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Decisive Bearing of Organizational Dynamics on the Application and Success of Hospital-Based Cardiac Rehabilitation

To the Editor: Analyses and reviews regarding cardiac rehabilitation (CR) are frequently featured in top-tier journals.[1,2] Cardiac rehabilitation is a comprehensive secondary prevention program involving exercise training as well as medical evaluation, cardiac risk factor modification, education, and counseling.[1] It been established as one of 9 performance measures for patients with ischemic heart disease by the American College of Cardiology Foundation and other preeminent medical organizations,[3] and it has growing relevance amid present-day surges of obesity, sedentariness,

multimorbidity, aging, and other complexities of care for a growing spectrum of patients.[1,4] Yet, CR underutilization remains entrenched. Logistic (eg, excessive distance and/or lack of transportation) and cost (eg, unaffordable copayments) impediments are often cited as key deterrents.[4] Many suggest that new models of care (particularly home-based CR) are essential to overcome imbedded obstacles.[4,5]

Although most CR analyses have focused on patient-specific factors affecting CR utilization, we investigated facility and organizational differences under the premise that there may still be unidentified modifiable organizational, local institutional, and personnel structures that influence enrollment and participation. By examining these relationships, we aimed to identify features conducive to utilization.

Methods. The Veterans Health Administration has 35 hospital-based CR programs among its 124 hospital facilities with inpatient cardiovascular services.[6] Severe underuse (only 8.4%) of hospital-based CR by veterans eligible for CR has been described previously.[6] Using administrative data, we found wide variations in utilization of CR across the different Veterans Health Administration facilities with CR programs. We identified 3 high-enrolling and 3 low-enrolling sites with similar complexity characteristics. Using a qualitative study design, we conducted semistructured interviews with a diverse range of patients and health care professionals (up to 4 of each) from each site to characterize features of high and low utilization. In each of the 6 programs, we spoke with patients who did and did not enroll, hospital cardiology staff (cardiologists, hospitalists, nurses), and CR staff (cardiologists, nurses, physical therapists, and exercise specialists) to clarify organizational and contextual barriers to and facilitators of CR utilization.

Results. Our results revealed important differences distinguishing high-enrolling vs low-enrolling sites. Patients from high-enrolling sites uniformly described participating because of strong health care professional endorsement. In contrast, patients from low-enrolling sites who did not enroll could not recall being informed about the program; most did not know the program even existed. Even if these patients were told and forgot, their statements suggest there was something ineffective about the messages they received. Health care professionals from high-enrolling sites uniformly described distinctive organizational climates in relation to CR, ie, there were coherent and uniform messages regarding the value and importance of CR as part of standard care and/or there were organizational processes in place to systematize CR referrals. They also described close working relationships between the cardiology and CR programs. In facilities with low enrollment, cardiology services and CR services were relatively less programmatically aligned. Cardiology staff described limited and sometimes even tense interactions with the CR service, particularly when CR was not managed by cardiology staff.

Although several patients at high-enrolling sites described distance as being a potential barrier to CR, these logistic impediments were generally offset by perceptions that CR had great value, that a spouse or family member could help with driving, and that CR programs could bend to accommodate their schedules and needs.

Discussion. The literature continues to promulgate the benefits of CR at a time when many hospital-based CR programs are closing amid dwindling enrollments. Our study results suggest that organization and personnel dynamics are an important aspect of CR program success. Logistics seemed relatively less determinant of utilization in programs with optimal organizational dynamics.

At a time when many aspects of medical care are being curtailed, especially if their value is deemed marginal, we assert that hospital-based CR is more impactful and feasible than many may appreciate. However, for patients to take advantage of CR, organizations must implement or reinforce good working relationships between cardiology and CR services and organizational processes that systematize CR referrals. Therefore, rather than dismissing hospital-based CR as impractical, we identified an opportunity to initiate changes that foster an organizational climate favorable to this vital secondary prevention program.

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Induction of Atrial Fibrillation by Topical Use of Nasal Decongestants

To the Editor: In recent years, risk factors for atrial fibrillation such as obesity, arterial hypertension, and diabetes have been identified. In this context also, drugs such as β_2-agonists, bisphosphonates, anabolic steroids, and xanthine derivates have been claimed to be associated with atrial fibrillation. The following report details the occurrence of atrial fibrillation in association with topical decongestants.

Report of Cases. A 60-year-old woman presented to our outpatient clinic because she had noticed an arrhythmic heartbeat for the preceding 5 days. She reported no continuous medication usage. Electrocardiography revealed atrial fibrillation with a heart rate of 100 beats/min. No abnormalities were noted on echocardiography and laboratory investigations. Electrical cardioversion was performed, and β-blocker therapy was initiated. However, 10 days later, atrial fibrillation recurred. During a second detailed inquiry, the patient reported that she had been using topical decongestants containing tramazoline for many years to treat recurrent sinusitis. She had severe attacks of congestion despite up to 5 applications of the decongestant per day. She was advised to stop using decongestants immediately and underwent a second electrical cardioversion. After this second cardioversion, the patient has remained without a recurrence for 6 months.

Three weeks after the second cardioversion, the patient's 62-year-old husband came to our outpatient clinic with atrial fibrillation. He also had a history of severe recurrent sinusitis and used decongestants on a regular basis with excessive applications during attacks, similar to his wife. Two months before his visit to our outpatient clinic, pulmonary vein isolation had been performed at another hospital. However, atrial fibrillation recurred 2 weeks after ablation. The husband was also advised to stop using decongestants immediately, and after electrical cardioversion, he has had stable sinus rhythm.

Discussion. Although previous reports have revealed that topical nasal decongestant abuse can cause severe systemic effects such as ischemic stroke,[1] hypertension,[2] and reversible cardiomyopathy,[3] to my knowledge, these patients are the first reported cases indicating that nasal decongestant use can cause atrial fibrillation. Tramazoline is an imidazoline derivative that binds to peripheral α-adrenergic and imidazoline receptors and thereby increases arterial pressure and causes complex neuroendocrine reactions.[4] These substances are absorbed by mucous membranes, and in pediatric patients, the potentially severe risks of toxicity are well known.[5]

Nasal congestion is a major health problem with an estimated incidence of 30% in the general population. Decongestants cause fast and sustained relief of symptoms. Because they are available without prescription, there is an increased risk of uncontrolled applications taken for longer periods of time and at higher dosages than recommended. Long-term use can cause rebound congestion leading to rhinitis medicamentosa. Topical application of drugs such as β_2-agonists prescribed for patients with chronic obstructive pulmonary disease has already been reported to be associated with atrial fibrillation. In this scenario, however, these drugs are taken under medical supervision, whereas a high number of unreported cases of abuse must be estimated for nasal decongestants. The pulmonary vein isolation the husband underwent underlines the lack of awareness of the potential risks of these drugs by patients and doctors.

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CORRECTION

In the Original Article entitled, "**Exercise Capacity and Atrial Fibrillation Risk in Veterans: A Cohort Study**" published in the May 2016 issue of *Mayo Clinic Proceedings* (*Mayo Clin Proc*. 2016;91(5):558-566), Figure 1 was incorrect. The Y axis should be labeled "Event-free Probability," and the legend should read "Probability of not developing atrial fibrillation according to fitness categories."

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