

Project Title:

**Implementation of a Longitudinal Point-of-Care Ultrasound
Curriculum for Northwell Hospitalists**

Co-Primary Investigators:

**Jared Honigman, DO and
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Affiliated Department:

**Division of Hospital Medicine at
North Shore University Hospital and Long Island Jewish Medical Center
Department of Medicine, Northwell Health**

Section of Focus:

Continuing Medical Education

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PROPOSAL ABSTRACT

Problem/Educational Issue:

The practice of point-of-care-ultrasound (POCUS) has grown tremendously over the past decade. POCUS is being taught in many medical schools, including the Barbara Zucker School of Medicine. However, there is little oversight in the hospital setting due to a lack of qualified providers competent in POCUS.

Goal:

We aim to create a longitudinal POCUS curriculum for Hospitalists in the Division of Hospital Medicine. Through this curriculum we plan on filling the need of a critical mass of instructors to provide oversight of trainees in Northwell's UME and GME programs.

Approach:

Learners will partake in a two-day intensive course, participating in both large group didactic sessions and small group hands-on practical session. Participants will take a pre-and post-test to assess knowledge gained through the course. Learners will then join weekly rounds with an ultrasound instructor that will combine didactics along with group ultrasound sessions on patients. A Portfolio will be built by each learner containing images they obtain. These images will be reviewed for quality of image and feedback provided. Once a participant's portfolio is completed, they are eligible to take a final assessment exam to achieve a certificate of course completion.

Predicted Outcomes:

We expect a proportion Hospitalists partaking in the POCUS curriculum to obtain competency in POCUS. We expect all the Hospitalist in the curriculum to improve their knowledge and image acquisition in POCUS. We anticipate the number of diagnostic chest radiographs will decrease with increased use of POCUS.

Anticipated Impact and Dissemination Plan:

Implementation of the POCUS curriculum is anticipated bridge the gap between UME, GME and CME training of POCUS. This along with improved diagnostic accuracy and skill with POCUS is expected to improve patient care.

PROPOSAL NARRATIVE

Rational/Statement of the Problem:

Recently coined the “fifth pillar to the bedside physical exam” in a 2018 JAMA article, a growing number of physicians have started incorporating point-of-care ultrasound (POCUS) into their clinical assessments¹. Over the past decade, many medical schools, including the Donald and Barbara Zucker School of Medicine, have started integrating POCUS into their educational curriculum². With the emergence of more affordable handheld solutions, practicing physicians and trainees with widely varying levels of training and competency have access to personal ultrasound devices which they use in the clinical evaluation of their patients. A significant void exists in a critical mass of faculty needed to provide oversight of trainees in the appropriate integration and interpretation of POCUS at the bedside. Since most of our current faculty trained in a pre-POCUS era, hospitalists try to keep pace with the rapid growth and evolution of POCUS. Our faculty POCUS training program aims to fill this void by creating a longitudinal curriculum, with the goal of developing a consistent, core group of hospitalist faculty who become skilled in the use of POCUS in the clinical setting.

Background/ Theoretical Framework:

Point of Care Ultrasound (POCUS) is quickly becoming a widely utilized adjunct to the bedside assessment of patients. Compared to consultative ultrasound studies, POCUS offers clinicians the advantage of timely bedside performance, image interpretation, and application of the findings - all by the provider who poses the clinical question. POCUS diagnostic use has been demonstrated in a multitude of disease processes, including pneumonia and pneumothorax^{3,4}. POCUS is now commonly used across multiple disciplines, including critical care, emergency medicine, and more recently by hospital medicine. The Zucker School of Medicine has been remarkably innovative in their ultrasound training, creating a longitudinal ultrasound training program from the first year of medical school. As the primary educators for the undergraduate and graduate medical trainees during their inpatient Medicine rotation, the Division of Hospital Medicine recognizes the value and necessity of training hospitalists in POCUS.

To meet the growing need for advanced training and dissemination of best practices, the Society of Hospital Medicine recently developed a POCUS certificate of completion pathway and published several position statements on procedural and diagnostic ultrasound use by hospitalists⁵. The American College of Physicians also recently released a statement in support of the use of point-of-care ultrasound by internists. Most available ultrasound courses focus on POCUS skills acquisition, but does not follow the participants to ensure clinical integration of their findings. We aim to fill these voids by creating a longitudinal point of care ultrasound curriculum for Hospitalists with a goal of achieving an entrustable skill.

