



Instructional Design Document

Asthma Management Patient Education in Second Life

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Learning Need

Asthma is the most prevalent chronic disease in the United States; it affects one in twelve Americans and accounts for one quarter of all emergency room visits. Annual costs are estimated at a staggering \$56 billion dollars and the disease is one of the leading causes of missed school days for children.

Education is a key component in managing asthma, there is no cure. Careful management includes avoiding things which trigger attacks, using medications correctly and consistently, and regular visits to the doctor. According to data from the CDC, in 2008 less than half of people with asthma reported being taught how to avoid triggers. Additionally, patient education is a critical factor in correct use of inhaled therapy for the disease. This course is designed to guide a newly diagnosed patient through the symptoms of the disease, the triggers which cause an asthma attack, and the correct use of an inhaled corticosteroid metered dose inhaler for long term management.

Learner and Contextual Analysis

Learner Analysis

The learners are newly diagnosed patients with asthma who are controlling their disease with inhaled corticosteroids delivered through a metered-dose inhaler (MDI). Excluded are other inhaled therapy delivery devices such as a spacer with an MDI, or a nebulizer, or dry powder inhaler.

- Entry Characteristics
- Second life account, avatar, and basic navigational skills.
 - Age: The targeted age is 9 – 65. Children age 9 can read well, follow directions, and learn to adequately deliver a dose of medication using a metered dose inhaler. Older patients are less likely to engage with the technology of the Second Life in order to receive the lesson and may use other delivery devices for long term

medication.

- Been recently diagnosed with chronic asthma which will be managed with inhaled corticosteroids via a metered dose inhaler
- Have already received their metered dose inhaler

Prior Knowledge of the Topic: Learners have basic knowledge of anatomy to understand the location of the lungs and their basic function. However, they have little or no knowledge of how the disease causes their symptoms and how the drug is delivered when the inhaler is activated.

Contextual Analysis

The training will take place in world in Second Life, which allows learners to explore their disease from inside their airways. Additionally, it provides learners with a visual experience to help them master the proper execution of their metered-dose inhaler to deliver drug deeply into their lungs. Finally, there is a social aspect for asthmatics to share ways to avoid triggers and manage their disease with others who have been recently diagnosed. A certified asthma educator will be in world to moderate these discussions during well publicized hours. Second Life offers an opportunity for the newly diagnosed patients to learn in a self-paced module. The scale of the virtual world allows one asthma educator reach out to many newly diagnosed patients early in the disease management process. This would normally be achieved through costly home visits. Transfer context is achieved through the visual 3D experience to help the learner imagining delivering the drug deeply into their lungs. A final quiz will assess whether the learner has gained any usable knowledge during the experience.

Instructional Goal

This course is designed to teach a newly diagnosed asthma patient what happens in the airways during an attack, what the symptoms of the disease are and what triggers those symptoms, and how to use a metered-dose inhaler (MDI) to deliver inhaled corticosteroids for the management of the disease. The goal of this instruction is to teach patients how to recognize and avoid triggers, and how to properly use an MDI to control their symptoms. This course will be delivered online via the virtual world, Second Life.

Learning Objectives

After completing this course, the learner will:

1. Describe the symptoms and what happens to the airways during an asthma attack.
2. Identify and list ways to avoid possible triggers of an asthma attack.
3. Describe the proper breathing pattern when actuating the inhaler in order to get the greatest benefit from the drug.

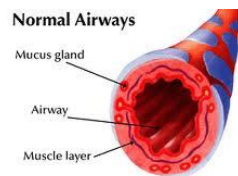
Instructional Approach

The learner will spend one to two hours in world exploring the spaces and engaging in the various learning activities. Finally, there is a social space for sharing experiences with other asthmatics. A registered asthma educator will facilitate discussions. Learners may return to this portion of the build regularly to ask questions or get advice from other people who are dealing with the disease.

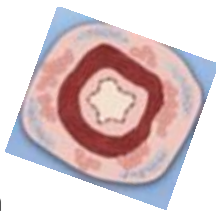
Learning Objective: Describe the symptoms and what happens to the airways during an asthma attack

Lesson: The build in Second Life will consist of an initial welcome board in an open space at the beginning end of a path (representing the journey of managing a chronic illness). The board will tell the

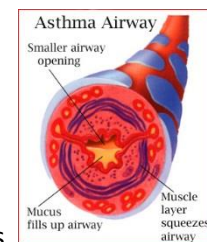
learners, “You will always have asthma, but if you avoid triggers you can avoid asthma attacks. You are in control of managing your disease.” The start of the path is arched by a giant normal airway



and as the learner walks easily through this opening, audio is triggered. Wheezing sounds begin and a narrator describes the symptoms of an asthma attack: shortness of breath, wheezing, and coughing. The narrator explains that these are due to inflammation and constriction of the airways and asks the learner to walk through the next giant airway arch which is narrowed by constriction and inflammation—the opening is built so that the avatar must be very carefully guided



through . When the avatar passes through that gate the narrator explains that it is difficult for air to pass through narrowed airways too, which is why it is difficult to breathe during an



attack. The last arch is an airway which is constricted and covered with mucus. When the avatar tries to pass through, coughing sounds are triggered and the narrator explains that over production of mucus causes coughing. The narrator explains that a rescue inhaler should be used and asks the avatar to click on a giant inhaler next to the path. When the inhaler is clicked the arch disappears and the narrator as well as another welcome board explains that to avoid attacks a patient must avoid triggers.

