

## Supplemental Online Content

Nguyen OT, Kunta AR, Katoju S, et al. Electronic health record nudges and health care quality and outcomes in primary care: a systematic review. *JAMA Netw Open*. 2024;7(9):e2432760. doi:10.1001/jamanetworkopen.2024.32760

**eTable 1.** Search Strategy

**eTable 2.** Study Characteristics

**eTable 3.** Study Quality Assessment Results

This supplemental material has been provided by the authors to give readers additional information about their work.

**eTable 1.** Search strategy

Database	Terms	Results
MEDLINE/PubMed	MeSH Headings: (attending physicians, hospital OR osteopathic physicians OR internship and residency OR medical students OR primary care physicians OR medical staff OR physicians OR nursing OR nurses OR rehabilitation center OR allied health personnel OR allied health occupation OR physical therapy specialty OR occupational therapy OR speech therapy OR social work OR hospital chaplaincy service OR physician assistant) AND (((electronic health records[MeSH Terms:NoExp]) OR (medical record systems, computerized[MeSH Terms])) OR (clinical decision support systems[MeSH Terms]) OR (medical order entry system[MeSH Terms]))	4,624

Keywords: ("intern" OR "interns" OR "internship" OR "resident" OR "residents" OR "residency" OR "residencies" OR trainee\* OR training OR fellow\* OR postdoc\* OR "post-doctoral" OR "post-doc\*" OR student\* OR hcp OR hcps OR "health care provider" OR "healthcare providers" OR clinician\* OR "general practitioner" OR "general practitioners" OR "primary care provider" OR "primary care providers" OR "PCP" OR "PCPs" OR internist\* OR "primary care physician" OR "primary care physicians" OR surge\* OR "general practice" OR "general practitioner" OR "general practitioners" OR "health care professional" OR "health care professionals" OR psychiatri\* OR hospitalist\* OR "internal medicine" OR internist\* OR cardiolog\* OR radiolog\* OR aneste\* OR anaesthe\* OR pediatric\* OR paediatric\* OR geriatric\* OR orthoped\* OR orthopaed\* OR ophthalmolog\* OR neurolog\* OR urolog\* OR pulmo\* OR oncolog\* OR otolaryngolog\* OR dermatolog\* OR otorhinolaryngolog\* OR gynecolog\* OR gynaecol\* OR obsteric\* OR gastroenterolog\* OR endocrinolog\* OR hepatolog\* OR hematolog\* OR neurosurge\* OR patholog\* OR rheumatolog\* OR immunolog\* OR "infectious disease" OR "infectious diseases" OR "communicable disease" OR "communicable diseases" OR nephrolog\* OR "emergency medicine" OR "medical examiner" OR "medical examiners" OR coroner\* OR osteopath\* OR endodont\* OR anatomist\* OR "behavioral health" OR "behavioural health" OR "mental health" OR "health care practitioner" OR "health care practitioners" OR "healthcare practitioner" OR "healthcare practitioners" OR "care practitioner" OR "care practitioners" OR "health practitioner" OR "health practitioners" OR "home health" OR "MD" OR "MDs" OR "DO" OR "DOs" OR "attending physician" OR prescriber\* OR "attending physicians" OR "physician" OR "physicians" OR doctor\* OR "Rehabilitation therapist" OR "rehabilitation therapists" OR "rehabilitation therapy" OR "allied health" OR "physical therapy" OR "physical therapist" OR "physical therapists" OR "occupational therapy" OR "occupational therapist" OR "occupational therapists" OR "speech therapy" OR "speech therapist" OR "speech therapists" OR "social work" OR "social worker" OR "social workers" OR "chaplain" OR "chaplains" OR "physician assistant" OR "physician assistants" OR "physician associate" OR "physician associates" OR "midlevel provider" OR "mid-level provider" OR "midlevel providers" OR "midlevel provider" OR "physician extender" OR "physician extenders" OR "Nursing student" OR "nursing students" OR nurse\* OR nursing OR midwi\* OR doula\* OR "registered nurse" OR "registered nurses" OR "licensed practical nurse" OR "licensed practical nurses" OR "licensed practical nursing" OR "nursing assistant" OR "birth assistant" OR "birth attendant" OR "nursing aide" OR "nursing aides" OR "geriatric aide" OR "advanced registered nurse practitioner" OR "advanced registered nurse practitioners" OR "advanced practice registered nurse" OR "advanced practice registered nurses" OR "RN" OR "RNs" OR "ARNP" OR "ARNPs" OR "LPN" OR "LPNs" OR "APRN" OR "APRNs" OR "nurse anesthetist" OR "nurse anesthetists" OR "advanced practice nurse" OR "advanced practice nurses" OR "advanced practice nursing" OR "cardiovascular nursing" OR "community health nursing" OR "critical care nursing" OR "emergency nursing" OR "critical care nursing" OR "emergency nursing" OR "ER nurse" OR "ER nurses" OR "ICU nurse" OR "ICU nurses" OR "ICU nursing" OR "family nursing" OR "forensic nursing" OR "geriatric nursing" OR "holistic nursing" OR "hospice nursing" OR "palliative care nursing" OR "maternal-child nursing" OR midwifery OR "military nursing" OR "nephrology nursing" OR "neuroscience nursing" OR "obstetric nursing" OR "occupational health nursing" OR "oncology nursing" OR "orthopedic nursing" OR "pediatric nursing" OR "perioperative nursing" OR "psychiatric nursing" OR "public health nursing" OR "radiologic nursing" OR "imaging nursing" OR "rehabilitation nursing" OR

