

Educating Patients and Virtual Nurse Avatars

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Welcome!

Objectives

- Define the terms avatar and virtual nurse avatar
- Meet some avatars
- Discuss the Embodied Conversational Agent (ECA) / Relational Agent
- Review the literature concerning virtual nurse avatars
- Explore ways that the nurse avatar can be used for patients

Background



Definition of the Avatar



Avatars in Popular Culture

Create an avatar for your Yahoo Messenger

Ask a question

f t g+

July 2017 ES US

Yahoo! Avatars as the name suggest is a service that allows you to create an avatar that can be used as your contact picture. You can customize your avatar according to your preferences. You can choose the face, clothing and other details. You can even make your avatar express your moods while you chat with your contacts.

To create your avatar:

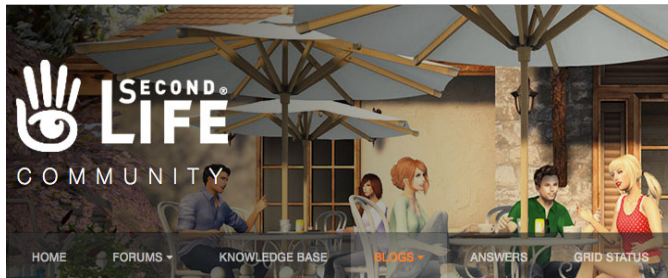

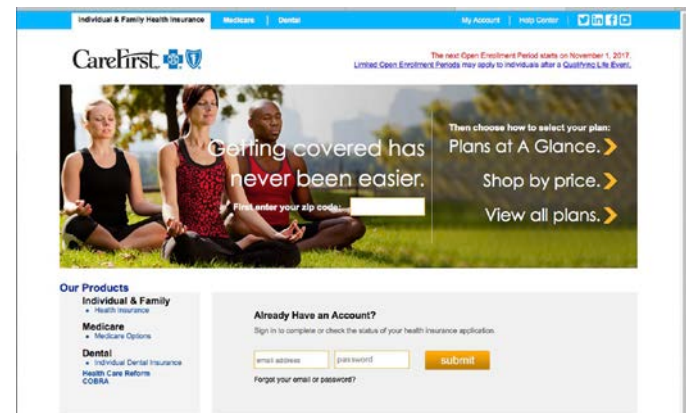


Photo credit: <http://bringto.life>



Avatars All Around

Individual & Family Health Insurance | Medicare | Dental | My Account | Help Center |

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The Foreign Language Assistance Notice is available in English, አማርኛ (Amharic), Ede Yorùbá (Yoruba), Tiếng Việt (Vietnamese), Tagalog (Tagalog), Español (Spanish), Русский (Russian), हिन्दी (Hindi), বাংলা-বেঙ্গলী (Bengali), বাংলা (Bengali), اردو (Urdu), العربية (Arabic), 中文繁体 (Traditional Chinese), Igbo (Igbo), Deutsch (German), Français (French), and 한국어 (Korean).

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How Can I Help?



The Virtual Nurse Avatar



Definition of the Virtual Nurse Avatar

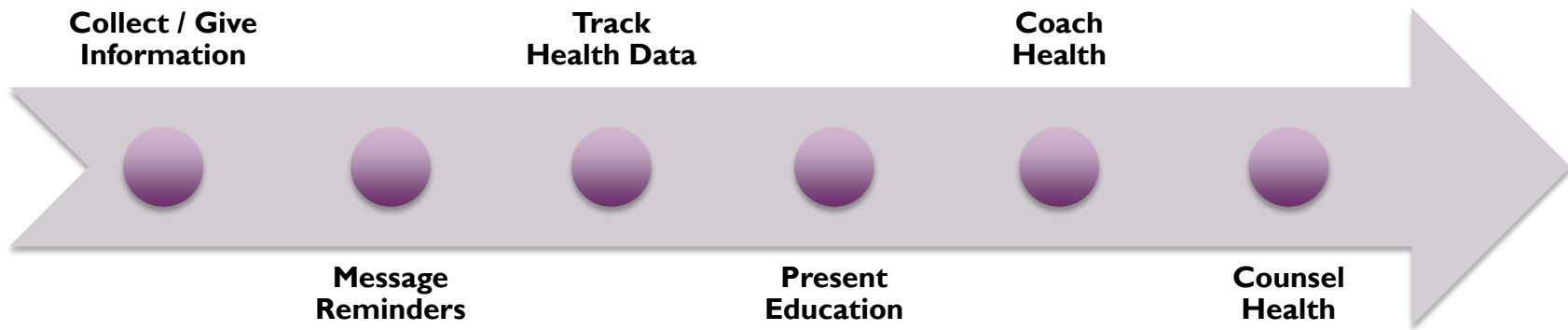
Why use a nurse avatar?

