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LTC C. Becket Mahnke, MD

PATH Director

Christopher.Mahnke@us.army.mil

<https://path.tamc.amedd.army.mil>

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**Honolulu is closer to:**

Dallas (3770 mi)

Atlanta (4490 mi)

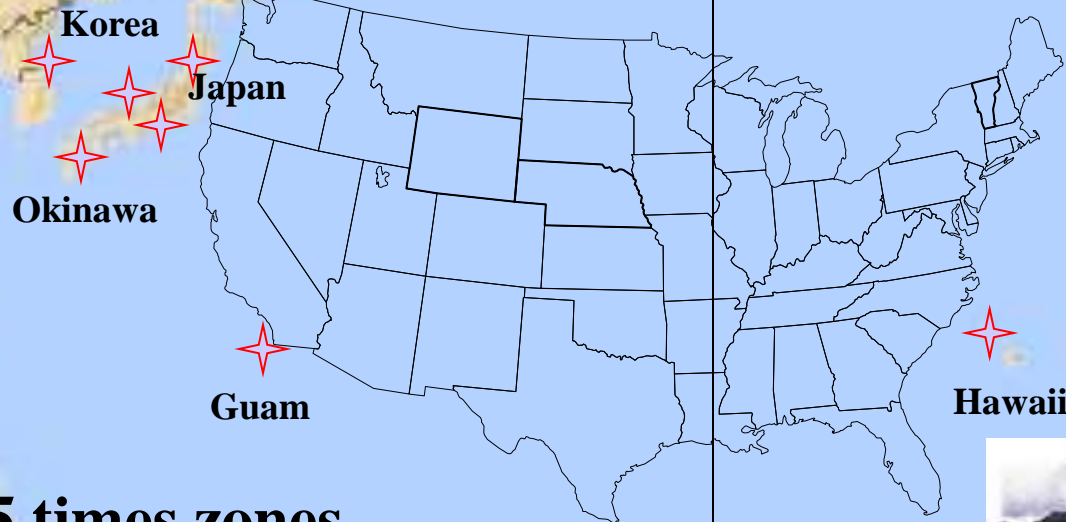
Chicago (4230 mi)

**Than it is to:**

Seoul (4550 mi)

Okinawa (4650 mi)

