



HEALTH IT: RIGHT TIME. RIGHT PLACE. IT'S ON

NEW ORLEANS
HIMSS 13
ANNUAL CONFERENCE & EXHIBITION

Mobile e-Visits Within the Medical Home

William C. Thornbury, Jr., M.D., R.Ph., FAAFP



Conflict of Interest Disclosure

William C. Thornbury, M.D.

Disclose ownership of Jobathco, Entp., Inc. which accounts for expenditures within medical technology.



Learning Objectives

- Recognize cultural pressures driving E-technology in healthcare
- Review 2-year study on mobile e-Visit technology
- Summarize the global benefits of mobile E-visit technology
- Analyze the implications of making the Medical Home virtual



Goals

1. Demonstrate Mobile e-Visits are possible, safe, effective---and, patients love them.
2. Enhance the Triple Aim: Improved patient experience, lower cost of care, and advance the population health.
3. Show opportunity for positive disruption in health delivery.
4. Prove that distance does not diminish care.



Are the Benefits of Telehealth a Myth?

Effect of telehealth on quality of life and psychological outcomes over 12 months (Whole Systems Demonstrator telehealth questionnaire study): nested study of patient reported outcomes in a pragmatic, cluster randomised controlled trial

OPEN ACCESS

Marlin Cartwright *research associate in health services research*¹, Shashivadan P Hirani *senior lecturer in health services research*¹, Lorna Rixon *research associate in health services research*¹, Michelle Beynon *research assistant in health services research*¹, Helen Doll *senior research associate*², Peter Bower *professor of health services research*³, Martin Bardsley *head of research*⁴, Adam Stewart *senior research analyst*⁵, Martin Knapp *professor of social policy*⁶, Catherine Henderson *research officer*⁷, Anne Rogers *professor of health systems implementation*⁸, Caroline Sanders *lecturer in medical sociology*⁹, Ray Fitzpatrick *professor of public health and primary care*⁷, James Darlow *professor of technology and innovation management (healthcare)*¹⁰, Stanton P Newman *principal investigator, professor, dean*¹, for the Whole Systems Demonstrator evaluation team

¹School of Health Sciences, City University London, London E1 6AA, UK; ²UK, ³University of East Anglia, Norwich, UK; ⁴The National Eye, London, UK; ⁵London School of Economics and Political Science, London, UK; ⁶University of Southampton, Southampton, UK; ⁷University of Manchester, Manchester, UK; ⁸University of Oxford, Oxford, UK; ⁹Imperial College Healthcare School, London, UK

Abstract

Objective To measure the effect of nested, patient, home-based telehealth on health related quality of life, anxiety, and depression. **Design** A study of patient reported outcomes (the Whole Systems Demonstrator telehealth questionnaire study) based on a 12-month pragmatic, cluster randomised trial of telehealth with the Whole Systems Demonstrator (WSD) (N=5000). **Setting** The trial was conducted in a pragmatic, cluster randomised trial of telehealth with the Whole Systems Demonstrator (WSD) (N=5000). **Participants** The trial was conducted in a pragmatic, cluster randomised trial of telehealth with the Whole Systems Demonstrator (WSD) (N=5000). **Intervention** The trial was conducted in a pragmatic, cluster randomised trial of telehealth with the Whole Systems Demonstrator (WSD) (N=5000). **Main results** The trial was conducted in a pragmatic, cluster randomised trial of telehealth with the Whole Systems Demonstrator (WSD) (N=5000). **Conclusion** The trial was conducted in a pragmatic, cluster randomised trial of telehealth with the Whole Systems Demonstrator (WSD) (N=5000).

(Continued) Primary results are that analysis based on nested telehealth, multivariate models controlled for clustering by general practice and a range of covariates. Analysis was conducted for 704 participants who completed questionnaire measures at all three time points (baseline, 4 months, and 12 months) who completed the baseline questionnaire plus at least one other questionnaire (available data only). Secondary per protocol analysis indicated that anxiety and depression (SD) and 100 participants in the complete data and available data cohorts, respectively.

