Supplementing Office-Based Care With A Population-Based Direct-To-Smoker Outreach Intervention Offering Free Treatment To Smokers In A Community Health Center: A Randomized Controlled Trial

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BACKGROUND: Tobacco remains the leading U.S. preventable cause of death. Treating tobacco use is among the most cost-effective actions in health care. Brief office-based interventions offered to all smokers are effective but clinicians do not reliably offer them. We hypothesized that tobacco treatment use and quit rates could be increased by offering treatment directly to all smokers, apart from office visits. We tested the effectiveness of a population-based direct-to-smoker (DTS) outreach program offering free tobacco treatment to smokers in a health care system.

METHODS: A randomized controlled trial of 590 smokers at 1 community health center compared usual care (n=177) to usual care plus DTS outreach (n=413). The DTS group was sent 3 monthly letters offering free phone consultation with a tobacco coordinator who offered fax-referral to the state telephone quitline and up to 8 weeks of free nicotine patches (NRT). Outcomes, assessed at 3 month follow-up, were the percent of smokers who used any tobacco treatment (counseling or meds), used NRT, used counseling, and self-reported 7-day and 30-day point prevalence tobacco abstinence.

RESULTS: 43 (10.4%) of 413 smokers in the DTS group accepted the treatment offer; 42 (98%) requested NRT and 30 (70%) were referred to counseling. At 3-month follow-up, in an intention-to-treat analysis adjusted by logistic regression for age, sex, race, insurance, and history of diabetes and/or coronary heart disease, a higher proportion of the DTS group, compared to controls, had used NRT (11.6% vs 3.9%, OR 3.47; 95%CI 1.52-7.92, p=.003), used any tobacco treatment (14.5% vs 7.3%, OR 1.95, 95%CI 1.04-3.65, p=.036), and reported tobacco abstinence for the past 7 days (5.3% vs. 1.1%, OR 5.35, 95%CI 1.23-22.32, p=.026) and past 30 days (4.1% vs. 0.6%, OR 8.25, 95%CI 1.08-63.01, p=.042). The treatment offer did not increase use of counseling (1.1% vs 1.7%, p=NS) or non-NRT medication use (3.6% vs 3.9%, p=NS). Estimated marginal cost per 7-day quit at 3 months was $576.

CONCLUSION: In a real-world effectiveness study, a population-based direct-to-smoker outreach offering free tobacco treatment to smokers in a community health center is a feasible, cost-effective way to increase the reach of treatment (primarily pharmacotherapy) and to increase short-term quit rates in the population.
Effectiveness of a Primary Care Physical Activity Intervention for Obese, Middle-Aged Women: 12-Week Results from the Healthy Bodies, Healthy Hearts Study

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BACKGROUND: Physical inactivity is a significant risk factor for cardiovascular disease and remains highly prevalent in women, especially in middle-age and beyond. Healthy Bodies, Healthy Hearts (HBHH) is a randomized, controlled physical activity (PA) intervention delivered in coordination with primary care and intended to increase leisure physical activity levels and decrease weight and waist circumference (WC) in obese, inactive middle-aged women.

METHODS: We recruited 99 inactive women aged 45-65 with BMI greater than or equal to 30 from 3 primary care clinics and randomized them to a 12-week, in-person activity intervention program (IP) or to an education-only, at-home (AH) group. Weekly IP sessions were 30 minute discussions followed by 30 minutes of moderate group PA; AH group received a 12-week self-guided manual based on the American Heart Associationâ€™s Choose to Move program. Assessments were conducted at baseline and 12 weeks. Leisure physical activity levels were measured with the one-month version of the Modifiable Activity Questionnaire. Weight and waist circumference were measured by a trained research assistant following a standardized protocol. Differences in measures by group between baseline and 12 weeks months were analyzed with a t-test or rank-sum test using an intention-to-treat principle. Missing data was imputed with the last observation carried forward method.