In this pilot curriculum, Hospitalists will be assessed for their baseline knowledge and skill in using focused POCUS. Through their initial training and subsequent longitudinal learning sessions, they will become proficient in image acquisition, image interpretation, and finally clinical integration. At the end of the curriculum, a final skills and knowledge assessment will be performed, culminating in a certificate of completion. Creating a cohort of hospitalists skilled in POCUS will improve patient care and bridge the gap between medical school training, residency training and continuing medical education.

Approach:

The POCUS Hospitalist Curriculum follows a modified version of the CHAMP ultrasound program successfully used at a large tertiary care center in Minnesota⁷. Our curriculum focuses solely on acquiring skill in diagnostic POCUS of the lung, heart, kidney, bladder, and assessment for deep venous thrombosis. Examples of the clinical problems that the course focuses on are using diagnostic ultrasound to identify a cause of hypoxia or acute kidney injury, and to help guide management of undifferentiated shock. The components of the training program follow the “Learn, See, Practice, Prove, Do, Maintain” pedagogy for

deliberate practice, with this curriculum reaching the “Prove” concept of the framework. This curriculum comprises of a two-day in-person course at Northwell’s Center for Learning and Innovation (CLI) with a pre- and post- assessment (Appendix 1), weekly group practical and didactic sessions, portfolio development, an optional refresher course at CLI, and a final knowledge and skills assessment.

Faculty

Drs. Linda Kurian and Jared Honigman are the developers of the longitudinal POCUS curriculum and will be the primary faculty running the program. They are providing their services without additional compensation as their current administrative responsibilities include development and implementation of this program, including:

- Organize the initial 2-day in-person course
- Establish learning objectives for training course components
- Organize and supervise didactic sessions and image review sessions
- Supervise weekly “GEL” rounds
- Evaluate portfolio review with a standardized rubric
- Administer the final knowledge and skills assessment.

Two-day in-person course — Learn, See, Practice.

The two-day course at CLI includes approximately four hours of didactics, six hours of image interpretation, and six hours of hands-on ultrasound instruction. The construct of the CLI course is based on the national SHM/CHEST ultrasound: Essentials in Critical Care course, which has proven to be effective in skills acquisition⁶. Prior to the start of the course, participants will take a written pre-test assessment to assess baseline skill (appendix 1). The course begins with large group didactics on a topic (i.e. pleura and lung ultrasound) and then divides into smaller groups for image interpretation and hands-on ultrasound training. Image interpretation involves review of both normal and pathologic high-yield images lead by a qualified instructor, building on the knowledge attained in the didactic session. Hands on ultrasound training will be completed in small groups of 3-4 participants with a standardized patient as a model and a qualified instructor moderating sessions. Learning objectives prior to each ultrasound scanning session will be clearly defined (Appendix 2). The course will end with a written post-course assessment (Appendix 1).

Weekly group sessions — Learn, Practice

Having acquired the prerequisite POCUS skills through the two-day in-personal training course, participants will continue a comprehensive longitudinal program with weekly group sessions for approximately one hour each week. The objective of the weekly group session is twofold: 1. continue to improve the psychomotor skill of diagnostic POCUS through deliberate practice and 2. To learn to interpret images acquired to impact clinical decision making. The main clinical questions this curriculum will focus on is how to use diagnostic POCUS to aide in the diagnosis of a patient with undifferentiated hypoxia and how to use diagnostic POCUS to aide in the diagnosis of a patient with acute kidney injury. The first month post-course will consist of “GEL” rounds, where learners perform point of care ultrasound on 3-4 clinically appropriate inpatients as a group, following patient consent. All “GEL” rounds will be supervised by a faculty member and will consist of one member performing a focused pre-determined POCUS exam with the faculty member observing the encounter. The faculty member will use a checklist to evaluate communication skills, probe positioning, hand placement, image acquisition and interpretation.

The second and third months will have alternating weeks of “GEL” rounds and didactic refresher sessions of heart, lung, vascular and abdominal point of care ultrasound. The fourth and subsequent months will alternate between “GEL” rounds and image interpretation sessions. During the image interpretation sessions, images uploaded to the shared online portal by participants will be reviewed under the direction of a qualified instructor. Attendance of weekly sessions are expected by all participants unless they are not working the day of the session.

