

THE POWER OF PHYSICIAN-PRESCRIBED PHYSICAL ACTIVITY

THE EXERCISE IS MEDICINE® GREENVILLE PROGRAMME

– Written by Jennifer L. Trilk and Ann Blair Kennedy, USA

According to the World Health Organization (WHO): “by 2020, two-thirds of global diseases will be the result of lifestyle choices that include lack of exercise and overall physical activity, poor diet and obesity¹.” In the United States, according to the Center for Disease Control and Prevention, chronic diseases such as diabetes, heart disease, stroke, cancer and chronic respiratory diseases are the leading causes of mortality, representing 50% of all deaths and 86% of healthcare costs annually². In the local community of Greenville, SC, USA, the South Carolina Department of Health and Environmental Control report that of the adults in Greenville County, nearly 28% lead a sedentary lifestyle, 68% are overweight or obese, 44% have high lipid levels, 40% have

hypertension, 12% are diabetic and 7 to 8% are prediabetic^{3,4}.

Lifestyle and obesity-related diseases are emerging as a major driver of rapidly growing healthcare costs. For example, in Greenville County the estimated cost of physical inactivity in 2013 was \$1956 per adult, almost twice as much as to the United States average of \$1050 per adult. Diabetes alone is the seventh leading cause of death in South Carolina, claiming 1186 lives in 2012 and total direct costs of hospitalisations and emergency room visits related to diabetes in Greenville County were over \$4.7 billion in 2012^{6,7}. Therefore, helping people to make healthier diet and lifestyle choices has become increasingly critical. Additionally, the United States healthcare environment

is shifting payment away from episodic sickness-based fee-for-service care, toward payment mechanisms that financially reward physicians who successfully promote healthier lifestyle behaviours in their patients, also called ‘value-based care’⁵.

Recognising the opportunity for reducing morbidity, mortality and healthcare costs by increasing levels of physical activity, the World Health Assembly adopted the WHO Global Strategy on Diet, Physical Activity and Health to promote regular physical activity for the prevention of chronic diseases⁸. A change in physical activity behaviour nationally, as well as globally, would have a major impact on population health management by preventing, reducing and/or reversing morbidity and mortality



related to chronic diseases. Therefore, the creation, investigation and evaluation of programmes that can impact populations' physical activity behaviour are necessary.

THE PLAYERS

The Exercise is Medicine® Greenville (EIM Greenville) programme is answering the call of the WHO by being the first in the US to partner a large healthcare system (Greenville Health System – GHS), an innovative medical school (the University of South Carolina School of Medicine Greenville – USC SOM Greenville), a respected physical activity and wellness organisation (Greenville YMCA) and a national professional association (American College of Sports Medicine – ACSM) to improve clinical patient population health in Greenville, South Carolina. EIM Greenville joins these resources to bridge clinical care teams with community care teams to drive forward a community-based, clinical exercise programme for clinical populations^{9,10}.

GHS is the 13th largest healthcare delivery system in the US and is committed to clinical healthcare delivery, workforce education/development and clinical research. USC SOM Greenville is the academic partner of GHS and runs a 4-year medical programme that embraces an integrated curriculum focused on systems-based practice, population health concerns and value-based care. USC SOM Greenville is the first medical school in the country to fully incorporate 'Lifestyle Medicine' (exercise physiology, nutrition, health behaviour change and self-care that includes stress resiliency) into all 4 years of its undergraduate medical school curriculum. The mission of GHS and USC SOM Greenville is to educate health professionals to care compassionately, teach innovatively and improve constantly; the vision is to educate and advance knowledge to transform healthcare for the benefit of the people and diverse communities we serve. The Greenville YMCA, founded on the principles of healthy 'body, mind and spirit,' has the primary focus on

youth development, healthy living and social responsibility. The YMCA has local presence and global reach to mobilise local communities to affect lasting, meaningful change. The ACSM is the largest sports medicine and exercise science organisation in the world and is dedicated to advancing and integrating scientific research to provide educational and practical applications of exercise science and sports medicine.