# Tele-health in the Pacific



**Spans 5 times zones**



Tripler Army Medical Center

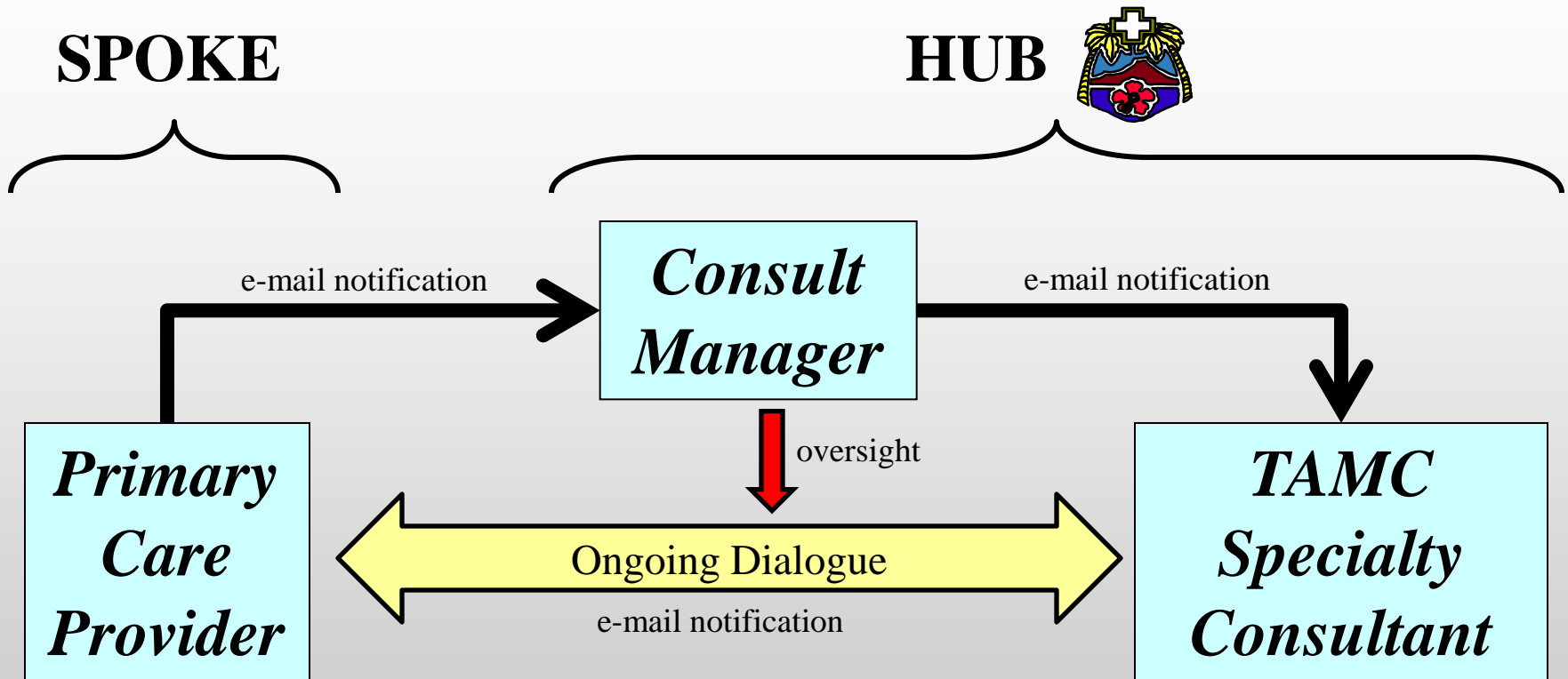
**International Date Line**

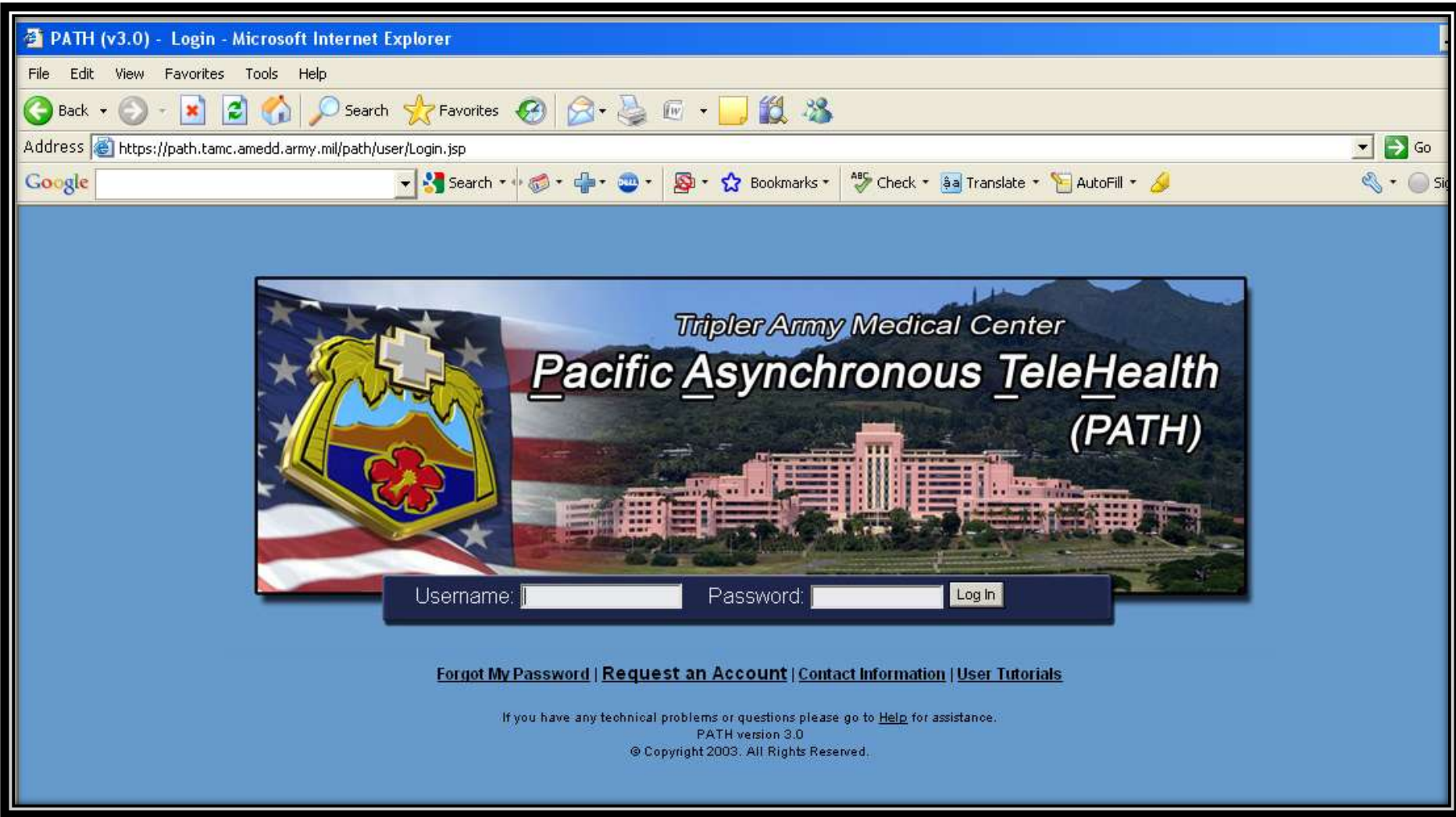
# Pacific Asynchronous TeleHealth (PATH) System

