Store-and Forward Teledermatology
The Vermont Experience

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Financial Disclosures - Conflicts of Interest

“I have no financial relationships with a commercial entity producing healthcare-related products and/or services relevant to the content I am presenting”
Outline

• Background of local health system and demographics
• Vermont experience
• Lessons learned
• Practical Points
Background

• The University of Vermont Medical Center (formerly Fletcher Allen Health Care) part of University of Vermont Health Network

Partnership of 4 hospitals in Vermont and Northern New York:
  • CVPH (Champlain Valley Physicians Hospital) Medical Center, Plattsburgh, NY
  • Central Vermont Medical Center (CVMC), Montpelier, VT
  • Elizabethtown Community Hospital, Elizabethtown, NY
University of Vermont Medical Center

- Vermont’s only academic medical center affiliated with the University of Vermont.
- Located in Burlington, VT
- Mission of community service, patient care, education and research
- ~580 physician practice, 190 community-based
- ~300 residents, 16 residency programs, 23 fellowship programs
- 562 licensed beds
- Level I trauma center - cover every major area of medicine.
- Serves > 1 million population in Vt and northern NY
My Background

• Medical dermatologist
  • Interest in cutaneous lymphoma and teledermatology

• 20% FTE in Clinical Informatics

• Board Certified in Dermatology and Clinical Informatics
Local Statistics

• 20 board certified dermatologists in Vermont
• 12 practice in the Burlington area.
  – 8 are academic dermatologists at the University
  – 4 four are in private practice
• Remaining 8 dermatologists are in individual practices throughout the state.
Dermatology Workforce

County Legend

- 0
- 0.10 - 1.75
- 1.75 - 2.75
- 2.75 - 4.25
- > 4.25

(Number of dermatologists per 100,000 population)

- Chittenden - 7.85
- Population 152782
NY our neighboring state
Why is workforce density important?

• Melanoma Death Rate Linked to Dermatologist Density
• Mortality rates are lower if there are 1 or 2 dermatologists/100,000 than if there are none.

History of Telederm at UVMC

• 2004-2009 - Live telemedicine was done with prison system in Northern New York.
• Allocated time to see telederm patients
• Contracted on a per visit basis
• UVMC stopped offering service due to lack of reimbursement when patient no showed
• Not cost effective
Current State

• 2012 – attempt to resurrect the teledermatology service as a store-and-forward service
Why?

Act No. 107 (H.37). Health; insurance; telemedicine

An act relating to telemedicine

This act requires all health insurance plans in Vermont to provide coverage for health care services provided through telemedicine to the same extent that the services would be covered if they were provided in person. This act authorizes health insurance plans to reimburse health care providers for teleophthalmology and teledermatology services provided by store and forward means. This act also requires the commissioner of financial regulation or designee to convene a work group to study whether and to what extent Vermont should require insurance coverage for telemedicine services provided outside a health care facility.

Passed by unanimous vote: May 8, 2012

Sec. 7. EFFECTIVE DATE
(a) Sec. 1 of this act shall take effect on October 1, 2012 and shall apply to all health insurance plans on and after October 1, 2012 on such date as a health
The Vermont journey

- Act. 107 in Vermont state legislature opened the door for potential reimbursement for store and forward (SAF) teledermatology
- Late 2012 - local insurers were contacted to inquire about their policies for SAF teledermatology
- Initial response was promising....
- However, once final draft of new policies were announced, results were disappointing.
Institutional support

• Despite the lack of reimbursement, dermatology was tasked with resurrecting the teledermatology service by senior leadership.
23% use S&F teledermatology for the sole purpose of triage
23% reported dual purposes of both triage and consultations
12% reported combination of triage, consultations, and direct care of patient

• Triage model
  – Review all new referrals for dermatology, prioritize and determine timing for patients requiring in-person consultations, and provide brief recommendations to the primary care providers.

