



CARDIOVASCULAR ADVANCED PRACTICE PROVIDERS (APP) ESSENTIAL EDUCATION SERIES

30 CME CREDITS

QUESTIONS AND ASSISTANCE

For technical support, please contact: tech_support@medaxiom.com

For course questions or assistance, please contact: academy@medaxiom.com

COURSE DESCRIPTION

This 12-week course is designed for new cardiovascular (CV) APPs and those who want to refresh their knowledge. It is led by MedAxiom's APP expert Ginger Biesbrock and features electrophysiology expert Maureen Knechtel and CV coding expert Nicole Knight as guest instructors. This course also features guest instructor and cardiovascular coding expert Nicole Knight. The course incorporates video, textbook, and online learning to cover these essential CV APP topics:

- CV Medicine and Decision Making
- CV History and Physical Examination
- EKG Review
- Ischemic Heart Disease Part 1
- Ischemic Heart Disease Part 2
- Peripheral Vascular Disease
- Hypertension and Hyperlipidemia
- Cardiomyopathy
- Congestive Heart Failure
- Structural Heart Disease
- Electrophysiology
- Healthcare Economics

Note: Access to quizzes and instructors has been extended to 12 months after the start of the course due to the COVID-19 pandemic.

COURSE GOALS

- **For APPs:** This curriculum is designed to help new APPs immerse themselves in clinical cardiology – to understand what they are experiencing in the clinics and hospital, and provide a didactic review of the pathophysiology, symptoms, diagnosis, therapies and clinical decision making.
- **For Employers of APPs:** This curriculum will help jump start and support your APPs' on-the-job learning and prove their level of competency in a quantitative manner.



REQUIRED MATERIALS

- **Resources Sold Separately:**

- Textbook: [Braunwald, E., Mann, D., Zipes, D., Libby, P., & Bonow, R. \(Eds.\). \(2015\). Braunwald's Heart Disease - A Textbook of Cardiovascular Medicine \(11th ed.\). Philadelphia: Elsevier Saunders.](#)
 - **Note:** Due to title variations, we provide chapters from both the 11th ed. and 10th ed.
- Textbook: [Knechtel M. EKGs for the Nurse Practitioner and Physician Assistant 3rd ed. New York: Springer. 2021.](#)
 - **Save 25% on EKGs for the Nurse Practitioner and Physician Assistant.** [Click here](#), add textbook to cart, select "Apply Discount Code" and enter **MedAxiom25**.
- Subscription: UpToDate (www.uptodate.com) – An Online Resource
 - **Note:** This paid subscription and all corresponding readings are *optional* but they are beneficial to reach optimal understanding of course material.

- **Provided Resources:**

- Electronic Links: ACC/AHA guidelines, Online Articles, Supporting Slides, YouTube Videos, PDF

THE METHODOLOGY

Each of the 12 weekly lessons has a 20-30 minute didactic video detailing the week's focus followed by assigned reading and a quiz. This course can be taken at the student's own pace, but must be completed within 12 months of starting the course. This is a pass/fail course; students must pass each weekly quiz with a score of 80% or above and complete the course evaluation in order to receive CME credits and a certificate of completion. Note: Week 1 does not include a video. Week 4 and Week 12 do not include a quiz.

COURSE GRADING

Statement of Grading Approach or Philosophy:

This is a pass/fail course based on the completion of the 12-week material. This course can be done at the student's own pace. However, each student will have a **maximum of 12 months** to complete the course material. Students must pass every weekly quiz with a score of 80 percent or above, and the final course evaluation feedback survey in order to receive the CME credits and certificate of completion.

EXPLANATION OF CREDITS

Total CME Credit Value: 30 AMA PRA Category 1 Credits. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Weekly Breakdown of Hours:

- Week 1: **2.13**
- Week 2: **0.90**
- Week 3: **4.37**
- Week 4: **3.23**
- Week 5: **3.17**
- Week 6: **2.13**
- Week 7: **1.13**
- Week 8: **1.32**
- Week 9: **4.68**
- Week 10: **2.18**
- Week 11: **4.23**
- Week 12: **0.63**



COURSE SCHEDULE

Disclaimer:

The instructors reserve the right to make modifications to this course material as needed.

