Vaccination Programs: Standing Orders

Summary Evidence Tables – Updated Evidence (search period: 1997-2012)

Standing Orders When Used Alone

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Bourdet (2003) **Study Period:** Jan –Feb 2001 **Design Suitability (Design):** Greatest (other w/concurrent comparison) **Outcome Measure:** Influenza vaccination PPV	**Location:** USA, Chapel Hill, NC **Intervention:** Pharmacist Assessment + Standing Orders **Comparison:** Usual Care	Pharmacist-managed program of Influenza and PPV immunization utlizing standing orders **Setting:** University of North Carolina, Chapel Hill Hospitals (teaching hospital) Study medical center: N=1 Eligible patients Adults: • ≥ 18 years of age Group N admitted N w/risk PPV Inf Inter 542 442 478 Comp 761 608 659	Vaccination rates: Influenza PPV	 C: 5 (0.8%) out of 659 C: 3 (0.5%) out of 608	 I: 47 (9.8%) out of 478 I: 66 (14.9%) out of 442	 +9.0 pct pts 95% CI= [6,12] +14.4 pct pts 95% CI= [11,18]	Interv period was 2 months
Author (Year): deHart (2005) **Study Period:** 1999-2002 **Design Suitability (Design):** Greatest (Prospective cohort study) **Outcome Measure:** PPV	**Location:** USA, Washington State **Intervention:** Prevalence/adoption of standing orders in or written guidelines by sampled patients in nursing homes in Washington State **Comparison:** Absence of standing orders or written orders by sampled patients in nursing homes	**Study Population:** Residents of Washington State nursing homes that were selected from the nursing home residents listed in the CMS required MDS • cross-sectional samples (10%) • ≥ 65 years or older Pd N selected N resp(%) 2000 1800 1444 (80) 2002 1487 1092 (73)	Odds ratio of PPV vaccination in the nursing homes (exposed to policy vs not exposed) Nursing home self-reported adoption of standing order protocol	NR NR 1999 103/268 (38.4%) nursing homes	NR NR 2001 129/257 (50.2%) nursing homes	OR 2.59 [1.54,4.34] OR 3.19 [1.68,6.01] +11.8 pct. pts [3.4,20.2]	Interv period was 2 year intervals

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Dexter (2004) **Study Period:** 1998-1999 **Design Suitability (Design):** Greatest (Group Randomized Trial) **Outcome Measure:** Influenza vaccination PPV	**Location:** USA, Indianapolis, Indiana **Intervention:** Computer-generated standing orders for eligible inpatients **Comparison:** Computer-generated provider reminders for eligible inpatients	**Study Population:** Inpatient medical ward physicians randomly assigned to interventions Standing orders: 4 teams Provider reminder: 4 teams Computer-generated eligible inpatients for vaccination Grp PPV Influenza SO 406 385 PR 423 463	Vaccination administration rates for eligible inpatients: Influenza PPV	 Provider Rem 137 **(30%)** of 463 Provider Rem 132 **(31%)** of 423	 Standing Order 163 (42%) of 385 Standing Order 209 (51%) of 406	 +12 pct pts 95% CI= [5.5,18.5] +20 pct pts 95% CI= [13.4,26.6]	Interv period was 14 months
Author (Year): Donato (2007) **Study Period:** 2002-2005 **Design Suitability (Design):** Moderate (Retrospective cohort w/ sequential before-after) **Outcome Measure:** Influenza vaccination	**Location:** USA, Pennsylvania **Intervention:** Nurse assessment and standing orders protocol + provider education campaign (2004) Nurse assessment + standing orders protocol (2003) **Comparison:** Nurse assessment and provider reminder (2002)	Consecutive sampling of inpatients records selected by admission day; starting Oct 15 of each study until minimum of 200 records were reviewed per year Year Nreviewed N eligible % 2002-2004 1,298 654 (50.3) Year N eligible pts Assmt+PR 287 Assm +SO 197 Assmt+SO+Ed 170 • All patients 18 years of age and older	Proportion of eligible inpatients who were sampled and vaccinated	2002 10/287 (3%) 2002 10/287 (3%)	2004 73/170 (43%) 2003 42/197 (21%)	2004 vs 2002 +40 pct pts P<0.001 95% CI [32.3,47.7] 2003 vs 2002 +18 pct pts P<0.001 95% CI [12.0, 24.0]	Interv period was for 1 influenza season each year