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**eTable 2.** Study characteristics

Study	Count	Clinician Type	Medical Conditions Studied	Length of Evaluation Period	Study Design	Sample Size	Overall Nudge Intent	Education Provided? (e.g., in-person, video, text, phone, email, screen shots)	Supporting Materials (e.g., notes, cards, emails, screen shots)	Positioning (e.g., in-clinic, home, office)	Audit and Feedback	Patient Education	Had Guidance?	Had Enabling?	Had Framing?	Had Provisional?	Electronic Health Records	Hardware	Had Temp?	Had Or?	Implementation Facilitators	Implementation Barriers
McDowell et al., 1989	Canada	Physicians, nurses	Hypertension screening	1 year	Parallel RCT	Letter reminder: 1,508 patients Telephone reminder: 1,433 patients Computerized reminder: 1,432 patients Usual care: 1,371 patients	Increase behavior frequency	No	No	No	No	Yes	No	No	No	Yes	Not reported	Yes	No	No	Not assessed	Not assessed

Flotto rp et al., 2002	Norway	Not report ed	Urinary tract infections, pharyngitis	4 months	Cluster RCT	<u>Sore throat</u> 56 intervention clinics, 57 control clinics	Increase behavior frequency	Yes	Yes	No	No	Yes	No	No	No	Yes	WinM ed	Yes	No	No	Not assesse d	Not assessed
						<u>UTI</u> 57 intervention clinics, 56 control clinics																
Tamb lyn et al., 2003	Canada	Physi cians	Overprescrib ing of medications	13 months	Cluster RCT	54 intervention physicia ns, 53 control physicia ns	Decrease behavior frequency	No	No	No	No	No	No	No	No	Yes	Not report ed	Yes	No	No	None reported	Compute r problems
Frank et al., 2004	Australia	Physi cians	Multiple preventive screening and immunization s	Not applic able	Parallel RCT	Intervention group 5118 patients; control group 5389 patients	Increase behavior frequency	No	No	No	No	No	No	No	No	Yes	Not report ed	Yes	No	No	Not assesse d	Not assessed

Sequist et al., 2005	United States	Physicians	Diabetes, coronary artery disease	6 months	Cluster RCT	92 physicians and 2,924 patients in intervention arm, 102 physicians and 3,319 patients in control arm	Increase behavior frequency	No	No	No	No	No	No	No	No	No	Yes	LMR	Yes	No	No	None reported	Lack of time during visit, patient noncompliance or refusal of treatment ; lack of knowledge of specific guideline recommendation, lack of awareness of guideline's existence , disagree with guideline recommendation
Palen et al., 2006	United States	Physicians	Laboratory values monitoring	1 year	Parallel RCT	207 physicians total: Alert condition: 103; Usual care condition: 104	Increase behavior frequency	Yes	No	No	No	No	No	No	No	No	Yes	IBM - Clinical Information System	Yes	No	No	Not assessed	Not assessed