• Consultative Model - most widely practiced
  – Serve as consultants and provide detailed recommendations after reviewing the clinical history and images.
  – Do not provide direct care for the patients; rather, the primary care providers decide whether to implement the dermatologists’ recommendations and assume full care of the patients.

• Direct Care Model
  – Patients seek and receive treatments directly from the specialists.
  – No specific reimbursement mandates exist in most U.S. states for the direct-care teledermatology model at the current time out-of-pocket expenses in commercial settings and is being evaluated in research.
Why SAF?

• Patient – convenient – no need to travel – no direct relationship with dermatologist

• Physician – more efficient – has limitations
Investigation

• Researched availability of vendors and resources
• Commercial vendors posed too much investment in upfront in cost and infrastructure with no reassurance of financial sustainability
  – MedWeb and Iagnosis and other vendors were considered
• Evaluated existing infrastructure
  – EPIC EHR had telemedicine and e-consult functionality - not built out in our system
• Free resources: Access Derm
Investigation

• Discussed with risk management about transmitting clinical photos electronically and using direct to consumer applications

• Medical director inquired to private insurers about demonstration project.
<table>
<thead>
<tr>
<th>Application Name</th>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Access Derm</strong></td>
<td>• Free</td>
<td>• PDF report of consult is generated - would not be discrete data</td>
</tr>
<tr>
<td></td>
<td>• Option for photo acquisition via smart device</td>
<td>• Do not own data – no access to photos</td>
</tr>
<tr>
<td></td>
<td>• Can be done Epic or non EPIC user</td>
<td>• Tracking data is limited</td>
</tr>
<tr>
<td></td>
<td>• Streamline workflow</td>
<td>• Cannot customize clinical data collected (limited)</td>
</tr>
<tr>
<td></td>
<td>• Available immediately</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Teaching component for residents</td>
<td></td>
</tr>
<tr>
<td><strong>Medweb</strong></td>
<td>• $$$</td>
<td>• Workflow not integrated with EPIC</td>
</tr>
<tr>
<td></td>
<td>• HL7 engine allows for some integration</td>
<td>• Referring physician buy-in may more challenging – communicating the recommendations more time consuming outside EPIC</td>
</tr>
<tr>
<td></td>
<td>• Can track data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• (&gt;20 yrs experience)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Can send back files (patient ed)</td>
<td></td>
</tr>
<tr>
<td><strong>EPIC Cantos and Haiku</strong></td>
<td>• Integration with PRISM</td>
<td>• Build would not start until after upgrade (Sept 2012)</td>
</tr>
<tr>
<td></td>
<td>• Own the data and images</td>
<td>• Potentially slow workflow</td>
</tr>
<tr>
<td></td>
<td>• Minimum build</td>
<td>• Images may not be embedded in note</td>
</tr>
<tr>
<td></td>
<td>• Could track data</td>
<td>• No workflow for non EPIC users</td>
</tr>
<tr>
<td></td>
<td>• Customize intake form</td>
<td>• New and potential hiccups</td>
</tr>
<tr>
<td><strong>EPIC Teledermatology module</strong></td>
<td>• Integration with PRISM</td>
<td>• Available with 2012 upgrade – FAHC not licensed to installed</td>
</tr>
<tr>
<td></td>
<td>• Own the data and images</td>
<td>• No workflow for non EPIC users</td>
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<td></td>
<td>• Customize intake form</td>
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</tr>
</tbody>
</table>
Criteria for choosing application

• System requirements
• HIPAA compliance, Security and Privacy
• Information Sharing and Storage
• User Interface
• Interoperability
• Scalability
• Billing
• Cost
Wish List

- Streamlined efficient workflow
- Workflow with EPIC and non EPIC users
- Access to images and data for clinical and teaching purposes
- In alignment with current delivery care model at UVMC
- Sustainable financially
- Track the data
- Image repository - Ability to store and retrieve images with metadata with de-identified data
Access Derm

