The U.S. Army Teledermatology Program

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AMEDD Teledermatology

- **Telemedicine And Advanced Technology Research Center (TATRC) and Walter Reed Army Medical Center development 1998 – 2001**
- **Internet based store-forward system**
- **Implemented February 2002 at three military medical facilities -- 19 teleconsultations received**
  - **32,000th teleconsultation submitted as of February 2010**
  - **Over 17 active sites involving Army, Air Force, and Navy facilities**

Benefits

- **PATIENT**
  - Improve patient access

- **PROVIDER**
  - Empowerment with knowledge
    - ✓ Education of the referring physician or resident
    - ✓ Improvement in quality of the delivery of care

- **ORGANIZATION**
  - Return on Investment
    - ✓ Effective Triage
    - ✓ More efficient utilization of dermatologic resources

Benefits
Comments from Provider

Well, my two cents as a provider who used it in the past....

It was brought online while I was there as a family practice doc. I probably used it more than anyone else there, and found that my patients were thrilled with the early feedback, I was thrilled with the feedback, and it saved our med group money to spend on other stuff.

Over time, I found that the more I used it, the less I needed it because I started learning a good bit of dermatology....the little nuances of diagnosis, the 'tricks' I picked up from the dermatologists looking at the cases, etc. I'm way better with derm now than I was when I started my career, and I attribute a good part of that to this program.....and my nightly reading of Habif, of course.

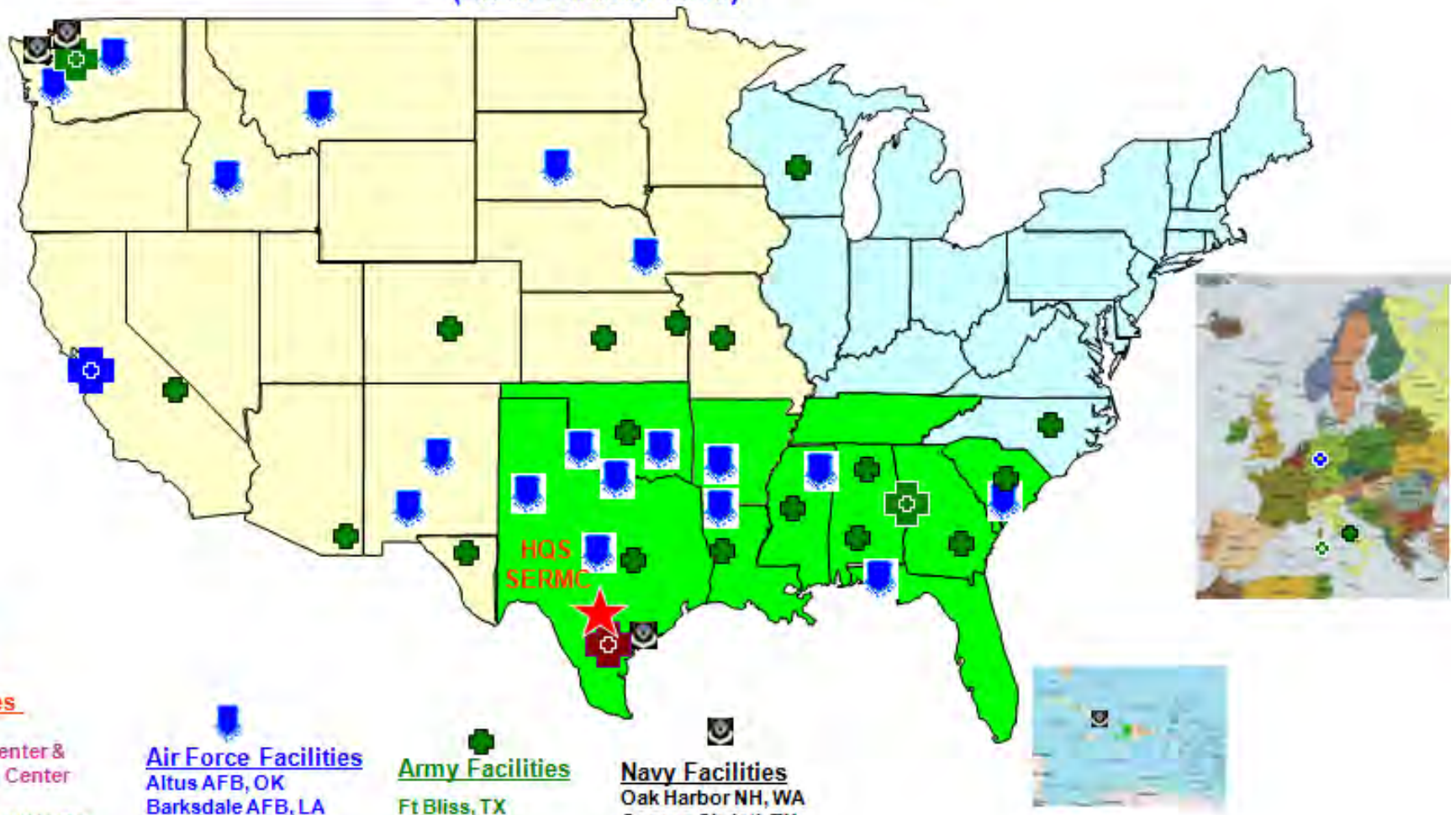
I'm a bit of skeptic when it comes to new computer based programs (AHLTA has forever scarred me) but this is really a sweet setup. All it takes is a digital camera, a computer, and a game plan on who is going to do what.

I would venture to guess that in every MTF that is dermatologist deficient, this ranks as probably #3 or 4 or the referral list. And, dermatologists in the civilian world are getting increasingly hard to find because of reimbursement issues, typically a 30-60 day wait for nonurgent issues.

Given the transient nature of many skin conditions (acutely, at least), the amount of distress they can cause the patient (and therefore the provider taking care of the patient), having a 24-48 hour turnaround time is fantastic.