Portfolio — Prove

Participants are expected to build a portfolio similar to the American College of CHEST Physicians portfolio requirements (appendix 3) including cardiac, pulmonary, abdominal, and deep venous thrombosis (DVT) studies. These requirements have been chosen as CHEST's portfolio requirements will likely align with that required by Northwell's POCUS task force. Participants are encouraged to review all images with faculty members for feedback, but are expected to archive only those images required for their portfolio. Images acquired from real patients in practice are to be submitted to a HIPAA compliant image archiving solution approved by Northwell (Q-PATH). Faculty will then assess image quality using a rubric mirroring that used in the CHAMP-US course with feedback provided.

Final Knowledge and Skills Assessment — Prove

Once a learner completed the initial two-day ultrasound course and completed their portfolio they are eligible to participate in the final knowledge and skills assessment mirroring that used for the Society of Hospital Medicine's Certificate of Completion. The exam will comprise of both a multiple choice written exam and a hands-on practical skills assessment administered by a faculty member. Participants who pass the course will receive a certificate of completion. Participants who do not pass the final assessments are provided opportunities for further training and are allowed to reattempt the assessment.

Anticipated Limitations and Required Resources

1. Cost of the Portable Ultrasound.
2. Q-path image archiving solution - cost graciously covered by the Division of Hospital Medicine.
3. Coordinator to organize weekly didactic and practical rounds. The Co-primary investigators of this grant are offering and coordinating this training without additional resources or time protection allocated to it.
4. Space for weekly didactic sessions will be provided at no cost by the Division of Hospital Medicine.
5. Protected time for participating Hospitalists.

Predicted Outcomes and Evaluation Plan:

We will implement the four-level Kirkpatrick model to evaluate our Hospitalist Point of Care Ultrasound Curriculum.

Level 1 Evaluation – Reaction:

We will evaluate our participants' reaction by applying a post-course survey assessment after the two-day ultrasound course. In addition, every month prior to a "GEL" round session, we will employ a nominal group technique with the group to encourage critique and opportunities to continue to improve the curriculum.

Level 2 Evaluation – Learning:

Participants will take a pre-test and post-test during the two-day ultrasound course. Differences between the pre and post-values will be assessed with 2-sample paired Wilcoxon signed rank test.

A final knowledge and skills assessment will be offered to Hospitalists who complete the portfolio requirements outlined previously (appendix 3). The final knowledge and skills assessment will be offered as an in-person assessment. Hospitalists who do not pass the final assessment will be given further opportunities for training and can re-attempt the final examination at a later time.

Level 3 Evaluation – Behavior:

We will utilize three different modalities to evaluate behavioral changes of the Hospitalists involved in the proposed curriculum. The first evaluation will be written assessments six months and one year after the initial course to evaluate information retention. The six month and one year assessments will comprise of the same written test and skills assessment as the post-test at the 2-day CLI course. These results will be compared with the post-test from the initial two-day course using 2-sample paired Wilcoxon signed rank

test. The second assessment modality employed will be review of uploaded images on the shared drive by the Hospitalists to interpret images and to evaluate image quality. Each image will be reviewed for quality using a checklist similar to that used in the CHAMP-US study. The last modality assessing implementation to daily practice is a log sheet in which Hospitalists will log their ultrasound usage per week.

Level 4 Evaluation – Results:

We predict that utilization of POCUS will improve patient satisfaction and reduce costs via reduced chest radiograph utilization. We will compare the number of chest radiographs and chest CT scans ordered by Hospitalists in this curriculum compared with Hospitalists not trained in POCUS. We will also compare the Press Ganey score of participants who complete the curriculum to their Press Ganey score before the CLI course.

Anticipated Impact and Plan for Dissemination of Project outcomes:

We anticipate that implementation of the hospitalist POCUS curriculum will result in both an educational and quality improvement. First, we anticipate the training of the cohort of Hospitalists within the Division of Hospital Medicine will create a “critical mass” to sustain and grow the POCUS program throughout the rest of the hospitalist division. Having a hospitalist division trained in POCUS will fill a much-needed void in the Northwell Health System. Trained hospitalist staff will bridge the gap between the training Hofstra medical students receive during their medical school training and the void of training thereafter in residency training. Hofstra students will benefit from the incorporation of daily diagnostic POCUS to their internal medicine rotation experience. Once a critical mass of trained faculty are achieved, the goal of the Division of Hospital Medicine and the Internal Medicine Residency Program is to develop a longitudinal POCUS curriculum for internal medicine residents. As a primary investigator of this grant is also an Associate Program Director of the Internal Medicine Residency Program, he will work jointly with both departments using the successes and challenges of this curriculum to build the residency POCUS curriculum.