Correspondence to: S P Newman stanton.newman.1@city.ac.uk

Some material supplied by the author (see <http://www.bmj.com/content/344/bmj.f5574/bmj.st004000>)

Web appendix 1: Whole Systems Demonstrator (WSD) technology

Web appendix 2: Description of the telehealth intervention

Web appendix 3: The protocol outline

Web figure 1: Position of peripheral telehealth devices to intervention participants in the WSD Telehealth Questionnaire Study

Web figure 2: Early removal of telehealth for reasons other than death across the 12 month trial period

Web table 1: Unadjusted mean change scores (Complete Case Cohort)

Web table 2: Unadjusted mean change scores (Available Case Cohort)

Web table 3: Means and estimated marginal means at each assessment point (intention-to-treat)

Web table 4: Means and estimated marginal means at each assessment point (per protocol)

Web appendix 4: Comparison of characteristics of participating and non-participating practices

No commercial reuse: See rights and options: <http://bmj.com/permissions>

Subscribe: <http://bmj.com/subscribe>

Cost effectiveness of telehealth for patients with long term conditions (Whole Systems Demonstrator telehealth questionnaire study): nested economic evaluation in a pragmatic, cluster randomised controlled trial

OPEN ACCESS

Catherine Henderson *research officer*¹, Martin Knapp *professor of social policy, director of personal social services research unit*², José-Luis Fernández *deputy director of personal social services research unit, principal research fellow*³, Jennifer Beecham *professional research fellow*⁴, Shashivadan P Hirani *senior lecturer in health services research*⁵, Martin Cartwright *research associate in health services research*⁶, Lorna Rixon *research associate in health services research*⁶, Michelle Beynon *research assistant in health services research*⁶, Anne Rogers *professor of health systems implementation*⁷, Peter Bower *professor of health services research*⁸, Helen Doll *senior research associate*⁹, Ray Fitzpatrick *professor of public health and primary care*⁷, Adam Stewart *senior research analyst*¹⁰, Martin Bardsley *head of research*¹¹, Jane Hendy *senior lecturer in healthcare management*¹², Stanton P Newman *dean, professor, principal investigator*¹³, for the Whole System Demonstrator evaluation team

¹London School of Economics and Political Science, London WC2A 2PL, UK; ²King's College London, London, UK; ³School of Health Sciences, City University London, London, UK; ⁴University of Southampton, Southampton, UK; ⁵University of Manchester, Manchester, UK; ⁶University of East Anglia, Norwich, UK; ⁷University of Oxford, Oxford, UK; ⁸The National Inst, London, UK; ⁹University of Surrey, Guildford, UK

Abstract

Objective To measure the costs and cost effectiveness of telehealth in addition to standard support and treatment, compared with standard support and treatment.

Design A randomised controlled trial comparing, cluster randomised controlled trial.

Setting Community based telehealth intervention in the whole system demonstrator.

Participants 5233 people with long term conditions (heart failure, chronic obstructive pulmonary disease, or diabetes) were recruited into the Whole Systems Demonstrator telehealth trial between May 2010 and December 2011. 33 participants took part in the Whole Systems Demonstrator telehealth questionnaire study measuring acceptability, effectiveness, and cost effectiveness. 145 were recruited to telehealth trial (21 to control case).

Correspondence to: C Henderson C.Henderson@lse.ac.uk

Intervention Telehealth participants received a personal telehealth equipped and monitoring service for 12 months, in addition to the standard health and social care services available in their area. Controls received usual health and social care.

Main outcome measure Primary outcome for the trial: effectiveness (healthcare incremental cost per quality adjusted life year (QALY) gained).

Results We conducted two benefit analyses of costs and outcomes for 305 patients (54 receiving telehealth, 431 control case). The unadjusted mean effectiveness (QALY) gain between groups at 12 months was 0.12. Total health and social care costs (including direct costs) of the intervention for the three months follow 12 months follow-up was £100 (95% CI, \$2780) and £1500 for the control case and telehealth groups, respectively. Cost effectiveness acceptability curves were presented to assess the decision uncertainty in the analysis surrounding the value of



The culture that shops online, banks online, purchases books, movies and music online---will conduct healthcare online.

The question is, *"With whom will they conduct it?"*





"I'm very sorry, but we cannot see you today."



"I'm very sorry, but we cannot see you today."

- Rural Multi-Specialty Clinic: Full



"I'm very sorry, but we cannot see you today."

- Rural Multi-Specialty Clinic: Full
- U.S. residents are retiring at 10,000/day
- 96,000 physician shortfall in U.S. by 2020
- 47,000 MD-equivalent work force cutback/4-yr



“U.S. Health System (Organization & Delivery) is Unsustainable”

(2005, IOM/NAE Joint Statement)



“U.S. Health System (Organization & Delivery) is Unsustainable”

(2005, IOM/NAE Joint Statement)

“ U.S. Health System Too Complex & Costly to Continue”

(2012, IOM Consensus Statement)



Standard of Medical Care

- Healthcare struggles to advance.
- Stifled by process, not science.
- *Systemic Indictment:* We simply cannot get the benefit of our knowledge to those in need of care in an efficient and effective manner.



