Supplemental Table 1. Summary of Papers Reporting on Pre-Visit Planning

Project authors	Field	Project description	PVP steps[1]	Automation	QI approach	Outcomes
Primary Care						
Rivo et al, 2016	Primary care	Examine impact of pre-visit preparation on reducing patient no-show rates and improving compliance with tests and screenings	**1** 2 **3 4 5 6 7 8 9** 10	-	-	Process: Percentage of patients in compliance for diabetic screening was higher for those contacted than those not contacted; no show rates decreased in both groups.
Vockell et al, 2018	Primary care (pediatric)	Describe role of parent coordinator to support a clinic	**1** 2 3 **4 5 6 7** 8 9 **10**	-	-	Intervention description only.
Peterson et al, 2008	Primary care	Determine whether implementation of a multicomponent organizational intervention can improve diabetes care and outcomes in primary care	**1 2** 3 **4 5** 6 **7** 8 9 10	-	-	Patient: Lowered proportion of patients with high systolic blood pressure; reduced mean HbA1C levels; Process: Increased examinations and testing.
Wooldridge et al, 2017	Primary care	Using SEIPS[2] conceptual model to improve processes in primary care	**1 2 3** 4 **5 6** 7 8 9 10	-	-	Description of process mapping for future improvement.
Howard and Sturner, 2017	Primary care (pediatric)	Review to describe process of screening and addressing developmental and behavioral problems using an online clinical screening and process support system	1 2 3 4 **5 6** 7 **8 9** 10	Pre-visit questionnaires automatically selected and sent to patients/ parents prior to visit; scores integrated into the EMR	-	Intervention description only.
Contratto et al, 2017	Primary care	Clerical support to improve physician order entry to improve physician	1 **2 3** 4 **5** 6 7 8 9 10	EHR automatically notified physicians of proposed	-	Provider: Physicians reported improvements in overall QOL, personal

		satisfaction and other provider outcomes		orders that were pending signature		balance, and burnout level; Process: Increase in work relative value units (wRVUs).
Cox et al, 2018	Primary care	Pre-visit pharmacist review of high-risk patients treated with opioids	1 2 3 **4** 5 6 7 **8** 9 10	-	Rapid cycle QI	Patient: Decreased opioid use, no change in pain scores; Process: 38% of pharmacist recommendations were implemented by physicians.
Kawamoto et al, 2017	Primary care	Evaluate the long-term impact of EHR record enabled, and chronic care model-based population health program; focus on management of diabetes population	1 **2** 3 4 5 6 **7** 8 9 10	EHR-facilitated population health management	-	Patient: No change in HbA1c levels; Process: EHR program took less time and resources to operate.
Allende-Richter et al, 2018	Primary care (pediatrics and adolescents)	Improve teamwork and increase same-day access to primary care services using patient completed pre-visit checklist reviewed by clinical assistant	1 2 3 4 **5** 6 7 8 **9** 10	-	PDSA	Provider: Positive staff feedback; Process: Increased use of reproductive health counseling and nursing services.
Bose-Brill et al, 2018	Primary care	Developed workflow around a framework sent via EHR-linked patient portal to complete ACP	1 2 3 4 **5** 6 **7** 8 9 10	ACP framework sent to patient via patient portal	-	Process: ACP documentation in EHR increased.
Hills et al, 2015	Primary care	Implement and evaluate a systematic, guideline-based QI program for cervical cancer screening using provider education, patient reminder letters,	1 2 3 4 **5 6** 7 8 9 10	Used clinical decision support system	QI	Process: Increased guideline compliant cervical cancer screening rates.

		clinical decision support, and procedures manual				
Wald et al, 2010	Primary care	Implementation of a pre-visit eJournal	1 2 3 4 5 6 **7** 8 **9** 10	System generated request for patient to complete eJournal at set time points prior to visit	-	Patient: Patients who completed an eJournal felt it improved visit preparation; Provider: Perception that patients who completed an eJournal were better prepared; information about medication, allergies, or diabetes may be of greater utility.
Wilkinson et al, 2013	Primary care	QI project to improve clinical preventive service performance rates involving care gap summaries and care coordinator role	1 2 3 4 **5 6** 7 8 9 10	Computer algorithm generated care gap summaries	PDSA	Process: Downward trend in missed screening.
Wong et al, 2019	Primary care	Improve adherence to quality measures for patients on opioid therapy and utilization of office visits using management templates and nursing workflow redesign	1 2 3 4 **5** 6 7 **8** 9 10	-	PDSA	Patient: Average daily morphine milligram equivalents decreased; Process: Increased documentation of annual toxicology and use of opioid risk tool.
Baker et al, 2011	Primary care	To see if addition of paper-based pre-visit quality reminders could improve performance for chronic care measures that had already been improved with EHR system improvements	1 2 3 4 **5** 6 7 8 9 10	EHR 'queried' to pull quality deficits automatically and printed on paper	-	Patient: Glycemic control (hemoglobin A1c <8 %) did not change; Process: Some performance measures improved, others declined.

