Telemedicine: The Live Interactive Method

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Disclosures

- My role:
  Medical Director
  Psychiatric Emergency Services
  OSU Wexner Medical Center

- No financial disclosures to report
Objectives

1. Understand the use of live interactive telemedicine

2. Recognize advantages and pitfalls in this technology, using Telepsychiatry as an example

Telepsychiatry

- Definition
  - Use of technology to provide and support mental health care when distance separates the participants

- Live interactive and synchronous
  - Most viable model for mental health care
### Telepsychiatry

- Also called telemental health
- Interdisciplinary workforce
  - Psychiatrists, psychologists, APPs, social workers, clinical counselors
- Clinical encounters
  - Initial assessment (ED or comprehensive)
  - Medication management
  - Therapy (individual or family therapy)
  - Patient education

### Telepsychiatry Applications

- Direct to consumer
  - Provider to patient
  - Can be patient initiated, from home
- Hub and Spoke models
  - Medical settings:
    - Emergency Department, Inpatients, Outpts
  - Non-medical settings:
    - Prisons, Nursing facilities, Schools
- On-Demand vs. Scheduled
Advantages of Telepsychiatry

4 key factors for telemedicine success:

- Process and acceptability
- Clinical outcomes
- Access
- Cost


Key Factor: Process/Acceptability

**Patient Satisfaction**

- Patients typically prefer use of telepsychiatry over waiting for face-to-face (FTF) assessment
- Some patients prefer telemedicine to FTF
  - Anxious, avoidant, youth

**Provider Satisfaction**

- More mixed; rural more satisfied than suburban
- Cite concerns about treatment alliance
**Key Factor: Clinical Outcomes**

**Clinical Outcomes**
- Review assessed 13 RCTs comparing Telepsychiatry interventions to treatment as usual / FTF interactions
- Treatment of depression, ADHD, bulimia, general psych population
- Outcomes focused on symptom severity
- 12 of the 13 showed telepsychiatry at least equivalent to TAU / FTF interactions

*Hubley et al. World J of Psychiatry 2016*

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**Reliability of telepsychiatry interview**

- 73 ED patients assessed by a second psychiatrist either in person or via telepsychiatry
- Diagnosis and disposition recommendations
- No difference in reliability, supports use of telepsychiatry for ED assessment

*Seidel and Kilgus, J Telemed and Telecare, 2014*
Key Factor: Access
Barriers to mental health care:

- Most US counties have a shortage of MH providers
- Geography limits access to care in rural or underserved urban areas
- Mobility limitations (physical disability, lack of transportation, incarcerated populations) limit access
- Not just physical limitation but also timeliness of care, e.g., faster consultation in the ED

Satiani et al, Psych Services, 2018

Key Factor: Cost

- Enables psychiatrists to work at multiple institutions in the same day
- Community facilities that need limited psychiatrist coverage can purchase the amount of coverage needed
- Has greater up-front costs
- Tipping point (patient volume) at which telepsychiatry becomes cost effective
Cost efficient care

- Use of telepsychiatry for pediatric mental health emergencies
- Measured time (ED LOS) and hospital charges
- Providers and parents reported high satisfaction

Thomas et al, Psych Services, 2018

Are there downsides?

- Telepsychiatry has favorable profile for:
  - Process and acceptability
  - Clinical outcomes
  - Access
  - Cost

- But also has its pitfalls:
  - Technological constraints
  - Provider licensure
  - Reimbursement
Technological considerations

- Technology must be HIPAA Compliant
  - Skype™, FaceTime™ are not

- Interruptions can occur
  - Lost Internet access, audio/video malfunction, bandwidth issues
  - Importance of having a back-up system

- Access and integration with EMR
  - Provider at remote site, overreliance on patient report

Provider licensure

- Telemedicine rules vary by state: Most states require that the provider is licensed in the state where the patient is located

- Exceptions: physician-to-physician consultations, US Military, medical emergencies / natural disasters

- National licensure compact: Some states are banding together to offer expedited pathway for licensure in multiple states
**Reimbursement**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Provider type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid</td>
<td>Must be located in a clinical site. At least 5 miles between provider and patient. Physicians, APPs, psychologists</td>
</tr>
<tr>
<td>Medicare</td>
<td>Requires that a patient be in a county outside a Metropolitan Statistical Area (MSA) or in a Rural Health Professional Shortage Area (RHPSA). Physicians, APPs, psychologists, clinical social workers</td>
</tr>
<tr>
<td>Commercial</td>
<td>Varies</td>
</tr>
</tbody>
</table>
### OSU Current Use of Telepsychiatry:

#### Psychiatry Consultation in OSU East ED

- OSU East is smaller, more community oriented
- Psychiatry Consult Volumes in 2012:
  - OSU Main Campus ED: ~400 per month
  - OSU East ED: 42 per month
- Not enough volume to support psychiatric staff
  - Telepsychiatry was implemented to improve access to timely assessments
OSU East ED Telepsychiatry

1. East ED physician orders psychiatry consult
   - *Exact same process as FTF assessment for patients in Main Campus ED*

2. Psychiatric Emergency Services (PES) team sees patients from both Main ED and East ED in the order of the consult

3. East ED patients are assessed using InTouch™ telemedicine software

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Process

OSU East ED Telepsychiatry

1. East ED physician orders psychiatry consult
   - *Exact same process as FTF assessment for patients in Main Campus ED*

2. Psychiatric Emergency Services (PES) team sees patients from both Main ED and East ED in the order of the consult

3. East ED patients are assessed using InTouch™ telemedicine software
Telepsychiatry Consult

• OSU East ED Staff will take the “Robot” to the patient’s room

• Psychiatric assessment is conducted over video but is otherwise the same as a FTF assessment

• Provider may be a social worker, clinical counselor, nurse practitioner, or psychiatrist

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Telepsychiatry Consult

• Provider’s view through telepsychiatry software
Outcomes

- April 2013 - December 2017, we had completed 4,275 psychiatry consults in the OSU East ED

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Volume</td>
<td>41.7 consults/month</td>
<td>64.5 consults/month</td>
<td>↑ 54.7%</td>
</tr>
<tr>
<td>ED LOS (Mean)</td>
<td>23.8 hours</td>
<td>17.4 hours</td>
<td>↓ 27.1%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>↓ 6.4 hours</td>
</tr>
<tr>
<td>ED LOS (Median)</td>
<td>19.4 hours</td>
<td>12.5 hours</td>
<td>↓ 35.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>↓ 6.9 hours</td>
</tr>
</tbody>
</table>

Growth in East ED Volume

The trend of sum of Number of Records for First Exit Dtrn Quarter: The data is filtered on Department and First Exit Dtrn. The Department filter keeps East ED. The First Exit Dtrn filter ranges from 8/10/13 2:28:00 PM to 12/31/17 11:39:00 PM.
Acknowledgements

• Karen Jackson, John Wooten, Brittany Locklear with the OSU Outreach Team. Our partners in the OSU East ED and our dedicated Psychiatric Emergency Services team.

Questions?
• Natalie.Lester@osumc.edu

Using telepsychiatry with non-English speaking patients
Telepsychiatry in child and geriatric psychiatry

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Telemedicine: The Store-and-Forward Method

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### Disclosures:

Conflicts of Interest:
Investigator: Celgene, Biogen, Xbiotech, Eli Lilly Co.
Grant Funding: Ohio Dept. of Medicaid, SPARC Awards (NIH + Takeda Pharma + Eli Lilly Co.), National Rosacea Society, American Acne and Rosacea Society, Dermatology Foundation

My Wife's Conflicts of Interest: Janssen, Novartis, Amgen, Sandoz, Abbvie, Eli Lilly Co.

Off Label Treatments: No

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### The Future of Digital Medicine

“For the first time, last year, we had over 110 million interactions between our physicians and our members,”

52% of them were done via smartphone, videoconferencing, kiosks, and other technology tools

-Bernard Tyson, CEO Kaiser, Oct 2016

Objectives

- 1. Understand the use of store-and-forward telemedicine
- 2. Recognize advantages and pitfalls in this technology, using dermatology as an example

Store-and-Forward Telemedicine

- Dyssynchronous
- May be direct-to-consumer
- New CPT Codes 99446-99449
- Reimbursed in some Western States, Veterans Affairs Systems, patchwork elsewhere
- We will use Dermatology or teledermatology as a prototypical specialty conducive to S&F telemedicine.
Background on Store and Forward Telemedicine (Teledermatology)

- There is a substantial wait for patients with medical complaints nationally; locally, we had over 2000 patients on our waitlist

- Live interactive telemedicine is not a viable model for dermatology

- Store-and-forward well-described in dermatology but not reimbursed here

- With proper patient selection, patient outcomes generally similar to in-person care (Pak et al. 2007, Lasiera et al. 2012)

Benefits:

- Non-inferior in diagnosis and management in specific scenarios

- From societal perspective, tends to be cheaper than conventional referrals to the payer(s) (Datta et al. 2015).

