Community Preventive Services Task Force

Cardiovascular Disease Prevention: Team-Based Care to Improve Blood Pressure Control

Task Force Finding and Rationale Statement

Table of Contents

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Intervention Definition

Team-based care to improve blood pressure control is a health systems-level, organizational intervention that incorporates a multidisciplinary team to improve the quality of hypertension care for patients. Team-based care is established by adding new staff or changing the roles of existing staff to work with a primary care provider.

Each team includes the patient, the patient's primary care provider, and other professionals such as nurses, pharmacists, dietitians, social workers, and community health workers. Team members provide process support and share responsibilities of hypertension care to complement the activities of the primary care provider. These responsibilities include medication management; patient follow-up; and adherence and self-management support.

- Team-based care interventions typically include activities to:
- Facilitate communication and coordination of care support among various team members
- Enhance use of evidence-based guidelines by team members
- Establish regular, structured follow-up mechanisms to monitor patients' progress and schedule additional visits as needed
- Actively engage patients in their own care by providing them with education about hypertension medication, adherence support (for medication and other treatments), and tools and resources for self-management (including health behavior change)

Task Force Finding (April 2012)

The Community Preventive Services Task Force recommends team-based care to improve blood pressure control on the basis of strong evidence of effectiveness in improving the proportion of patients with controlled blood pressure and in reducing systolic (SBP) and diastolic (DBP) blood pressure. Evidence was considered strong based on findings from 80 studies of team-based care organized primarily with nurses and pharmacists working in collaboration with primary care providers, patients, and other professionals. The economic evidence indicates that team-based care is cost-effective.

Rationale

Basis of Finding

The Task Force finding is based on evidence from a systematic review published in 2006 (Walsh et al., 28 studies, search period January 1980-July 2003) and a more recent Community Guide review (52 studies, search period July 2003-May 2012). Results from both reviews demonstrate the effectiveness of team-based care (TBC) in improving blood pressure outcomes. Magnitude of effect estimates, number of studies, and consistency of effects provide the basis for the strong evidence finding (Table).

Table 1: Team-Based Care for Improved Blood Pressure (BP) Control: Results

Outcome	Walsh 2006 (1980 - 2003)		Community Guide (2003 - 2012)	
	Number of Studies	Median Effect Estimate	Number of Studies	Median Effect Estimate
Improvement in proportion of patients with BP controlled*	9 (SBP) 6 (DBP)	21.8 pct pts (IQI: 9.0, 33.8) 17.0 pct pts (IQI: 5.7, 24.5)	33 (SBP+DBP)	12.0 pct pts (IQI: 3.2, 20.8)
Reduction in Systolic BP (SBP)	17	9.7 mm Hg (IQI: 4.2, 14)	44	5.4 mm Hg (IQI: 2.0, 7.2)
Reduction in Diastolic BP (DBP)	21	4.2 mm Hg (IQI: 0.2, 6.8)	38	1.8 mm Hg (IQI: 0.7, 3.2)

*Absolute percentage point increase in proportion of patients achieving BP control
IQI = Interquartile Interval
pct pts = percentage points

The benefits of TBC in organizing around a system of care might apply to comprehensive cardiovascular disease risk reduction. The current Community Guide review found that in addition to improvements in blood pressure outcomes, TBC was effective in improving diabetes-related outcomes and lipid outcomes, especially total cholesterol and LDL-cholesterol.

From the current review, the predominant team members who worked with patients and primary care providers were nurses (28 studies), pharmacists (15 studies), or both (5 studies). When pharmacists were added to teams, the median improvement in the proportion of patients with controlled blood pressure was considerably higher than the overall median increase for this outcome. Median reductions in SBP and DBP were similar to overall estimates. When nurses or both nurses and pharmacists were added to teams, median estimates for all three outcomes were comparable to overall effect estimates. Only four studies examined the effectiveness of adding other team members, such as community health workers, social workers, or dietitians without nurses or pharmacists. In these few instances, median effect estimates were smaller in magnitude compared to overall effect estimates. Most studies added one team member; results were similar when compared to studies that added two or more team members, for all three outcomes.

Studies in the current review also examined effectiveness of TBC when team members could make changes to hypertensive medications independent of the primary care provider (16 studies); with primary care provider approval or consultation (15 studies); or not at all (22 studies). The first two levels of medication management achieved larger improvements in blood pressure outcomes when compared to the third level, where team members provided

adherence support and hypertension-related information but did not make medication changes or recommendations. Other important team member roles include support for health behavior change (e.g., counseling sessions) and systems support mainly via telephone follow-up.

