APPENDIX A. SEARCH STRATEGY

Database: Ovid MEDLINE(R) <1950 to May Week 4 2010>

Search Strategy:

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1 exp *Health Services Accessibility/ (34616)

2 limit 1 to (english language and humans and yr="1990 -Current" and "all adult (19 plus years)" and english) (6577)

3 *Veterans/ (4309)

4 *United States Department of Veterans Affairs/ (1252)

5 *Hospitals, Veterans/ (2008)

6 or/3-5 (6992)

7 2 and 6 (75)

8 access.mp. (114750)

9 6 and 8 (287)

10 limit 10 to (english language and humans and yr="1990 -Current" and "all adult (19 plus years)" and english) (182)

11 7 or 10 (209)

APPENDIX B. PEER REVIEW COMMENTS AND AUTHOR RESPONSES

REVIEWER COMMENT	RESPONSE
1. Are the objectives, scope, and methods for this review clearly described?	
Three specific comments about the search strategy: a. The primary (or only) barrier to access that appears to be addressed in KQ1 was distance. However, there are numerous other relevant barriers and facilitators to access that I expected to be addressed in KQ1, including price/income, social support, health literacy, and access to other health systems (e.g., Medicare). These are all implied by the Potential Moderators in Figure 1, but only distance receives attention. A Medline search limited to "Health Services Accessibility" in Appendix A missed articles that address these issues, and studies that I expected to be included in KQ2. b. It would be helpful to delineate whether specific types of studies were explicitly excluded or not considered for some reason. There may not have been such exclusion, but if so it should be mentioned. c. Clear definitions of the seven types of interventions discussed in KQ2 would be informative for the reader who had some other studies in mind and wondered what category they would fall in.	a. Thank you for the suggestion. We revised the KQ1 section to highlight other barriers and facilitators to access. To re-do the search at this point would markedly expand the scope and practice. b. The inclusion and exclusion criteria are outlined in the method section. We attempted to clarify that for KQ1, we included only studies that reported on how a measure of access impacted system-level or patient-level outcomes. Further, for KQ2, we included only studies that reported impact of the intervention on a measure of access (objective, subjective, or satisfaction with access). c. We clarified that the types of interventions were not a priori categories used in the search, but rather, we developed after the search as a way to more cohesively present the findings. A brief description of each of the types of interventions is now presented in Table 2.
2. Is there any indication of bias in our synthesis of the evidence?	
As mentioned in Comment #1 above, I expected to see a review of other barriers to access besides distance in response to KQ1. Not sure if it represents a bias per se.	As noted above, we revised the KQ1 section.
I expected there to be a number of studies reviewed in KQ2 that were not and it isn't clear to me why they weren't included. Not sure if it represents a bias per se. a. In the section on CBOCs, I expected to see the following cites: Maciejewski et al. BMC HSR 2007, Liu et al. HSR 2010.. b. In the section on intensive case management, I expected to see Bosworth Ann Intern Med 2009 and Am Heart J 2009; Piette 2001 (diabetes); Heisler Ann Intern Med 2010; other self-management trials by VA researchers c. The copay section should include papers by Stroupe Medical Care 2007 and Doshi Circulation 2009	Thank you for the suggested references. We have reviewed these citations and have included those that met our inclusion criteria.
3. Are there any <u>published</u> or <u>unpublished</u> studies that we may have overlooked?	
a. For the section on page 6 (discussion of 2 Medicare papers), there are a number of papers (Wright, Petersen, Weeks, West, Liu, Morgan) that also address this issue of choice of VA or non-VA facilities that should be incorporated. b. Given the SOTA focus on e-health applications to improve access, all published e-health interventions (MyHealtheVet, telemedicine, nurse case management via telephone or Web) should be reviewed and included.	a. We have reviewed the suggested references and included those that met our inclusion criteria. b. We have included studies of e-health applications if they met our inclusion criteria and presented data regarding the impact of the intervention on a measure of access (objective, subjective, or satisfaction with access).

4. Additional comments	
This is a good paper on an important topic. It is even more important now that the VA has mandated 14 day access to all clinics. This mandate makes it even more important to carefully understand the literature and its limitations.	Thank you.
I strongly feel there needs to be much more attention to the quality of studies synthesized in this paper. I would like some summary for each section of the types and quality of the studies contributing data to the discussion. There seems to be little discrimination between RCTs and cross-sectional studies as an example ---- no clear sense of guidance from the authors on how the reader should weight the study findings.	We agree and have added information about study type and quality.
I believe that "wait times" and "distance from the VA" should be considered separately – one is controlled by the VA and one is controlled by the patient. It seems to me that all of the studies evaluating patient health outcomes and their association with distance from the VA (or any other medical system) are almost meaningless. Unless the studies very carefully control for health status, SES, patient choices, etc., the findings are not useful, other than for the evaluation of access. It is impossible to know whether patients more distant from medical care are similar to those that are closer. Patients choose where they live for complex reasons some of which could be controlled for if assessed but some which might not ever be able to be accounted for in an observational study. If this body of literature includes studies that attempted to control for other factors, the authors need to describe this and weight the studies by their attempts to control for these potential confounders. On the other hand, waiting times are within the control of the VA and are much less likely to be confounded by patient factors. I feel strongly that each of these categories should be a subsection relating to key questions 1 and 1a. In addition to better descriptions/weighting of the studies, these issues should be more fully explored in the discussion.	Thank you for the suggestion. However, in light of the suggestion to include other barriers/facilitators, we modified the response to KQ1 to highlight factors other than distance and wait time. We organized the section by clinical area. We have rated the quality of the included studies and control of potential confounding factors was an important consideration in assigning the quality rating.
I consistently find putting the summary of findings at the beginning of a section awkward and confusing. The summary should come at the end, not the beginning of a section.	We moved the summary of findings to the end of each section.
The data on copayments seems fairly strong yet is not discussed much if at all in the discussion. This seems like fairly good and important data that could make a difference to patient care at the VA.	We agree and we added a discussion of the copayment studies to both the conclusions and future research sections.