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- Web-based, HIPAA compliant, secure system-  
Available ANYWHERE!
- Provider-to-Provider consultation-
- Asynchronous (store & forward), multi-media-
- Pediatric, adult, & “other” modules-

# PATH Workflow/Consult Mgmt





*https://path.tamc.amedd.army.mil*

PATH homepage: Outside Firewall

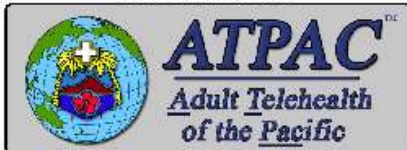


[Log Out](#)

Select a Module

Click on the Module you want to enter.

Teleconsultation

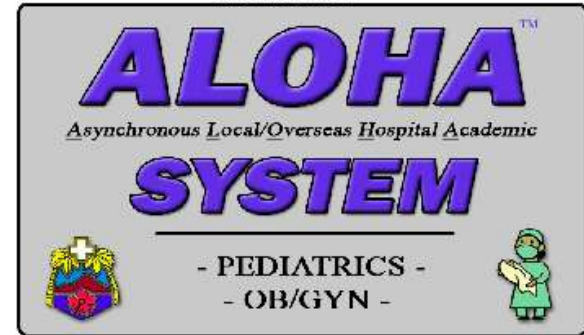


Other

- [ALOHA - TeleEducation](#)
- [Child Abuse Pediatrics](#)
- [Concussion Clinic](#)
- [Demonstration](#)



TeleEducation



If you have any technical problems or questions please go to [Help](#) for assistance.

PATH version 3.0

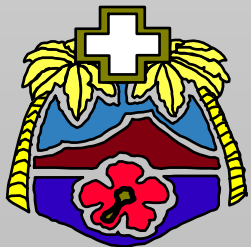
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# PATH Benefits

↑ Access to Care

↑ Quality of Care

↓ Cost



# PATH Benefits

A hand holding a yellow lightning bolt over a globe. The hand is positioned as if holding the lightning bolt, which is a stylized representation of an electrical discharge. The globe is a light blue and green color, representing the Earth. The background is a light gray gradient.

Malone F, Callahan C, Chan D, Sheets S, Person D. Caring for children with asthma through teleconsultation: "ECHO-Pac: The Electronic Children's Hospital of the Pacific." *Am Telemed J* 2003.

- **Improved Access**

- pediatric pulmonologist, pediatric asthma nurse, and pediatric clinical pharmacist

- **Improved Quality**

- MDI scores increased
- Everyone with score <70% improved

- **Decreased Cost**

- **Fewer emergency room visits:** 3.85 vs. 0;  $p < 0.05$
- **Fewer unscheduled clinic visits:** 1.57 vs. 0.38;  $p < 0.05$

A hand holding a smartphone over a globe. The hand is positioned as if holding the phone, with the screen of the phone pointing towards the viewer. The globe is a light blue and green color, representing the Earth. The background is a light gray gradient.

# PATH Benefits

Callahan et al. “Effectiveness of an Internet-Based Store-and-Forward Telemedicine System for Pediatric Subspecialty Consultation” *Arch Pediatr Adolesc Med* 2005;159:389-393.