- Rising healthcare costs
- An aging population
- Nursing shortage
- Problems with one-on-one encounters
- Problems with static materials

Benefits of a Nurse Avatar

- Enhanced engagement
- Increased interactivity
- Anywhere, anytime, reach larger population
- Convey health information to patients with inadequate health literacy / English as second language
- Effective in short-term and longitudinal health interventions
- Improved outcomes

Role of the Nurse *Avatar*



What does a nurse avatar

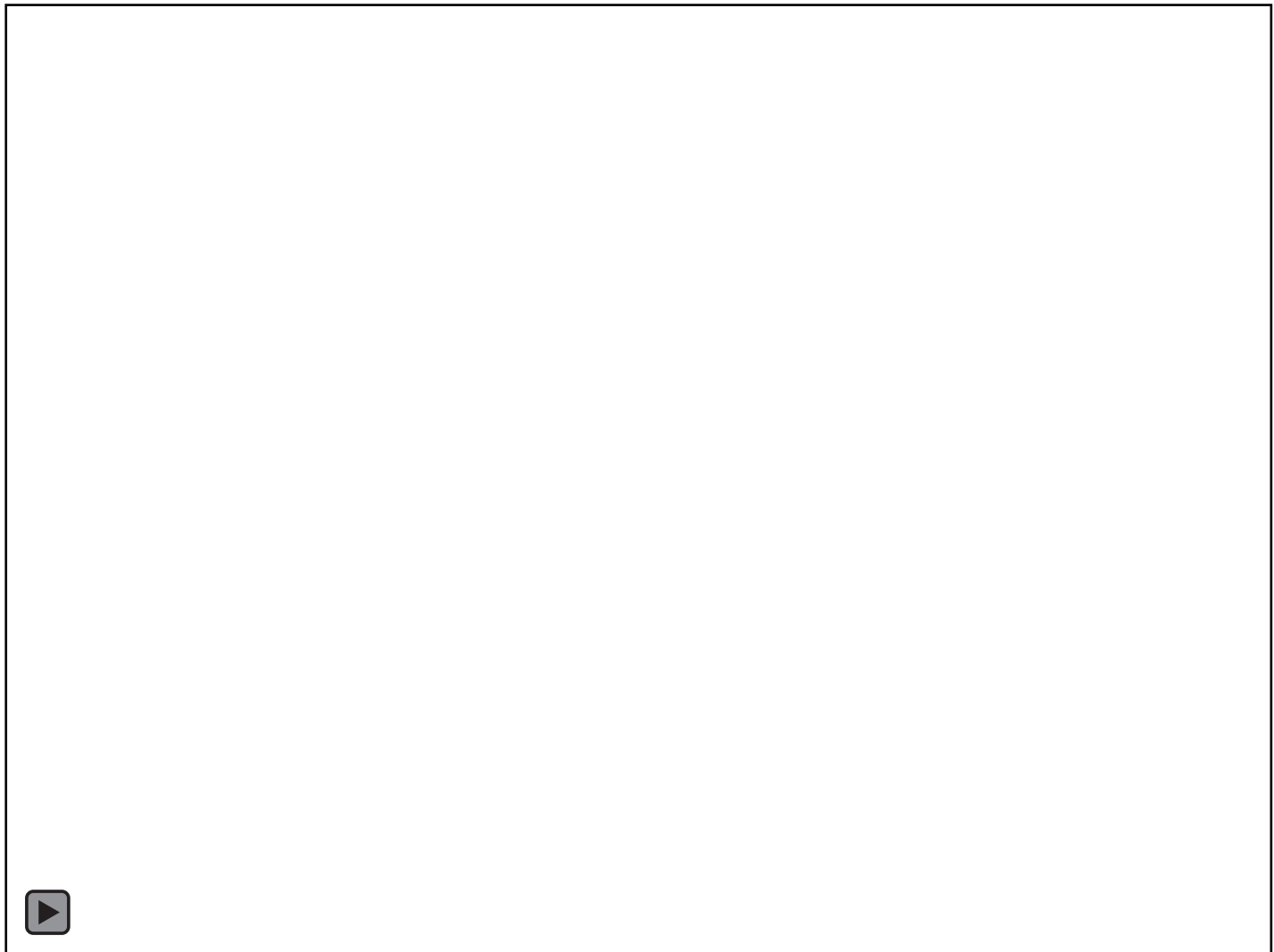
Pump Introduction: 1 The Agila Infusion System

