Development of Adaptive Scenario-based E-Learning Modules to Enhance Clinical Competencies in Medication Management

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Adaptive Scenario-based E-Learning Modules

Why?
Clinical Competence

- Knowledge
- Skills
- Attitudes

- Fact Gathering (Knowledge)
- Interpretation/Application (Competence)
- Demonstration of learning (Performance)
- Integration into Practice (Action)
E-Learning for Health Education

- Limitations of real-world training sites
  - Availability subject to multiple factors
  - Capacity
  - Relevance to learning objectives
  - Consistency of teaching

- Role of e-Learning
  - Additional simulated learning environment
  - Reproducible and scalable
  - Self-paced
What?
Adaptive Scenario-based e-learning Modules

• Adaptive
  • Different decisions made by students will lead to different outcomes
  • Allow students to learn from feedback and consequences of their own decisions

• Scenario-based
  • Virtual clinical case – Clinical documents, audio-visual data

• E-Learning
  • Moodle Learning Management System – Lesson Module
The lesson activity module enables a teacher to deliver content and/or practice activities in interesting and flexible ways. A teacher can use the lesson to create a linear set of content pages or instructional activities that offer a variety of paths or options for the learner. In either case, teachers can choose to increase engagement and ensure understanding by including a variety of questions, such as multiple choice, matching and short answer. Depending on the student’s choice of answer and how the teacher develops the lesson, students may progress to the next page, be taken back to a previous page or redirected down a different path entirely.

A lesson may be graded, with the grade recorded in the gradebook.

Lessons may be used
- For self-directed learning of a new topic
- For scenarios or simulations/decision-making exercises
- For differentiated revision, with different sets of revision questions
How?
(1) Define learning outcomes
(2) Design branching scenarios
(3) Produce scenario case content
(4) Build Scenarios on Moodle
(5) Pilot Test and Review
(6) Implementation
(7) Evaluation and Feedback
You are a pharmacist working in HKU Hospital E2 Ward. MBC, F/82, has just been admitted to the ward for SOB.

Case No: HN12345678(3)
Patient Name: CHAN MEI SO (陳美秀) Sex: F Age 82y

Admission Note  Echocardiography Report  Laboratory Investigations  Medication
Examine the patient

As you pressed onto the patient's swollen leg, a pit was formed and remained for a while.

Monitoring Parameters | Levels
--- | ---
Sodium | 136-148 mEq/L
Potassium | 3.6-5 mmol/L
Chloride | 86-109 mEq/L
Urea | 2.9-8 mmol/L
Creatinine | 40-62 μmol/L
Estimated GFR | >90 unit
Calcium | 2.25-2.63 mmol/L
Adj calcium | 2.24-2.63 mmol/L
Phosphate | 0.88-1.45 mmol/L
Total protein | 67-87 g/L
Albumin | 39-50 g/L
Globulin | 26-40 g/L
Are you taking any other OTC/Chinese Medicine/Medications from other providers?

Well done!

Self-medication with over-the-counter medication and health products is common. It is always important to check if the patient is taking any other medications, as well as those prescribed by other providers, so as to check for potential drug-induced problems or drug-drug interactions. Healthcare professional can take this opportunity to reconcile the medication record and provide education if appropriate.
Question 1 Initiate Lisinopril 5mg daily and discontinue Amlodipine

You chose:

Initiate Lisinopril 5mg daily and discontinue Amlodipine

Correct!

This patient has HFREF with LVEF 25%, and she belongs to NYHA Class III as she has marked limitations on physical activity but asymptomatic at rest. However, according to 2017 ACC/AHA/HFSA Guideline on Management of Heart Failure, she is not receiving the optimal HF therapy with ACEi and beta-blocker, so the initiation of lisinopril is rational as all HF patients should be initiated with ACEi unless there is a contraindication. In view of her relative low BP (121/60), and the lack of proven benefit of DHP CCBs on morbidity or mortality in HF, amlodipine should be discontinued.

Step 1 Establish Dx of HFpEF: assess volume: initiate GDMT
Step 2 Consider the following patient scenarios
Step 3 Implement indicated GDMT: Contraindications are not mutually exclusive, and no order is inferred
Step 4 Assess symptoms
Step 5 Consider additional therapy

A Discontinue Amlodipine
B Discontinue Lisinopril
C Discontinue Metoprolol CR
Observations
Students

- Supplements didactic teaching
- Flexible to fit into self-paced learning
- Instant feedback can guide learning
- Good readiness to use the Moodle platform
- Good for motivated learners
Teachers

- No extra cost and time to build and to get accustomed to the new online platform
  - Low technical barrier to maintenance
- Suitable for simple clinical cases and focused learning outcomes
  - Technical restrictions intrinsic to Moodle system limit the level of details and flexibility in the clinical case design
- Takes time to develop case flow and audio-visual materials
- Less efficient for follow-up discussions than problem-based learning and online clinical case workshops
Conclusion
Conclusion

- Adaptive scenario-based e-learning modules are
  - Viable teaching and learning strategy
  - Not bound by classroom and training sites
  - Suitable as supplement to didactic sessions in development of clinical competencies
Thank you
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