Learning Objective: Identify and list ways to avoid possible triggers of an asthma attack.

Lesson: The avatar is invited to explore an open space with many floating objects; instructions challenge the learner to identify possible triggers of an asthma attack by clicking on those objects he believes are asthma triggers. The idea is provide a context around the objects when the learner clicks them and audio will initiate which tells how to avoid the trigger, in addition a card is offered for the learner. Example: a snowflake, when clicked will start falling into a pile of snow as the audio explains that cold weather can trigger an asthma attack, a giant nose with a tissue when clicked will become a person sneezing and the audio will explain that colds and flu can lead to asthma complications, a cigarette when clicked will become a person smoking at a bar and the audio will advise the learner to avoid people who are smoking or places which allow people to smoke. The space will also include objects which are not triggers such as a bathtub, a fish, or a television. If the learner tries to continue on the path and leave the space without clicking all the objects, he will be reminded to return to the space to learn more about triggers. When all of the triggers have clicked the learners may proceed on the path toward a giant set of teeth.

Learning Objective: Describe the proper inhaling technique when actuating the MDI in order to deliver the drug deeply into the lungs.



Lesson: Learners arrive at the giant mouth . The welcome board instructs learners to click the gold tooth. Once the tooth is activated the narrator explains that this “ride” will help them visualize how to deliver the corticosteroid drug particles deeply into their lungs where it can help them manage their disease.

An instruction board tells learners to select one of three drug particles (yellow cubes) and asks them to sit on it. Once the learner is seated on drug cube they are instructed to click on green tooth. The game has a Goldie Locks theme to it; one of the drug cubes is inhaled too quickly and it crashes into the back of the throat, one is inhaled too slowly and it drops on the back of tongue. During the incorrect methods, a sign is flashed stating, "Inhaling too quickly" or, "Inhaling too slowly." When the drug is inhaled with a deep and slow breath and then held for 10 seconds, the drug reaches the deepest part of the lungs where it can help manage the patient's inflammation. A sign is activated along the path which states, "Just right." The avatar is seated on this drug cube and rides along the airway and deeply into the lung. Breath sounds are playing and the audio is explaining that mastering the technique of inhaling deeply and slowly when the inhaler is actuated is very important. It asks the avatar to ride the "just right" cube of drug again and this time during the ride they should be breathing in deeply and slowly during the entire ride. They may repeat this ride as many times as they wish.

Social Meet up Space

The final area which is within the large 3D lungs will consist of an in world meeting up for asthmatics to share ways to manage their disease with other newly diagnosed patients. Learners can meet other patients and realize they are not alone in dealing with this disease. They can talk about medications and triggers as well as discuss strategies they are learning and/or using in order to deal with their chronic illness using local chat. A certified asthma educator will be in world and clearly identified to answer questions and monitor discussions during well publicized windows of time each day. Within this space there will be a well labeled teleport pad which will allow the avatars to return to any section of the build they would like to revisit.

Assessment

When they reach the deep interior of the lungs during the Goldie Locks ride through the airways, a three question quiz will be visible on a board upon arrival:

Question One: Click the button next to three ways to avoid triggering asthma attacks.

- Bathe rather than take a shower
- Limit your time outside during high pollen count days
- Avoid a high fat diet
- Use caution in cold weather
- Reduce your salt intake
- Avoid smoke filled bars and restaurants

Question Two: True or False: Your inhaled medicine can cure your disease.

Question Three: Which of the following breathing patterns will best deliver the drug deeply within your lungs as you actuate your inhaler?

- Breathe in as fast as you can to get as much drug in your mouth as possible.
- Breathe in slowly and deeply, and then hold your breath for 10 seconds (if you can).
- Breathe in and out (as if panting) as many times as you can within 10 seconds.

If the learner gets any of these questions wrong, he is reminded that managing his disease and avoiding asthma attacks is an important part of staying healthy, in fact it is crucial to staying alive. The correct answer is then given and a link to teleport to the relevant area is also offered. If all three questions are answered correctly the learner is invited to the social meet up area to discuss any questions he may have with a certified asthma educator and other people who are also dealing with this chronic disease.

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