AT THIS TIME OF YEAR WHEN WE CELEBRATE THANKSGIVING, I THINK OF TIME SPENT WITH FAMILY AND FRIENDS AS WELL AS “GIVING THANKS” FOR ALL OF OUR BLESSINGS. With that in mind, I would like to thank Judy Flannery for all of her help and support to the MACVPR for 30+ years. Judy is retiring from her job as well as stepping down from her position as Education Co-Chair. Judy has been involved with the MACVPR for as long as she has been working in cardiac rehab… specifically starting the cardiac rehab program at Harrington Hospital years ago when cardiac rehab was just becoming more mainstream. Over the years, she has been involved with the Executive Committee in many positions such as Education Chair and Co-President. I would like to thank Judy from the bottom of my heart for all of the time, talent and dedication that she has shared with the MACVPR over many years. She has been wonderful to work with and will certainly be missed!!!

I would also like to thank our fabulous Newsletter Editor Melissa Tanguay who also will be stepping down from her position, as she is no longer working in cardiac rehab. We appreciate all of your hard work and for taking the newsletter up to another level!

I am also thankful that Jackie Pierce was voted in as the new Education Co-Chair, along with Paulette Pontier, whom I am sure will continue to provide us with excellent educational offerings in 2018. We are still in need of someone to fill the Newsletter Editor position or we are at risk of not having a newsletter at all. If you have good skills in Word and are creative you are just the person to take on this role! Melissa is willing to train any new person to the job… it’s a great way to be active on the Executive Committee and boost your resume at the same time!!! It is also a great way to network with colleagues on the Executive Committee and get support for your program! And of course, we still need someone to fill the President Elect position. Please contact me at lynne.macdonald12@gmail.com or consider coming to one of our Executive Committee meetings to see how things operate. All of our meetings are open to all our members. We meet only five times per year and the next meeting will be in February.

It was great to attend the national AACVPR meeting in Charleston, SC and see a number of you from Massachusetts there as well! I always have such a hard time deciding which presentation to go to as they are all so good. Karen Lui provided us with an update on the results of the Medicare audits in April done on a small number of cardiac rehab programs around the country. The biggest issues were that the ITPs were lacking the required components of the exercise prescription and that the ITPs were not signed within the 30 days. In listening to the many questions asked at that presentation, it seems that many clinicians had questions regarding the 30-day issue (i.e. patient is out sick, patient on medical hold, 30 days is on a weekend etc…). To be clear, the ITPs need to be signed every 30 days or less no matter what the reason. This is true for both cardiac rehab and pulmonary rehab. So, if the 30th day falls on a weekend, you complete and sign it early and then that date becomes your new date for the next 30 days. Also remember that the initial ITP must be signed before the first day of exercise for both cardiac and pulmonary rehab.

continued on page 2...
I am sure you all have seen the updates announcing that Supervised Exercise Therapy (SET) may now be implemented for Peripheral Artery Disease (PAD) as of October 1, 2017 using the ICD 10 code I73.9 “PVD unspecified” and the CPT code 93668. The reimbursement for this is only $54.55 for 2017. As with cardiac and pulmonary rehab, Medicare will be gathering data from charges submitted on your cost reports for these new programs. AACVPR is asking that you think carefully about what it actually costs you to run your PAD program before determining what you are going to charge for it. AACVPR has developed a PAD Tool Kit, similar to the PR Tool Kit, in order to help you correctly figure out those charges. This will hopefully result in an increase in reimbursement in upcoming years.

In case you missed it, we had a phenomenal full day meeting in October with a nice balance of speakers on topics of interest to both cardiac and pulmonary rehab professionals. One long time pulmonary rehab attendee told me “I think this is the best meeting you have ever had!” Please read the Education Update section for a summary of the topics presented from our talented speakers. I would also like to thank our many sponsors. If we didn’t have their support we wouldn’t be able to put on these great conferences!!! I encourage you all to support their products when you are considering a purchase for your departments.