- Frequent change in diagnosis, in hospital/ED setting decrease rate of admission for skin disease (Duong et al. 2014)

- Improves access to dermatology among Medicaid enrollees (Uscher-Pines 2016)
### Background on Teledermatology:

<table>
<thead>
<tr>
<th>Active Programs</th>
<th>2003</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>62</td>
<td>37</td>
</tr>
<tr>
<td>Annual Volume</td>
<td>184 (3-1500)</td>
<td>309 (5-6500)</td>
</tr>
<tr>
<td>Delivery Method</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Live Interactive</td>
<td>59%</td>
<td>14%</td>
</tr>
<tr>
<td>Store-and-Forward</td>
<td>29%</td>
<td>51%</td>
</tr>
<tr>
<td>Both</td>
<td>12%</td>
<td>19%</td>
</tr>
</tbody>
</table>


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### Access to Care
## Access for Underinsured

<table>
<thead>
<tr>
<th></th>
<th>Before Teledermatology</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Enrollees &gt;0 Visit Rate/1000</td>
<td>Enrollees &gt;0 Visit Rate/1000</td>
</tr>
<tr>
<td><strong>Users</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telederm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>In-Person</td>
<td>2790</td>
<td>1.2</td>
</tr>
<tr>
<td>All</td>
<td>2790</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Non-Users</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telederm</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>In-Person</td>
<td>962</td>
<td>1.2</td>
</tr>
<tr>
<td>All</td>
<td>962</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Uscher-Pines L. et al. JAMA Dermatol 2016; 152(8)905-12

## Access for Underinsured

<table>
<thead>
<tr>
<th></th>
<th>Change Fraction with any Derm visit</th>
<th>Change All Derm visits per 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>User Practices</strong></td>
<td>63.8*</td>
<td>64.6*</td>
</tr>
<tr>
<td><strong>Nonuser Practices</strong></td>
<td>20.5</td>
<td>60.1</td>
</tr>
</tbody>
</table>

Uscher-Pines L. et al. JAMA Dermatol 2016; 152(8)905-12
Access for Underinsured

Figure: Dermatology Visits per 1000 Enrollees in the Health Plan of San Joaquin per Quarter (Adapted)

Uscher-Pines L. et al. JAMA Dermatol 2016; 152(8)905-12

<table>
<thead>
<tr>
<th>Type of Visit</th>
<th># Enrollees</th>
<th>&gt;0 Visit</th>
<th>Rate per 1000</th>
<th>% Telederm Visits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Continuously Enrolled</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telederm</td>
<td>1039</td>
<td>1.1</td>
<td>17</td>
<td>17.5%</td>
</tr>
<tr>
<td>In-person</td>
<td>4907</td>
<td>1.8</td>
<td>97</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>5946</td>
<td>3.0</td>
<td>112.8</td>
<td></td>
</tr>
<tr>
<td><strong>Newly Enrolled</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Telederm</td>
<td>837</td>
<td>1.7</td>
<td>19.7</td>
<td>43.0%</td>
</tr>
<tr>
<td>In-Person</td>
<td>1110</td>
<td>0.6</td>
<td>28.1</td>
<td></td>
</tr>
<tr>
<td>All</td>
<td>1947</td>
<td>2.2</td>
<td>45.5</td>
<td></td>
</tr>
</tbody>
</table>

Uscher-Pines L. et al. JAMA Dermatol 2016; 152(8)905-12
The Parkland UTSW Model

Outcomes of Referrals from Southeast Dallas Healthcare Center to Parkland (Adapted)


Table 2. Diagnostic and Management Concordance Between PCPs, Teledermatologists, and In-Clinic Dermatologists