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Eckrode (2007) **Study Period:** 09/2004-11/2004 **Design Suitability (Design):** Least (Before -After) **Outcome Measure:** PPV	**Location:** USA, Portland, OR **Intervention:** Nurse Assessment & Standing Orders **Comparison:** Before -After	Inpatients of study hospital were randomly sampled from population that met the program criteria for two periods (Before and after the implementation of SO program) Grp N N eligible (%) n I 5072 1106 (28) 286 C 5543 2874 (52) 338 • 65 years of age or greater • 2-64 years of age w/risk factors for PPV	Proportion of eligible inpatients who were vaccinated during their hospital stay Pneumococcal vaccine	0(0%) of 338	44(15.4%) of 286	+15.4 pct pts P=.00 95% CI [11.2, 19.6]	Interv period was 3 months
Author (Year): Gamble (2008) **Study Period:** 1999-2001 **Design Suitability (Design):** Least (Before-after) **Outcome Measure:** Influenza vaccination PPV	**Location:** USA, North Carolina **Intervention:** Standing Orders **Comparison:** Before-After	Study Clinic: N=3 Community outpatient primary care clinics Clinic Influenza PPV 1 148 73 2 29 20 3 146 96 Total 323 189 Patients: +65 years of age	Immunization rates of eligible patients Influenza PPV	51.1% 16.9%	57.8% 15.7%	+6.7 pct pts 95% CI: [-0.8,14.2] -1.2 pct pts 95% CI: [-0.9,6.2]	Interv period was 2 seasons

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Loughlin (2007) **Study Period:** 2003-2005 **Design Suitability (Design):** Moderate (Retrospective cohort) **Outcome Measure:** Influenza vaccination	**Location:** USA, Houston, Texas **Intervention:** Standing Orders (pharmacist assessment) **Comparison:** Usual Care	Secondary prevention lipid clinic of the Kelsey-Seybold clinic (a large multi-specialty group practice) Season N patients 03-04 Pre 476 04-05 Post 266	Patient vaccination rates for influenza	Pre: 186 (39%) out of 476	Post: 202 (76%) out of 266	+37 pct pts 95% CI [30,44] Note: Intervention period 133 (66%) of 202 vaccinated patients were vaccinated in lipid clinic	Interv period was 2 influenza seasons
Author (Year): Lawson (2000) **Study Period:** 1994-1995 **Design Suitability (Design):** Least (Before-after) **Outcome Measure:** Influenza vaccination	**Location:** USA, Edmonton, Canada **Intervention:** Assessment and Standing Orders **Comparison:** Before-after	All inpatients ≥ 65 years of age who had been discharged between the study period (Oct-Dec) Study Pd N N eligible Fall 2004 761 761 N f/u= 761(83 deaths)	Vaccination status of study patients	Pre-hospitalization 332/761 (43.6%)	Post-hospitalization 511/761 (67.1%)	+23.5 pct pts 95% CI [19,28]	Interv period was for 1 influenza season

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Stevenson (2000) **Study Period:** 1998-1999 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** PPV	**Location:** USA, Alaska, Idaho, Montana, and Wyoming **Intervention:** Assessment + Standing orders. (Montana, Wyoming and Idaho were the 3 states that implemented standing orders in their long-term care facilities) **Comparison:** Before-After	Collaborative effort between Peer Review Organizations and LTCFs to increase PPV rates among LTCF residents. (4 states) LTCFs: 133 (41% out of 321) Eligible patients Adults: 8,926 (47%out of 18,883)	Vaccination of eligible LTCF residents: PPV Vaccination of eligible LTCF residents: PPV (facilities) Idaho Montana	3050 (40%) out of 7589 Non-Standing Orders 112 (59% out of 191) 711 (53% out of 1334)	5720 (75%) out of 7623 Standing Orders 606 (70% out of 871) 2625 (83% out of 3175)	+35.0 pct pts 95% CI= [34,36] 11 pct pts 95% CI= [3,19] 30 pct pts 95% CI=[27,33]	Interv period was 2 -3 months