Southern Regional Medical Command
Teledermatology Facilities

(As of 1 March 2010)



Supporting Facilities
(Teledermatologists)
Brooke Army Medical Center &
Wilford Hall AF Medical Center
San Antonio, TX
Eisenhower Army Medical Center,
Fort Gordon, GA
Landstuhl Army Medical Center
Germany w/duty in Vicenza, Italy
Madigan Army Medical Center,
Ft Lewis, WA
Travis AFB, CA

Air Force Facilities
Altus AFB, OK
Barksdale AFB, LA
Columbus AFB, MS
Dyess AFB, TX
Edwards AFB, CA
Ellsworth AFB, SD
Fairchild AFB, WA
Holloman AFB, NM
Hurlburt AFB, FL
Luke AFB, AZ
Mountain Home AFB, ID
Shaw AFB, SC
Tinker AFB, OK

Army Facilities
Ft Bliss, TX
Ft Hood, TX
Ft Jackson, SC
Ft Leavenworth, KS
Ft Leonard Wood, MO
Ft Polk, LA
Ft Riley, KS
Ft Stewart, GA
Ft Sill, OK
Ft Rucker, AL
Redstone Arsenal, AL

Navy Facilities
Oak Harbor NH, WA
Corpus Christi, TX

Inactive Facilities

Camp Shelby, MS
Everett NH, WA
Fort Bragg, NC
Fort Carson, CO
Fort Huachuca, AZ
Fort Irwin, CA
Fort McCoy, WI
Guantanamo NH, Cuba
Goodfellow AFB, TX
Kirtland AFB, NM
Little Rock AFB, AR
Livorno, Italy
Malmstrom AFB, MT
McChord AFB
Offutt AFB, NE
Sheppard AFB, TX

Business Model

- Consult Manager at facility is the link between patients and the primary care physician

- Accountability
  - Number of consult managers at facility is based on volume

- Optimize utilization
  - Integrate consult flow into the patient referral process
  - Each site is unique: no "one size fits all" mentality

- Marketing
  - Buy in from Providers and patients

- Regional Support Team
  - Consulting Dermatologists
  - Information Management
  - Operations Management

3rd Year Dermatology Residents Training

- **Dermatology Resident's and Teledermatology**
  - **Teledermatology is part of 3rd Year Dermatology Resident's training**
  - **On-call 3rd Year Dermatologist reviews teleconsultation**
  - **Resident's evaluation is reviewed and graded by on-call Dermatologist**
    - **Diagnosis + Treatment Plan + Follow-up**
    - **Agree or Partially Agree or Disagree**
  - **Recommendation goes out under the authority of the dermatologist**
  - **Resident receives feedback – verbal or e-mail**

Basic Requirements for Teledermatology

- **<u>Minimum</u> equipment**
  - **Digital camera with 3 mega-Pixels**
    - ✓ **Most new cameras are rated at 10 mP or higher**
    - ✓ **Zoom and / or macro (close-up) capability**
  - **Memory card or direct connection via USB cable**
  - **Computer with compatible web browser (Internet Explorer or Firefox)**

- **Training**
  - **On-site or Distance Learning**
  - **Distance Learning via PowerPoint presentations, video-teleconferences and / or conference calls**
    - ✓ **Consult Manager Training**
    - ✓ **Staff coordination**
    - ✓ **Physicians Update**
  - **Distance Learning is now the preferred method as more remote sites are added**

GPRMC - TeleDermatology - Internet Explorer provided by Dell

https://tderm.gprmc.amedd.army.mil/

Certificate Error

GPRMC - TeleDermatology

Working Diagnosis:
50 UNSPECIFIED SKIN DISORDER

Specific Questions/Additional Relevant Information:
Active duty black male with vesticle formation in his right foot since February 2010. These vesticles may last one to two weeks ther burst. At all stages of their development these vesticles are painful to touch. He has tried various over-the-counter medications for fungus without relief. Presenting now because he's getting similar lesions to the left foot. Please advise.

Images (pix by pix)

Image 1 # 1:
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Image 2 # 2:
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Image 3 # 3:
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Image 4 # 4:
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Image 5 # 5:
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Additional Images

Image 1 # 6:
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Image 2 # 7:
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Image 3 # 8:
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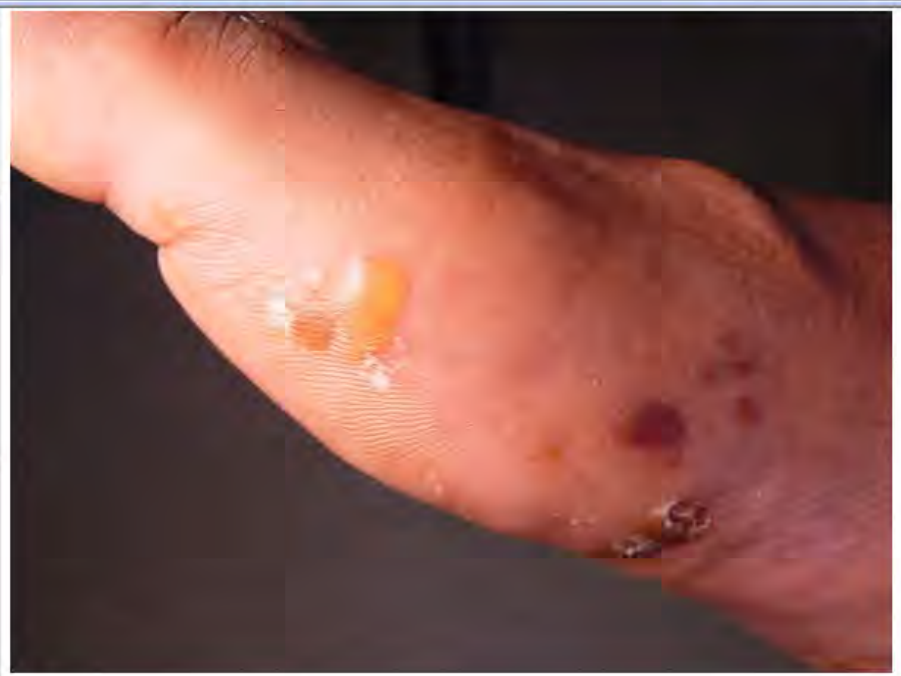

