

Patient Exam Cameras

An Overview of the Market and Technology

December 30, 2010

A Webinar from the Telehealth Technology Assessment Center

Welcome

- Slides and recorded presentation will be posted to the website – www.telehealthtac.org
- Funding for this presentation comes from the Health Resources and Services Administration, the Office for the Advancement of Telehealth, and Indian Health Services
- Presented in partnership with the Regional Telehealth Resource Centers – www.telehealthresourcecenters.org

Welcome – Overview of Today's Talk

- Definition of Terms and Technology Overview
- Product Overview
- Making Them Work With VTC
- Making Them Work With S&F
- Image Comparisons
- Usability Review
- Summary
- The Toolkit
- Q&A

Definition of Terms

A look at the terminology associated with exam cameras, including details specific to patient exam cameras, camcorders, and digital cameras

Definitions – The Categories

- Exam Cameras
 - Live video output
 - Supports one-handed operation
- Patient Exam Cameras
 - In-camera lights, freeze/still images
 - AMD and GlobalMedia
- Camcorders
 - Recording capabilities
 - Consumer-grade technology

Definitions – The Categories

- Point-and-Shoot Digital Cameras
 - Recording capabilities
 - Consumer-grade technology
- Security Cameras
 - Simple interface
 - No physical controls

Definitions – Resolution

- Standard Definition
 - 640x480 pixels (NTSC)
 - ~300,000 pixels, or $< 1/3$ megapixel
 - Uses S-Video or Composite cables / connectors
 - 4:3 aspect ratio
- High Definition
 - 720 vs 1080
 - ~1 megapixel vs ~2 megapixels
 - Uses HDMI or Component cables / connectors
 - 16:9 aspect ratio

Definitions – Frames and Scanning

- Frame Rate
 - The number of frames per second
 - 24, 25, 30, 50, 60, 72
 - Not especially clinically relevant
- Interpolation and Progressive Scanning
 - Interpolation – scanning every other horizontal line every other frame
 - Progressive – scanning the entire image every frame

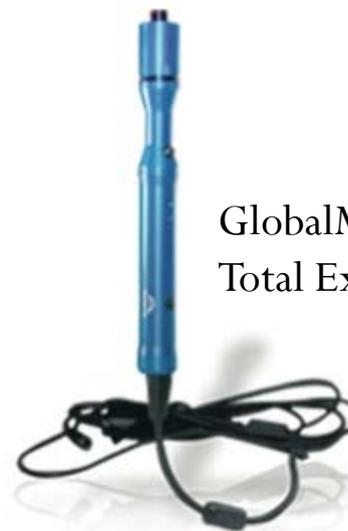
Product Overview

A more detailed look at what devices or technologies are included in the review, their features, their strengths, and their weaknesses

Patient Exam Cameras



AMD-2500
General Exam Camera



GlobalMedia
Total Exam Camera

Patient Exam Cameras – Overview

- S-Video output
- External power
- Built-in light
- Manual focus
- Freeze-frame / pause
- No in-camera recording capability
- Expensive

Camcorders



Camcorders - Overview

- Larger market, consumer product
- Video output – HDMI and “standard-definition” outputs
- Some have built in lights
- Records videos and photos
- Various focusing options
- Does not have an easy way to “pause” a live video
- Relatively inexpensive

Digital Cameras



Digital Cameras – Overview

- Larger market, consumer product
- Video output – HDMI and “standard-definition” outputs
- On-camera flash
- Records videos and photos
- Focusing can be a problem
- Does not have an easy way to “pause” a live video
- Relatively inexpensive

Security Cameras



Security Cameras - Overview

- Standard-definition output
- No controls or buttons
- Automatic focus
- No macro capability
- Cheap

Making Them Work With VTC

Getting exam cameras to work with videoconferencing systems.