Patients are an integral part of the team and work with primary care providers and other team members to improve involvement in self-management activities. Compared with patients treated by primary care providers only, a higher proportion of patients in TBC adhered to prescribed medication (>80%; 9 studies) and had greater satisfaction (3 studies). These improvements are likely attributable to greater emphasis in TBC on improving patient engagement and the quality of self-management support through health behavior change activities (37 studies) and pro-active follow-up, mainly via telephone (24 studies).

Applicability and Generalizability Issues

A majority of included studies in the current review were from the U.S. (38 studies), with other studies from Canada, Japan, and Western Europe. Although most studies were implemented in health care settings (42 studies), TBC was also evaluated in community settings (10 studies), indicating applicability of findings to both.

Evidence from the current review suggests TBC leads to larger improvements in populations where a majority has uncontrolled blood pressure (≥140/90 mmHg). However, median effect estimates from studies in populations whose hypertension was managed at enrolment (mean baseline SBP of 130-140 mmHg or mean DBP of 80-90 mmHg) were similar to the overall effect estimates, suggesting that benefits of TBC interventions apply to all populations with hypertension.

Adults, older adults, and male and female patients were balanced across study populations. White and African-American populations were well-represented across studies, indicating applicability of findings to these populations. Three studies that targeted low-income populations showed mixed results. Five studies with greater than 50% of target populations considered low-income had improvements in all three blood pressure outcomes. Five studies with greater than 50% of target populations receiving public health insurance (Medicare or Medicaid) or being uninsured, and one study with 100% of the target population receiving public health insurance, observed improved blood pressure outcomes.

Information about patients' education levels was limited, and results from a small number of studies where a higher proportion of patients had less than a high school education were mixed. Information on socioeconomic status (SES) and analysis by these variables was generally sparse across the body of evidence.

Data Quality Issues

Forty-seven studies from the current review were randomized controlled trials; remaining studies were quasi-RCTs or used other study designs with concurrent comparison groups. The most common limitations affecting this body of evidence were significant differences between intervention and comparison groups at baseline and potential for contamination.

Other Benefits and Harms

Median effect estimates for lipid outcomes (reported in 17 studies) and diabetes outcomes (19 studies), from the current review, indicated improvement associated with TBC. Researchers assessing these outcomes usually organized teams to address multiple cardiovascular risk factors, such as hypertension, hyperlipidemia, and diabetes. Two studies also reported a reduction in depressive symptoms from TBC interventions that incorporated services to address depression. Nine studies from the current review targeted blood pressure control among persons with diabetes and four

other studies were conducted with populations in which the majority had diabetes. Improvements were found for all three blood pressure outcomes, suggesting applicability of findings to efforts targeting blood pressure control in populations with diabetes. No harms to patients were identified from TBC in studies from the current review or published in the broader literature. Potential adverse effects from medication for hypertension (and related risk factors) could be mitigated through TBC by facilitating efficient communication between patients and providers on the team.

Economic Evidence

Thirty-one studies were included in the economic review (search period January 1980 through May 2012). All monetary values reported are in 2010 U.S. dollars.

Intervention cost is the cost of setting up and running TBC. Twenty studies provided 29 estimates of intervention cost, and found the median cost per patient per year for TBC was $284 (IQI: $153 to $670). The variation in intervention cost is partly explained by the number of cost components considered by the studies; the number of patients in the intervention group; and whether the intervention had objectives beyond blood pressure control.

Health care cost is the cost of products and services provided by the health care system, including outpatient, inpatient, emergency room visits, and medications. Twenty studies provided 23 estimates of health care cost. Compared to usual care, the median cost for TBC was $65 higher per patient per year (IQI: -$235 to $318). The variation between estimates was notable, and ten estimates from ten studies showed health care cost for TBC was lower than cost for usual care indicating health care cost savings. The variations in health care cost is partly explained by the number of health care components considered by studies; existence of comorbidities; and time frame of the analysis. Estimates likely reflect the short-term impact on health care cost and not the potential savings from reduced blood pressure that would accrue over time.

Cost-effectiveness ratios assess intervention cost per quality-adjusted life year (QALY) saved. One study reported that TBC cost $4763 per QALY saved. Ten additional studies provided 14 estimates of the cost associated with reductions in SBP due to TBC, and these estimates were translated to cost per QALY saved using two separate formulas. The median cost per QALY saved was $13,992 (IQI: $8339 to $32,292) based on the first formula (Mason et al. 2005) and $9716 (IQI: $5971 to $22,425) based on the second formula (McEwan et al. 2005). All but two estimates were below a conservative threshold for cost-effectiveness of $50,000; indicating TBC for blood pressure control is a cost-effective intervention.

