Department of Veterans Affairs
Health Services Research & Development Service

Evidence-based Synthesis Program

QUERI

Shared Medical Appointments for Chronic Medical Conditions: A Systematic Review

EXECUTIVE SUMMARY

July 2012

Prepared for:
Department of Veterans Affairs
Veterans Health Administration
Quality Enhancement Research Initiative
Health Services Research & Development Service
Washington, DC 20420

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PREFACE

Quality Enhancement Research Initiative's (QUERI's) Evidence-based Synthesis Program (ESP) was established to provide timely and accurate syntheses of targeted healthcare topics of particular importance to Veterans Affairs (VA) managers and policymakers, as they work to improve the health and healthcare of Veterans. The ESP disseminates these reports throughout VA.

QUERI provides funding for four ESP Centers and each Center has an active VA affiliation. The ESP Centers generate evidence syntheses on important clinical practice topics, and these reports help:

- develop clinical policies informed by evidence,
- guide the implementation of effective services to improve patient outcomes and to support VA clinical practice guidelines and performance measures, and
- set the direction for future research to address gaps in clinical knowledge.

In 2009, the ESP Coordinating Center was created to expand the capacity of QUERI Central Office and the four ESP sites by developing and maintaining program processes. In addition, the Center established a Steering Committee comprised of QUERI field-based investigators, VA Patient Care Services, Office of Quality and Performance, and Veterans Integrated Service Networks (VISN) Clinical Management Officers. The Steering Committee provides program oversight, guides strategic planning, coordinates dissemination activities, and develops collaborations with VA leadership to identify new ESP topics of importance to Veterans and the VA healthcare system.

Comments on this evidence report are welcome and can be sent to Nicole Floyd, ESP Coordinating Center Program Manager, at nicole.floyd@va.gov.

Recommended citation: Edelman D, McDuffie JR, Oddone E, Gierisch JM, Nagi A, Williams JW Jr. Shared Medical Appointments for Chronic Medical Conditions: A Systematic Review. VA-ESP Project #09-010; 2012.

This report is based on research conducted by the Evidence-based Synthesis Program (ESP) Center located at the Durham VA Medical Center, Durham, NC, funded by the Department of Veterans Affairs, Veterans Health Administration, Office of Research and Development, Quality Enhancement Research Initiative. The findings and conclusions in this document are those of the author(s) who are responsible for its contents; the findings and conclusions do not necessarily represent the views of the Department of Veterans Affairs or the United States government. Therefore, no statement in this article should be construed as an official position of the Department of Veterans Affairs. No investigators have any affiliations or financial involvement (e.g., employment, consultancies, honoraria, stock ownership or options, expert testimony, grants or patents received or pending, or royalties) that con¬flict with material presented in the report.

EXECUTIVE SUMMARY

BACKGROUND

The most successful health care systems offer ready access to high-quality primary care—an approach that is embedded in the fundamental design of Veterans Affairs (VA) health care and which is consistent with the Institute of Medicine's definition of high-quality care. This definition emphasizes safe, effective, patient-centered, timely, efficient, and equitable health care. Group medical visits are a method to deliver health care that offers the promise of improving these aspects for patients with chronic conditions.

Group visits (or clinics) are a system redesign in which clinicians see multiple patients together in the same clinical setting. Shared medical appointments (SMAs) are a subset of such clinics and are defined by groups of patients meeting over time for comprehensive care for a defining chronic condition or health care state. SMAs usually involve both a person trained or skilled in delivering patient education or facilitating patient interaction and a practitioner with prescribing privileges. SMA sessions typically last 60 to 120 minutes, with time set aside for social integration, interactive education, and medication management, in an effort to achieve improved disease outcomes.

SMAs have been scientifically tested in an array of primary care settings over the last 10 to 15 years. However, there has been great variability among these studies in relation to setting; components included in the intervention; and measurement of clinical, cost, and utilization outcomes. For example, the patient group may stay constant, in an attempt to provide group bonding, or the patients may be allowed to choose sessions from a schedule at their convenience to promote attendance. Like patients, provider teams can be constant or vary over time. This uncertainty regarding the optimal design and impact of SMAs led the VA to commission this evidence synthesis report.

Our objective was to summarize the effects of SMA on staff, patient, and economic outcomes and to evaluate whether the impact varied by clinical condition or specific intervention components.

Key Question 1. For adults with chronic medical conditions, do shared medical appointments (SMAs) compared with usual care improve the following:

- Patient and staff experience?
- Treatment adherence?
- Quality measures such as (a) process of care measures utilized by VA, National Quality Forum, or National Committee for Quality Assurance and (b) biophysical markers (laboratory or physiological markers of health status such as HbA1c and blood pressure)?
- Symptom severity and functional status?
- Utilization of medical resources or health care costs?