- Sponsored by the American Academy of Dermatology - goal is to provide care to underserved populations in the United States.
- Must be initiated by a board certified dermatologist
- Can consult remotely on dermatology cases using mobile devices and the Internet.
  - Available free on iPhone, iTouch, iPad, Android
  - Can also access the program via any Web browser
- Primary care clinicians submit consultations that dermatologists then receive on their personal mobile devices or the Internet via HIPAA-secure and compliant means.
- Due to licensure requirements, can provide remote consultation on cases that originate in a state where he or she is licensed.
- Currently being used in 16 states.
- As of June 6, 2014, AAD volunteer teledermatology programs have provided 1,056 consults to underserved patients.
Pilot Telederm Project

• Identify a primary care clinic that was within our health system that did not have access to dermatological care.
• Former clinical informatics colleague worked in this clinic.
• Identified individuals in the clinic who would be receptive to this service.
• Initiated communication....
The approach

• Introductory e-mail – offer service free of charge – with the understanding that this is a pilot to collect data that could potentially justify reimbursement in the future

• Site visit with education on telederm, training materials, demo of workflow
  – 5 minute powerpoint on types of teledermatology
  – Statistics on usage of type of telederm in country
  – Training brochure on how to take a medical photo
  – "Tips and tricks sheets" on how to use Access Derm

• Met initially with office manager and medical director

• Demoed 2 workflows - Access Derm and our own EHR functionality
Current Pilot Teledermatology Workflow

1. Patient signs consent
2. Staff acquires digital image via Access Derm app
3. Template telederm consult entered by MD
4. Staff transfers telederm consult to access derm app
5. E-mail alert that consult has been requested
6. E-mail alert that consult has been answered
7. Reviews consult and replies
8. Secured server
Workflow to obtain image in EHR vs mobile app

Image is taken

Memory card is removed from camera and placed in card reader attached to computer

Image file is transferred to computer

Staff or physician imports file to EHR record

TIME

5 minutes

staff acquires digital image via Access Derm app

secured server

TIME

15 seconds

The University of Vermont
CASE 1234

Printed by Dave Klein (Lahey Clinic)  Printed on Sep-9, 2012 at 10:00 am

STATUS: Answered

Age, gender, case title: 24M, Rash on left hand
How long has the patient had this condition?: 2 months
What are the symptoms of this condition?: Bad rash
Does anyone in the family have similar condition?: No
Where on the body did the rash/lesion first appear?: Left hand
Which areas of the skin are currently involved?: Left hand
Does anything make the skin problem worse?: No
Does anything make the skin problem better?: Yes, Lotion A
Has the rash been treated with anything?: No
What other medications is the patient taking?: Nothing
Please list any relevant past medical history: Eczema
What do you think is the most likely diagnosis?: Rash
What is the treatment plan for the patient?: Lotion A
Please list when the patient will be seen in follow up in your clinic: On Monday, Sep 10
In the absence of this teledermatology service, how would this patient have otherwise received care for this condition? (Check all that apply): I would take care of the issue myself, Urgent care or emergency room
Additional comments: Nothing much

History of Case Updates

Updated On Aug 21, 2012 5:34 pm by Dave Klein

Field Changed From Changed To
Additional comments nothing much to add just came in with a rash on the leg

RESPONSE

Dave Klein (UPENN Derm Group) Answered on Sep-10, 2012 at 6:04 pm

Diagnosis: Rash
Treatment: Lotion B
In-person dermatologic evaluation: No
Unforeseen circumstances

• Primary care clinic preferred the Access Derm workflow due to ease of use...however much to my surprise.... no provider in the office owned a smart mobile device.