Grant et al, 2016 & 2017; Vo et al, 2019	Primary care	RCT, multisite intervention to get patients with poorly controlled type 2 diabetes to identify their top priorities before a visit and send those priorities to the physician via progress note in EHR	1 2 3 4 5 6 **7** 8 9 10	Email sent to patients via patient portal with link to survey prior to visit; survey responses viewable by provider in EHR	-	Patients: No changes in HbA1c; patients more likely to report being given choices about their treatment and prepare questions for their doctor in advance.
Grout et al, 2019	Primary care (pediatric)	Improve adolescent self-report rate on pre-visit screening through alerts to clinic staff and person completing the questionnaire	1 2 3 4 5 6 7 8 **9** 10	EHR alerted front desk staff to deliver prescreening form via tablet	QI	Process: Increased self-reporting by adolescents.
Hunt et al, 2011	Primary care	Improve the efficiency of annual exam by proactively identifying and preordering appropriate tests so that test results would be available to discuss at the time of visit	1 2 **3** 4 5 6 7 8 9 10	-	-	Process: Nursing time to do pre-orders increased with less input from provider; 87.8% of patients with pre-ordered tests completed them; 61% with pre-ordered labs had abnormal results and could be discussed face-to-face during the appointment.
Specialty care						
Jackson et al, 2019	Hemophilia clinic	Used QI to optimize outpatient comprehensive hemophilia clinic flow	**1** 2 **3** 4 **5** 6 7 **8 9 10**	Standardized EHR phrase created to streamline information captured during rooming process	Lean methods (value stream mapping, PDSA)	Patient: Perceived less downtime between providers during single clinic encounter; Process: Average clinic visit duration remained constant; clinic utilization increased from 60% to 89%.

Cooper et al, 2019	Tertiary pediatric care	Increase education and pregnancy screening in rheumatology clinic by physician-nurse teams	1 2 **3 4 5** 6 7 **8** 9 10	-	PDSA	Process: Statistically significant increases in patient education and pregnancy screening.
Harris et al, 2015	Pediatric rheumatology	Improve pneumococcal vaccination rates in pediatric rheumatology patients through staff education, pre-visit planning, and reminders	1 2 3 **4 5** 6 **7** 8 9 **10**	-	QI	Process: Vaccination rates increased.
Ho, 2014	Diabetes clinic	Improve wait time, communication and workflow between various health care providers for a diabetes center, and improve clinic experience; improve patient turnaround time	**1 2 3** 4 5 **6** 7 8 9 10	-	QI	Patient: Compliments from patient feedback increased; Provider: 95% of staff interviewed (n=22) satisfied with clinic efficiency; Process: No improvement in patient turnaround time; non-attendance rates decreased.
Crandall et al, 2011 & 2012	Pediatric gastroenterology	Used IHI Breakthrough series collaborative across centers to test changes in chronic illness care for children with IBD; 23 sites using QI approaches to improve care	1 2 **3 4 5** 6 7 8 9 10	-	QI collaborative, PDSA	Patient: Proportion of patients with inactive disease increased; Process: Increase in proportion visits with complete disease classification, measurement of TPMT and appropriate dosing of thiopurine.
Garg et al, 2018	Rheumatology	Improve the rate of pneumococcal vaccination in patients with systemic lupus erythematosus through physician chart	1 2 3 **4 5** 6 7 8 **9** 10	-	QI	Process: Immunization rates increased.

		review and day-of-visit planning				
Jean et al, 2017	Pediatric GI and rheumatology	Use QI approach to improve hepatitis B screening and vaccination rates in pediatric IBD patients	1 2 **3 4 5** 6 7 8 9 10	Automated reports of patients in need of hepatitis B screening/ immunization	PDSA	Process: Screening rates increased.
Savarino et al, 2016	Pediatric gastroenterology	Use PVP with care recommendations made by a team to increase remission rate in IBD patients	1 2 3 **4 5** 6 7 8 9 **10**	EMR-generated report	PDSA	Patient: IBD remission rate increased; Provider: Physicians found recommendations from care team helpful.

[1]PVP: Pre-visit planning. AMA categories of 10 steps for PVP

1. Reappoint the patient
2. Visit planner
3. Lab tests
4. Visit preparations
5. Care gap checklist
6. Appointment reminder
7. Pre-visit phone call/email
8. Huddle
9. Questionnaire
10. Handoff

[2]SEIPS: Systems Engineering Initiative for Patient Safety