

Application Information for ACPE Accreditation

Updates in the Management of Sickle Cell Disease

Nkem P. Nonyel, PharmD, MPH, BCPS
SNPhA Regions I & II Conference, UPMC
February 22, 2020

Job Title

Assistant Professor of Pharmacy Practice
School of Pharmacy and Health Professions
University of Maryland Eastern Shore
Princess Anne, Maryland, 21853

Ambulatory Care Clinical Pharmacist
Peninsula Regional Family Practice
Peninsula Regional Medical Group
Salisbury, Maryland, 21801

Description of Expertise to Present on the Topic

I am a pharmacy practice faculty at the University of Maryland Eastern Shore School of Pharmacy. I am a Board Certified Pharmacotherapy Specialist and I teach sickle cell disease (SCD) within our Pharmacotherapy and Medication Management: Hematology/Oncology course. My clinical pharmacy practice is a part of an underserved, rural community health system, (Peninsula Regional Health System) located on the Eastern Shore of Maryland. I also work at another hospital in the Maryland area, and we have a lot of SCD patients. I dedicate my time to interacting with the SCD patients, providing disease-specific and medication education to them. I currently have a scholarship activity on SCD. I have also presented Continuing Medical Education/Continuing Pharmacy Education/ Continuing Education on Sickle Cell Disease. I believe that I possess the knowledge, skills, and expertise to present on the topic:

Learning Objectives

1. Given a patient case, determine the risk for developing sickle cell disease (SCD).
2. Explain at least two of the several complications of SCD.
3. Given SCD patient case, recommend an appropriate medication therapy for the patient.

Attachments

1. COI Disclosure Form
2. Biography
3. CV
4. Course Materials
 - a. PowerPoint Slides
 - b. Self-Assessment Questions
 - c. KEY: Self-Assessment Questions

COI Disclosure Form

All individuals who have the ability to control or influence the content of an educational activity must disclose all relevant relationships with any commercial interest, including but not limited to members of the planning committee, speakers, presenters, authors, and/or content reviewers.

Name :

Activity Title:

Date of Activity:

Instructions: List the names of commercial interests (defined in the "Glossary of Terms" below) with which you or your spouse/partner have, or have had, a relevant financial relationship within the past 12 months. For this purpose we consider the relevant financial relationships of your spouse or partner that you are aware of to be yours.

- Check One: I have/had no relevant financial relationships with any commercial interests.
 I have, or have had, a relevant financial relationship within the past 12 months.

Nature of Relationship**Name of Commercial Interest**

- Grant/Research Support:
 Consultant:
 CE Speakers' Bureau:
 Stockholder:
 Other:

- Statement of Understanding** I attest that the information above is accurate and confirm that I am not receiving direct payment from a commercial entity for honorarium, travel or other expenses. I also agree to abide by all policies of the University of Pittsburgh and University of Pittsburgh Medical Center, including those related to patient privacy. I agree that all elements of the educational activity for which I am responsible will be balanced, based upon the best available scientific evidence, and free of commercial influence. An "X" in the box serves as the electronic signature of the individual completing this Conflict of Interest Form and attests to the accuracy of the information given above.

Completed By (First Name, Last Name): Nkem P. Nonyel, PharmD, MPH, BCPS

Date Completed: 12/01/2019

Glossary of Terms

Commercial Interest: The ACCME defines a "commercial interest" as any entity producing, marketing, re-selling, or distributing health care goods or services, used on, or consumed by, patients. The ACCME does not consider providers of clinical service directly to patients to be commercial interests. For more information, visit www.accme.org.

Financial relationships: Financial relationships are those relationships in which the individual benefits by receiving a salary, royalty, intellectual property rights, consulting fee, honoraria, ownership interest (e.g., stocks, stock options or other ownership interest, excluding diversified mutual funds), or other financial benefit. Financial benefits are usually associated with roles such as employment, management position, independent contractor (including contracted research), consulting, speaking and teaching, membership on advisory committees or review panels, board membership, and other activities from which remuneration is received, or expected. ACCME considers relationships of the person involved in the CME activity to include financial relationships of a spouse or partner.

Relevant financial relationships: ACCME focuses on financial relationships with commercial interests in the 12-month period preceding the time that the individual is being asked to assume a role controlling content of the CME activity. ACCME has not set a minimal dollar amount for relationships to be significant. Inherent in any amount is the incentive to maintain or increase the value of the relationship. The ACCME defines "relevant" financial relationships as financial relationships in any amount occurring within the past 12 months that create a conflict of interest.

Conflict of Interest: Circumstances create a conflict of interest when an individual has an opportunity to affect CME content about products or services of a commercial interest with which he/she has a financial relationship.

Nkem P. Nonyel, PharmD, MPH, BCPS

Updates in the Management of Sickle Cell Disease

Nkem P. Nonyel, PharmD, MPH, BCPS
SNPhA Regions I & II Conference, UPMC
February 22, 2020



Dr. Nonyel is an Assistant Professor in the Department of Pharmacy Practice and Administration at the University of Maryland Eastern Shore School of Pharmacy (UMES SOP) & Health Professions. Her clinical practice focuses on Ambulatory Care at Peninsula Regional Medical Group, in Salisbury, Maryland. Prior to joining the UMES workforce, she worked as a full-time clinical pharmacist at Holy Cross Hospital, Silver Spring, Maryland where she completed an ASHP-accredited PGY1 pharmacy residency. Before entering the pharmacy profession, Dr. Nonyel practiced as a Licensed Practical Nurse in both acute and sub-acute care settings, and in pediatric home care.

Dr. Nonyel earned a Doctor of Pharmacy degree from the University of Maryland School of Pharmacy, and a Master of Public Health from the University of Maryland School of Medicine. She is a Board Certified Pharmacotherapy Specialist, and she teaches Sickle Cell Disease. Her scholarship interests include Medication Safety, Health Disparities, Cultural Competency, Public & Global Health, and Leadership/Professional development.

