Disclosure:

Dr. Neil Herendeen has no financial interests to declare

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Objectives

Identify the challenges of bringing new technology into primary care practice and medical care to the school.

Identify the potential ways that telemedicine can improve the delivery of health care within the medical home model

Describe how the use of telemedicine in a school-based program can help meet a wide range of health needs of children

Understand how to start a school telemedicine program and what considerations one must face prior to starting such a program

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Rogers'(1995) Diffusion of Innovation

Stages of adoption:

Awareness - the individual is exposed to the innovation but lacks complete information about it

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What a medical home provides...

Preventive/Primary care

- Screening
- Acute illness care
- Chronic disease management

Coordination of subspecialty care

Patient & family advocacy

Coordination of community resources

Transitional care

What we need is...

Ideal for patients with special needs, but the gold standard of care for all!

Driving Forces in Seeking Medical Care for Childhood Illness

Subtle presentations of potentially serious illness lead parents and caregivers to seek expert advice

Desire to decrease discomfort of ill child

Desire to prevent spread of communicable disease with early detection and treatment

Public health rules requiring a "back to school note" in order to return to group setting

Medical-legal risk of caring for child outside the home: play it safe and send the child back to her parents to assume the risk

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Burden of Childhood Illness

For working families it is the #1 cause of parental absenteeism from work

Average time lost from work =4.5 hours per illness episode

Higher rates of childhood illness among lower SES, greater disease in those least able to handle

For many working poor, lost time = lost wages

Potential for Telemedicine Solutions

Overcome geographic distance

Overcome transportation barriers

Bring pediatric expertise to communities that could not otherwise support that specialty

Rapid response to medical need

Provide care by most appropriate, least costly provider

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Telemedicine terminology

1. **Telehealth**:   Broad term for remote healthcare including clinical services, tele-education, teleresearch, and other non-clinical applications. Videoconferencing, transmission of still images, e-health including patient portals, remote monitoring of vital signs, continuing medical education and nursing call centers are all considered part of telemedicine and telehealth.

2. **Telemedicine**: The use of medical information exchanged from one site to another via electronic communications to improve patients' health status. Telemedicine is typically considered a subset of telehealth services.

3. **Originating Site**: Location of the patient receiving a telemedicine service. Telepresenters may be needed to facilitate the delivery of this service. Other common synonyms include spoke site, patient site, remote site, and rural site, access site.

4. **Distant Site**: Site at which the provider delivering the service is located at the time of the telehealth service. Other common synonyms include hub site, specialty site, provider/physician site, referral site and consulting site.

5. **Facilitator**: An individual who may or may not have a clinical background who is present with the patient during a telemedicine encounter. Responsibilities may vary with practice site, but may include scheduling, organizing, executing the connection and/or patient presenter functions. Examples may include a clinical provider, support staff or parent/legal representative.

6. **Presenter** (Patient Presenter, Telepresenter): An individual with a clinical background trained in the use of telehealth equipment who may be available at the originating site to manage the cameras and perform any "hands-on" activities to complete the tele-exam successfully. Examples include: RN, RRT, LPN, CNA, MA.