From a clinical standpoint, we expect to see improved time-to-diagnosis for the patient with undifferentiated hypoxia. We also expect our chest radiograph utilization as a Hospitalist division to decrease and overall patient care to improve with increased use of bedside point of care ultrasound.

We intend to present our findings at an Academy of Medical Educators conference as well as other medical educational conferences when accepted. We plan to submit our findings to the Society of Hospital Medicine’s annual conference. We fully anticipate and encourage independent Hospitalist-led quality improvement projects that will arise as a result of standard use of point-of-care ultrasound.

WORK CITED

1. Narula J, Chandrashekar Y, Braunwald E. Time to Add a Fifth Pillar to Bedside Physical Examination: Inspection, Palpation, Percussion, Auscultation, and Insonation. *JAMA Cardiol.* 2018;3(4):346-350
2. Rempell JS, Saldana F, DiSalvo D, et al. Pilot Point-of-Care Ultrasound Curriculum at Harvard Medical School: Early Experience. *West J Emerg Med.* 2016; 17(6):734-740.
3. Llamas-Alvarez A, Tenza-Lozano M, Latour-Perez, J. Accuracy of Lung Ultrasonography in the Diagnosis of Pneumonia in Adults. *Chest.* 2017. 151(2):374-382.
4. Ding W, Shen Y, Yang J, He X, Zhang M. Diagnosis of pneumothorax by radiography and ultrasonography: a meta-analysis. *Chest.* 2011; 140 (4):859-866.

5. Soni NJ, Schnobrich D, Mathews BK, [et al, including **Kurian LM**]. Point-of-Care Ultrasound for Hospitalists: A Position Statement of the Society of Hospital Medicine. *J. Hosp. Med (accepted for publication 2018)*.
6. Greenstein Y, Littauer R, Narasimhan M, Mayo P, Koenig, S. Effectiveness of a Critical Care Ultrasonography Course. *Chest* 2017; 151(1) 34-40.
7. Benji K. Mathews, MD, FACP, SFHM, Kreegan Reiersen, MD, Khuong Vuong, MD, Ankit Mehta, MBBS, FHM, FACP, Paula Miller, MPH, Seth Koenig, MD, FCCP, Mangala Narasimhan, DO, FCCP, The Design and Evaluation of the Comprehensive Hospitalist Assessment and Mentorship with Portfolios (CHAMP) Ultrasound Program. *J. Hosp. Med* 2018;8;544-550

APPENDICES

Appendix 1: Sample Pre- and Post-training Assessment

Assessments (Pre and Post)					
Faculty Score Sheet - Prompts for Skills Based Assessment					
Faculty ID #:		Learner #:		Date:	
Initial machine set up: Machine is on, linear transducer probe attached, vascular preset, at maximal depth, maximal reduction of total field gain, with image marker on the left of screen.					
Lung/Abdomen set up: Phased array transducer attached (by either instructor or learner), abdomen preset, image marker on the left of the screen.					
Time: 15 minutes					
Verbal Prompt to Learner	Task Demonstration	Done (1 Point)	Not Attempted	Done Incorrectly	Comments
Vascular					
1. "Assess the IJ for venous access"	Pre-scan the lung looking for sliding on both sides				
	Examine/compress IJ				
	Scan both sides of the neck				
4. "Demonstrate a DVT exam of one leg"	Include CFV, GSV, FV, Popliteal				
	Images Optimized in Vascular (Gain, Depth, Correct Transducer, Image Marker in Position)				
Lung					
6. "Locate sliding lung on one side"	Show sliding lung & A-lines				
7. "Demonstrate a screening exam of one lung"	Show longitudinal scan lines in with mid-clavicular line, anterior axillary line, mid-axillary line, posterior axillary				
8. "Locate the hemi-diaphragm on one"	Show hemi-diaphragm				
	Images Optimized in Lung (Gain, Depth, Correct Transducer, Image Marker in Position)				
Abdomen					
10. "Locate one kidney in longitudinal and transverse planes"	Show kidney in both planes				
11. "Locate the hepato-renal"	Show recess				
12. "Locate the"	Show the bladder				

Appendix 2: Sample Learning Objectives for CLI Point-of-Care Ultrasound Course**

A. Lung Ultrasonography (image acquisition and interpretation)

- a. Identification and interpretation of air artifacts suggestive of the normal aeration pattern: A-lines with sliding lung
- b. Identification and interpretation of air artifacts suggestive of alveolar interstitial pattern: number and location of B lines
- c. Identification and interpretation of consolidated lung: identification of tissue density lung, with or without air bronchograms
- d. Identification and interpretation of air artifacts to rule out pneumothorax: presence of sliding lung, presence of B-lines
- e. Knowledge of the limitations of not visualizing lung sliding/B lines
- f. Identification and characterization of findings that rule in pneumothorax: presence of lung point.