For KQ1, I recommend describing the literature you found under each subsection. For example, it the "system-level outcomes" section, I think it would be much easier to follow the studies if you describe what you found for these types of studies there rather than in the literature summary paragraph on page 4 that precedes this section. I would like to know more about these 17 studies. Were they cross-sectional, prospective or retrospective cohort studies, or RCTs and what was their quality? I would like to know how many of each of these contribute to the section. It might even make sense to divide KQ1 into 2 parts rather than include both system level and patient level outcomes in one KQ. Few of the studies contribute to both outcomes.	Thank you for the suggestion. We have added information about study design and quality to the text.
I would like to see more epidemiologic thought in the discussion. The issue of more care equating to with improved care deserves a little more discussion than it was given. The Weinberger paper should be discussed more fully in this regard.	Thank you for the suggestion. We expanded our discussion of the issue as to whether more care equates with better care and reference Weinberger 1996 as an example.

APPENDIX C. EVIDENCE TABLES

Table 1. Studies examining variation in outcomes associated with variation in access (KQ1)

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
Burgess & DeFiore, 1994[13] Fair	Cross-sectional n=6,386 veterans (national survey)	Inclusion: Responders to the 1987 Survey of Veterans (SOV)	Choice of VA over other outpatient options and amount of VA outpatient use Distance, characteristics of closest VA facility, age	1) Likelihood of using VA for outpatient services decreased as distance increased up to 60 miles (little change beyond 60 miles) 2) For veterans who choose some outpatient VA services, distance has a smaller additional effect on number of visits	N/A*	Effect of distance on number of outpatient VA visits is greatest for those >65 yrs
Cunningham et al., 1995[26] Fair	Cross-sectional n=205 HIV infected patients interviewed at one VA (n=28) and one county-run hospital (n=177)	Inclusion: ≥18 years of age, first seen with at least one of a) sustained fever, b) involuntary weight loss, c) sustained diarrhea Exclusion: cognitive impairment	Overall perceived access, temporal access, health related quality of life (HRQOL) Age, gender, race, mode of HIV transmission, education, income, marital status, log of CD4 counts, symptoms	Prevalence of access problems: Cost of care: 49% Office hours: 48% Location: 34% Appt. w/ Specialists: 15% Transportation time >30 min: 55% >1 hour: 17% # days to schedule urgent appt >1 day 50% >2 days 23% Office wait time >1 hour 54% >2 hours 32%	Better overall perceived access to care associated with better HRQOL for 8 of 11 scales including overall quality of life (p<0.001); temporal access scores not significantly associated with HRQOL	Adjusted access scores for VA care significantly (p<0.05) higher† for: a. covering cost of care (vs. uninsured) b. availability of emergency care (vs. uninsured or Medi-Cal) c. availability of hospital care (vs. uninsured) d. office wait time (vs. uninsured or Medi-Cal) VA scores significantly (p<0.05) lower for: a. convenience of contacting provider (vs. uninsured or Medi-Cal) b. transportation time (vs. Medi-Cal)
Druss & Rosenheck, 1997[14] Fair	Cohort n=44,533 veterans nationwide	Inclusion: discharged to the community from VA inpatient psychiatry and substance abuse programs during 6 month period in 1994-95, primary psychiatric or substance abuse disorder and secondary medical disorders	Four measures representing access, timeliness, and intensity of outpatient medical services utilization System-facility factors (e.g., region, hospital size, academic emphasis, specialization in mental health care) Predisposing factors (e.g., age, gender, race, marital status, diagnosis of psychiatric or substance abuse) Enabling factors (e.g., compensation, proximity, receipt of psychiatric or substance abuse services within 30 days of discharge) Illness leading to seeking treatment	Proximity to VA clinic, receipt of VA compensation payments, mental health follow-up within 30 days of discharge, and psychiatric diagnosis associated (p<0.01) with receipt of medical-surgical follow-up within 6 month post-discharge, receipt of medical services within 30 days post-discharge, number of days from discharge until first medical visit (among those with a visit), and number of visits in 6 month post-discharge	N/A	N/A