					physicians total																	
Feldstein et al., 2006	United States report	Not reported	Osteoporosis	25 day follow-up	Parallel RCT	15 total clinics: 1) EHR alert group (4 clinics, 44 clinicians, 196 patients) ; 2) voice mail group (3 clinics, 44 clinicians, 267 patients) ; 3) pharmacy team outreach (4 clinics, 56 clinicians, 261 patients) ; 4) Usual care group (4 clinics, 56 clinician	Increase behavior frequency	No	No	No	No	No	No	No	No	Yes	Not reported	Yes	Yes	No	Not assessed	Not assessed



van Wyk et al., 2008	Nethe rlands cians	Physi cians	Dyslipidemia	12 month follow-up	Clust er RCT	Total: 38 practice s; 1) Alert conditio n (13 practice s; 26 physicia ns; 31211 patients) ; 2) On-demand support conditio n (14 practice s; 34 physicia ns; 29518 patients) ; 3) Control conditio n (11 practice s; 20 physicia ns; 31325 patients)	Incre ase beha vior frequ ency	No	No	No	No	No	No	No	No	Yes	ELIAS syste m	Ye s	No	No	Not asse ssed	Not assessed
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Lo et al., 2009	United States	Physicians, NPs, PAs, nurses	Laboratory values monitoring	Not applicable	Cluster RCT	Control: 191 providers and 1520 patients; intervention: 175 providers and 1245 patients	Increase behavior frequency	No	No	No	No	No	No	No	No	No	Yes	Longitudinal Medical Record	Yes	No	No	Not assessed	Not assessed
Gill et al., 2009	United States	Physicians	Lipids monitoring	1 year	Cluster RCT	12 offices intervention arm (26,996 patients, 49 physicians), 13 offices control arm (37,454 patients, 56 physicians)	Increase behavior frequency	No	No	No	No	Yes	No	No	No	Yes	Centricity	Yes	Yes	Yes	Not assessed	Not assessed	
Linder et al., 2009	United States	Physicians, PAs, NPs	Smoking cessation	9 months	Cluster RCT	14 practices, 314 clinicians, and 68,309 patients in	Increase behavior frequency	No	No	No	No	No	No	No	No	Yes	LMR	Yes	No	Yes	Not assessed	Not assessed	

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ion arm

Fortu na et al., 2009	United States Physicians	Overprescrib ing of hypnotic medications	1 year	Clust er RCT	14 internal medicin e practice s	Decrease beha vior frequ ency	Yes	Yes	No	No	No	No	Yes	No	Yes	Epic	Ye s	Yes	Ye s	Not asse s ed	Not assess ed
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Schriefer et al., 2009	United States	Physicians	Obesity	Unclear	Cluster RCT	2 teams, 18 physicians, 379 patients were in intervention arm, 2 teams, 19 physicians, and 467 patients were in control arm	Increase behavior frequency	No	No	No	No	No	No	No	No	No	Yes	Not reported	Yes	No	No	Not assessed	Not assessed
Fiks et al., 2009	United States	Not reported	Influenza immunizations	6 months	Cluster RCT	5,809 patients in control arm, 6,110	Increase behavior frequency	Yes	Yes	No	No	No	No	No	No	No	Yes	Epic	Yes	No	No	Not assessed	Not assessed

					patients in intervention arm																	
Co et al., 2010	United States	Physicians	Attention-deficit/hyperactivity disorder	Not applicable	Cluster RCT	412 patients total: Intervention: 206 patients; control: 206 patients; each group included 3 community health centers and 3 private practices	Increase behavior frequency	Yes	Yes	No	No	No	No	No	Yes	Yes	Longitudinal Medical Record	Yes	Yes	No	Not assessed	Not assessed
Playe r et al., 2010	United States	Physicians, PAs, NPs	Gastroesophageal reflux disease	1 year	Cluster RCT	13 offices with 53 providers were randomized to the intervention group, and 14	Increase behavior frequency	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Community	No	Yes	Yes	Not assessed	Not assessed

offices with 66 providers were randomized to the control group.