VTC Overview – Inputs

- Videoconferencing systems often support auxiliary inputs
 - VCR, DVD player, etc
 - Older Tandberg units supports Composite inputs
 - Tandberg C* series codecs may support HDMI, Component, Composite and DVI
 - Polycom supports S-Video inputs
 - Vidyo does not support auxiliary inputs
 - Recommends using a “video scaler” device
 - Lifesize supports HDMI, Component, Composite, S-Video, and DVI inputs

Connections and Conversions

- Connecting to Standard Definition
 - S-Video and Composite connectors
 - Patient exam cameras and security cameras support this
 - Many camcorders and digital cameras support this through A/V outputs
 - May require S-Video to Composite converter, possible “gender-changer”
 - High-definition converters
 - Requires down-conversion from HDMI or Component to SD
 - Aspect ratio becomes a problem

Connections and Conversions

- Connecting to High Definition
 - HDMI and Component
 - Camcorders and digital cameras may support this
 - Patient exam cameras and security cameras do not
 - High-definition converters
 - Requires up-conversion from S-Video or Composite to HDMI or Component
 - Will not gain resolution in conversion
 - Aspect ratio becomes a problem

Desktop Videoconferencing

- USB-based converters
 - S-Video and Composite video can be attached to USB “dongles” that make the camera input appear as a webcam to desktop videoconferencing applications
 - Success may depend on software and USB converter
 - Would require switching the video source from the normal USB webcam to the converter

Making Them Work With S&F

Getting exam cameras to work with frame grabbers and store-and-forward systems.

Frame Grabbers

- Capture standard-definition video or high-definition video to a PC through a special card
 - Usually integrated with a store-and-forward software application
 - Same requirements as VTC systems
 - Converters, connectors, etc

Full-Resolution Captured Content

- Digital cameras and camcorders support capturing video and images to internal memory or removable media
- Requires USB connection or memory card reader
- Allows saved files to be transmitted
- Atypical “exam camera” scenario, but useful benefit of cameras and camcorders