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
Elhai et al., 2008[15] Good	Cross-sectional n=20,048 veterans who completed 2001 National Survey of Veterans	Inclusion: non-institutionalized, identified by random digit dialing and from lists of patients enrolled in VA health care or receiving VA compensation or pensions	Treatment use over past 12 months – VA and non-VA outpatient health care visits, VA and non-VA mental health treatment Gender, age, race, education level, marital status, combat exposure; health insurance status, employment status, urban/rural residence; disability status, SF-12 mental and physical health components	Outpatient health care: 1) VA visit counts associated with younger age, unmarried status, lack of health insurance, unemployment, disability rating, poorer physical health (all $p<0.01$) 2) non-VA visits associated with female gender, older age, college education, unemployment, disability rating, poorer physical and mental health (all $p<0.01$) Mental healthcare use: 1) VA use associated with younger age, unmarried status, unemployment, lack of health insurance 2) non-VA use associated with female gender, younger age, college education, unmarried status, unemployed, urban residence, and poorer physical and mental health	N/A	N/A
Fasoli et al., 2010[16] Fair	Cohort n=421 veterans from 2 VA mental health centers in Boston area	Inclusion: English speaking, receiving inpatient or outpatient mental health service (MHS), mid 2004 to mid 2006	MHS utilization (outpatient, inpatient, residential), Global Assessment of Functioning (GAF), and Behavior and Symptoms Identification Scale-24 (BASIS-24) after 3 months Demographics, partial self-pay for care, employment, social support, emotional support, problems getting to treatment, housing, level of care at enrollment, baseline GAF and BASIS-24, diagnoses, comorbidities, disability, service connection, MHS use 6 months prior	1) Increased outpatient utilization among patients who reported fewer access problems and no social support (both $p<0.05$); greatest predictor of use was clinical need 2) Increased inpatient hospitalization associated with homelessness; greatest predictor was clinical need	GAF and BASIS-24 at 3 months not significantly related to access or outpatient utilization; inpatient hospitalization predicted worse GAF and BASIS-24 at 3 months	N/A

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
Fortney et al., 1995[9] Good	Cohort n=4,631 male veterans from 33 VA treatment programs	Inclusion: Primary diagnosis of alcohol dependence; completed VA inpatient program, discharged with outpatient appointment, resided in primary service area of the inpatient facility	Attendance at aftercare appointment within 30 days of discharge Travel distance, socio-medical characteristics (age, race, severity of illness, marital status, level of urbanization)	Patients living farther from the treatment program were less likely to choose to attend their aftercare appointment as were urban residing (with distance held constant) patients and unmarried patients	N/A	Older patients and rural residents more negatively affected by distance than younger patients or urban residents
Fortney et al., 1999[17] Fair	Cross-sectional n=109 veterans from Little Rock, AR VAMC	Inclusion: Walk-ins to Psychiatric Evaluation Clinic in Emergency Medicine Service Exclusion: missing data, out of state residence, restricted medical records	Disposition (admission or outpatient appointment) Age, marital status, employment status, ethnicity, travel distance, number of psychiatric and medical comorbidities, number of psychosocial and environmental problems, current GAF	Admissions: 17% of those living <60 mi from VAMC; 43% of those living 60+ mi from VAMC (p=0.003); controlling for case mix OR=4.8 [1.06-22.1]; age >65 and lower GAF also associated with increased likelihood of admission	N/A	N/A
Gamache et al., 2000[27] Poor	Cross-sectional n= 663 homeless veterans in Access to Community Care and Effective Services & Supports program in 9 states	Inclusion: homeless, serious mental illness, not involved in ongoing community treatment	Lifetime use of VA health services Age, gender, marital status, race/ethnicity, education, military service era, addiction severity, health problems, service connection, income, residence in city with VA hospital	Veterans with service connected disabilities or non-service connected pensions or veterans living in cities with VA medical centers or hospitals were more likely to have used VA services (all p<0.05)	N/A	N/A
Gordon et al., 2010[28] Poor	Cross-sectional n=3,595 veterans interviewed FY† 2002-2003, VISN4	Inclusion: presently or recently homeless military veterans; identified in community, VA hospitals and clinics, veteran's centers, prisons	Use of any VA services in past 6 months Metropolitan/non-metropolitan location, demographics, military history, living situation, employment, medical history	Greater use associated with metropolitan location and VA financial support (p<0.001)	N/A	Significant interactions - metro/non-metro & use of services (p<0.05): Age, military service period, monthly income, time homeless, past alcohol or drug dependency