Standing Orders When Used with Additional Interventions

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Bardenheier (2005) **Study Period:** 1999-2002 **Design Suitability (Design):** Greatest (Prospective Cohort) **Outcome Measure:** Influenza vaccination Pneumococcal	**Location:** USA: DC, FL, HI, ID, KY, MA, MN, MT, NM, OH, PA, WI, SC, NV **Intervention:** Standing Orders+ Registry+ Provider Education+ Client Education+ Provider Reminder+ Provider Assessment and Feedback	Quality Improvement Project with an emphasis on promoting Standing Orders Programs in long-term care facilities in an effort to increase immunization coverage among residents States: Intervention: 9 Control: 5 * States were selected based on the QIO's rating of the SOP project LTCFs: 20 sites per state Residents: 100 residents randomly selected from each LTCF	Proportion of facilities that adopted standing orders for: Influenza Pneumococcal	 No 179(88%) out of 202 No 182 (90%) out of 202	 Yes 23(12%) out of 202 Yes 20 (10%) out of 202	 pct pts [NA] 95% CI [not calculated] pct pts [NA] 95% CI [not calculated]	Interv period was 3 years
Author (Year): Bardenheier (2010) **Study Period:** 2004 **Design Suitability (Design):** Greatest (Other design w/concurrent comparison) **Outcome Measure:** Influenza vaccination	**Location:** USA, nationwide **Intervention:** Long-term care facilities with standing orders **Comparison:** Long-term care facilities without standing orders	Cross-sectional data from the 2004 National Nursing Home Survey (NNHS) **Setting:** Long-term Care Facilities n=1152 **Study Population:** • Residents aged 65 years and older • n=11,939 residents	Proportion of residents vaccinated	No standing orders policy 61.1% (95% CI: 59, 63)	Standing orders policy 67.5% (95% CI: 65, 75)	+6.4 pct pts	Interv period was 5 months

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Britto (2006) **Study Period:** 1999-2003 **Design Suitability (Design):** Moderate (Time Series) **Outcome Measure:** Influenza vaccination	**Location:** USA, Cincinnati, Ohio **Intervention:** Quality Improvement Project Registry + Client Reminder/Recall + Client Education + Provider Reminder + Provider Education + Standing Orders + Expanding Access **Comparison:** Before-After	Study Medical Center: N=1 CF clinic Patients of Cystic Fibrosis Clinic Clinic N eligible Cystic Fibrosis 205 (03-04) Eligible patients Children (high-risk) Outpatients Cystic Fibrosis Clinic	Vaccination rates among the patients of the Cystic Fibrosis clinic Influenza	Baseline 1999-2001 (2 seasons) Yr Coverage 99-00: 17.3% 01-02: 41.3%	QI Project (2 seasons) Yr Coverage 02-03: 85.5% 03-04: 90.4%	+49.1 pct pts 95% CI= not calculated	Interv period was 4 years
Author (Year): Byrnes (2006) **Study Period:** 2004 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** Influenza vaccination	**Location:** Bundaberg (Queensland) **Intervention:** Standing Orders + Client Reminder/Recall **Comparison:** Before-After	Study Clinic: N=1 Patients: • ≥ 65 years of age • who attended the practice within the previous 12 months • had not transferred to another practice • had a Bundaberg address Year N analysis 2004 574 2005 580	Vaccination rates among patients ≥ 65 years of age	2004 442 (77%) out of 574	2005 482 (83%) out of 580	+ 6 pct pts 95% CI=[1,11]	Interv period was approx 6 months