B. Pleural Ultrasonography (image acquisition and interpretation)

- a. Identification of pleural effusion: A hypoechoic or echo-free space surrounded by typical anatomic boundaries: diaphragm, chest wall, ribs, visceral pleura, normal/consolidated/atelectatic lung
- b. Identification of characteristic dynamic findings of pleural fluid, such as diaphragmatic motion, floating lung, dynamic fluid motion, respirophasic shape change
- c. Characterization of fluid: anechoic; echogenicity (using liver/spleen as reference); homogeneous or heterogeneous; presence of strands/debris/septations
- d. Identification of miscellaneous findings, such as pleural-based masses or thickening
- e. Recognition of specific limitations of ultrasonography to identify

pleural fluid, such as inadequate image quality due to technical limitations, subcutaneous emphysema, hemothorax, echo-dense purulent fluid, mimics of effusion such as mesothelioma or pleural fibrosis

**Complete learning objectives available on request.

Appendix 3: Image Portfolio Requirements

<ol style="list-style-type: none"> 1. Cardiac Study (10 studies with the following images per study)- Total: 50 images <ol style="list-style-type: none"> a. Parasternal long axis view b. Parasternal short axis view c. Apical four-chamber view d. Subcostal long axis view e. Inferior vena cava longitudinal view 2. Lung/Pleural Study (4 studies with the following images per study)- Total: 12 images <ol style="list-style-type: none"> a. Pleural effusion (any size) b. Sliding Lung c. Consolidation 3. Abdominal Study (4 studies with the following images per study)- Total: 16 Images <ol style="list-style-type: none"> a. Left kidney longitudinal view with splenorenal space b. Right kidney longitudinal view with hepatorenal recess c. Abdominal aorta longitudinal view d. Bladder transverse view 4. Vascular Diagnostic DVT Study (5 studies with the following images per study. Include right and left legs)- Total: 40 images <ol style="list-style-type: none"> a. Right common femoral vein with compression b. Left common femoral vein with compression c. Right common femoral vein at saphenous intake with compression d. Left common femoral vein at saphenous intake with compression e. Right superficial femoral vein with compression f. Left superficial femoral vein with compression g. Right popliteal vein with compression h. Left popliteal vein with compression.

PROJECT TIMELINE

May 2019	Participants to undergo a two-day intensive ultrasound course at Hofstra’s Center of Learning and Innovation. Written Pre-test and Post-test to be given along with a survey to be taken before and after the course.
May 2019 – June 2019	Learners will participate in weekly GEL rounds for the first four weeks after the two-day ultrasound course. The first week will focus on Lung and Pleura ultrasound. The Second week will focus on Cardiac ultrasound. The third week will focus on DVT studies. The fourth week will focus on kidneys, bladder and abdominal aorta.
June 2019- August 2019	Didactic sessions will alternate with GEL rounds to continue to reinforce fundamental knowledge. The first didactic session will be ultrasound of lung and pleura followed by GEL rounds the next week focused on lung and pleura. This will be repeated for heart, DVT and abdominal organs.
September 2019 -May 2020	Learners will participate in weekly rounds alternating between GEL rounds and image interpretation sessions.
June 2019 – May 2020	Participants to create a portfolio of the required images by uploading images to an online secure share drive (Q-PATH).
November 2019	6 Month written test assessing knowledge retention from the initial course.
May 2020	1 year written assessment assessing knowledge retention
May 2020 – November 2020	Once portfolio is complete, to have a summative written and skill based competency assessment.

BUDGET:

The financial support from this grant is intended to expand on existing financial support allocated by the Division of Hospital Medicine towards the development of the Hospitalist Faculty Ultrasound Training Program at LIJMC and NSUH. As part of our academic initiative for 2019, the Division has successfully secured funding for and purchased 4 handheld Lumify ultrasound devices and Qpath, to be added to the existing Sonosite M-turbo cart-based ultrasound solution that was previously granted. All of the devices are currently allocated for use only at LIJMC as the previous funding was acquired through a foundation donation for this project. As our division of over 100 faculty practice across the 2 academic sites of LIJMC and NSUH, the funding from this Academy of Medical Educators Innovation Grant is intended to extend the program to our faculty at North Shore University Hospital.