Key Question 2. For adults with chronic medical conditions, do the effects of SMAs vary by patient characteristics such as specific chronic medical conditions and severity of disease?

Key Question 3. Is the intensity of the intervention or the components used by SMAs associated with intervention effects?

METHODS

We searched MEDLINE® (via PubMed®), Embase®, CINAHL® , PsycINFO®, and Web of Science for peer-reviewed publications comparing shared medical appointments or group visits with usual care from January 1996 through April 2012. Our search strategy used the National Library of Medicine's medical subject headings (MeSH) keyword nomenclature and text words for group visits, and validated search terms for both randomized controlled trials and relevant observational studies. We limited the search to articles published in the English language involving human subjects 18 years of age and older. We developed our search strategy in consultation with a master librarian. We supplemented the electronic searches with a manual search of citations from a set of key primary articles, review articles and systematic reviews. As a mechanism to assess the risk of publication bias, we searched www.clinicaltrials.gov for completed but unpublished studies.

DATA SYNTHESIS

Using prespecified inclusion and exclusion criteria, we critically analyzed studies to compare their characteristics, methods, findings and quality. When meta-analysis was appropriate, we used random-effects models to synthesize the effects quantitatively, reporting by a weighted difference of the means when the same scale (e.g., blood pressure) was used and a standardized mean difference when the scales (e.g., health-related quality of life) differed across studies. Heterogeneity was examined among the studies using graphical displays and test statistics (Cochran's Q and I^2). We explored heterogeneity in study effects by using subgroup analyses for categorical variables (e.g., study quality) and meta-regression analyses for continuous or discrete variables (e.g., baseline HbA1c, intervention robustness). Our subgroup and meta-regression analyses should be considered hypothesis-generating because they consist of indirect comparisons and thus are subject to confounding. Outcomes not suitable to meta-analyses were described qualitatively

RATING THE BODY OF EVIDENCE

In addition to rating the quality of individual studies, we evaluated the overall strength of evidence (SOE) for each Key Question by assessing the following domains: risk of bias, consistency, directness, precision, strength of association (magnitude of effect), and publication bias. These domains were considered qualitatively, and a summary rating of high, moderate, low, or insufficient SOE was assigned after discussion by two reviewers.

PEER REVIEW

The draft version of the report was reviewed by technical experts and clinical leadership. A transcript of their comments is in an appendix of the full report and elucidates how each comment was considered in the final report.

RESULTS

We identified 1104 unique citations from a combined search of MEDLINE (via PubMed, n=323), CINAHL (n=290), Embase (n=145), PsycINFO (n=157), the Web of Science (n=186) and by manual searching of included study bibliographies and review articles (n=2). After applying eligibility criteria, 25 articles (representing 19 unique studies) were included in the review.

Of the 19 studies, 16 (13 trials) evaluated SMA interventions in patients with diabetes mellitus and 3 (2 trials) evaluated SMAs in older adults with high utilization of medical resources. SMAs were generally led by teams of 1 to 3 clinicians that usually included a physician and/or a registered nurse. Typically, sessions involved fixed patient panels and included individual breakouts for medication management. Group size averaged 6 to 10 members; median visit length was 2 hours and visit frequency ranged from approximately every 3 weeks to every 3 months. Followup ranged from 4 to 48 months. All studies compared SMAs with usual care or enhanced usual care; there were no direct comparisons between SMA and other quality-improvement strategies.

Our search of www.clinicaltrials.gov did not identify any completed but unpublished studies. We found four ongoing studies, three for patients with diabetes and one for those with heart failure.

Key Question 1. For adults with chronic medical conditions, do shared medical appointments (SMAs) compared with usual care improve the following:

- **Patient and staff experience?**
- **Treatment adherence?**
- **Quality measures such as (a) process of care measures utilized by VA, National Quality Forum, or National Committee for Quality Assurance and (b) biophysical markers (laboratory or physiological markers of health status such as HbA1c and blood pressure)?**
- **Symptom severity and functional status?**
- **Utilization of medical resources or health care costs?**