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
Gurley et al., 2001[29] Fair	Cross-sectional n=621 male veterans from American Indian reservation communities in Southwest (n=316) and Northern Plains (n=305)	Inclusion: Vietnam service, living on or within 50 miles of reservation, born between 1930 and 1958 NOTE: VA services described by authors as more readily available for Northern Plains veterans	Use of VA, Indian Health, other biomedical health services, and traditional healer (inpatient in past year, outpatient in past 6 months)	Significantly greater (p≤ 0.05) use of VA services by veterans from Northern Plains reservation communities for physical and mental health problems; significantly greater (p≤ 0.001) use of traditional healer by Southwest reservation veterans	N/A	N/A
Holloway et al., 1990[18] Good	Cross-sectional n=6,317 veterans with index admission to Ann Arbor VA Medical Center (data from random sample of 3,159 used to develop model)	Inclusion: discharged from internal medicine, surgery, intermediate care, or neurology services or a tertiary care VA medical center 1/1/81 to 12/31/82 Exclusion: patients admitted to psychiatry service, uncertainty about readmission	Early readmission (within 30 days of discharge) for any reason Location of residence (relative to VA medical center), number of surgical procedures, compensation and pension status, readmission risk class (based on diagnosis-related group), bed section of discharge, age	Increased distance of county of residence from VAMC associated with non-significant increased probability of early readmission; significantly increased probability if two or more surgeries performed, readmission risk above "very low," or patient on intermediate, neurology, or surgery service at discharge	N/A	N/A
Hynes et al., 2007[19] Good	Cross-sectional n=1,474,417 veterans in outpatient analysis n=416,455 veterans in inpatient analysis	Inclusion: veterans eligible to use VA and Medicare health care in 1999, had used VA health services between 1997 and 1999 Exclusion: veteran status unknown, missing or invalid zip code, lived in Puerto Rico or other US territory, ≤65 years old on 1/1/99, end-stage renal disease, enrolled in Medicare+Choice care	VA and Medicare use (outpatient and inpatient services) Age; gender; race; vital status; VISN; priority level in VA;, health status risk score; distance to nearest VA inpatient hospital, VA outpatient center, and Medicare inpatient hospital; ZIP code (for poverty level); number of physicians, general hospitals, and beds in county of residence	Outpatient: decreased likelihood of exclusive use of VA as distance to VA increased; older age, higher health risk status, urban residence, and more hospital beds in county also associated with decreased exclusive use of VA; black race, high VA priority level, and high poverty level associated with increased exclusive use of VA Inpatient services: same pattern (all p<0.01)	N/A	N/A

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
LaVela et al., 2004[20] Fair	Cross-sectional n=8,983 veterans with spinal cord injuries and disorders	Inclusion: traumatic lesions or demyelinating disease of the spinal cord; intraspinal, nonmalignant neoplasms, vascular insults, cauda equina syndrome, inflammatory disease of the spine, unstable traumatic lesions of the spinal column Exclusion: multiple sclerosis; missing, invalid, or non U.S./ Puerto Rico zip code; mobile clinic use; VA residential care patient; home care and telehealth related clinic stops, no VA utilization	Number of outpatient visits; number of inpatient discharges History of illness, travel distance to actual facility used; travel distance to nearest facility, age, race, gender, marital status, level of injury	Patients utilized outpatient services less frequently when VA facilities were farther away from their residences (p<0.000); increased age, non-white race, and history of respiratory, kidney/urinary tract, circulatory, or digestive system disease associated with increased outpatient utilization (all p<0.01) Patients had less inpatient utilization if they lived at greater distances (p<0.000); history of illnesses of respiratory, skin/ subcutaneous tissue/breast, kidney/urinary tract, circulatory, or digestive systems associated with increased inpatient utilization (all p<0.02)	N/A	N/A
McCarthy & Blow, 2004[21] Fair	Cohort n=142,055 veterans from national VA registry	Inclusion: diagnosis of bipolar disorder, schizophrenia, or other psychosis in year FY 2000 with some VA contact in FY 1999 Exclusion: little or no willingness to seek VA care, homeless, stay of 150+ days, died in FY 2000	Total outpatient non-psychiatric visit days, total outpatient psychiatric visit days Age, gender, race/ethnicity, marital status, urban/rural residence, distance to nearest relevant VA provider; psychiatric diagnosis type; comorbidity level, initial treatment location of FY	Patients further from outpatient care had fewer outpatient non-psychiatric visit days; older age, married, female, rural residence, initial visit at outpatient non-psychiatric facility, and higher comorbidity rating associated with increased visit days (all p<0.01) Patients further from psychiatric services had fewer outpatient psychiatric visit days; initial visit at non-psychiatric facility, higher comorbidity rating, and rural residence also associated with fewer psychiatric visits (all p<0.001)	N/A	Negative effects of distance on outpatient non-psychiatric visits - greater for patients with schizophrenia than bipolar disorders and for patients >65 yrs; on outpatient psychiatric visits - greater for patients with schizophrenia and for ages 45 to 65 yrs.