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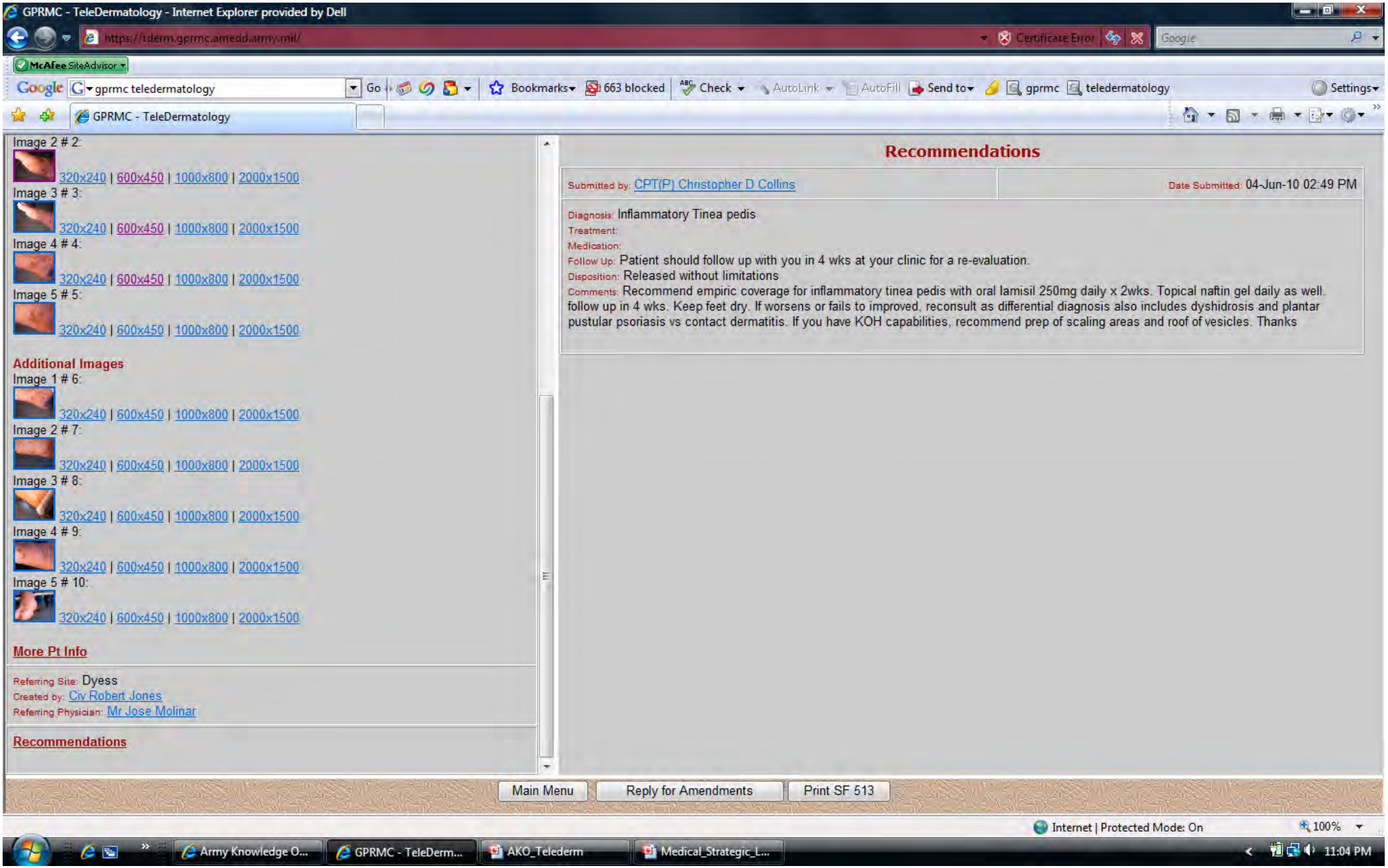
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Image 5 # 10:
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More Pt Info
Referring Site: Dyess
Created by: Civ Robert Jones
Referring Physician: Mr Jose Molinar
Recommendations
Recommendations
Submitted by: CPT(P) Christopher D Collins
Date Submitted: 04-Jun-10 02:49 PM
Diagnosis: Inflammatory Tinea pedis
Treatment:
Medication:
Follow Up: Patient should follow up with you in 4 wks at your clinic for a re-evaluation.
Disposition: Released without limitations
Comments: Recommend empiric coverage for inflammatory tinea pedis with oral lamisil 250mg daily x 2wks. Topical naftin gel daily as well. follow up in 4 wks. Keep feet dry. If worsens or fails to improved, reconsult as differential diagnosis also includes dyshidrosis and plantar pustular psoriasis vs contact dermatitis. If you have KOH capabilities, recommend prep of scaling areas and roof of vesicles. Thanks
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Reply for Amendments
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GPRMC - TeleDerm...
AKO_Telederm
Medical_Strategic_L...
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Summary

- Teledermatology prevents dermatological referrals to network
- Patients benefit from faster access to care
- Implementation Challenges
  - Up-front cost for equipment, personnel, and training

Army Knowledge Online

- **Program to support U.S. military and NATO physicians**
- **E-mail based system**
- **No patient identifying information transmitted**
- **24 / 7 coverage**
- **Average Reply Time from receipt of teleconsultation until a recommendation sent is around 5 hours**
- **Specialties with established contact groups**

