Use of Virtual Patients in Dental Education

Robert A. Cederberg, DDS, John A. Valenza, DDS,
Dan A. Bentley, DDS and Richard Halpin, MEd

University of Texas at Houston School of Dentistry
Why We Did It

• Variability in clinical education
• Gaps in clinical education
• Variable live patient experiences with standardized virtual patients
Challenges

- What to teach
- How to teach
- Need for realism
- Integrating with clinical education
Benefits

• Consistency in learning
• Integration of EBD, applied basic sciences, ethics/prof
• Faculty calibration
We Get It

• Simulation is not just about tooth preparation, but also simulation of patient communication, history taking, social interaction, medical and dental emergency scenarios and ethical dilemmas.

• Medical models
The UTSD Concept

• Use of simulation across all 4 years of the DDS curriculum and across 2 years of DH curriculum.

• Key – EHR in the simulation environment.
The Virtual Patient

- Complex human simulation experiences in a controlled clinical environment.
- Willing Student Interaction Required

- A Scripted Production
- Treatment outcomes and diagnostic viability of student generated decisions.
- Acceleration and augmentation of clinical confidence.

It’s not that complicated- we are giving them an opportunity to play doctor again.
Introduction to Clinic: Ideal VP Starting Point

• Navigating the unfamiliar clinical environment: New Language, New Landscape, New Laws


• VP Access not limited to clinic time.

• Assess progress and even become a testing vehicle.

Using the EHR and simulation center as a stage, an effective gaming system is developed to move a student through a patient examination, evaluating verbal and written information and applying it exactly as for a live patient.
VP Production

- Objective: Independently generate EHRs, practice infection control, utilize the dispensary.
- Identify potential VP patients (real ones are best)
- Develop modules for training and testing
- Implementation: Faculty calibration
- Testing: Mastery of the EHR format including decision making opportunities
- Ethical/Diagnostic dilemmas are included
- These elements must co-exist.

1) relevance to dental practice
2) required learning objectives must be challenging
3) patients must have relevance and depth of personality
Time and Workload Commitment

With collaboration from IT/Video/Audio experts and each clinical administrative component from scheduling to financial, put in 100+ hours to develop the first patient, with subsequent patients taking less but still significant time.

It took 2 years.

Minnie Chewsalot, Connie Chung, and Sharon Middleteen were born.

Clinical Faculty and Administrative commitment was critical for success.
Connie Chung Medical Interview
Perceived and Actual Benefits

A specific goal: Be ready to work in clinic

VPs can exceed goals: pathology, ethics and the “unlikely to be encountered by all” situations to standardize experiences

A BIG ONE

Clinical Faculty Leadership established prior to patient contact
Students’ Perspective

• Case –based EHR during pre-clinical operative exercises add relevance, clinical preparedness
• Simply explaining the software inadequately prepared them for EHR proficiency.
• When the VP model was used in “Intro”, 4 complete patient exams before clinic started.
• They were ready.
• VP presentation was too slow for some.
Was this a win?

• I wish we had Dental Wii

• I wish Axium upgraded “Intro” documents for new versions.

• VPs generate a great deal of independent student thought and self-discovery.

• Multiple patient scenarios created a systematic TP approach.

• Advanced record keeping skills were obtained by each student.

• Confidence to navigate the clinic was increased. That is worth much effort.
What did we add to the learning experience?

• Intro to Clinic is a great canvas for VP utilization

• VPs are safe, student/faculty interaction is patterned

• Complex diagnostic data is woven into the story.

• “Acting” as a real dentist without touching or communicating with patients while fumbling with technology.

• Virtual professionalism is transferrable
Pitfalls

- Computer upgrades and software changes can make months of work inadequate when creating an EHR related video.

- You can’t do this very well and fast.

- Virtual patient design is video game creation, or making a movie.
It doesn’t work very well to throw too much into a VP at the same time.

When the faculty facilitators and the students are both challenged, successful outcomes result.
Advice

- Basic scientists need to be engaged in explaining the science behind the cases.
- Great discussions result from Basic Science “mini-rounds” sessions.
- Complexity and conflicting data: a salad of mixed medical problems must blend to taste right
- Real patients with real problems seem to work better.
- By duplicating the clinical experience as much as possible, more students are able to have a similar learning experience.
Our Patients

• Minnie Chewsalot: She has her own Facebook page, she is a very simple patient case, and fun. A little medical HX

• Connie Chung: A party girl with obvious caries, social drug/alcohol user, more complex.

• Sharon Middleteen: The mid-term/final case. 15 years old, giant cell granuloma growing during orthodontics with post-ortho caries to manage during the lull between interferon therapy sessions at MD Anderson.

• Each other: Students pair up and examine each other after each part of the VP activity.

You can start imagining the possibilities.
Student Reaction
Overview of Technology

• Technology was used as a vehicle to deliver teaching and enhance the virtual patient experience

• Various techniques were tried at different points and refined as the project progressed

• The aim was to try to make the technology integrate as seamlessly as possible
Technology Used

• aXium EHR
• Adobe Captivate
• Adobe Soundbooth
• Blackboard
• Facebook
• Final Cut Pro
• Powerpoint
• Others as needed...
Really Not About The Tech...

