

Student-created videos can enhance peer understanding of renal physiology concepts

Clarifying Renal Clearance: An educational approach using visualisation of virtual volumes via student developed video resources

👤 **Kirsten Bradshaw & Derek Scott**

INTRODUCTION

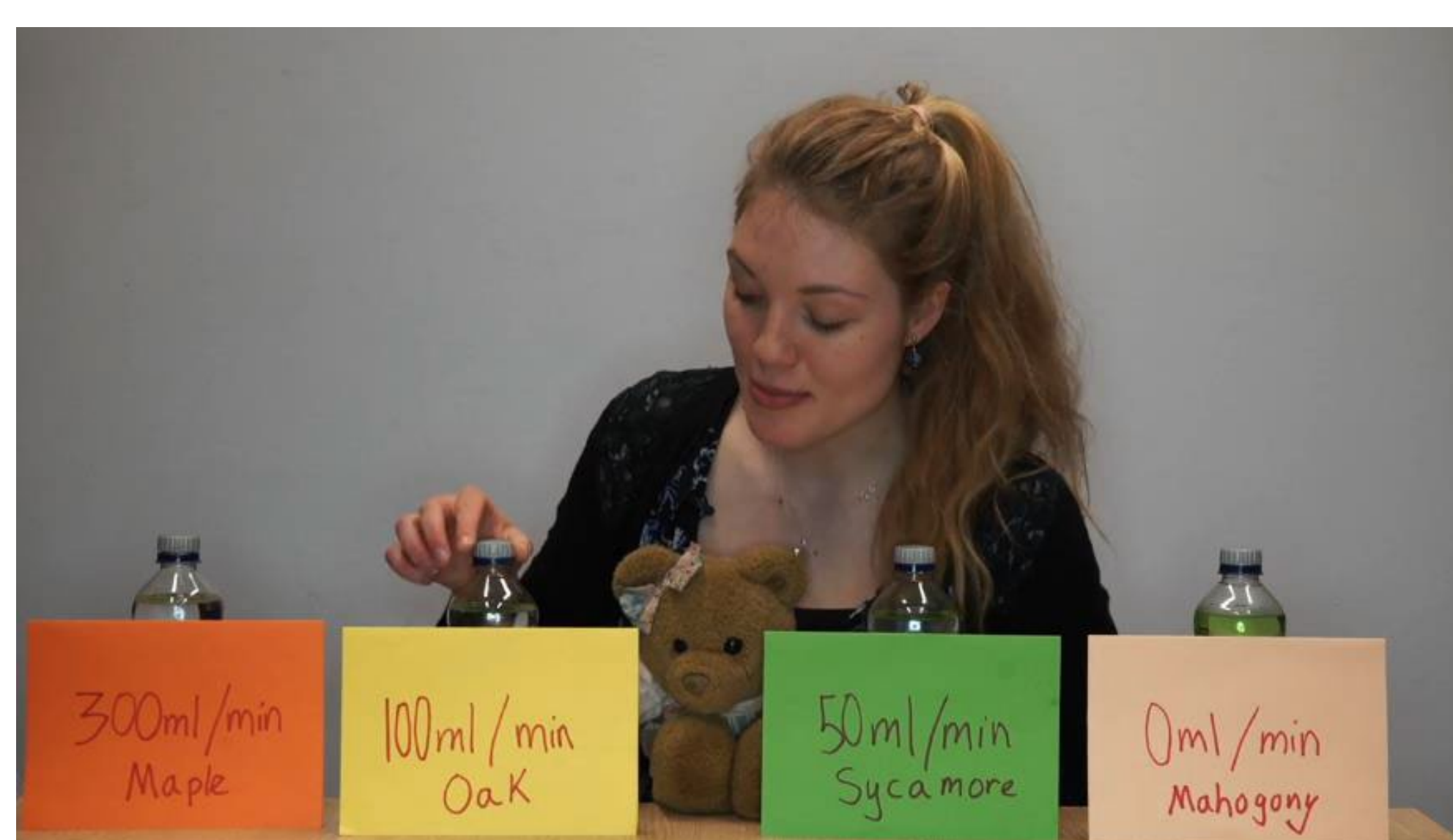
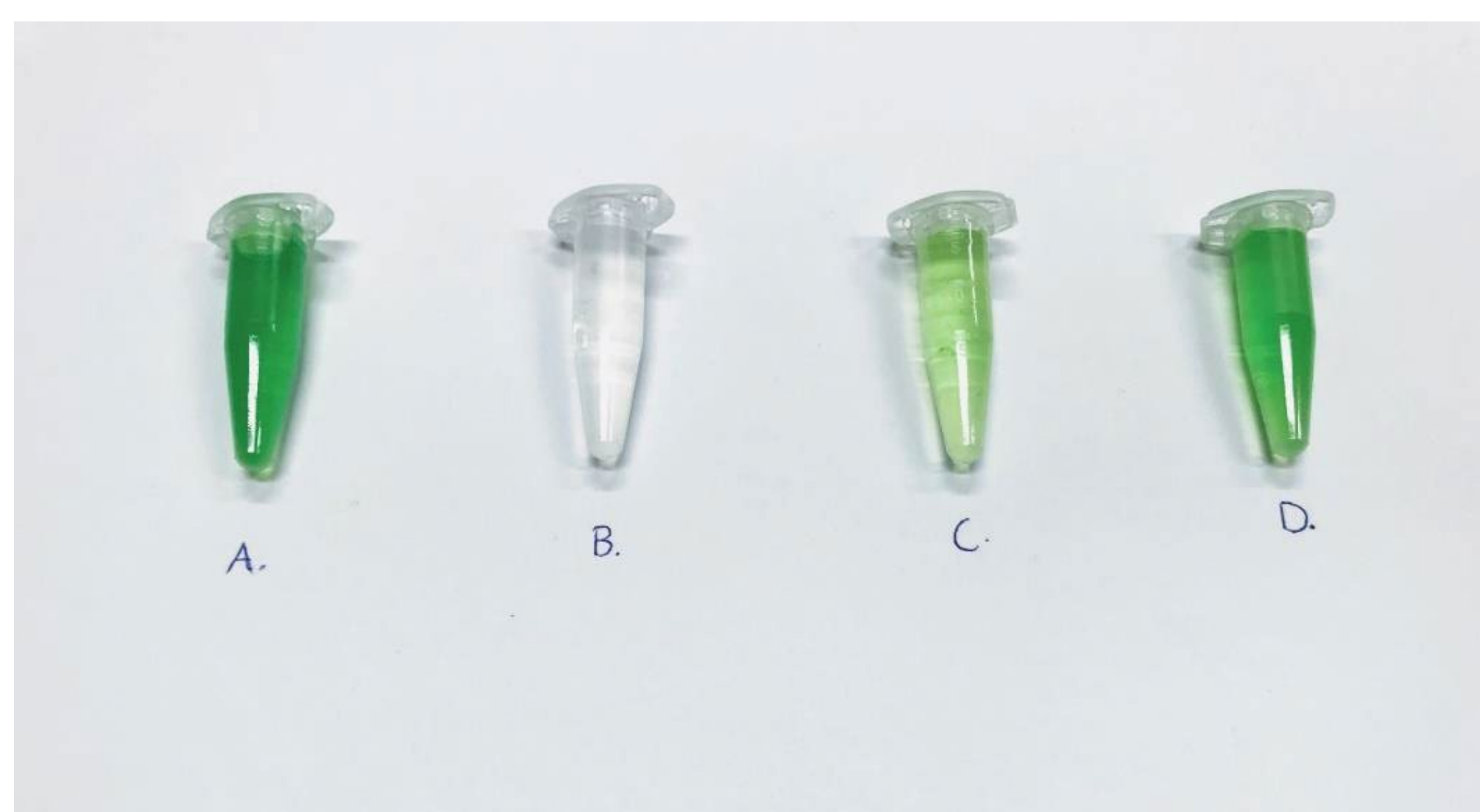
- There are many aspects of physiology which seem harder to teach and learn than others. One such aspect is renal clearance.
- Whether this is due to its perceived complexity or whether it is genuinely a more complicated topic to navigate, it appears to be difficult to for some students to conceptualise.
- Guevara & Milanick (2017) published their approach to visualising virtual volumes using simple and cheap resources.
- This project aimed to replicate their approach, but to deliver the material via student-created videos that students could access via their virtual learning environment (VLE) at any time.