- ✓ Burn-Trauma
- ✓ Cardiology
- ✓ Dermatology
- ✓ Dentistry
- ✓ Infectious Diseases
- ✓ Internal Medicine
- ✓ Infection Control
- ✓ Microbiology
- ✓ Neurology
- ✓ Nephrology
- ✓ Prev / Occup Med
- ✓ Ophthalmology / Optometry
- ✓ Orthopedics
- ✓ Pediatrics
- ✓ Rheumatology
- ✓ Sleep Medicine
- ✓ Toxicology
- ✓ Traumatic Brain Injury
- ✓ Urology

Army Knowledge Online

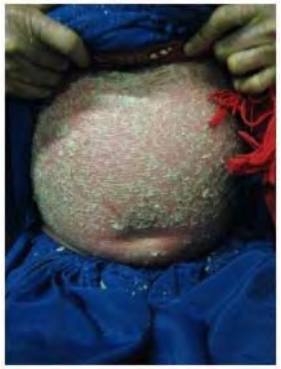
- **Other specialties "as requested"**
  - Allergy
  - Endocrinology
  - ENT
  - Flight Medicine
  - Gastroenterology
  - General Surgery
  - Hematology
  - Legal
  - Neurosurgery
  - OB-GYN
  - Oncology
  - Pharmacy
  - Pulmonary
  - Plastic Surgery
  - Psychiatry
  - Radiology
  - Speech Pathology
  - Vascular Surgery
- **Contact Project Manager for current list and on-call consultant**

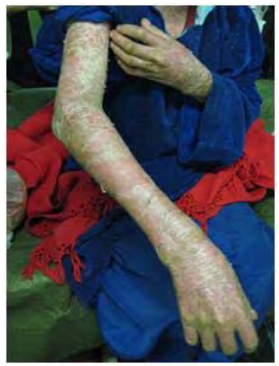


Botfly Larva in Patient's Eye (Iraq)

Army Knowledge Online

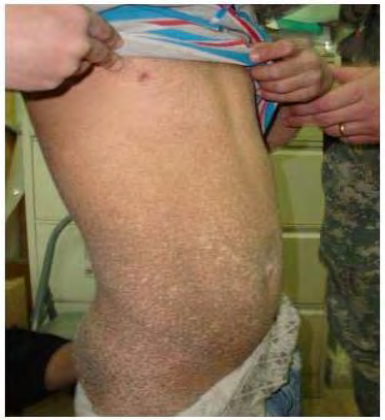
- **No restrictions on patient branch of service or nationality**
  - **If the patient comes to your clinic and you need assistance, send the consult**
  - **Use for advice on the treatment of host nation patients**
- **Consults are answered every day of the week including weekends and holidays**
- **Project Manager receives all teleconsultations and serves as the gate keeper**



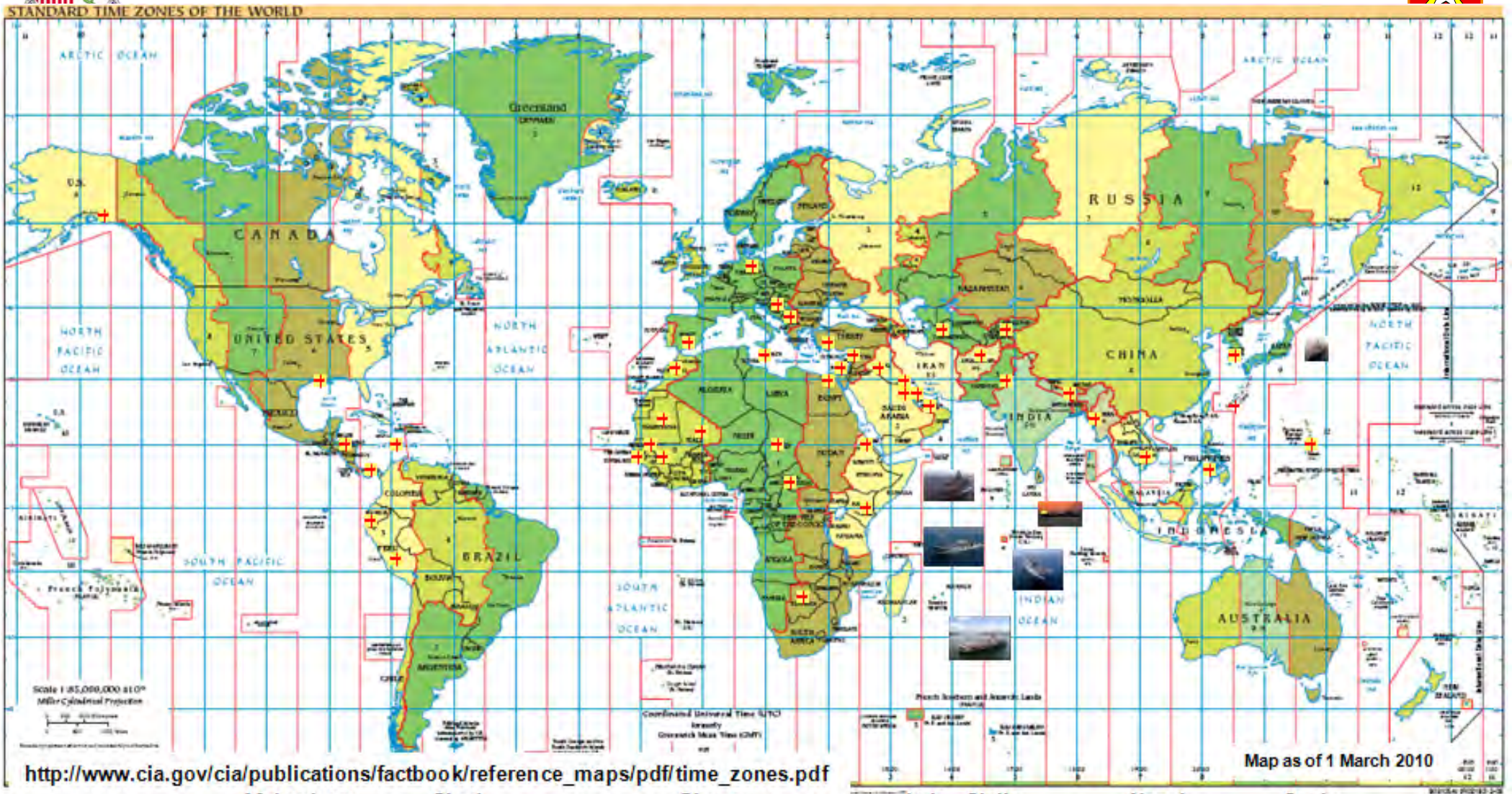


Feedback From Provider
Afghanistan Child With Lamellar Ichthyosis

Thank you again for your help with this case. You have been very helpful and it is encouraging because I feel I have some direction now so I can help this young girl.



