Conflict of Interest

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Lakisha McNeil, Care coordination

Has no real or apparent conflicts of interest to report.
Conflict of Interest

Nick Patel M.D., Benjamin Schooley Ph.D., Lakisha McNeil

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Other: N/A
Agenda

- Introduction of panelists
- Overview of current patient education
- Gaps in education
- Review current data
- Review preliminary results of POC at Palmetto Health
- Next steps
PANEL INTRODUCTION

• Nick Patel M.D. - Exec. Medical Director Clinical Informatics
• Ben Schooley, Ph.D. - Director, Health IT Consortium, College of Engineering and Computing, USC
• Lakisha McNeil - Patient Educator, PH-USC Medical Group
Who We Are

• Largest, locally owned, not-for-profit hospital system in South Carolina
• USC School of Medicine partnership
• Approximately 1,500 beds across 5 hospitals
• 13,000 employees
• Approx. $180 million in charity care
• Level 1 trauma center; approximately 140,000 ER visits/year
• Full Cerner integration – Palmetto Health
• Full Epic integration - GHS
## The Big picture: Need for improving education

| **Reduced adherence** | Missed appointments  
Confusion of treatment plan  
Medication errors  
Medication noncompliance |
|-----------------------|--------------------------------------------------|
| **Patient dissatisfaction** | Worsening survey scores (CGCAPS/HCAHPS)  
Loss of patients  
Disjointed care |
| **Higher expense** | More ER visits  
Readmissions  
Higher services  
Complications |
EDUCATION CHALLENGES

- LACK OF INFORMATION RETENTION (MEMORY)
- VAST AMOUNTS OF AVAILABLE INFORMATION ON THE INTERNET
- PATIENT ANXIETY PRE-PROCEDURE/INTERVENTION
- PATIENT HEALTH LITERACY\(^1\)
- ADHERENCE TO SCHEDULED PROCEDURES, MEDICATIONS, MEDICAL INSTRUCTIONS\(^2\)
- PATIENT RELATIONSHIP WITH PROVIDER, COMMUNICATION\(^3\)
- TIME
- CONNECTING EDUCATION WITH IMMEDIATE PATIENT NEEDS
- PATIENT VS PROVIDER ACCOUNTABILITY
Patients don’t remember

- In traditional instruction
  - 40-80% of medical information provided by healthcare practitioners is forgotten immediately.
  - The greater the amount of information presented, the lower the proportion correctly recalled.
  - Almost half of the information that is remembered is incorrect.
Why?

- Clinician/Provider Issues (such as low empathy, use of difficult medical terminology, lack of time)
- Mode of information Issues (e.g. spoken vs written vs visual)
- Patient Issues (such as low education, low health literacy, or expectations)
Good and bad Information is readily available

Patients are seeking information about their health
- 75% of adults have looked for health or medical information
- 60% of adults have searched for health information online
- Searching for health information is one of the top 3 most popular online activities
- Caregivers are more likely than other adults to take part in a wide range of health-related information and engagement activities

Caregivers and health activities
% of caregivers vs. non-caregivers who do the following health-related activities ...

- Consult online reviews of drugs: 13% vs. 24%
- Got information, care, or support from others with the same condition: 21% vs. 30%
- Got information, care, or support from friends and family: 28% vs. 46%
- Go online for a diagnosis: 33% vs. 52%
- Participate in any online social activity related to health in past year: 54% vs. 70%
- Gather health information online: 72%

Source: Pew Internet Health Tracking Survey, August 07 – September 06, 2012. Total number ("n") of interviews=3,014 adults ages 18+. Interviews were conducted in English and Spanish and on landline and cell phones. Margin of error is +/- 2 percentage points for results based on all adults.
But...Most do not understand

Health literacy in the U.S.: Proficient: 12%; Intermediate: 53%; Basic health literacy: 22%; Below Basic health literacy: 14%

• More than 1 in 2 adults can’t:
  – Use a BMI graph to find their healthy weight
  – Understand a vaccination chart
  – Read a drug label