Not all telemedicine is created equally

Store-and-Forward Telemedicine: Transmission of stored digital images or diagnostic studies across a distance for diagnosis or management of medical conditions. Synonyms include Image Enhanced or Asynchronous Telemedicine.
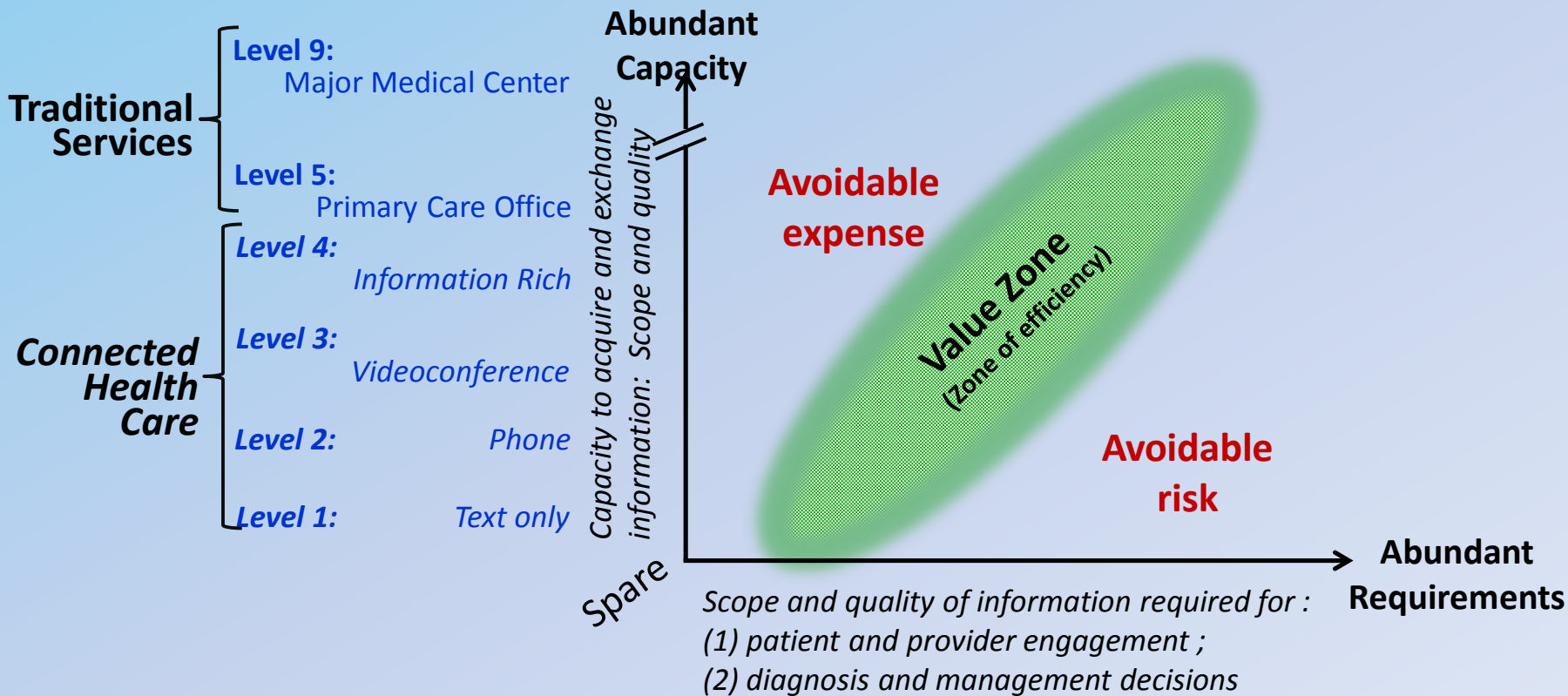
Videoconference-Enhanced Telemedicine: Use of real-time videoconferencing between sites to provide medical care to a patient.

In Office Equivalent: telemedicine capabilities allow for diagnostic assessment equal to the exam that a provider would normally complete for a specific condition. (ie otoscope view for ear complaints, stethoscope exam for wheezing or cough)

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Conceptual Model:
Value and the Continuums of Information Requirements and Capacity*

Traditional Services
- **Level 9:** Major Medical Center
- **Level 5:** Primary Care Office

Connected Health Care
- *Level 4: Information Rich*
- *Level 3: Videoconference*
- *Level 2: Phone*
- *Level 1: Text only*

Abundant Capacity

Capacity to acquire and exchange information: Scope and quality

Spare

Avoidable expense

Value Zone (Zone of efficiency)

Avoidable risk

Abundant Requirements

Scope and quality of information required for :
(1) patient and provider engagement ;
(2) diagnosis and management decisions

Telehealth assistants at the school or child care center provide the link to examine the eyes, ears, throat, lungs and skin.

Videoconferencing provides the "face to face" interaction.

Need to get providers to think of their desktop computer as an exam room .

Convenient care with telemedicine can recapture some of the patient volume going to afterhours urgent care centers

Rochester experience:

Started small in 2001: 3 child care centers linked to one office. Now all 63 schools in city (37 sq miles) with 3 mobile units/presenters. > 14,000 visits

96% completion rate

Among children with a participating primary care practice, 87% continuity. (Visit completed by their practice.)

