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Recommended Citation

Reichman, William C.; Takamori, Kim E.; and Thompson, Diana K., "The disease game: An interactive simulation program designed to teach ocular disease management skills" (1998). *College of Optometry*. 1259.

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The disease game: An interactive simulation program designed to teach ocular disease management skills

Abstract

The Disease Game is a computer simulation designed to aid students in practicing test selection, disease diagnosis and disease management skills. Features of the simulation include a game format, digitized images and videos, and the ability to add additional patients.

Degree Type

Thesis

Degree Name

Master of Science in Vision Science

Committee Chair

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Subject Categories

Optometry

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THE DISEASE GAME:
AN INTERACTIVE SIMULATION PROGRAM
DESIGNED TO TEACH OCULAR DISEASE MANAGEMENT SKILLS

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A thesis
submitted to the faculty of the
College Of Optometry
Pacific University
Forest Grove, Oregon
for the degree
Doctor of Optometry

May, 1998

Advisors:
Diane P. Yolton, PhD, OD
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BIOGRAPHY

William Reichman was born in Lawton Oklahoma and graduated from Pacific University in 1996 with a Bachelor of Science Degree in Visual Science. He will graduate from Pacific University College of Optometry in May, 1998.

Kim Takamori was born in Hawaii and graduated from Pacific University in 1996 with a Bachelor of Science Degree in Visual Science. She will graduate from Pacific University College of Optometry in May, 1998.

Diana Thompson was born in Washington state and graduated from University of Washington in 1994 with a Bachelor of Science in Biology. She will graduate from Pacific University College of Optometry in May 1998.

ACKNOWLEDGMENTS

We would like to thank our advisors, Dr. Diane Yolton and Dr. Robert Yolton: Dr. Diane Yolton for her vision to create an interactive learning aid for the optometric student and Dr. Robert Yolton for his help in creating and "debugging" the Game into a playable as well as educational format. We also would like to thank Dr. Alan LeRoy for taking the input from Drs. Yolton and us and programming it into the "Disease Game."

ABSTRACT

The Disease Game is a computer simulation designed to aid students in practicing test selection, disease diagnosis and disease management skills. Features of the simulation include a game format, digitized images and videos, and the ability to add additional patients.

INTRODUCTION

Computer simulations are becoming increasingly popular as an effective method for educating students. Simulations allow students to function without anxiety and expense of actual patient encounters. They also allow students to learn at their own pace and to make errors without significant consequences.

Recently there has been considerable interest in developing ocular disease management skills with Optometry. To help optometry students learn these skills, a computer simulation called The Disease Game was created. The Disease Game is designed to enhance their ability to select the most appropriate tests for a patient with an ocular disease and to use the test results to determine a correct diagnosis and management strategy. The Game does this by using an interactive format in which the player first selects a patient identified only by number from a list of available cases. A digitally recorded voice announces that the "doctor's next patient has arrived" and a picture of the patient is displayed on the screen. The player then selects various tests from pull-down menus. The menus include subjective, vision, anterior segment, posterior segment, imaging, lab, and neurologic. As each test is selected, the results of the test is shown to the player. If a picture or movie icon is shown beside the test name, the player goes to the menu entitled pics or movie and selects the picture or movie associated with the test. The picture or movie will always be available to view throughout the game after being selected.

Each test has a cost listed next to it on the pull down menus. When a test is selected, its cost is deducted from the patient's fee which is set at \$100 at the beginning of the visit. The object of the Game is to select only the tests that indicated on the basis of the patient's history and the results of previous tests. When the player has selected all of the tests he or she feels is necessary to make a diagnosis, the diagnosis and treatment option is selected. The player is informed that she/he can earn \$50 if the diagnosis is correct on the first attempt. If the diagnosis is not correct, the Game gives the player a second chance and \$25 is earned if the second diagnosis is correct. To select the diagnosis, a list of the possible diagnoses are given grouped as to anatomical location. The list is scrolled and the player selects the diagnosis from the list. The player is then told whether the diagnosis is correct. If the first and second attempts at making the diagnosis are incorrect the Game gives the correct diagnosis.

Once the correct diagnosis is achieved, a management strategy needs to be selected. The three management strategies that are presented are (1) manage by sending the patient away/referral to specialist, (2) managing by monitoring and supportive therapy only and (3) manage by using topical TPAs. With each of the three categories, a correct option selection earns the player a \$50 bonus while and incorrect selection earns the player a \$50 penalty and play of the patient is discontinued.

If the first option, manage by referral is selected, the player then has a choice of professionals to choose from such as cardiologist, corneal ophthalmologist, and glaucoma ophthalmologist.

If the second option, managing by monitoring and supportive therapy only, is selected, the player then selects up to three options from a list such as warm compresses, lid scrubs, lubricants.