<table>
<thead>
<tr>
<th>Concordance Comparison (Total No. of Cases)</th>
<th>Discordan, No. (%)</th>
<th>Partially Concordant Level 1, No. (%)</th>
<th>Partially Concordant Level 2, No. (%)</th>
<th>Completely Concordant, No. (%)</th>
<th>Observed Concordance (Partial 1 and 2 and Completely)</th>
<th>Expected Concordance (Partial 1 and 2)</th>
<th>1-Sided P Value Using Yates Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCP vs tele 1 Diagnosis</td>
<td>49 (62)</td>
<td>9 (11)</td>
<td>10 (13)</td>
<td>11 (14)</td>
<td>30 (38)</td>
<td>68</td>
<td>&gt;.99</td>
</tr>
<tr>
<td>Tele 1 vs tele 2 Diagnosis</td>
<td>0</td>
<td>10 (13)</td>
<td>44 (56)</td>
<td>25 (32)</td>
<td>79 (100)</td>
<td>88</td>
<td>0.001</td>
</tr>
<tr>
<td>Tele 1 vs derm clinic Diagnosis</td>
<td>3 (10)</td>
<td>5 (17)</td>
<td>10 (35)</td>
<td>11 (38)</td>
<td>26 (90)</td>
<td>67</td>
<td>0.008</td>
</tr>
<tr>
<td>PCP vs tele 1 Management</td>
<td>44 (56)</td>
<td>8 (10)</td>
<td>23 (29)</td>
<td>4 (5)</td>
<td>35 (44)</td>
<td>61</td>
<td>0.99</td>
</tr>
<tr>
<td>Tele 1 vs tele 2 Management</td>
<td>12 (15)</td>
<td>4 (5)</td>
<td>33 (42)</td>
<td>30 (38)</td>
<td>57 (85)</td>
<td>75</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Hospital Access

Inpatient Telederm Triage Agreement Decisions

0% 10% 20% 30% 40% 50% 60%
Same Day Next Day Within Hospitalization Outpatient

InPerson Telederm 1 Telederm 2

Barbieri et al. JAMA Dermatol. 2014

Hospital Access

Most Common Dermatologic Diagnoses

Drug Reaction 7 (14%)
Stasis Dermatitis 4 (8%)
Graft vs host disease 3 (6%)

InPerson Telederm 1 Telederm 2

Barbieri et al. JAMA Dermatol. 2014
### Potential Cost Savings

### Emergency Dept and Inpt Management

**Intervention Costs Incurred by Referral Group (adapted)**

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>Referral Group, Cost, $</th>
<th>Teledermatology (n = 195)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conventional (n = 196)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>Maximum</td>
</tr>
<tr>
<td></td>
<td>Minimum</td>
<td></td>
</tr>
<tr>
<td>Teledermatology referrals</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Dermatology clinic visits</td>
<td>45 353</td>
<td>37 905</td>
</tr>
<tr>
<td>Intervention costs</td>
<td>45 353</td>
<td>37 905</td>
</tr>
</tbody>
</table>

*Datta SK, et al. JAMA Dermatol. 2015*
# Cost

## VA Perspective and Societal Perspective Total Costs by Randomization Group (adapted)

<table>
<thead>
<tr>
<th>Cost Element</th>
<th>VA perspective</th>
<th>Societal perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention, mean</strong></td>
<td>45 353</td>
<td>59 917 (min/37,152)</td>
</tr>
<tr>
<td><strong>Travel reimbursement</strong></td>
<td>3591</td>
<td></td>
</tr>
<tr>
<td><strong>Dermatology medication</strong></td>
<td>17 201</td>
<td>59 917 (min/37,152)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>56 145</td>
<td>59 917 (min/37,152)</td>
</tr>
<tr>
<td><strong>Other incurred</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Travel</strong></td>
<td>6460</td>
<td></td>
</tr>
<tr>
<td><strong>Productivity</strong></td>
<td>32 600</td>
<td></td>
</tr>
<tr>
<td><strong>Care sought outside the VA</strong></td>
<td>989</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40 049</td>
<td></td>
</tr>
<tr>
<td><strong>Societal perspective</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total, mean</strong></td>
<td>106 194</td>
<td>59 917 (min/37,152)</td>
</tr>
<tr>
<td><strong>Other incurred</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Travel</strong></td>
<td>5460</td>
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<tr>
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<td></td>
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<tr>
<td><strong>Societal perspective</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total, mean</strong></td>
<td>106 194</td>
<td>59 917 (min/37,152)</td>
</tr>
</tbody>
</table>

Datta SK, et al. JAMA Dermatol. 2015

## Per-Participant Cost and Utility Change Score by Randomization Group (Adapted)

<table>
<thead>
<tr>
<th>Randomization Group</th>
<th>Perspective Cost, Mean (SD), $</th>
<th>Change in Utility Score, Baseline to Month 9, Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conventional</strong></td>
<td>338 (291)</td>
<td>0.02 (0.18)</td>
</tr>
<tr>
<td><strong>Teledermatology</strong></td>
<td>308 (298)</td>
<td>0.03 (0.19)</td>
</tr>
</tbody>
</table>