Preliminary Schedule of Topics, Learning Objectives, Readings and Quizzes

WEEK #	TOPIC/LEARNING OBJECTIVES/REQUIRED READINGS
1	<p>Topic: CV Medicine and Decision Making</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Develop an understanding of the risks that lead to coronary artery disease and how to risk stratify the typical cardiac patient – including demographics and distribution of risk factors. 2. Develop an understanding of what is required for effective clinical decision making for patients evaluated and managed in the typical cardiology program. 3. Review sensitivity and specificity as relates to cardiac testing. 4. Develop an understanding for shared decision making as relates to the cardiac patient. <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Braunwald – Clinical Decision Making in Cardiology (Ch. 3 Ed. 11 / Ch. 4 Ed. 10), Heart Disease in Varied Populations (Ch. 91 Ed. 11 / Ch. 2 Ed. 10) <p><i>Optional Readings:</i></p> <ol style="list-style-type: none"> 1. <u>Overview of established risk factors for cardiovascular disease</u>
2	<p>Topic: CV History and Physical Examination</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Review of the evaluation of the patient with known or suspected CV disease. 2. Develop an understanding of performing a directed history and targeted physical exam. 3. Develop an understanding of how the clinical context of the patient encounters should influence the history and physical exam. <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Braunwald – The History and Physical Examination: An Evidence-Based Approach (Ch. 10 Ed. 11 / Ch. 11 Ed. 11) <p><i>Additional Resources:</i></p> <ol style="list-style-type: none"> 1. <u>Murmurs</u> 2. <u>Grading Murmurs</u> 3. <u>Pulsus Paradoxus Exam</u>



3	<p>Topic: EKG Review</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none">1. Discuss the systematic assessment of EKGs to include the evaluation of rate, rhythm, intervals, ischemia, and axis2. Utilize clinical information and correlate with the EKG printout3. Differentiate between benign and potentially life-threatening EKG findings4. Discuss the pathophysiology of abnormal EKG findings to include hypertrophy, conduction delays, ischemia, and infarction5. Create an accurate descriptive analysis of an EKG utilizing a systematic approach <p><i>Required Readings:</i></p> <ol style="list-style-type: none">1. EKG for the Nurse Practitioner and Physician Assistant 3rd edition Chapters 4-10 <p><i>Optional Readings:</i></p> <ol style="list-style-type: none">1. Ozdemir S, Cimilli OT, Eyinc Y, Onur OE, Keskin M. Wellens' Syndrome - Report of two cases. Turk J Emerg Med. 2016;15(4):179-181. Published 2016 Mar 11. doi:10.1016/j.tjem.2014.07.0022. Indraratna P, Tardo D, Delves M, Szirt R, Ng B. Measurement and Management of QT Interval Prolongation for General Physicians. J Gen Intern Med. 2020;35(3):865-873. doi:10.1007/s11606-019-05477-7
4	<p>Topic: Ischemic Heart Disease Part 1</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none">1. Review the pathophysiology and therapy for CAD.2. Review the evaluation of chest pain including history and physical exam.3. Develop a good understanding of non-invasive cardiac testing to rule out ischemic heart disease – which test and when.4. Develop understanding of secondary prevention for CAD and longitudinal care for this patient population. <p><i>Required Readings:</i></p> <ol style="list-style-type: none">1. Braunwald – Exercise Testing (Ch. 13 Ed. 11 / Ch. 13 Ed. 10), Nuclear Cardiology (Ch. 16 Ed. 11 / Ch. 16 Ed. 10), Approach to the Patient with Chest Pain (Ch. 56 Ed. 11 / Ch. 50 Ed. 10), Coronary Blood Flow and Myocardial Ischemia (Ch. 57 Ed. 11 / Ch. 49 Ed. 10)2. <u>2013 AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk</u> <p><i>Optional Readings:</i></p> <ol style="list-style-type: none">1. <u>Stable Ischemic Heart Disease: Overview of Care</u>



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Topic: Ischemic Heart Disease Part 2

Learning Objectives:

1. Review of invasive coronary artery disease (CAD) imaging options.
2. Review of revascularization options for CAD.
3. Develop an understanding of managing the STEMI patient.
4. Develop an understanding of managing the NSTEMI patient.