Item	Cost
Philips Lumify S4-1 Probe – Lease at \$274/month x 18 months (Qty 1)	\$4932
Samsung Tablet (Qty 1)	\$350
Samsung Tablet Cover (Qty 1)	\$50
QPath Image Archiving System	Gratis
Total:	\$5332

DEVICE MANAGEMENT:

The device is to be used by 5-7 hospitalists at NSUH who will be enrolled in the pilot training program. The device will be maintained by the division ultrasound director, to be stored in a locked cabinet, with access granted to hospitalists within the training program. The device will be enabled (following HIPAA compliant standards) through Dr. Kurian's Lumify Project, for which she has a dedicated health system project management team.

BIOGRAPHICAL SKETCH

NAME: **Jared Honigman**

POSITION TITLE: Hospitalist, Assistant Professor of Internal Medicine, Associate Program Director of Northwell NS-LIJ Internal Medicine Residency Program, Director of Point of Care Ultrasound.

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Tufts University Medford, MA	B.A.	05/2008	Biology
New York College of Osteopathic Medicine Old Westbury, NY	D.O/M.S	05/2013	Doctor of Osteopathic Medicine Masters in Musculoskeletal Sciences
North Shore Univeristy Hospital			
Manhasset, NY and Long Island Jewish Hospital New Hyde Park, NY	PGY 1-3	6/2016	Internal Medicine

A. Personal Statement

I am thrilled to be directing the Point of Care Ultrasound (POCUS) curriculum initiative for the Hospitalist Division of Northwell Health. My interest in POCUS stemmed from when I was an intern in the Northwell-Long Island Jewish Intensive Care Unit. We admitted a patient in undifferentiated shock of unknown etiology. The ICU attending performed a whole-body focused POCUS exam in less than three minutes, diagnosing a pulmonary embolus with resulting right ventricular overload and hypotension. At the bedside, he administered tPA and within minutes the patient became hemodynamically stable. This rapid bedside assessment using novel technology expedited care and saved the patient's life. That encounter demonstrated the power of POCUS to improve patient outcomes and sparked my passion for POCUS.

I continued to hone my skills in POCUS throughout my residency, including participating in a pulmonary ultrasound elective in which I performed 10-12 ultrasounds daily. My desire to continue my ultrasound training continued when I became a Hospitalist, when I partook in a two-day intensive POCUS course at our center of learning initiatives (CLI) during my first year. The training and my passion yielded opportunities to teach, as I was invited to instruct the third year Hofstra medical students during their POCUS training session as well as became an instructor for

the national CHEST – sponsored essentials in critical care ultrasound course in September, 2018. My experiences culminated with my appointment as the Director of POCUS for the Division of Hospital Medicine. My POCUS teaching experience and my interests in medical education make me an ideal candidate to lead the Hospitalist POCUS curriculum.

B. Positions and Honors

August 2018-Present: Director of Point of Care Ultrasound, Division of Hospital Medicine
July 2018: Recipient of Hospitalist Teacher of the Year Award 2017-2018
July 2018-Present: Hospitalist, Division of Hospital Medicine, Long Island Jewish Hospital
January 2018-Present: Associate Program Director, Northshore-LIJ Internal Medicine Residency Program
July 2016-July 2018: Hospitalist, Division of Hospital Medicine North Shore University Hospital.

C. Contributions to Science

September 2018: Invited Instructor for National Course – *Ultrasound: Essentials in Critical Care*

D. Additional Information: Research Support and/or Scholastic Performance

1. **Honigman JS**, DiGregorio KM, Dedkov EI, Leheste JR, Leng L, Bucala R, Torres G. Distribution Maps of D-Dopachrome Tautomerase in the Vertebrate Brain. *Neuroscience* 226 (2012). 382-387.
2. Leheste JR, Digregorio K, **Honigman J**, Hallas B, Torres G. Resveratrol therapy for Alzheimer's disease. *Kopf Carrier #72*. Oct 2011.
3. **Honigman JS**, Weinstein J, Katona, K. The Tale of the Regurgitant Liver. *Journal of Hospital Medicine*. 2015; 10 (suppl 2). Presented poster at Society for Hospital Medicine Annual Meeting.

