Case Western Reserve University – University Program Medical School

Block 7: Action Plan 2020-2021

Year 1 (July – May)

Becoming A Doctor	2 Weeks Anatomy Bootcamp	**The Human Blueprint**	**Food to Fuel**	**Homeostasis**
Block 1 (5 Weeks)		Block 2 (11 Weeks)	Block 3 (9 Weeks)	Block 4 (14 Weeks)
Population Health, Epidemiology, Biostatistics, Health Disparities		Endocrinology, Reproduction, Development, Genetics, Molecular Biology, Cancer Biology	Gastroenterology, Nutrition, Biochemistry	Cardiovascular, Pulmonary, Renal, Cell Physiology and Pharmacology
Field Experiences Assessment Week		Integrative Week Assessment Week	Assessment Week	Clinical Immersion Week Assessment Week
Structure (GARLA and "Systems and Scholarship") Foundations of Clinical Medicine (Tuesday Seminars, Communications, Physical Diagnosis, Patient Based Experiences)				

Year 2 (August- March)

Summer Break (10 weeks)	**Host Defense & Host Response**	**Cognition, Sensation & Movement**	**Step 1 Study (6-8 weeks)**
	Block 5 (13 Weeks)	Block 6 (14 Weeks)	
	Immunology, Microbiology, Hematology, Oncology, Infectious Diseases, Rheumatology, Dermatology	Neurology, Mind, Musculoskeletal	
	Assessment Week	Integrative Week Assessment Week	
	Structure (GARLA and "Systems and Scholarship") Foundations of Clinical Medicine (Tuesday Seminars, Communications, Physical Diagnosis, Patient Based Experiences)		

1. Course Description:

Block 7, or "Structure", is a longitudinal block that starts in Block 1 and continues through Block 6. The major components of Block 7 and the faculty leader(s) for each include: Gross Anatomy, Radiology and Living Anatomy or GARLA (Dr. Wish-Baratz), Histology/Histopathology or HP (Dr. Ziats). Block 7 integrates basic and clinical concepts of these disciplines and a thorough understanding of each will form the framework for the basic mechanisms that underlie health and disease. *The overall learning objective of this longitudinal block is to develop an understanding of macro-, micro- and ultramicroscopic human structure, nomenclature, imaging techniques, basic physical examination skills related to the topic at hand and the respective functions of normal and diseased organs, tissues and cells and to view these tissues directly and as accomplished in the clinical setting*. It is believed by many that all medical science flows from an instinctive appreciation of physiology and pathophysiology.

However, a sophisticated knowledge of anatomy/radiology, biochemistry, cell biology, and basic genetics are requisite for understanding normal physiology as well as pathophysiology. The knowledge of normal gross and microscopic anatomy, as well as imaging (radiology) of these organs and tissues is necessary for appreciation of the relationships between altered structure and disturbed function. Thus, Block 7 bridges normal and diseased, and begins to prepare students for the transition from classroom to ward. If a student conceptually masters the principles of anatomy/radiology, cell biology, histology, genetics, physiology and pathology (at least), they will have mastered much of the basic science of medicine. This knowledge will be necessary to differentiate the variability (and artifacts) of normal tissues and organs from diseased ones.

GARLA Schedule during the pandemic: In Blocks 2-6, the official class time for GARLA is: 10 – noon for year 1 and 8-10 for year 2 on either Tuesdays OR Thursdays (Figure 1). During the 2020- 2021 academic year attendance was mandatory for Gross Anatomy and Radiology sessions which were presented remotely via Zoom but not for Living Anatomy. Students were directed to view pre-recorded Living Anatomy videos during Blocks 2, 3, 5 and 6 since they could not have hands-on PD and/or ultrasound experiences. Block 4 included in-person Living Anatomy sessions that were held in conjunction with remote instruction via Zoom for HoloAnatomy and Radiology. Due to remote delivery, Block 6 held one GARLA session per week instead of two, with all students in attendance. HoloAnatomy could not be used in Block 6 because students needed to share lenses but could not do so because of quarantine requirements after the winter holidays.

Supplemental materials for all GARLA blocks that include videos and PowerPoint presentations are posted on Canvas. The GARLA schedule varies slightly throughout the year, and it is necessary that students consult the weekly schedule on Canvas to know their schedule.

