Introduction: Over the past several decades, medical schools across the globe have transitioned from traditional medical school curricula to curricula that emphasize active-learning through problem-based learning and flipped classroom models. In the past, PowerPoint presentations were used in the University of Colorado School of Medicine anatomy block to present the cardiovascular and lymphatic systems. With the curriculum reform starting for the class of 2025, the former "circulatory tools" no longer align with course objectives, thus fostering the need for new, active learning pre-lab assignments to be completed on an individial basis prior to its presentation in gross anatomy education. Current research supports the use of pre-lecture assignments for improving student learning outcomes, long-term retention, student confidence, and promotes self-regulated behaviors (Dunlosky et. al., 2003).

This project aims to implement interactive pre-work modules that align with the Trek Curriculum (TC) and assess the efficacy of the pre-assigned material qualitatively, via medical student perception and satisfaction with the learning modules, and quantitatively by evaluating student exam learning outcomes.

Methods: H5P, an online platform used to create, share, and reuse HTML5 content was used to create weekly, interactive learning modules aligning with the University of Colorado School of Medicine's TC learning objectives.

Each week, learning objectives (LOs) were placed into four categories: nervous system, cardiovascular system, regional anatomy, and other. Modules for each category was delivered with clear objectives that aligned with course content, integrated active recall and spaced repetition, and was graded for completion. Additionally, a variety of H5P content types were utilized including interactive videos, branching scenarios, and interactive books with "accordion" books, layered "agamatto" images, image hotspots, fill in the blank, drag and drop, multiple choice, and mini quizzes.

To assess student perception, open-text responses from weekly surveys were collected and categorized to create a qualitative thematic analysis. Feedback was de-identified, evaluated, and utilized to edit and improve pre-work modules with the goal of continuously creating a user-friendly, engaging experience for medical students.

To assess student learning outcomes, analytics were continuously captured through H5P and analyzed for student performance. While students were only graded for completion, a cut-off score on the end-of-assignment quiz of 60% was used as the benchmark for appropriate module interaction for analytical purposes.

Results:
Open-text feedback submitted in weekly and end-of-course surveys fell into three general themes: user experience, content structure and relevance, time management, and learning preferences. Overall, students shared that the prework successfully introduces the

material prior to lecture and enhances their comprehension of basic cardiovascular, nervous, and regional anatomy topics; however, there were concerns about the relevance of prework to the week's material and appropriate time management to complete the pre-work. Students favored tools that were simple to understand and engage with, had explicit instructions, were visually appealing, and promoted active learning. Modules that seemed repetitive, had more complex instructions, and required lower levels of engagement were viewed less favorably.

From a quantitative perspective, it was found that student interaction with pre-assigned learning appears to decrease with curriculum progression. Throughout the curricular year as students progressed through each of the anatomical systems, the number of students obtaining >60% on the end of assignment quizzes began to noticeably decrease with each system. Plotting this data on a linear curve reveals a moderate negative correlation (R=0.79) between progression through the curriculum and students obtaining >60%.

Discussion: Literature review, H5P analytics, and student feedback suggest that introducing complex concepts in medicine through interactive learning modules is an effective way to increase student engagement and perceived comprehension of these concepts. As H5P modules are self-paced and self-directed, it is not possible to prevent students from either clicking through the modules without any engagement or spending additional time with the material. In addition, utilizing optional, free-text responses from students does not offer an adequate assessment of all students' perceptions.
Future research should analyze performance on prework modules in comparison to exam scores testing the same learning objectives and assess the effectiveness of individual H5P content types in conveying complex anatomy concepts.

From a quantitative standpoint, student interaction with pre-assigned learning appears to decrease with curriculum progression with a moderate negative correlation suggesting that as the students progress through the curriculum, they began to "click through" the module more frequently. There are many factors that may contribute to this finding including increasing student workload with intra-curricular and extracurricular activities, increasing burnout, decreased perceived usefulness of the modules, and thus decreased module interaction, or increased cognitive load.