She is very passionate about the pharmacy profession, and mentoring current and prospective PharmD students. She serves as the Student Organization Director for UMES SOP and the faculty advisor for the UMES chapters of the Student National Pharmaceutical Association (SNPhA).

Dr. Nonyel holds several professional pharmacy leadership positions at the local, regional, state, and national levels including:

1. American Association of Colleges of Pharmacy (AACP)
2. Maryland Pharmacy Coalition (MPC)
3. Maryland Pharmaceutical Society (MPHS)
4. National Pharmaceutical Association (NPhA)
5. Nigerian Association of Pharmacists and Pharmaceutical Scientists in the Americas (NAPPSA)

Nkem P. Nonyel, PharmD, MPH, BCPS

EDUCATION

Master of Public Health (MPH) May 2017
Concentration: Global Health
Department of Epidemiology and Public Health
University of Maryland School of Medicine
Baltimore, MD

MPH Capstone Project: Strengthening capacity for sustainability of international medical missions to Haiti: global health collaborative opportunities among healthcare professionals, students, and volunteers
Preceptor: Hoai-An Truong, PharmD, MPH, FNAP, FAPhA

Post Graduate Year-1 Pharmacy Residency Program (ASHP-Accredited) Jul 2015
Holy Cross Hospital
Silver Spring, MD
Residency Program Director: Kikelola Gbadamosi, MS, MBA, PharmD, BCPS

Doctor of Pharmacy (PharmD) May 2014
University of Maryland School of Pharmacy
Baltimore, MD

Associate of Arts in Biology and Chemistry (High Honors) May 2009
Prince George's Community College
Largo, MD

Licensed Practical Nursing (LPN) Feb 1999
University of District of Columbia
NW Washington, DC

Bachelor of Science in Physics and Education May 1991
University of Nigeria
Nsukka, Enugu

PROFESSIONAL LICENSURE AND CERTIFICATION

Licensure

Pharmacist License: State of Maryland 2014 – Present
Nursing License (Licensed Practical Nursing): State of Maryland 1999 – 2018

Certification: Professional Pharmacy

Board Certified Pharmacotherapy Specialist (BCPS) 2016 – Present
Pharmacy Residency Teaching Certification 2014 – 2015
Pediatric Advanced Life Support (PALS) 2015 – Present

Advanced Cardiac Life Support (ACLS)	2014 – Present
Pharmacy-Based Immunization Delivery Certification	2012
Basic Life Support for Providers (BLS) Certification	1998 – Present

Certification: Clinical Research

NIDA Clinical Trials Network certification	May 2019 – Present
The National Institute of Health (NIH) Office of Extramural Research certification	May 2019 – Present
Association of Clinical Research Professionals (ACRP) certification	May 2019 – Present
Collaborative Institutional Training Initiative (CITI) Program Certificate	Jan 2019 – Present
Research and Scholarship Certificate Program	2018 – 2020
American College of Clinical Pharmacy Research & Scholarship Academy	[in progress]

PROFESSIONAL EMPLOYMENT EXPERIENCE

Pharmacy Practice

Peninsula Regional Medical Center	Aug 2017 – Present
<ul style="list-style-type: none"> ● Ambulatory Care Clinical Pharmacist 	
Holy Cross Hospital	Jul 2014 – Present
<ul style="list-style-type: none"> ● Clinical Pharmacist ● Clinical Pharmacist (Resident) ● Clinical Pharmacist (Resident) Aspen Hill Clinic 	
Rite Aid Pharmacy (Student Intern)	Jul 2012 – Jun 2013

Nursing Practice

Licensed Practical Nurse	Apr 1999 – 2018
--------------------------	-----------------

Teaching Experience

Teaching Appointment (PharmD)

Assistant Professor, University of Maryland Eastern Shore School of Pharmacy	Jul 2017 – Present
<ul style="list-style-type: none"> ● Assistant Professor of Pharmacy Practice ● Ambulatory Care Clinical Specialist, Peninsula Regional Medical Center ● Preceptor, Advanced Pharmacy Practice Experience Required Rotation ● Preceptor, Post-Graduate Year 1 (PGY1) Pharmacy Residency: <ul style="list-style-type: none"> ○ Ambulatory Care Elective Rotation ● Student Organization Director (Desk title) 	
Clinical Assistant Professor, University of Maryland School of Pharmacy	Aug 2015 – 2018
<ul style="list-style-type: none"> ● Preceptor, Advanced Pharmacy Practice Experience 	

Course Coordinator: University of Maryland Eastern Shore School of Pharmacy

PHAR 681: Coordinator and Developer, Medication Safety Elective	Fal 2019
PHAR 613: Pharmacotherapy and Medication Management: Immunology & Rheumatology	Spr 2018 – 19
<ul style="list-style-type: none"> ● Coordinator (Spring 2020) ● Co-Coordinator (Spring 2019) 	

Didactic Course Instructor/Lecturer: University of Maryland Eastern Shore School of Pharmacy

PHAR 614: Pharmacotherapy and Medication Management: Pulmonology and Ophthalmology	Fal 2019
PHAR 622: Pharmacotherapy and Medication Management: Endocrinology & Urology	Fal 2019 Fal 2018
PHAR 615: Pharmacotherapy and Medication Management: Gastroenterology	Spr 2019
PHAR 613: Pharmacotherapy and Medication Management: Immunology & Rheumatology	Spr 2018, 2019
PHAR 620: Pharmacotherapy and Medication Management: Hematology/Oncology	Spr 2018, 2019
PHAR 624/625: Integrated Pharmacy Practice (IPP) I/II	Spr 2018, 2019
PHAR 799: Advanced Seminar	Spr 2018, 2019
PHAR 703: Ambulatory Care Required Advanced Pharmacy Practice Experience	Jan 2018 – Present
PHAR 561: Professional Development I	Fal 2018
PHAR 543: Public Health for Pharmacists	Spr 2017, 2018, 2019

Elective Course Instructor/Lecturer: University of Maryland Eastern Shore School of Pharmacy

PHAR 681: Medication Safety Elective	Fal 2019
PHAR 680: Independent Study	Sum 2019