In keeping with the theme of “thanks”, I would also like to thank all you for your support of MACVPR to keep our organization strong and meeting the needs of our members. Please continue to stay involved by coming to meetings and providing feedback on your needs and interests for upcoming meetings. I also encourage you to get involved on the Executive Committee... I guarantee you won’t regret it!

I want to wish Happy Holidays to you and your families. I hope you can find time to rest and relax during this stressful time of year. I look forward to seeing you all on January 25th for our next Half Day Meeting.

Warm Regards,

Lynne MacDonald PT, CCRP
MACVPR President

MACVPR does not accept responsibility for the accuracy of the information produced herein. The statements and opinions contained in the articles of the MACVPR Newsletter are solely those of the individual authors and contributors and not of MACVPR. We do encourage comments, articles, and other contributions while reserving the right to reject or edit the material. The articles in the newsletter are for readers to use as they deem necessary in their programs of clinical practice and are not necessarily standards of care by MACVPR.
Regulatory & Reimbursement Update

Wayne Reynolds, RN, FAACVPR, CCRP

Supervised exercise therapy for peripheral artery disease (SETPAD): Although as of October 1, 2017 Supervised Exercise Therapy (SET) for Peripheral Artery Disease (PAD) may be implemented, there is no word yet from Centers for Medicare and Medicaid Service (CMS) Jurisdiction K (J-K) medical directors on an official implementation date for processing claims for reimbursement. I have requested the J-K medical directors discuss with their counterparts in other Medicare Administrative Contractor (MAC) districts, as implementation of SETPAD claims processing has been varied. For example, one MAC has stated that they will accept billing pending the official implementation of SETPAD, while a few others have told cardiac rehab programs to go ahead and start accepting patients, but to hold billing until they get further instruction from CMS. Others, like J-K, our MAC, have remained as silent as possible. Hang in there, it will happen!

HR1155 and SR1361 Update: Good news! We now have both Senators Warren and Markey from Massachusetts as co-sponsors on SR1361. From the House side, we have four co-sponsors for the companion bill, HR1155 - Joseph Kennedy III, Seth Moulton, Nikki Tsongas and Richard McGovern - and there are 71 co-sponsors total from the house. As a reminder, these bills provide a very important correction to the Social Security Act, which currently only allows physicians to supervise cardiac and pulmonary rehab programs. This oversight was due to unintended specific wording in the Social Security Act. With the technical corrections outlined in SR1361 and HR1155, physician extenders will be allowed by Medicare statute to supervise cardiac and pulmonary rehabilitation programs. While a physician will still be required to be the medical director, there will be flexibility for day-to-day supervision of the programs.

We are hopeful that these bills have a chance of being passed by year’s end. With the assistance of the American Heart Association, our lobbying efforts have intensified; the results are beginning to show with increased co-sponsorship on both sides of the capitol.

Bundled Payments: Now that Eric Hargan has been appointed Secretary of Health and Human Services, we have learned that the bundled payment system has been officially cancelled. There is “talk” of some sort of voluntary participation in a bundled payment system and coupled with possible incentives as well, but at this time, nothing definite has been determined. We will keep you posted!

KEY TAKEAWAYS FOR AVOIDING ISSUES WITH CMS AUDITS:

- Ensure that your supervising physician signs a patient’s ITP prior to the patient starting the cardiac or pulmonary rehab program.
- Make sure ITPs are signed within 30 days of the initial signature date.
- If ITPs cannot be signed on exactly the 30th day, they should be signed prior to the 30th day. This restarts the 30 day “clock” and the ITP should then be signed within 30 days of that new date.

PLEASE CONTACT YOUR LOCAL MAC RESOURCE GROUP IF YOUR PROGRAM IS AUDITED SO WE CAN ASSIST WITH APPEALS, HELP COMPILE DATA TO PRESENT, AS WELL AS HELP OTHER PROGRAMS IN OUR JURISDICTION LEARN FROM THE AUDIT.