• The watchword with the technology was “Appropriateness”

• Was the technology the most appropriate vehicle for the educational message?

• If not, we used other techniques, such as small group facilitated discussion, readings, presentations
Using Tech In Novel Ways

• We used Powerpoint and Camtasia to create self guided patient interviews where the students could “quiz” the virtual patients

• Kind of like one of those ‘Choose-Your-Own Adventure’ books

• Lets try it and see if it works...
Welcome Adventurer...

You step through the doorway, the sunlight fading behind you, to be replaced by the eerie light of the dungeons glowing crystals. You shiver in the cold of a place that has never seen light, just darkness and death. A little way down the passage, you see a series of boxes built into the side of the passage. A few are open, others are closed and one is hanging in pieces, splinters littering the passageway. One of the boxes has your name on it!

Investigate It

Continue Down The Passage
Investigate It

The box has an inscription on it-

*Answer correctly and rewarded you shall be*

*Fail and pain is your punishment!*

*It never rains, but it pours!*

On top of the box are some carvings, but they are covered in a layer of dust.

- Brush The Dust Aside
- Blow The Dust Aside
- Continue Down The Passage
Brush The Dust Aside

As you brush the dust, one of the symbols lights up. Suddenly, the box explodes in your hand.

That hurt a lot and your hand is all charred. Whatever was in the box is gone now, so, cursing, you continue up the passage.
Blow The Dust Aside

There are five carvings on the box. One is a snowflake, another a sword. There is a jug, a crown and a cloud. Do you:

- Press The Snowflake
- Press The Sword
- Press The Jug
- Press The Crown
- Press The Cloud
- Continue Down The Passage
Press The Snowflake

As you press the Snowflake, it lights up. Suddenly, the box explodes in your hand. Ouch!

Whatever was in the box is gone now, so, cursing, you continue up the passage.
Press The Sword

As you press the Sword, it lights up. Suddenly, the box explodes in your hand. Ouch!

Whatever was in the box is gone now, so, cursing, you continue up the passage.

Continue Down The Passage
Press The Jug

As you press the Jug, it lights up. The box springs open. You have answered correctly- a jug does not rain, but it can pour! Inside is a note and a bronze ring with a crude star etched on it. You slip the ring on your finger and read the note-

*Congratulations adventurer!*

*The puzzle of the box means we shall give aid only to those who deserve it! You have earned your prize- This ring may aid you in the future; its magic is powerful, But it can only be used once, so careful how you use it! Do not try to take another’s ring- they are tuned only for the rightful person*

*Good Luck- you’ll need it*

Smiling, you continue up the passage.
Press The Crown

As you press the Crown, it lights up. Suddenly, the box explodes in your hand. Ouch!

Whatever was in the box is gone now, so, cursing, you continue up the passage.

Continue Down The Passage
Press The Cloud

As you press the Cloud, it lights up. Suddenly, the box explodes in your hand. Ouch!

Whatever was in the box is gone now, so, cursing, you continue up the passage.
Continue Down The Passage

Leaving the boxes behind, you soon come to a junction.

Which way to you go?
The Social Media Link

• Attempt to increase realism of virtual patient experience

• Patient (Minnie Chewsalot) was created in Facebook and posted comments, photos etc. in advance of being encountered as a patient in clinic

• Moderately successful but requires more tight scripting to match the clinical encounters and more practice
The Life of Minnie Chewsalot

Minnie Chewsalot

- Worked at Lamar High School (Head of English)
- Studied at University of Houston
- Lives in Houston, Texas
- Widowed

About

Friends

Photos

Map

Likes

Post | Photo | Gift

Write something...

Friends

See All

See All

Likes

So the year is drawing to a close. Does this mean our time together is almost over?

Like · Comment

Minnie Chewsalot

28 November 2011

I will always recall our time together fondly. I have not been very good updating here since the wedding. I have been spending some time with family, enjoying Thanksgiving and getting ready for Christmas.

2 December 2011 at 15:41 · Like
Educational Approach

• Expose students to a standardized patient experience and allow them to explore possibilities for treatment and interaction

• Small groups and individual work with faculty as facilitators

• Create a safe and positive environment for learning, exploration, discussion, comment and feedback
Scaffolding

- As well as standardizing important patient encounters for each student it is hoped that the virtual patients with help scaffold instruction from didactic classes.

- Bridge the gap between didactic teaching and clinical practice.

- Virtual patients used to encourage evidence based thinking in the students.
Lessons Learned

• Technology can be jarring when used badly
• Students are not necessarily as tech savvy as faculty like to think
• Faculty calibration for facilitated discussions can be challenging
• Creating a fully detailed virtual patient takes a great deal of time and requires a lot of input
Discussion

• We have talked long enough. Time for some input from you guys

• Is your School currently using virtual patients?
  • What have your experiences been like?
  • What do your students think?

• If you are not using them do you think they are something you might consider?
Questions?