Didactic Course Instructor/Lecturer: University of Maryland School of Pharmacy

PHAR 5002: (Resident) AST 2	Spr 2015
APPE 499/APPC/APEX: Lecturer (Resident), Clinical Track: Orientation, Feedback, Professionalism	Spr 2015
PHAR 538: (Resident), Abilities Lab 2	Spr 2015
PHAR 518: (Resident), Abilities Lab 2	Fal 2015

Advisor/Mentor (PharmD)

Faculty Advisor, American Society of Health Systems Pharmacist (ASHP-SSHP)	Jul 2019 – Dec 2019
Faculty Co-Advisor, Pharmacy Student Government Association (PSGA)	Oct 2018 – Present
Faculty Advisor, Student National Pharmaceutical Association (SNPhA)	Jul 2017 – Present
Academic Advisor, Class of 2020	2017 – 2020
National Pharmaceutical Association-Student National Pharmaceutical Association Pharmacy Student Mentoring Program	2017 – 2018

SCHOLARSHIP

Refereed Publication

Nonyel NP and Gogineni HP. <i>Rheumatoid Arthritis Module</i> . APhA PharmacotherapyFirst: A Multimedia Learning Resource (Book Chapter)	Apr 2019
---	----------

Non-Refereed Article

Nonyel NP. <i>Quality Improvement Initiative: Insulin Best Practices and Strategies for Ensuring the Safe Use of Insulin in the Hospital</i> Holy Cross Hospital Monthly Newsletter, <i>Inside the Pill Box</i> . Volume 4, Issue 3, pages 6-8, May 2015	May 2015
--	----------

Nonyel NP. "University of Maryland Student National Pharmaceutical Association (SNPhA) Gains Wealth of Experience at the National Pharmaceutical Association (NPhA) 65th Annual Conference in Las Vegas, Nevada"
<https://rxsecure.umaryland.edu/apps/news/view/story.cfm?id=290> Aug 2012

Nonyel NP. PGCC at the MACC Student Advocacy Day Mar 2009
 PGCC Newspaper
The Owl Volume 53, Number 6, pages 1 & 4, March 4, 2009

Reviewer / Editor

2019 AACP Pharmacy Practice Section Oct 2019
 New Investigator Award Application Reviewer

Student National Pharmaceutical Association (SNPhA) Jul 2019
 Clinical Skills Competition Judge

AACP Trainee Poster Competition Judge: Poster Walk Rounds (#134, #142, #152) Jul 2019

2019 AACP Pharmacy Practice Section Poster Abstract Judge Apr 2019
 Research/Education and Trainee Poster Abstract Reviewer (6 abstracts)

SAGE Publishing: Peer Reviewer for Clinical Medicine Insight Nov 2018 – Present

Ambulatory Care Judge: Poster Walk Rounds, ACCP Global Conference Oct 2018

ACCP: Boyle CJ, Ford-Wade A, **Nonyel NP**, Barnard M, O'Connell MB. Evolution of Women's Health Care and Research (Chapter 1) in *Women's Health Across the Lifespan: A Pharmacotherapy Approach*. 2nd Edition. AccessPharmacy Apr 2018

Abstracts / Posters

Nonyel NP. *Strategic Initiatives for Assimilating Pharmacists into Primary Care Settings* Sep 2019

Nonyel NP. *Medication Safety Initiative: Assessing Adherence to ACIP PCV13/PPSV23 Timing for Adults ≥65 Years* Jul 2019

Hasan K, **Nonyel NP**, Tejada F. *Opioid Awareness Among UMES PharmD Students* Jul 2019

Nonyel NP. *Lessons Learned Developing a new Pharmacy Practice in Rural Area* Jul 2018

Nonyel NP. *Environment of change: the value of a residency program in achieving strategic initiatives* Aug 2015

Nonyel NP. *Impact of pharmacist led medication education on pharmacy care experience of high-risk hospitalized patients* May 2015

Nonyel NP. *Impact of pharmacist led medication education on pharmacy care experience of high-risk hospitalized patients* Dec 2014

RESEARCH

Association Between Implicit Bias, Explicit Bias, and Responses to Clinical Cases 2019-2020
 (In progress)

Healing Communities Maryland (HCM) Initiative (NIDA grant) Grant unapproved
 Community Advisory Board Member

ORAL/PODIUM PRESENTATION

Invited Continuing Professional Development & Continuing Pharmacy Education (ACPE-Accredited)

Nonyel NP. <i>Strategies for Optimizing Medication Safety Among Culturally Diverse Patient Population</i> (Live CPE Credit: 1.0) (accepted to be completed)	Jan 2020
Nonyel NP. <i>"The Grass is Greener Where You Water It": The Purposeful Leadership</i> (Live CPE/CE Credit: 1.0) (accepted to be completed)	Dec 2019
Nonyel NP. <i>Strategies to Alleviate Patient-Related Barriers to Safe Medication Use</i> (Live CPE Credit: 1.0) (accepted to be completed) ACPE #0215-0000-19-020-L05-P; ACPE #0215-0000-19-020-L05-T	Dec 2019
Nonyel NP. <i>One Size Does Not Fit All: Ensuring Medication Safety Among Culturally and Linguistically Diverse Patient Population</i> (Live CPE Credit: 1.0) ACPE #0217-9999-19-227-L05-P	Nov 2019
Nonyel NP. <i>Environment of Care: Ensuring Medication Safety and Enhancing Clinical and Humanistic Outcomes in Sickle Cell Disease</i> (Live CPE/CME/CE Credit: 1.0) ACPE #JA4008181-000-19-188-L04-P	Nov 2019
Nonyel NP. <i>Nutraceuticals in Chronic Disease Management: Key Interactions with Therapeutic Drugs</i> (Live CPE Credit: 1.0) ACPE #0215-0000-19-016-L01-P	Jul 2019
Nonyel NP and Wade L. <i>"I Don't Understand You! Cultural and Linguistic Competency Considerations for College/University Faculty"</i> (Live presentation)	Jun 2019
Nonyel NP. <i>Refining Your Preceptorship Brand</i> (Live CPE/CME/CE Credit: 1.0) ACPE #JA4008181-0000-19-004-L04-P	Jan 2019
Nonyel NP. <i>Optimizing the Management of Gout Across the Continuum of Care: An Interprofessional Approach</i> (Live CPE/CME/CE Credit: 1.0) ACPE #0798-9999-18-193-L01-P; UAN: 0798-9999-18-193-L01-T	Sep 2018
Nonyel NP. <i>Nutraceuticals: "What Every Pharmacist Needs to Know"</i> (Live CPE/CE Credit: 1.0) ACPE #0798-9999-18-135-L04-P; UAN: 0798-9999-18-135-L04-T	Jul 2018
Nonyel NP. <i>ICU Delirium</i> (Live CPE/CME/CE Credit: 1.0) ACPE #0025-9999-15-102-L01-P	Jun 2015
Nonyel NP. <i>Impact of pharmacist led medication education on pharmacy care experience of high-risk hospitalized patients</i> (Webinar CPE Credit: 1.0)	Apr 2015