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
McCarthy et al., 2007[22] Fair	Cohort n=156,631 veterans nationwide	Inclusion: diagnosis of schizophrenia or bipolar disorder in FY 1998 Exclusion: missing data or Alaska resident	Time to first 12-month gap in 1) VA health services utilization and 2) VA mental health services (through the end of FY 2002) Age, gender, marital status, race/ethnicity, VA service connection status, homelessness, primary psychiatric diagnosis, comorbidity index, distance to nearest VA service site or VA provider of substantial psychiatric services, inpatient care in FY 1998, VA and non-VA inpatient beds per 1000 county residents	Risk of gap in health service utilization increased with increased distance to nearest VA facility, homelessness, inpatient stay in FY98, and unknown or non-white race; decreased with more VA beds, increased age, female gender, married, VA service connection, higher comorbidity score, diagnosis of schizophrenia (all $p<0.05$) Risk of gap in mental health utilization increased with residence further from VA psychiatric service site, age, female gender, non-white race, homelessness, higher comorbidity score, inpatient stay in FY98; decreased with married, VA service connection, diagnosis of schizophrenia (all $p<0.05$)	N/A	N/A
Morgan et al., 2009[23] Fair	Cross-sectional n=3,424,699 veterans	Inclusion: enrolled in VHA and Medicare for at least 1 month in 2002	VHA pharmacy use Health status, income, race/ethnicity, age, metropolitan/non-metropolitan status, participation in Medicaid, VA priority status	Decreased likelihood of using VHA pharmacy if enrolled in Medicare HMO plan with pharmacy benefits, older than 65 yrs, income of $20,000 or greater, female, priority status other than 1 (no copayment), Medicare state buy-in, resident of metropolitan statistical area, and patient at a teaching hospital Increased likelihood if Hispanic race and poorer health status	N/A	N/A
Petersen et al., 2010[24] Good	Cross-sectional n=1,943,129 veterans	Inclusion: inpatient or outpatient VA or Fee basis use FY 2003 & 2004 who were also Medicare enrollees (including < 65 yrs) Exclusion: missing priority classification, diagnostic data, or ZIP code; died in FY 2003 or 2004; ZIP code outside of US	Reliance on VA health care (overall, inpatient, outpatient) Age, gender, race, differential distance (distance to VA Medical Center minus distance to non-VA hospital), priority classification, aggregated conditions categories (ACCs)	Overall increased reliance on VA care if differential distance is lower, if under age 65, or if disability or low income VA priority classification; mental health and substance abuse ACCs significantly associated with increased reliance on VA care Similar results for outpatient care Patients with transplant and amputation ACCs more likely to have inpatient VA care; other ACCs associated with inpatient VA care included infectious and parasitic disorders, substance abuse, mental health disorders, and eye disorders	N/A	Interaction of age and distance was significant but parameter effects were less than main effects Mental health and diseases of eyes, ears, nose, and throat associated with increased reliance on VA care for <65 yr group Mental health, substance abuse, diabetes, and infectious diseases associated with increased VA care for ≥65 yr group

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
Piette & Moos, 1996[10] Good	Cohort n=4,637 male veterans from national VA databases	Inclusion: Admitted to VA acute care hospital, discharge diagnosis of myocardial infarction (MI) Exclusion: Death or readmission within 90 days of index discharge; index length of stay >100 days, reside >100 mi from a source of VA care or >200 mi from admitting facility	Outpatient medical care visits within 30 and 90 days of discharge following acute MI admission; death from all causes or recurrent cardiac admission 91 to 365 days after discharge Age, VA service connection, comorbidity index, alcoholism, teaching hospital, catheterization or revascularization procedure	Patients with service connected disability, over age 55, with comorbid conditions, discharged from a teaching hospital, and having revascularization are more likely to have 1 or more visits within 30 days; patients with history of alcohol abuse and living more than 20 miles from admitting hospital were less likely (all p<0.05); similar pattern for 1 or more visits within 90 days except comorbidity, alcoholism, and hospital type not related	Age greater than 55, comorbidities, and distance greater than 20 miles associated with increased risk of death within 1 year; revascularization procedure and any VA ambulatory care in 90 days after index visit associated with decreased risk of death (all p<0.05); age greater than 65, comorbidities, and any VA ambulatory care in 90 days associated with increased risk of readmission (all p<0.05)	N/A
Prentice & Pizer, 2007[11] Good	Cohort n=37,489 veterans from 89 VAMCs	Inclusion: veterans ≥65 years old who visited at least one of three types of VA geriatric outpatient clinics between 10/1/00 and 6/30/01 and survived through 9/30/01	6-month mortality (odds of dying between 10/1/01 and 3/31/02) Age, gender, principal diagnoses, comorbidity index, preventable hospitalization in past year, service connected disability (50% or greater); facility 3-month mortality rate, facility wait time	N/A	Facility-level wait times of ≥31 days associated with significantly higher mortality; increased age, ≥ 50% service connected disability, preventable hospitalization, higher comorbidity index, and diagnosis of cancer or endocrine, neurological, psychiatric, pulmonary, or other disease associated with increased mortality; female gender associated with decreased mortality (all p<0.05)	N/A