- **Improved Access (sub-specialists)**
  - Reviewed and forwarded by consult manager: 8 +/- 8 hrs
  - **Reply from consultant: 32 +/- 8 hours**
- **Improved Quality**
  - **Changed diagnostic and management plans: 20-25% of cases**
- **Decreased Cost**
  - 32 (12%) of these 267 cases would have been air-evacuated if not for the telemedicine consultation
  - **Air-evacuations were reduced by 30%**
  - Minimum savings: ~\$5,800 / air-evac
  - Avoidance of need to refer to local network providers

# PATH Benefits

- Mahnke CB, Jordan CP, Bergvall E, Pinsker JE, Person DA. *The Pacific Asynchronous TeleHealth (PATH) System: Review of 1,000 Pediatric Teleconsultations*. Telemedicine and e-Health, 2010.
  - 1,000 patient consults evaluated from >30 sites
    - 28 different specialties
    - **Median specialist response time was 14.5 hrs**
      - (92% by three days, 97% by one week)
  - 74% from rural, 26% from urban
  - Specialties
    - Medical: Cardiology 20%, GI 17%, Neuro 16%, Endo 15%
    - Surgical: ENT 31%, Urology 23% Peds Surg 11%

# PATH Benefits

A hand holding a yellow lightning bolt over a globe. The hand is positioned in the center, with the lightning bolt extending upwards and downwards. The globe is light blue and green, representing Earth. The background is a light gray gradient.

- Mahnke CB, Jordan CP, Bergvall E, Pinsker JE, Person DA. *The Pacific Asynchronous TeleHealth (PATH) System: Review of 1,000 Pediatric Teleconsultations*. Telemedicine and e-Health, 2010.
  - Question Resolved: 63%
  - Change in Dx/Tx: 74% (65-84%)
  - **Air evac avoided: 12-43%**
  - Cost avoidance of nearly > \$200,000/year
  - RVU generated: average 2.3 RVUs/case

# PATH Benefits

- **MEDEVAC Coordination/Case Mgmt**
  - **Decreased lost duty time**
  - **Remote Provider Education/Mentoring**
  - **HIPAA Compliant**
  - **Proper Documentation**
  - **Workload Credit**
- } vs. e-mail or phone