Invited Professional Presentation

Nonyel NP. <i>"To Infinity and Beyond": Career Choices in Pharmacy Profession</i>	Oct 2019
Nonyel NP. <i>"The Grass is Greener Where You Water It": The Purposeful Leadership</i>	Oct 2019
Nonyel NP. <i>Medication Safety Alerts on Vaccines</i>	May 2019
Nonyel NP. <i>Diabetes Self-Management Education Support Group</i>	May 2019
Nonyel NP. <i>Formulary Review: Menveo & Bexsero (Meningococcal Vaccine)</i>	Jan 2018
Nonyel NP. <i>Introduction to PRMC Vaccine Education Initiative</i>	Nov 2018
Nonyel NP. <i>Strategies to Alleviate Patient-Related Barriers to Successful Chronic Medication Management</i>	Oct 2018
Nonyel NP. <i>Building Strong Relationship with Your Student Organization Faculty Advisor</i>	Jul 2018
Nonyel NP. <i>New Formulary Vaccine: Shingrix (Shingles/herpes vaccine)</i>	May 2018
Nonyel NP. <i>A Slice of Policy: "All Hands on Deck"</i>	May 2018

Nonyel NP. Formulary Review: Shingrix (Shingles/herpes vaccine)	Mar 2018
Nonyel NP. Legislative Day Student Preparation	Feb 2018
Nonyel NP. Pharmacy Update: Drug-Induced QTc Interval Prolongation	Jan 2018
Nonyel NP. Industrial Pharmacist Association (IPhO) Round Table	Apr 2017
Nonyel NP and Gbadamosi K. Utilizing Quality Compass to Strengthen Antimicrobial Stewardship Program	Jul 2015

PROFESSIONAL AFFILIATIONS/SERVICE ACTIVITY

Professional Pharmacy Organizations

● Nigerian Association of Pharmacists and Pharmaceutical Scientists in the Americas (NAPPSA), Inc.	Mar 2019 – Present
● American Association of Colleges of Pharmacy (AACCP)	2017 – Present
● American College of Clinical Pharmacy (ACCP)	2017 – Present
● Maryland Pharmacy Coalition (MPC)	2015 – Present
● National Pharmaceutical Association (NPhA)	2014 – Present
● Maryland Pharmaceutical Society (MPhS)	2014 – Present
● <i>Lambda Kappa Sigma</i> International Pharmaceutical Fraternity (LKS)	2010 – Present
● American Society of Health-System Pharmacists (ASHP)	2010 – 2017
● American Pharmacists Association (APhA)	2010 – 2016
● Students National Pharmacy Association (SNPhA)	2010 – 2014

Service to Pharmacy Profession

Nigerian Association of Pharmacists and Pharmaceutical Scientists in the Americas (NAPPSA), Inc.	Mar 2019-Present
● Mentorship Committee, Co-Chair (2019-2020)	
● Education Committee, Member (2019-2020)	
● Scholarship Committee, Member (2019-2020)	
American College of Clinical Pharmacy (ACCP)	2018 – Present
● Research Process Committee, Member – Ambulatory Care PRN (Pharmacy Research Network) (2018-2019)	
● Ambulatory Care Judge: Poster Walk Rounds	
American Association of Colleges of Pharmacy (AACCP)	2017 – Present
● Health Disparities Cultural Competency (HDCC) SIG <ul style="list-style-type: none"> ○ Secretary of Information Management, HDCC (2019-2021) ○ Chair, Resolutions Ad Hoc Committee (2019-2021) ○ Executive Planning Committee (2019-2020) ○ Nominations Committee (2019-2020) ○ Programs Committee Member (2019-2020) 	
● Practice Section <ul style="list-style-type: none"> ○ Research Development Committee/Research & Scholarship Committee, Member (2018-2019) ○ Section Poster Abstract Reviewer (2019) ○ NIA Award Application Reviewer (2019) 	
● Public Health SIG <ul style="list-style-type: none"> ○ Global Health Committee (2018-2019) ○ Workgroup: Research in the context of international partnerships - GPE SIG and Public Health SIG (2018-2019) ○ Scholarship Committee (2019-2020) 	

<ul style="list-style-type: none"> ● AACP Trainee Poster Competition Judge: Poster Walk Rounds - #134, #142, #152 (2019) 	
Maryland Pharmacy Coalition (MPC)	2015 – Present
<ul style="list-style-type: none"> ● Lead, Governance Committee (2019-2020) ● Chair, MPC (2017-2018) ● Chair, Public Relations/Public Health Committee (2016-2017) ● Member, Pharmacist Provider Status Workgroup (2015-2016) 	
National Pharmaceutical Association (NPhA)	2014 – Present
<ul style="list-style-type: none"> ● Zone 1 Director (2018-2020) <ul style="list-style-type: none"> ○ Membership Committee (2018-2020) ● Public Relations Committee, LinkedIn Administrator (2017-2018) ● Clinical Skills Competition Judge SNPhA (2019) 	
Maryland Pharmaceutical Society (MPhS)	2012 – Present
<ul style="list-style-type: none"> ● Immediate Past President (2019-2021) ● MPhS Representative to MPC (2018-19, 2019--20) ● President (2017-2019) ● President-Elect/Vice President (2015-2017) 	
Lambda Kappa Sigma International Pharmaceutical Fraternity (LKS)	2012 – Present
University of Maryland School of Pharmacy, Baltimore (<i>Epsilon</i> chapter)	
<ul style="list-style-type: none"> ● Professionalism Chair (2012-2013) ● Professionalism Co-chair (2011-2012) 	
Student National Pharmaceutical Association (SNPhA)	2010 – 2014
University of Maryland School of Pharmacy, Baltimore chapter	
<ul style="list-style-type: none"> ● President (2012-2013) ● President-Elect (2011-2012) 	