	Monday	Tuesday	Wednesday	Thursday	Friday
8-9		Structure M2s Or FCM M1s		Structure M2s	
9-10					
10-11		Structure M1s Or FCM M2s		Structure M1s	
11-12					

Figure 1
Block 7 within the WR2 Curriculum

Boot Camp

Prior to Block 2, a Dissection Boot Camp sets the stage for GARLA. This two-week intensive course takes place on Monday – Thursday either in the morning OR in the afternoon. Due to the COVID-19 pandemic, 2020 Boot Camp framing lectures were pre-recorded, and students arrived to the labs at staggered times in full PPE (masks, goggles, gowns, gloves, and scrubs). On the first Friday of the Boot Camp, there was a formative practical assessment in the morning and on the final Friday there was a summative practical exam in the morning and the donor memorial service in the afternoon. Figure 2 shows the Boot Camp schedule during the COVID pandemic. As previously mentioned, students entered the lab at staggered times wearing full ppe.

The 2020 memorial service took was prerecorded by CWRU MediaVision. Reverend Richard Israel officiated, and second year students performed. Students and families participated via zoom and break-out rooms were set up for students to meet families who wished to interact with them.

Group A (92)	8-8:50am	Staggered entry into lab	Staggered entry into lab	Staggered entry into lab	Staggered entry into lab	Formative Practical (Group 1 + 2)	Staggered entry into lab	Staggered entry into lab	Staggered entry into lab	Staggered entry into lab	Cumulative Summative Practical (Group 1 + 2)
	9-10:50am	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)		Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	
	11-11:50am	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit		Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	
		Lunch									
Group B (92)	1-1:50pm	Staggered entry into lab	Staggered entry into lab	Staggered entry into lab	Staggered entry into lab		Staggered entry into lab	Staggered entry into lab	Staggered entry into lab	Staggered entry into lab	
	2-3:50pm	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Lab (E329/30)		Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Labs (EG20/24 & E329/30)	Required Remote Memorial Service
	4-4:50pm	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit		Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	Peer Teaching Staggered Exit	

Figure 2
Boot Camp Schedule with COVID-19 Restrictions (Class of 2024)

2. **Block Co-Leaders:**
   Nicholas Ziats, Susanne Wish-Baratz

3. **Design Team:**
   Nicholas Ziats, Susanne Wish-Baratz, Anastasia Rowland Seymour (consultant), Lisa Navracruz (consultant), Navid Faraji, Robert Jones, Greg Nemunaitis, Scott Simpson, Darin Croft, Andrew Crofton, Jay Costantini, Patti Quallich, Nivo Hanson, Michele Mumaw, Colleen Croniger (The design team has not met due to COVID curricular limitations and the fluid nature of the schedule. Instead, faculty involved in the teaching during a given block have been involved in block design, curricular planning and adjustments.)

4. **Block Goals:**

Competency and Definition	Educational Program Objective (EPO)	Block Goals Block 7	Recommended Changes
Knowledge for Practice Demonstrates knowledge of established and evolving biomedical, clinical, epidemiological and social-behavioral sciences as well as the application of this knowledge to patient care	Demonstrates ability to apply knowledge base to clinical and research questions Demonstrates appropriate level of clinical and basic science knowledge to be an effective starting resident physician	Develop a three-dimensional understanding of the structure of the human body. Apply this knowledge during their clinical clerkships and, ultimately, in the practice of medicine. Understand the role of various radiological imaging modalities in the diagnosis and treatment follow-up of diseases. Develop a foundation for interpretation of radiological images.	None when in-person. During Block 4 a hybrid format was initiated to enable students in the Class of 2024 to have hands-on ultrasound experience with Dr. Jones and his team.
Knowledge for Practice Demonstrates knowledge of established and evolving biomedical, clinical,	Demonstrates ability to apply knowledge base to clinical and research questions	Integrate the anatomy, imaging anatomy, pathophysiology, and pharmacologic treatment of the respiratory system with general homeostasis.	No change recommended