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Connors (1998) **Study Period:** 1993-1994 **Design Suitability (Design):** Least (Post only) **Outcome Measure:** Hepatitis B vaccination	**Location:** Australia, Northern Territory, Darwin **Intervention:** Nurse Standing Orders + Client Education **Comparison:** Hospital B (Client Education)	New universal vaccination policy for all neonates that was implemented in 1993. Universal neonatal Hep B vaccination program **Study Hospital:** N=2 Hospital A: referral center for smaller regional hospitals Hospital B: private facility Eligible patients All neonates Year Hospital Nbirths 1993 A 1369 1993 B 685 N= 2054 births 1994 A 1400 1994 B 711 N=2111births	Vaccination rates: first dose (overall) Hep B	Hospital B 1032 (74%) out of 1396	Hospital A 2614 (94%) out of 2769	+20 pct pts 95% CI= [18,23]	Interv period was 2 years

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Coyle (2004) **Study Period:** 1999 **Design Suitability (Design):** Greatest (Group non-Randomized Trial) **Outcome Measure:** PPV	**Location:** USA, Bronx, New York **Intervention:** Standing orders activated in CIS by pharmacist + Client education Computerized provider reminder inserted into pharmacy recommendation screen for providers **Comparison:** Usual care	**Study hospital:** N=1 Study wards= N=3 assigned to condition SO, PR, UC **Patients:** Hospitalized, unvaccinated, ≥65 yrs of age,competent to give oral consent,had not received vaccination within the previous 5 years Arm Nadmit Neligible N accepted SO 147 56 42 PR 122 55 35 UC 155 NR NR	Proportion of adults who received PPV Pneumococcal vaccine	UC (0.6%)	SO 27.9% P<0.0001	+27.3 pct pts 95% CI [19.9,34.7]	Interv period was 4 months
Author (Year): Daniels (2006) **Study Period:** 2004 **Design Suitability (Design):** Least (Post only) **Outcome Measure:** PPV	**Location:** USA, San Francisco, CA **Intervention:** Standing orders + Provider reminders **Comparison:** Post only	**Study Clinic:** N=1 University-based general internal medicine clinic **Patients:** +65 years of age N eligible: 370	Proportion of adults who received PPV Pneumococcal vaccine		327 (88%) out of 370		Interv period was 7 months

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Donato (2007) **Study Period:** 2002-2005 **Design Suitability (Design):** Moderate (Retrospective cohort w/ sequential before-after) **Outcome Measure:** Influenza vaccination	**Location:** USA, Pennsylvania **Intervention:** Nurse assessment and standing orders protocol + provider education campaign (2004) Nurse assessment + standing orders protocol (2003) **Comparison:** Nurse assessment and provider reminder (2002)	Consecutive sampling of inpatients records selected by admission day; starting Oct 15 of each study until minimum of 200 records were reviewed per year All patients 18 years of age and older Year Nreviewed N eligible % 2002-2004 1,298 654 (50.3) Year N eligible pts Assmt+PR 287 Assm +SO 197 Assmt+SO+Ed 170	Proportion of eligible inpatients who were sampled and vaccinated	2002 10/287 (3%) 2002 10/287 (3%)	2004 73/170 (43%) 2003 42/197 (21%)	2004 vs 2002 +40 pct pts P<0.001 95% CI [32.3,47.7] 2003 vs 2002 +18 pct pts P<0.001 95% CI [12.0, 24.0]	Interv period was for 1 influenza season each year

