Excellence in Dermatology™

William James, M.D., FAAD
President, AAD
Mobile Teledermatology

- Using mobile phones with built-in cameras and customized software to provide dermatologic services at a distance.
- Ebner et al: Demonstrated no statistically significant difference between diagnosis resulting from face-to-face evaluation vs. mobile phone Teledermatology.
- Patient acceptance excellent.


1. Capture Image & Symptoms
2. Transmit Image & Symptoms
3. Transmit Image & Symptoms
4. Provide Diagnosis & Treatment Advice
5. Transmit Diagnosis & Treatment Advice
6. Convey Diagnosis & Treatment Advice

Cell Phone - Internet Interface
Teledermatology in Developing World

- Standard Internet-based teledermatology
  - Urban centers in Africa
  - Latin America
- Mobile teledermatology
  - Urban and rural sub-Saharan Africa
  - Egypt
African Teledermatology Sites
Africa Teledermatology Project
(Uganda, Botswana, Malawi, Swaziland, Burkina Faso, and Lesotho)

Here you find our main cooperation partners and the members directory.

Case of the month

Telemedicine utilizes modern telecommunication technology to provide medical services at a distance by connecting two or several medical centers and enabling exchange of expert medical information. Telemedicine has therefore a potential to offer developing countries qualitative and quantitative improvements in medical care. The inherent visual nature of dermatology makes Teledermatology easily applicable to virtual medicine.

African Teledermatology has been created to provide dermatology support to local physicians, dermatologists, and health care workers in hospitals and clinics throughout Africa. This support is provided through Teledermatology consultation services, discussion pertaining to diagnosis and management of patients with skin diseases, links to educational resources, and access to a dermatologic curriculum created specifically for African sites.

African developing countries have only a very limited number of qualified dermatologists. Teledermatology has therefore the potential to offer a prompt channel for long distance consultation and consequently provide means for improving medical care of skin diseases.

The purpose of this project is to establish a virtual collaboration between African partners, USA, and Austria. A unique online archive of tropical skin conditions will also emerge which should serve as an internet source of educational material for training and updating of medical specialists and health personnel. A secondary aim of the project is to establish and secure an active channel and platform for dermatological research collaboration. The scope of this project is the integration of the various aspects of Teledermatology and Tele-dermatopathology, using a best practice model, creating an innovation- and investment-friendly surroundng for the broad-scaled implementation of telemedical applications in Africa.

This project has been funded by the Commission for Development Studies, Austrian Academy of Sciences (KEF: Kommission für Entwicklungsfragen, Österreichischen Akademie der Wissenschaften) (Originally Uganda-Austria Telederm Project) and the American Academy of Dermatology.

Project and Site Coordinators are

Steven Kaddu, MD
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Carrie Kovarik, MD
carrie.kovarik@uphs.upenn.edu

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africa.telederm.org
Consultations

• Since launch of the africa.telederm.org program, more than 700 consults from 12 countries have been completed
  – Botswana, Burkina Faso, Eritrea, Kenya, Liberia, Lesotho, Malawi, Mozambique, South Africa, Swaziland, Tanzania, Uganda

• Received, processed, and diagnosed approximately 60 conditions via skin biopsy
“Training in Botswana was an inspiring experience that profoundly enriched my life.”

--Jennifer Tan-Billet, MD, Harvard Medical School, 2010 Resident International Grant Recipient
Expansion to Spanish-Speaking Countries

Proyecto Latinoamericano de Teledermatología

La telemedicina utiliza tecnología de telecomunicaciones para proveer servicios médicos a distancia y facilitar el intercambio de información médica entre expertos en distintas localidades. Por lo tanto, la telemedicina tiene el potencial para incrementar la cantidad y la calidad de los servicios médicos en países en vías de desarrollo. La teledermatología es la aplicación ideal de la telemedicina debido a las propiedades visuales intrínsecamente asociadas con el estudio de la dermatología.

