

# Preventive Cardiovascular Nurses Association (PCNA) 2020 Winning Abstracts

In response to the COVID-19 crisis, the Preventive Cardiovascular Nurses Association (PCNA) hosted its 26th Annual Cardiovascular Nursing Symposium, virtually. PCNA is proud to present the winning abstracts showcased during that groundbreaking meeting.

## **SYMPTOMS AND SKELETAL MUSCLE IN PERSONS WITH HEARTH FAILURE WITH PRESERVED EJECTION FRACTION**

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**Background:** Hypertension resulting in left ventricular hypertrophy (LVH) is a primary cause of heart failure with preserved ejection fraction (HFpEF). Recent evidence demonstrates changes in skeletal muscle parallel those in cardiac muscle in HF. Thus, skeletal muscle may not only provide a window into the changes occurring in the development and progression of HFpEF, but also may be a target for physiological improvements with exercise and provide prediction for outcomes.

**Purpose:** The purpose of this study was to examine symptoms, aerobic capacity, and skeletal muscle ultra-structure in 20 adults with hypertension and LVH.

**Methods:** Persons with hypertension and L VH underwent an exercise treadmill test to assess aerobic capacity, as measured by peak oxygen consumption ( $\text{VO}_{2\text{max}}$ ). Symptoms were measured using PROMIS Fatigue 8a and Dyspnea Severity questionnaires and Medical Outcomes Study-short form (SF-36v2). Skeletal muscle biopsies in a subset of participants ( $n=10$ ) were collected. Skeletal muscle ultrastructure was examined via transmission electron microscopy.

**Results:** Participants were  $53 \pm 12$  years of age, 75% female, and 75% Black. Skeletal muscle biopsies in a subset of participants ( $n=10$ ) demonstrated significant skeletal muscle fiber loss with increased lipid deposition, as compared to a healthy age-matched control. This loss of skeletal muscle structure was accompanied by reduced exercise capacity, as evidenced by very poor age- and gender-matched  $\text{VO}_{2\text{max}}$  values ( $18.9 \pm 6$  ml/kg/min). Higher aerobic capacity was related to decreased symptoms of fatigue ( $r=-.521$ ,  $p=.027$ ) and dyspnea ( $r=-.666$ ,  $p=.001$ ) and positively related to the SF-36 General Health scale ( $r=.654$ ,  $p=.002$ ).

**Conclusions:** Individuals with hypertension and LVH display reduced aerobic capacity and symptoms of dyspnea and fatigue. Significant skeletal muscle remodeling may reflect similar cardiac changes that relate to cardiomyocyte dysfunction and undiagnosed HFpEF.

**Implications for Practice:** Symptoms and functional capacity should be assessed in persons with hypertension and LVH, as they are at increased risk for HFrEF.

## **MATTERS OF THE HEART – NAVIGATING RESOURCES TO ASSIST PATIENTS IN MANAGING CARDIOVASCULAR CONDITIONS**

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**Background:** Patient Advocate Foundation (PAF) professional case management (CM) staff respond to a broad variety of patient concerns: preauthorization and reimbursement requests, assistance with appeals process, access to clinical trials and resolution of coding/billing concerns. PAF's focus is to assure access to prescribed health care while educating and empowering consumers to facilitate informed decisions and positive resolutions to issues with denial of access to healthcare.

**Purpose:** Sharing expertise surrounding the challenges patients with cardiovascular disease (CVD) experience: financial stability, medical debt crisis and insurance products - delivered through a free on-line self-directed resource for professionals, patients and caregivers.

**Description:** We served patients with CVD via online tools (with CM support) including a self-empowering educational component. Patients accessed materials over the web and/or phone to gain basic information about topics and issues that are impacted by their diagnosis. PAF educated CVD partners on the services available prior to launch.

**Evaluation:** Over a 13-month period, 3,734 unique visitors accessed the site (393 unique users; average 3.4 clicks-per-user; 5.7 minutes-per-session). Insurance/financial matters (35%) and understanding diagnosis (21%) were the most frequently view categories. One hundred ninety-eight individuals utilized the chat function (3.5 minutes-per-chat). In addition, CM provided one-on-

one assistance to 975 patients identifying 1,791 issues (average 1.8 issues-per-patient; 16.8 contacts-per-patient). Most resolved issues were insurance (62%) and debt crisis/cost-of-living concerns (21%). Debt-relief obtained on patient behalf \$970,069.