THE PROGRAMME

The EIM Greenville programme is a provider-referred, clinical exercise prescription programme that uses a Population Health Management model, where patients receive extended therapeutic and rehabilitative care both in the clinic and in the community for the prevention and management of chronic diseases, obesity and sedentary lifestyles. The goal is to place opportunity for health behaviour change at the centre of the patient's life, in the community where they live, work and play. GHS patients who are diagnosed specifically with chronic diseases such as overweight/obesity, type-2 diabetes, dyslipidaemia, hypertension, cardiovascular disease and/or a sedentary lifestyle (e.g. meeting less than 150 minutes/week of moderate intensity physical activity) are eligible to participate. The overall goal of EIM Greenville is to positively affect patient health outcomes by using exercise therapy to improve biometrics and health behaviour change to improve likelihood of maintaining a healthy lifestyle. Specific programme goals include:

- Programme goal 1: to improve haemoglobin HbA1C, lipid profiles, blood pressure and body weight/waist circumference in clinical patients who participate in the 12-week EIM Greenville programme.

- Programme goal 2: to improve patient behaviour in healthy choices (e.g. physical activity behaviour), increase self-efficacy and improve depression scores and quality of life in clinical patients who participate in the 12-week EIM Greenville programme.
- Programme goal 3: to continually improve the EIM Greenville programme by evaluating the programme's feasibility, acceptability and sustainability across the GHS delivery system, the Life Center and the Greenville community YMCAs.

The innovative, evidence-based, multi-component programme looks to influence individual patient health long-term. The exercise portion of the programme also targets unique issues faced by the patient with chronic disease. Throughout the programme, participants are encouraged to continue exercising to help ensure that the new practices become ingrained habits. The cost of the programme is \$199 and the YMCA offers scholarships (up to 100%) to those who demonstrate financial need, as they live by the promise that 'no one is turned away for their inability to pay'. Indeed, over \$125,000 has been raised in philanthropy for scholarship EIM Greenville patients between 2015 and 2016.

THE PROCESS

EIM Greenville is divided into three components:

1. Healthcare practices.
2. The EIM Greenville Care Co-ordinator.
3. The Community Exercise Intervention.

Each of the three components are evidence-based. The providers in the healthcare practices influence the patient's exercise behaviour by seeking to change the environment through integrating the Exercise Vital Sign (EVS), counselling and referral into the programme. The EIM Greenville Co-ordinators assess the patients' stage of change toward readiness to participate in an exercise programme. Finally, the exercise intervention within the community setting seeks to improve biometrics as well as help patients gain self-efficacy, improve self-regulation and learn positive behaviours in a social setting. The process and flow of the programme can be seen in Figure 1.

Component 1: healthcare practices

EIM Greenville is currently implemented in practices within the GHS Departments of Internal Medicine and Family Medicine. The EIM Greenville programme is integrated through the Epic electronic health record (EHR) system and a practitioner

referral process. Specifically, our team has created EIM Clinician Decision Modules, incorporated into the Epic EHR, which includes:

- **Module 1** – The EVS to establish during each patient visit the minutes per week of exercise/physical activity obtained.
- **Module 2** – Order Sets that include EIM prescriptions for chronic conditions.
- **Module 3** – EIM referral protocol to transition patients into the programme.

The use of the modules in the EHR are also guided by a three-step process.

- **Step 1:** GHS patients who are seen by one of the participating healthcare practices have their physical activity assessed with the EVS at every visit, just as heart rate and blood pressure would be assessed. The EVS is performed through the Epic EHR to capture the patient's exercise/physical activity behaviour (Figure 2). This vital sign indicator is a simple, two-question prompt based on the 2008 Physical Activity Guidelines for Americans, which is administered by either a physician or support staff to determine if the patient is meeting the recommended 150 minutes/week of a moderate or higher level of physical activity. Scientific evidence concludes that this level of exercise/physical