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Ginson (2000) **Study Period:** 1997 **Design Suitability (Design):** Greatest (Group randomized trial) **Outcome Measure:** Influenza vaccination PPV	**Location:** Canada, Moncton, New Brunswick **Intervention:** Standing Orders (proxy) + Client Education Note: We considered the pharmacist written conditional order to be a proxy for Standing Orders in this case (as opposed to a Provider Reminder) **Comparison:** Usual care	Patient-focused education and a standing order for vaccination Study Hospital: 393-bed tertiary care hospital **Study Population:** N=36 providers and 353 admits over the period of study Adults Inpatients Patients: Group Prov Enrolled I elig PPVelig Inter NR 50 28 49 Comp NR 52 37 48	Proportion of vaccine eligible patients who were vaccinated by the 3m f/u Influenza PPV	 C: 16% C:21%	 I: 61% I: 67%	 +45 pct pts p=0.0001 95%CI=[23, 67] +46 pct pts p=0.0001 95%CI=[28, 64]	Interv period was 1 month
Author (Year): Gruber (2000) **Study Period:** 1998-1999 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** PPV	**Location:** USA, Long Branch, New Jersey **Intervention:** Provider Education (lecture, small media reminders) + Client Education (small media) + standing orders (nursing staff) **Comparison:** Before-After	**Setting:** Community Health Center (primary care clinic/ outpatient) Eligible outpatients Period N eligible Pre 94 Post (9m) 65	Proportion of eligible outpatients that were vaccinated during the study period	30 (32%) of 94	41 (63%) of 41	+31 pct pts 95% CI [16, 46] P<0.001	Interv period was 9 months

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Honeycutt (2007) **Study Period:** Oct 2003-Mar 2004 **Design Suitability (Design):** Moderate (Retrospective Cohort) **Outcome Measure:** Influenza vaccination PPV	**Location:** USA, North Carolina **Intervention:** Standing Orders + Provider Reminder + **Comparison:** Pre-Printed Orders	**Setting:** North Carolina Hospital Association members N= 9 member hospitals with existing influenza and pneumococcal vaccination programs Eligible inpatients 10 Immunization programs • 4 standing orders programs • 3 pre-printed orders • 3 provider reminder	Percentage of admitted patients for whom at least one vaccine was ordered	529 (3.2%) vaccinated	822 (8.9%) vaccinated	+5.7 pct pts 95% CI= [cannot be calculated]	Interv period was 6 months
Author (Year): Kleschen (2000) **Study Period:** Oct 1998- Jan 1999 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** PPV	**Location:** USA, Guam **Intervention:** Standing Orders + Electronic Care Monitoring System + Provider Education + Reduced Out-of-Pocket Cost + Expanding Access + Client Reminder + Provider Reminder	**Setting:** FHP Guam Medical Group (HMO) Study Clinic: N=1 • staff-model primary care clinic (HMO) **Study Population:** Eligible patients Adults: • actively enrolled patients with diabetes N=1278 patients	Vaccination rates: Pneumococcal	1998 540 (42%) out of 1278	1999 789 (62%) out of 1278	+20 pct pts 95% CI= [16,32]	Interv period was 4 months

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Logue (2011) **Study Period:** 2007-2009 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** Influenza vaccination	**Location:** USA, not reported **Intervention:** Standing Orders + Clinic-based Client Education + Expanded Access **Comparison:** Before-after	**Setting:** outpatient clinic of the health system's family medicine residency program **Study Population:** all Family Medicine Cneter patients over the age of 6 months with an office visit during study pd (1) (2007-2008) and study pd (2) (2008-2009) Period N eligible Pre 4497 Post 5061 *50-75% of the same patients are present in both cohorts	Infleunza vaccination rates	36%	49%	+ 13 pct pts 95% CI: [11,15 pct pts]	1 year
Author (Year): Melinkovich (2007) **Study Period:** 1995-2006 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** 3-2-2-2 series (1 yr olds) 4-3-1-3-3 series (2 yr olds) vaccination	**Location:** USA, Denver, CO **Intervention:** Registry + Standing Orders + Provider Assessment and Feedback + Client Reminder + Provider Education **Comparison:** Before-After	Immunization initative that was designed to increase childhood immunization rates in the high-risk pediatric population served through the DCHS safety-net delivery system Study Clinic: N=9 DCHS sites **Study Population:** Eligible patients Children: • younger than 3 yrs of ages • made a medical visit to one of the nine DCHS sites serving infants and younger children	Up-to-Date vaccination rates: 3-2-2-2 series (1 yr olds) 4-3-1-3-3 series (2 yr olds)	 66% 38%	2006 92% 85%	 +26 pct pts 95% CI= not calculated +47 pct pts 95% CI= not calculated	Interv period was 11 years