CMS Audits: CMS is continuing to audit programs for compliance. The J-K medical directors have not yet made comments on audits, although we have requested meetings to clarify the auditors’ interpretations of regulations. Recent audits have cited programs for not having the physician signature on the ITP within 30 days and for lack of documentation of session length. The primary advice provided by the MAC Task Force to avoid having payments revoked is to be sure that the physician signs the ITP prior to the patient starting the program, and signs the ITP within 30 days thereafter. If signing exactly on 30 days is not possible, it is critical to have the ITP signed prior to the 30-day limit, and then, once signed, the 30 days begins anew from that signature date. The next advice is to be sure there is some documentation of session length for each patient. Most monitoring systems have a start and end time for each session. Remember a full session minimum is 31 minutes.

Please contact your local MAC Resource Group if your program is audited so we can assist with appeals, help compile data to present (if we are able to meet with the MAC medical directors), as well as help other programs in our jurisdiction learn from the audit.
Paulette Pontier MSN, CNL, CCRP
Education Co-Chair

The MACVPR New England Symposium was held on October 19, 2017 at the Hampton Inn in Natick, MA. The event was the result of hard work by education co-chairs Judy Flannery and Paulette Pontier, along with help from the education committee Jacqueline Pierce and Arlene Gaw as well as the MACVPR Executive Committee members. This collaborative effort aims to provide information to area cardiac and pulmonary rehabilitation professionals in order to advance their profession as well as improve patient care and outcomes. At the end of the day participants were provided 5.7 nursing contact CEU’s through Berkshire Health Systems and 5.0 through AACVPR.

The day opened with MACVPR President Lynne MacDonald greeting participants. Lynne provided a brief business update, including information about area cardiac and pulmonary rehab programs that recertified in 2017. She covered some AACVPR national updates, including the importance of having ITPs signed every thirty days or less. Lynne also encouraged participants to join the MACVPR executive committee, as we have openings in 2018. We also said goodbye to Judy Flannery, co-chair of education, who spent numerous years volunteering for MACVPR.

Five amazing professionals agreed to present at this year’s symposium. A brief summary of their presentations follows:

**SESSION 1: Update on the CCRP and New Pulmonary Rehab Certificate: “How it evolved and where are we now”**

*Karen Lafond MSN, CCRP*

Karen Lafond is a member of the AAVCPR professional certification committee and brought forth the last information regarding the upcoming pulmonary certificate for professionals and provided an update of the Cardiac Rehabilitation Professional Certification (CCRP).

**SESSION 2: Hot off the Press from 2017: Research Advances for the Cardiopulmonary Clinician**

*Quinn Pack, MD, M.Sc*

Dr. Quinn Pack, cardiologist from Bay State Health, and an accomplished researcher, discussed latest research findings and identified trends in cardiovascular risk factors. He described cutting edge cardiovascular therapies and provided insight on applying the research in the cardiopulmonary setting.

**SESSION 3: Heart Failure Population Health**

*Richard Soucier, MD, FACC*

Dr. Richard Soucier, director of Yale University’s Heart Failure Population Health Program, discussed basic principles of heart failure population health. He covered the identification of heart failure all the way through interventions designed to improve quality of life and duration of life in patients with heart failure, with a focus on following outcomes over time to reduce readmissions and mortality.

**SESSION 4: Weight Management Strategies for the Cardiac and Pulmonary Rehabilitation Population**

*Jessica Unick, PhD*

Jessica Unick, PhD provided participants with helpful information about standard behavioral weight loss interventions, as well as the primary predictors for individuals who achieve successful weight loss and maintenance. She wrapped up her presentation by identifying practical strategies that could be utilized for motivating and assisting the cardiopulmonary patient in achieving their personal weight loss goals. For example, she highlighted a review of twenty-two studies that found a consistently strong relationship between self-monitoring and successful weight loss, highlighting the important role that food diaries and activity records can play for patients.