epidemiological, and social-behavioral sciences as well as the application of this knowledge to patient care	Demonstrates appropriate level of clinical and basic science knowledge to be an effective starting resident physician		
Common to all Blocks:			
Teamwork & Interprofessional Collaboration Demonstrates knowledge and skills to promote effective teamwork and collaboration with health care professionals across a variety of settings	Performs effectively as a member of a team	Develop and practice the knowledge and skills that promote effective teamwork across a variety of settings.	No change recommended
Professionalism Demonstrates commitment to high standards of ethical, respectful, compassionate, reliable, and responsible behaviors in all settings, and recognizes and addresses lapses in behavior	Commonly demonstrates compassion, respect, honesty, and ethical practices Meets obligations in a reliable and timely manner Recognizes and addresses lapses in behavior	Understand and practice the behaviors of an ethical, respectful, compassionate, reliable, and responsible physician.	No change recommended
Interpersonal & Communication Skills Demonstrates effective listening, written and oral communication skills with patients, peers, faculty and other health care professionals in the classroom, research,	Uses effective written and oral communication in clinical, research, and classroom settings Demonstrates effective communication with patients using a patient-centered	Understand and demonstrate effective communication skills for learning and clinical practice environments.	No change recommended

and patient care settings	approach Effectively communicates knowledge as well as uncertainties		
Research & Scholarship Demonstrates knowledge and skills required to interpret, critically evaluate, and conduct research	Analyses and effectively critiques a broad range of research papers Demonstrates ability to generate a research hypothesis and formulate questions to test the hypothesis Demonstrates ability to initiate, complete and explain his/her research	Analyze, critique and present research studies from the primary literature.	No change recommended

5. **In the grid below, please list the specific course changes you made this year based on last year's report**.

What changes were made 2020-2021?	How did the changes work?	How will you follow-up on these changes next year 2020-2021?
COVID-19 changes were made in order to run the Boot Camp. These changes included staggered and alternative entrances to buildings, social and physical distancing, sanitizing hands and surfaces, donning masks at all times and personal protective equipment.	The changes worked well, no students, staff or faculty contracted COVID-19	We will continue to comply with the university's guidelines and adapt as needed.
Boot Camp required prerecorded lectures. The memorial service was pre-recorded due to the COVID-19 pandemic (please see above).	See Figure 3	Boot Camp lectures were in-person (Boot Camp AY21-22 already happened) and staggered entry times were discontinued. Memorial service was in-person and recorded for families who could not attend.
GARLA was remote in all blocks but Blocks 1,2, 4, 5 and 6 maintained roughly the same schedules they had in the past. The Block 3 GARLA schedule was altered substantially due to COVID restrictions and HoloLens partnering. Instead of spreading GARLA out between November and February, Block 3 GARLA was entirely concentrated in the month of January. Half of the class had GARLA during the first 2 weeks of January and the other half of the class began B3 in mid-January. The exam followed immediately.	This did not work well at all. We could not provide the students with enough study time during Block 3 in AY2020-2021 due to the pandemic. The schedule changes made Block 3 too condensed and stressful for both the students and the faculty.	Block 3 will return to its former schedule extending between November and February. We are also committed to providing all students at least two weeks between the last GARLA session and their exams. This enables ample study time and access to the shared HoloLenses.
Radiology: Dr. Navid Faraji (radiology UH) replaced Dr. Karin Herrmann during Ay 20-21.	This worked well given the constraints and will provide an excellent foundation for the material to be covered in radiology sessions in AY	Drs Faraji and Costantini will continue to be involved in GARLA in AY 2020-21.

Radiology in B6 was delivered by a new GARLA team member, Dr. Jay Costantini (Radiology CCF). The radiologists delivered a live PowerPoint-based lecture for each session.	2020-21.	
Living Anatomy: In Blocks 2 and 3 Living Anatomy was taught using pre-recorded videos. In Block 4, students were brought in for in-person Living Anatomy sessions.	During Block 4, students had minimal hands-on experience but considering most of the curriculum was remote we felt fortunate to have the few B4 sessions that we did. According to Dr. Jones: "I think for what we were dealing with last year with COVID and all of the facility restrictions this worked out well. However, I would not want to implement that in non-COVID times. It was difficult getting faculty for those sessions (16 stations) and overseeing all of the rooms. Not having standardized patients meant that we were not able to do the cardiac scanning sessions and I feel that was a huge negative. This is where GARLA ultrasound can shine in Block 4."	All GARLA Living Anatomy is scheduled to be hands-on during AY21-22.
Living Anatomy in Block 5 replaced MSK week. Greg Nemunaitis (PM&R CCF) made a huge investment and created outstanding Living Anatomy PowerPoint videos for each Block 5 topic. Viewing of these videos was required.	The videos were outstanding and a perfect substitute during the pandemic, but they cannot replace the hands-on opportunity provided by GARLA.	Dr. Nemunaitis is teaching in-person during AY 2021-22.
Living Anatomy in Block 6 recruited clinicians from different specialties (otolaryngology, plastic surgery, ophthalmology).	These would have been better as interactive sessions, but they worked well under the circumstances, especially considering that these were	Nearly all the same faculty will be used for the Living Anatomy component of GARLA in AY 2021-22, as well as the neurology

