



Pediatric Critical Care Telemedicine

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Financial Disclosures Conflicts of Interest

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Why

PICUs and Pediatric Intensivists are scarce resources

In the US we train about 125 Pediatric Intensivists per year

Regionalization of Pediatric Critical Care services

- Improves care and outcome
- Improves efficiency of care
- Leads to disparities in access

Why

Critically ill children presenting to EDs without pediatric expertise receive poorer quality care

Ped Emerg Care 2001;17:170

Ann Emerg Med 2001;37:371

JAMA 2005 294:2611

J Pediatr 2008;153:783

Pediatr 2012;130:83



Why

EDs without pediatric expertise may not be adequately equipped to care for pediatric emergencies

Pediatr 2007;120:229

Pediatr Emerg Care 2007;23:94

Pediatr Emerg Care 2007;23:681



Why

EDs without pediatric expertise with a relative lack of equipment, infrastructure, and experienced personnel can result in delayed/incorrect diagnoses, suboptimal therapies, imperfect medical management

Crit Care Med 1991;19:150

JAMA 1992;268:1708

Crit Care Med 2000;28:601

J Pediatr 2008;153:783



Why

Outcomes for critically ill/injured pediatric patients are better when they are cared for by pediatric intensivists, in tertiary care pediatric intensive care units, and Level 1 trauma centers

Crit Care Med 1991;19:150

Pediatr 2000;102:289

Crit Care Med 2001;29:2007

Ped Crit Care Med 2005;5:5

Starting a program

Visit each institution personally

- **ED Director**
- **Nurse Manager**
- **MD stakeholders**
- **Information Services**
- **Public Relations**



Billing

VT has a new law allowing billing for telemedicine

Documentation issues

Electronic Health Record issues

Bundling issues



Legal stuff

Out-of-state consults

Do you need a license?

Do you need formal privileges in all hospitals?





UC Davis Children's Hospital & Telemedicine for Children Presenting to Rural Emergency Departments

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Confirmed Existing Programs-Interviewed

