseline · Blinded outcomes assessment · Completeness of follow-up and differential loss to follow-up · Whether incomplete data were addressed appropriately · Protection against contamination · Selective outcomes reporting.

<table>
<tr><th>Term</th><th>Definition</th></tr>
<tr><td></td><td>Summary ROB ratings for a study:
· Low ROB—Bias, if present, is unlikely to alter the results seriously
· Unclear ROB—Bias that raises some doubts about the results
· High ROB—Bias that may alter the results seriously</td></tr>
<tr><td>Scoping review</td><td>Scoping reviews are used to identify knowledge gaps, set research agendas, and identify implications for decision-making. Scoping studies differ from systematic reviews because authors do not typically assess the quality of included studies.</td></tr>
<tr><td>Strength of evidence (SOE)</td><td>We assessed SOE using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach for 4 domains[32]:
<table>
<tr><th>Domain</th><th>Rating</th><th>How Assessed</th></tr>
<tr><td>Risk of bias</td><td>Low
Unclear
High</td><td>Assessed primarily through study design and aggregate study quality</td></tr>
<tr><td>Consistency</td><td>Consistent
Inconsistent
Unknown/NA</td><td>Assessed primarily through whether effect sizes are generally on the same side of “no effect,” the overall range of effect sizes, and statistical measures of heterogeneity</td></tr>
<tr><td>Directness</td><td>Direct
Indirect</td><td>Assessed by whether the evidence involves direct comparisons or indirect comparisons through use of surrogate outcomes or use of separate bodies of evidence</td></tr>
<tr><td>Precision</td><td>Precise
Imprecise</td><td>Based primarily on the size of the confidence intervals of effect estimates, the optimal information size and considerations of whether the confidence interval crossed the clinical decision threshold for using a therapy</td></tr>
</table>
Summary SOE ratings for a body of evidence:
· High—High confidence that the true effect lies close to that of the estimate of the effect.
· Moderate—Moderate confidence in the effect estimate. The true effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different.
· Low—Limited confidence in the effect estimate. The true effect may be substantially different from the estimate of the effect.
· Very low—Very little confidence in the effect estimate. The true effect is likely to be substantially different from the estimate of effect.
· Insufficient—Impossible or imprudent to rate. In these situations, a rating of insufficient is assigned.</td></tr>
</table>