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Nichol (1998) **Study Period:** 1985-1996 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** Influenza vaccination	**Location:** USA, Minneapolis, MN **Intervention:** Nurse Standing Orders (general medical clinic) Nurse Standing Orders + Client Education + Expanding Access **Comparison:** Provider Education	**Setting:** Institution-wide, multifaceted, influenza vaccination program MinneapolisVA Medical Center Study Hospital: N=1 Eligible patients Adults: • >65 years of age • outpatient and inpatients of the VA	Vaccination doses administered: Influenza Outpatients Provider Ed vs Full Program Standing Orders (GMC) vs Full Program Inpatients Full Program	 1985 1250 doses 1986 4500 doses 1994 23000 doses	 1996 24000 doses 1996 24000 doses 1996 24000 doses	 +22750 doses 95% CI= not calculated +19500 doses 95% CI= not calculated +1000 doses 95% CI= not calculated	Interv period was 10 years
Author (Year): Nowalk (2008) **Study Period:** 2001-2005 **Design Suitability (Design):** Greatest (Other Design with Concurrent Comparison) QOE: Good **Outcome Measure:** Influenza vaccination PPV	**Location:** USA, Pennsylvania **Intervention:** Standing orders + Provider education + Client reminder/recall + Reduced out-of-pocket costs + Client education + Expanded Access + Provider reminder + Client incentives + Provider incentives **Comparison:** Usual care	**Setting:** Faith-based centers and community inner city health centers **Study Population:** • Adults • ≥50 years of age Period / I (N) / Site / C (N) / Site Year 1 / 255 / A,B / 313 / C,D,E Year 2 / 401 / A,B,C / 167 / D,E Year 3 / 507 / A,B,C,D / 61 / E Year 4 / 507 / A,B,C,D / 61 / E	Receipt of vaccinations Influenza PPV	 27.1% 48.3%	 48.9% 81.3%	 + 21 pct pts [95% CI: 13, 29] + 33 pct pts [95%CI: 24, 42]	4 years

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Parry (2004) **Study Period:** 1998-2002 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** Influenza vaccination	**Location:** USA, Stamford, Connecticut **Intervention:** Standing Orders + Client Reminder + Registry+ Home Visits + Expanded Access + Reduced Out-Of-Pocket Costs **Comparison:** Before-after	**Setting:** Stamford Hospital partnered with the Stamford, Connecticut Department of Health to increase the number of patients receiving influenza vaccine Settings: N=4 Hospital clinics, Immediate Care Center, Stamford Department of Health	Number of patients vaccinated in all settings during each season Influenza	1998-1999 7387 patients	2001-2002 18471 patients	Relative (150%)	Interv was 3 years

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Rhew (1999) **Study Period:** 06/1997-07/1997 **Design Suitability (Design):** Greatest (Group Randomized Trial) **Outcome Measure:** PPV	**Location:** USA, West Los Angeles, CA **Intervention:** 1. Nurse/clerk assessment, Nurse standing orders, comparative feedback, client education (reminders), provider reminders 2. Nurse/clerk assessment, nurse standing orders w/compliance reminders, client education (reminders), provider reminders **Comparison:** Client education (reminders) and provider reminders	**Setting:** 3 health care firms/teams in geographically distinct areas. Providers were randomly assigned to condition **Study Population:** Study clinic (provides care to 12,000 patients; 90% men; 36.5% age 65 yrs and older; lower SES) Team N patients seen in 12wks 1 1,101 2 1,221 3 1,180	Total number of vaccines given by team (all eligible staff) Pneumococcal vaccine $\chi 2$ analysis used for between group comparisons	NR NR	Team 1 22% 3 5% P<0.001 Team 2 25% 3 5% P<0.001	+17 pct pts 95% CI [14.3, 19.7] +20 pct ts 95% CI [17.3,22.7]	Interv period was 12 weeks