• Older adults are 3 times more likely to have below basic health literacy skills than adults ages 16 to 49
• Hispanic/Latina adults are 4 times more likely to have below basic health literacy skills than white adults
• People with poor health are 5 times more likely to have below basic health literacy skills than people with good health
• Lower educational levels are associated with lower health literacy, which in turn is associated with lower rates of instruction adherence (Ojinnaka et al., 2015).
Patient fears: A barrier to understanding

- Patient fears are a barrier to understanding their condition and affects compliance
- 10 to 25% of patients experienced significant fear in advance of minor surgeries (Burkle, 2014)
- Fear effects memory performance: Peripheral information, such as education, therapy adherence or follow-up appointments, is not processed and stored into memory
- Patient concerns and fears about medical conditions and procedures include:
  - fear of sensory/discomfort (such as pain, gagging, needles) (Drossman, Brandt, Sears, & Li, 1996; Subramanian, Liangpunsakul, & Rex, 2005);
  - fear of adverse outcomes (such as the possibility of finding cancer, leading to a need for surgery);
  - fear of medical mistakes and their consequences (such as not enough sedation, procedural accidents, insufficient knowledge about the procedure, possibility of a need for additional procedures) (Hagiwara et al., 2015);
  - and other fears (fear of physicians, concern about others watching the procedure).
- Patients often have multiple concerns, identified in more than one category (Brandt, 2001; McEntire, Sahota, Hydes, & Trebble, 2013).
Communication challenges

- 70% of accidental deaths and serious injuries in hospitals are linked to communication failures
- $12 billion wasted annually as a result of communication inefficiencies
- Patients perceive communication with the provider as important
Adherence

50% of patients do not take their medications as prescribed and 33% percent never even fill their first prescription.

700,000 Americans experience adverse reactions to prescribed drugs that require an emergency room visit.

$290 billion per year is estimated to be lost due to underuse, non-use, and overuse of prescription medicines.

The true cost of non-compliance is staggering. Two-thirds of patients do not take their medications correctly.

Patients take some of their medicine, 1/3

Patients don’t take any medicine at all or RX never filled, 1/3

Patients take all of their medicine, 1/3

Poor adherence to treatment of chronic diseases is a worldwide problem of striking magnitude

50% or lower depending on country

For every 100 prescriptions written:

50-70% are filled at the pharmacy
48-66% are picked up from the pharmacy
25-30% are taken properly
15-20% are refilled as prescribed

The importance of patient education

- REDUCING PATIENT ANXIETY PRE-PROCEDURE/INTERVENTION
- INCREASING PATIENT COMPREHENSION OF CONTENT
- INCREASING PATIENT UNDERSTANDING ABOUT HEALTH
- INCREASING ADHERENCE TO SCHEDULED PROCEDURES
- IMPROVING MEDICATION INSTRUCTIONS
Key Components:

Education solution

- A foundational belief that information is critical to anyone’s successful health journey
- Content that’s easy to understand
- Unbiased and evidence-based information
- Teach with visuals
- Personalize the communication
- Appropriate pre and post communications
- Connect the education with practical actionable steps
Making it Visual

Education modes tested in prior research

- CARTOON IMAGES
- EDUCATIONAL BOOKLETS
- PAPER HANDOUTS
- EDUCATIONAL PAMPHLETS
- 2D VISUAL AIDS
- MUSIC
- TELEPHONE BASED EDUCATION PRE-PROCEDURE/VISIT
- VIDEOS
- 3D IMAGES
- COMPUTER BASED TRAINING
- TEACH-BACK METHOD\(^6\)
Enhanced Instructions = Better understanding

• Regular instruction = verbal and/or written/printed materials
• Enhanced instruction = videos, cartoons, 3D models
• Example study: Instruction for colonoscopy preparation
• Tested regular instruction, enhanced instruction, and regular + enhanced instruction
• The study found benefits from E.I. irrespective of purgative medication types or diet restrictions
• E.I. led to:
  – Better patient preparation
  – Cleaner colons
  – Greater patient willingness to repeat bowel preparation
  – (Guo et al., 2017).
Formal education

The internet and digital technologies give teachers more access to teaching resources, yet also increase the range of content and skills they must be knowledgeable about.

Have the internet and other digital technologies had a major impact, minor impact, or no impact on you personally in each of the following ways?