Locations Submitting Teleconsultations

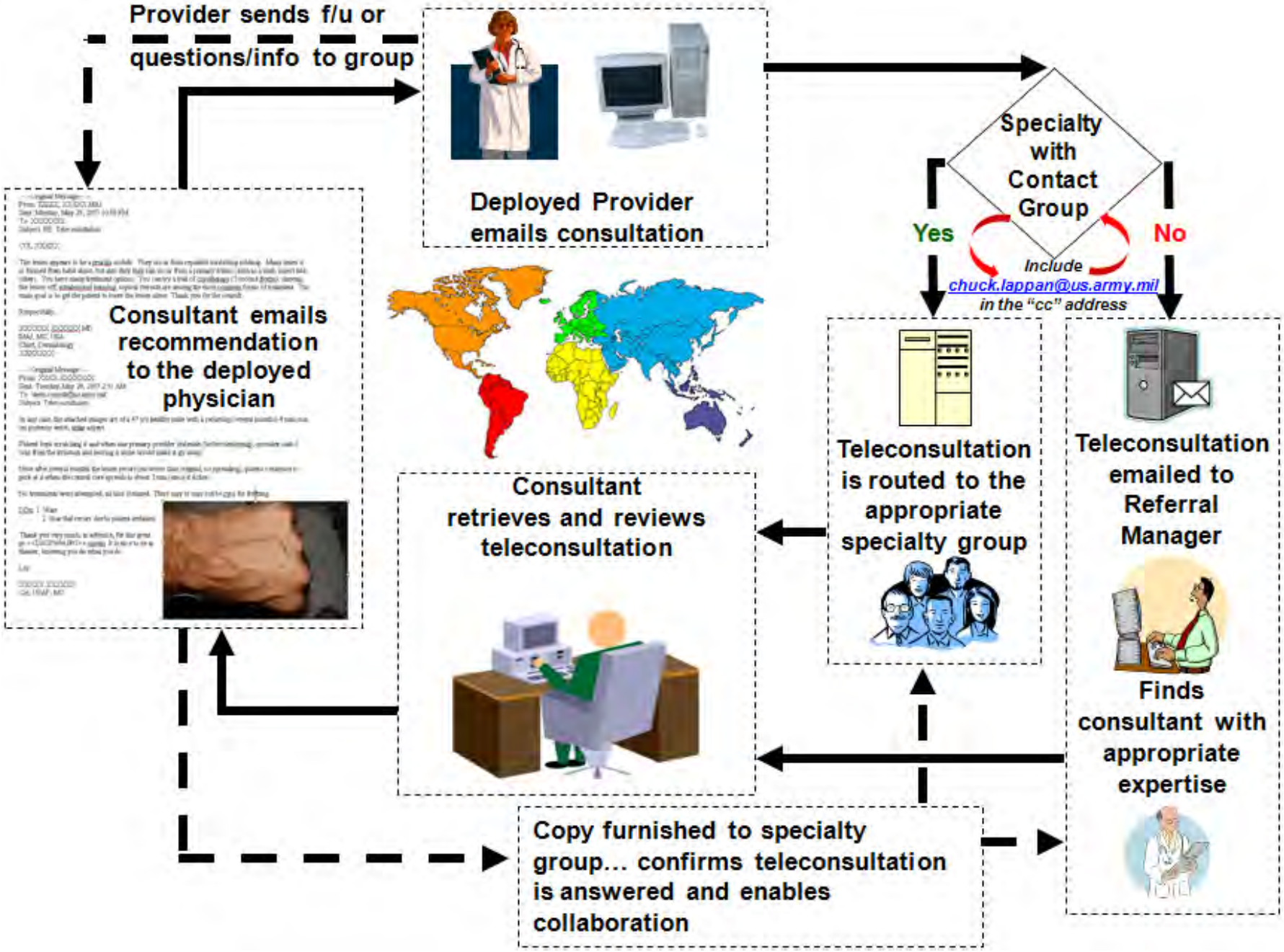


http://www.cia.gov/cia/publications/factbook/reference_maps/pdf/time_zones.pdf

Supported Facility

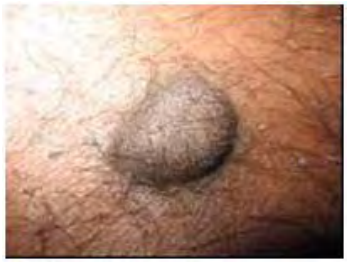
Afghanistan	Chad	Ghana	Italy - Sicily	Nepal	Spain
Albania	Continental US)	Germany	Kenya	Okinawa	Thailand
Bahrain	Djibouti	Guam	Kuwait	Pakistan	Turkey
Belize	Ecuador	Guatemala	Kyrgyzstan	Peru	Turkmenistan
Bosnia	Egypt – MFO Sinai	Guinea	Mali	Philippines	United Arab Emirates
Botswana	Haiti Relief	Hurricane Katrina	Mauritania	Qatar	US & Australian Navy afloat
Congo	Honduras	Iraq	Morocco	Senegal	