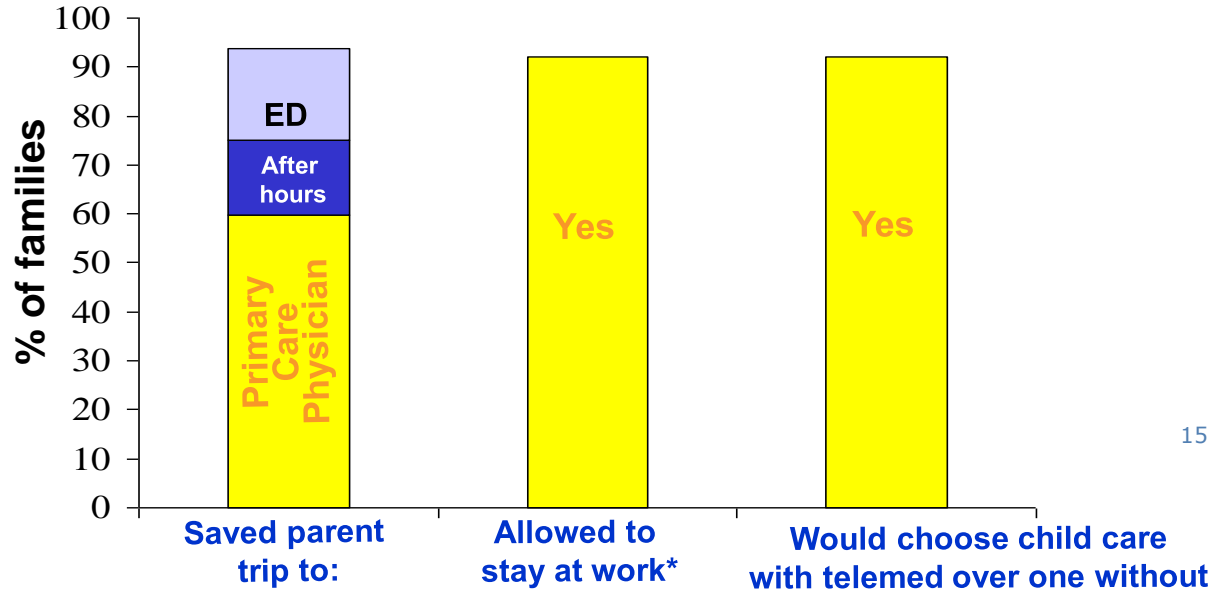Head to Head comparison, similar dx and treatment.

63% reduction in absence due to illness from daycare

Exclusion criteria updated per AAP Red Book

Parent Satisfaction

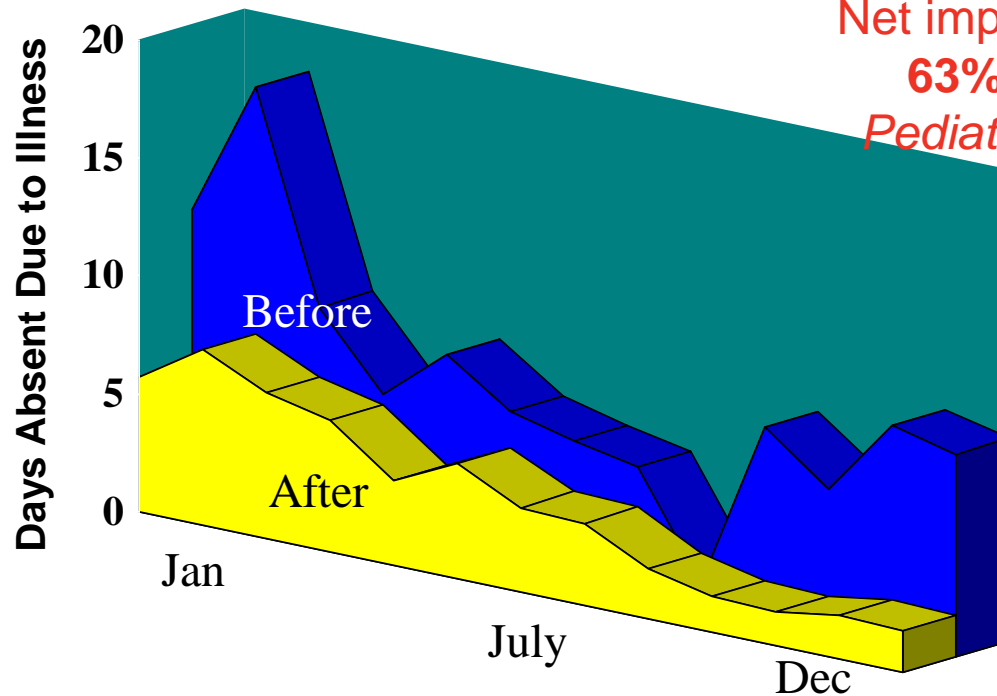Interviews with parent after first use of child care based telemedicine. N = 229.