Datta SK, et al. JAMA Dermatol. 2015
### Management Comparison Between Dermatologist and ED Physician (Adapted)

<table>
<thead>
<tr>
<th>Management</th>
<th>ED Physician (n = 110)</th>
<th>Dermatologist (n = 111)</th>
<th>Concordance Cohen κ (95% CI)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>No immediate specialized consultation</td>
<td>109 (99.1)</td>
<td>111 (100)</td>
<td>0.75 (0.64-0.86)</td>
<td>0.04</td>
</tr>
<tr>
<td>No specialized consultation</td>
<td>79 (71.8)</td>
<td>54 (69.2)</td>
<td>0.49 (0.14-0.84)</td>
<td>&lt;10−4</td>
</tr>
<tr>
<td>No immediate hospitalization</td>
<td>101 (91.8)</td>
<td>103 (92.8)</td>
<td>0.49 (0.41-0.57)</td>
<td>&lt;10−4</td>
</tr>
<tr>
<td>Patient discharges (no)</td>
<td>67 (60.9)</td>
<td>59 (53.2)</td>
<td>0.74 (0.67-0.81)</td>
<td>&lt;10−4</td>
</tr>
</tbody>
</table>

Duong et al. JAMA Dermatol 2014.
Factors Associated with “Success”

1. Selecting Patients Appropriate for Telederm Consult
2. High Quality Photography
3. Dermoscopy for Pigmented Lesions
4. Effective Infrastructure and Culture to Implement Consults

# Mobile-Phone Based Screening for Skin Cancer

Concordance measures between in-person and mobile teledermatology evaluation

<table>
<thead>
<tr>
<th>Outcome:</th>
<th>% Concordance N=107</th>
<th>95% CI</th>
<th>Cohen Kappa</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregated Diagnostic Concordance</td>
<td>0.620.51-0.71</td>
<td>0.6&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary Categorical Diagnostic Concordance</td>
<td>0.820.73-0.89</td>
<td>0.62&lt;0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management Concordance</td>
<td>0.810.72-0.88</td>
<td>0.57&lt;0.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


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# Diagnostic Concordance
Diagnostic Concordance

In over 2009 Telederm Images:

- 51% of patients retained their medical home
- 12 days to specialty appointment vs 81 days for conventional referral
- Concordance rates: K>0.8 among observers
- Sensitivity 99% for malignancies (Imaged)
- Specificity 62% for malignancies

Moreno-Ramirez et al. Arch Dermatol 2007

An Example of an Ineffective System

<table>
<thead>
<tr>
<th>Time Impact Study (Adapted)</th>
<th>Average Time (min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td></td>
</tr>
<tr>
<td>Time invested by dermatologist in consultation</td>
<td>6</td>
</tr>
<tr>
<td>Time invested in face to face consultation</td>
<td>10</td>
</tr>
<tr>
<td>Time spent by GP to take image</td>
<td>12.3</td>
</tr>
<tr>
<td>Time spent by GPs to complete referral information</td>
<td>6.7</td>
</tr>
<tr>
<td>Total Time spent by GP</td>
<td>19</td>
</tr>
<tr>
<td>Time invested by GP in normal dermatology consultation</td>
<td>10</td>
</tr>
</tbody>
</table>

### Apprehensive about the Amazonification of Dermatology? Its happening!

<table>
<thead>
<tr>
<th>Of 57 Encounters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>US BC Dermatologist (27)</td>
<td>NP Derm (3)</td>
</tr>
<tr>
<td>Internist (5)</td>
<td>PA Derm (3)</td>
</tr>
<tr>
<td>Emergency Medicine (3)</td>
<td>PA Emergency Med (1)</td>
</tr>
<tr>
<td>Family Medicine (3)</td>
<td>PCPs in India (5)</td>
</tr>
<tr>
<td>Ob/Gyn, PMR, Cardiology, Pain (1 each)</td>
<td>Dermatologists in Sweden (2)</td>
</tr>
</tbody>
</table>


### Apprehensive about the Amazonification of Dermatology? Its happening!

<table>
<thead>
<tr>
<th>Correct Diagnoses/Management</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Secondary Syphilis</td>
<td>1/8 Completed Encounters</td>
</tr>
<tr>
<td>Stasis Dermatitis</td>
<td>7/7 Completed Encounters</td>
</tr>
<tr>
<td>Nodular Melanoma</td>
<td>11/14 Completed Encounters</td>
</tr>
<tr>
<td>Gram Negative Folliculitis</td>
<td>2/12 Completed Encounters</td>
</tr>
</tbody>
</table>

Apprehensive about the Amazonification of Dermatology? Its happening!

