Improving cardiac rehabilitation referral rates at AIM Clinic through academic detailing
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A. Study Purpose and Rationale

The purpose of this study is to increase provider referral rates for cardiac rehabilitation through academic detailing in the Associates in Internal Medicine (AIM) clinic at Columbia University Medical Center.

Cardiac rehabilitation is a coordinated multifaceted intervention designed to optimize a cardiac patient's physical, psychological, and social functioning in order to reduce morbidity and mortality[1]. It typically involves exercise sessions 2-3 times per week supplemented by cardiac risk factor modification counseling (i.e. diet, smoking cessation, medication adherence) and psychosocial support. The American Heart Association recommends participation in cardiac rehab for patients with history of acute MI, CABG, PCI, or cardiac transplant, chronic stable angina or chronic heart failure, peripheral vascular disease, and other forms of CVD[1].

There is strong evidence for the efficacy of cardiac rehab. A 2004 meta-analysis by Taylor *et al* showed that in patients with coronary heart disease, compared to usual care cardiac rehab was associated with reduced all-cause mortality (OR 0.80; 95% CI: 0.68-0.93), reduced cardiac mortality (OR 0.74; 95% CI: 0.61-0.96), greater reductions in total cholesterol level, triglyceride level, systolic blood pressure, and lower rates of self-reported smoking[2]. A 2004 Cochrane Review found that exercise-based cardiac rehab improved exercise capacity and quality of life in patients with mild to moderate heart failure[3]. Ades *et al* calculated that in the year 1995, cost effectiveness of cardiac rehab was $4,950 per year of life saved, favorably comparing to cost effectiveness of other preventive measures in cardiology with the exception of smoking cessation[4].

Despite strong evidence for the effectiveness of cardiac rehab and reimbursement by Medicare and some Medicaid and private insurance programs, cardiac rehab is an underused resource. One estimate showed that only 10-20% of appropriate candidates participate in formal cardiac rehab programs[5]. Many studies have been performed on barriers to care and predictors of cardiac rehab entry; most are of low quality. A 2006 systematic review of 10 observational studies from 1999-2004 studying determinants of referral to cardiac rehabilitation programs in patients with CAD found highest rates of referral reported in studies that used an automatic referral process[6]. A 2005 quantitative review of 32 studies on predictors of referral to cardiac rehab found that the main predictor of referral and patient participation was the physician's strong endorsement of cardiac rehab[7].

Cardiac rehabilitation is available at Columbia University Medical Center at the on-site Fauth Center in the Vanderbilt Clinic. It is staffed by a multidisciplinary team of physicians, licensed therapists, and educators. Despite a highly-ranked cardiology program, on-site availability, and a significant number of patients in AIM Clinic who meet AHA criteria for referral, AIM clinic providers share with their national counterparts' poor referral rates to cardiac rehab. Certainly, this is an area of poor quality in our clinic which deserves closer scrutiny and action. The aim of this study is to increase referral rates among AIM providers for cardiac rehabilitation through academic detailing.

Changing a physician behavior, such as rate of referral, is notoriously challenging and has been topic of increasing debate and study as the eras of evidence-based medicine, pay-for-performance, and quality have emerged. Among the different strategies studied is academic detailing, an outreach effort by physicians or other knowledgeable health professionals to change their physician peers' practice behaviors. Also known as educational outreach, academic detailing originated in response to the success of the pharmaceutical industry's success with face-to-face visits in altering physician prescribing practices. Academic detailing, in contrast to industry goals, involves a visit by a physician or professional to promote high-quality, evidence-based, patient-centered, cost-effective medicine within the practice. It often involves physician profiling, reminder systems, and educational material for both physicians and patients. A 2007 Cochrane

Review of educational outreach visits (academic detailing) found improvement in patient care and physician prescribing practices with variable rates of improvement in other professional performance[8].

The aim of this study is to increase referral rates among AIM providers for cardiac rehabilitation through academic detailing.

B. Study Design and Statistical Analysis

This is an experimental non-randomized controlled study of a quality improvement intervention. A sample of providers from AIM clinic will serve as the intervention group for which academic detailing will be performed. Given that the intervention includes posters and easily available educational material at the clinic site, the nature of the intervention prevents randomization or blinding at the AIM site. To serve as a control, baseline and one year referral rates will be measured at the New York University Internal Medicine Clinic which is assumed to have equal baseline cardiac rehab referral rates as AIM.