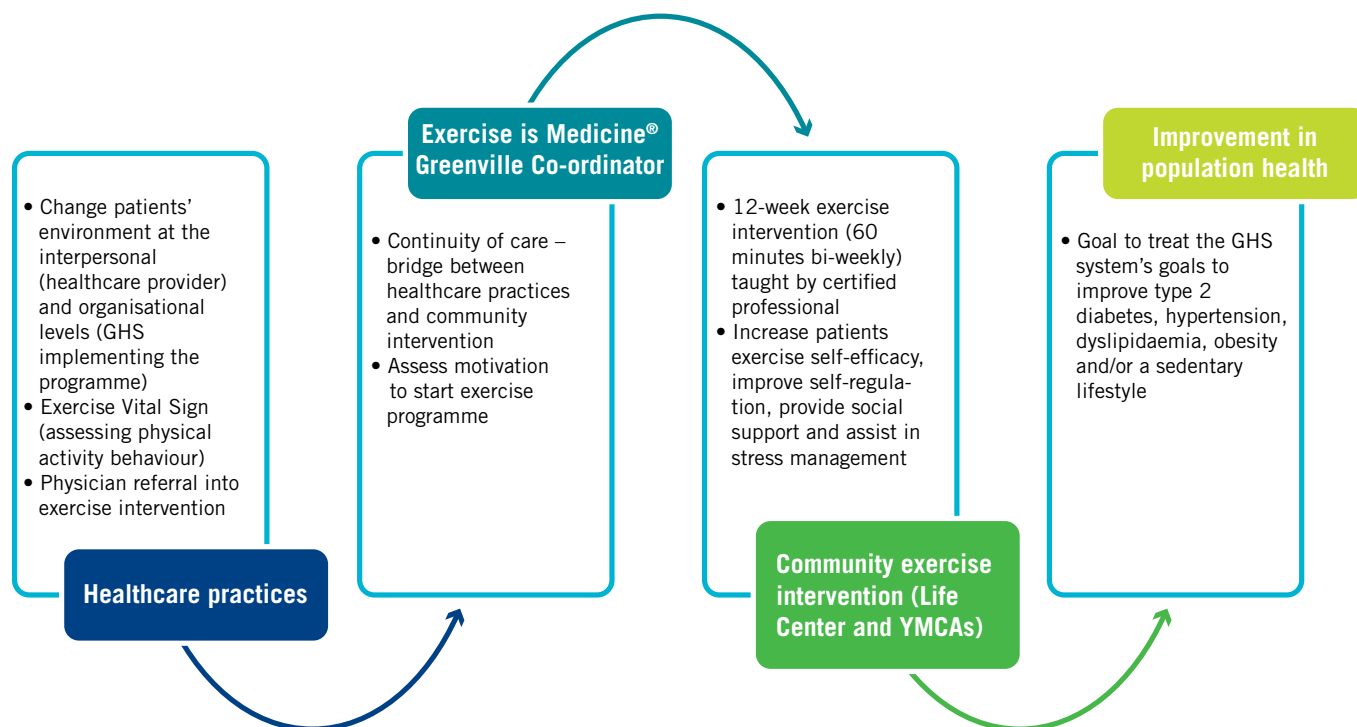


Figure 1: Process of patient flow through EIM Greenville.