**Conclusions:** What people want most of all is health information that is available at specific decision milestones. Through the widget patients and providers can take direct control of access to healthcare resources.

**Implications:** The Matters of the Heart widget is a free, easy to use, smart finder tool for on-the go healthcare, financial and insurance help. It is perfect for patients and providers who want to guide their patients to programs that may be able to reduce barriers to care.

## SYMPTOMS PREDICT LOWER QUALITY OF LIFE IN PATIENTS WITH FIBROMUSCULAR DYSPLASIA

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**Background:** Fibromuscular dysplasia (FMD) can result in life-threatening complications, including stroke and heart attack. Many FMD patients complain of feeling like they are living with a “ticking time bomb”.

**Purpose:** The purpose of this study was to examine the impact of FMD symptoms and complications on quality of life, anxiety, and depression.

**Methods:** A cross-sectional design was conducted. Patients in an FMD registry were mailed surveys ( $n = 339$ ). SF-36 scale, PROMIS SF Anxiety and Depression scores were compared to symptoms and complications of FMD, and other diseases.

**Analysis:** Pearson's chi-square or Fisher's exact tests, or Kruskal-Wallis or ANOVA were used. Alpha of 0.05 was assumed. Analyses were performed using SAS® Software.

**Results:** Of 162 (47.8%) surveys received, 156 were female (97.5%), 130 had carotid and vertebral involvement (80.2%). Patients reporting stroke ( $p=0.004$ ) and transient ischemic attack (TIA) ( $p=0.046$ ) had higher mean depression. Higher RAND SF-36 Mental Component Score (MCS) was associated with decrease in stroke ( $p=0.004$ ) and TIA ( $p=0.002$ ), heart, and lung disease, and diabetes ( $\leq 0.05$ ). Those with hypertension ( $p=0.015$ ) had lower RAND SF-36 Physical Component Scores (PCS). Those with migraine, tinnitus, neck, dizziness, flank, abdominal, or leg pain, and other symptoms

( $p<0.001$ ) had lower PCS. After backward selection removed non-significant factors, migraine ( $p=0.004$ ), neck ( $p=0.002$ ) and leg pain ( $p=0.001$ ) were predictors of decreased PCS. Migraine ( $p<0.001$ ), neck ( $p=0.002$ ), and flank pain ( $p=0.010$ ) were predictors of decreased MCS.

**Conclusions:** Those who reported symptoms and complications consistent with carotid or vertebral involvement had lower MCS and PCS, increased depression, and anxiety. More research is needed to examine ways to address quality of life in this population.

**Practice Implications:** Patients with FMD live with high risk for stroke and heart attack. Careful assessment of symptoms can help nurses improve care and quality of life in patients with FMD.

## IMPROVING SYMPTOM RECOGNITION AND INTERPRETATION IN WOMEN WITH ACUTE CORONARY SYNDROME: RESULTS FROM A FEASIBILITY STUDY

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**Background:** Although guidelines recommend pre-discharge education for women with Acute Coronary Syndrome (ACS) include information about recurrent symptoms and when to call 9-1-1, current education does not include skill-building – a critical component of self-care.

**Objective:** To test the feasibility and acceptability of an individualized education and skill-building intervention to improve symptom recognition and interpretation in women with recurrent ACS symptoms.

**Methods:** Building on past research, a single-group, pre-post feasibility study was conducted to evaluate the addition of symptom monitoring notebooks to an education and skill-building intervention for women with ACS. Ten women received the nurse-delivered intervention within the 2 weeks of hospitalization. After baseline data collection, we provided one in-person teaching session followed by a phone session to reinforce teaching/answer questions, and evaluated outcomes at the close-out (phone) visit ~30 days from baseline.