Of the 13 randomized trials that evaluated the effects of SMAs on outcomes for patients with diabetes, ten examined type 2 diabetes only, one examined type 1 only, and two examined a mixed patient population. Other chronic medical conditions were not represented. Studies enrolled patients with poor glucose control (thresholds varied from A1c .6.5% to >9%); a minority required elevated blood pressure or lipids. Only two trials described the effects on patient experience, and neither of those trials showed greater satisfaction among those in SMAs compared with usual care. All studies reported effects on average hemoglobin A1c at the end of the intervention. SMAs were associated with lower A1c than usual care at 4 to 48 months' followup (mean difference=-0.55; 95% CI, -0.99 to -0.11). However, effects varied significantly across studies and this was not explained by study quality. Eight studies reported effects on either total or LDL cholesterol, showing small but statistically nonsignificant treatment effects that varied across studies. Five studies reported effects on systolic blood pressure, showing a consistent and statistically significant effect (mean difference=-5.2; CI, -7.40 to -3.05). Five studies reported large improvements in health-related quality of life (standardized mean difference=-0.84; CI, -1.64 to -0.03), but effects were greater when using a disease-specific measure. Three observational studies examined a more limited set of outcomes, with findings

generally consistent with those of the randomized trials.

The effects of SMAs on hospital admissions and emergency department visits were explored in five studies on patients with diabetes. In three of these, admission rates were lower with SMAs, but the result was statistically significant in only one study. Two studies found emergency department visits decreased significantly with SMAs. Four studies reported effects on total costs, but results were mixed. In one, total costs were significantly higher; in another, total costs were significantly lower; in a third, results did not differ significantly; and the fourth was conducted in Europe and so costs may not be applicable to the U.S. health system.

We identified two randomized trials and one observational study that evaluated the effects of SMAs on older adults with high health care service utilization rates. All studies reported positive effects on patient experience with SMAs compared with usual care. Both trials reported effects on overall health status and functional status, but there was no difference compared with usual care for either of these measures. Biophysical outcomes were not reported. All three studies showed fewer hospital admissions in the SMA groups, and both trials reported a statistically significant decrease in emergency department visits with SMAs compared with usual care. Total costs also were lower for the SMA group in each study but varied substantially across studies and did not reach statistical significance for any study.

Table ES-1 summarizes the strength of evidence (SOE) for KQ 1.

Table ES-1. Summary of the strength of evidence for KQ 1

Population	Number of Studies[a] (Subjects)	Domains Pertaining to SOE				SOE
		Risk of Bias: Study Design/ Quality	Consistency	Directness	Precision	Effect Estimate (95% CI)
Staff experience						**Insufficient**
Diabetes	0	NA	NA	NA	NA	Not estimable
Older adults	1 (1236)	Obs/Fair	NA	Direct	Imprecise	Not estimable
Patient experience						**Insufficient**
Diabetes	2 (769)	RCT/Fair	Consistent	Direct	Imprecise	No effect
Older adults	2 (444)	RCT/Fair	Inconsistent	Direct	Imprecise	Small to large positive effect
Treatment adherence						**Insufficient**
Diabetes	3 (536)	RCT/Fair	Some inconsistency	Direct	Imprecise	Not estimable
Older adults	0	NA	NA	NA	NA	Not estimable
Biophysical						
Diabetes: A1c	13 (2921)	RCT/Good	Inconsistent	Direct	Some imprecision	MD = -0.55 (-0.99 to -0.11) Moderate SOE

Population	Number of Studies[a] (Subjects)	Domains Pertaining to SOE				SOE
		Risk of Bias: Study Design/ Quality	Consistency	Directness	Precision	Effect Estimate (95% CI)
Diabetes: Total Cholesterol	5 (1556)	RCT/Fair	Inconsistent	Direct	Imprecise	MD = -4.9 (-17.8 to 7.9) Low SOE
LDL Cholesterol	5 (997)	RCT/Fair	Inconsistent	Direct	Imprecise	MD -6.6 (-16.1 to 2.8) Low SOE
Diabetes: Blood pressure	5 (1125)	RCT/Good	Consistent	Direct	Some imprecision	MD = -5.2 (-7.4 to -3.1) Moderate SOE
Older adults	0	NA	NA	NA	NA	Not estimable
Health-related quality of life or functional status						
Diabetes	5 (1561)	RCT/Fair	Inconsistent	Direct	Imprecise	SMD = -0.84 (-1.6 to -0.03) Low SOE
Older adults	2 (615)	RCT/Fair	Inconsistent	Direct	Imprecise	Not estimable
Economic						
Diabetes	5 (1339)	RCT/Good	Inconsistent	Direct	Imprecise	*ED visits* lower rates in 2 of 5 studies Insufficient SOE
	5 (1339)	RCT/Good	Consistent	Direct	Some imprecision	*Hospitalizations* lower in 4 of 5 studies Low SOE
	4 (1125)	RCT/Fair	Inconsistent	Direct	Imprecise	*Total costs* range from lower to higher Insufficient SOE
Older adults	2 (615)	RCT/Fair	Consistent	Direct	Imprecise	*ED visits* lower rates in 2 of 2 studies Low SOE
	2 (615)	RCT/Fair	Some inconsistency	Direct	Imprecise	*Hospitalizations* lower in 1 of 2 studies Insufficient SOE
	2 (615)	RCT/Fair	Inconsistent	Direct	Imprecise	*Total costs* lower but not statistically significant Insufficient SOE

[a]Studies (subjects) given are for randomized trials; observational studies were also considered in SOE ratings but are not listed separately in the table.