The physician instructors provided recorded lectures focusing on physical diagnosis and clinical aspects of anatomy. For one Living Anatomy session, the UH neuropsychology fellow recorded a video in which he described the anatomical structures tested in each part of a typical neuropsychiatric evaluation.	new sessions and each one was conducted by a faculty member new to WR2/GARLA (an approach necessary because head/neck anatomy provides almost no opportunities for using ultrasound).	residents, so despite the challenges posed by AY 2020-21, it served as a good "test run" for these participants and their content. Students seemed to enjoy the sessions.
Block 6 lectures were recorded as narrated PowerPoint presentations with lecture note annotations that could be viewed by students prior to GARLA sessions.	This worked well	Resources will be posted on Canvas and available to students in the future
Block 6 added one GARLA session after the B6 structure exam, (which takes place in the middle of the block). This session covers/reviews structures relevant to the Psychiatry portion of Block 6.	We hope that this session was helpful for students.	We plan to continue giving this session in AY2021-22.
Block 6 HoloAnatomy could not be used due to quarantining restrictions associated with student travel and incomplete neuroanatomy content. Class time in B6 was divided between gross anatomy and radiology. In gross anatomy sessions, Dr. Croft or Crofton used Complete Anatomy software to review the relevant anatomy and associated significance with students.	This worked reasonably well as a substitute for HoloAnatomy, as the sessions could be free-form and interactive.	In AY21-22 GARLA will be implemented with HoloAnatomy, HoloNeuroAnatomy, Radiology and Living Anatomy.

What changes were made 2020-2021?	How did the changes work?	How will you follow-up on these changes next year 2020-2021?
HoloLens administration was transferred from the Interactive Commons to UTech.	UTech has done an outstanding job!	UTech will continue learning and improving and we will continue feeling grateful for such an outstanding team.
HoloBuddy System Created	Enough HoloLenses were purchased for pairs of students to share HoloLenses. This worked well until after Thanksgiving when some students were required to quarantine (preventing them from sharing lenses).	As long as students do not have to quarantine, there are enough HoloLenses for pairs of M1s and M2s to have HoloLenses simultaneously.
Students learned to: 1. use HoloLens 2 and 2. sanitize their lenses prior to and after exchanging.	There were no complaints about this.	Students sanitize lenses after doffing so that their partners receive a "clean" lens.
In Block 6, Complete Anatomy (a 2D anatomy resource) was used to teach.	This worked reasonably since HoloAnatomy, a 3D software program, was unavailable.	HoloAnatomy and HoloNeuroAnatomy 1.0 are complete and will be used in AY21-22. Complete Anatomy will remain a resource for the students who wish to use it.

6. **What changes do you anticipate making to the Block next year (AY 2021-2022)?**
   - All sessions (Boot Camp) and Blocks 1-6 in-person
   - Block 6 will have GARLA format for first time

7. **What successful, innovative components of your block are best practices that you would like to share with the other Blocks?**

We just completed creating HoloNeuroAnatomy. It is in the process of being "optimized" by programmers at the Interactive Commons. It should be ready to be loaded onto the HoloLenses by UTech on October 15.

8. **What specific changes (lectures, TBL, IQ cases, other) do you plan to make to the course next year?**

Changes anticipated for next year	Reason for changes (evidence)
All GARLA will be presented using HoloAnatomy and HoloNeuroAnatomy. Block 6 will transition to GARLA.	There will be (are) enough lenses for entire first and second-year classes
In-person GARLA to enable in-person PD and ultrasound	With the exception of a few sessions in Block 4, there were no hands-on ultrasound sessions COVID-19 pandemic.