BIOGRAPHICAL SKETCH

NAME

Linda M. Kurian, MD, FACP, FHM

POSITION TITLE

Chief, Division of Hospital Medicine
North Shore University Hospital and
Long Island Jewish Medical Center
Assistant Professor, Department of Medicine
Donald and Barbara Zucker School of Medicine

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
University of Debrecen Medical School Debrecen, Hungary	M.D.	08/2004	Doctor of Medicine
New York Medical College at St. Vincent's and St. John's Hospital	Residency	06/2009	Internal Medicine
GNYHA Clinical Quality Fellowship Program	N/A	04/2015	Clinical Quality

A. Personal Statement

My personal POCUS journey started over 6 years ago when I took over as director of our hospital's Invasive Procedure Team. Realizing then that I had a very expensive ultrasound machine at my disposal (which at the time was primarily used for procedural guidance), I enrolled in the Society of Hospital Medicine's POCUS pre-course to capitalize on my machine's diagnostic potential. From that moment, I was hooked. Under the guidance of some of the giants of critical care ultrasound (Mayo, Narasimhan, and Koenig), I received additional POCUS training, mentorship in ultrasound education, and support in developing my hospitalist division's POCUS program. Through my involvement in the Society of Hospital Medicine's POCUS Executive council, I have also had the opportunity to network within a community of national POCUS enthusiasts who work to advocate for its utility and to further POCUS education nationally.

Fundamentally, my true passion for POCUS stems from its ability to bring the clinician back to the bedside. For many 21st century physicians, the art of the physical exam has declined over time. The advent of POCUS has reinvigorated a return to the patient's bedside through enhanced physical examination and point-of-care diagnosis. I'm honored to serve as faculty both locally and nationally at various POCUS courses and I continue to champion its widespread applicability in comprehensive patient care delivery. My personal academic mission is to spread the power of POCUS to attendings, residents, and students across Northwell Health and beyond. As an educator and division chief, I am committed to filling the void of faculty needed to provide appropriate trainee oversight in POCUS integration at the bedside. My leadership prowess, extensive POCUS educational experience, advocacy of its safe and judicious use, and personal devotion to the POCUS movement will drive the successful development of this project.

B. Positions Held

- 2018 - present Chief, Division of Hospital Medicine
North Shore University Hospital and Long Island Jewish Medical Center
- 2016 - 2018 Associate Chief, Division of Hospital Medicine
North Shore University Hospital, Manhasset, New York and
Long Island Jewish Medical Center, New Hyde Park, New York
- 2012 - 2018 Director, Invasive Procedure Team
Long Island Jewish Medical Center, New Hyde Park, New York
- 2012 - 2015 Co-Director, Division of Hospital Medicine
Long Island Jewish Medical Center, New Hyde Park, New York
- 2010 - 2012 Academic Hospitalist
Long Island Jewish Medical Center, New Hyde Park, New York

C. Honors & Awards

- 2018 Executive Council Member, Society of Hospital Medicine Point-of-Care Ultrasound SIG
- 2015 Fellow, Society of Hospital Medicine
- 2014 Fellow, American College of Physicians

D. Contributions to Medical Education

- 05/2019 Co-Chair, New York Point-of-Care Ultrasound Course (Collaboration with NYU)
- 02/2019 Faculty, Weill Cornell Medicine, HM-POCUS Course
- 02/2019 Co-Director, Northwell Point-of-Care Ultrasound Course (at CLI)
- 11/2018 Faculty, American College of CHEST Physicians, Essentials of Critical Care Ultrasound Course
- 09/2018 Co-Director, Northwell Point-of-Care Ultrasound Course (at CLI)
- 09/2018 Faculty, American College of CHEST Physicians, Essentials of Critical Care Ultrasound Course
- 07/2018 Co-Director, Northwell Point-of-Care Ultrasound Course (at CLI)
- 07/2018 Faculty, Weill Cornell Medicine, HM-POCUS Course
- 03/2018 Faculty, Society of Hospital Medicine, Point-of-Care Ultrasound Pre-Course
- 03/2018 Faculty, American College of CHEST Physicians, Essentials of Critical Care Ultrasound Course
- 11/2017 Faculty, American College of CHEST Physicians, Essentials of Critical Care Ultrasound Course
- 05/2017 Faculty, Zucker School of Medicine, 3rd year POCUS course

E. Selected Scholastic Performance

Soni NJ, Schnobrich D, Mathews BK, [et al, including **Kurian LM**]. Point-of-Care Ultrasound for Hospitalists: A Position Statement of the Society of Hospital Medicine. *J. Hosp. Med* (accepted for publication 2018).