*continued on page 5....*
SESSION 5: Outpatient Rehabilitation of the Post Lung Transplantation Patient

Abby Folger, PT, DPT, CCS

Abby Folger PT, DPT, CCS brought energy to the program by discussing the postoperative course following lung transplantation as well as the signs and symptoms of complications. She provided considerations for exercise progression after a transverse thoracosternotomy, or “clam shell” incision often used for a bilateral lung transplant, and identified exercise interventions to address common physical impairments. We learned that while pulmonary function tests usually return to near normal post lung transplant, exercise capacity as measured by peak VO₂ does not. A highlight of the day was the inclusion of an actual post lung transplant patient who discussed the trials and tribulations of her lung disease progression, her preparation for surgery, as well as recovery.

The symposium was very well received by participants, who felt it was well worth their time. Feedback was that there was an excellent mix of both cardiac and pulmonary rehabilitation topics. The speakers were engaging and able to present material in an easily understood fashion.

FUTURE MEETING DATES

MACVPR will hold its January 2018 half-day meeting on Thursday, January 25 and the May 2018 half-day meeting on Thursday, May 3. Agendas with speakers and topics will be coming soon. As a reminder, the half day meetings are free for AACVPR/MACVPR joint affiliate members. Hope to see you there!

MACVPR LOCAL CHAPTER UPDATES

TREASURY REPORT

Donna Hawk, RRT, AE-C
Treasurer

AS OF NOVEMBER 11, 2017
- Checking - $17,691.87
- Money Market - $2,635.82
- Total - $20,327.69

MEMBERSHIP REPORT

Diane Gaughran, BS, ACSM-RCEP, CCRP
Membership Chair

AS OF SEPTEMBER 2017:
The MACVPR currently has 92 members. As you may know, MACVPR is a Joint Affiliate organization with the American Association of Cardiovascular and Pulmonary Rehabilitation (AACVPR). Please encourage your co-workers and associates to join and receive all that the Joint Affiliation has to offer:

- Continuing education opportunities:
  - Two half-day complimentary meetings
  - Reduced registration fee at the Fall Full-Day Membership meeting with national speakers
  - Free access to all of AACVPR’s educational webcasts and corresponding CEUs (a $650) value

- Full access to the AACVPR websites including:
  - Roadmap to Reform presentations/resources
  - Latest updates on reimbursement and legislation
  - Certification updates
  - Access to members-only resources on the AACVPR website
  - Tri-annual ‘MACVPR NEWS’ newsletters

- Automatic enrollment in MACVPR and AACVPR
  - One annual dues payment of $215 for the AACVPR Joint Affiliate membership for essentially two memberships with all the associated benefits.

If you have any questions about membership please feel free to contact Diane M. Gaughran BS, ACSM-RCEP, CCRP at diane.gaughran@steward.org or 781-278-6265.
THANK YOU TO OUR 2017 SILVER SPONSORS:

INTERESTED IN BECOMING A 2018 MACVPR SPONSOR?

Diamond Level $4000+
- Your company will be the sole Diamond level sponsor of MACVPR for the year
- Your company will sponsor a conference speaker of choice with logo on large screen prior to presentation. A representative from your company will introduce the speaker
- Free use of MACVPR’s Membership list (for one-time use)
- Premier space in exhibit area
- Able to have a table at our Half Day meetings in January and May
- Sponsorship of members’ lunch at our October full day meeting
- Sponsor logo on place cards on tables at lunch
- Sponsor logo with link on MACVPR website
- Complimentary lunch at conference
- One skirted exhibit table
- Large Logo will appear on conference materials given to attendees
- Verbal acknowledgement by the President of MACVPR at the conference
- Half page advertisement in MACVPR newsletter three times per year

Silver Level $1000
- Sponsor logo with link to MACVPR website
- Complimentary lunch at conference
- One skirted exhibit table
- Midsize logo will appear on conference materials given to attendees
- Verbal acknowledgement by the President of MACVPR at the conference
- Mid size logo in the MACVPR newsletter three times per year

Bronze $750
- Complimentary lunch at conference
- One skirted exhibit table
- Small logo will appear on conference materials given to attendees
- Verbal acknowledgement by the President of MACVPR at the conference
- Small Logo in next MACVPR newsletter

Please contact Lisa Dion at admin@macvpr.org if you would like to become a sponsor or need more information. Thank you for your support.
HOW IS IT ALREADY DECEMBER? THE WEATHER HAS BEEN COOLING DOWN AND WINTER IS IN THE AIR. THIS TIME OF YEAR CAN BE A NICE BREAK FROM THE SUMMER, BUT IT CAN ALSO BE THE BEGINNING OF LESS EXERCISE, MORE DINING OUT AND COMFORT FOOD EATING.