Bell et al., 2010	United States	Physicians	Asthma	1 year	Cluster RCT	Control- 9035 Intervention- 10415 Total= 19450	Increase behavior frequency	Yes	No	No	No	No	No	No	No	Yes	Epic	Yes	Yes	Yes	Not assessed	Not assessed
Gill et al., 2011	United States	Physicians, NPs, PAs	Gastrointestinal monitoring for patients taking non-steroidal anti-inflammatory drugs	1 year	Cluster RCT	53 clinicians and 2,222 patients in intervention arm, 66 clinicians and 3,012 patients in control arm	Increase behavior frequency, decrease behavior frequency	Yes	Yes	No	No	No	No	No	No	Yes	Centricity	Yes	Yes	Yes	Not reported	Took too much time
O'Connor et	United States	Physicians	Diabetes	21 months	Cluster RCT	6 clinics, 20 physicians,	Increase behavior	Yes	No	No	No	No	No	Yes	No	Yes	Not reported	No	No	No	Not assessed	Not assessed

al., 2011					1,194 patients in intervention arm; 5 clinics, 20 physicians, 1,362 patients in control arm	frequency															
Abdel-Kader et al., 2011	United States	Physicians	Chronic kidney disease	1 year	Parallel RCT	103 patients and 15 physicians in control arm, 145 patients and 15 physicians in intervention arm	Increase behavior frequency, decrease behavior frequency	Yes	No	No	No	No	No	No	Yes	Epic	Yes	No	Yes	Not assessed	Not assessed
Loo et al., 2011	United States	Physicians	Pneumococcal immunizations, influenza immunizations, osteoporosis screening, designation	12 months	Parallel RCT	17 physicians and 1,336 patients received only EMR reminders, 17	Increase behavior frequency	No	No	No	No	No	No	No	Yes	Not reported	Yes	No	No	Not assessed	Not assessed

		of a health care proxy				physicians and 1,394 patients received EMR reminders and panel management, 20 physicians and 1,930 patients in usual care																
Feder et al., 2011	United Kingdom	Not reported	Domestic violence screening	1 year	Cluster RCT	24 intervention clinics, 24 control clinics	Increase behavior frequency	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Not reported	No	Yes	No	Not assessed	Not assessed
Tang et al., 2012	United States	Physicians	Weight management	6 months	Cluster RCT	15 physician control physicians. 200 randomly selected patients	Increase behavior frequency	Yes	No	No	No	No	No	No	Yes	Yes	Epic	Yes	Yes	Yes	Not reported	Insufficient time in clinic, tool complexity, patient disinterest, personal disinterest



Tamblyn et al., 2012	Canada	Physicians	Overprescribing of psychotropic drugs	Cluster RCT	81 physicians and 5628 patients total; intervention: 41 physicians and 2887 patients; control: 40 physicians and 2741 patients	Decrease behavior frequency	Yes	No	No	No	No	No	No	No	Yes	MOXXI	Yes	No	No	Not assessed	Not assessed
Sequist et al., 2012	United States	Physicians, PAs, NPs	Chest pain	2-month follow-up	Parallel RCT intervention group (149 clinicians; 3634 patients); control group (143 clinicians, 3449 patients)	Increase behavior frequency	Yes	No	No	No	No	No	Yes	No	Yes	Epic	Yes	No	No	Not assessed	Not assessed

Wright et al., 2012	United States	Not reported	ADHD, asthma/COPD, breast cancer, CAD, congenital coagulopathy, CHF, diabetes mellitus, glaucoma, hypertension, hyperthyroidism, hypothyroidism, myasthenia gravis, osteoporosis/osteopenia, rheumatoid arthritis, renal failure/insufficiency, sickle cell disease, stroke	6 months	Cluster RCT	14 clinics and 38,025 patients in intervention arm, 14 clinics and 41,039 patients in control arm	Increase behavior frequency	No	No	No	No	No	No	Yes	No	No	Yes	LMR	Yes	No	No	Not assessed	Not assessed
Høye et al., 2013	Norway	Not reported	Upper respiratory infections	One year	Cluster RCT	40 groups of clinicians in intervention arm, 41 groups in control arm. Together	Decrease behavior frequency	Yes	No	No	No	No	No	Yes	No	No	No	Not reported	Yes	No	No	Not assessed	Not assessed