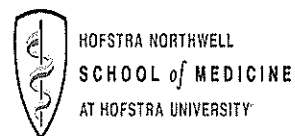
Whitson, M, Idriss N, **Kurian LM**. Setting New Standards: A Novel Approach to Large Volume Paracentesis [abstract]. *Journal of Hospital Medicine*. 2015; 10 (suppl 2). – **Innovation Finalist**

Harris PW, **Kurian LM**, Gong J. Abdominal Wall Hematoma Following Paracentesis: A Case for Dynamic Ultrasound Guidance [abstract]. *Journal of Hospital Medicine* 9 Suppl 2 :442, March 2014

Gong J, Ouchi K, Zeitoun N, **Kurian, LM**, Ahmed SS, Hertz C, et al. The Invasive Procedure Team: Improving Patient Care and Resident Education [abstract]. *Journal of Hospital Medicine* 8 Suppl 1 :630, May 2013

D. Research Support.

None



Division of Hospital Medicine

October 29th, 2018

To Whom It May Concern,

I am very happy to provide this letter in support of Dr. Jared Honigman, who is the primary investigator for a project titled "Implementation of a Sustainable Point of Care Curriculum amongst Northwell Hospitalists and a Path to Competency".

Dr. Honigman has been a Hospitalist within the Division of Hospital Medicine at North Shore University Hospital and Long Island Jewish Hospital for three years. Dr. Honigman is a diligent, hardworking Hospitalist and educator. He has taken to his new role as Director of Point of Care Ultrasound with great enthusiasm and work ethic.

Dr. Honigman has my full support in this endeavor and I am confident he will succeed in this project.

Sincerely,

A handwritten signature in black ink, appearing to read "SLV".

Sean LaVine MD FACP

Associate Chief, Division of Hospital Medicine

Assistant Professor of Medicine

Donald and Barbara Zucker School of Medicine at Hofstra/Northwell

Long Island Jewish Medical Center

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DONALD AND BARBARA
ZUCKER SCHOOL *of* MEDICINE
AT HOFSTRA/NORTHWELL

Department of Medicine

October 29, 2018

To Whom It May Concern,

It is my pleasure to write this letter of support for Dr. Linda Kurian's grant application for the Academy of Medical Educator's Dean's Fund for Innovation in Medical Education. Dr. Kurian has been a passionate advocate and educator for point-of-care ultrasound (POCUS) both locally and beyond. As a proponent of its integrated use at the bedside, she has been instrumental in developing the POCUS program for the academic Division of Hospital Medicine.

Her contributions to furthering POCUS education are evidenced by her commitment to educating learners of all levels - from medical students and residents to hospitalist and critical care attendings. Locally, Dr. Kurian co-directs (with pulmonologist/intensivist Dr. Mangala Narasimhan) the Northwell POCUS Course which is held quarterly at CLI. Participants of the course include practicing physicians, residents, medical students, and advanced care providers. She represents the Hospital Medicine Service line on the Northwell Health System Ultrasound Task force. Regionally and nationally, she is a consistent visiting faculty member at the Weill Cornell Medicine's POCUS course and invited faculty at the American College of CHEST Physician's Essentials in Critical Care Ultrasound course. Dr. Kurian also serves on the Society of Hospital Medicine's Executive Council for POCUS and was a contributing author in the Society's upcoming position statement on the use of POCUS by hospitalists.

I am in full support of Dr. Kurian's project as it aims to innovate care delivery while promoting the educational mission of the Department of Medicine of integrating undergraduate, graduate and continuing medical education.

Sincerely,

A handwritten signature in black ink that reads "Karen A. Friedman".

Karen A. Friedman MD MS-HPPL FACP
Vice Chair for Education
Residency Program Director
Associate Professor of Medicine
Donald and Barbara Zucker SOM at Hofstra/Northwell
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IRB APPROVAL:

This is a project of continuing medical education for the Hospitalists in the Division of Hospital Medicine at Long Island Jewish Medical Center and North Shore University Hospital. We do not plan to seek IRB approval since this is not a research project involving human subjects. Any survey questions will be directed to the educational experience of the Hospitalists. If QI projects arise in the course of this project the Hospitalists will seek IRB for their specific individual projects.