FRESENIUS
KABI



Florence

Meet Florence



Meet Louise



The Virtual Nurse in action

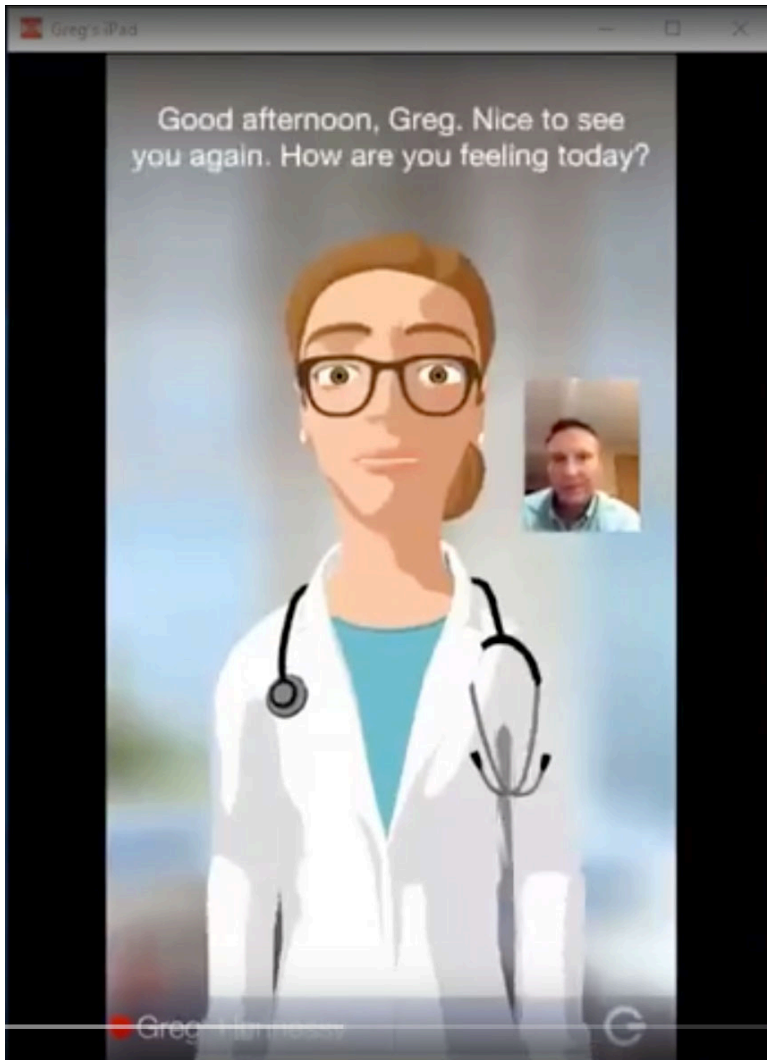


Video courtesy of [Simplifilm](#)

Meet Alice



Meet Molly



Meet Sophie

The Embodied Conversational Agent (ECA)

Not just a pretty face...

- Computational linguistics
- Multimodal interfaces
- Computer graphics
- Autonomous agents