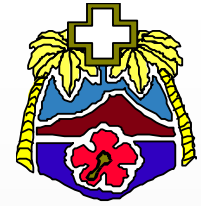
Medical  
Information

Phone

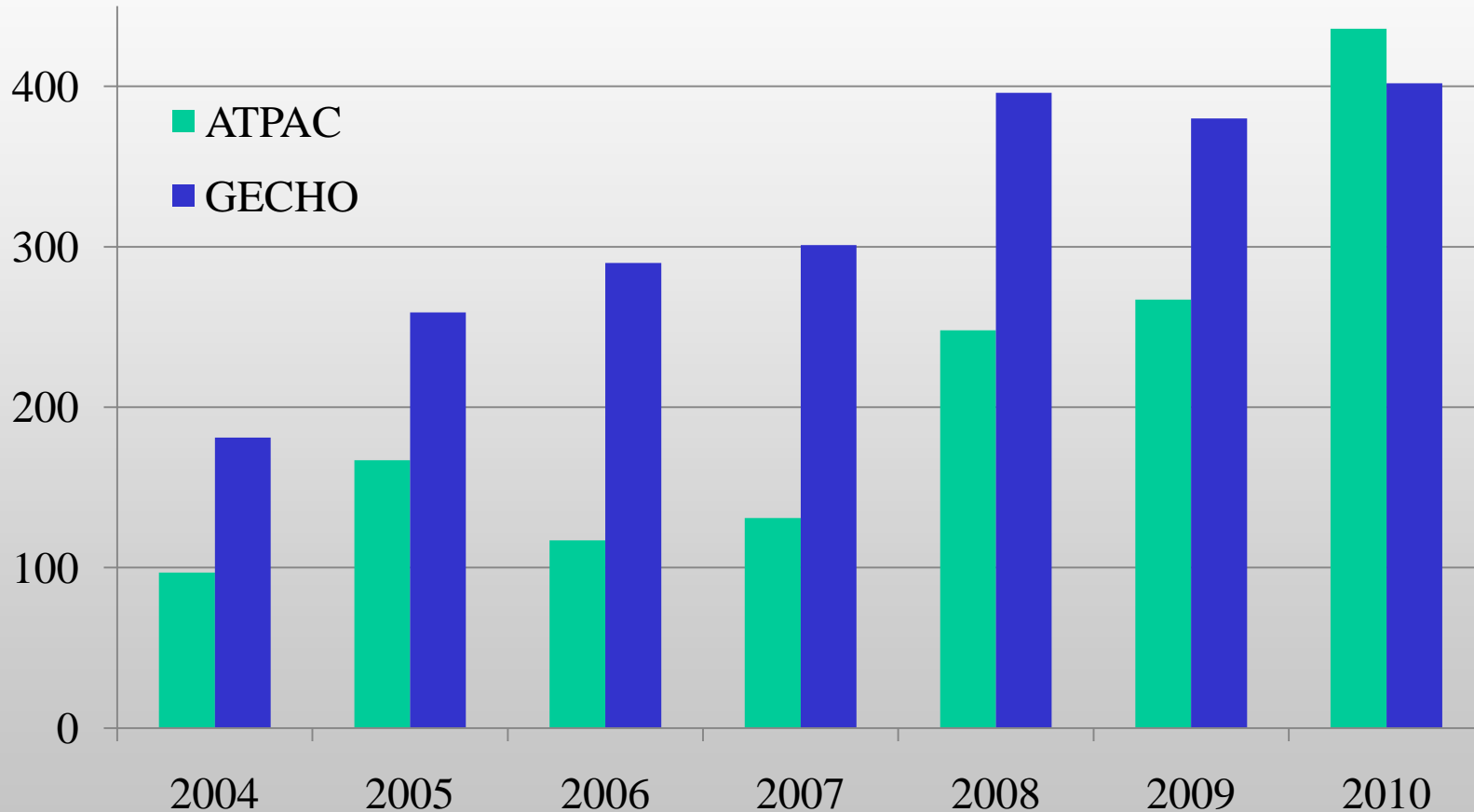
Fax

E-mail





# PATH Case Volume

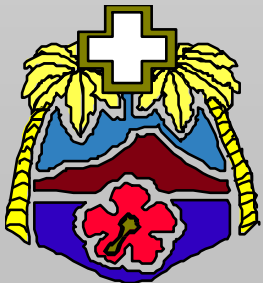


\*Total growth: 2004-10: 22%/yr; 2000-04: 9%/yr

# Tele-Consultation Challenges

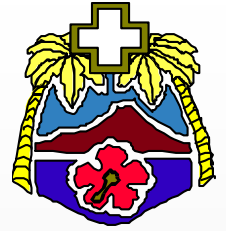
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- Documentation -
- Licensure/Credentials -
- Re-imburement -
- Privacy/Consent -
- Technical -
- Cultural -

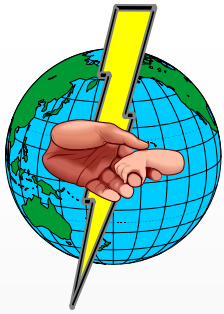




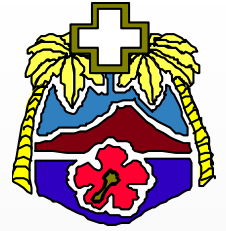
# PATH Challenges



- Documentation
  - AHLTA ↔ PATH
- Licensure/Credentials
  - Provider-to-Provider vs. Provider-to-Patient



# PATH Challenges

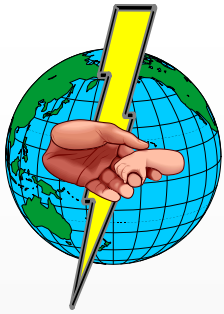


- Re-imburement

- RVU model
- GQ modifier or new codes?
- System cost

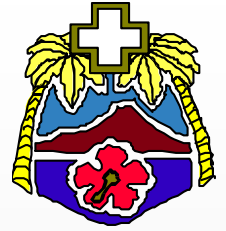
- Privacy/Consent

- HIPAA, PII, etc.
- Information assurance



# PATH Challenges

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- Technical

- Platforms
- Imaging

- Cultural

- Practice Standard?
- Patient “ownership”
- Patient preferences

# PATH: Future Directions

## Improved user experience

“every click counts”  
the two “customers”

## Easy entry into PATH

Remember the competition

## “Forced” entry in PATH



# “other” modules

PATH (v3.0) - Module Selection - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <https://www2.tamc.amedd.army.mil/path/actions/login.do> Go Links


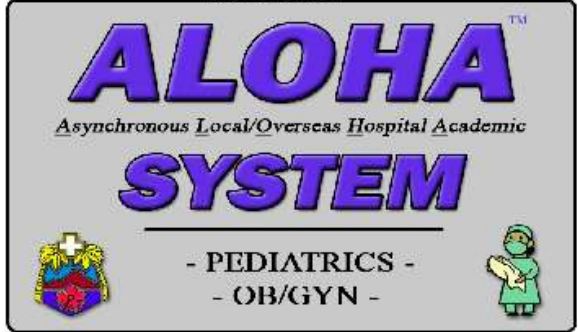



Google Search + DELL Bookmarks Check Translate AutoFill Sign In

Tripler Army Medical Center  
**Pacific Asynchronous TeleHealth (PATH)**

Log Out

Select a Module

Click on the Module you want to enter.