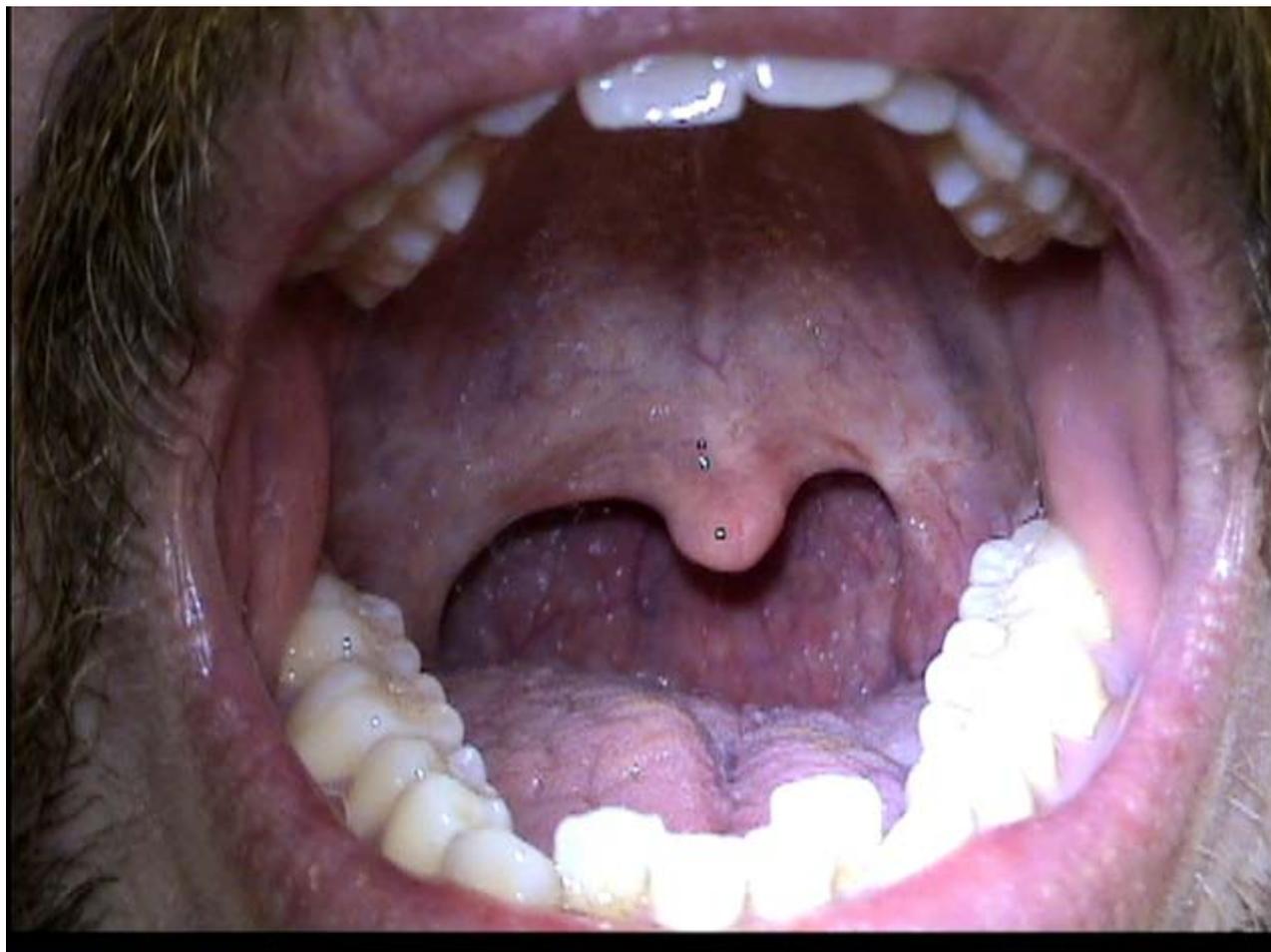
Image Comparisons

A review of images from various devices, looking at detail and color.