As the holidays approach and lives become busier, it is easy to dine out or resort to fast foods. As we all know, it is best to try and prepare foods at home and plan ahead, but what happens if this is not always feasible? How can you dine out healthfully? Here are some ideas that you can use to help stay fit and healthy during the cooler holiday months ahead.

---

**ENJOY THE HOLIDAY SEASON THAT IS UPON US AND CHEERS TO MAKING HEALTHY FOOD CHOICES!**

**BEFORE THE MEAL**

- Avoid appetizers as they pack on an extra 500-1000 calories before you eat the meal. If needed, split or for a better option order a garden salad prior to your meal. Fill up on greens.
- If you can, try to avoid soups before the meal. They are filling and if right can provide some vegetables but they also provide a lot of extra salt.
- Split your meal in half and take some home or ask for lunch portions. If this is not available try to split a meal with a friend. Not only will you cut back on portions but you will have fewer calories, fat and salt.
- Avoid the bread and chip basket as it can easily add an extra 500-1000 calories before you even eat your meal.

**ENTRÉE Selections**

**Salads:**

- Choose ones with darker greens for added vitamins and nutrients. Try to avoid the iceberg lettuce.
- Choose less cheese or have the cheese on the side.
- Order dressing on the side rather than in the salad.
- Choose a lean protein such as grilled chicken, fish or egg. Fried foods or red meat can add up in calories and fats.
- Ask for extra veggies and fruits in the salad.
- Try to avoid crispy wontons or croutons as they add in an extra 200-300 calories per serving.
- Be cautious with nuts and dried fruits. A little goes a long way.

**Sandwiches:**

- Use whole grain breads rather than white breads and sub rolls
- Order a half sandwich with a side salad or soup. Skip the fries
- Try to avoid wraps, as they can have more calories than bread
- Avoid club sandwiches or panini’s, which tend to be higher calorie.

**DESSERT**

- Split with many folks, if something sweet is really needed. Otherwise try to skip dessert altogether.
- Some restaurants have dessert shots that are small and satisfying and give you a taste of sweetness. Give these a try.
- Be careful of coffee drinks. Many of these beverages have more calories than one dessert and when paired with a dessert can really put you over your calorie budget. For example, a 16 oz. mocha Frappuccino from Starbucks can have 410 calories. Pairing that with an apple fritter adds an extra 460 calories to bring you to a whopping 870 calories. That may be half of your daily allowance!

**DRINKING YOUR CALORIES**

- Consume alcohol in moderation, if approved by your primary care provider. A standard drink is considered 5 oz. of wine, 1.5 oz. of distilled spirits or a 12 oz. beer. According to the dietary guidelines for Americans moderate alcohol consumption is 1 drink per day for women and 2 drinks per day for men.

*Enjoy the holiday season that is upon us and cheers to making healthy food choices!*
PEARLS ABOUT PILLS

This is the sixth in a series of guides about the medications commonly prescribed to patients with cardiovascular disease. This guide will focus on a group of medications known as diuretics, also known as “water pills”.

Most commonly, diuretics are used to treat hypertension or heart failure, but can also be used for non-cardiac purposes as well.

Diuretics can be an important component to maintaining your cardiovascular health and knowing a bit about how they work will help you understand some of their uses and side effects. The three classes of diuretics (loop, thiazides, and potassium-sparing) all work in your kidneys to remove excessive amounts of electrolytes and fluid in your body. They also can cause relaxation of blood vessels. The final effect is to relieve fluid pressure in blood vessels and the heart.