Teleconsultation Program Business Practice



Program Summary by Specialty

	Total Consults By FY								
	2004 Totals	2005 Totals	2006 Totals	2007 Totals	2008 Totals	2009 Totals	2010 Totals	Program Totals	% Consults Program
Burn-Trauma		23	24	19	32	31	6	135	2%
Cardiology		2	67	41	61	67	32	270	4%
Dental						14	7	21	0.3%
Dermatology	321	543	528	467	562	526	215	3,162	46%
Infection Control						11	9	20	0.3%
Infectious Diseases		82	110	106	100	110	34	542	8%
Internal Medicine				34	50	57	31	172	3%
Microbiology						8	0	8	0.1%
Nephrology		13	18	33	30	29	8	131	2%
Neurology				78	123	145	55	401	5.9%
Ophthalmology	10	51	38	54	70	65	24	312	5%
Orthopedics				11	105	169	74	359	5.3%
Pediatrics		8	21	27	24	20	6	106	2%
Prvt Med			3	13	13	25	7	61	0.9%
Rehabilitation			1			0	0	1	0.0%
Rheumatology			13	26	20	21	12	92	1.4%
Sleep Medicine						12	3	15	0.2%
Toxicology		2	19	15	14	8	3	61	0.9%
Traumatic Brain Injury					8	42	21	71	1.0%
Urology				6	69	108	56	239	3.5%
Other Specialties		7	61	124	178	185	67	622	9%
Totals	331	731	903	1,054	1,459	1,653	670	6,801	

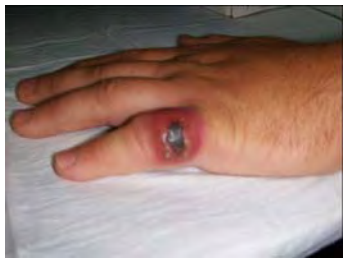


Lichen Simplex Chronicus

Top Specialties FY10

Dermatology: 32%
Orthopedics: 11%
Other Specialties: 10%

Spider Bite (Iraq)



Top Locations
FY 10

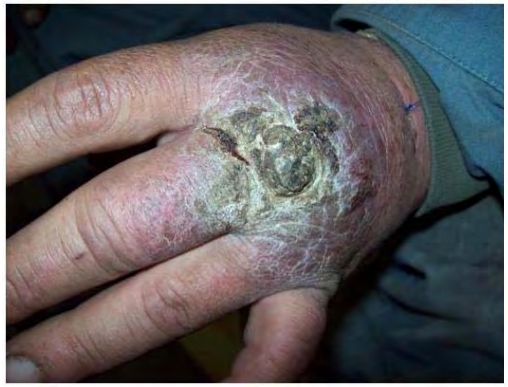
43% Iraq
27% Afghanistan
15% Navy Afloat

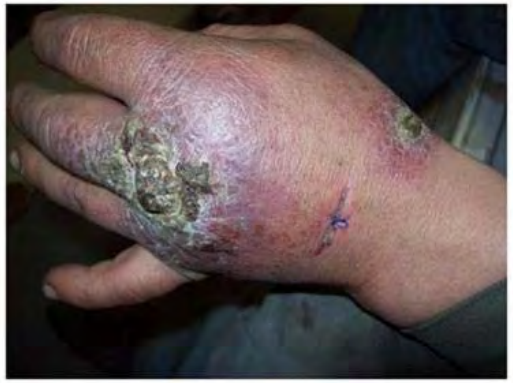
Physician Feedback

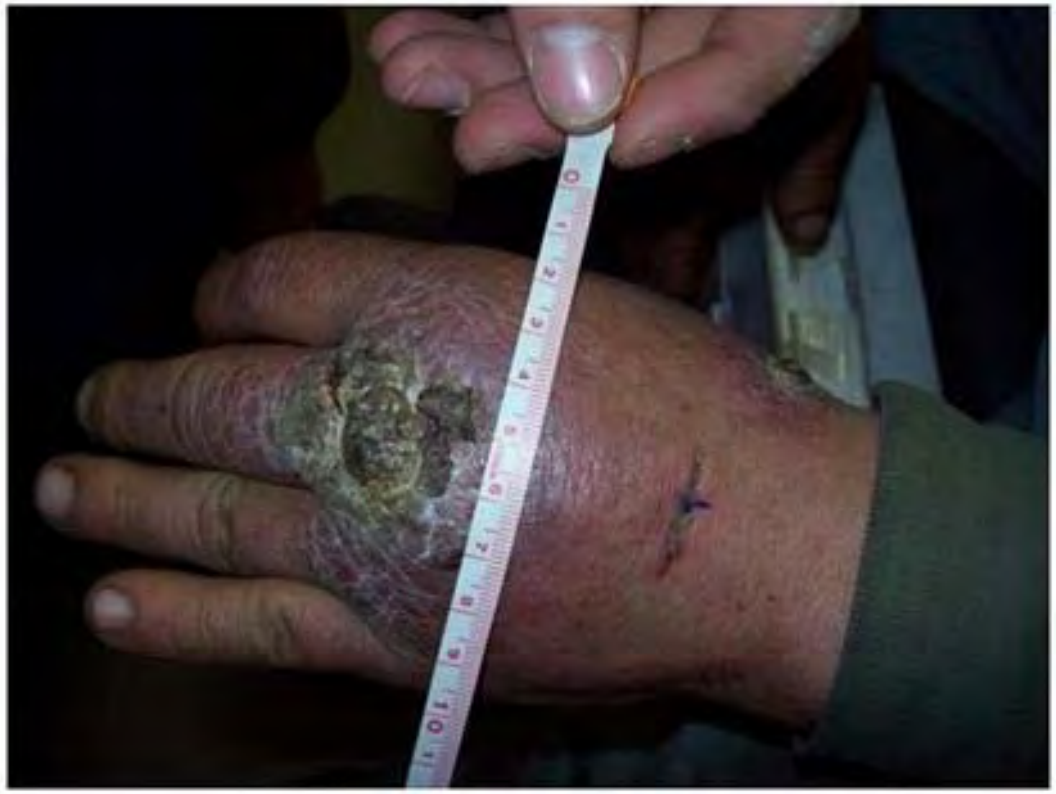
- **In my opinion, this program is the single most important thing that the Army can provide to a deployed physician other than a rifle and medical supplies**
  - **For several ortho cases the recommendations changed my management.**
- **I have found that I get several responses within a couple hours of sending a message. This rapid turn-around allows the soldier to begin receiving more directed therapy the same day as the consult is sent. This is in reality faster than trying to evac the soldier to another FOB or further back in the system to begin care.**
- **For those difficult cases, it helps to get a second opinion because as you know lives are at stake whenever you fly someone off the ship not to mention the cost and loss of manpower. I have to admit it also makes it a bit easier to swallow sometimes when our leadership know that a subject matter expert concurs in these instances.**