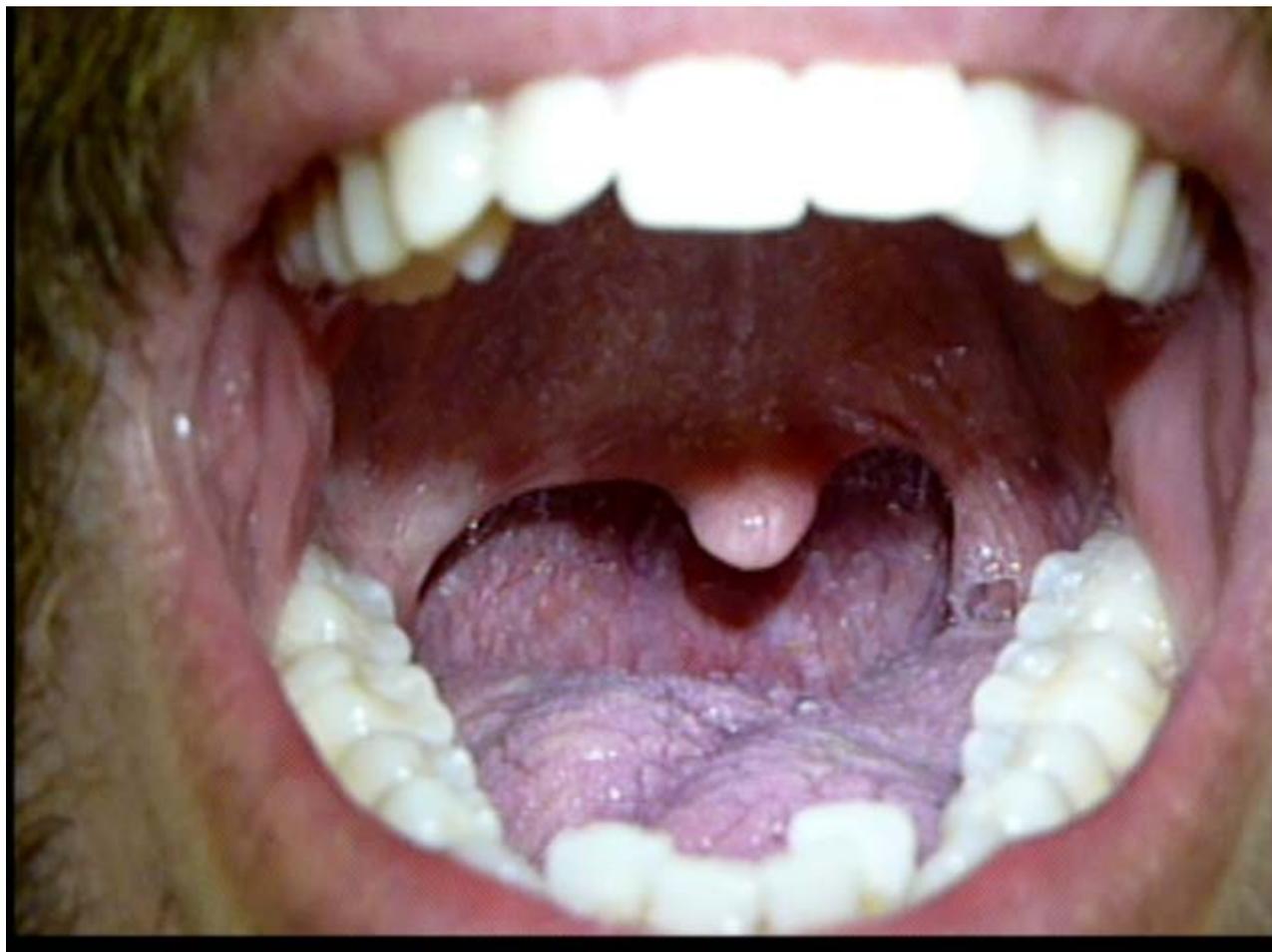
Mouth – Patient Exam Camera



Mouth – Old Camcorder



Mouth – Point-and-Shoot



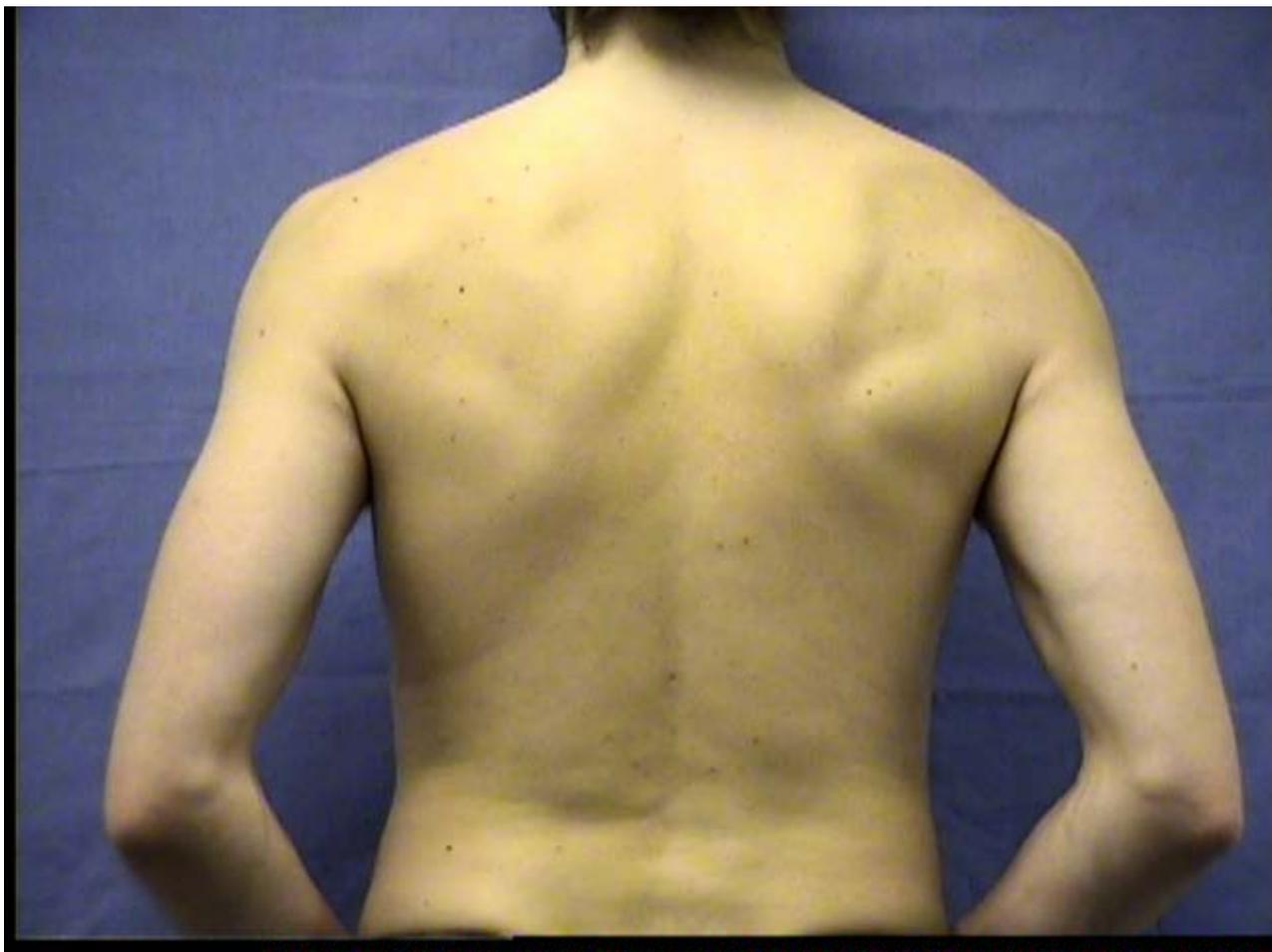
Mouth – New Camcorder



Mouth – New Camcorder, no light



Back – Patient Exam Camera



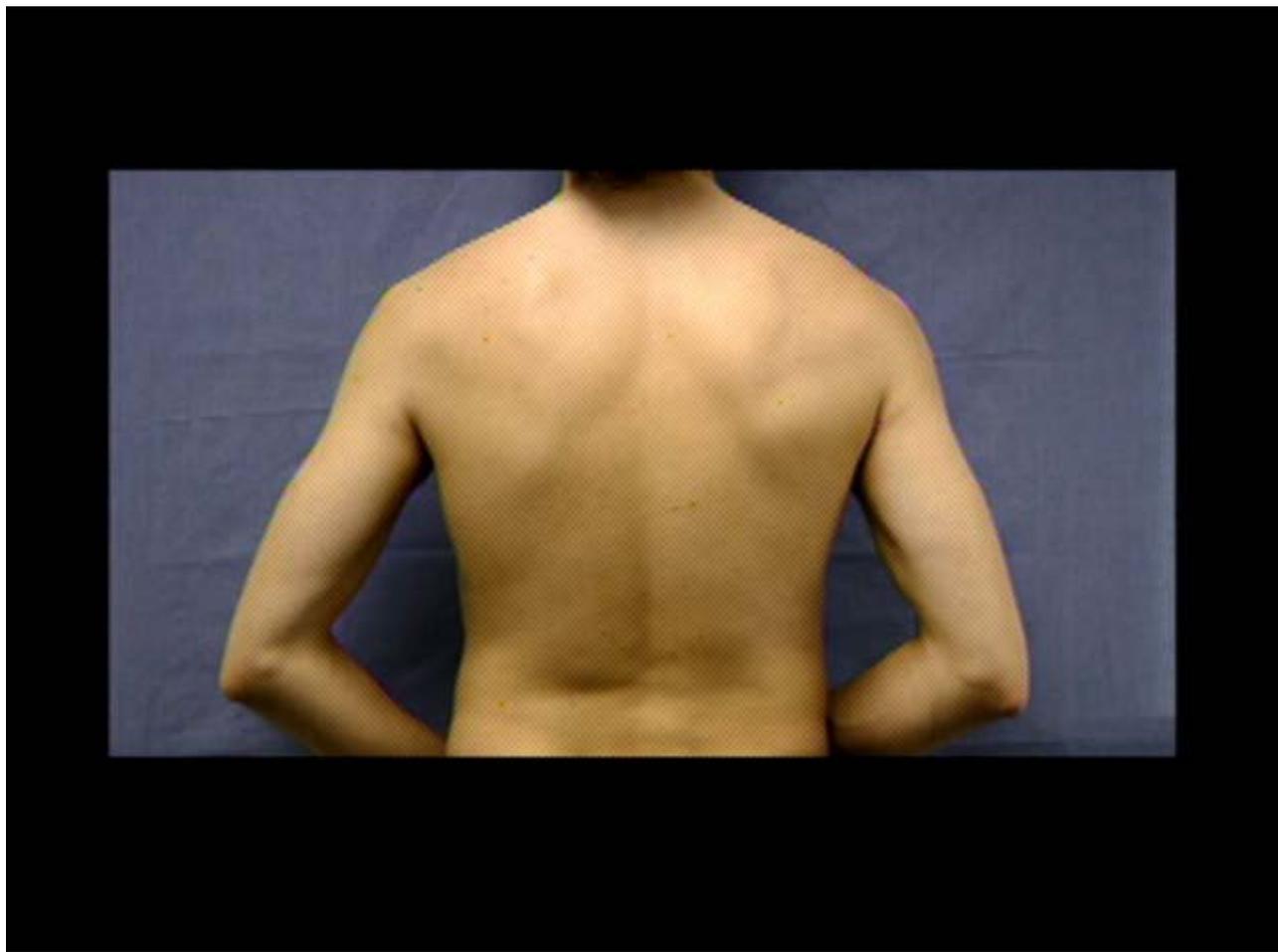
Back – Patient Exam Camera



Back – Point-and-Shoot



Back – New Camcorder



Vitiligo – Old Camcorder



Vitiligo – Patient Exam Camera



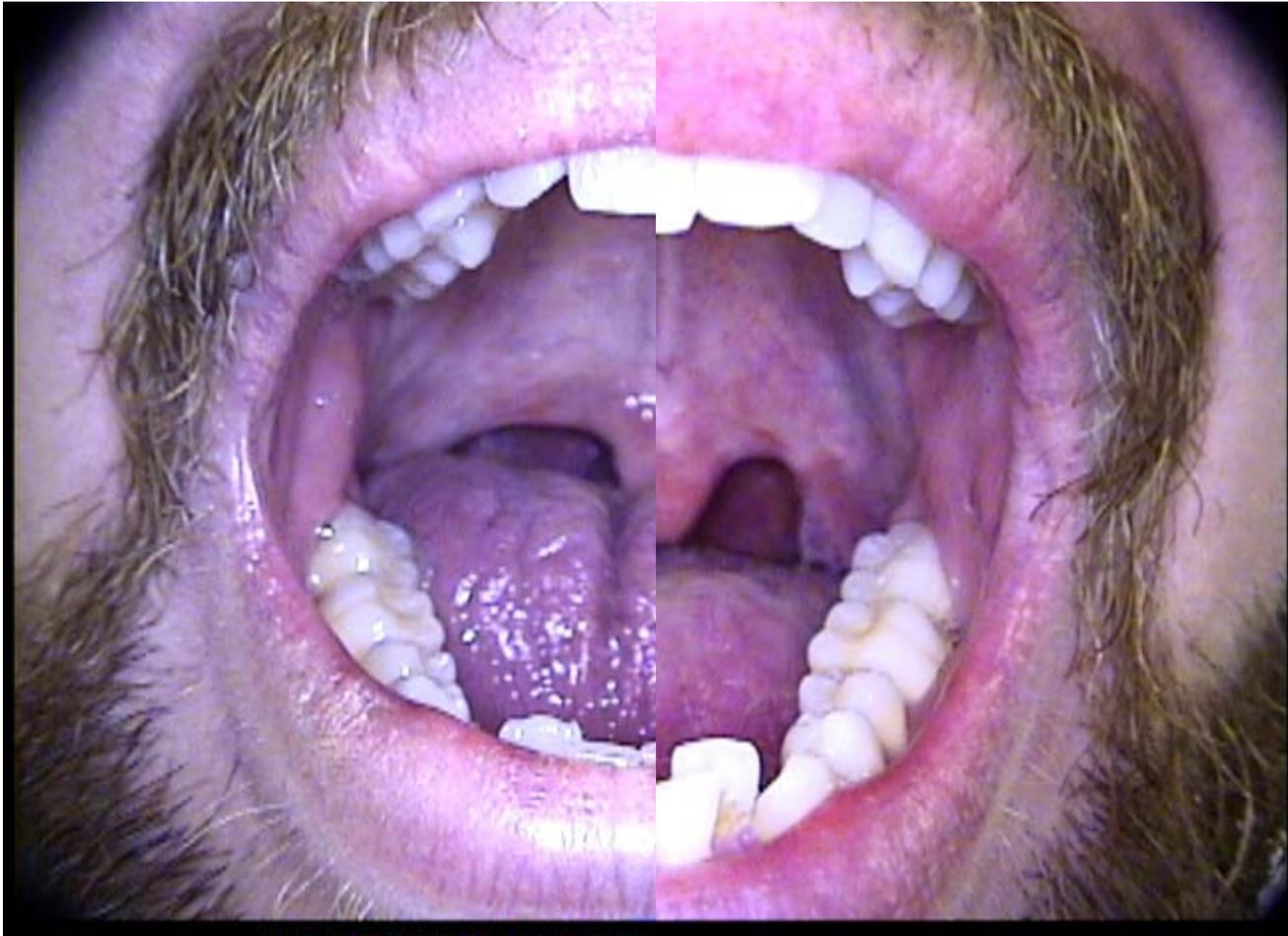