Abbreviations: CI=confidence interval; ED=emergency department; MD=mean difference; NA=not applicable; RCT=randomized controlled trial; RD=risk difference; RR=risk ratio; SMD=standardized mean difference; SOE=strength of evidence

Key Question 2. For adults with chronic medical conditions, do the effects of SMAs vary by patient characteristics such as specific chronic medical conditions and severity of disease?

No included studies explored the subgroups of patients that would benefit most from an SMA intervention.

Key Question 3. Is the intensity of the intervention or the components used by SMAs associated with intervention effects?

No included studies explored the specific components of an SMA intervention that were most potent. SMA interventions did, however, have certain common components. SMAs were led by teams of 1 to 3 clinicians that included a physician (n=15), clinical pharmacists (n=9; the prescribing clinician in 3 studies), and a registered nurse. The clinical team was multidisciplinary in most studies; pharmacists and licensed mental health professionals participated in almost half the studies. Sessions were designed for closed panels of patients in all but three studies, which used drop-in models. Group size was 6 to 10 members for most studies, with size ranging between 10 and 20 members in 4 studies and as large as 25 members in 1 study. The planned visit frequency ranged from monthly to approximately every 3 months. SMA visits were a median of 2 hours (range 1 to 3.5 hours). At least 16 of 19 studies offered individual breakouts with a physician or clinical pharmacist as part of the SMA design specified that medication changes could be made at group visits. Details of the SMA interventions are given in an appendix of the full report.

We devised an intervention robustness score to attempt to address KQ 3 quantitatively, but it was not associated with treatment effects. More than 70 percent of all studies were similar on six of the seven variables used in the robustness score: (1) whether the team was continuous, (2) whether the group was closed, (3) whether individual breakout sessions were conducted, (4) whether medication changes were made, (5) how long each session was, and (6) whether there was contact outside the session. It is possible that there are other more important variables that are not being measured with current approaches. The strength of evidence for both questions was judged to be insufficient.

RECOMMENDATIONS FOR FUTURE RESEARCH

We used a structured framework to identify gaps in evidence and classify why these gaps exist (Table ES-2).

Table ES-2. Evidence gaps and future research

Evidence Gap	Reason	Type of Studies to Consider
Patients		
Absence of data for patients with conditions other than diabetes mellitus and high utilization	Insufficient information	Single and multisite RCTs Quasi-experimental studies
Interventions		
Uncertain which elements of an SMA intervention are most effective and efficient	Insufficient information	RCTs of head-to-head comparisons of different types of SMAs; Disaggregation trials

Evidence Gap	Reason	Type of Studies to Consider
Outcomes		
Uncertain effects on patient and staff satisfaction	Insufficient information	Nonrandomized or cluster randomized, multisite implementation studies, qualitative studies
Uncertain effects on physiological variables other than HbA1c	Insufficient information	Large scale RCTs Nonrandomized, cluster controlled trials, controlled before-and-after studies, interrupted time series
Uncertain effects on health system costs with the exception of the elderly high utilizers of the health system	Insufficient information	Costs analyses
Uncertain whether there would be unintended consequences to other aspects of the health care system if SMAs were implemented	Insufficient information	Multisite observational studies

Abbreviation: RCT=randomized controlled trial; SMA=shared medical appointment

CONCLUSION

Our review shows that SMAs—typically using closed groups with individual breakouts and opportunity for medication management—improve intermediate clinical outcomes for type 2 diabetes. A smaller literature shows positive effects on patient experience in older adults and the possibility of lower health care utilization. SMAs may be most effective for illnesses such as diabetes that have a phase in which the risk of complication is relatively high while the disease is simultaneously asymptomatic, and in which medication titration and self-management are important. Until further studies are done that allow for comparisons across conditions, the targeting of SMA interventions for chronic conditions other than diabetes will remain speculative.

ABBREVIATIONS TABLE

CI	confidence interval
ED	emergency department
KQ	key question
MD	mean difference
MeSH	medical subject headings
NA	not applicable
NR	not reported
RCT	randomized controlled trial
RD	risk difference
RR	risk ratio
SMA	shared medical appointment
SMD	standardized mean difference
SOE	strength of evidence
VA	Department of Veterans Affairs