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Slobodkin (1998) **Study Period:** 1996-1997 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** Influenza vaccination PPV	**Location:** USA, Chicago, Illinois **Intervention:** Nurse Assessment + Standing Orders + Provider Education + Incentives + Dedicated staff (2wks) + Client Education (min) **Comparison:** Before-After	**Study Population:** Adult patients seen in the ED during the 6 week study period Nursing staff screened and determined eligibilty for the high-risk patients <u>N screened</u> <u>N high-risk</u> 2631 716 (27% screened)	Vaccination rates estimates in screened adult high-risk patients in the ED Influenza PPV	200 (28%) of 716 self-reported vaccination within the previous year 25 (3.5%) of 716	621 (87%) of 716 266 (37.2%) of 716	+59 pct pts 95% CI [55,63] +33.7 pct pts 95% CI [30,38]	Interv period was 6 weeks
Author (Year): Slobodkin (1999) **Study Period:** Summer 1997 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** PPV	**Location:** USA, Chicago, Illinois **Intervention:** Nurse Assessment + Standing Orders + Provider Education + Incentives + Client Education **Comparison:** Before-After	**Setting:** Adult patients seen in the ED during the study period N=17,556 visits during study period **Study Population:** Nursing staff screened and determined eligibilty for the high-risk patients <u>N screened</u> 1833 (13% of all patients)	Vaccination rates estimates in screened adult high-risk patients in the ED PPV	183 (10%) of 1833 screened adult ED patients	1356 (74%) of 1833 screened adult ED patients	+64 pct pts 95% CI [62,66]	Interv period was 2 months

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Sokos and Skedlar (2007) **Study Period:** 2003-2005 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** PPV Influenza vaccination	**Location:** USA, Chicago, Illinois **Intervention:** Pharmacy Assessment + (dedicated staff) + Standing Orders + Provider Education campaign (during start) **Comparison:** Provider Reminder	**Setting:** Hospital with DUDSM program that provides internship for pharmacy students **Study Population:** Eligible inpatients Adults: - ≥ 65 years or older - patients hospitalized with pneumonia Pd / Intervention / N 2003 Prov Rem NR 2004 SOP in NR 2005 SOP NR	Vaccination of eligible inpatients-PPV Vaccination of eligible inpatients-Influenza	2003 38% NR	2005 70% -At-risk adults was 87.5% in 2005 Season 2004-2005: 65% 2005-2006: 73%	+32 pct pts 95% CI= not reported Post only: 65% 73%	Interv period was 2 years
Author (Year): Swenson (2012) **Study Period:** 2005-2008 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** PPV	**Location:** USA, Denver, Colorado **Intervention:** Quality Improvement (Provider Ed + Standing Orders using Clinical Decision Support System (CDSS) + PAF) **Comparison:** Before-after	**Setting:** Denver Health and Hospital Authority: Large integrated, safety-net health care system. Including community health clinics and hospital units **Eligible patients:** • Adults • Ages 65+, 18-64 w/ diabetes and 18-64 w/ COPD	Vaccination of patients-PPV			The CDSS standing order led to a 10% improvement in immunization rates. However, the statistical model showed that the use of CDSS did not change the trend of increasing rates over and above the initial QI efforts.	Interv period was 3 years

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Veltri (2009) **Study Period:** 2006-2007 **Design Suitability (Design):** Least (Before-after) **Outcome Measure:** Influenza vaccination PPV	**Location:** USA, Bronx, New York **Intervention:** Pharmacy-based inpatient Standing Orders + Client Education **Comparison:** Before-after	**Setting:** Montefiore Medical Center **Study Population:** • Inpatients • Aged 65 years and older	In-patient vaccination encounter rates Influenza PPV Overall vaccination rate of hospitalized patients(in-house) after implementation of STOP program	 27% 18%	 55% 85% 74% 89%		Interv period was 1 year
Author (Year): Weaver (2007) **Study Period:** 2002-2004 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** Influenza vaccination	**Location:** USA; 23 VA Spinal Cord Injury **Intervention:** Quality Improvement Project: Provider Education + Nurse Standing Orders + Provider Reminder + Client Education + Client Reminder **Comparison:** Before-After	Study SCI&D Clinic: N=23 **Study Population:** - Adults (High-risk) - Outpatient Year 1: N=3015 Year 2: N=3038 Period N Nanalyzed Baseline NR NR Int 1 1733 1517 (50%) Int 2 3038 1615 (53%)	Self-report of influenza vaccine by responding SCI&D patients Standing orders used in inpatient and outpatient	2001 33%	2003 67.4%	+34.4 pct pts 95% CI= not calculated OR=1.18 95% CI= [.79,1.75] P=.424 ns	Interv period was 2 years