“You never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete.”

-Buckminster Fuller



Who is this?





United States

- 25% Symptom-checker as much as going to MD
- 27% Instead of going to MD
- 10% Web-based info-Tx saved their life
- 70 million already have online access to their MD

(Royal Phillips Electronics Study, 12/12)(http://www.newscenter.phillips.com/us_en/standard/news/press/2012/20121212_phillips_survey_health_info_tech.wpd)

(www.census.gov/prod/2005pubs/p23-208.pdf)



Worldwide

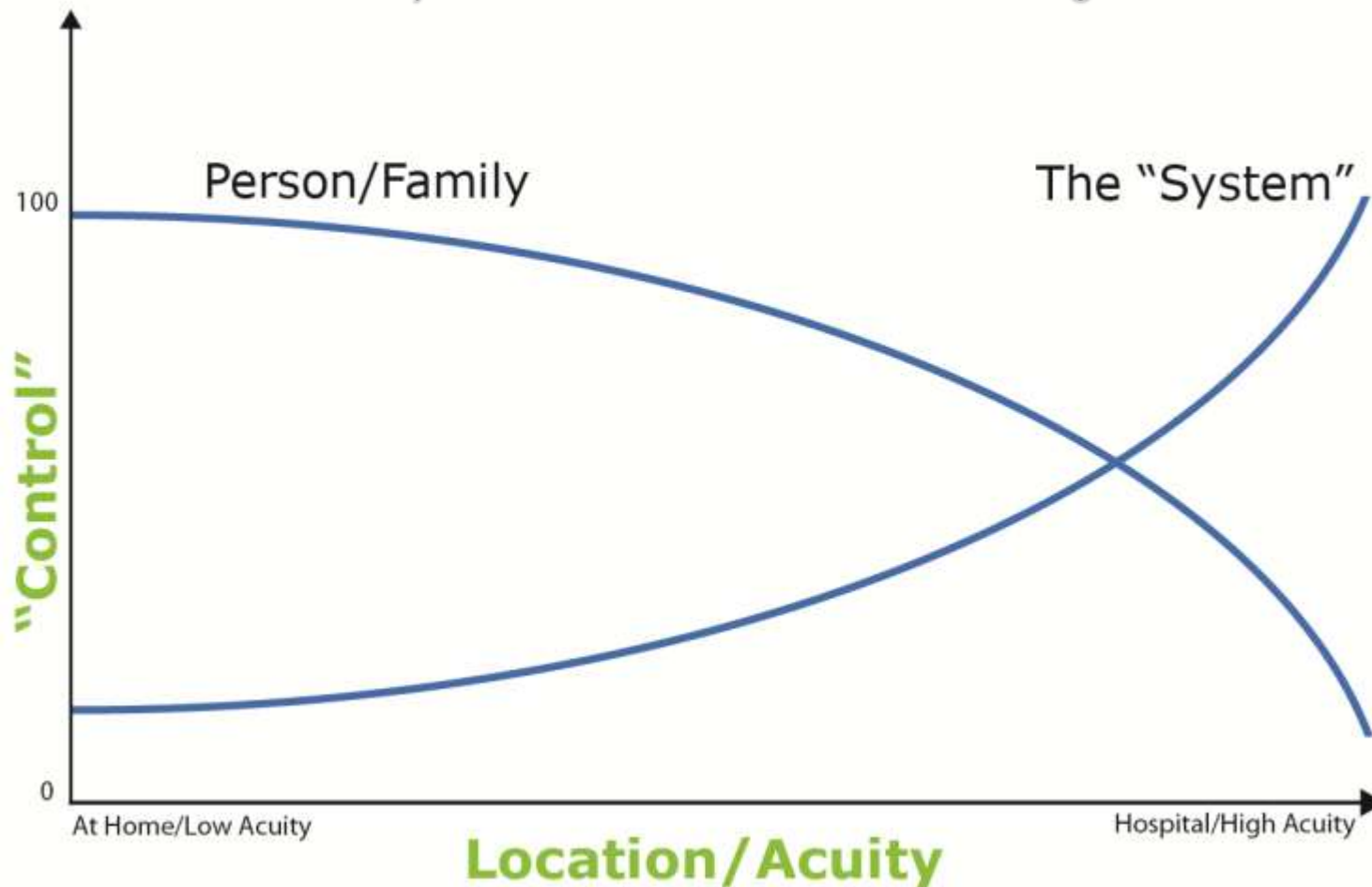
- 6 Billion Cell phones in use
- 1 Billion Smartphones (2X by 2015)
- ½ Billion will have Med Apps by 2015

(Research2Guidance 2010---<http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm263340.htm>)



The Next Market Solution?