University of California, Davis

Boston Children's Hospital

Vermont Children's Hospital at Fletcher Allen Health Care

University of Arkansas

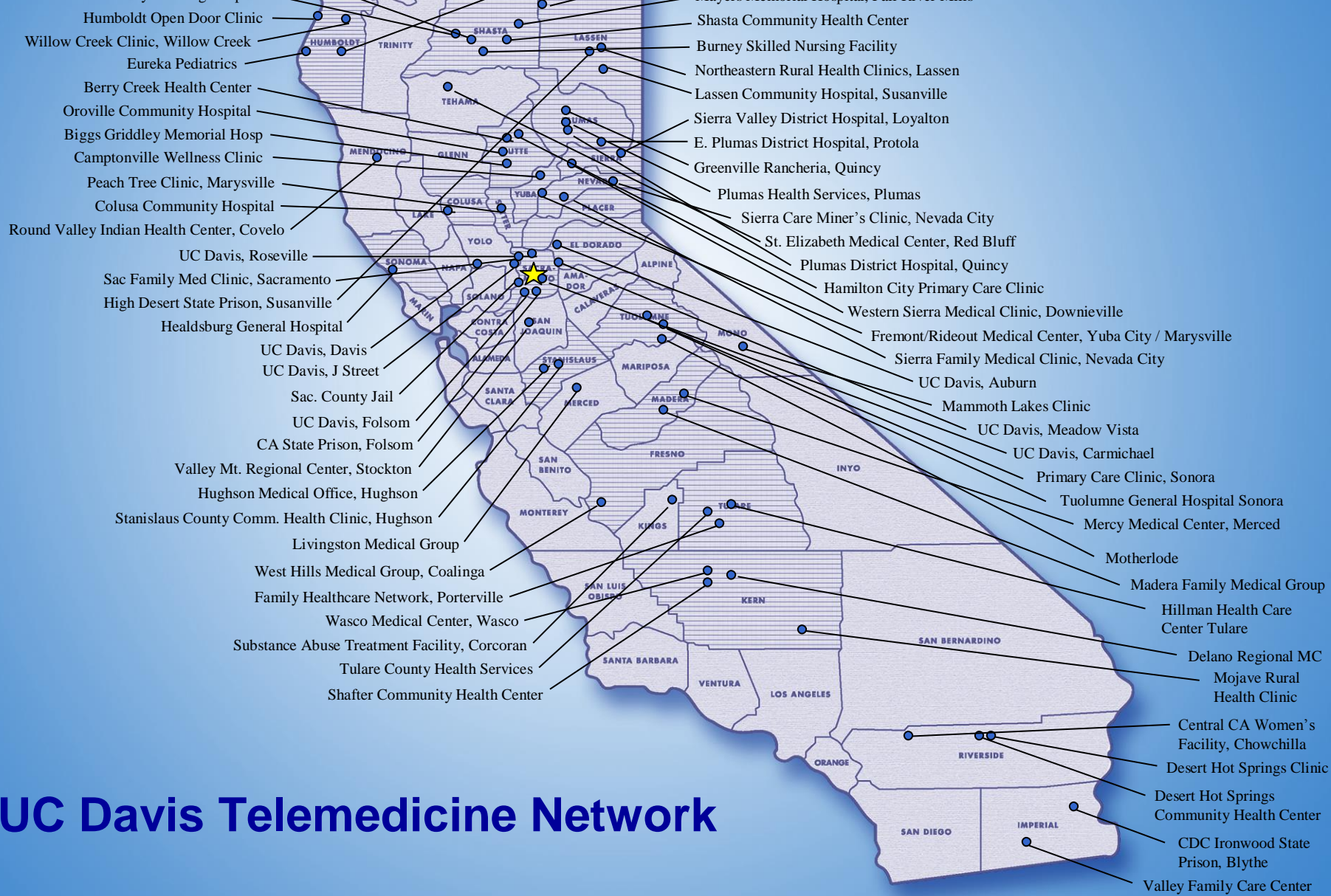
Oregon Health and Science University

University of New Mexico

Massachusetts General

Eastern Maine Medical Center in Bangor

Children's Hospital of Orange County



UC Davis Telemedicine Network

Telemedicine in the ED

- Examples of specialty consultations
 - Tele-radiology
 - Tele-stroke
 - Tele-Emergency Care
 - University of Mississippi
 - April 19, 2012
 - EM Physician to NPs in Emergency Departments
 - Other specialty consultations

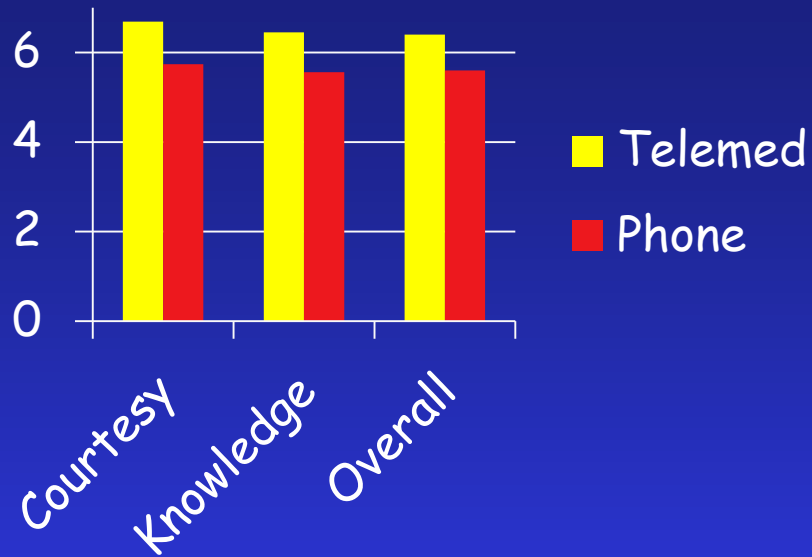
UC Davis Pediatric ED Telemedicine Network