Case Studies
Dermatology

Images







Referring Physician Narration

Local male, estimated 24 years old, presents to battalion aid station with 3 month history of rapidly expanding lesions on the dorsal surface of the left hand. Lesions began as small erythematous papules with central scaling, then expanded dramatically. The dominant lesion on the hand currently overlies the 3rd MCP joint, with a 2cm raised (?hyperkeratotic) scale on a large 6-7cm dusky erythematous base with moderate swelling. He has been treated previously by both local and Canadian healthcare providers, but was lost to follow up. Local physicians informed him they were suspicious of possible leishmaniasis, but no treatment was initiated.

Help with differential diagnosis and recommended treatment would be appreciated. Of note, this is a Role 1 treatment facility without lab/biopsy capabilities. The patient has already sought help at the local Afghan hospital, and was told "they couldn't do anything for him."

Dermatologist's Recommendation / Dx

I agree this could very well be leishmaniasis. If he was a US soldier he would be sent to WRMC for systemic therapy because of the joint involvement. Unfortunately he needs a biopsy to confirm his diagnosis (which you can not provide) but I am curious as to why he has a suture in his wrist - was a biopsy done somewhere else.

For treatment I know some NGOs/WHO have in the past treated patients in CC. In general lesions tend to self resolve in 12-18 months but will leave scarring (possibly contracture in this patient). If it is caused by L tropica it may also recur.

Unfortunately there is not much you can do. I would treat him with either a 14 day course of doxycycline or bactrim for good staph coverage.

Other than that there is not much else that can be done with your limited resources.

Leishmania Laboratory Directors Comments

Great case... could be leish, but likely a pretty bad secondary infection as well. If it were me with no real support, I might consider Augmentin and presumptive therapy with Liposomal Ampho B....

Case Studies
Neurology

Referring Physician's Narration

I evaluated a Patient today, she is a 46 Y/o Female; smoker (1 ppd for 20 years), perimenopause symptoms started taking STROVEN caps about 3 days ago, she states about 8 hours presented episode of motor aphasia and loss peripheral vision Right eye, the event lasted less than 2 minutes, completely resolved and the pt came to my clinic after she received advise from her boss. This has never happened before. ROS negative except for night sweats.
PMH: seasonal allergies occasional take Claritin.
Meds Stroven caps started 3 days ago.
PSH tubal ligation 10 years ago.
G1P0 LMP Jan/10
FH Esophageal cancer father, neg CAD, Stroke, DM
Smoker as above
Alcohol neg for last 6 month, heavy drinker at home
PE BP 116/74 HR 74 RR 14 Temp98.4 SAT 95 % RA Blood sugar 101 no fasting.
Detail physical exam was completely normal including neuro without any focal deficit, not carotid bruit
No evidence of cardiac abnormalities.
Idx: TIA
Plan stop smoking, ASA 81 mg daily, stop Stroven, education about stroke symptoms and early consult

Question: Does she need an urgent evaluation? She does not meet criteria for admission for high risk patient ABCD trial, Should I send this patient for early evaluation Vs keeping her in theater.

Consultation forwarded to In-country Neurologist by Program Manager

1st Neurologist' Recommendation / Dx - CONUS

If you suspect TIA she needs to be medevac'ed out ASAP. There is an AF theater neurologist at XX. However as greatest risk for stroke is next 48 hours urgent eval is warranted. The ddx, though, for someone so young would include hemiplegic migraine and hypercoagulable states. If she had a neg head CT, I would start ECASA 325 mg qd and also make sure she is hydrated.

In-Country Neurologist's Recommendation

I concur that she needs to go as, given the history of smoking & estroven exposure, she could have had a TIA. The aphasia and apparent homonoymous hemianopsia both localize to the left hemisphere so I am concerned about here. You could send her here, but frankly all I would do is send her straight to LRMC because all I have is a CT. I would not TpA her either given the resolution of her symptoms and the time since onset.

TIA: Transient Ischemic Attack

Continued on Next Page

Case Studies
Neurology

2nd Neurologist's Recommendation - Germany

Concur with the need for further eval...Dr. xx is currently the neuro doc on-call; I pick up the service on Friday morning.

3rd Neurologist's Recommendation - CONUS

In addition to comments from CDR XX and Capt yy, I also recommend ASAP medevac out of theater. TIA evaluation has undergone changes back and forth since I was in training, but present recommendation is to consider TIA of the same urgency as cardiac events such as angina or MI. I concur with ASA, smoking and estrogen cessation, and close monitoring until she departs theater. Hopefully she can be moved expeditiously. Hope this helps. Let the group know if you have any more management questions or need any assistance with medevac.

4th Neurologist's Recommendation - Germany

If for any reason she is going to be delayed and in her hold-over location there are cardiology capabilities, consider an echo.

Also - if sx's recur in spite of cessation of meds and administration of med regimen, consider advancement to plavix vs heparinization (pending head ct results)

2nd Neurologist's Follow On

In absence of a clear indication for anticoagulation, heparin is not indicated for the treatment of TIA/acute stroke. While heparin is sometimes used for crescendo TIA, there is little evidence based medicine to support its efficacy in this circumstance.