Control: *Who really makes the decisions influencing outcome?*





Consumers

87% would love the convenience -- and the savings -- of using online technology to consult with their doctors.

MyHealthGuide Source: Stacy Johnson, MoneyTalkNews, 9/12/2010





ORIGINAL ARTICLE

Safety of Prescribing PDE-5 Inhibitors via e-Medicine vs Traditional Medicine

MARK A. MUNGER, PHARM.D; GREGORY J. STODDARD, MS; ALLEN R. WENNER, MD; JOHN W. BACHMAN, MD;
JOHN H. JURIGE, MD; LAURA POE, RN; AND DIANA L. BAKER, RN

OBJECTIVE: To determine the safety of a US-based, state-regulated Internet system vs a multispecialty primary care system for prescribing phosphodiesterase type 5 (PDE-5) inhibitors for erectile dysfunction.

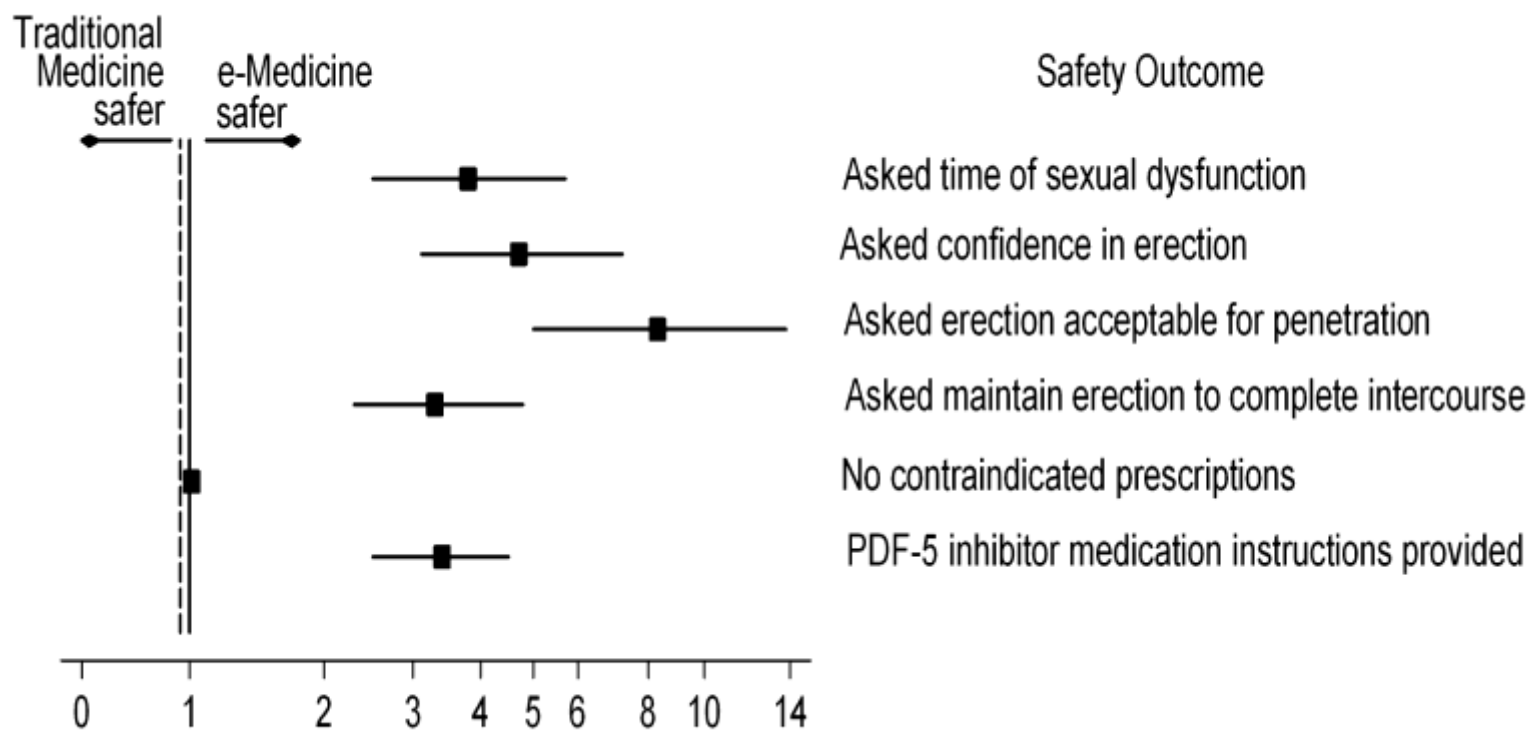
PATIENTS AND METHODS: From January 1, 2001, through December 31, 2005, 500 e-medicine clients (mean \pm SD age, 47 \pm 11 years; hypertension, 60%; type 2 diabetes mellitus, 2%; mean \pm SD number of medications, 0.4 \pm 0.8) vs 500 traditional medicine patients (mean \pm SD age, 57 \pm 12 years; hypertension, 50%; type 2 diabetes mellitus, 23%; mean \pm SD number of medications, 5.1 \pm 3.1) with erectile dysfunction symptoms were assessed. Noninferiority safety was assessed in this retrospective, cross-sectional study with stratified random sampling by identification