**TAKING DIURETICS IN THE MORNING IS RECOMMENDED OVER EVENING DOSING SINCE YOU ARE ALREADY AWAKE DURING THE DAY. DOSING IN THE EVENING OR AT BEDTIME WILL OFTEN MEAN TRIPS TO THE BATHROOM IN THE MIDDLE OF THE NIGHT.**

When talking about side effects, it is important to remember that many of the side effects are related to the dose of the medication and the type of medication itself.

Because diuretics flush out fluids from your body, they can increase thirst and also urination. Before reaching for that bottle of water, keep in mind that drinking too much water may cancel out the effects of your diuretic. How do you monitor the right amount of fluid intake? One way is to weigh yourself regularly at the same time of day (e.g. after waking up or before eating breakfast). If there is unexpected weight gain from day to day or over the course of a week, let your physician know as this may mean you need to adjust your medication or your water intake habits.

Diuretics can also decrease electrolyte levels (e.g. sodium and potassium) in the body. Sometimes this manifests as muscle cramps and can also be dangerous for your heart. Office visits are a good time for checking your electrolyte levels and discussing with your physician if you have questions about this. Over-the-counter potassium or other supplements may be an option if you have persistently low electrolyte levels.

Taking diuretics in the morning is recommended over evening dosing since you are already awake during the day. Dosing in the evening or at bedtime will often mean trips to the bathroom in the middle of the night.

Side effects such as dizziness, light-headedness, and fatigue are usually mild and transient. However, if they persist, discuss this with your physician to see if dose adjustment or a different drug is needed. If you have gout, kidney or urinary problems or liver disease, diuretics may not be appropriate for you as they may exacerbate these conditions.

If you are on a thiazide diuretic and a beta blocker, some studies show increased risk of developing diabetes. This does not mean that you should stop taking diuretics. As with all medications, risks and benefits must be considered. Diuretics are very effective at controlling blood pressure and improving cardiovascular health, and this benefit may far outweigh the slight risk of increased blood sugar.

As always, do not abruptly stop taking your medication without medical consultation. Please ask your physician or pharmacist if you have further concerns not addressed by this guide.

**EXAMPLES OF COMMON DIURETICS:**
- Furosemide (Lasix)
- Bumetanide (Bumex)
- Torsemide (Demadex)
- Hydrochlorothiazide (Hydrodiuril)
- Spironolactone (Aldactone)
- Metolazone (Zaroxolyn)
- Chlorothalidone (Thalitone)

Yue See Lee, RPh
Pharmacist, Beth Israel Deaconess Hospital - Milton
STRESS IS HEIGHTENED AROUND THE HOLIDAY SEASON. FOR BOTH PATIENTS AND FAMILIES, AS WELL AS CAREGIVERS, OUR EXPECTATIONS OFTEN OUTPACE REALITY. The practice of mindfulness, the ability to notice and observe in the present moment, without judgment, is a skill that can be especially helpful in navigating holiday stressors.

Think about taking "micro-actions" instead of making large changes and you will find that you can move from stress-FULL to stress-LESS. Here are some of my favorite tips to meet the holidays differently this year:

**Seven Tips to Shift from Stress-FULL to Stress-LESS this Holiday Season:**

**TIP 1:** “No” is a complete sentence. Practice this fine art often.

**TIP 2:** Find a source of personal renewal amidst the business. For every hour that you spend on “holiday” tasks, grant yourself 1-3 minutes of centering or renewal. Some suggestions: gentle stretching, close your eyes and focus on breathing low and slow in the belly, have a mindful snack.

**TIP 3:** Try mono-tasking. Research has shown up to 40% more efficiency for those who perform tasks sequentially versus simultaneously.

**TIP 4:** Prioritize tasks. Write down everything you feel you must do, and then ELIMINATE at least one item on the list. Review your list periodically and see if other non-essential tasks might also be eliminated.