RESULTS: Data from 98 women was available for analysis. At baseline, mean (SD) age was 53.9 (5.4) years and 37% were black. Mean weight was 92.3 (17.7) kg, mean BMI was 34.7 (5.9), and mean WC was 105.7 (11.4) cm. Median leisure PA level was 2.8 MET-hr/week (IQR 12.0). 68 (69%) women attended 12-week follow-up visit, with black women and women in AH group being more likely to be lost to follow-up. At 12 weeks, women in the IP group had significantly greater increases in PA levels (6.3 vs. 0 MET-hr/week; p=0.001) than those in AH group. Women in IP group had modest decreases in weight (-1.5 vs. -0.9 kg; p=0.19) and waist circumference (-2.2 vs. -1.2 cm; p=0.15) that were not significantly different when compared to those in the AH group.

CONCLUSION: The HBHH intervention was successful in increasing the physical activity levels of obese, inactive middle-aged women. However, no significant changes in weight or waist circumference were observed. It remains to be seen whether the increases in PA will be sustained in longer-term follow-up and whether the HBHH intervention could be replicated in other primary care settings.
The association between minor and major ECG changes and incidence of coronary heart disease events

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**BACKGROUND:** Electrocardiographic (ECG) abnormalities are common in older adults, but data on their prognostic importance to predict future coronary heart disease (CHD) are conflicting. Our goal was to determine whether baseline ECG abnormalities or development of new and persistent ECG abnormalities during follow-up are associated with increased incident CHD events in older adults, independently of traditional cardiovascular risk factors (CVRFs).

**METHODS:** We studied 2191 elderly men and women (age range 68-80 years, 59% Caucasian, 41% Black) from the Health, Aging, and Body Composition Study without known cardiovascular disease at baseline. During 8 years of follow-up, self-reported CHD events, defined as hospitalization for acute myocardial infarction, coronary death, angina, angioplasty of coronary arteries and coronary artery surgery, were adjudicated by review of medical records. Baseline study ECG abnormalities were classified according to the Minnesota Code as minor (minor ST-T changes) and major (major ST-T changes, Q-QS wave abnormalities, left ventricular hypertrophy, complete bundle branch block or intraventricular block, atrial fibrillation or atrial flutter). After 4 years of follow-up, 1670 participants had a second study ECG to determine the presence of new or persistent ECG abnormalities. We used Cox models to assess the value of adding ECG abnormalities to traditional risk factors for the prediction of future CHD events. Primary analyses were adjusted for traditional CVRF included in the current Framingham Risk Score (age, gender, total and high density lipoprotein cholesterol, systolic blood pressure, smoking status), as well as diabetes. We categorized 7.5-year estimates for incident CHD as low risk (0% to 7.5%), intermediate risk (7.5% to 15%), and high risk (15% or more) to calculate net reclassification in the intermediate risk categories using Harrel's C index.

**RESULTS:** At baseline, 276 participants had minor and 506 had major ECG abnormalities. During 8 years of follow-up, 351 participants had CHD events. Minor ECG abnormalities at baseline were associated with an increased risk of CHD (hazard ratios (HR) and 95% confidence interval [CI] 1.45 [95% CI: 1.14 - 1.85] after adjustment for CVRFs). CHD risk was also increased among those with major ECG abnormalities at baseline (HR = 1.51, 95% CI: 1.20 - 1.90) and those with any ECG abnormality defined as either minor and/or major abnormalities (HR = 1.64, CI: 1.32 - 2.03). The presence of any ECG abnormality at baseline accurately reclassified 7.1% overall and 13.6% of intermediate risk participants (both P 0.005). Of the 1670 adults with a second ECG after 4 years, 208 had a new abnormality and 416 had a persistent abnormality. After adjustment for CVRFs, both new and/or persistent ECG abnormalities at 4 years were associated with an increased risk of subsequent CHD events (HR = 1.67, CI: 1.31 - 2.96 and HR = 1.52, CI: 1.07 - 2.16, respectively).

**CONCLUSION:** Minor and major ECG abnormalities in elderly adults are associated with an increased risk of CHD events and provide additional risk stratification information beyond traditional CVRFs. These data suggest a potential value of including ECG findings in the overall assessment of cardiovascular risk in elderly populations.
Clinicians do not account for overall cardiac risk in hypertensive treatment intensification

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BACKGROUND: Measures of overall cardiovascular risk (OCR) such as the UK Prospective Diabetes Study (UKPDS) Risk Engine can aide prioritization in clinical decision-making, because a patient who is likely to have a clinical event will likely benefit from its treatment. While OCR predicts the benefit of treatment intensification (TI) for patients with hypertension, it remains unclear if physicians use OCR in decision-making or if they guide treatment using blood pressure alone. In this study we examined the influence of OCR in the likelihood of treatment intensification.

