A diagnostic labyrinth: a gastrointestinal pathophysiology learning module

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Rationale

Students in large enrolment pathophysiology classes are generally presented with the name of the disease prior to its effects on the human body. In contrast, medical care professionals are presented with the signs and symptoms first.

Developing an online learning tool will help students critically assess different clinical situations and allow them to use their knowledge gained from the fourth year pathophysiology course (PHS4300) to draw conclusions and make diagnoses.

An interactive case study, where signs and symptoms are provided first, will challenge students' problem solving, diagnosis and procedural training skills.

Methods

Four common gastrointestinal disorders were thoroughly researched: gastric reflux, gastric ulcer, chronic gastritis and gastric cancer.

Microsoft PowerPoint was used to develop multiple-choice-style exercises for each of the four diseases. The hyperlink function was used to link the various branch points of each disorder (figure 1).

Once all the branch points were created in PowerPoint, each step of the learning module was transferred to Quandary (Arneil & Holmes, 2009). Quandary is a maze-building software that is used to create online formative exams. It supports feedback-supported multiple choice questions (Carnegie et al, 2012). A free download is available at: http://www.halfbakedsoftware.com/quandary.php

Results

A gastrointestinal pathophysiology learning module was developed using Quandary. The exercise begins with a case study, describing signs and symptoms common to all four diseases. Once the student has selected a pathway pertaining to one disease based on symptoms, they proceed to identify the most relevant diagnostic tests, risk factors, optimal treatment and consequences of the associated condition.

Students collect points for each correct answer. In some cases, there is more than one correct answer. Feedback is provided for both correct and incorrect options, which allows the student to better understand their selection. Once the student has reached the end of the exercise, they may go back to the beginning and select another diagnostic pathway.