**TIP 5:** Let go of expectations. Delegate and allow others to participate in the preparation. Release expectations. Can you live with giving up some control of the outcome to be less stressed in the moment?

**TIP 6:** Cultivate gratitude. Find a bit of beauty each day.

**TIP 7:** Practice “De-Tribing”. Take a mental and physical mini-vacation away from you “tribe”. This could be walk by yourself in nature, a soak in the tub, disappearing for a half-hour with a good book and a cup of tea. By consciously cultivating times of solitude, you will be more present with others when you return to your “tribe”.

*Remember micro-actions create significant change. Start small and notice the results in your stress level. Let me know what tips have worked for you!*

As always, I love comments and feedback from readers. What topics of mind/body/spirit would you be interested in exploring in future columns? Let me know at pressler@StressResources.com
**BACKGROUND:**
This is a dual lead (II and III) monitoring strip from a 71-year-old male referred to Phase II cardiac rehabilitation s/p NSTEMI and CABG x 3. He has a history notable for COPD, diabetes mellitus, hypertension, hyperlipidemia, and active smoker. He presented initially with dyspnea on exertion, shortness of breath and a productive cough. He was treated for a presumed COPD exacerbation when troponin checked on admission was found to be elevated at 22. EKG revealed new onset lateral ST depressions, and a left heart catheterization was planned. He developed atrial fibrillation with a rapid ventricular response, possibly triggered by Albuterol nebulizer, and was started on amioderone after initial Lopressor and diltiazem, which restored NSR. EF 60%. He presents today to exercise.

**MONITOR STRIP 1:** Base line EKG monitoring strip

![Rest](image1.png)

**MONITOR STRIPS 2 - 4:** Session 16 initial resting strip without symptoms

![Rest](image2.png)

This patient's initial rhythm broke during repeat blood pressure check (Monitor Strip 2) and resolved to Monitor Strip 3. Expert consultation was sought and the patient proceeded to exercise.

**Winter 2017 ECG Challenge:**
Case Presentation

Deirdre Proudman, MSN, RN-BC, CCRN, CCRP
Lowell General Hospital
**QUESTION 1** – Session 16 initial presentation rhythm on monitor strip 1 is:
- a. normal sinus rhythm  
- b. Supraventricular tachycardia  
- c. atrial fibrillation  
- d. sinus tachycardia

**QUESTION 2** – Counting starting from the arrow on monitor strip 2, analyze the patient’s rhythm. What is the heart rate? What is the duration of the pause prior to the first ventricular contraction?

**MONITOR STRIP 5:** Treadmill tracing

![Treadmill tracing](image)

**QUESTION 3** - The eighth R wave falls on a heavy black line. Use this as a start to calculate heart rate. What is this rhythm?

Session strips faxed to MD with a follow up visit in place. The patient returned to cardiac rehabilitation the following week wearing a holter monitor. Medication reconciliation revealed that amioderone was discontinued. Resting EKG revealed NSR at a rate of 58 beats per minute.

**MONITOR STRIP 6:** Session 17 initial resting strip

![Resting strip](image)

**MONITOR STRIPS 7-9:** Session 17, treadmill tracing, representing a continuous monitoring strip

![Treadmill tracing](image)
The patient complained of palpitations and general malaise and nausea. He was transported to the emergency department.

**QUESTION 4:** The patients monitor pattern is suspected recurrent _______ ______ and symptomatic ____________.

**QUESTION 5:** What co morbidity does this patient have that could mask angina?

The arrhythmias noted in cardiac rehabilitation prompted left heart catheterization and EP evaluation. Angiography demonstrated this patients LAD and circumflex grafts were open but the vein graft to the RCA had failed. This was a very diffusely diseased artery and bare metal stents were placed proximal and mid vessel. Drug eluting stents, long ones, were required for the distal right coronary artery. Amioderone was restarted to suppress arrhythmias short term as well as Ticagrelor and anticoagulation. Aspirin was reduced to 81 mg and he was also on a low dose beta blocker.

