

Online Supplementary Material

Crabtree BF, Miller WL, Tallia AF, et al . Delivery of clinical preventive services in family medicine offices. *Ann Fam Med*. 2005;3:430-435.

<http://www.annfammed.org/cgi/content/full/3/5/430/DC1>

Supplemental Appendix 1. Details on Sampling, Data Management, and Data Analysis

This appendix provides supplemental descriptions of the methods used in the Prevention & Competing Demands in Primary Care study, including the sampling of practices and patients, data management, and data analysis.

Sampling

Sampling of Practices

Practice selection was based on results from a previous study in which 91 practices from a single Midwestern state were randomly selected to participate in a study of tobacco prevention and cessation.¹ These 91 practices were ranked according to tobacco-related services delivery rates and then purposefully chosen in an iterative process to include a range in tobacco-related prevention rates, practice size, and geographic location (urban, suburban, and rural). An initial sample of 10 practices was selected. Because a primary intent was to identify success factors, these initial 10 included 7 high-rate practices representing all 3 geographic locations and practice size (1 to 2, 3 to 4, 5 or more clinicians). Three practices, each with 2 clinicians and low tobacco-related prevention rates, were also selected. Initial analyses of these 10 suggested that system ownership, large size, and rural location were possible additional important features. This finding resulted in a refinement of the sampling strategy so that 2 practices (1 with a low rate and 1 with a higher rate) from each of 4 hospital systems in this Midwestern region were selected along with 2 larger practices and a rural practice with low tobacco-related delivery rates.

Twenty-three practices were contacted; the participation rate was 78%, yielding 18 participating practices. Initial contact was made to 1 of the practice physicians, but all physicians in the practice needed to agree to participate for the practice to be included. The inability to recruit all practice physicians led to lack of participation. For example, in 1, 5-physician practice, 2 of the physicians did not wish to participate.

Sampling of Patients

The field researcher approached consecutive patients in the waiting room with a goal of obtaining consent from 30 patients for each clinician in the practice. After receiving a verbal explanation of the study, patients were asked to sign a written consent form giving permission for the field researcher to observe the encounter and to abstract the patient's medical record. It generally required approaching 35 to 40 patients to achieve consent from 30 patients. In rare cases, when a part-time clinician was in the practice only sporadically, it was not possible to recruit 30 patients for that clinician; however, in each case there were other full-time clinicians in the practice for whom 30 patients were consented.

Data Management

Audiotaped in-depth interviews and dictated observational field notes were transcribed and imported into FolioViews 4.2 (Open Market, Inc, Salt Lake City, 1999), a text management software program. Chart audit and structured checklist data were entered into Microsoft Excel and imported into SPSS.

Calculation of Preventive Services Delivery Rates

We selected preventive services that have been widely publicized: mammography, Papanicolaou (Pap) smears, and cholesterol testing for screening; smoking cessation counseling; and recommended childhood immunization schedules and adult vaccinations for tetanus, pneumonia, and influenza. Each patient was assigned a score for each service based on 3 data sources: medical record reviews, patient exit card, and patient visit observations. The patient visit observations were captured with detailed descriptive field notes. Patient exit cards consisted of a brief questionnaire (card) completed by patients in the waiting room that included questions about current and past tobacco use and women's health history. The process for assessing the delivery of each service used the following steps and was repeated for each patient:

1. Patient's eligibility for a given preventive service was determined based on age and sex using the US Preventive Services Task Force guidelines.² For example, women aged 50 years or older are eligible for an annual mammogram, whereas men aged 35 years or older and women aged 45 years or older are eligible for a cholesterol test every 5 years.
2. Patient's medical record data were reviewed to determine whether a given preventive service was received within the appropriate timeframe. If it was, this service was labeled as a "hit," indicating the service was up-to-date based on the chart review.
3. Descriptive field notes from the observed patient visit were reviewed to determine whether a given preventive service or counseling was delivered at the observed visit (and not yet recorded in the chart). If it was, the service was labeled as "hit" even if the chart audit had not identified the service as having been done.
4. The exit card completed by the patient at the time of the visit was reviewed to identify any self-reported health history information that would change eligibility. For example, the denominator was adjusted for tobacco counseling when the patient exit card self-report indicated that the medical record did not accurately report smoking status (this generally was in favor of increasing the number of eligible patients, since smoking status of patients was often missing), or Pap smear eligibility was adjusted when patients reported that they had had a hysterectomy.
5. Prevention delivery rates for each service were calculated by dividing the number of patients receiving a service (as documented by chart or observed in the encounter) by the number of patients eligible to receive that service (as adjusted by the patient exit card).