Required Readings:

1. Braunwald – Coronary Arteriography and Intracoronary Imaging (Ch. 20 Ed. 11 / Ch. 20 Ed. 10), ST-Elevation Myocardial Infarction: Pathology, Pathophysiology, and Clinical Features (Ch. 58 Ed. 11 / Ch. 51 Ed. 10), ST-Elevation Myocardial Infarction: Management (Ch. 59 Ed. 11 / Ch. 52 Ed. 10), Non-ST Elevation Acute Coronary Syndromes (Ch. 60 Ed. 11 / Ch. 53 Ed. 10)
2. [2014 AHA/ACC Guideline for the Management of Patients with Non–ST–Elevation Acute Coronary Syndromes](#)



6	<p>Topic: Peripheral Vascular Disease</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Review of PV risk factors, pathophysiology, clinical features and therapy options. 2. Develop an understanding of when to order ankle-brachial index (ABI) and/or noninvasive vascular imaging. <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Braunwald – Peripheral Artery Diseases (Ch. 64 Ed. 11 / Ch. 58 Ed. 10) 2. <u>2016 AHA/ACC Guideline on the Management of Patients with Lower Extremity Peripheral Artery Disease</u>
7	<p>Topic: Hypertension and Hyperlipidemia</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Review of the most recent hypertension management guidelines. 2. Review of the most recent hyperlipidemia management guidelines. 3. Develop an understanding of the work-up for a patient with newly diagnosed hypertension based on age, comorbidities, etc. 4. Develop an understanding of longitudinal care for patients requiring hyperlipidemia therapy – surveillance and management. <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. <u>JNC 8 Hypertension Guidelines</u> 2. <u>2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines</u> 3. <u>2013 ACC/AHA Guideline on the Treatment of Blood Cholesterol to Reduce Atherosclerotic Cardiovascular Risk in Adults</u> <p><i>Optional Readings:</i></p> <ol style="list-style-type: none"> 1. <u>Overview of hypertension in adults</u> 2. <u>Management of low density lipoprotein cholesterol (LDL-C) in secondary prevention of cardiovascular disease</u> <p><i>Additional Resources:</i></p> <ol style="list-style-type: none"> 1. <u>2016 ACC Expert Consensus Decision Pathway on the Role of Non-Statins Therapies for LDL-Cholesterol Lowering in the Management of Atherosclerotic Cardiovascular Disease Risk</u> 2. <u>Statin Use for the Prevention of Cardiovascular Disease in Adults: A Systematic Review for the U.S. Preventive Services Task Force</u> 3. <u>2017 Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults – Guidelines Made Simple</u>
8	<p>Topic: Cardiomyopathy</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Review of the pathophysiology of the development of cardiomyopathy (CM) – dilated and restrictive. 2. Review of the etiology and factors that increase risk for developing CM – dilated and restrictive.