* Estimated time saved = 4.5 hours (SD 2.2) per telemed visit

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Childcare Absence Due to Illness Before and After Telemedicine

Net impact of telemed:
63% reduction
Pediatrics May 2005

Y-axis: Days Absent Due to Illness (0, 5, 10, 15, 20)

X-axis: Jan, July, Dec

Before

After

16

* Absence from child care due to illness, in mean days absent per week per 100 registered child-days.

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Diagnosis of acute otitis media:
Telemed *more* accurate than in-person??

Normal tympanic membrane

Marked Bulging

Middle ear fluid with air bubble
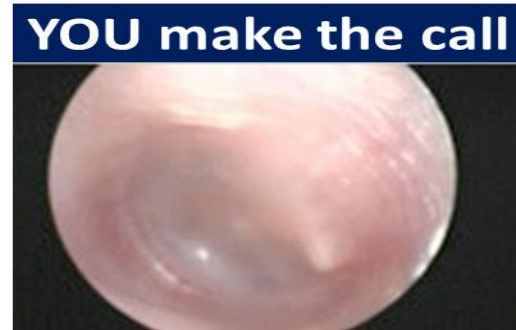
YOU make the call

Day-to-Day Change

YOU make the call

11/4/02
Retracted, middle ear fluid, not infected

11/5/02
Bulging (bulla), infected

Diagnosis Distribution

Diagnoses for All Completed Telemedicine Visits

		%
1	acute otitis media	28.7
2	upper respiratory illness	17.5
3	conjunctivitis	7.9
4	viral illness	7.6
5	tinea corporis	4.1
6	diaper dermatitis	3.8
7	otitis media with effusion	3.4
8	dermatitis, other	2.8
9	pharyngitis, other	2.8
10	skin infection	2.2
11	atopic dermatitis	2.1
12	minor trauma	2.0
13	pharyngitis, strep	1.7
14	insect bites	1.7
15	lower respiratory illness	1.4
16	skin, other	1.4
17	all other	8.9
		100.0

Opposition to School-based Telemedicine

❖ Concerned costs would affect school budget.

❖ It is not school's responsibility to provide medical care

❖ Schools don't need more responsibility

❖ There are no access issues; appointments are easy to get

❖ Do not want local or federal government involved in

 child's healthcare.

❖ Not appealing to see provider over **a television** - impersonal

❖ It would encourage sick kids to stay or come to school sick

❖ It would only benefit those that live off the system. Enables parents.