**Results:** As measured by the ACS Response Index, mean knowledge scores increased by 2.9%, attitudes towards symptom recognition and help-seeking increased by 10.5%, and beliefs towards expectations and actions increased by 16.3%, on average. All 10 women completed the daily symptom monitoring activities (mean

adherence 93.8%). All 10 reported  $\geq 1$  symptom episode during follow-up (8 made notebook entries and reported symptoms during their close-out call; 2 reported symptoms during the close-out visit). Symptoms in 7 women were not heart-related and were self-limited. Two women had symptoms of stable angina (both recognized symptoms and acted promptly); one woman had symptoms of worsening heart failure and notified her provider within a week. Satisfaction/acceptability scores were excellent (mean 1.3) including not feeling burdened by the notebooks (mean 1.7) on a 4-point Likert Scale ("1" as "strongly agree"; "4" as "strongly disagree").

**Conclusions:** Delivery of the intervention is feasible/acceptable in the single-group. Testing in a randomized controlled study is needed.

**Implications:** Incorporating skill-building into education is necessary to optimize self-care.

#### POST EVENT-CARDIOVASCULAR RISK PERCEPTION SURVEY:VALIDITY AND RELIABILITY IN CARDIAC REHABILITATION PATIENTS POST HEART EVENT

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**Background:** CVD remains the number one killer of Americans in the United States. Efforts to decrease CVD risk factors have been extensive. Cardiac rehabilitation (CR) has shown to reduce morbidity, improve quality of life and appears to facilitate secondary prevention. However, perception of CVD post event in CR patients is unknown.

**Aim:** The purpose of this study to evaluate the validity and reliability of the Post Event-Cardiovascular Risk Perception Survey (PE-CRPS) among a group of CR patients who recently experienced a heart event.

**Methods:** This is a descriptive, cross-sectional design study. A convenient sample of 250 post event participants were recruited for testing the validity and reliability of a newly developed scale, derived from the original 10-item Likert scale Cardiovascular Risk Perception Survey (CRPS). Data were analyzed using SPSS version 26. Descriptive and exploratory factor analyses were the methods used to analyze the data and factors.

**Results:** An exploratory factor analysis (principal axis) was conducted on 9 out of the 10 items with an oblique (direct oblimin) rotation. Item 5 (smoking=sm) was not included in the analysis, as it did not meet the assumptions for inclusion. The investigators therefore

proceeded with, and interpreted exploratory factor analysis of all items except item 5 (sm). Two factors were extracted, which explained 54% of the variance in the responses. One contained responses for five items 1–4 & 6, which represented a latent medical history variable. The other latent variable contained items 7–10, which are items pertaining to stress and family history. Based upon Cronbach's  $\alpha$  reliability analyses, both factors were reliable. They were also strongly related with a correlation of .75.

**Conclusion:** Cardiovascular risk perception may be explained by two factors: Family History/Stress and Perception of Medical History.

#### A STANDARDIZED DISCHARGE PROTOCOL FOR HEART FAILURE PATIENTS TO REDUCE HOSPITAL READMISSIONS

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**Problem & Purpose:** Heart failure (HF) is an incurable chronic condition and a leading cause of hospitalizations and readmissions. Nurses and other healthcare professionals on a cardiac progressive care unit (CPCU) in a large academic center have provided patients with discharge education for managing HF, based on individual knowledge. However, inconsistent patient education can lead to poor self-care and increased readmission rates. The purpose of this project was to implement a standardized discharge protocol, based upon HF care guidelines, for all adult patients admitted to CPCU with a diagnosis of HF to improve the discharge process and reduce 30-day hospital readmission rates.

**Methods:** This quality improvement project was conducted over a 14-week period. The first three weeks were dedicated to educating staff nurses. A pre- and post-test was used to assess change in nurses' knowledge of HF management. The standardized HF discharge protocol was implemented over 10 weeks. An audit tool measured weekly compliance. A system usability scale (SUS) was used to evaluate the ease of the use of the standardized HF discharge protocol.

**Results:** Nurses' knowledge significantly improved after education (pre-mean 76.5%, post-mean 93.7%,  $p<0.001$ ). All nurses administered the discharge protocol by week 6, and 100% of the patients received the discharge protocol by week 6. Readmission rates for department of cardiology three months prior to the intervention (July, August, and September 2019) were 13.9%, 10.2%, and 13.1%, respectively. The readmission rate for October was 10.2%. The average SUS score was 86.7 (range 70–100), a grade "A" rating.