r, there  
were  
328 GPs

156 GPs  
in  
intervention  
groups  
172 GPs  
in  
Control

Fiks et al., 2013	United States Physicians Human papillomavirus immunizations	12 month follow-up	Cluster RCT	22 practice sites total: 1) clinician focused intervention only (4495 families) ; 2) family focused intervention only (5714 families) ; 3) clinician and family focused intervention (5593 families)	Increase behavior frequency	Yes	No	No	Yes	No	No	No	No	Yes	Epic	Yes	No	No	Not assessed	Not assessed
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Stockwell et al., 2015	United States	Physician, NPs, nurses	Influenza immunizations	1 year	Crossover RCT	6593 patients	Increase behavior frequency	Yes	No	No	No	No	No	No	Yes	No	Yes	Allscripts Sunrise	Yes	No	No	Not assessed	Not assessed
Szilagi et al., 2015	United States	Physicians, nurses	Pediatric immunizations	1 year	Cluster RCT	11 clinics in control arm, 11 clinics in intervention arm	Increase behavior frequency	Yes	No	No	No	No	No	No	No	Yes	Not reported	Yes	No	No	Not reported	Lack of time, errors in how prompts are fired, lack of complete intervention acceptance by clinicians and staff	
Meeker et al., 2016	United States	Physicians	Upper respiratory infections	18 month follow-up	Cluster RCT	Total: 49 practices; 6 practices; 27 clinicians (control condition); 6 practices; 42 clinicians (suggested alternati	Decrease behavior frequency	No	No	No	Yes	No	No	No	Yes	Yes	Mixed	No	No	Yes	Not assessed	Not assessed	

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Guiriguet et al., 2016	Spain	Physicians, nurses	Colorectal cancer screening	1 year	Parallel RCT	67 GPs and 21,619 patients in intervention arm, 63 GPs and 19,423 patients in control arm	Increase behavior frequency	No	No	No	No	No	No	No	No	Yes	Not reported	Yes	No	No	Not assessed	Not assessed
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Kressin et al., 2016	United States	Physicians	Hypertension	1 year	Cluster RCT	8866 patients, sample size per group not reported	Increase behavior frequency	Yes	No	No	No	No	No	No	Yes	Yes	Yes	Not reported	Yes	No	No	Not assessed	Not assessed
Federman et al., 2017	United States	Physicians, medical assistants	Hepatitis C Virus testing	11 months	Cluster RCT	82 clinicians in intervention arm and 45 clinicians were in control arm. There were also 14,825 patients in intervention arm and 10,795 patients in control arm.	Increase behavior frequency	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Epic	Yes	No	Yes	Not assessed	Not assessed	
Kharbanda	United States	Physicians, nurses	Hypertension	90-days	Cluster RCT	20 practice sites total: intervention	Increase behavior	Yes	No	No	No	No	No	No	Yes	TeenBP	Yes	No	Yes	Not assessed	Not assessed		

et al., 2018						ion: 607 patients, control: 607 patients																
Karlsson et al., 2018	Sweden	Physicians	Atrial fibrillation	1 year	Cluster RCT	22 clinics in intervention, 21 clinics in usual care	Increase behavior frequency	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Change Health care Systems	Yes	No	No	Not assessed	Not assessed
Sequist et al., 2018	United States	Physicians	Chronic kidney disease	1 year	Parallel RCT	76 physicians and 3,913 patients in intervention arm, 77 physicians and 3,778 patients in control arm	Increase behavior frequency	No	No	No	No	Yes	No	No	No	Yes	Epic	Yes	No	No	Not assessed	Not assessed
Chak et al., 2018	United States	Not reported	Hepatitis B screening	1 year	Parallel RCT	1,484 patients in intervention arm, 1,503 randomized in	Increase behavior frequency	No	No	No	No	No	No	No	Yes	Epic	Yes	No	No	Not assessed	Not assessed	



						control arm																	
Tamblyn et al., 2018	Canada	Physicians	Uncomplicated hypertension	60 months	Parallel RCT	38 physicians and 1,914 patients in intervention arm, 38 physicians and 1,678 patients in control arm	Increase behavior frequency	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Not reported	Yes	No	Yes	Not reported	Having only one option to choose from, which prevents clinical judgment from being used to determine the best option for patients	
Gulliford et al., 2019	United Kingdom	Not reported	Upper respiratory infections	Not applicable	Cluster RCT	41 intervention clinics, 38 control clinics	Decrease behavior frequency	Yes	No	No	Yes	No	No	No	No	Yes	Not reported	Yes	No	No	Not assessed	Not assessed	
						Unknown number of clinicians in each arm																	