- Human-to-human conversation



ECA Models

- Verbal communication
- Nonverbal communication
- Context of the conversation
- Autonomous agents
- Psychophysiological data

The Relational Agent

What is a Relational Agent?

Build and maintain a long-term, social-emotional relationship with the patient

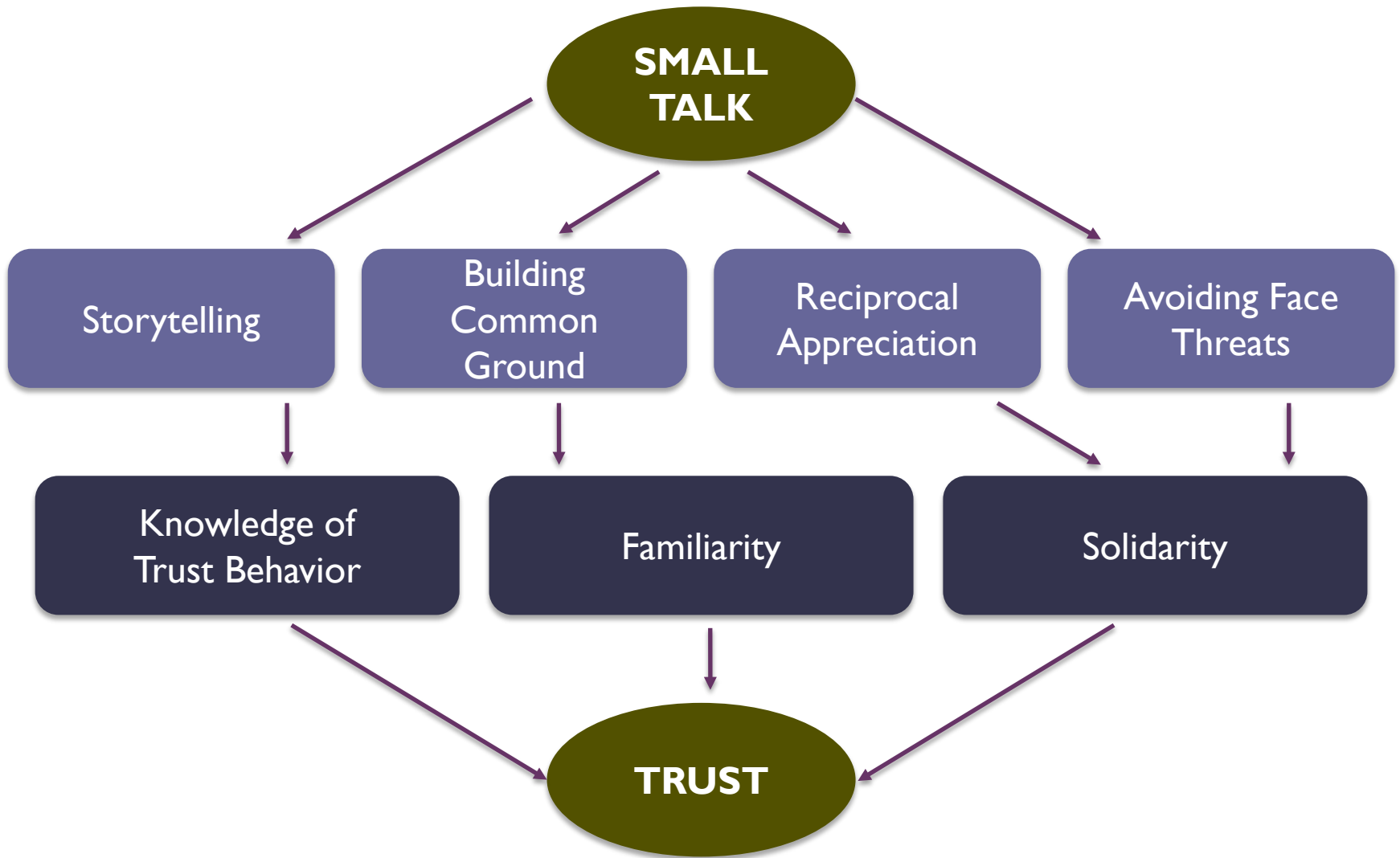
Relational Strategies:

- Social dialogue
- Empathy
- Nonverbal "liking" behaviors

Long-term Engagement Strategies:

- Variability in dialogue
- Autobiographical back story





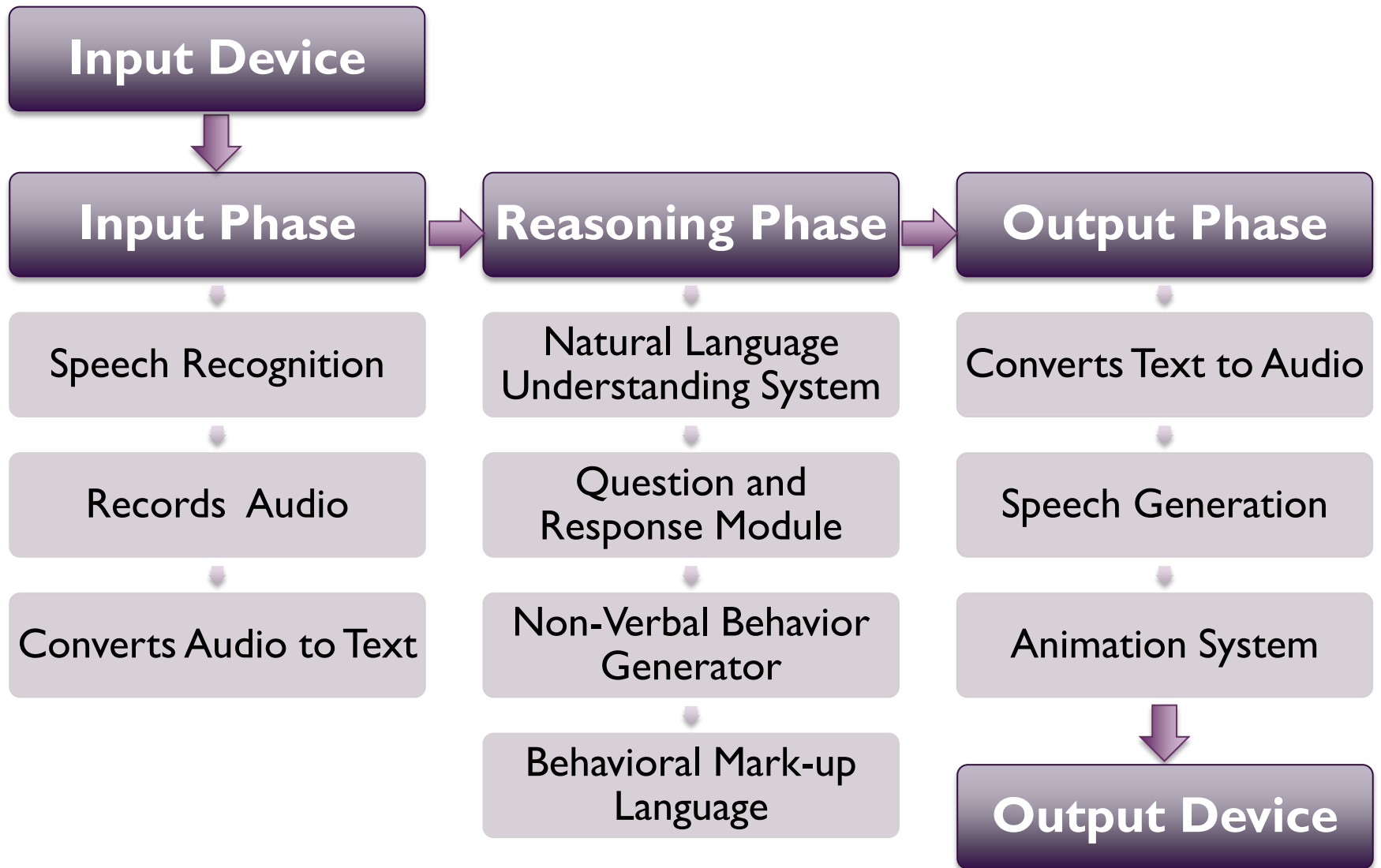
Conversational Strategies

Non-Verbal Behaviors

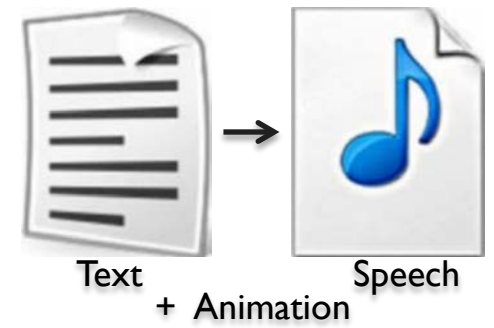
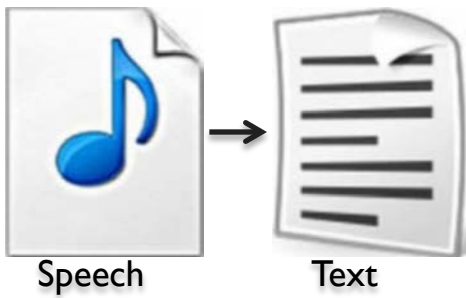
- Express emotion
- Communicate interpersonal attitudes
- Support speech



The Technology



How does the technology work?



Input Phase

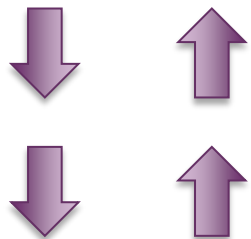


Output Phase

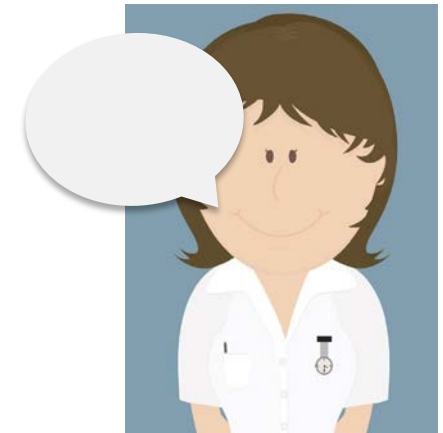
Input Device

Reasoning Phase

Output Device



- Natural Language Unit
- Question and Response Module
- Non-Verbal Behavior
- Behavior Markup Language