Service to the UMES School of Pharmacy and Health Professions

Pharmacy Practice and Administration Community Events Workgroup	Sep 2019 – Present
UMES Faculty Liaison	
<ul style="list-style-type: none"> ● District of Columbia-College of Clinical Pharmacy (DC-CCP) ● Co-Liaison, American College of Clinical Pharmacy (ACCP) College of Pharmacy Faculty Liaison ● Maryland Pharmaceutical Society 	<p>Jul 2019 – Present</p> <p>Jan 2019 – Present</p> <p>Jul 2018 – Present</p>
Student Organization Director	Oct 2018 – Present
Admissions Committee	Jul 2018 – Present
Student Conduct Committee	Jul 2017 – Present
Search Committee for Practice Faculty (Ambulatory/Acute Care)	Oct 2018 – Aug 2019
OSCE (Objective Structured Clinical Examination) Sub-Committee	Jul 2017 – Jun 2019
UMES/Wilmington Delaware Interprofessional Education	Oct 2017

Service to the University of Maryland Eastern Shore

Senate Constitution Committee	Sep 2019
UMES Community Fall Festival Planning Committee	Oct 2019
UMES Fall 3K Fun Walk and Community Festival Planning Committee	Oct 2018

Service to the University of Maryland School of Pharmacy

<ul style="list-style-type: none"> ● Second Henrietta Lacks Biennial Symposium Planning Committee ● Theme: <i>The Dignity of Difference</i> ● University of Maryland Strategic Plan 2011-2016 	<p>2013</p> <p>2011</p>
--	-------------------------

Service to the Community

International Community Initiatives (ICI) Medical Mission Training Coordinator 2016 – Present
JACQUES Initiatives HIV Counseling and Testing Certification 2013

Service to Peninsula Regional Medical Center (PRMC)

Peninsula Regional Medical Group (PRMG) Primary Care Provider Meetings (Only Pharmacist) Sep 2017 – Present

Service to Holy Cross Hospital/Holy Cross Health (HCH)

Pharmacy and Therapeutics Committee Jul 2014 – Jun 2017
Antimicrobial Stewardship Subcommittee Jul 2014 – Jun 2017
Medication Safety Subcommittee Jul 2014 – Jun 2017
Risk Management and Patient Safety Committee Jul 2014 – Jul 2015

AWARDS/HONORS

-
- ACCP Ambulatory Care PRN 2018 Academy Sponsorship 2018
 - Maryland Pharmaceutical Society 2013 Scholarship Award and recognition for dedication to the promotion of pharmacy profession and services to underserved communities in the state of Maryland May 2014
 - Certificate of Appreciation from Sheppard Pratt Health System for giving loyal and valuable services voluntarily Dec 2013
 - Rho Chi Recognition Certificate for recognition of high scholastic achievement for the academic year Nov 2013
 - Student Government Association Leadership Award Oct 2013
University of Maryland School of Pharmacy
 - SNPhA/Rite Aid Leadership Academy Award Jul 2013
 - University of Maryland, School of Pharmacy Student Ambassador Honor and Scholarship 2010 – 2013
 - University of Maryland, School of Pharmacy Scholarship Ambassador Honor 2012 – 2013
 - Who's Who Among Students in American Universities and Colleges Award, Prince George's Community College, Largo 2009
 - Prince George's Community College 2009 Science Achievement Award 2009

SKILLS

Clinical Systems and Software: Proficient in the use of Cerner, EPIC, DoseEdge, Pyxis Enterprise, Pyxis MedStation ES, OmniCell, Quality Compass, CRISP, SlicerDicer, FDB AlertSpace

Classroom Technology: ExamSoft (assessment creation, administration and analysis software), TurningPoint Technology ResponseWare, Blackboard Learning Management System

Updates in the Management of Sickle Cell Disease

Nleem P. Nonye, PharmD, MPH, BCPS
Assistant Professor, DMES School of Pharmacy

SMPA Reports I & II
CPE-UPMC
February 22, 2020

Disclosure/s

I do not have a financial interest, arrangement or affiliation with one or more organizations that could be perceived as a real or apparent conflict of interest in the context of the subject of this activity.

Learning Objectives

1. Given a patient case, determine the risk for developing sickle cell disease (SCD).
1. Explain at least two of the several complications of SCD.
1. Given SCD patient case, recommend an appropriate medication therapy for the patient.

What is Sickle Cell Disease?

- ❖ Autosomal recessive inheritance of homozygous sickle cell gene (HbS,S)
- ❖ Hemoglobin **polymerization**
 - Erythrocyte rigidity
 - Hemolysis
 - **Vaso-occlusion**

1. Miller AB, Wong JB, Hoff VA, et al. Hemoglobinopathies. 2015;40:124.
2. Miller AB, et al. 2015, July. 43(7):1-43.

Global Burden of SCD

SCD Region	2010		2050		2050-2010 % Change
	95	%	95	%	
Global	265,771	100	424,490	100	+52.2
American	41,584	15.7	31,028	7.3	-31.9
Arab-India	47,264	17.8	30,540	7.2	-35.7
Turkey	5,450	2.1	4,470	1.1	-17.7
Southeast Asia	2	0	0	0	-14.3
Sub-Saharan Africa	249,487	94.2	353,332	83.7	+40

4. Pielak D. 2014. BMC Public Health 14:101484.
5. Miller AB, et al. 2015, July. 43(7):1-43.
6. Miller AB, et al. 2015, July. 43(7):1-43.