METHODS: Data were from the ABATe study (Addressing Barriers to Treatment for Hypertension), a prospective cohort study of 856 diabetic US Veterans with diabetes and twice-measured blood pressure >= 140/90 at a single scheduled primary care visit between 2005 and 2006. We defined TI (the dependent variable) as a change in medication or dosage in the 3 months after the office visit. We divided OCR (the independent variable) into three groups - history of heart attack or congestive heart failure, high risk (UKPDS 10-year event risk > 20 %) or low-medium risk (UKPDS 10-year event risk <20%). We then conducted logistic regression models to assess the association between OCR and TI. All models were adjusted for systolic blood pressure, previous year's mean systolic blood pressure, comorbidity count, and clustering by clinician. We also assessed whether the association of OCR with TI was affected by uncertainty about hypertensive status, as measured by patient-reported home blood pressure values, or uncertainty of additional benefit of TI, as measured by the patient being on four classes of antihypertensive medications.

RESULTS: Of the 856 participants in the final model, 44% had a history of MI or CHF, 38% had high CV risk, and 19% had low or medium CV risk. Average BP was 154/79 +/- 14/12 (SD). Compared to veterans with low-to-medium CV risk, high risk veterans had 1.10 times the odds of TI (95% CI 0.75-1.6, p = 0.61) and those with a history of MI/CHF had 1.28 times the odds of TI (0.78-1.8, p = 0.43). Three individual components of total risk were associated with TI: higher systolic blood pressure (OR = 1.15, 1.02-1.30, p = 0.02 per 10 mmHg), higher hemoglobin A1C (OR 1.11, 1.01-1.23, p = 0.03 per 1% increase), and total:HDL cholesterol ratio (OR = 1.09 0.99-1.19, p = 0.06). Other individual risk factors including age, race, and smoking status were not associated with likelihood of TI. These findings were robust to multiple confounders, including clinical measures, measures of uncertainty of hypertension and measures of uncertainty of benefit of TI.

CONCLUSION: While certain cardiac risk factors such as hypertension severity play a major role in clinical decisions to intensify hypertension treatment, we found no evidence that clinicians account for overall cardiovascular risk in clinical decision-making. Emphasizing the role of overall risk on clinical treatment priorities will increase the efficiency and patient-centeredness of hypertension care.
Translating Medical Student Knowledge of Quality Improvement: A Quality Improvement Pilot Curriculum Demonstration Jason Fish¹; Carl Stevens¹; LuAnn Wilkerson¹. ¹UCLA, Los Angeles, California. (Proposal ID # 10846)

BACKGROUND: With a persistent gap between evidence-based best practices and actual medical care in the US, healthcare systems are investing deeply in the integration of quality improvement (QI) methods but are lacking a physician workforce committed to and trained in project-based QI methodology. To address this, we developed and piloted a QI curriculum, embedding QI didactic and practical elements in the core third year internal medicine clerkship.

METHODS: The curriculum includes didactics on basic principles of QI methodology and health services research. In 2009-2010, 23 students were exposed, and assessment of all third year medical students' ability to develop any structured QI strategy was determined using the Objective Structured Clinical Examination. The grading of the exam focused on broad QI categories.

RESULTS: The mean score on the exam was 43%. Those students exposed to the curriculum scored 20.9% higher than those students not exposed (p less than 0.001). We also found that those students participating in the QI pilot curriculum scored 21.1% higher than those students not participating in the curriculum (P less than 0.001), controlling for all students reporting exposure to some other QI didactics or QI projects (neither of which were significant in the multivariate model). Using t-tests, we identified that students in the pilot curriculum were more likely to recognize the importance of identifying key stakeholders, current institutional processes, and the need for continuous evaluation.

CONCLUSION: Out data indicates that our pilot demonstration of a QI curriculum using QI and health services methodology, coupled with practical business modeling tools, improved our students' ability to recognize opportunities for QI and develop key strategies for improving quality. Yet, our data also indicates that students still have difficulty applying QI to clinical practice. More research is needed to identify how best to teach QI to medical students in a way that translates into appropriate application.