In Other Words

Text Received

Text Analyzed

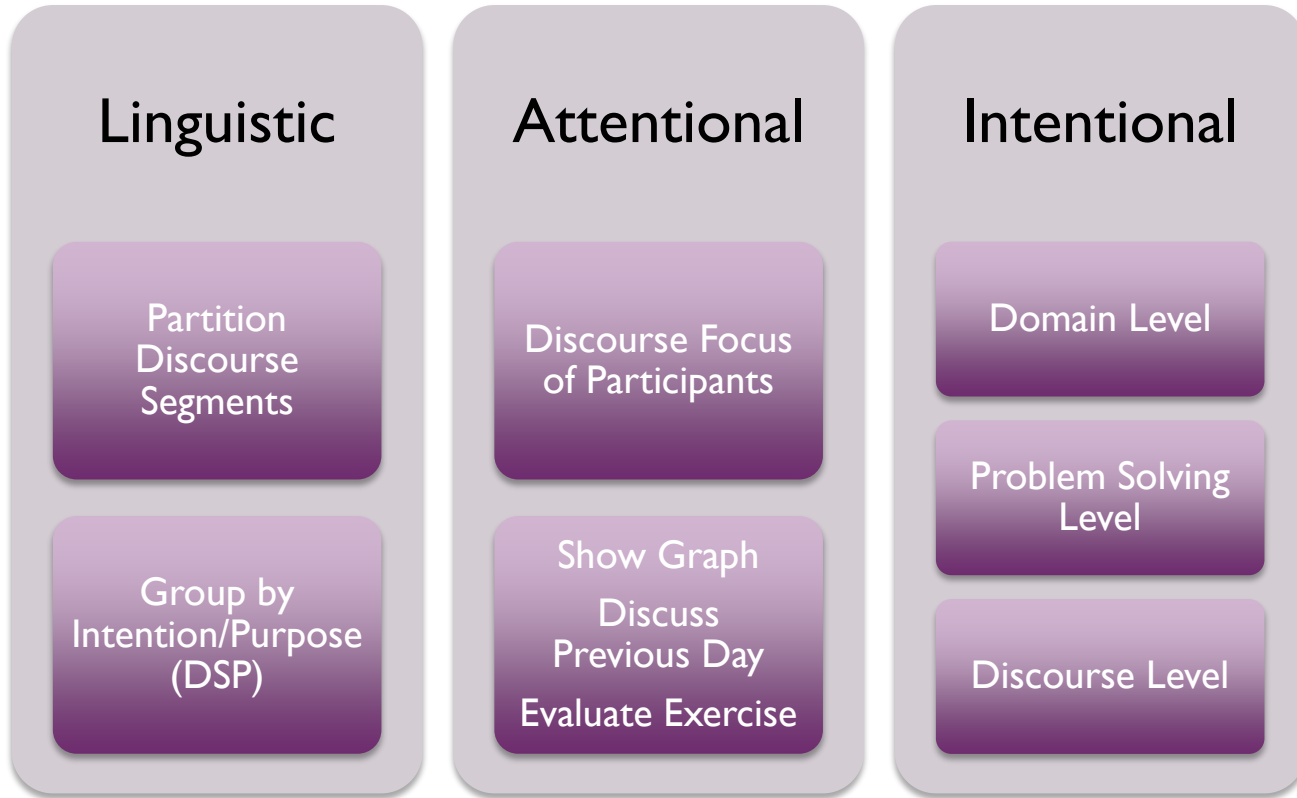
Verbal Response Selected



Photo credit: <http://www.adamheine.com/2013/07/writing-game-dialogue.html>

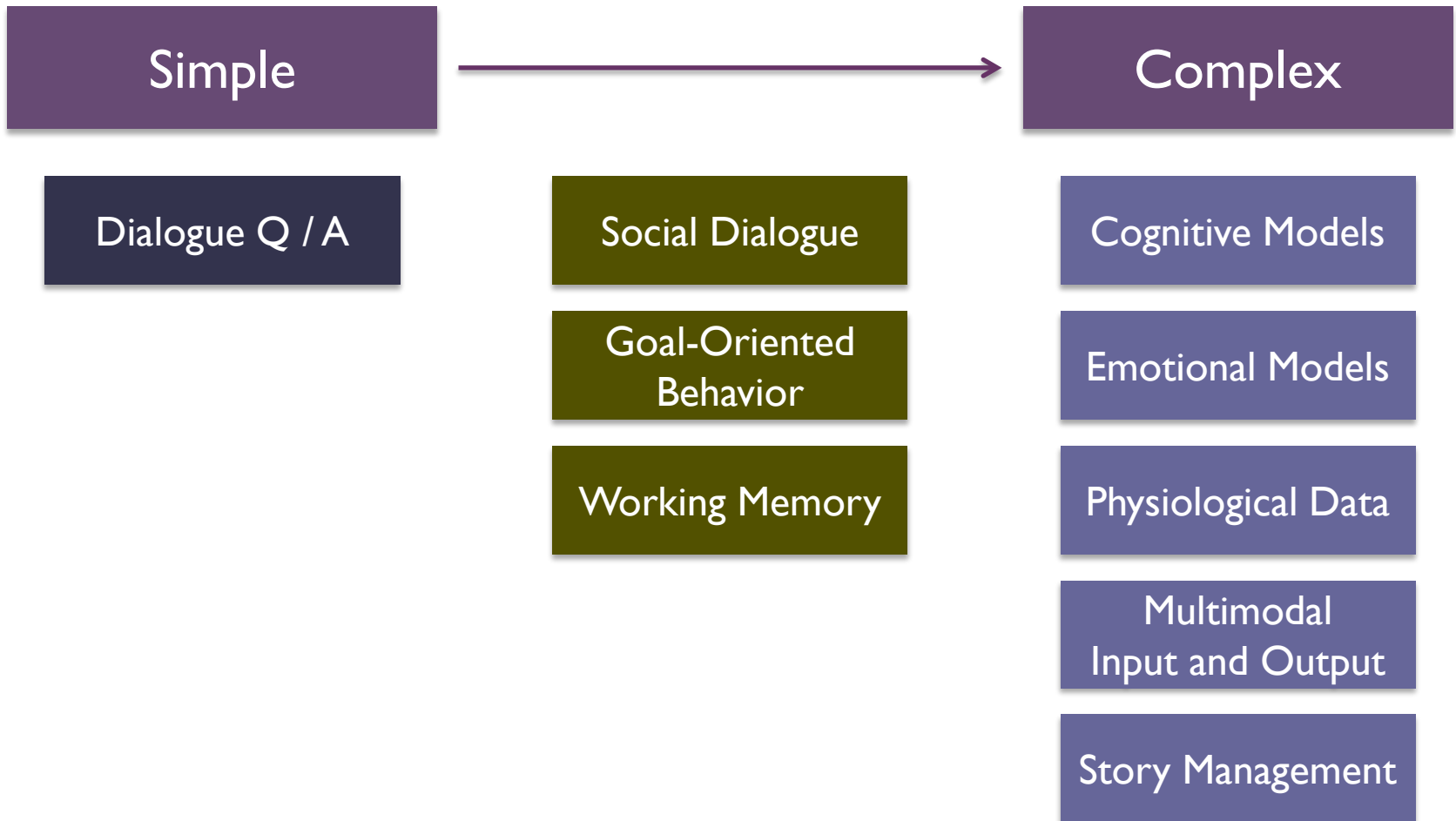
Question and Response

Natural Language Understanding Model

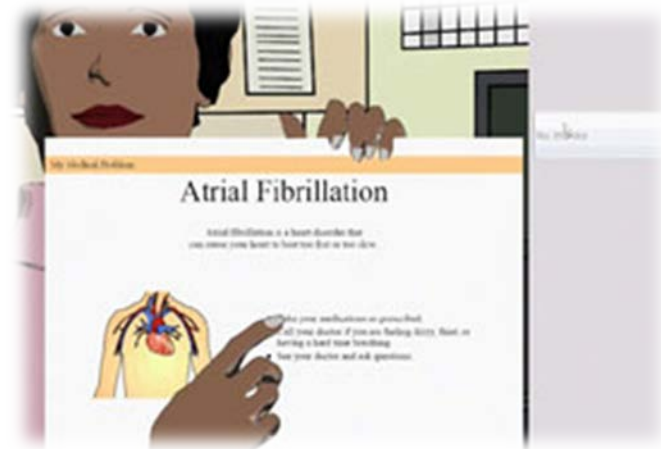