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
Prentice & Pizer, 2008[12] Fair	Cohort n=33.431 veterans from 86 VAMCs	Inclusion: same as above except visits between 10/1/00 and 3/31/01, surviving through 6/30/01	Dependent variable: probability of hospitalization for an ambulatory care sensitive condition between 7/1/01 and 12/31/01 Age, gender, principal diagnoses, comorbidity index, ambulatory care sensitive condition (ACSC) hospitalization in past year; facility 3-month ACSC hospitalization rate	Facility-level wait times of ≥29 days associated with greater probability of hospitalization for ACSC compared to wait times of <22.5 days Facility average ACSC hospitalization rate, age, previous ACSC hospitalization, cormobidity index, and diagnosis of cancer, or endocrine, heart, or pulmonary disease also associated with increased probability of ACSC hospitalization (all p<0.02)	N/A	N/A
Schmitt et al., 2003[25] Fair	Cohort n=33,952 veterans from national VA databases	Inclusion: Admitted to substance abuse units, *eligible for outpatient* aftercare Exclusion: Discharged against medical advice, death or re-hospitalization within 90 days of index discharge, no valid zip code of residence	Use of any outpatient aftercare, number of mental health clinic visits within 90 days (for those with at least one visit) Comorbidity index	Increased likelihood of receiving aftercare if distance < 50 miles with greatest likelihood if distance <10 miles; age, married, service-connected eligibility, psychiatric comorbidity, substance use disorder, and teaching hospital associated with increased likelihood; medical comorbidity index 1, 2, or > 4 associated with decreased likelihood (all p<0.05) Volume of aftercare only greater if distance <10 miles (relative to >50 miles)	N/A	N/A
West & Weeks, 2006[30] Fair	Cross-sectional n=47,185 men who responded to the 2000 Behavioral Risk Factors Surveillance System telephone survey	Inclusion: Non-veteran or no longer in military service Exclusion: refused to say or didn't know whether ever in military service	Health in general, maximum poor health days (physical, mental, or limited usual activity in prior month), inability to afford needed care in past year	Non-metropolitan VA patients age 18 to 44 were significantly more likely to say they needed to see a doctor but could not because of cost than others of same age (p<0.005); among 45 to 64 year olds, VA patients (regardless of residence) more likely to report cost as a factor in accessing needed treatment	Self-reported health poorest for non-metropolitan veterans in VA care age 45 or older Days in past 30 of poor health highest for veterans in VA care regardless of residence (NOTE: veterans in VA care identified based on self-reported use of VA in past 12 months)	N/A

Author, Year Study Quality^	Study Design, Sample Size	Inclusion/Exclusion Criteria	Outcomes Assessed Covariates	Impact on System-Level Outcomes	Impact of Access on Patient-Level Outcomes	Interactions
West et al., 2008[31] Fair	Cross-sectional n=2,827,602 admissions (veterans hospitalized 2000 or 2001)	Inclusion: ≥65 yrs on date of admission, VA enrollee for whom Medicare claims were submitted; received any of 14 high-risk elective procedures	Utilization of VA or non-VA care, utilization of lower or higher quality care	Overall, 89% of heart surgeries, 84% of vascular surgeries, and 79% of cancer resections obtained in non-VA hospitals with little difference based on residence Urban residents more likely to obtain heart surgery (significant only for bypass grafting) and cancer resection in high performance hospitals; rural residents more likely to get vascular surgery in high performance hospitals Travel time to high performing hospital indicated that urban veterans had least travel burden; travel time to high performance hospital for heart surgery was shorter than to low performance, regardless of residence; no difference for vascular surgery	N/A	N/A

^Quality based on assessment of participant selection, outcomes assessment, and analysis (see text); †Access scores: 0=worst possible access, 100=best possible access; *N/A=Not available; †FY=fiscal year (October 1 to September 30 of the following year); NS=non-significant; VISN=Veterans Integrated Service Network

Table 2. Studies examining the efficacy of interventions designed to increase access for veterans (KQ2)

Author, Title	Study Design, Study Quality	Setting	Patient Characteristics	Intervention / Comparator	Impact of Intervention on Access	Impact of Intervention on System-Level Outcomes	Impact on Intervention on Patient-Level Outcomes
Community Based Outpatient Clinics (CBOCs) – Opening of satellite primary care clinics							
Borowsky et al., 2002[36]	Cross-sectional survey, fair	44 CBOCS and 36 corres-ponding parent VAMCs	Randomly selected subset of veterans who had care at one of the selected CBOCs or VAMCs in the preceding six months.	Utilization of CBOCS / VAMC users	Veterans using CBOCs reported better access / timeliness and were more likely to report waits less than 20 minutes.	Veterans using CBOCS had more ratings of good / excellent visits; fewer problems in a variety of areas (e.g., emotional support, preferences, care coordination, education, courtesy).	N/A
Fortney et al., 2002[32]	Retrospective cohort analysis, fair	38 CBOCs and 32 parent VAMCs	All primary care patients treated at participating CBOCs or VAMCs.	Utilization of CBOCS / VAMC users	CBOC patients more likely to be new VA users.	CBOC patients had more primary care encounters and fewer specialty care encounters.	N/A
Fortney et al., 2005a[33]; 2005b[34]	Quasi-experimental, fair	Fifteen CBOCS that offered primary care and opened during a six month period in 1997	All veterans living in the CBOC catchment area who had any VA service use in the six months before the CBOC opened. Included a matched group of veterans residing outside the catchment area of any new CBOCs	Implementation of CBOCs / pre-CBOC implementation	Decrease in travel distance to the closest VA facility for those in CBOC catchment area.	Decrease in travel distance predicted increase in primary care encounters; across diagnoses, those in CBOC catchment had more primary care visits, ancillary visits, and extended care physical health visits.	N/A
Morgester et al., 2002[37]	Case series, poor	One CBOC and the parent VAMC	Veterans with an appointment at the CBOC or VAMC during the recruitment period; veterans who lived in the CBOC catchment area and received non-VHA primary care	Utilization of CBOCS / utilization of VAMC or non-VA care	All three groups (VAMC, CBOC, non-VA care) reported few problems finding clinic (93-100%) and found the hours of operation convenient (97-100%). There were no statistical comparisons.	All three groups (VAMC, CBOC, non-VA care) reported satisfaction with care (93-100%); 82-83% of the VAMC and 90-93% of the CBOC veterans reported they had enough information about their condition and medication; 93% of CBOC and 90% of VAMC veterans felt they could care for themselves until next visit. There were no statistical comparisons.	N/A

