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# Virtual, Non-Clinical “Bootcamp” to prepare for the NBME Subject Matter (Shelf) Exam during the Pediatric Clerkship

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## Background

Medical education changed due to the COVID-19 pandemic. Educational sessions were offered virtually. There are published education innovations for pre-clinical curricula. However, providing virtual education during the clinical clerkship was a daunting challenge. In addition to the delay in patient care exposure, students’ performance in the NBME Subject Matter (Shelf) Exam scores have declined during the pandemic . VCU School of Medicine also needed to provide continued instructions virtually to students whose clinical clerkships were delayed.

## Description of the Innovation

Due to the COVID-19 pandemic, the clinical start for the class of 2022 was delayed by 3 months. During the 3-month time, various non-clinical (virtual) educational curricula were offered. For the Pediatrics clerkship, we designed and implemented a two-week, virtual “bootcamp” for students to prepare for the NBME Subject Matter (Shelf) Exam. We offered didactic sessions (two 1-hour sessions per day), M4 Teaching Assistant (TA) study sessions (1-hour session per day), virtual office hours for students to connect with the M4 TAs and the clerkship director to ask questions, and self-study time. At the end of the two-week curriculum, students were given the option to take the exam at the end of the two weeks or take the exam at the end of the clinical clerkship.

## Results

We examined the Shelf Exam performance for the Class of 2021 (pre-COVID), Class of 2022 and 2023 (COVID affected) who were offered the two-week virtual, non-clinical bootcamp, and the class of 2024 (post-COVID). For the classes of 2021 and 2024, students had weekly didactic sessions (one half-day per week) and self-study time. All students were required to take the Shelf exam at the end of the clinical block. We specifically looked at the total number and percentage of students achieving an exemplary mark (indicated by Shelf exam score  $\geq 80\%$ ). For the classes of 2022 and 2023 (COVID affected), we looked at the number of students achieving the exemplary mark who took the exam at the end of the two-week curriculum. Our hypothesis was that COVID-affected students would perform less well than their pre-COVID or post-COVID counterparts due to the fact that these students were preparing for the exam without the benefit of clinical education. For the class of 2024, the Shelf exam grades for the first 5 blocks (out of 7) are available for analysis. The percentage of students who achieved an exemplary designation was similar in all 4 years (class of 2021=56%, class of 2022=56%, class of 2023=64%, and class of 2024=46%). The mean Shelf exam scores from exemplary designations were also not statistically significant (class of 2021=84.57, class of 2022=85.11,  $p=0.324$ , class of 2023=85.23,  $p=0.224$ , and class of 2024=84.81,  $p=0.654$ ).

	Class of 2021 (pre-COVID)	%	Class of 2022 End of curriculum	%	Class of 2022 End of clerkship	%	Class of 2022 Total	%	Class of 2023 End of curriculum	%	Class of 2023 End of clerkship	%	Class of 2023 Total	%	Class of 2024 (post-COVID) *	%
Total Exemplary ( $\geq 80\%$ )	95	56	70	56	19	34	89	49	70	64	26	31	96	49	56	46
Total Competent (60-79%)	73	43	52	42	36	64	88	49	39	35	57	68	96	49	65	53
Total Fail (<60%)	1	0.6	2	1	1	2	3	2	1	0.9	1	1	2	1	1	0.8
Grand Total	169		124		56		180		110		84		194		122	

**Table 1:** Data from classes of 2021 (pre-COVID cohort), class of 2022 and class of 2023 (COVID affected cohort), and class of 2024 (post-COVID cohort)  
\*Class of 2024 data: Block 5 of 7 completed

	Class of 2021 Exemplary	Class of 2022 Exemplary End of Curriculum	Class of 2023 Exemplary End of Curriculum	Class of 2024 Exemplary
Total N	95	70	70	56
Mean score	84.57	85.11	85.23	84.81
Varianc e	11.3	12.4	14.1	14.2
P		0.324	0.224	0.654

**Table 2:** Mean Shelf exam scores

Date	June 1	June 2	June 3	June 4	June 5	June 6	June 7
AM	Self-study	Self-study	Self-study	Self-study	Self-study	Self-study	Self-study
8am-10am							
9am-10am							
10am-11am							
11am-noon							
PM						Self-study	Self-study
1pm-2pm	Lecture 1	Neurology	Rheumatology	GI	Lecture 9	Office hour	Office hour
2pm-3pm	Outpt illness	Nephrology	Development	Lecture 8	Newborn	Office hour	Office hour
3pm-4pm	Review 1	Review 2	Review 3	Review 4	Check-in	Office hour	Office hour
Date	June 8	June 9	June 10	June 11	June 12	June 13	June 14
AM	Self-study	Self-study	Self-study	Self-study	Shelf Exam		
8am-9am							
9am-10am							
10am-11am							
11am-noon				TA office hour			
PM				Self-study	Shelf Exam		
1pm-2pm	Cardiology	Lecture 13	Genetics	TA office hour			
2pm-3pm	Lecture 12	Lecture 14	Gen Pediatrics	TA office hour			
3pm-4pm	Review 5	Review 6	Review 7	Last meeting			

## Conclusion

We were able to successfully develop and implement a two-week, virtual, non-clinical curriculum that prepared the students for the NBME Subject Matter Exam. When compared to the pre-COVID student cohort, there was no difference in the percentage of students who achieved an exemplary mark as well as the mean exam score. In fact, we were able to demonstrate this from two class cohorts (classes of 2022 and 2023). From our experience, we can surmise that the Shelf exam performance does not depend on clinical experience. This is in contrast to previous studies which positively correlated clinical performance to standardized test scores. Students who took the Shelf exam prior to starting the clinical clerkship were less stressed about studying for an exam and concentrated more on patient care. This approach to clinical education may be worth duplicating in other clerkships and in future years.

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