Dialog / Discourse Management

The Virtual Human Nurse



Evolution to Realistic Virtual Human



Progression of the Nurse Avatar



Meet Abby

Research in Health



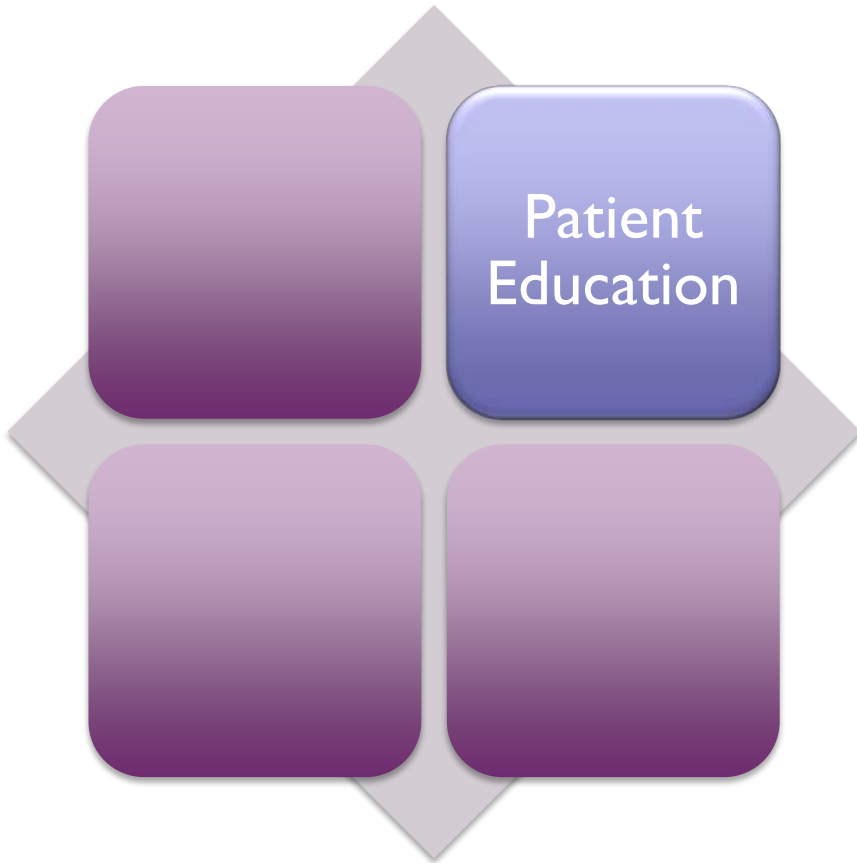
What do patients think?



Nursing Tasks

- Explain medical documents
 - Consent forms
 - Advanced care planning
- Collect family health history