If the third option, manage by using topical TPAs, is selected. a list of drugs is presented and the player can choose up to 3 options. If the drug or drugs is correct, then the player needs to choose either supportive therapy and/or a return to clinic time.

A major advantage of the Game is that it can provide an interesting and challenging practice experience at a time and place convenient to the player and without the need for examination equipment, live patients, office staff, etc. A second advantage of working with the Game is that errors are not as costly as they would be if they were made with actual patients. A third advantage is to allow the player to gain experience with patients not commonly seen during their clinic time.

The Disease Game uses actual patient photos, videos and chart information. Adobe Photoshop, Adobe Premiere, Video Fusion, Sparkle and Movie Player were used in producing the digital pictures and videos for the game. Apple Simple Sound was use to produce the audio portion of the Game.

HOW TO "PLAY" THE DISEASE GAME

1. Turn on computer, inset CD.
2. Double click on CD.
3. Double click on the Disease Game mw icon.
4. A screen then appears and scrolls instructions.
5. Click on the screen to proceed.
6. Now you enter the name of the doctor and press return.
7. To open a patient, go to the file menu and scroll down to open patient.
8. List of patients are presented in the control box and click on the patient that you would like to play. It should then become highlighted.
9. Click on open.
10. It will then show the patient you have selected.
11. Click on open. (Note: to open the patient faster, you can double click on its name.)

12. A picture of the patient is displayed. To proceed, click on the close box in the upper left corner.
13. Now the game begins.
14. Select from the menu display a test you would like to purchase (ie. subj, vision, ant, post), scroll down to a specific test in the category and release the mouse. The test results will appear.
15. Continue selecting specific tests that you think will help you in the diagnosis and treatment of the disease.
16. Occasionally an icon will be displayed beside the test name, one for movies or pictures. To view these, go to the menu entitled pics or movie, scroll down and select the movie or picture you just purchased. These picture and movies will always be available to view throughout the game after being purchased.
17. To view the picture, after the mouse is released on the picture you have selected, the picture will show up. To continue playing the game, click on the close box in the upper left corner of the picture.
18. To view a movie, after the mouse is released on the movie you have selected, the movie will show up. In order to play the movie, click the play button that is located in the lower left hand corner of the control box. Some movies have a scroll bar at the bottom of the control box that allows you to select individual frames of movie.
19. When you feel confident that you have enough information to diagnose and treat, go up to the file menu, click the mouse and scroll down to diagnosis and treatment; then release the mouse.
20. A screen appears advising you that you can earn \$50 if you correctly diagnose it the first time, otherwise you have a second chance. Click continue in the control box.
21. A list of various ocular structures where the disease is located and a scrolling list of possible diagnoses along with ICD-9 codes appears. Select the ocular location first. This moves the diagnoses and ICD-9 code scroll list to that area of anatomy.
22. Click on the diagnosis you think is correct and then click on enter.
23. If your diagnosis is correct, control box for management strategies appears. Now select one of the three managements by clicking with the mouse.
24. If refer the patient has been selected, next select an appropriate referral source and you will be given credit for the patient. If you select the wrong

referral source, you will be shown a correct choice in addition to your choice. This will end your encounter with this patient and now you can choose another patient to play.

25. If manage with supportive therapy only is selected, select the proper therapy (up to three can be selected).
26. If manage with supportive therapy only was selected, and a correct therapy was then selected, the player will be given credit for the patient. If the player selected a wrong supportive therapy, a correct one will be shown in addition to your choice. This will end this patient and now another patient can be played.
27. If manage with drugs is selected, select the proper drug or drugs from the alphabetical list (up to three can be selected). The player is now prompted to select a supportive therapy (if appropriate) by clicking on the ones chosen (up to three can be selected).
28. If manage with drugs and supportive therapy was selected and if your choice is correct, you will be given credit for the patient. If your choice is wrong, a correct drug(s) and supportive therapy will be shown in addition to your choice. This will end this patient and now another patient can be played.
29. If either manage with supportive therapy only or manage with TPAs was selected, you then need to select an appropriate return to clinic time. If correct, you get credit. If not, you are penalized. Either way, the patient encounter is complete and you can choose another patient.

CONCLUSIONS

The goal of this project was to create an interactive software program simulation to aid in teaching disease management skills. The program has been completed along with 17 simulated patients. The students who have played the game have found it to provide an interesting and challenging educational experience. As more simulated patients are created, the value of the Disease Game will increase. But even in its current form it demonstrates the value of computer simulation in education.

The next step for the "Disease Game" will be developing more patients for the students to play. In addition, The Game may be used on the Internet by presenting unusual patients on Pacific's Web Page or as part of a continuing educational program.

COMPUTER REQUIREMENTS

The Game will run on a Macintosh computer with (1) a CD player, (2) system 7.5 or newer operating system, (3) a 68040 or better processor, (4) a minimum RAM of 4 Mb, and (5) Quick Time 2.5 or better.