Two cost-benefit studies compared the economic benefits (averted health care cost) to the intervention cost, resulting in benefit-to-cost ratios of 12.2:1 and 10:1. However, each study had limitations likely to affect generalizability of results. The first study considered health care cost for conditions beyond hypertension, did not have a comparison group, and selected from a patient population of high utilizers of health care. The second study underestimated the cost of developing a decision-support system, and found blood pressure to be reduced only for high-income participants.

Considerations for Implementation

At the health system level, important considerations include resource allocation; effective reimbursement mechanisms for all team members; and return on investment. Additional strategies to maintain provider engagement such as feedback mechanisms and incentives are valuable. Health systems would need an effective method for identifying and prioritizing patients into these TBC arrangements and a clear understanding of the scope of the team's activities, mainly in targeting multiple cardiovascular disease risk factors in addition to hypertension (e.g., hyperlipidemia, diabetes, smoking, poor nutrition).

At the intervention level, it is important to have clear decisions about team constitution and sufficient support to train providers, foster team-building, and communicate effectively. Various modalities for care delivery and communication need to be considered, including telephones and mobile phones, the Internet, and newer technologies.

Team member roles in medication management are also important for implementation. Medication management roles that allow team members to independently change medications or make recommendations to primary care providers may be more important for achieving blood pressure and lipid control, whereas roles in which team members provide support for adherence and information on hypertension and other cardiovascular risk factors might be more relevant for maintaining control of blood pressure and related cardiovascular disease risk factors. It is essential that self-management support for patients be integrated into TBC. Systems supports such as electronic medical records (EMRs) and home blood pressure monitors are also important in these efforts.

Evidence Gaps

More evidence is needed on larger-scale studies (n>500). Only four studies from the current review were considered large in scale and their effect estimates were smaller in magnitude compared with overall effect estimates. TBC interventions also should be implemented to serve minority and low-SES populations to gain a better understanding of effectiveness in various contexts. Though included studies had information on race, ethnicity, income, education level, and insurance status, results were seldom analyzed by these variables.

More evidence is needed also on the effectiveness of TBC with team members such as community health workers or dietitians. Few studies evaluated the type and frequency of interaction between primary care providers and other team members. More evidence is needed to evaluate the role communication plays in TBC. Future studies should provide information on patient and provider preferences for communication within teams. New technology has the potential to improve sharing of evidence-based recommendations between team members and the subsequent uptake of these suggested changes. Use of new and emerging technologies is especially important in developing better channels of communication among providers and between providers and patients.

Patient-centered outcomes of satisfaction with care and adherence to behavioral change activities were rarely reported. More evidence is needed on patient perspectives, including TBC's effects on uptake of self-management activities.

Additional evidence is needed on the long-term sustainability of TBC interventions. Most studies in the current review conducted TBC interventions that lasted between 6 and 12 months. More information is needed about costs and effective reimbursement mechanisms that might impact the intensity of TBC.

The data presented here are preliminary and are subject to change as the systematic review goes through the scientific peer review process.

References

Mason JM, Freemantle N, Gibson JM, New JP. Specialist nurse-led clinics to improve control of hypertension and hyperlipidemia in diabetes. *Diabetes Care* 2005;28(1):40-6.

McEwan P, Peters JR, Bergenheim K, Currie CJ. Evaluation of the costs and outcomes from changes in risk factors in type 2 diabetes using the Cardiff stochastic simulation cost-utility model (DiabForecaster). *Current Medical Research and Opinion* 2006;22(1):121-9.

Walsh J, McDonald KM, Shojania KG, Sundaram V, Nayak S., et al. Quality improvement strategies for hypertension management: a systematic review. *Medical Care* 2006;44:646-57.

Publications

Proia KK, Thota AB, Njie GJ, Finnie RKC, Hopkins DP, et al. Team-Based Care and Improved Blood Pressure Control: A Community Guide Systematic Review. *American Journal of Preventive Medicine* 2014;47(1):86–99.

Community Preventive Services Task Force. Team-Based Care to Improve Blood Pressure Control. Recommendation of the Community Preventive Services Task Force. *American Journal of Preventive Medicine* 2014;47(1):100–2.

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