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Rosenheck et al., 2000[35]	Cohort Study, poor	All counties and the District of Columbia (compared those with and without CBOCS that opened from1995-1998).	All veterans, based on census data	Implementation of CBOCs/ pre-CBOC implementation	Significantly greater proportion of veterans in counties with CBOCs accessed general VA medical services. In counties with CBOCs that had specialty mental health, mental health access greater.	N/A	N/A
Primary Care Mental Health Integration – Co-location of primary care and mental health services							
Blue-Howells et al., 2008[42]; McGuire et al., 2009[43]	Quasi-experimental, poor	Greater Los Angeles VA Medical Center	All veterans newly entering the Homeless Program	Implementation of integrated mental health, primary care, and homeless social services clinic / pre-implementation	Shorter wait time for initial primary care visit.	Improved preventive care, more primary care visits, lower emergency care service use.	No significant differences.
Druss et al., 2001[40]	RCT, fair	Large VA Medical Center	Veterans within mental health clinic without a primary care provider.	Integrated primary care services into mental health clinic / usual care.	Better self-reported access.	More primary care visits, fewer ER visits, improved preventive care, higher satisfaction	Higher (better) scores on the SF-36 physical component summary.
Saxon et al., 2006[41]	RCT, good	VA Puget Sound Health Care System	Veterans presenting for substance use treatment who did not have a primary care provider and had at least one chronic health or asymptomatic condition (e.g., high blood pressure).	Implemented an onsite (within the substance use clinic) primary care clinic / usual care	Shorter wait for initial primary care visit; greater odds of attending rescheduled initial visit; more likely to attend at least 1 primary care visit.	More likely to attend return primary care visits and averaged more primary care visits; less non-VA primary care. More likely to remain engaged in substance use treatment at 60 days.	No significant differences

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Shiner et al., 2009[38]	Cohort study, poor	Large VAMC and three CBOCs	Veterans who screened positive for depression in primary care.	Varying models of Primary Care Mental Health (PCMH). The VAMC had co-location of, and advance or open access to mental health providers; and standardized assessments. CBOC-A had walk in access one day per week, evaluation by a psychotherapy and a psychopharmacologically oriented provider, and standardized assessment. CBOC-B had a psychotherapist as part of the primary care team and back-up telepsychiatry services (by appointment). CBOC-C did not have PCMH, but mental health care was available at the CBOC. CBOC-D did not have PCMH and there was no mental health care on site (comparator).	Following implementation, VAMC and CBOC-A had increases in veterans seen in mental health within both 4 days and 30 days. CBOC-B had an increase of veterans seen within 30 days and percentage receiving optimal care. No differences in CBOCs C & D.	More patients at VAMC, CBOC-A, and CBOC-B received "optimal depression treatment."	N/A
Watts et al., 2007[39]	Cohort study, fair	White River Junction VAMC & CBOCs	Veterans who screened positive for depression in primary care	PCMH Integration / no PCMH integration	More patients received mental health services in primary care and were seen in mental health; shorter wait time for initial mental health appointment (all outcomes only significant for VAMC, not CBOCs)	More patients received "optimal depression treatment" (at VAMC, not CBOC)	N/A
Intensive Case Management – High intensity treatment coordination to facilitate identification of and access to needed services							
Ritchie et al., 2002[44]	Case series, poor	Two VAMCs	Elderly veterans in rural counties who were frail and at risk of repeated hospitalization	Pilot implementation of the Coordination and Advocacy for Rural Elders (CARE) program, which performs scheduled, standardized assessments; identifies problems; develops care plans; and tracks resolution of problems / no comparison	Over 56% received a medical service of referral / linkage.	N/A	N/A