El Proyecto Latinoamericano de Teledermatología ha sido diseñado con miras a facilitar el intercambio de recursos y conocimientos entre médicos locales, dermatólogos, y demás trabajadores de salud en varios puntos de toda Latinoamérica. El apoyo se facilita a través de consultas de teledermatología, foros para discusiones sobre el diagnóstico y tratamiento de pacientes, enlaces de internet a recursos educativos, y acceso a un currículum de estudios dermatológicos diseñados específicamente para países latinoamericanos.

Muchos países latinoamericanos en vías desarrollo no cuentan con suficientes dermatólogos para todas las necesidades de sus poblaciones. Por lo tanto, teledermatología ofrece un canal viable para obtener consultas dermatológicas a larga distancia que contribuyan al mejoramiento del tratamiento médico de las enfermedades de la piel.

El objetivo del proyecto es forjar una colaboración virtual entre colegas de América Latina, los EE.UU. y Austria. A largo plazo, este proyecto también creará un archivo virtual de imágenes de casos tropicales que podrá ser accesible a través del internet y servirá como una fuente de material educativo para el enseñamiento continuo de trabajadores de salud. Un objetivo secundario es el establecimiento y el mantenimiento de una plataforma activa de colaboración pertinente a la investigación dermatológica. El proyecto tiene suficiente alcance como para forjar un modelo de integración de los diversos aspectos de la Teledermatología y Teledermatopatología; el proyecto promoverá la innovación técnica y la inversión económica suficiente como para abrir las puertas hacia la creación de un sin número de nuevas aplicaciones en el campo de la telemedicina en toda Latinoamérica.

http://latinoamerica.telederm.org
UPenn Expansion in Philadelphia

- For uninsured or underinsured patients in Philadelphia with limited access to specialty care
  - Sayre Clinic in West Philadelphia
  - Lax Center in Center City Philadelphia
- Mobile telemedicine: time efficient, no need for Internet connection/computers, security of equipment
- Pilot program started in Aug 2009
- 75 consults successfully transmitted to date
U Penn’s Mobile Teledermatology Work Flow

Community Health Centers

Specialist Consults

Consult Answer

Discoid Lupus Erythematosus

American Academy of Dermatology
• Provide dermatology specialty consultation to uninsured and Medicaid patients seen in clinics

• Address need to expand access to dermatology specialty care while tapping volunteerism spirit of dermatologists

• Using mobile phones for store-and-forward images with Web portal access by clinics and dermatologist volunteers

• Involving 22 dermatologist volunteers

• Serving 14 clinics with 26 locations (in 6 states)
AAD Mobile Teledermatology Process

1. Patient with skin condition visits clinic
2. Clinic GP/nurse records and sends patient case via mobile phone
3. Remote dermatologist reviews and consults on case via website
4. Clinic GP/nurse provides necessary treatment, referral or follow-up
Device Overview: ClickDerm on Android

Home Screen

- **GoogleChat** for ClickSupport
- **ClickDerm** for AAD Telederm Program
- **Gmail** for notifications
- **Web browser** for Internet and case viewing
- **Menu Button**: press to unlock phone and awake phone from sleep mode
- **Back Button**: use anytime to exit current screen
- **Call Button**: use to make calls during emergency if voice plan is activated
- **Home Button**: use *anytime* to Home Screen (this screen)
- **Power On/Off**: hold for 5 seconds
Clinician Adds New Patient

Add New Patient – enables request for consult for the newly added patient

Enter patient account number

Click Derm Diagnostics

In collaboration with Carnegie Mellon University, Harvard, MIT, Sana, and University of Pennsylvania

Add new patient
Perform Procedure
View Consults

Register
Clinician Completes Questionnaire

Which areas of the skin are currently involved?

- Same as before
- Back
- Chest
- Abdomen
- Arms
- Legs

What are the symptoms?