Teleconsultation	Other	TeleEducation
 <b>ATPAC</b> Adult Telehealth of the Pacific	<a href="#">ALOHA - TeleEducation</a> <a href="#">Child Abuse Pediatrics</a> <a href="#">Concussion Clinic</a> <a href="#">Demonstration</a>	 <b>ALOHA</b> Asynchronous Local/Overseas Hospital Academic <b>SYSTEM</b> - PEDIATRICS - - OB/GYN -
 <b>GECHO</b> Global Electronic Children's Hospital	 <b>Heartsounds</b> Tele-Auscultation	
	 <b>PDEP</b> Pediatric Diabetes Education Portal	

If you have any technical problems or questions please go to [Help](#) for assistance.  
PATH version 3.0  
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# ♥ Heartsounds ♥



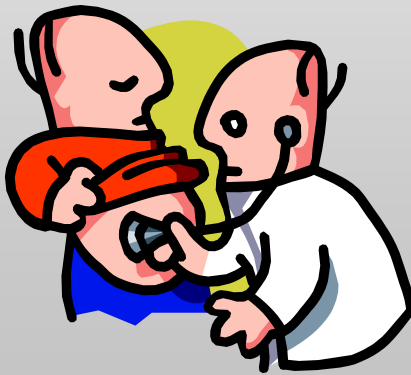
Tele-Auscultation

## Heart Murmurs

Common

Scary

Difficult to dx



Mahnke et. al. Utility of store-and-forward pediatric telecardiology evaluation in determining normal from 21 pathologic pediatric heartsounds. Clinical Pediatrics Vol. 47, No. 9, 919-925, 2008.

# ♥ Heartsounds ♥



Tele-Auscultation



**Signal**<sup>™</sup>  
Telemedicine

Heart Sounds

DIAPHRAGM	BELL	DIAPHRAGM	BELL
SUPINE		UPRIGHT	

PULMONIC

1. Capture  
2. Transfer  
3. Playback  
4. Reporting

# Tele-education (GME and CME)

# ALOHA

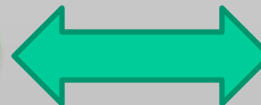
*Asynchronous Local/Overseas Hospital Academic*

# SYSTEM



- PEDIATRICS
- OB/GYN
- RADIOLOGY
- INTERNAL MEDICINE
- ORTHOPEDICS
- GENERAL SURGERY

Tele-  
CONSULTATION



Tele-  
EDUCATION



View Site As: - Select Role -

Home

Syllabus

Schedule

Announcements

Resources

Assignments

Tests & Quizzes

Gradebook

Activities

Site Info

Search

Help

## Recent Lecture Videos

Options

These are the ten most recent lecture videos.

- Apr 14: Febrile Seizures
- Apr 13: Sickle Cell Anemia
- Apr 12: Near Drowning
- Apr 9: Staff/Housestaff Meeting
- Apr 8: Syncope and Palpitations
- Apr 7: Necrotizing Enterocolitis
- Apr 6: Bronchiolitis
- Apr 5: Hyperthyroidism
- Apr 2: Precocious Puberty
- Apr 1: PREP review

*a complete listing can be found in the RESOURCES tab*

## Site Information Display

Options

This page is a central location for Pediatric residents and staff to access resources and information relevant to the Pediatrics Morning Conference (Mon-Fri, 0815-0900). Please take some time to become familiar with the site using the links listed on the navigation bar on the left side of the screen.