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20

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What parents want/expect

Staff- local providers; parents need to trust the provider

Maintain confidentiality, security & privacy

Parents want to be present, in person or phone

Must collaborate with child's primary provider

Parents want to be contacted prior to use

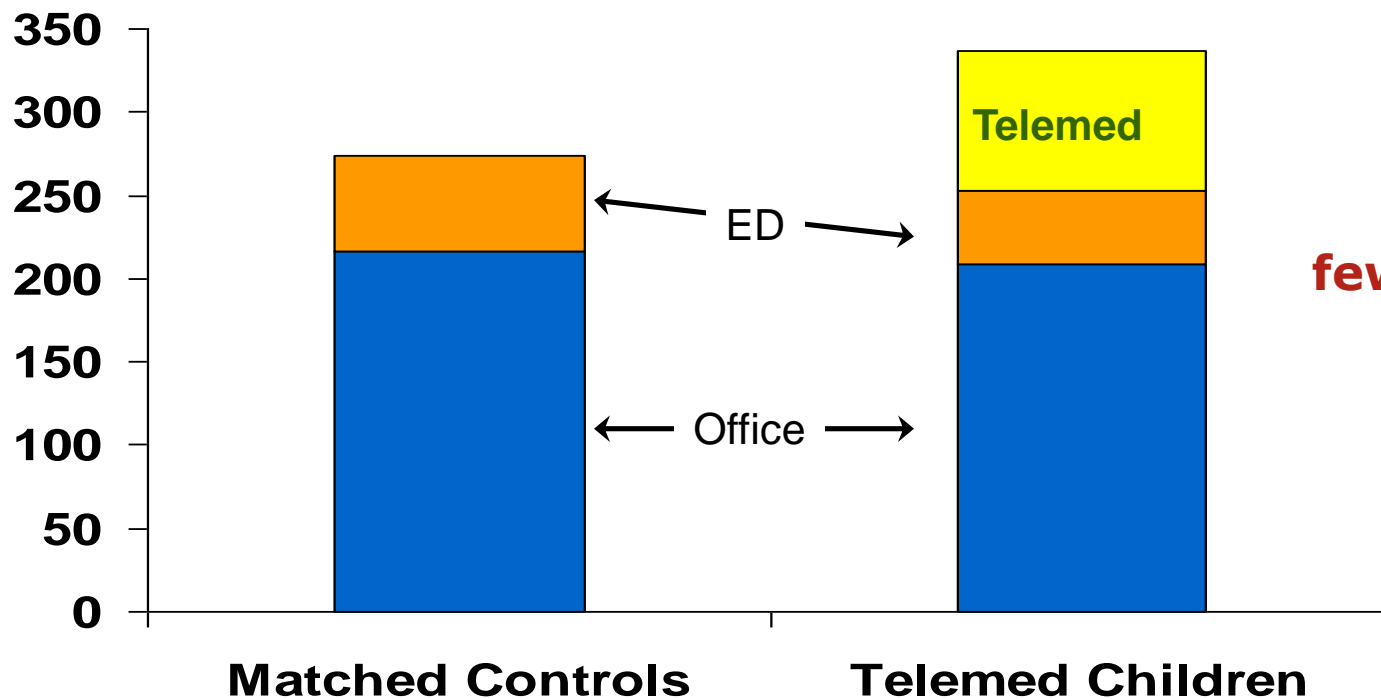Easy to access paperwork and streamline services

Open before, during & after school

Must not use money allotted for educational use to fund program

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Impact of Telemedicine on Utilization for Outpatient Illness Visits

Annual visits per 100 children

Telemed

ED

Office

Matched Controls

Telemed Children

23% fewer ED visits

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Impact on Annual Payments for All Illness Visits
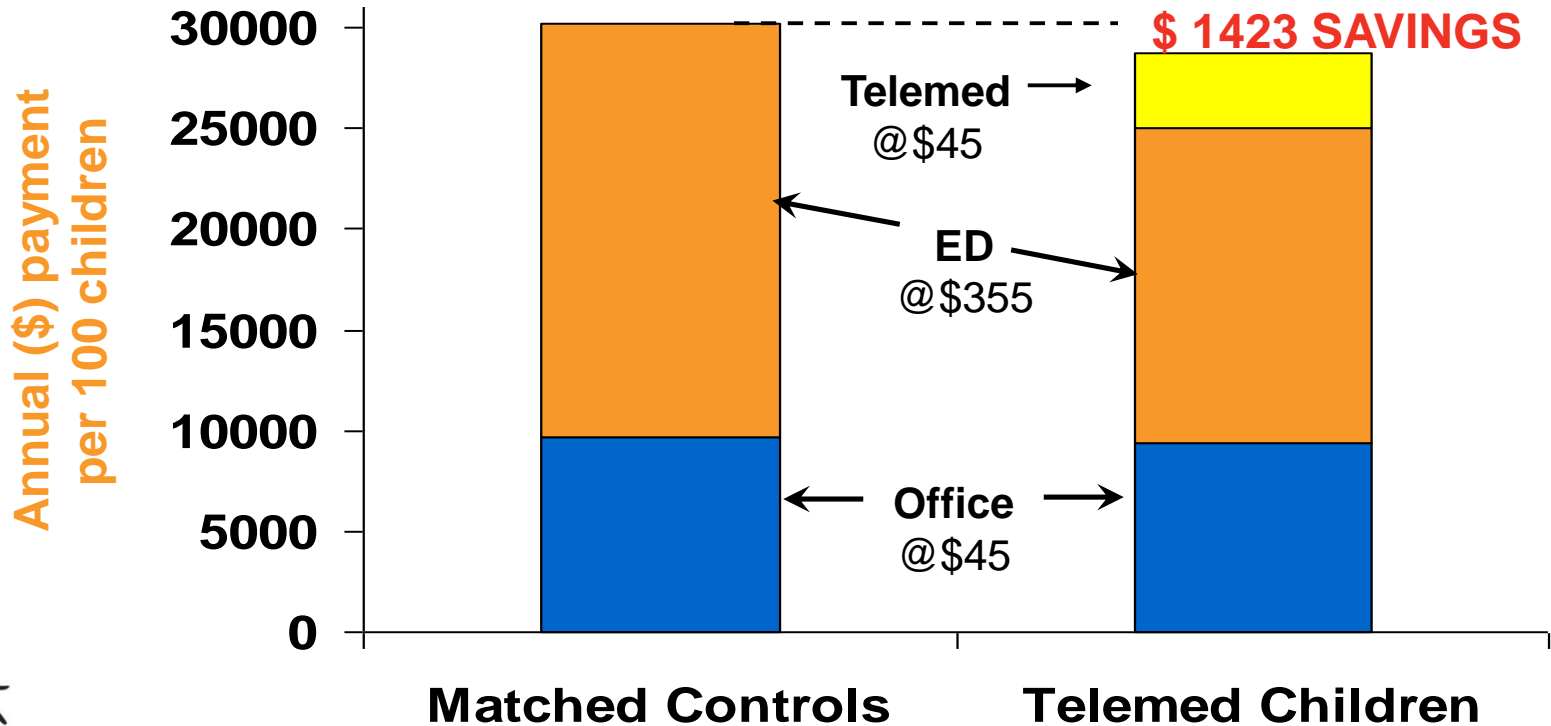
$ 1423 SAVINGS