• Additionally, this clinic referred to a local dermatologist in private practice when possible.
Plan

• Continue to partner with this clinic and provide an iTouch.
• Train the support staff to take photos and enter the consult.
• Generate report from clinic on how many dermatology referrals were made to our clinic vs private dermatology clinic.
SAF Telederm must produce outcome data

• Strongest body of research exists regarding the diagnostic reliability of teledermatology
• Clinical outcomes are the least researched area of teledermatology
• Need to track outcomes and demonstrate that SAF telederm improves care.
• Studies have shown the ability of a dermatologist to diagnosis a skin conditions exceeds those of primary care
METRICS

• QUANTITATIVE

• Baseline Data - Pre-implementation
  • # Patients/Month Referred To UVMMC Derm From Pilot Site
  • Avg Wait Time For In Person Clinic Derm Visit

• Terminal Data - Post-implementation
  • # Patients/Month Referred To UVMMC Derm From Pilot Site
  • Avg Wait Time For In Person Clinic Derm Visit
  • # SAF Telederm Consults/Month
  • # SAF Telederm Consults Requiring In-person Clinic Visit In Derm
  • Dx Of Patients Seen In SAF Telederm Consult
  • Dx Of Patients Seen For In Person Clinic Derm Visit
  • Wait Time Of Patients Referred For In Person Clinic Derm Visit
  • Time To Complete Consultation

• QUALITATIVE

• Survey Data
  • Patient Satisfaction
  • Referring Providers
Pilot Data

Pilot data from May 2013-Dec 2014

• 1 remote primary care clinic - 1 hour away

• Walk-in Clinic (1 provider)

• 47 consults requested
### PRE-IMPLEMENTATION DATA

<table>
<thead>
<tr>
<th>Number of traditional consults</th>
<th>108</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average wait for appointment</td>
<td>60.2 days (0-370)</td>
</tr>
</tbody>
</table>

### POST-IMPLEMENTATION DATA

<table>
<thead>
<tr>
<th>Number of SAF consults</th>
<th>44</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average response time of SAF consult</td>
<td>9.2 hours (0.6-39.9)</td>
</tr>
<tr>
<td>Average wait for appointment</td>
<td>12.9 days (2-32 days)</td>
</tr>
</tbody>
</table>

Wait time reduced by 78.6%
<table>
<thead>
<tr>
<th>PRE-PILOT</th>
<th>POST-PILOT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DIAGNOSIS</strong></td>
<td><strong>DIAGNOSIS</strong></td>
</tr>
<tr>
<td># REF</td>
<td># REF</td>
</tr>
<tr>
<td>Benign neoplasm</td>
<td>Rash</td>
</tr>
<tr>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>Actinic keratos(es)</td>
<td>Neoplasm/new growth</td>
</tr>
<tr>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Psoriasis</td>
<td>Lesion</td>
</tr>
<tr>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Neoplasm of uncertain origin</td>
<td>Don’t know</td>
</tr>
<tr>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Seborrheic keratos(es)</td>
<td>Pyogenic granuloma</td>
</tr>
<tr>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>Personal hx of melanoma or skin cancer</td>
<td>Other</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
</tr>
</tbody>
</table>
Feedback and lessons learned from pilot

• Generally well-received by provider and patient
• Wireless internet was biggest issue
  • Images were lost if device was not connected to internet when app was opened
  • Training issue to check connectivity first
• Hospital IT department inadvertently blocked/firewalled this server for several weeks
  • Required lots of troubleshooting
Next Steps: Provide feedback

• Regular visits to remote site and review cases
• Provide basic dermatology education
• Track if common diagnoses reach a higher concordance rate
HIPAA and Business associate agreement

• “business associate” is a person or entity, who performs functions or activities on behalf of, or provides certain services to, a covered entity that involve access by the business associate to protected health information.

• A “business associate” also is a subcontractor that creates, receives, maintains, or transmits protected health information on behalf of another business associate.

• The HIPAA Rules generally require that covered entities and business associates enter into contracts with their business associates to ensure that the business associates will appropriately safeguard protected health information.

• The business associate contract also serves to clarify and limit, as appropriate, the permissible uses and disclosures of protected health information by the business associate, based on the relationship between the parties and the activities or services being performed by the business associate.

• A business associate may use or disclose protected health information only as permitted or required by its business associate contract or as required by law. A business associate is directly liable under the HIPAA Rules and subject to civil and, in some cases, criminal penalties for making uses and disclosures of protected health information that are not authorized by its contract or required by law. A business associate also is directly liable and subject to civil penalties for failing to safeguard electronic protected health information in accordance with the HIPAA Security Rule.