METHODS

1. Inexpensive resources such as bottles, red sweets, clear mineral oil and coloured water were obtained as summarised by Guevara & Milanick (2017).
2. Different volumes of coloured fluid were used to represent change in concentrations before and after renal clearance had occurred to aid understanding of virtual volumes.
3. Instructional videos were developed by an undergraduate science student using basic camera and editing resources and placed on the VLE of a 2nd year organ system physiology course (n = 173).
4. A voluntary quiz was made available to students before and after the video resources were released to determine if the teaching had benefitted the students (65 answered).
5. The second quiz had additional renal questions, plus some optional questions about the video resources on the VLE (59 answered). The correct answers were only provided to the students in a feedback session after Quiz 2 had closed.



Students had to match the 'blood plasma' bottles with the matching 'urine sample' tubes. The green food dye represented a drug that had to be cleared by the kidneys.



Five videos were created. These covered topics such as filtration, reabsorption, secretion, medication monitoring, norms for different populations, and effects of multiple medications.

RESULTS

- Students rated Quiz 2 as being easier than Quiz 1 (8.5 ± 1.6 vs 7.9 ± 1.9 , $P = 0.0015$, Mann-Whitney test).
- Substantial increases in the number of students answering questions correctly in Quiz 2, with some questions that had previously been answered incorrectly ~80% of the time changing to 100% correct.
- Feedback indicated that videos were valued by students with special learning requirements or those for whom English was not their first language.

86%

of students preferred having renal quizzes online

8.5/10

Rating for helpfulness of video resources

9.6/10

Rating for audio-visual quality of video resources

9.2/10

Rating for ease of viewing via the VLE

DISCUSSION

- This project shows that relatively simple video resources developed in partnership with students can prove useful in enhancing students' understanding of renal physiology concepts and in helping them improve their knowledge and understanding.
- Given the positive response to the video resources this year, we intend to keep these resources permanently on the VLE so that future cohorts of students can use them to enhance their studies.
- We hope to adapt this idea to other areas of the curriculum so that we can cater for a wider range of learning needs.