- Giving you access to more material, content and resources to use in your teaching: MAJOR (92%), MINOR (8%), NO IMPACT (8%)
- Increasing the range of content and skills you need to be knowledgeable about: MAJOR (75%), MINOR (22%), NO IMPACT (3%)
- Allowing you to share ideas with other educators: MAJOR (68%), MINOR (29%), NO IMPACT (4%)
- Enabling interaction with parents: MAJOR (67%), MINOR (30%), NO IMPACT (3%)
- Enabling interaction with students: MAJOR (57%), MINOR (37%), NO IMPACT (6%)
- Generally requiring more work for you as a teacher: MAJOR (41%), MINOR (42%), NO IMPACT (18%)

Source: The Pew Research Center’s Internet & American Life Project Online Survey of Teachers, March 7 to April 23, 2012, n=2,462 middle and high school teachers.

- The top 3 reasons for teachers to use technology in the classroom
  - Adapt to diverse learning styles (76%)
  - Boost student motivation (77%)
  - Enhance the material being taught (76%)
- 29% of teachers use social media for coursework, compared to now 80% of college professors
- 43% of teachers have used online games in the classroom
Updating our Tools

Adopting technology Vs Technology adapting to us
Gaps in education delivery

• GAPS IN CONTENT, DELIVERY, AND PORTABILITY
  o DIVERSITY OF MOBILE DEVICES
  o ONLINE PATIENT AND PROVIDER FACING
  o INTERACTIVE 3D
  o INTERACTIVE VIDEO
  o SOCIAL MEDIA CONNECTED
  o VIRTUAL REALITY / AUGMENTED REALITY
  o PATIENT CENTERED
  o SHARED DECISION MAKING/CUSTOMIZATION
  o PATIENT DIRECTED - REPEAT ACCESS AND DELIVERY
Barriers to mobility

• Organizational
  – Limited resources to support
  – BYOD vs health system ownership
  – Cost
  – Wireless network support
  – Pre-existing policies, procedures, protocols for change management

• Technology
  – Security concerns
  – Compatibility to software solutions
  – Learning curve
  – Device choice (form factor)
Power of Mobile Tablet Computing

Impacts of mobile tablet computing on provider productivity, communications, and the process of care

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ABSTRACT

Objective: Health information technology investments continue to increase while the value derived from their implementation and use is missed. Mobile device adoption into practice is a recent trend that has increased dramatically and formal studies are needed to investigate consequent benefits and challenges. The objective of this study is to evaluate practitioner perceptions of improvements in productivity, provider-patient communications, care provision, technology usability and other outcomes following the adoption and use of a tablet computer connected to electronic health information resources.

Methods: A pilot program was initiated in June 2013 to evaluate the effect of mobile tablet computers at one health provider organization in the southeast United States. Providers were asked to voluntarily participate in the evaluation and were each given a mobile tablet computer. A total of 42 inpatient and outpatient providers were interviewed in 2015 using a survey style questionnaire that utilized yes/no, Likert-style, and open ended questions. Each had previously used an electronic health record (EHR) system a minimum of one year outside of residency, and were regular users of personal mobile devices. Each used a mobile tablet computer in the context of their practice connected to the health system EHR.

Results: The survey results indicate that more than half of providers perceive the use of the tablet device as having a positive effect on patient communications, patient education, patient’s perception of the provider, time spent interacting with patients, provider productivity, process of care, satisfaction with EHR when used together with the device, and care provision. Providers also reported feeling comfortable using the device (82.9%), would recommend the device to colleagues (69.2%), did not experience

- Improved Patient/Provider communications
- Review chart prior to going into room for a more directed visit (saves another 2-3 minutes)
- Faster note completion (same day)
- Ability to document anywhere
- Smaller technology footprint
- Improved workday
- Provider productivity
- Decreased patient wait times
- Faster triage
- No perceived negative impact on workflow, unlike most EHRs
Mobility on the rise

This infographic is from the CDW Healthcare Report (whitepaper). Source: IDC Health Insights Survey "Business Strategy: US Clinical Mobility 2011-2016".
How Benefits Were Realized