Vitiligo – Patient Exam Camera



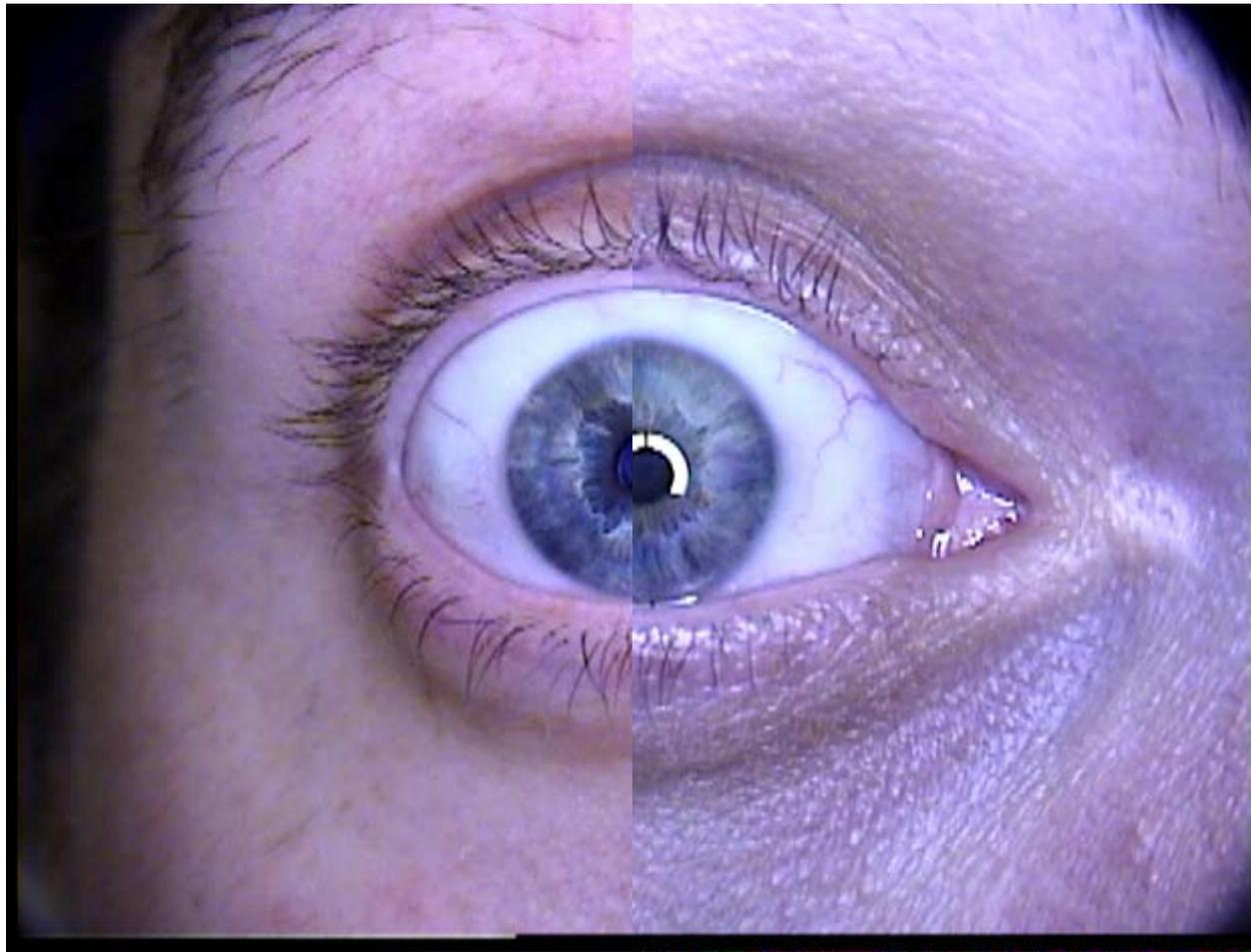
Vitiligo – New Camcorder



Mouth – AMD 2500



Eye – AMD 2500



The Benefit of Image Recording – Patient Exam Camera



The Benefit of Image Recording – Patient Exam Camera



The Benefit of Image Recording – Patient Exam Camera



The Benefit of Image Recording – Camcorder Playback



The Benefit of Image Recording – Camcorder Playback (Zoomed In)