Practice level rates were calculated for each of 3 types of preventive services: screening (combination of cholesterol, Pap smear, and mammogram), counseling (smoking cessation counseling), and immunization (combination of childhood series, and adult tetanus, influenza, and pneumonia). To calculate practice-level delivery rates for each type of service, the total number of services completed for a type of service was divided by the total number of services that should have been performed for that type of service. For example, to calculate practice screening rates among the patients sampled, the number of mammograms, Pap smears, and cholesterol tests that should have been performed based on eligibility was used as the denominator, and the total number of tests done was the numerator. In practice 1 in Online Supplemental Table 1, there were 34 women aged 50 years or older who were eligible for a mammogram, 33 women aged 18 years or older eligible for a Pap smear (reflecting the great number of rural women who have had a hysterectomy), 30 men aged 35 years or older eligible for a cholesterol test, and 36 women aged 45 years or older eligible for a cholesterol test, yielding a total of 133 eligible screenings that should have been performed. Among these 133 eligible screenings were 33 mammograms, 23 Pap smears, and 63 cholesterol tests, for a total of 119 screening tests, which calculates to an overall screening rate of 89%. By combining these 3 screening services, the overall screening rate includes a relatively easy blood test, a more complex in office examination, and a test that usually requires a referral.

Data Analysis

Qualitative analyses and interpretation were performed in several phases.³ Throughout data collection from 1997-1999, field notes were reviewed by the research team so immediate feedback could guide data collection while field researchers were still in the practices. Preliminary summaries were completed and provided for each practice so the practices could offer feedback to

the research team. After data collection was completed, intense secondary analyses took place throughout 2000-2002. Two authors (BFC and DJC) read all the practice-level observational data one practice at a time and copied any segment of text relevant to preventive services into a Word file. These concentrated text segments were then sorted and used to construct an initial summary of a practice's approach to preventive service delivery. The larger multidisciplinary team focused on understanding preventive services in the clinical encounters by reading aloud 5 to 10 encounters for each clinician in each practice and discussing individual clinician's philosophy and style. Practice summaries, calculated rates for preventive services, and descriptions of individual clinician's approaches were combined to create a summary characterizing each practice's strategy for delivering preventive services. Larger patterns were identified by comparing summaries and identifying common and unique patterns.

References

1. McIlvain HE, Crabtree BF, Backer LE, Turner PD. Use of office-based smoking cessation activities in family practices. *J Fam Pract.* 2000;49:1025-1029.
2. U.S. Preventive Services Task Force. *Guide to Clinical Preventive Services: Report of the U.S. Preventive Services Task Force.* 2nd ed. Baltimore, Md: Williams & Wilkins; 1996.
3. Miller WL, Crabtree BF. The dance of interpretation. In: Crabtree BF, Miller WL, eds. *Doing Qualitative Research.* 2nd ed. Thousand Oaks, Calif: Sage Publications; 1999:127-143.

Supplemental Appendix 2. Three Contrasting Case Illustrations

Each practice in this study developed its own unique and relatively stable pattern for delivering preventive services that were adopted over time according to the influence of local contexts both inside and outside the practice. In 2 practices (1 and 2 in online Supplemental Table 1) very different approaches resulted in acceptable rates for common screening procedures (eg, mammography, Papanicolaou [Pap] smears, and cholesterol testing) and childhood and adult immunization, as well as counseling for smoking cessation. Most of the other practices had satisfactory rates on 1 or two of services, but were relatively low on the others. The case illustrations focus on the 2 top-performing practices and, the only practice that provided services to less than 50% of eligible patients for all 3 types of services (practice 17).