• Provider satisfaction (71%)
• Comfortable with device (83%)
• Reduced time spent after work documenting (64%)
• Improved access to health records (54%)
• Share real time data with patients at bedside
• Faster documentation (46%)
• Improved security of patient records (less printing)
• Secure network/fingerprint access/Windows
• Improved patient communication (54%)
• Overall improved patient education
• Improved workflow (64% reduced login times)
• Reduction in transcription costs
• Less desktops needed
Proof of Concept

Bedside multimedia content
OVERVIEW

PROOF OF CONCEPT

• 3 MONTHS
• 16-18 TABLET DEVICES
• 16-18 NURSE EDUCATORS AT PALMETTO HEALTH USC MEDICAL GROUP
• EVALUATION BY COLLEGE OF ENGINEERING AND COMPUTING, USC
• PATIENT SURVEY RESPONSES
• NURSE INTERVIEWS
Education solution includes specialty specific patient content

Current bundles used in study:

- Internal Medicine
- Health Education
- General Surgery
- Oncology
- Dermatology
- Ophthalmology
- Orthopedic
- Cardiac
- Women’s Health
- Pediatrics
PURPOSE

• PURPOSE: DETERMINE THE EFFICACY OF 3-D MULTI-MEDIA PATIENT EDUCATION ENABLED THROUGH MOBILE DEVICES.

• HYPOTHESIS: 3-D MULTI-MEDIA PATIENT EDUCATION DELIVERED BY MOBILE DEVICES AS PART OF THE CLINICAL CONSULT, IMPROVES PATIENT COMPREHENSION, ENGAGEMENT, AND OVERALL SATISFACTION, AS WELL AS CLINICIAN AND PATIENT INTERACTION.
Current state

PERSPECTIVE FROM CARE COORDINATORS
Describe the current educational content you use to educate patients.

ANSWER CHOICES             RESPONSES
Paper handout               100.00%  13
Brochures                   100.00%  13
EHR education content (Krames, Healthwise) 30.77%  4
Charts                      23.08%  3
Plastic Models              7.69%   1
Other (please specify)      7.69%   1
Total Respondents: 13
What changes would need to occur at work to incorporate these technologies into your regular routine?

Answered: 13  Skipped: 0

<table>
<thead>
<tr>
<th>ANSWER CHOICES</th>
<th>RESPONSES</th>
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<tbody>
<tr>
<td>Process</td>
<td>84.62%</td>
</tr>
<tr>
<td>Policy</td>
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</tr>
<tr>
<td>Location/physical environment</td>
<td>7.69%</td>
</tr>
<tr>
<td>Budget</td>
<td>30.77%</td>
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<tr>
<td>Employee education</td>
<td>46.15%</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Total Respondents: 13
Of the patients that you see regularly, which age group would benefit from digital mobile multi-media education. Select all that apply.

Answered: 13  Skipped: 0

**Answer Choices** | **Responses**
--- | ---
18-24 | 46.15% | 6
25-34 | 61.54% | 8
35-44 | 76.02% | 10
45-54 | 84.62% | 11
55-64 | 84.62% | 11
65-74 | 76.92% | 10
75 or older | 46.15% | 6

Total Respondents: 13
Among patients that you see regularly, which of the following education levels would benefit from digital mobile multi-media education. Select all that apply:

- 8th grade or less: 61.54% (8 respondents)
- Some high school: 76.92% (10 respondents)
- High School Graduate or GED: 76.92% (10 respondents)
- Some College/2-year degree: 69.23% (9 respondents)
- More than 4-year college degree: 53.85% (7 respondents)
- Other (please specify): 7.69% (1 respondent)

