

Introduction

This poster presents a process by which clinical faculty and instructional designers collaborate in order to develop robust and re-playable virtual patient cases. Branching narratives afford medical students the opportunity to work through increasingly complex cases as part of their pre-clerkship curriculum. To facilitate this process, initial branching case creation can be based on existing linear cases, so there is no need to start “from scratch.” Gameplay elements such as differential scoring and health care cost tracking add a competitive spin as well as model some real-world constraints. The use of multimedia, interactivity, scaffolding, feedback and variety in question types allows the collaborators to develop cases for a wider array of learners. Best of all, no special software is required. These cases can be built in readily available cloud-based survey tools.

Gameplay Elements

Differential Scoring

- Award points based on not just **what** path was chosen, but **when** in the process
- Consider which actions might cause the learner to **lose** points

Health Care Cost Tracker

- Limit the **number** of tests that can be ordered so as to avoid a fishing expedition
- Keep track of the **cost** of ordered labs and imaging

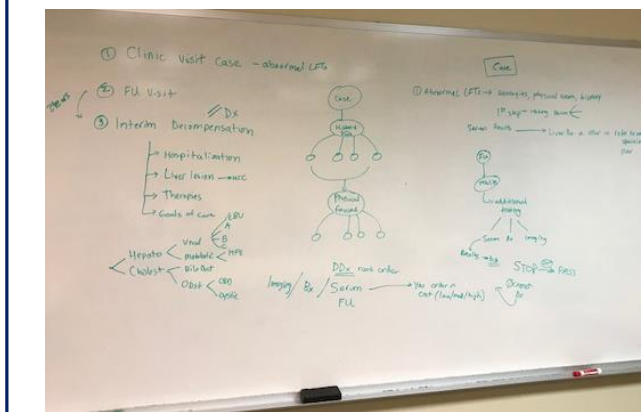
Re-playability

- A **compelling narrative** with multiple paths makes for a more engaging case
- Consider the use of **scaffolds** at break points in the case. Should it direct the learner back to a more ideal path or should the learner be able to wander aimlessly down a dead-end path?

Guidelines for Case Development

	<ul style="list-style-type: none"> Balance the information delivery among text and images, audio, and video 	<h3>Script Concordance Test</h3> <p>Case 1: A 39-year-old woman presents complaining of frequent urination and severe low back pain radiating down to the external genitals.</p> <table border="1"> <tr> <td>If you were thinking</td> <td>and the following new information were to become available</td> <td>this diagnosis would become...</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>Very Unlikely Unlikely Neither Likely nor Unlikely More Likely Very Likely</td> </tr> <tr> <td></td> <td></td> <td>-2 -1 0 +1 +2</td> </tr> <tr> <td>Q1 CHF Exacerbation</td> <td>EKG with left bundle and ST elevations</td> <td><input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/></td> </tr> </table>	If you were thinking	and the following new information were to become available	this diagnosis would become...						Very Unlikely Unlikely Neither Likely nor Unlikely More Likely Very Likely			-2 -1 0 +1 +2	Q1 CHF Exacerbation	EKG with left bundle and ST elevations	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>
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	<ul style="list-style-type: none"> Decide at what intervals the case should provide feedback as to the learner’s choice Make this developmentally appropriate for the stage of learning 	<h3>Working Differential</h3> <p>Do you think the following diagnoses should be include in your working differential (true/false)?</p> <table border="1"> <tr> <td></td> <td>True</td> <td>False</td> </tr> <tr> <td>Medication Overdose</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Tylenol Toxicity</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Cerebral Vascular Accident</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>Hepatic Encephalopathy</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </table>		True	False	Medication Overdose	<input type="checkbox"/>	<input type="checkbox"/>	Tylenol Toxicity	<input type="checkbox"/>	<input type="checkbox"/>	Cerebral Vascular Accident	<input type="checkbox"/>	<input type="checkbox"/>	Hepatic Encephalopathy	<input type="checkbox"/>	<input type="checkbox"/>
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	<ul style="list-style-type: none"> Have fellows and attendings play through the cases for feedback and to help determine scoring paths 	<h3>Rank Order</h3> <p>After obtaining a history from your available sources, you decide to ask some follow-up questions.</p> <ol style="list-style-type: none"> Did the patient take any new medication? Did the patient have any recent procedures? Did the patient have any fevers? Did the patient have any change in her urine? 															
	<ul style="list-style-type: none"> Have anyone else play through the cases to check on the logic and branching flow – hooking it all together can be complicated 																
	<ul style="list-style-type: none"> Build in opportunities for summarization and reflection 																

Tools



- Whiteboards are great for initial case mapping
- Collaborative ID process to find branch points and set parameters
- Move to digital mapping of case once structure is set
- Easier to update and revise once digital



- There are a variety of free or University-wide site-licensed cloud-based survey tools
- Most support complex branching
- A wide assortment of question types are available on these platforms
- No need for specialized software
- Easy collaboration for multiple authors

Selected References

Fournier JP, Demeester A, Charlin B. Script concordance tests: guidelines for construction. *BMC Med Inform Decis Mak*. 2008;8:18. Published 2008 May 6. doi: [10.1186/1472-6947-8-18](https://doi.org/10.1186/1472-6947-8-18)

Posel N, Fleischer D, Shore BM. 12 Tips: Guidelines for authoring virtual patient cases. *Medical Teacher* 2009; 31(8):701-708; doi: [10.1080/01421590902793867](https://doi.org/10.1080/01421590902793867)

Future Directions

- New cases for the “From Classroom to Clinical” capstone in December 2019 in planning stage
- Future iterations to incorporate further student feedback
- Future exploration to include differentiation for learner’s experience level within the same basic case