• http://www.hhs.gov/ocr/privacy/hipaa/understanding/coveredentities/contractprov.html
The questionnaire is intended for use in the review of many different systems. As such, not all sections will apply to every system. Please respond with NA (“not applicable”) in these sections. Please use this response only when the question is not relevant. If the question is relevant but the system does not support the referenced feature, specify “none”, or “not supported”, etc., not “NA”. Again, it should be emphasized that a complete response is expected, so all applicable sections should have a response.

Vendors should also note that FAHC might request that responses this questionnaire be committed to in any contract for the subject system.

Name of system:

Questions

1. ASP Provider Network

1.1. Please describe the preferred connection method(s) between our network and yours including required/recommended bandwidth and any redundancy or load-balancing features used to ensure high-availability.

1.2. If the Internet is used to facilitate network connection from our LAN to your production network, what methods are used to protect information transmitted over the Internet (e.g. TLS, SSL, FTPS/SFTP, etc.)?

1.3. Describe any network security features, such as firewalls, proxy servers, etc. that you use to protect your network from unauthorized access.

1.4. Do you require the use of multi-factor authentication for administrative control of routers, firewalls, or other critical network infrastructure components on your network?

1.5. Do you perform and document internal security audits on your network infrastructure? If so, how often are these test performed and what is the process used?

1.6. Do you perform, or have a third party perform, external penetration tests on your network infrastructure? If so, how often are these test performed and what is the process used?

1.7. Do you have documented requirements for customer network security (with audit functions) to ensure that other customers will not compromise your production network? If so, please describe.

1.8. Are you HIPAA / Hitech compliant?

1.9. Are you PCI compliant?

2. ASP Provider Platform

2.1. Do you have a documented policy for hardening the operating system on your Web and other servers? If so, please describe.

2.2. How do you insure separation of data and security authorizations between different customer applications that may be hosted on your network?

2.3. Please describe your process for evaluating and installing operating system and application vendor critical patches and security alerts.

2.4. How do you monitor the utilization of the Network and Servers used to host this application?

2.5. What are your data retention policies?

3. ASP Provider Operations

3.1. How many physical sites do you have that are capable of hosting this application? Where are the sites located?

3.2. Do you own and physically manage the primary data center used to host this application?

3.3. Do you own and physically manage all secondary data centers or “Hot Sites” that may be used to host this application? If not please describe.

3.4. Please describe the physical security features of the primary data center facility used to host this application and, if applicable, any secondary or “Hot Site” facilities.

3.5. How do you screen the staff who may have physical or administrative access to servers and software components used to support his application?

3.6. How long do you retain audit and security logs? How are these logs stored and protected against modification or deletion?

3.7. Do you have documented procedures for intrusion detection and security incident response/escalation? If so, please describe.

3.8. Please describe your data center disaster recovery configuration and process.

4. ASP Provider Services

4.1. Please describe your service level and support structure, including escalation and response times.

4.2. Do you offer any services for End-User Help Desk or Application security administration?

4.3. If you provide services that allow users to request ID unlocking, password reset, etc, what procedures do you use to authenticate the user before performing the requested action?

5. ASP Web Browser Support

5.1. If you require browser add-ons including (but not limited to): ActiveX controls, toolbars, Java applets, flash or Shockwave componentry, or Browser Helper Objects in order to Fletcher Allen to use the proposed system, please list them here, including the minimum required version:

<table>
<thead>
<tr>
<th>Web Browser Required Add-ons</th>
<th>Minimum Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Java applets</td>
<td></td>
</tr>
<tr>
<td>Flash/Shockwave</td>
<td></td>
</tr>
<tr>
<td>ActiveX Controls</td>
<td></td>
</tr>
<tr>
<td>Browser Helper Objects</td>
<td></td>
</tr>
<tr>
<td>Toolbars</td>
<td></td>
</tr>
<tr>
<td>Bookmarks/lets</td>
<td></td>
</tr>
<tr>
<td>[Other Format not listed above]</td>
<td></td>
</tr>
</tbody>
</table>