**Conclusion:** Nurses' knowledge improved significantly after education on HF and its management. The SUS score suggests that the standardized education protocol was easy to use and implement. Although it is too early to make any definitive conclusion, the readmission rate a month into implementation (October 2019) was 10.2%, lower than that of the previous month (September 2019) 13.1%. A standardized, evidence-based discharge process and HF patient education can positively impact HF self-management after discharge, thus improving quality of life and reducing hospital length of stay and 30-day readmission rates.

#### RAPID CHANGE TO IMPROVE DOOR TO ECG TIMES

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This evidence-based quality improvement project explored process changes to decrease door-to-ECG time on patients meeting rapid ECG criteria in an adult Emergency Department. The American Heart Association (AHA) and the American College of Cardiology (ACC) both endorse a guideline of rapid door-to-ECG times in less than 10 minutes. In October 2018, the door-to-ECG time was the highest it had been all year at 21 minutes (median). The overall 2018 YTD was 17 minutes.

The key stakeholders reviewed 912 ECGs performed on rapid criteria patients in the ED. After review or data and current workflows, five process improvement interventions were implemented to improve door-to-ECG times: dedicated ECG spaces, pilot ECG log, re-education of staff, development of a 'Pulse' newsletter, and the creation of a clinician first position. Data was collected through the J. Lee Garvey Chest Pain Network and manually.

In 2019, data was analyzed comparing median times and standard deviation. The median time was 9.5 minutes (SD 1.201) from a previous 2018 median of 17 minutes (SD 3.545). Additionally, the overall percentage of ECGs performed within 10 minutes on rapid criteria patients increased from 26% in 2018 to 54%. In February 2019, the door-to-ECG time was the lowest at 7.5 minutes (median).

Post-implementation, the ED was able to reduce the median ECG times over 30% from the previous year and meet the Atrium Health and national standards. The manual ECG log provided real-time data for review and follow-up, however, was discontinued in March 2019 due to excessive time consumption. Data from 2018 was abstracted manually, and 2019 was automated giving a larger and more accurate sample size.

#### IT'S TIME TO GET IT UNDER CONTROL: ASSESSING HYPERTENSION IN 2020

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**Background Summary:** Hypertension (HTN) is a leading cause of atherosclerotic cardiovascular disease (ASCVD) in the USA. Its prevalence is estimated to be ~ 50% in the US adult population, with suboptimal control rates. Accurate assessment of blood pressure (BP) remains a barrier to HTN control, leaving uncertainty of patients "true" BP readings. This lack of confidence in BP readings leads to clinical inertia leaving patients at a higher risk for ASCVD.

**Problem Being Addressed:** To institute better BP control, an evidence-based framework was needed to help recognize barriers and identify gaps in BP accuracy, clinical inertia, and patient selfcare management.

**Program Innovation:** The Measure Accurately, Act Rapidly, and Partner with Patients (M.A.P.) program is a three-domain framework founded on evidence-based principals. The M.A.P. tools provide hypertension management strategies that address diagnostic uncertainty, clinical inertia, and patient management. This was implemented in a single-centered cardiology preventive clinic. Impact on BP measurement was assessed.

**Evaluation & Outcomes:** An environmental assessment was completed and the Measure Accurately phase initiated. Workflow was adjusted and a confirmatory BP implemented in all consecutive patients. If initial Automated BP (AOBP) from either arm was  $>130/80$ , two confirmatory unattended AOBP with a 5-minute delay completed and recorded as per ACC/AHA guidelines.

**Conclusion:** By implementing the ACC/AHA Hypertension Guidelines, a more reliable BP measurement was demonstrated and acted upon. Implementation of the M.A.P. has improved the quality of patient care, specifically reducing clinical inertia and demonstrating self-management assessment of home BP measurements for patients.

**Implications for Practice:** Accurate assessment of BP is important and can change clinical inertia of BP assessment and profoundly affect the care of patients.

TABLE

(N=98)	Initial Read	Repeat Read (Average)	Change in BP
Systolic Blood Pressure (mmHg)	152±16	133±15	-18
Diastolic Blood Pressure (mmHg)	83±10	80±8	-3