Outcomes

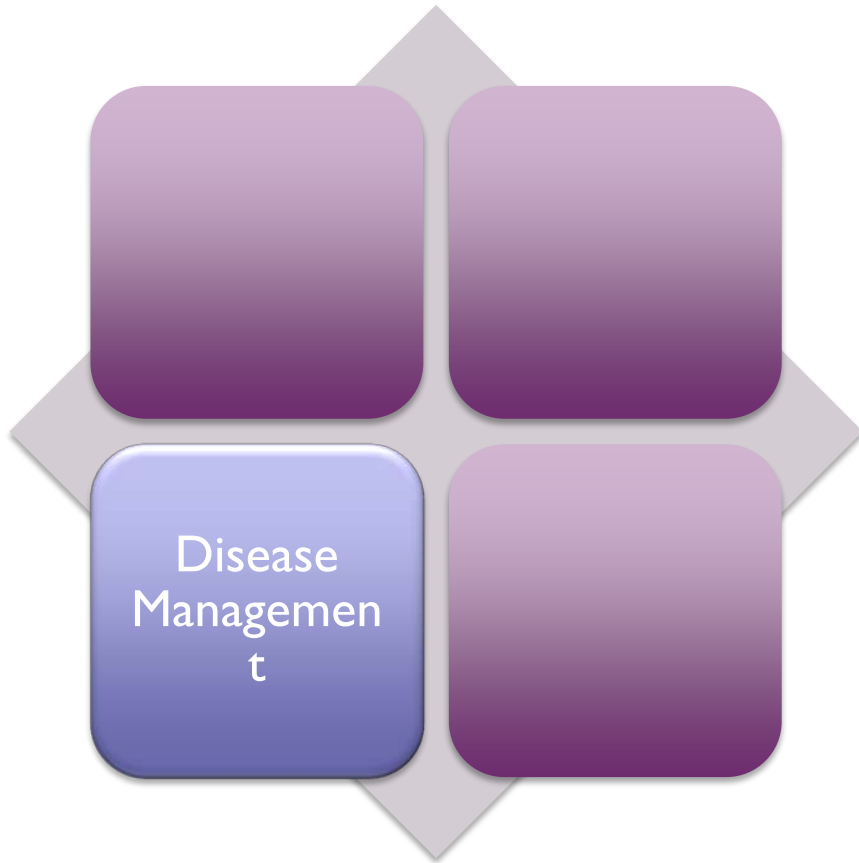


- Discharge teaching
- Ileostomy education

Planned

- Diabetes
- Anesthesia
- Spinal cord injury
- Atrial fibrillation
- Lactation
- Schizophrenia

Outcomes



- Heart failure knowledge and self-management
- Diabetes lifestyle coach
- Depression self-management
- Overactive bladder self-management

Outcomes



- Promote walking in older adults
- Breastfeeding promotion
- Promote healthy behaviors:
 - Increase physical exercise
 - Fruit and vegetable intake
- Adherence to antipsychotic medication

Outcomes

Challenges / Concerns

- Unable to make complex moral judgments
- Unable to engage in collaboration
- Need to create virtual characters that can learn from users and adapt to their preferences
- Need to insure privacy and security

Avatar Creation

Websites

- SitePal: <http://www.sitepal.com/>
- Voki: <http://www.voki.com/>
- Learnbrite: <http://bringto.life/>

Software

- Reallusion: <https://www.reallusion.com>
- Adobe: <https://www.mixamo.com/fuse/>
- Logic Junction: <http://logicjunction.com>



Create a Nurse Avatar

Customizable Solutions

- Medical Avatars: <http://medicalavatar.com/>
- True Image Interactive:
<http://trueimageinteractive.com/>
- iDAvatars: <https://www.idavatars.com/>
- Sensely: <http://sensely.com/>



Buy a Nurse Avatar

Deploy a Nurse Avatar

- Tablet
- Computer
- Mobile phone
- Smart watch
- Website
- Patient portal
- Patient education video, powerpoint, or e-learning
- Online learning games
- Kiosk

SitePal™

WELCOME Let's Get Started!

- 1 Choose your base model
- 2 Accessorize your model to your liking
- 3 Choose a background
- 4 Add audio to your model
- 5 Add a function to your player



LET'S START

Do not show this message again

1

Models



2

Accessories



3

Backgrounds



4

Audios



5

Players



Make an Avatar

Create an Agent

Location

Words to Speak

Actor Voice

Actor Shot Type

Actor Position

Actor Size

Email

The image shows the Wikipedia homepage with a 3D female avatar overlaid on the right side. The avatar is a woman with brown hair, wearing a dark blue dress with a light-colored sash. The Wikipedia homepage features the logo "WIKIPEDIA The Free Encyclopedia" at the top, followed by a grid of language options with article counts: English (5,443,000+), 日本語 (1,068,000+), Español (1,344,000+), Deutsch (2,081,000+), Русский (1,408,000+), Français (1,889,000+), Italiano (1,371,000+), 中文 (952,000+), Português (973,000+), and Polski (1,232,000+). Below the language options is a search bar and a "Read Wikipedia in your language" button. At the bottom, there are links to various Wikimedia projects like Commons, Wikibooks, Wikiversity, Wikisource, Wikivoyage, Wikinews, Wikiquote, and Wikispecies. A small text box on the left side of the page states: "Wikipedia apps are now available: Download for iOS on the App Store, Download for Android on Google Play, View full list of available Wikipedia apps".

Overlay an Avatar

A rose by any other name...

- Virtual Nurse Agent
- Animated Pedagogical Agent
- Intelligent Virtual Agent
- Embodied Interface Agents
- Embodied Conversational Agent (ECA)
- Relational Agent (RA)
- Virtual Human

The Virtual Patient

The Perfect Match



Photo credit: www.drexel.edu

A Word About Second Life...



Photo credit: <http://secondlife.com/destination/nightingale-isle>

Summary

Summary

- Defined the term avatar and explored where it originated
- Traced the avatar's evolution from computer games to healthcare
- Became acquainted with a number of nurse avatars
- Discussed the design and capability of avatars, including the Embodied Conversational Agent and the Relational Agent
- Explored areas that the avatars are showing promise in healthcare:
 - Collecting information
 - Patient education
 - Disease management
 - Behavioral change coaching
- Identified challenges / concerns / ethical considerations raised around nurse avatars

Goodbye!