The outcome being measured is absolute change in mean percent referral of eligible patients among a sample of individual providers pre- and post- an academic detailing intervention. Absolute change (%) is defined as: mean % referral post-intervention – mean % referral pre-intervention. The individual referral rate per provider (%) is defined as: (# of patients referred to cardiac rehab in last year)/(# of patients seen in last year eligible for referral to cardiac rehab) x100. Patients considered eligible for cardiac rehab are those that have not previously participated in a cardiac rehab program and also meet American Heart Association criteria as previously outlined in the study rationale (section A). Data on numbers of patients eligible and referred will be obtained via chart review.

Mean referral rates among the sample of providers at the intervention and control sites will be measured at baseline and one year after the intervention is performed at the AIM Clinic. Absolute mean percent change in referral rates will be calculated for the intervention and control groups. These two means will be compared using an unpaired t-test.

For power analysis, anticipated absolute percent change in referral rates is obtained from a 2007 Cochrane Review of academic detailing. In this review, one of the analyses examined studies for any intervention in which educational outreach visits (academic detailing) were a component (including educational materials for all comparisons) compared to no intervention (including educational materials) for continuous outcome measures. The adjusted relative percentage change varied from 0% to 617%. The median percentage change was 21% (interquartile range 11% to 41%). Of note, the Cochrane Review defined relative percentage change attributable to the intervention as adjusted difference between the post-intervention experimental and control group means divided by the post-intervention control group mean x 100[8]. Assuming baseline referral rates for the control and intervention groups are the national average (15%), the absolute percentage change post-intervention is equal to 3%. The formulae for this calculation are as follows:

Assuming baseline referral rates are national average (15%), anticipated absolute percentage change after academic detailing intervention:

$$\text{Adjusted relative percent change attributable to intervention} = \frac{(\text{post-intervention exper mean}) - (\text{post-intervention control mean})}{(\text{post-intervention control mean})} * 100$$

$$21\% = \frac{(\text{absolute percentage change post-intervention})}{(0.15)} \times 100$$

Absolute percentage change post-intervention = 3%

Assuming normal distribution, standard deviation of 5%, and effect being anticipated absolute change post-intervention (3%), it is estimated that 45 subjects will be required in each group in order to achieve 80% power and p=0.05.

C. Study Procedure
The study will take place over approximately one year. Baseline data will be obtained and the academic detailing intervention will occur shortly after for approximately 1 month. Follow-up data will be obtained one year after the intervention.

D. Study Drugs
Not applicable

E. Medical Device
Not applicable

F. Study Questionnaires
Not applicable

G. Study Subjects
Study subjects will include resident and attending level physicians and nurse practitioners at Columbia University Medical Center Associates in Internal Medicine (intervention group) and New York University internal medicine (control group) clinics. The study sample of providers will reflect existing proportions of attending, resident and nurse practitioner providers within the control and interventional clinics. Providers with less than one year of practice will be excluded as their patient panels have insufficient numbers to assess referral rate to cardiac rehab.

Waiver of consent will be obtained for patients whose charts are being examined. Waiver of consent is appropriate as no risk is anticipated to the patient, waiver will not adversely affect rights and welfare of patients, and research could not practically be performed without waiver of consent.

H. Recruitment of Subjects
Subjects will providers at AIM clinic and NYU Internal Medicine outpatient clinics. They will be recruited via e-mail or personal contact by the investigator.

I. Confidentiality of Study Data
Data will be obtained in a confidential manner, numerically coded, and will not be linked to any identifying characteristics of the provider such as sex or age. Data will be stored securely, with access limited only to the investigator.

J. Potential Conflict of Interest
There is no anticipated conflict of interest.

K. Location of the Study
This study will be conducted in the Columbia University Medical Center AIM outpatient clinic and at New York University Internal Medicine Residency Program outpatient clinic.

L. Potential Risks
There are no anticipated risks to study subjects.

M. Potential Benefits
Potential benefits include increased referral and utilization of cardiac rehab, a safe intervention that has proven benefit in all-cause and cardiac mortality as described in the study rationale.

N. Alternative Therapies
Not applicable.

O. Compensation to Subjects
There will be no compensation for subjects.

P. Costs to Subjects

Providers will be required to take time to be enrolled in the study and participate in the academic detailing intervention.

Q. Minors as Research Subjects
Not applicable.

R. Radiation or Radioactive Substances
Not applicable.

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