Zafar et al., 2019	United States	Physicians	Lower back pain	The intervention period varied for each condition: Baseline- 8 months Intervention period 1 with report cards for group 1 and CDS alerts for group 2- 10 months Intervention period 2- 12 months both groups receive	Cross-over RCTs with average of 142.000 annual adult outpatient visits.	8 PCP practice s with average of 142.000 annual adult outpatient visits.	Decrease behavior frequency	No	No	No	Yes	No	No	No	No	Yes	Not reported	Yes	No	No	Not assessed	Not assessed
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reports  
cards  
and  
CDS  
alerts

Weiner et al., 2020	United States	Physicians	Hypoglycemia	Five-month follow-up assessment	Parallel RCT	343 total clinicians: 1) intervention condition (123 clinicians, 3350 patients); and 2) control condition (220 clinicians, 3395 patients)	Increase behavior frequency	No	No	No	No	No	No	No	No	No	Yes	Regenstrief G3 system	Yes	No	No	Not assessed	Not assessed
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McKie et al., 2020	United States	Physicians, APPs	Cardiovascular disease	7-day follow-up after patient visit	Cluster RCT	20 care teams: 1) intervention condition (10 care teams; 55 clinicians); 2) control condition	Increase behavior frequency	Yes	No	No	No	No	No	No	No	Yes	General Electric Centricity	Yes	No	No	Not assessed	Not assessed
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						n (10 care teams; 54 clinicians)																
Chak et al., 2020	United States	Not reported	Hepatitis B screening	3 years	Parallel RCT	Cohort 1: 1,542 intervention patients, 1,568 control patients Cohort 2: 2,599 intervention patients, 2,590 control patients	Increase behavior frequency	No	No	No	No	No	No	No	No	Yes	Epic	Yes	No	No	Not assessed	Not assessed
Stephens et al., 2021	United States	Physicians, NPs	Pediatric immunizations	1 year	Crossover RCT	Not reported	Increase behavior frequency	No	No	No	No	No	No	No	Yes	Not reported	Yes	No	No	Not reported	Concerns on accuracy of reminder	
Campbell et al., 2021	United States	Not reported	Anticholinergics	12 months	Cluster RCT	254 patients in intervention arm, 298 patients in	Decrease behavior frequency	No	No	No	No	Yes	Yes	No	No	Yes	Not reported	Yes	No	Yes	Not assessed	Not assessed

						control arm																
Dhingra et al., 2021	United States	Physicians, NPs, PAs	Musculoskeletal or neuropathic pain	6 months	Crossover RCT	Early Implementation: n=256 patients and 3 practices Delayed Implementation: n=272 patients and 3 practices	Increase behavior frequency	Yes	Yes	No	No	No	No	No	No	Yes	Epic	Yes	Yes	Yes	Not assessed	Not assessed
Kraemer et al., 2022	United States	Not reported	Musculoskeletal pain, headache	12 months	Cluster RCT	12 practice sites and 5,082 patients in control arm, 12 practice sites and 7,006 patients in arm with opioid justification, 12 practice sites and	Decrease behavior frequency	No	No	No	Yes	No	No	Yes	Yes	Yes	Not reported	Yes	No	Yes	Not assessed	Not assessed

5,704 patients in arm with clinician comparison, and 12 practices and 4,828 patients in arm with opioid justification and clinician comparison

Weiner et al., 2022	United States	Physicians	Not reported	6 months	Parallel RCT	177 patients in intervention arm, 275 patients in control arm	Increase behavior frequency	No	No	No	No	No	No	No	No	No	Yes	Cerner, Epic	Yes	No	No	Not assessed	Not assessed
Lee et al., 2023	United States	Not reported	Alcohol screening	2 yrs, 7 months	Crossover RCT	19 sites and 255,789 patients in usual care arm, the	Increase behavior frequency	Yes	No	No	Yes	No	No	No	No	No	Yes	Not reported	Yes	No	No	Not assessed	Not assessed

same 19 sites and 228,258 patients in intervention arm

Sigel et al., 2023 United States reported Not Firearm screening 3 years Paralel RCT 15 visits in control arm, 41 in intervention arm Increase behavior frequency Yes No No No No No No No No Yes Not reported Yes Yes No Not assessed Not assessed