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Zimmerman (2003) **Study Period:** 2000-2002 **Design Suitability (Design):** Least (Before-After) **Outcome Measure:** Influenza vaccination	**Location:** USA, Pittsburgh, PA **Intervention:** Provider Education + Nurse Standing Orders + Provider Reminder + Reduced Out-of-Pocket Costs + Client Education + Expanded Access + Client Reminder **Comparison:** Before-After	**Setting:** Faith-based neighborhood health centers that serve the disadvantaged in inner-city neighborhoods in Pittsburgh **Eligible patients:** Adults: • 50-64 years of age • ≥ 65 years of age Study Clinic: N=2 Health Center A Health Center B	Vaccination of eligible adults: Influenza • Doses administered Electronic Medical Records (EMRs) (50-64 yrs) Electronic Medical Records (EMRs) (≥ 65 yrs)	2000-2001 1147 doses 24% 45%	2001-2002 1821 doses 30% 53%	 +148% 95% CI= not reported +6 pct pts 95 CI%= not reported +8 pct pts 95 CI%= not reported	Interv period was 2 years

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Zimmerman (2006) **Study Period:** 2002-2004 **Design Suitability (Design):** Greatest (Other w/concurrent comparison) **Outcome Measure:** Influenza vaccination	**Location:** USA, Pittsburgh, PA **Intervention:** Community health system project to improve vaccination rates Individual clinics adopted their own sets of interventions including Provider Education + Nurse Standing Orders + Provider Reminder + Client Education + Expanded Access + Client Reminder **Comparison:** Usual care (Provider Education)	**Setting:** Participating clinic within the University of Pittsburgh School of Medicine **Study Population:** N=5 practices in 10 offices Condition / N practices / N patients Inter / 5 / (Pre) 2438; (Int1) 2935; (Int 2) 3311 Comp / 1 / Not reported Outpatient Children (high-risk)	Vaccination rates of eligible children: Influenza	Baseline I: 10.4% C: 42.0%	Year 2 I: 18.7% C: 42.7%	I: 8.3% vs C:0.7% +7.6 pct pts 95% CI= not reported	Interv period was 2 influenza seasons

Study	Location and Intervention	Study Population and Sample	Effect measure	Reported baseline	Reported effect	Value used in summary [95%CI]	Follow-up time
Author (Year): Zimmerman (2009) **Study Period:** (NR) **Design Suitability (Design):** Least (Cross-sectional) **Outcome Measure:** Influenza vaccination PPV Adults (65 years +)	**Location:** USA, Pittsburgh, PA Physicians and practices were surveyed about office systems for proving adult immunizations **Intervention:** standing orders+ provider reminders+ client reminder/recall **Comparison:** No use of standing orders	**Setting:** Solo or multiphysician practices selected serving primarily minority patients were matched with practices that served primarily white patients in sociaioeconomically comparable neightborhoods N=30 physicians in 17 practices **Study population:** • Patients aged 65 years and older receiving care • Urban • Socioeconomically disadvantaged • Majority of participants were largely female and white N=2021 patients	Correlated of vaccination status in multivariate hierarchical linear modeling • Practice uses standing orders (Influenza)			OR: 2.12 [95% CI: 1.57-2.87] P<0.001 17-19% increase in influenza rates for practices using standing orders	N/A