## Search

Admin

Search

This Site  All My Sites

## Calendar

Options

July, 2009

< Today >

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	1	<u>2</u>	3	4
5	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	11
12	<u>13</u>	<u>14</u>	<u>15</u>	<u>16</u>	<u>17</u>	18
19	<u>20</u>	<u>21</u>	<u>22</u>	<u>23</u>	<u>24</u>	25
26	<u>27</u>	<u>28</u>	<u>29</u>	<u>30</u>	<u>31</u>	1

## Hematologic Emergencies

Date: Jul 6, 2009 8:00 am - 9:00 am  
 Event Type: Class session  
 Description: --prevent--  
 lecturer: Dr. Kratovil  
 description: Presentation on blood disease related emergencies.  
 keywords: blood  
 Site: Ped 102 01 2009  
 Attachments: [20090706081722.html](#)  
[20090706081722.ppt](#)

# Patient-to-Provider

# PDEP


Pediatric Diabetes  
Education Portal



- Status:
  - > 50 active management cases
  - Hgb A1C reduction in first 3 months ( $p=0.03$ )
    - absolute reduction 2.7%, relative reduction 28%
    - For every 2% reduction, costs decrease \$30k

*Model for other chronic disease pt populations*

# Questions?



*Tripler Army Medical Center*  
**Pacific Asynchronous TeleHealth**  
**(PATH)**



Username:  Password:

[Forgot My Password](#) | [Request an Account](#) | [Contact Information](#) | [User Tutorials](#)

If you have any technical problems or questions please go to [Help](#) for assistance.

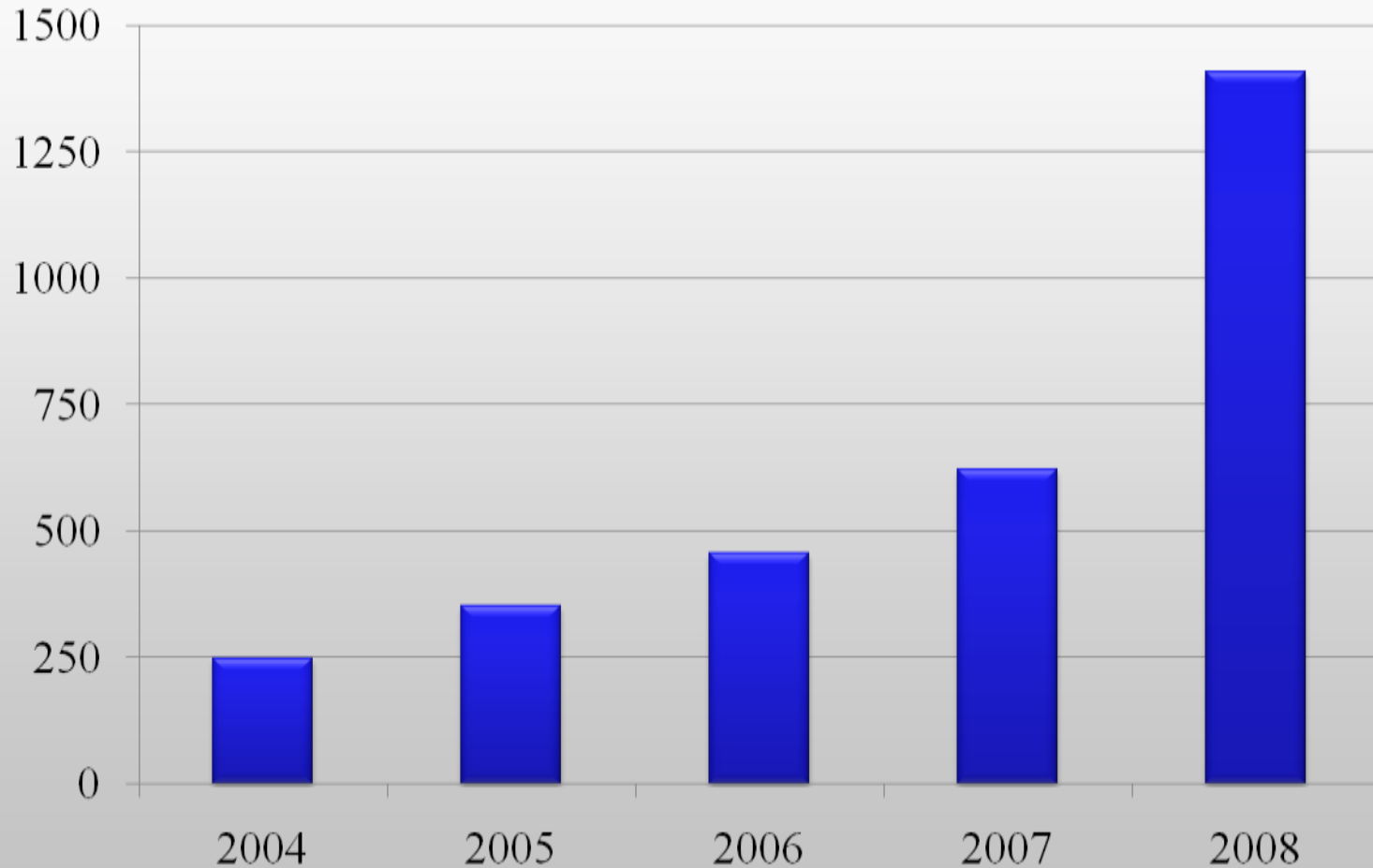
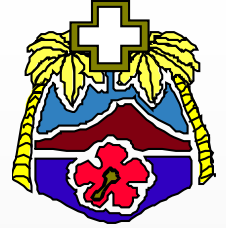
PATH version 3.0