Practice 1 is a small-group practice that provides care for obstetric, pediatric, adult, and geriatric patients in a rural community. The clinicians have long-standing close personal relationships with many of the patients and their families and use a family chart to capture their multigenerational focus. Patient encounters are often lengthy and flexible to accommodate patients' and family needs. One physician acts as a prevention role model and spends considerable time during physical examinations and health care maintenance (HCM) visits ensuring patients are offered the necessary preventive services, including influenza and pneumococcal vaccines. He is thorough in identifying hypercholesterolemia and has a special interest in colon screening, doing a large number of flexible sigmoidoscopies and colonoscopies. Even during illness visits, he reviews the charts at the beginning of patient encounters to ensure prevention is covered. Another physician is known as a teacher and educator and takes time to discuss issues with patients during their encounters. He gives frequent advice to quit smoking. The practice includes 2 physician's assistants who see many of the physicians' patients for acute care visits, thus providing time for the physicians to perform prevention activities during health care maintenance or chronic illness follow-up visits. Immunizations are given both at the clinic and at the "shot clinic," which is open for about 2 hours once a month. A great amount of patient education material is available in the practice, and posters in the examination rooms advise against smoking. The clinic has a symbiotic relationship with the local hospital, and patients are sent across the parking lot to the hospital radiology department for such tests as mammography. The clinic has its own CLIA (Clinical Laboratory Improvement Amendments) approved laboratory for most laboratory needs, so a high rate of reimbursable cholesterol screening (95% up-to-date) helped to offset some financial disincentives for doing prevention.

Practice 2 is also a small-group practice located in a rural community. It is the only medical clinic for miles around, and the physicians are deeply committed to their patients and to this community. The physicians are active in the community, particularly in the area of immunizations. Although the local hospital owns the building, the senior physician owns the practice business. After years of studying options, the senior physician implemented an electronic medical record (EMR), and paper charts have been completely phased out. During intake interviews, assistants ask questions about Pap smears, mammograms, smoking behaviors, immunization status, children's helmet use, seat belt use, and prostate-specific antigen (PSA) screening; and the EMR protocol reminds physicians about needed care before patient encounters. Automatic visit notes are generated by the computer based on a template for health maintenance visits. One of the office staff scans the medical data coming from outside the clinic, such as Pap smear reports, mammogram results, and consultants' reports, into the computerized record, while another enters laboratory work results. The computer program has the capacity to recall patients for preventive services, but it is not used. One physician noted that sometimes acute illness overrides prevention, but also commented that sometimes an acute illness is the best time to stimulate behavior change noting that unexpected events sometimes promote lifestyle change toward healthier behaviors. Nonetheless, the physicians recognize that preventive care takes time, and insurance does not usually pay for it. For this reason, one physician introduced brief counseling techniques that can be interjected when patients are most receptive, often during acute and chronic visits.

Practice 17 is a small-group practice located in a middle-class suburb of a growing Midwestern city. The local community represents a cross-section of different social and economic levels and has been growing rapidly since the practice was established. The practice is owned by a hospital-based health system and was the first primary care clinic established in this area; however, it has

seen its market share eroded by an influx of new primary care practices built by competing health systems. The clinicians in practice 17 have a common vision, strong leadership by the physicians, and a smooth-running, efficient system that seeks to minimize patient wait time. On more than one occasion the senior physician alluded to "taking care of sick people is my job," and illness management seems to be his focus. All the physicians voice a belief in the importance of providing preventive services but cite lack of time as the primary barrier to providing prevention in any visit except for HCM visits. Because many women received gynecologic and obstetric care elsewhere, adults often did not schedule HCM visits, so overall preventive service delivery was quite low. Charts were well organized and contained a summary of care with a list for use during HCM examinations, but this list was rarely filled out or kept up to date. X-ray and CLIA-approved laboratory facilities were on site; however, chemistry profiles and other laboratory tests were usually sent out for processing, so there was no financial incentive for cholesterol screening. Unlike practices 1 and 2, none of the 3 physicians prioritized prevention.