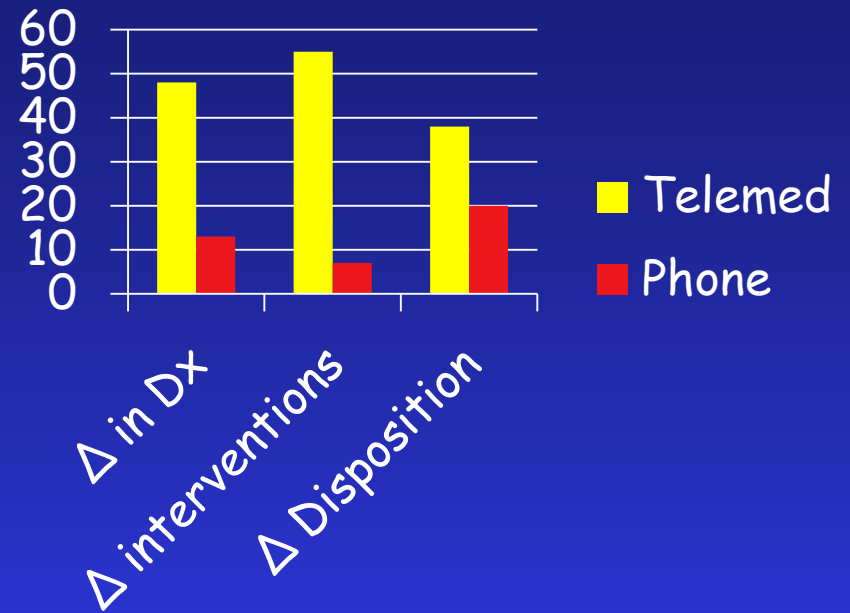


- 1-2 in-house PICU attendings 24/7
- Four telemedicine stations in PICU with at-home backup
- Seamless integration with standard referral process (800-UCD4KID)

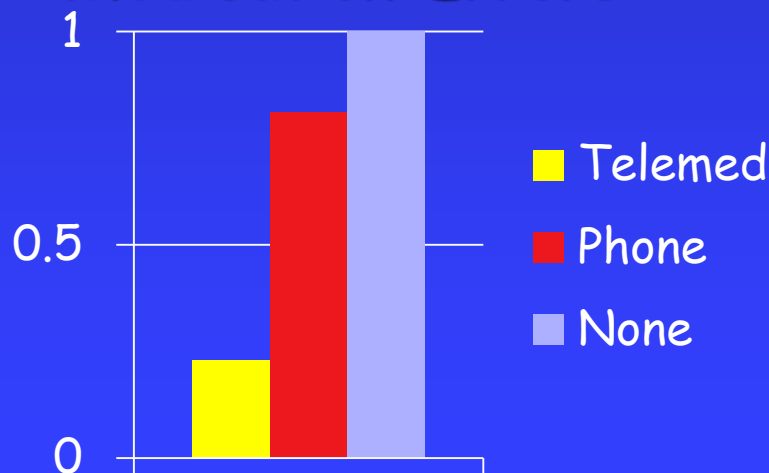
Parent Satisfaction



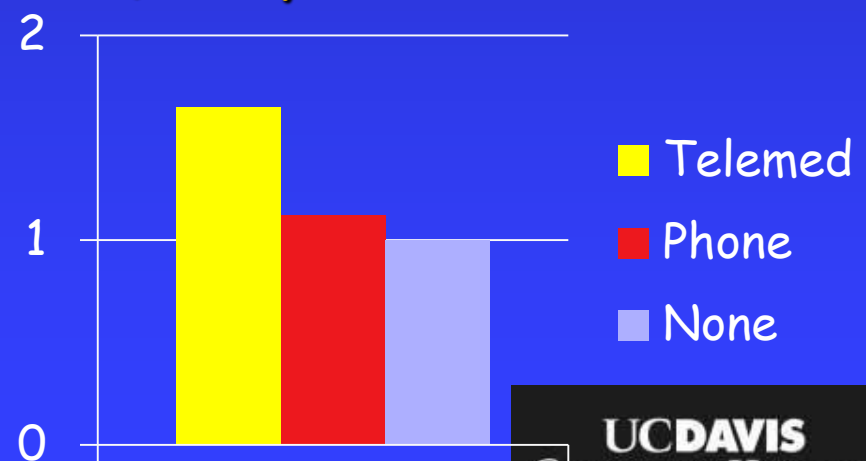
Provider Satisfaction



Medication Errors



Quality of Care



Research Outcomes

- Heath B, et al: *Pediatr Crit Care Med*. 2009 Sep;10(5):588-91.
- Marcin, et al: *J Pediatr* 2004;144:375
- Marcin, et al: *Pediatr Crit Care Med* 2004;5:251
- Marcin, et al: *Telemed J e-Health* 2004; 10(suppl2):S1
- Dharmar, et al: *Crit Care Medicine* (in press)
- Dharmar, et al: *Pediatrics* (in press)

Lessons Learned

- Integrate into existing P&Ps
- Remote ED Physician "in charge"
- Test Calls!!
- Working with other providers to keep more children hospitalized in community

Thank You