FAHC IS-ASC Questionnaire v4.07 (January 2014)
Lessons learned

• Need to understand your organization's governance structure upfront to prevent delays

• Delivering consults via referring institution’s EHR.
  • Consult alert by e-mail most helpful for rapid response – would not be automated
Lessons learned

• Must have a strong personal motivation as personal time and effort not accounted for
• Learning curve – very cautious in the beginning and most patients were seen in clinic to confirm the diagnosis
Practical Points

• Is there a need in your practice and geographic area?
• Research your local laws
• Utilize local and national resources
• Contact private insurers and CMS if you live in an approved area
  – Understand the policies and billing requirements
  – Must care come from a healthcare facility?
  – Is consultative services and/or follow-up care covered?

• Discuss with your insurer about liability.
Practical Points

• Pilot or start small scale - find one clinic to partner with
  – Train the distant site
    – How to take photos
    – Is the equipment and lighting adequate?
  – Provide a template with required information to complete consult
  – Negotiate reimbursement
  – Standardize consent
Practical Points

• Plan infrastructure for storage of photos and data
  • Will the data be an integrated, tethered or stand alone clinical information system?
    – How will the data travel and is it secure? e.g. encrypted e-mail, secure server, secure website etc.
• Is there a mechanism in place should the patient need to be seen in person? Are you personally willing to see the patient?
HIPPA and transmission of data

• Skype is not considered HIPPA compliant
• Encrypted e-mail on an intranet - probably
• Facetime is argued to be HIPPA compliant
  • “iPad supports WPA2 Enterprise to provide authenticated access to your enterprise wireless network. WPA2 Enterprise uses 128-bit AES encryption, giving users the highest level of assurance that their data will remain protected when they send and receive communications over a Wi-Fi network connection.
  • In addition to your existing infrastructure each FaceTime session is encrypted end to end with unique session keys. Apple creates a unique ID for each FaceTime user, ensuring FaceTime calls are routed and connected properly.”
• Wireless connections (Wi-Fi):
  • WPA2 Enterprise configuration provides an extra level of authentication when establishing a wireless connection. WEP does not provide the appropriate level of security, and WPA and WPA2 personal settings are questionable
• SMS messaging (texting from cell) not HIPPA compliant
American Academy of Dermatology position statement May 2015

• Minimum 800x600 pixel resolution recommended
• For systems that transmit over the Internet, a minimum 128-bit encryption and password-level authentication are recommended.
• Liability should be based on the information available at the time the consult was answered
• Write a letter on intent to insurer informing them that provider will be billing for telemedicine services
• Internet Prescribing
  – Dermatologist should take care to recommend as oppose to prescribe. Most states have regulations that discourage or prohibit prescribing for patients they have not seen face-to-face.
AAD position statement

• Liability
  – Shared liability between referring provider and consultant based on extent to which recommendations were followed.
  – Providing across state lines – need to educate yourself about licensing and regulations for the states in which they wish to provide care.

• Training and Quality Assurance
  – Active training and quality assurance for both distant and receiving sites.
  – Document their training program.
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  – Document their training program.
AAD position statement

• Licensing
  – Most stated will permit license in another state to act as consultants as long as local doctor takes responsibility for care and treatment.

• Privacy and Confidentiality
  – Patient should be notified that their information will be travelling electronically. Data should be encrypted.
AAD position statement

• Current Reimbursement

As of 2014 CMS reimburses store-and-forward teledermatology only as a demonstration project in Hawaii and Alaska. However, several states are currently reimbursing store-and-forward teledermatology for Medicaid patients. There are also private insurers that are paying for store and forward modalities, including those that are part of a Medicare Advantage plan. Providers who wish to provide store-and-forward services should inquire with their payers regarding reimbursement.
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