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Weinberger et al., 1996[45]	RCT, good	Nine VAMCs with diversity in location and academic affiliation	Hospitalized veterans with one of three chronic diseases without continuous primary care.	Implemented intensive primary care program designed to increase access to primary care; intervention included both an inpatient (e.g., follow-up planning, scheduling) and outpatient (e.g., appointment reminders, check-in phone call) components / usual care	Median time from hospital discharge to primary care shorter. Better satisfaction with self-reported access.	More likely to have at least one general medical clinic visit; more general medical clinic visits during six-months post-discharge; higher monthly hospital readmission rate; more days of hospital readmission; greater satisfaction with care.	No significant differences.
Telemedicine – Conducting encounters via telephone or interactive video conferencing							
Barnett et al., 2006[46]	Retrospective matched cohort analysis, fair	Four VAMCS in Florida, Puerto Rico, and Georgia	Older veterans with type two diabetes at high risk for multiple VA inpatient and outpatient visits.	Nurse coordinators monitored data from a home telehealth messaging device and made phone calls or scheduled appointments with the physician as necessary / treatment as usual	Care coordinator-initiated primary care clinic visits increased by 8.9%.	Decrease in all cause hospitalization, diabetes related hospitalizations (no longer significant after controlling for baseline A1C).	N/A
Hopp et al., 2006[47]	RCT, fair	Home care service line at a large VAMC in Indianapolis	All patients receiving home care services at the VAMC	In addition to traditional home care services, participants contacted VAMC using telehealth units / home care as usual	Most reported that their level of contact with VA providers increased.	No significant differences.	Improvement on the mental component summary of the Health Related Quality of Life scale
Wakefield et al., 2004[48]	Cross-sectional survey, poor	Two VAMCs and a long term care facility	Residents living at the Iowa Veterans Home.	Implemented interactive video conferencing to provide specialty consultation to veterans living at the long term care facility / no comparator	92% of veterans reported that using telemedicine made it easier to see the specialist.	81% of veterans reported satisfaction with the telemedicine consultation process.	N/A
Wilkins et al., 2007[49]	Pilot case series, poor	Two VAMCs without multidisci-plinary wound care teams	Veterans with a wound who sought care at a VAMC without a wound care team.	Implemented telemedicine to seek consultations from a remote wound care team/ no comparator	Veterans reported that telemedicine was more convenient than travelling to wound care team.	Almost all (92.8%) participants were satisfied with telemedicine.	N/A

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Outreach – Providing information about how to access care							
McFall et al., 2000[50]	RCT, poor	Large urban VAMC	Vietnam veterans living in vicinity of VAMC who are service-connected for PTSD without use of VA mental health or substance use services in the prior 12 months.	Outreach intervention with (1) a mailing which included information regarding PTSD treatment services and a letter from the PTSD program outlining three ways to initiate care (return postcard, call, or walk-in clinic) , and (2) direct phone call during which veterans could ask about services, schedule an appointment, or address barriers / no intervention control group.	Significantly more likely to schedule an intake, present for intake session.	Significantly more likely to attend at least one follow-up session.	N/A
Copayments – Change in medication copayments							
Doshi et al., 2009[53]	Cohort study, fair	One large VAMC	Veterans on lipid-lowering medications	Increase in medication copayments from $2 to $7 / copayment exempt.	Lipid refill rates decreased for all veterans after copayment increase, but the decrease small among those without copayment.	N/A	N/A
Maciejewski et al., 2010[51]	Cohort study, fair	Four large VAMCs	Veterans with diabetic or hypertension who had a prescription for those conditions (a portion of whom had copayments).	Increase in medication copayments from $2 to $7 / copayment exempt.	At the end of the study, lower adherence to diabetic and hypertensive medications among veterans with a copayment.	N/A	N/A
Stroupe et al., 2007[54]	Cohort study, fair	VA-Wide	A random sample of 5% of VA pharmacy users.	Increase in medication copayments from $2 to $7 / copayment exempt.	Those with a copayment received 8% fewer 30-day refills than those without payments.	N/A	N/A

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Zeber et al., 2007[52]	Cohort study, fair	VA-wide	All veterans receiving a diagnosis of schizophrenia or schizoaffective disorder from 1998-1999 (a portion of whom had copayments).	Increase in medication copayments from $2 to $7 / copayment exempt.	For all medication and medical prescriptions: those exempt from copayments, prescriptions increased steadily throughout study, while for those with a copayment, growth slowed after price increase. For psychiatric drugs: for those exempt from copayments, prescriptions increased throughout study, while for those with a copay, use decreased after price increase.	Copayment group more likely to have psychiatric admission.	N/A
Other Access Interventions							
Bates et al., 2007[56]	Retrospective cohort analysis, poor	Two types of VAMCs, those with and without specialized rehab units	Veterans with lower-extremity amputations during study time frame.	Presence of Specialized Rehabilitation Unit (SRU) within the hospital / hospital without an SRU	No difference in the probability of receiving an initial rehabilitation consult; those in SRU more likely to receive specialized rehabilitation.	Longer length of non-ICU stays in SRU VAMCs.	Problems in peripheral circulation more common in non-SRU VAMCs, skin breakdown more common in SRU VAMCs.
Hagedorn et al., 2007[55]	Quasi-experimental, poor	A substance use clinic within a large VAMC	Veterans receiving services within the substance use clinic	Implementation of the Healthy Liver Program, designed to increase access to services for the prevention (vaccination), identification (testing), and treatment (referrals) of viral hepatitis within a substance use clinic / pre-implementation.	Testing for hepatitis increased, 94% of appropriate veterans started the vaccine series (vaccine was not available prior to implementation).	78% of those who learned they had hepatitis attended their intake at the hepatitis clinic.	N/A

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Rodriguez et al., 2007[57]	Qualitative study following implementation, poor	Two low income urban neigh-borhoods within the VA Pittsburgh Healthcare System	Elderly, urban, predominately African American men receiving care at one of the mobile care units.	Implemented a mobile care program, which had healthcare staff and resources to conduct basic medical care within the van / no comparator.	Accessibility of care was mentioned 26 times in 18 interviews (2nd most common topic behind quality of care).	Quality of care was mentioned 28 times in 18 interviews.	N/A