Epidemiology

- ❖ SCD Globally: prevalent in tropical countries
- Affects about 300,000 of neonates
- ❖ SCD in Americans: 100,000 individuals
- African-Americans: 1 in 365 births
- Hispanic: 1 in 16,300 births
- ❖ Sickle cell trait: 1 in 13 African-American
- Prevalence for sickle cell trait ranges from 2-27%

1. Pielak D, et al. 2014. BMC Public Health 14:101484.
2. Miller AB, et al. 2015, July. 43(7):1-43.

Morbidity and Mortality

- ◆ Acute pain crisis and end-organ damage
- ◆ **Tissue infarction** secondary to microvascular obstruction from the sickled cells
- ◆ Hospitalizations: 75,000 in U.S. (1989-1993)
 - Costing about \$475 million
- ◆ Predictor of life expectancy: high HbF
 - Average lifespan
 - ◆ 1973: 14 years of age
 - ◆ 2016: ~45-68 years of age

© PNAS 06/18/2016; DOI: 10.1073/pnas.1519111113
 2016; DOI: 10.1073/pnas.1519111113
 © 2016 American Society for Human Genetics

Inheritance of Sickle Cell Gene

© 2016 American Society for Human Genetics
 © 2016 American Society for Human Genetics

Hemoglobinopathy

a) α-chain

Amino acid position	1	2	6	26	67	68	141
Normal	Glu	Glu	Lys	Glu	Val	Asn	Arg
Hb variants:							
HbI			Asp	Glu	Val	Asn	Arg
Hb-G Honolulu			Lys	Gln	Val	Asn	Arg
Hb Norfolk			Lys	Glu	Asp	Asn	Arg
Hb-G Philadelphia			Lys	Glu	Val	Lys	Arg

b) β-chain

Amino acid position	1	2	6	26	67	121	146
Normal	Glu	His	Glu	Glu	His	Glu	His
Hb variants:							
Hb-S			Val	Glu	His	Glu	His
Hb-C			Lys	Glu	His	Glu	His
Hb-E			Glu	Lys	His	Glu	His
Hb M Saskatoon			Glu	Glu	Lys	Glu	His
Hb Zurich			Glu	Glu	Arg	Glu	His
Hb-D β Punjab			Glu	Glu	His	Gln	His

© 2016 American Society for Human Genetics
 © 2016 American Society for Human Genetics

Types of Sickle Cell

Types	RBC Life Span (days)
Sickle cell anemia (SCA-HbSS)	17 (~60% to 65%)
Sickle cell hemoglobin C (HbSC)	28 (~25% to 30%)
Sickle cell hemoglobin CC (HbCC)	29
Sickle cell β ⁰ -thalassemia (HbSβ ⁰ -thal)	75
Sickle cell β ⁻ -thalassemia (HbSβ ⁻ -thal)	75
Sickle cell trait (SCT-HbAS)	93

Normal hemoglobin: HbAA 120

Other Types:

- ◆ HbSD
- ◆ HbSE

© 2016 American Society for Human Genetics
 © 2016 American Society for Human Genetics

Audience Participation

NR, a 19-year-old woman with SCD presents to the emergency department with vaso-occlusive pain crisis. Her oral medication regimen includes hydroxyurea, folic acid, oxycodone, oxycodone PRN for severe pain, acetaminophen PRN for mild-to-moderate pain, and multivitamin. She reveals she and her boyfriend are planning to have a baby, and that her boyfriend has the sickle cell trait.

What is NR's risk for having a baby with sickle cell disease?

- A. 25%
- B. 50%
- C. 75%

Pathophysiology

© 2016 American Society for Human Genetics
 © 2016 American Society for Human Genetics

12

Complications

Meet the grime star with sickle cell disease using rap to get blood for black patients: "I want to help save lives"
 [Tobi Akingbade, March 30, 2019]

https://youtu.be/gPaX0kVj_IQ

14

Complications

Neurocognitive dysfunction
 Hemolytic anemia
 Splenic dysfunction
 Sickle hemoglobinuria
 Gallstones
 Abnormal bone growth
 Subtotal thymic atrophy
 Papillary necrosis
 Delayed puberty
 Folate deficiency
 Priapism
 Renal medullary necrosis
 Bone marrow infarction
 Osteomyelitis
 Acute chest syndrome
 Pulmonary hypertension
 Acute renal failure
 Acute pain event
 Cardiac death
 Stroke
 Transfusions
 Splenic infarction
 Spleen sequestration
 Complications of pregnancy
 Stroke
 Osteomyelitis
 Chronic pain

- ◆ Pregnancy
- High blood pressure
- Blood clot
- Miscarriage
- Premature birth
- Low birth weight & growth retardation

Legend:
 ◆ Acute complications
 • Chronic complications

Ward CL, Patel B, Bost CQ, Galloway J, O'Brien Thompson K, et al. Sickle cell disease. Nat Rev Dis Primers. 2018;8(4):434-600.

15

Newborn Screening (NBS)

Timing of Screening & Communication of Results

- ◆ **At birth**, regardless of birth setting
- ◆ 1st pediatrician **must** verify screening result
- ◆ Confirmatory test: **no later than 2 months** of age
- ◆ ***Communication of newborn carrier status

Treatment

- ◆ By 2 months of age: **penicillin prophylaxis**
- ◆ Pneumococcal vaccine

U.S. Preventive Services Task Force. Screening for Sickle Cell Disease in African American Infants and Young Children.

16

Audience Participation

VA, a 30-year-old man with sickle cell disease presented to the ED with chest pain, cough, tachypnea, and fever, all of which started less than 24 hours ago. His chest X-ray shows evidence of new pulmonary infiltrate. His oxygen saturation is 90%, and he was started on oxygen @ 2L via nasal cannula.

Which of the following describes VA's sickle cell presentation?