This patient returned to cardiac rehabilitation after two weeks. Medication reconciliation revealed that his Metformin had been held prior to the catheterization and the patient had not resumed it at home. Blood glucose preexercise was >400.

**QUESTION 6:** The cardiac rehabilitation professional should:

- Recheck the blood glucose on the department’s glucometer.
- Confirm the glucose with a lab draw.
- Postpone exercise for BG>300 mg/dl and notify physician
- If hyperglycemic hyperosmolar state is suspected, contact physician immediately
- All of the above.

Patient’s random glucose was by lab draw 622 mg/dl.

**ANSWER KEY**

**Question 1:** D, sinus tachycardia. The electrical signal originates in the SA node. There is a p wave followed by a QRS followed by a T wave. Intervals are within normal limits. The rate is greater than 100 beats per minute. Sinus tachycardia usually has an underlying cause such as exercise, drugs or missed medications, caffeine, anxiety, etc.

**Question 2:** In the above example, the initial rate is 120 beats per minute (the first two beats are normal), then there is a 2.5 second sinus pause before the heart resumes, initially with junctional beats at a rate of 20 – 30 beats per minute followed by the resumption of sinus rhythm at a slower rate of 52 beats per minute (sinus bradycardia).

Junctional rhythm occurs when the electrical activation of the heart originates near or within the atrioventricular node, rather than from the sinoatrial node. Because the normal ventricular conduction system (His-Purkinje) is used, the QRS complex is frequently narrow and the intrinsic rate is 20 – 40 beats per minute. Sinus pause describes a condition where the SA node fails to generate an electrical impulse for what is generally a brief period of time.

*Review: 5 large boxes equal one second, 30 large boxes equal 6 seconds when counting heart rate on a strip.*

**Question 3:** Using the Cardiac Ruler or Sequence Method, count the number of big boxes between R waves and count using the sequence 300-150-100-75-60-50-43-37. Count from the first QRS complex, the first thick line is 300, the next thick line 150 etc. Stop the sequence at the next QRS complex. When the second QRS complex is between two lines, take the mean of the two numbers from the sequence. The rate is accurate at 175 beats per minute. Beginning from the black arrow indicating the eighth R wave, the first large box line is 300; the next is 150 which is after the next complex. The rate is between 150 and 300 with the R wave falling closer to 150.
The rate is rapid with no discernible P waves, a normal QRS, and is irregular. 12 lead would reveal bursts of atrial fibrillation. Atrial fibrillation is characterized on the EKG by the absence of P waves and an irregular ventricular response.

The lack of coordinated atrial contractions can also result in less blood entering and leaving the left ventricle. The loss of what is often called “atrial kick” can decrease cardiac output by as much as 30%.

**Question 4:** The patients monitor pattern is suspected recurrent atrial fibrillation and symptomatic non-sustained ventricular tachycardia (NSVT). A variety of definitions of NSVT have been published, but the most commonly used definition is: three or more consecutive ventricular beats; rate of >120 beats per minute; duration of less than 30 seconds. There are two general goals in the management of NSVT:

- Identification of patients at risk for malignant, sustained arrhythmias and SCD
- Treatment to suppress symptoms caused by NSVT, when present and clinically significant

**Question 5:** Patients who have diabetic heart disease (DHD) may have no signs or symptoms of heart disease such as angina. This is called “silent” heart disease. Diabetes-related nerve damage that blunts heart pain may explain why symptoms aren’t noticed. Other CHD signs and symptoms include nausea, fatigue, shortness of breath, sweating, light-headedness, and weakness.

**Question 6:** The correct answer is all of the above. Patient’s random glucose was by lab draw 622 mg/dl. He was transported Emergency Department for a hyperosmolar hyperglycemic state complicated by acute kidney injury.

Questions or comments on this vignette and may be sent to Deirdre.Proudman@lowellgeneral.org.

**References:**
- Lowell General Hospital Cardiac Rehabilitation EKG strips used by permission.

Thank you Judy Flannery, RN, BSN for your many years of work in cardiac rehabilitation and your service to the MACVPR! You will be missed!