	<ol style="list-style-type: none"> 3. Develop an understanding of the pathophysiology with a patient CM and how this leads to the typical presenting symptoms. 4. Review of the diagnostic imaging and work-up for a patient newly diagnosed with CM. <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Braunwald – The Dilated, Restrictive, and Infiltrative Cardiomyopathies (Ch. 77 Ed. 11 / Ch. 65 Ed. 10) <p><i>Optional Readings:</i></p> <ol style="list-style-type: none"> 1. <u>Definition and classification of the cardiomyopathies</u>
9	<p>Topic: Congestive Heart Failure</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Develop an understanding of how to perform an effective history and physical in patients presenting with symptoms of potential heart failure. 2. Review the diagnostic work-up of a patient presenting with heart failure symptoms. 3. Develop an understanding of how the therapy—pharmacologic, device and procedural – works and leads to improved symptoms and prognosis. <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Braunwald – Clinical Assessment of Heart Failure (Ch. 21 Ed. 11 / Ch. 23 Ed. 10), Diagnosis and Management of Acute Heart Failure (Ch. 24 Ed. 11 / Ch. 24 Ed. 10) <p><i>Optional Readings:</i></p> <ol style="list-style-type: none"> 1. <u>Determining the etiology and severity of heart failure or cardiomyopathy</u> 2. <u>Overview of the management of heart failure with reduced ejection fraction</u> 3. <u>Treatment and prognosis of heart failure with preserved ejection fraction</u>
10	<p>Topic: Structural Heart Disease</p> <p><i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Review the common valvulopathies – how they present and the required work-up. 2. Develop an understanding of current valve therapies to include pharmacologic, procedural and surveillance requirements. 3. Brief overview of the more common congenital heart disease abnormalities – specifically those that survive into adulthood and would be managed in an adult cardiology practice. <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Braunwald – Valvular Heart Disease (Ch. 72 Ed. 11 / Ch. 63 Ed. 10), Congenital Heart Disease (Ch. 75 Ed. 11 / Ch. 62 Ed. 10) 2. <u>2017 AHA/ACC Focused Update for the Management of Patients with Valvular Heart Disease</u>



11	<p>Topic: Electrophysiology <i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Discuss the etiology, epidemiology, presentation, evaluation and management of atrial arrhythmias to include PACs, atrial arrhythmias and paroxysmal supraventricular tachycardia 2. Understand the significance of the CHADS2VASc score and apply it to a novel patient with atrial fibrillation or atrial flutter 3. Compare and contrast rate and rhythm control in the management of atrial fibrillation and atrial flutter 4. Understand the significance of a delta wave on an EKG 5. Discuss the etiology, epidemiology, presentation, evaluation and management of premature ventricular contractions, ventricular tachycardia, ventricular fibrillation 6. Understand the indications for implantable cardioverter defibrillators 7. Create a management plan for a novel patient with a ventricular arrhythmia <p><i>Required Readings:</i></p> <ol style="list-style-type: none"> 1. Braunwald’s Heart Disease 11th edition: Part V, Chapters 37-39 2. Sana AM, Stevenson WG, Ackerman MJ, et al. 2017 AHA/ACC/HRS guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death. <i>Circulation</i>.2018;138(13):e272 – e391.doi.org/10.1161/CIR.0000000000000549 3. January, C., Wann, S. and Calkins, H, et al. 2019 AHA/ACC/HRS focused update of the 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association task force on clinical practice guidelines and the Heart Rhythm Society in collaboration with the society of thoracic surgeons. <i>Circulation</i>. 2019 Jan 28; 140(2): 125-155. doi.org/10.1161/CIR.0000000000000665 <p><i>Optional Readings:</i></p> <ol style="list-style-type: none"> 1. Watchman Procedure Left Atrial Appendage Occlusion: https://www.acc.org/latest-in-cardiology/articles/2017/01/31/13/08/left-atrial-appendage-occlusion 2. Tang P, Do D, Li A, et al. Team management of the ventricular tachycardia patient. <i>Arrhythm Electrophysiol Rev</i>. 2018;7(4):238 – 246.doi: 10.15420/aer.2018.37.2.
12	<p>Topic: APP Coding, Documentation and Reimbursement <i>Learning Objectives:</i></p> <ol style="list-style-type: none"> 1. Review of current APP services reimbursement options. 2. Overview of billing and coding regulations for the most commonly performed APP services -- documentation requirements, etc. <p><i>Required Readings:</i> NONE</p>