Figure 1. Diagnostic branch pathway using PowerPoint

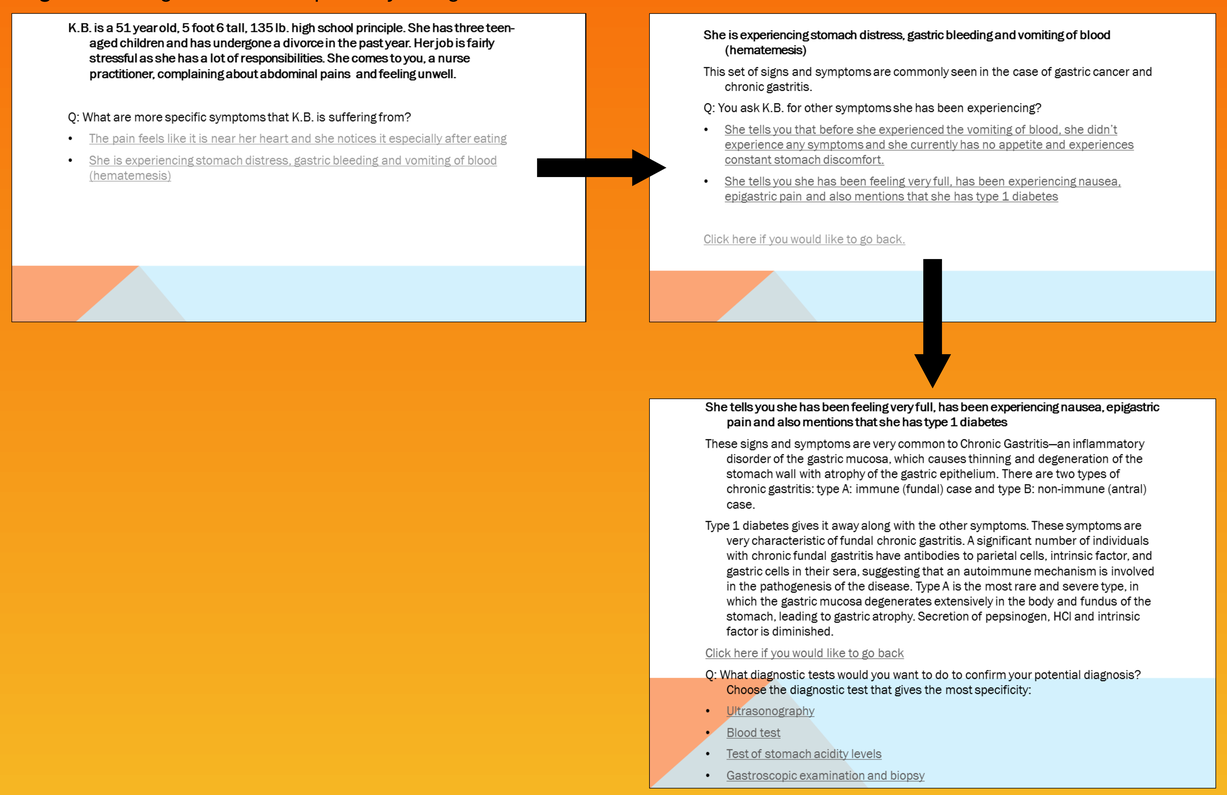
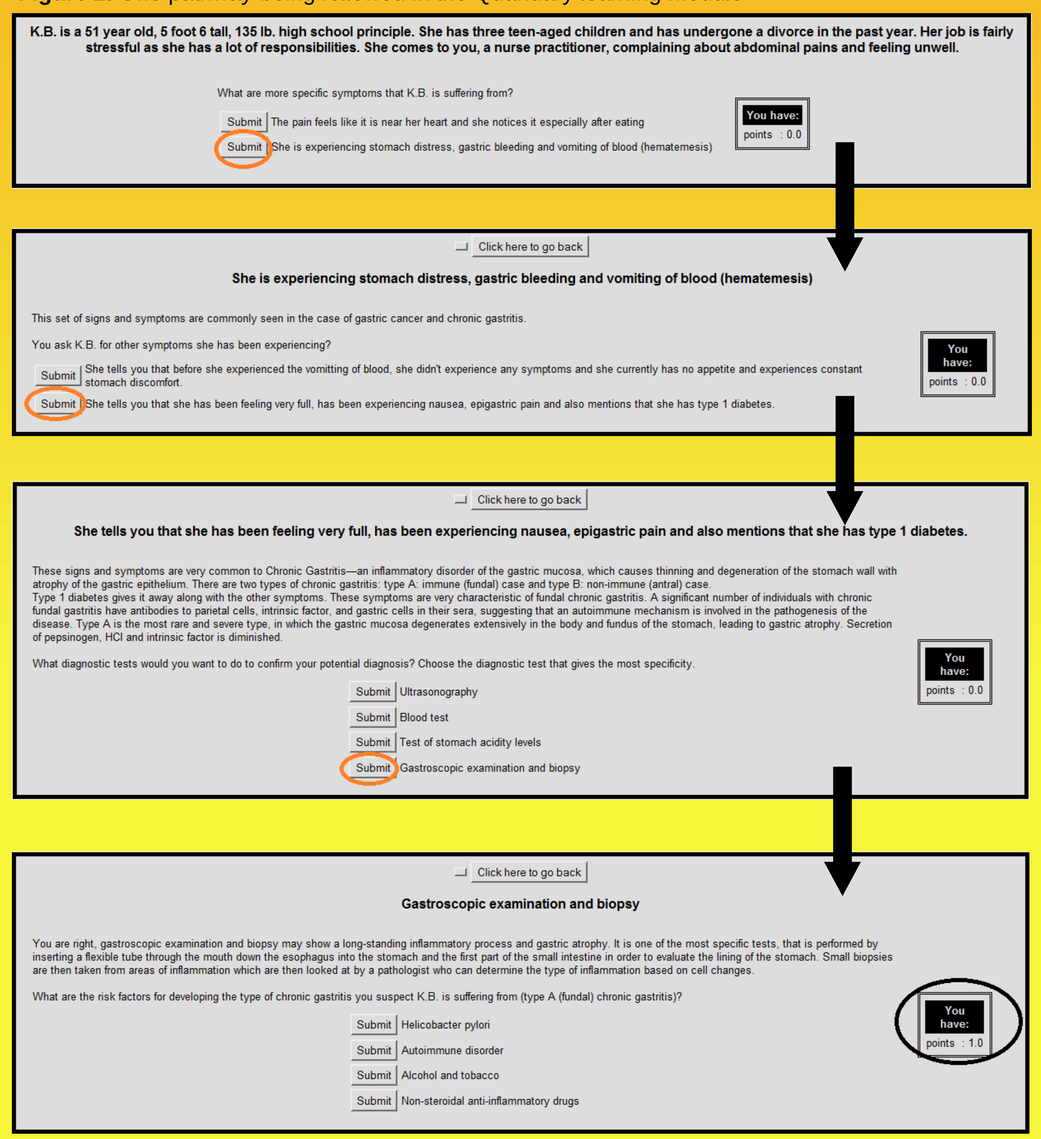


Figure 2. One pathway being followed in the Quandary learning module.



Future Perspectives

Interactive multiple-choice-style questions will encourage students to use recently acquired pathophysiological knowledge to interpret diagnostic results and arrive at a clear understanding of the identity of each disease and effect of body function.

The four gastrointestinal diseases have very common signs and symptoms, thus the exercise will allow the student to identify the subtle differences among them. This approach can be used to develop learning modules for diseases of other systems of the human body.

Dr. Carnegie is currently developing a project which will combine modules with case-based videos, to make the scenario more 'real', for an even more interactive approach.

In the near future, the ability of these learning modules to promote learning in large-enrollment classes will be assessed by comparing student outcomes on summative examinations.

References

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