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# Extra Slides



# PATH Images



*0.9 images/case*  *1.8 images/case*

# Case Submission

Request - General Consult | Session: 176:14

## Request for a General Consult on Japan Demonstration FMP/SSN: 02/652-36-2365 DOB: 05/14/1969

Please complete this form with as much detail as possible. All required fields are labelled in **RED**.

**Consent:**  Per DoD regulations, [Consent Form \(OF522\)](#) is now required to be placed in the patient's record. **(required!)** By checking this box you agree that the form has been completed. If the patient has not given consent you will not be able to submit this consult.

Request for a General Consult on Japan Demonstration

Select User: Administrator, Root ( System Administrator, Tripler Army Medical Center)  
Eble, Marc ( Provider, Tripler Army Medical Center)  
Mannix, Root ( Root, Tripler Army Medical Center)  
Prauner, Ronald ( Pediatric Hematology-Oncology, Tripler Army Medical Center)

### ----- Request Consult -----

**H&P:** [out & paste from AHLTA](#) 15 yr old AA male with syncope. This occurred during school yesterday after standing for pledge of allegiance.....

**Other Information:** PMHx of asthma, eczema. Father of patient recently diagnosed with Na sensitive HTN

**Assessment:** suspect vasovagal syncope

**Consult Question:** Is further evaluation warranted for this patient?  
Is there a role for tilt table testing?

For additional details, see AHLTA note dated: 04/03/2007

Submit

# Case Example



Session: 178:40

[Home Page](#) [Request Consult](#) [Search](#) [My Preferences](#) [Admin Home](#) [Help](#) [Log Out](#)

Administrator Mahnke in Demonstration | Today is 08/29/2009

**CASE D4315** Submitted: 08/29/2009 1:28 PM GMT-10:00 [New Case](#)

### Patient Information

**Patient Name:** [San Antonio Test](#)  
**FMP/SSN:** 01/546-25-3652  
**Patient DOB:** 08/06/2008  
**Age:** 1yrs 0mo  
**Military Service:** Army

### Provider Information

**Provider:** [C. Becket Mahnke](#)  
**Title / Department:** Pediatric Cardiologist / Pediatric Cardiology  
**Organization:** Tripler Army Medical Center  
**Location:** Tripler AMC, HI  
**Country:** United States of America

### Consult Request

**Date Submitted:** August 29, 2009 01:28 PM  
**Origin:** Tripler Army Medical Center (Tripler AMC, HI, United States of America)  
**H&P:** 1 yr old child with an irregular heart rate noted on routine physical exam. Child is thriving with no symptoms and no significant past medical history  
**Consult Question:** **I believe these are simple PACs. Can you confirm? Any other evaluation or testing needed? Or can I just follow the patient?**

### Images, Video & Sound [Upload Media](#)

### Attached Forms [Add / Remove Forms](#)

[Effectiveness](#)

### Admin Forms

Post Case Statistics	Desc
----------------------	------

Forwarded to Pediatric Cardiology (C. Becket Mahnke) by Mahnke, C. Becket on 08/29/2009 1:28 PM GMT-10:00

Forwarded to Telehealth (Administrator Mahnke) by Mahnke, C. Becket on 08/29/2009 1:29 PM GMT-10:00



SF600

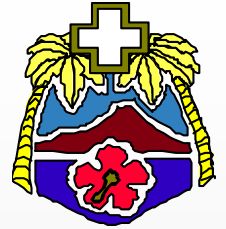


Work Load Credit

[Add New Comment](#)

[No Further Comments](#)

[Decline Consultation](#)



# Staffing

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- “Director”
- Consult Managers: 1 Adult, 3 Pediatric MDs
- System Administrator: 1.0 FTE
- System Developer: 1.0 FTE
- Needs:
  - Administrative asst: registration, billing, training
  - Systems Administrator (additional)
  - Clinical Nurse: Consult Mgmt