Total Respondents: 13
### CHRONIC DISEASE STATES: THE MOST NEED

<table>
<thead>
<tr>
<th>Disease</th>
<th>Percentage</th>
<th>Count</th>
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<tbody>
<tr>
<td>Asthma</td>
<td>23.08%</td>
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<td>Allergies</td>
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<td>Anxiety/Depression</td>
<td>46.15%</td>
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<td>Arthritis</td>
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<td>Cancer</td>
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<tr>
<td>CHF/Heart Disease</td>
<td>76.92%</td>
<td>10</td>
</tr>
<tr>
<td>COPD</td>
<td>53.85%</td>
<td>7</td>
</tr>
<tr>
<td>Dementia/Alzheimers</td>
<td>15.38%</td>
<td>2</td>
</tr>
<tr>
<td>Diabetes</td>
<td>84.62%</td>
<td>11</td>
</tr>
<tr>
<td>Domestic Violence</td>
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<td>HTN</td>
<td>84.62%</td>
<td>11</td>
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<tr>
<td>Kidney and Bladder</td>
<td>30.77%</td>
<td>4</td>
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<tr>
<td>Lung disease</td>
<td>15.38%</td>
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<td>Osteoporosis</td>
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<tr>
<td>Obesity</td>
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<td>Parkinson's</td>
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<tr>
<td>Preventive Health</td>
<td>30.77%</td>
<td>4</td>
</tr>
<tr>
<td>Stroke</td>
<td>38.46%</td>
<td>5</td>
</tr>
<tr>
<td>Other (please specify)</td>
<td>15.38%</td>
<td>2</td>
</tr>
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</table>

**Total Respondents: 13**
Panel Discussion
Preliminary Study Results
Which content did you provide for this patient?

- Traditional instruction: 12.50% (6 responses)
- Video/3D instruction with Patient Nexus: 87.50% (42 responses)
- Total: 48 responses

Did you feel the educator provided information that was helpful?

- Yes, definitely: 95.83% (46 responses)
- Yes, somewhat: 4.17% (2 responses)
- No: 0.00% (0 responses)
- Total: 48 responses
Did this educator ever use a computer or handheld device to show you information?

Answered: 47  Skipped: 1

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<th>ANSWER CHOICES</th>
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<td>93.62%</td>
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<tr>
<td>No (If no, go to #6)</td>
<td>6.38%</td>
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<tr>
<td>TOTAL</td>
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Was this educator’s use of a computer or handheld device helpful to you?

Answered: 45  Skipped: 3

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<td>95.56%</td>
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<td>2.22%</td>
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<tr>
<td>No</td>
<td>2.22%</td>
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<tr>
<td>TOTAL</td>
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Did this educator’s use of a computer or handheld device make it harder or easier for you to talk with him?

Answered: 45  Skipped: 3

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<td>Harder</td>
<td>0.00%</td>
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<tr>
<td>Not harder or easier</td>
<td>51.11%</td>
</tr>
<tr>
<td>Easier</td>
<td>48.89%</td>
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</table>

Do you understand your condition better now, sir, receiving your education today?

Answered: 48  Skipped: 0

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<thead>
<tr>
<th>ANSWER CHOICES</th>
<th>RESPONSES</th>
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<td>Yes, definitely</td>
<td>75.00%</td>
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<tr>
<td>Yes, somewhat</td>
<td>25.00%</td>
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<tr>
<td>No</td>
<td>0.00%</td>
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</tbody>
</table>

TOTAL

#HIMSS18
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Did the instruction you received motivate you to care for yourself at home?

Answered: 48  Skipped: 0

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<tr>
<th>ANSWER CHOICES</th>
<th>RESPONSES</th>
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<td>70.83%</td>
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<tr>
<td>Yes, somewhat</td>
<td>27.08%</td>
</tr>
<tr>
<td>No</td>
<td>2.08%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>48</td>
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Did the instruction you received help you feel capable of making healthcare decisions together with your doctor?

Answered: 48  Skipped: 0

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<th>ANSWER CHOICES</th>
<th>RESPONSES</th>
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<td>68.75%</td>
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<td>Yes, somewhat</td>
<td>29.17%</td>
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<td>No</td>
<td>2.08%</td>
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<td>TOTAL</td>
<td>48</td>
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As a result of the education you received, how likely are you to follow the instructions given to you by your doctor as a result of the education you received?

Answered: 48    Skipped: 0

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<td>Not likely</td>
<td>2.08%</td>
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<tr>
<td>Somewhat likely</td>
<td>31.25%</td>
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<tr>
<td>Very likely</td>
<td>66.67%</td>
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Implementation lessons learned

• Check bandwidth requirements for video and 3D images
• Provide detailed hands-on education on how to use the devices
• Evaluate video / 3D content for each medical specialty long before implementation
• Follow-up with educators a lot. It will take time to adjust and adopt new modes of education
• Get patient feedback!
Please complete online session evaluation
References