- A. Acute chest syndrome
- B. Chronic pain syndrome
- C. Acute renal failure
- D. Avascular necrosis

17

Treatment Options

18

Goals of Therapy

- ◆ Control pain
- ◆ Prevent end-organ damage
- ◆ Enhance health-related quality of life

10

Non-Pharmacological Therapy

- ❖ Blood transfusion
- ❖ **Stem cell transplant**
- ❖ Gene therapy
- ❖ Exchange transfusion
- ❖ Preventive Lifestyle

Erythrocytapheresis



© NANA

20

Pharmacological Therapy

Disease-Modifying	FDA-Approval
❖ Hydroxyurea <small>Leucovorin</small>	1998
❖ L-glutamine (Endari)	2017
❖ Crizanlizumab-tmca (Adakveo)	2019
❖ Voxelotor (Oxbryta)	2019

Investigational SCD Drug	Others: Analgesics
Anti-P-Selectin	❖ ***Opioids
❖ Rivipansel	❖ NSAIDs

Kugel H, Fuster A, Fuster L, et al. • Exp Hematol 2017;45:439-449
 ***Nausea (Phase 3 SCD) data: [medrxiv.org/content/10.1101/2019.01.15.19000000](#)

21

Opioids

Safety Concerns

- ❖ Tolerance versus addiction versus hyperalgesia
- ❖ Central nervous system depression
- ❖ Respiratory depression
- ❖ Gastrointestinal effects (need bowel regimen)
- ❖ Neuromuscular and skeletal effects
- ❖ Concomitant use with benzodiazepines

22

Hydroxyurea (Droxia[®], Siklos[®])

- ❖ FDA-approved: 1998
- ❖ **Class:** Antimetabolite, fetal hemoglobin inducer
- ❖ **Indication:**
- ❖ **MOA:** via nitric oxide
 - Induces expression of fetal hemoglobin
 - Mediates vasodilation
 - Alters the adhesion of RBCs to the endothelium
- ❖ **Dose:** (using IBW or TBW whichever is less)

23

Hydroxyurea (Droxia[®], Siklos[®])

Safety

- ❖ **BBW:** myelosuppression, malignancy (leukemia, skin CA)
- ❖ **Adverse Effects/Monitoring:** elevations in LFTs, uric acid, SCr, BUN, alopecia, low sperm count in males
 - Macrocytosis: folate used to decrease side effects
- ❖ **Teratogenic:** effective contraception during and after treatment:
 - Females: at least 6 months
 - Males: at least 1 year
- ❖ **Drug interactions:** with pimecrolimus, tacrolimus, myelosuppressive therapies, antiretrovirals due to

24

L-Glutamine Oral Powder Endari[®]

- ❖ FDA-approved: 07/07/2017
- ❖ **Class:** amino acid
- ❖ **Indication:** to reduce acute complications of SCD in all patients >5 years of age
- ❖ **MOA:** Unclear:
 - Decreases oxidative stress - damages sickled RBCs
 - Increases availability of reduced glutathione thereby improving NAD redox potential of the sickled RBCs
- ❖ **Dose:** 5-15 g per twice daily based on body weight
- ❖ **Adverse Effects:** headache, chest pain, flatulence, nausea, constipation, abdominal pain, limb and back pains, coughs

https://www.accessdata.fda.gov/drugsatfda_docs/nda/2017/212537Orig1s001.pdf

Crizanlizumab-tmca (Adakveo®)

SUSTAIN trial

- ❖ **FDA-approved:** 11/15/2019
- ❖ **Class:** P-selectin inhibitor
- ❖ **Indication:** to reduce the frequency of VOC crisis in individuals ≥ 16 years old with SCD
- ❖ **MOA:** Humanized IgG2 kappa monoclonal antibody that binds and inhibits P-selectin, a cell adhesion protein involved in multicellular interactions resulting in vaso-occlusion
- ❖ **Dose:** 5 mg/kg IV infusion over 30 minutes on Week 0, Week 2, and every 4 weeks thereafter
- ❖ **Adverse Effects:** nausea, arthralgia, back pain, and pyrexia

Insufficient human data for use in pregnancy; only use if benefit-risk

Voxelotor (Oxbryta®)

HOPE trial

- ❖ **FDA-approved:** 11/25/2019
- ❖ **Class:** Hemoglobin S polymerization inhibitor
- ❖ **Indication:** to increase hemoglobin in individuals ≥ 12 years old with SCD
- ❖ **MOA:** preferential binds to hemoglobin S (HbS) increasing HbS affinity for oxygen and inhibits HbS polymerization in a dose-dependent manner.
- ❖ **Dose:** 1500 mg orally once daily (1000 mg for Child Pugh C)
- ❖ **Adverse Effects:** headaches, diarrhea, abdominal pain, nausea, fatigue, rash, and pyrexia

Insufficient human data for use in pregnancy; only use if benefit-risk

Audience Participation



NR, a 19-year-old woman with SCD presents to the emergency department with vaso-occlusive pain crisis. She discloses that she has a positive pregnancy test two days ago, and has not moved her bowel since four days ago. Her oral medication regimen includes hydroxyurea, folic acid, oxycodone PRN for severe pain, acetaminophen PRN for mild-to-moderate pain, and multivitamin.

Which of the medications pose(s) the most safety concerns for NR? (select all that apply)

- A. Acetaminophen
- B. Folic acid
- C. Hydroxyurea

Audience Participation



12 months later, NR presents to the emergency department with her baby boy for uncontrollable cries. The doctor suspects that the baby has vaso-occlusive pain crisis. The baby's pain was managed with appropriate analgesics.

Which of the following medications is disease-modifying and should be initiated for NR's baby?