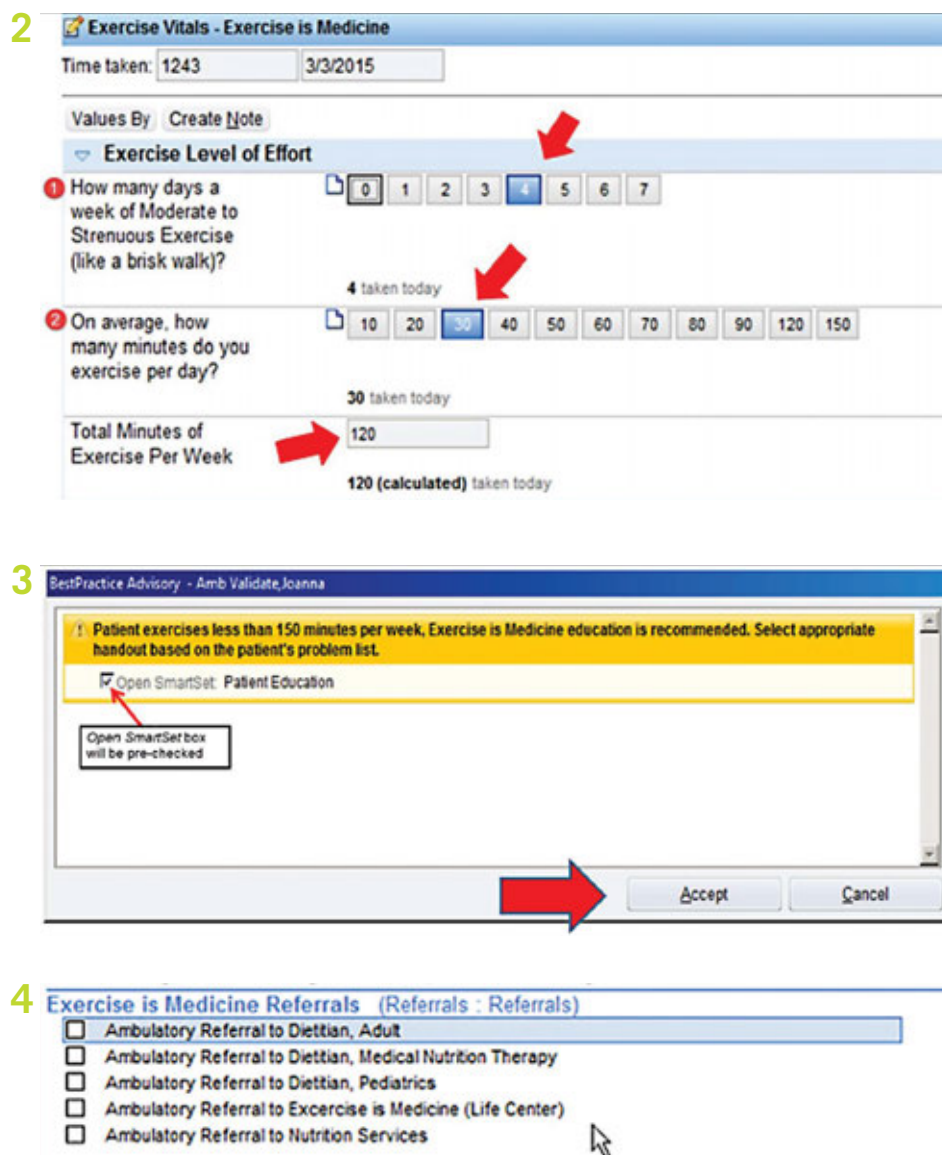


Figure 2: Exercise Vital Sign in Epic.

Figure 3: Best Practice Advisory within Epic Electronic Health Record.

Figure 4: EIM referrals in Epic.

activity correlates with prevention of, and positive health outcomes from, many chronic diseases^{11,12}. Additionally, evidence suggests changing the patients' environment (e.g. healthcare practitioners asking, counselling and/or referring about physical activity) can positively impact physical activity behaviour^{13,14}.

- Step 2: the physician then determines patients' eligibility for the programme by EVS and chronic disease diagnosis and/or risks (Figure 3). Patients who are diagnosed as having a chronic disease and/or physical activity levels under the United States guidelines, and do not have any contraindications

to exercise per the 2015 ACSM risk stratifications guidelines, are counselled by the physician with a shared decision-making and motivational interviewing approach on the benefits of exercise using patient education materials. The patient education materials, created by ACSM and EIM have been uploaded into Epic for easy access for physicians, the handouts are also available to the public via the EIM Global website (http://www.exerciseismedicine.org/support_page.php/your-rx-for-health-series).

- Step 3: the physician then follows the EIM Greenville referral prompts programmed into Epic, receives patient's signature for intent to treat

and completes the electronic referral of the patient to the EIM Greenville Care Co-ordinator through the Epic system (Figure 4).

Component 2: the EIM Greenville Care Co-ordinator

The EIM Greenville Care Co-ordinator is a full-time GHS employee who is trained in engagement and referral processing. The Care Co-ordinator receives referrals through Epic EHR and confirms patients are diagnosed with a chronic disease through a standard health risk-stratification process. The Care Co-ordinator also verifies that the EVS has been taken and the patient has completed the EIM Greenville Consent and Release of Information. In order to optimise engagement and sustainability in the programme, the Care Co-ordinator contacts the patient to identify perceived patient barriers and address physical and motivational readiness along with personal preferences (e.g. transportation, locations and ability to pay). The Care Co-ordinator then transitions the patient to the facility best suited to their needs. The Care Co-ordinator is also responsible for any information that needs to go back to the healthcare provider through the Epic EHR, such as patient contraindication to exercise notifications, patient participation updates and physical activity consult summary forms.