- Constant itching around rash/lesion
- Occasional itching around rash/lesion
- Itching all over
- Constant pain with rash/lesion
- Occasional pain with rash/lesion
- Burning in the area of the rash/lesion
- Associated Fever

Check all that apply:

- The rash comes and goes
- The rash has worsened over time
- The rash has gotten better over time
- The rash is the same as when it started
- The lesion is enlarging
- The lesion is stable
Clinician Takes Pictures, Submits Case

Press to take pictures, as many as needed

IMPORTANT:
• Use the photo button on the application screen.
• Press and hold the button to focus image. You should hear a beep sound
• DO NOT change phone or keyboard position until thumbnail of image appears.

Press when finished
Notification of Cases via email

ClickSupport

Email notification to consulting dermatologist of a new case awaiting consult

ClickSupport is available on gchat
Remote Dermatologist Accesses Website

Welcome to American Academy of Dermatology’s Teledermatology Partnership for the Underserved. The goals of this program are as follows:

- To provide teledermatology consultations to underserved populations in the United States and Canada
- To improve the health of underserved communities
- To encourage AAD members to volunteer in their communities

As President of the American Academy of Dermatology, it is my hope that more dermatologists across the country may be encouraged to provide care to our country’s underprivileged. Access to dermatologists in the United States varies significantly and is not limited to rural areas. In fact many of the underprivileged in urban areas have significant difficulty accessing dermatologists. Given the generosity of our membership, I believe this program will allow our AAD members to volunteer a few hours a week or month to provide online consultation and will be met with great excitement.

Sincerely Yours,

Dr. William D. James
President of the American Academy of Dermatology
# Dermatologist Selects Case

**Welcome Doctor Doctor1!**

**Please respond to your cases by clicking on the corresponding case status link.**

<table>
<thead>
<tr>
<th>Status</th>
<th>Case ID</th>
<th>Patient ID</th>
<th>Requester</th>
<th>Date/Time Submitted</th>
<th>Consulting Doctor</th>
<th>Remaining Response Time</th>
<th>Location</th>
<th>Health Facility</th>
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<tr>
<td>open</td>
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<td>clickphone1</td>
<td>8/3/10 7:30:38 AM.000</td>
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<td>5:56:16</td>
<td>Rockville, MD</td>
<td>Test Clinic</td>
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<td>open</td>
<td>56</td>
<td>testpatient1</td>
<td>clickphone1</td>
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<td>11:36:48</td>
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<td>Test Clinic</td>
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<td>Rockville, MD</td>
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<tr>
<td>under review</td>
<td>63</td>
<td>testpatient1</td>
<td>clickphone1</td>
<td>8/3/10 4:46:46 PM.000</td>
<td>Click Doctor1</td>
<td>16:56:23</td>
<td>Rockville, MD</td>
<td>Test Clinic</td>
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<tr>
<td>open</td>
<td>66</td>
<td>testpatient3</td>
<td>phonoclick3</td>
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<td>clickphone1</td>
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<td>Rockville, MD</td>
<td>Test Clinic</td>
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<tr>
<td>under review</td>
<td>71</td>
<td>1122</td>
<td>clickphone1</td>
<td>8/4/10 1:10:08 AM.000</td>
<td>Click Doctor1</td>
<td>16:55:35</td>
<td>Rockville, MD</td>
<td>Test Clinic</td>
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<tr>
<td>under review</td>
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<td>testpatient1</td>
<td>clickphone1</td>
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<td>followup</td>
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<td>Rockville, MD</td>
<td>Test Clinic</td>
</tr>
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</table>

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### Dermatologist Reviews Case

**Case owner** – no other doctor sees this case in their queue

**Name of clinician** who submitted request - will appear in format [gp.lastname, fi.], e.g. gp.johnson.mi

**Time to answer case:** Once the case link is clicked, a response should be entered within 24 hrs

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### Patient Case Information:

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consent signed by the patient in file?</td>
<td>Yes</td>
</tr>
<tr>
<td>Age of the patient</td>
<td>20-40 years old</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
</tr>
<tr>
<td>Is the patient:</td>
<td>Very ill due to the current skin condition, Living in poor conditions, Immuno-compromised other than HIV</td>
</tr>
<tr>
<td>How long has the patient had this condition?</td>
<td>1-2 days</td>
</tr>
<tr>
<td>Does anyone in the family have a similar condition?</td>
<td>No</td>
</tr>
<tr>
<td>Where was the first area the rash/lesion began?</td>
<td>Back</td>
</tr>
<tr>
<td>Which areas of the skin are currently involved?</td>
<td>Back, Chest</td>
</tr>
<tr>
<td>What are the symptoms?</td>
<td>Constant itching around rash/lesion, Occasional itching around rash/lesion, Occasional pain with rash/lesion</td>
</tr>
<tr>
<td>Check all that apply:</td>
<td>The rash has Worsened over time</td>
</tr>
<tr>
<td>Does anything make the skin problem worse?</td>
<td>Yes</td>
</tr>
<tr>
<td>If yes, indicate what makes the skin problem worse:</td>
<td>test</td>
</tr>
</tbody>
</table>

### Images:

[Click to enlarge image]
Clinician Receives Notification About Consult

Email notification
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
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<tbody>
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<td>Male</td>
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<td>Is the patient ill?</td>
<td>Very ill due to the current skin condition, living in poor conditions, immunocompromised other than my</td>
</tr>
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<td>How long has the patient had this condition?</td>
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</tr>
<tr>
<td>Does anything make the skin problem worse?</td>
<td>yes</td>
</tr>
<tr>
<td>If yes, indicate what makes the skin problem worse:</td>
<td>text</td>
</tr>
<tr>
<td>Does anything make the skin problem better?</td>
<td>yes</td>
</tr>
<tr>
<td>If yes, indicate what makes the skin problem better:</td>
<td>text</td>
</tr>
<tr>
<td>Has the rash been treated with:</td>
<td>steroid cream, antibacterial cream</td>
</tr>
<tr>
<td>Response to treatment[previous question]</td>
<td>No change</td>
</tr>
<tr>
<td>Is the patient currently taking medication for:</td>
<td>an infection that is not on the skin</td>
</tr>
<tr>
<td>If other, list the medications:</td>
<td></td>
</tr>
<tr>
<td>What do you think is the most likely diagnosis?</td>
<td>text</td>
</tr>
<tr>
<td>Please enter the follow-up plan for the patient:</td>
<td>Follow-up with me</td>
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<tr>
<td>If follow up with me, indicate how many days to wait</td>
<td>2</td>
</tr>
<tr>
<td>If other, specify:</td>
<td></td>
</tr>
<tr>
<td>Additional comments:</td>
<td></td>
</tr>
</tbody>
</table>
Challenges

- Diverse clinic practice arrangements
  - Ensuring custody of phones and patient information
- Establishing relationships among various entities:
  - AAD
  - Application vendors
  - Dermatologist volunteers
  - Clinics
  - Patients
- Ensuring appropriate handling of sensitive, but technically not personal health information (PHI)
- Large geographic area (US and parts of Canada)
Successes

• Many communities have high numbers of needy patients and primary care physicians who are enthusiastic about possibilities

• Wonderful team of selfless, committed volunteers and hard-working staff supporting this effort

• Technology capable of supporting a larger trial
AAD Teledermatology Pilot Timeline

July ‘10
- Tested upgraded mobile phone application

Aug/Sept ‘10
- Conducting on-site training for clinics, dermatologist volunteers

October ‘10
- Review launch and develop upgrades to application

February ‘11
- Present initial evaluation at AAD Board of Directors meeting
Dermatology in Action

• Academy strategic initiative on volunteerism
• Opportunities and encouragement to give back:
  – Academy programs
  – Resources on volunteerism
  – Donating supplies/Funding support
  – Recognition for volunteer efforts
Dermatology in Action
Total Volunteer Hours

- Volunteers reporting hours: 1,213
  - Gold: 276
  - Silver: 187
  - Bronze: 411
- Total Hours Reported: 877,694
- Total Dollar Value: $98,014,698