- A. Penicillin
- B. Voxelotor
- C. Hydroxyurea
- D. Crizanlizumab-tmca

Preventive Health Maintenance

- ❖ Penicillin prophylaxis
- ❖ Timely administration of necessary vaccines:
 - Annual influenza
 - Pneumococcal (PCV13, PPSV23)
 - Meningococcal (ACWY-Menveo, Menactra)
 - Salmonella (where available)

https://www.cdc.gov/mmwr/preview/mmwrhtml/aa6002a1.htm. Updated February 6, 2019

Role of Pharmacists

Acute care setting

- ❖ Proper antibiotics
- ❖ Empiric 3rd generation cephalosporin for pediatrics
- ❖ Supportive care measure
- ❖ Timely administration of analgesia


Chronic care setting

- ❖ Advocate for adequate chronic pain control and pain management clinic
- ❖ Make referrals to psychosocial services
- ❖ Guide appropriate use of chelating agents
- ❖ Patient education


31

Resources for SCD Patients

- ❖ Sickle Cell Disease National Resource Directory: <https://www.cdc.gov/nceh/ncbddd/sicklecell/map/map-nationalresourceindex.html> OR 1-800-CDC-INFO (232-4636), TTY: 1-888-232-6348 or e-mail: cdcinfo@cdc.gov (Last updated 10/08/2019)
- ❖ World Sickle Cell Awareness Day: June 19





American Society of Hematology
Helping hematologists conquer blood diseases worldwide




32

Key Takeaways

- ❖ Hemoglobin polymerization and occlusion of the microvasculature lead to complications of SCD.
- ❖ Genetic counseling is important for decreasing the incidence and prevalence of SCD.
- ❖ Voxelotor, crizanlizumab-tmca, hydroxyurea, and L-glutamine are the FDA-approved disease-modifying therapies for SCD.

33



Updates in the Management of Sickle Cell Disease

Nkem P. Nonyel, PharmD, MPH, BCPS
Assistant Professor, UMES School of Pharmacy

SAPPA Response I & II
CPI, UPAC

February 22, 2020

Updates in the Management of Sickle Cell Disease

Nkem P. Nonyel, PharmD, MPH, BCPS
SNPhA Regions I & II Conference, UPMC
February 22, 2020

Self-Assessment Questions

1. NR, a 19-year-old woman with SCD presents to the emergency department with vaso-occlusive pain crisis. Her oral medication regimen includes hydroxyurea, folic acid, oxycontin, oxycodone PRN for severe pain, acetaminophen PRN for mild-to-moderate pain, and multivitamin. She reveals she and her boyfriend are planning to have a baby, and he has the sickle cell trait. What is NR's risk for having a baby with sickle cell disease?
 - a. 25%
 - b. 50%
 - c. 75%
 - d. 100%
2. VA, a 30-year-old man with sickle cell disease presented to the ED with chest pain, cough, tachypnea, and fever, all of which started less than 24 hours ago. His chest X-ray shows evidence of new pulmonary infiltrate. His oxygen saturation is 90%, and he was started on oxygen @ 2L via nasal cannula. Which of the following describes VA's sickle cell presentation?
 - a. Acute chest syndrome
 - b. Chronic pain syndrome
 - c. Avascular necrosis
 - d. Acute renal failure
3. NR, a 19-year-old woman with SCD presents to the emergency department with vaso-occlusive pain crisis. She discloses that she has a positive pregnancy test two days ago, and has not moved her bowel since four days ago. Her oral medication regimen includes hydroxyurea, folic acid, oxycontin, oxycodone PRN for severe pain, acetaminophen PRN for mild-to-moderate pain, and multivitamin. Which of NR's medications pose(s) the most medication safety concerns? (*Select all that apply*)
 - a. Acetaminophen
 - b. Folic acid
 - c. Hydroxyurea
 - d. Oxycontin
4. 12 months later, NR presents to the emergency department with her baby boy for uncontrollable cries. The doctor suspects that the baby has vaso-occlusive pain crisis. The baby's pain was managed with appropriate analgesics. Which of the following medications is disease-modifying and should be initiated for NR's baby?
 - a. Penicillin
 - b. Voxelotor
 - c. Hydroxyurea
 - d. Crizanlizumab-tmca

Updates in the Management of Sickle Cell Disease

Nkem P. Nonyel, PharmD, MPH, BCPS
SNPhA Regions I & II Conference, UPMC
February 22, 2020

KEY: Self-Assessment Questions

1. NR, a 19-year-old woman with SCD presents to the emergency department with vaso-occlusive pain crisis. Her oral medication regimen includes hydroxyurea, folic acid, oxycontin, oxycodone PRN for severe pain, acetaminophen PRN for mild-to-moderate pain, and multivitamin. She reveals she and her boyfriend are planning to have a baby, and he has the sickle cell trait.

What is NR's risk for having a baby with sickle cell disease?

- a. 25%
 - b. *50%
 - c. 75%
 - d. 100%
2. VA, a 30-year-old man with sickle cell disease presented to the ED with chest pain, cough, tachypnea, and fever, all of which started less than 24 hours ago. His chest X-ray shows evidence of new pulmonary infiltrate. His oxygen saturation is 90%, and he was started on oxygen @ 2L via nasal cannula.

Which of the following describes VA's sickle cell presentation?

- a. *Acute chest syndrome
 - b. Chronic pain syndrome
 - c. Avascular necrosis
 - d. Acute renal failure
3. NR, a 19-year-old woman with SCD presents to the emergency department with vaso-occlusive pain crisis. She discloses that she has a positive pregnancy test two days ago, and has not moved her bowel since four days ago. Her oral medication regimen includes hydroxyurea, folic acid, oxycontin, oxycodone PRN for severe pain, acetaminophen PRN for mild-to-moderate pain, and multivitamin.

Which of NR's medications pose(s) the most medication safety concerns? (*Select all that apply*)

- a. Acetaminophen
 - b. Folic acid
 - c. *Hydroxyurea
 - d. *Oxycontin
4. 12 months later, NR presents to the emergency department with her baby boy for uncontrollable cries. The doctor suspects that the baby has vaso-occlusive pain crisis. The baby's pain was managed with appropriate analgesics.

Which of the following medications is disease-modifying and should be initiated for NR's baby?

- a. Penicillin
- b. Voxelotor
- c. *Hydroxyurea
- d. Crizanlizumab-tmca