9. **Please review your Block objectives. Have you added or deleted major concept areas to your Block?**
    - Most of the adjustments in GARLA during AY20-21 were due to the COVID-19 pandemic.
        - Ultrasound and living anatomy were primarily taught via video recordings. Remote presentation limits our capacity to apply these anatomical concepts. In AY21-22 GARLA will be in-person.

10. **Did formative and summative assessment in the Block support achievement of block objectives?**
    Yes

11. **What specific changes do you plan to make to the course next year?**

Changes anticipated for next year	Reason for changes (evidence)
Block 1-6 in-person	End of pandemic restrictions
Boot Camp	In-person framing lectures; end staggered entry/exit procedures; hybrid memorial service (both recorded and in-person).

12. **Describe how faculty teaching quality was reviewed for your block. What faculty development opportunity was offered in response to student feedback?**

    Faculty teaching quality was assessed via student feedback at the end of each block. Students appreciate small group teaching for Living Anatomy and Radiology. Students

prefer having their own HoloLenses but managed well with the "HoloBuddy" sharing system. Students appreciate access to teaching assistants during Boot Camp.

13. Response to PEAC Report

No new recommendations from PEAC were received.

14. Scholarly Accomplishments

Thom, M.L., Kimble, B.A., Qua, K., Wish-Baratz, S. "Is remote near-peer anatomy teaching an effective teaching strategy? Lessons learned from the transition to online learning during the COVID-19 pandemic." Anatomical Sciences Education 2021; 00:1-10 DOI:10.1002/ASE2122.

Baratz, G., Sridharan, P.S., Yong, V., Tatsuoka, C., Griswold, M.A., Wish-Baratz, S. Comparing Learning Retention in Medical Students using Mixed Reality to Supplement Cadaveric Dissection. Submitted for publication IJME August 2021.

15. Acknowledgements:

We could not have realized this curriculum without the devotion of the GARLA design team and anatomy faculty/staff including Darin Croft, Scott Simpson, Andy Crofton, Bryan Singelyn, Rebecca Enterline, Bob Jones, Anastasia Rowland-Seymour, and Lisa Navracruz, Navid Faraji, Greg Nemunaitis, Jay Costantini, and Karin Herrmann.

We thank Patti Quallich for all her efforts and patients to make Block 7 a success. We also thank Nivo Hanson and Eva Orszag for their assistance in Block 7. Special thanks to Minoo Darvish who worked to figure out the scheduling for this extremely complex curriculum.

Many thanks to Michele Mumaw and Kathy Dilliplane have been invaluable in their support and assistance during the exam process. We also thank Klara Papp, Bryan Singelyn, Rebecca Enterline, and the anatomy teaching assistants for the enormous effort they put forth during the many exam procedures (i.e., set-up, administration, and grading).

We would like to thank all members of the curricular affairs team for their help with GARLA during AY2020-2021. This was NOT an easy year.

We are grateful for the help of all members of UTech and particularly Victor Guinto, Megan Slabach and Paul Salzgeber.

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We thank Sara Lee, the Executive Director of the University Health and Counseling Services, for her support and for the efficient manner in which she evaluated our many proposals and guided us to ensure that our students were safe during the COVID-19 pandemic.

Percentage of Students who rated "Very Good" or "Excellent"

Block 7: Longitudinal Themes				
Block 1				
Longitudinal Themes Components	2017-18* %	2018-19 %	2019-20 %	**2020-21 %**
GARLA	--	--	78	**55**
Histopathology	85	70	91	**70**
Bioethics	83	76	81	**71**
Block 2				
GARLA	--	--	58	**56**
Histopathology	81	45	65	**66**
Bioethics	57	52	65	**52**
Block 3				
GARLA	--	--	54	**44**
Histopathology	100	80	80	**85**
Bioethics	51	52	61	**37**
Block 4				
GARLA	--	--	55	**59**
Histopathology	83	81	76	**64**
Block 5				
GARLA	--	--	51	**47**
Histopathology	75	67	73	**75**
Bioethics	42	18	22	**43**
Block 6				
GARLA	--	--	52	**62**
Histopathology	67	71	74	**57**
Bioethics	68	67	62	**67**

* In AY2017-18, the rating scale is "Good or Excellent".