Outcome

Patient evacuated to Germany

Consultation Time Line

- Consultation received: 0710
- Forwarded to In-country Neurologist: 0746
- 1st CONUS neurologist replied: 0751
- In-country neurologist replied: 0755
- 1st Germany neurologist replied 0816
- 2nd CONUS neurologist replied: 0826
- 2nd Germany neurologist replied: 0831
- Evacuation initiated:1030

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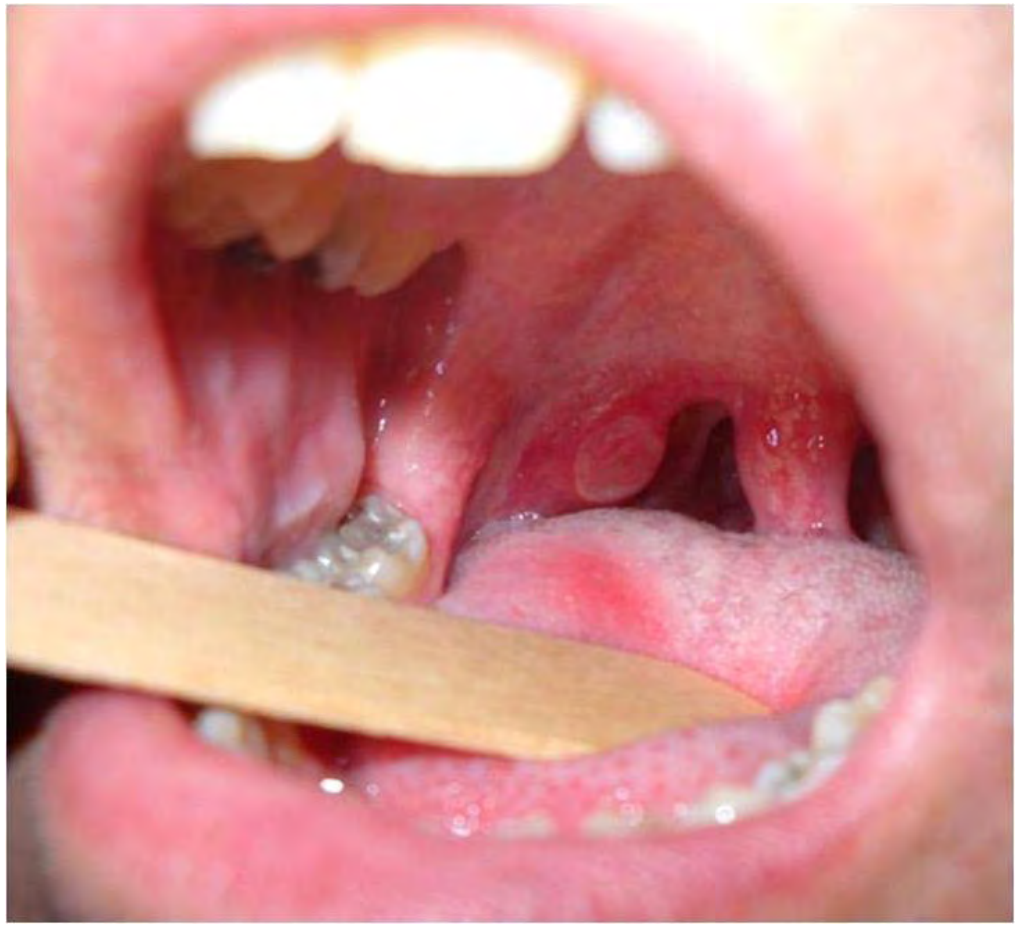
Case Studies
Otolaryngology

Image



Deployed Provider's Narration

The Patient is a 26 year old male, with a history of depression, who presented with a 10 day history of sore throat, specifically ulceration of R tonsil. He has been seen twice with same symptoms and diagnosed with pharyngitis. He was initially treated symptomatically with salt-water gargles, cepacol prn, and ibuprofen prn. He was started on Celexa a few weeks ago, this was discontinued as well thinking was that this meds may have caused mucosal ulceration of the R tonsil. He denies fever, cough, n+v, or any other infectious symptoms throughout course. No changes in taste or voice, no trismus. He has pain in the R pharynx esp with swallowing. Pt is using vicous oral lidocaine/mylanta suspension with brief relief. Pt states still having problems with food or liquids if he dose not use oral lidocaine.

Vital signs all wnl. Physical exam- Right tonsil: There is a large 1.2 cm denudgation, ulcerative type lesion, with peripheral erythma, no exudates, slight tonsillar swelling. Neck- Right posterior anterior cervical adenopathy in the region that is adjacent to the tonsillar pillar. Rest of the exam is nl.

He had quick strep test x 2 all negative.

Following last visit we empirically started patient on course of clindamycin.

Otolaryngologist's Recommendation

The photograph was much appreciated. A picture truly is worth a thousand words.

The lesion depicted is NOT on the tonsil. Rather it is on the anterior tonsillar pillar. It represents a large apthous ulcer (apthous stomatitis). The etiology is unknown but is felt to be viral. They usually last 10-14 days. Exquisite pain is a typical characteristic.

Please obtain a tube of Orobase with Kenalog from the pharmacy. (This is a dental paste with steroid which is directly applied, by finger over the surface of the lesion). The patient can do this 3-4 times per day until the ulcer resolves.

Deployed Provider referred to in-country Otolarynologist for assistance

Program Summary

- **Program Summary**
  - **19 specialties with contact groups: xxx.consult@us.army.mil**
  - **6,801 teleconsultations (Apr 04 to Feb 10 – 71 months)**
  - **87 known evacuations prevented**
  - **273 known evacuations facilitated following consultant's recommendation**
  - **1,747 different referring health care professionals**
  - **849 teleconsultations on non - US patients**
  - **Average Reply Time 5 hr 9 min**