Telemed @$45

ED @$355

Office @$45

Matched Controls   Telemed Children

Annual ($) payment per 100 children

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Reimbursement strategies

1. Utilization data to show cost savings of ED avoidance

2. Ask for reimbursement at same rate as an office visit

3. Ask for reimbursement for infrastructure of the telepresenter, connectivity, equipment, etc.

4. Look at pay for performance measures and how you can achieve lofty goals by bringing the service directly to the child especially when the visit is time sensitive or means more to the provider than the parent (ie follow up of med initiation for ADHD within 30 days, asthma follow up visits).

5. Are PCPs willing to contribute to shift urgent care visits back to their medical home or will Managed Medicaid cover those costs to avoid ED use?

6. Grants (if they still exist).   Local tech companies?

7. School districts: if increased attendance is a priority (not that they have any money ☹)

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Getting started

Who do you want to partner with? What are current gaps in care?

How big of a program do you want to have?

Do you have champions at the originating sites and provider sites?

Is there competition or perceived threats to existing care?

Can you get reimbursement for providers? Infrastructure?

Do you have money for equipment and connectivity?

What peripheral devices do you need besides videoconferencing?

Do you need consent/HIPAA release/IRB approval?

Learn more from ATA Pediatric SIG, AAP Section on Telehealth Care

https://www.aap.org/en-us/professional-resources/practice-transformation/telehealth/Pages/compendium.aspx

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True Health Care Reform

Bringing medical care to children when and where they need it by providers they know and trust.

Emphasis on Family Centered Care as a foundation of the reform. Help families make good choices for prevention, healthy life choices, risk avoidance, chronic care management and access to high quality care.

Technology can bring the power of information but wisdom and knowledge are the essential elements of what pediatric providers offer and families value.

Rogers Diffusion of Innovation

Stages of adoption: Where are YOU now??

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Creating the Evidence base

Health-e-Access in Rochester

McConnochie KM, Tan J, Wood NE, Herendeen NE, Kitzman HJ, Roy J, Roghmann KJ. "Acute illness utilization patterns before and after telemedicine in childcare for inner-city children: a cohort study." Telemedicine journal and e-health : the official journal of the American Telemedicine Association. 2007; 13(4):381-90.

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- McConnochie KM, Conners GP, Brayer AF, Goepp J, Herendeen NE, Wood NE, Thomas A, Ahn DS, Roghmann KJ. "Differences in diagnosis and treatment using telemedicine versus in-person evaluation of acute illness." Ambulatory pediatrics 2006; 6(4):187-95; discussion 196-7.

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- McConnochie KM, Wood NE, Kitzman HJ, Herendeen NE, Roy J, Roghmann KJ. "Telemedicine reduces absence resulting from illness in urban child care: evaluation of an innovation." Pediatrics. 2005; 115(5):1273-82.

Herendeen NE, Schaefer GB "Practical Applications of Telemedicine for Pediatricians". *Pediatric Annals* Sept 2009 38(10) 567-569.

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