Component 3: the EIM Greenville Community Exercise Intervention

The 12-week Community Exercise Intervention is conducted at one of the six community locations: the GHS Life Center and 5 different YMCAs across upstate Greenville County. The exercise intervention is provided by EIM Greenville Professionals. These staff are trained to carry out the EIM Greenville programme within the healthcare system. They must be at least Bachelors-prepared exercise science fitness trainers with the additional national Exercise is Medicine® certification through the ACSM. This certification allows for high-level education in understanding how physical activity is incorporated into chronic disease treatment. The Professionals are also trained to manage patients on a group level (approximately 6 to 10 patients) for a 12-week evidence-



EIM Greenville Professionals are reporting positive health changes and behaviour outcomes in patients, such as reductions in HbA1c, blood pressure, total cholesterol and triglyceride, and body weight/waist circumference



based exercise protocol, as well as working on the individual level to address patient needs and offer on-going behavioural and emotional support. Patients are provided with a clinical exercise programme tailored for their specific disease conditions. The exercise programme targets disease-specific exercise modes for each patient; for example, the 'Cardiometabolic Module' is designed to focus on aerobic exercise for patients with hypertension, type 2 diabetes and dyslipidaemia; whereas the 'Musculoskeletal Module' is designed to focus on muscle strengthening and stretching for those with chronic pain, osteoarthritis or strength/mobility issues. Patients also are monitored for their engagement with the programme, adherence to the prescribed exercise regimen appropriate to their health status and learn motivational behavioural change and self-management strategies.

Tracking of patients

EIM Greenville tracks all sessions and patient progress using REDCap (Research Electronic Data Capture)³⁵, a cloud-based, HIPAA-compliant software programme used for public health and healthcare system studies that is accessible to the EIM Greenville Care Co-ordinators, EIM

Greenville Professionals and research staff. All pre-post metrics as well as information from every exercise intervention session, are gathered in the REDCap database to examine changes in HbA1c, blood pressure, lipid profiles, weight, BMI and waist circumference. Quality of life patient outcomes are ascertained using the 36-Item Short Form Health Survey (SF-36) and the Patient Health Questionnaire (PHQ9) – a multi-purpose instrument for screening, diagnosing, monitoring and measuring the severity of depression. On a population health level, health economics and value-based care cost are also being evaluated.

Evaluation of the programme for continual improvement

A critical component to the success of EIM Greenville is evaluation of the acceptability, usability and efficacy of the protocols by healthcare practices, research staff, EIM Greenville Professionals and patients. Therefore, investigating the degree to which each component of the programme is implemented is important. Research staff gather data by investigating Epic reports, REDCap reports and programme evaluation/satisfaction surveys distributed to all participants, EIM Greenville Co-ordinators, EIM Greenville Professionals and

all employees in the healthcare practices, to discover how well the programme components were implemented. The results of the implementation investigation helps guide programme improvements and helps staff understand outcomes (e.g. lack of outcome improvements may be due to lack of attendance in exercise intervention).

CONCLUSION

Instructed in the principles of comparative effectiveness and outcomes research, the EIM Greenville programme is a champion of transformation, working with the hospital system and community to solve the present and future challenges of healthcare delivery. Current referring physicians as well as EIM Greenville Professionals are reporting positive health changes and behaviour outcomes in patients, such as reductions in HbA1c, blood pressure, total cholesterol and triglyceride, and body weight/waist circumference; with increases in patient motivation and self-efficacy to adopt and sustain a physically active and healthy lifestyle. Research and programme staff regularly work with the physicians, Co-ordinators, exercise Professionals and patients of the programme to continually evaluate and seek guidance on ways to improve the programme to be in line with the GHS mission of 'improving constantly'. In addition to being the first in the US to implement a programme of this scale, EIM Greenville has created tools, training and referral mechanisms for physicians across the nation and globe that will help start similar programmes in their communities. Short- and long-term goals of EIM Greenville are to pursue policy interventions that support EIM Global; build healthcare coalitions and partnerships; provide strategy and functions supporting the EIM Greenville programme; and identify, advance and nationally disseminate 'what works' models for physicians, patients and communities. Outcomes of the study (changes in anthropometrics, biometrics and health behaviours) are being collected in order to disseminate the effectiveness of the programme to the Greenville community, as well as potentially to help drive US policy change by fostering discussions of reimbursement potential for clinical community-based exercise intervention programmes related to chronic disease.

The goal is to place opportunity for health behaviour change at the centre of the patient's life, in the community where they live, work and play

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Jennifer L. Trilk Ph.D., F.A.C.S.M.
Assistant Professor, Department of
Biomedical Sciences
University of South Carolina School of
Medicine Greenville

Co-Founder
The Lifestyle Medicine Education
Collaborative
Greenville, South Carolina, USA

Ann Blair Kennedy Dr.P.H
Clinical Assistant Professor, Department of
Biomedical Sciences
University of South Carolina School of
Medicine Greenville
Greenville, South Carolina, USA

Contact: trilk@greenvillemed.sc.edu