The Benefit of Image Recording – Digital Camera Playback



The Benefit of Image Recording – Digital Camera Playback (Zoomed In)



Usability Review

A quick overview of the TTAC review of mechanics and ease-of-use for patient exam cameras, camcorders, digital cameras, and security cameras.

What We Compared

Mechanics-Rating 1-5
Overall Feel
Appearance
Material
Durability of Camera
Mounting brackets/hardware
Accessibility of Ports
Durability of Ports
Power
Button Layout & Configuration
Ease-of-use-(Rating 1-5)
Powering On / Off
Settings
Connectivity & Cables
Recording and Playback (Capture)
Ease of Image Freeze / Review
Lighting
Macro (Measurement=)
Focus
Color balance
Zoom

Summary

Summary

- Telehealth specific exam cameras work very well, and are highly rated
- Camcorders and digital cameras may provide a valid option in some scenarios
- Security cameras are not recommended for use in telehealth

Toolkit

- A toolkit on Patient Exam Cameras is available at the Telehealth Technology Assessment Center's website – www.telehealthtac.org
- Includes more information, additional comparison data, and will have labeled sample images available for review

Webinars

- Beginning a monthly webinar schedule in January
- Looking for webinar ideas – either requests for information or offers to give a presentation
- Adding podcasts to our lineup of content

Questions

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