Adusumalli et al., 2023 United States Physicians prescribing Statin 6 months Cluster RCT 7 clinics, 39 clinicians, and 1,032 patients in control arm Increase behavior frequency No No No Yes No No No No Yes Epic Yes No No Not assessed Not assessed

7 clinics, 44 clinicians, 1,181 patients in patient nudge arm

7 clinics, 32

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7 clinics,  
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**eTable 3.** Study quality assessment results

Study	Randomization Process	Timing of Identification or Recruitment of Participants	Carryover Effects	Assignment to Interventions	Adhering to Interventions	Missing Outcome Data	Measurement of Outcome	Selection of Reported Result	Overall Risk of Bias
Adusumalli et al., 2023	Low	Low	N/A	Low	Low	Low	Low	Low	Low
Bell et al., 2010	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Campbell et al., 2021	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Co et al., 2010	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Feder et al., 2011	Low	Low	N/A	Low	Some	Low	Low	Low	Some
Federman et al., 2017	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Fiks et al., 2009	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Fiks et al., 2013	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Flottorp et al., 2002	Low	Low	N/A	Low	Some	High	Low	Some	High
Fortuna et al., 2009	Some	Low	N/A	Some	High	Low	Low	Low	High
Gill et al., 2009	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Gill et al., 2011	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Gulliford et al., 2019	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Hoye et al., 2013	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Karlsson et al., 2018	Low	Low	N/A	High	High	Low	Low	Some	High
Kharbanda et al., 2018	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Kraemer et al., 2022	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Kressin et al., 2016	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Linder et al., 2009	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Lo et al., 2009	Some	Low	N/A	Low	Some	Low	Low	Some	Some
McKie et al., 2020	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Meeker et al., 2016	Low	Low	N/A	Low	Some	Low	Low	Some	Some
O'Connor et al., 2011	Some	Low	N/A	Low	Some	High	Low	Some	High
Player et al., 2010	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Schriefer et al., 2009	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Sequist et al., 2005	Some	Low	N/A	Low	Some	Low	Low	Some	Some

Szilagyi et al., 2015	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Tamblyn et al., 2012	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Tamblyn et al., 2003	Low	Low	N/A	Some	High	Low	Low	Low	High
Tang et al., 2012	Low	Low	N/A	Low	Some	Low	Low	Some	Some
van Wyk et al., 2008	Some	Low	N/A	Low	Some	Low	Low	Some	Some
Wright et al., 2012	Low	Low	N/A	Low	Some	Low	Low	Some	Some
Zera et al., 2015	Some	Low	N/A	Low	Some	High	Low	Some	High
Palen 2006	Low	N/A	N/A	High	High	Low	Low	Some	High
Sequist 2012	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Hsu 2013	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Frank 2004	Some	N/A	N/A	Low	Some	Low	Low	Some	Some
Weiner 2020	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Sequist 2018	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Chak 2018	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Tamblyn 2018	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Guiriguet 2016	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
McDowell 1989	Some	N/A	N/A	Low	Some	Low	Low	Some	Some
Chak 2020	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Abdel-Kader 2011	Some	N/A	N/A	Low	Some	Low	Low	Some	Some
Loo 2011	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Sigel 2023	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Weiner 2022	Low	N/A	N/A	Low	Some	Low	Low	Low	Some
Feldstein et al., 2006	Low	N/A	N/A	Low	Some	Low	Low	Some	Some
Zafar 2019	Low	N/A	Low	Low	Some	High	Low	Some	High
Stockwell 2015	Low	N/A	High	Low	Some	Low	Low	Some	High
Dhingra 2021	Some	N/A	Low	Low	Some	High	Low	Some	High
Stephens 2021	Low	N/A	High	Low	Some	Low	Low	Some	High
Lee 2023	Low	N/A	Low	Low	Some	Low	Low	Low	Some