<table>
<thead>
<tr>
<th>Available Apps</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermatology Only</td>
<td>General Medical + Derm</td>
</tr>
<tr>
<td>DermatologistOnCall</td>
<td>Amwell</td>
</tr>
<tr>
<td>Dermcheck</td>
<td>First Opinion</td>
</tr>
<tr>
<td>DermLink</td>
<td>HealthTap Prime</td>
</tr>
<tr>
<td>Direct Dermatology</td>
<td>MD Live</td>
</tr>
<tr>
<td>First Derm</td>
<td>MeMD</td>
</tr>
<tr>
<td>SkyMD</td>
<td>Teladoc</td>
</tr>
<tr>
<td>Spruce</td>
<td>Virtuwell</td>
</tr>
<tr>
<td>Virtual Acne</td>
<td></td>
</tr>
<tr>
<td>YoDerm</td>
<td></td>
</tr>
</tbody>
</table>


Regulations
The patient may be either new to the consultant or an established patient with a new problem or an exacerbation of an existing problem. However, the patient should not have been seen by the consultant in a face-to-face encounter within the previous 14 days.

Medicare, Medicaid, private insurance
Coverage is not uniform. Generally covered by the Veterans Affairs Medical Centers and more likely in the West.

HIPAA, secure transmission and documentation
Documentation to be performed by consulting physician within secured medical record system
OSU Current Use of Teledermatology

1. OSU Emergency Department: Informal Triage System since 2011

2. OSU East Consult Service with OSU Family Medicine for Skin Biopsies: Operational since 2014

3. Econsult Platform: Outpatient, Operational since 1/2017

4. Primary One Health: Outpatient, Operational since 8/2017

Stakeholders: Primary Care Providers

- Rapid and Direct Education and Feedback
- Patient Satisfaction with rapid confirmation/change plans
- Maintenance of Patient Medical home and Avoiding Fragmented Care
- Confirmation prior to Procedure (some)

<table>
<thead>
<tr>
<th>ECON Order</th>
<th>MRN</th>
<th>ECON Order</th>
<th>ECON Close</th>
<th>Calendar</th>
<th>Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grand Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.90</td>
</tr>
</tbody>
</table>

- Used by 120 out of ~1700 Attending Physicians at this time
Stakeholders: Health System

- Removal of bottlenecks to additional specialists
- Testing for application for its ACO and the OSU Health plan
- Support to primary physicians
- Test Specialty for enhanced referrals/other Econsults

Dermatologists

- Naturally Triage/Manage the Waitlist
- Remove intradepartment bottlenecks (surgery)
- Decrease “No-Show” rate

Patient Access

- 71% Diversion Rate
- Free (currently)
- Patients seen within 2 weeks (3 mo or longer)
- Cancers removed faster
- Dermatologic Care at hospitals previously without

Process
Results:

- Went live January 15, 2017
- Averaging 3-5 E-Consults per Week after first several weeks and increasing
- Most users have become repeat users within 4 weeks
- Total Number of Consults: 630
- 100 Consults monthly as of January 2017
- Estimated Diversion Rate:
Results:

Ambulatory Referral Volume vs Econsults 2017

Amb Ref Volume

Econsult Volume

Years: 2017-1 to 2017-12

Results:

Econsults as a % of Dermatology Consults

Econsult Volume

Years: 2017-1 to 2017-12
Future Plans
1. Develop teaching clinic
2. Collect official metrics
   And publish
3. Convince payers to cover
   99446-8 codes
4. Develop direct-to-consumer arm
5. Provide digital dermatoscopic cameras to high-use PCP offices
6. Extend reach to outlying hospitals? COPC, Primary One, FastCare? VA, Prisons

Acknowledgements
Thank you to Dr. Wexler, Dr. Thomas, Dr. Rizer and IT team, Dr. Welker and the Upper Payment Limit Award Committee at OSUWMC, Shelly Pluta, AAMC, and the entire primary care network.

Thank you!
- Benjamin.Kaffenberger@osumc.edu
- Questions?