care industry has appropriately raised serious concerns about the safety of prescribing over the Internet.⁵⁻⁷

Two major obstacles exist for the safe and effective delivery of e-medicine prescribing. The first is need for a medical interview tool that generates a complete and accurate individualized medical history.⁸ An expert interview tool has been developed and is currently being used in an e-medicine prescribing system.⁹ The interview uses confirmatory questions and standardized scales to collect medical history, symptoms, drug history, and prior adverse drug



Analysis of Safety Endpoints





User Name

Sign In

Keywords

Search

Advanced >

Mayo Clinic Proceedings

A peer-reviewed medical journal sponsored by
Mayo Clinic and authored by physicians worldwide

ORIGINAL ARTICLE

Pilot Study of Providing Online Care in a Primary Care Setting

STEVEN C. ADAMSON, MD, AND JOHN W. BACHMAN, MD

OBJECTIVE: To study the use of e-visits in a primary care setting.

PATIENTS AND METHODS: A pilot study of using the Internet for online care ("e-visits") was conducted in the Department of Family Medicine at Mayo Clinic in Rochester, MN. Patients in the department preregistered for the service, and then were able to use the online portal for consultations with their primary care physician. Use of the online portal was monitored and data were collected from November 1, 2007, through October 31, 2009.

RESULTS: During the 2-year period, 4282 patients were registered for the service. Patients made 2531 online visits, and billings were made for 1159 patients. E-visits were submitted primarily by women during working hours and involved 294 different conditions. Of the 2531 e-visits, 62 (2%) included uploaded photographs, and 411 (16%) replaced nonbillable telephone protocols with billable encounters. The e-visits made office visits unnecessary in 1012 cases (40%); in 324 cases (13%), the patient was asked to schedule an appointment for a face-to-face encounter.

CONCLUSION: Although limited in scope, to our knowledge this is

regulatory issues, and concerns over security, privacy, and confidentiality.²¹ Also, electronic consultations to date have generally used online forms or secure e-mail. The information in these formats is unstructured and often lacks sufficient information, prompting the clinician to respond to the patient to request further information, which results in delays.²² Furthermore, the lack of organization in an e-mail makes it difficult to code complexity; consequently, the same fee is often charged for all online consultations, regardless of complexity.²³

Isolated reports of the use of online consultations have been disappointing. For example, despite indications that electronic communication could decrease health care costs²⁴ and provide reimbursement from patients,^{25,26}

**For editorial
comment,
see page 701**



The Kentucky Doctor



The Kentucky Doctor

- Online



The Kentucky Doctor

- Online >>>> Mobile



The Kentucky Doctor

- Online >>>> Mobile >>>> Safe



The Kentucky Doctor

- Online >>>> Mobile >>>> Safe >>>> Efficient



The Kentucky Doctor

- Online >>>> Mobile >>>> Safe >>>> Efficient
- House Call by Smartphone



The Kentucky Doctor

- Online >>>> Mobile >>>> Safe >>>> Efficient
- House Call by Smartphone
- Mobile + Smartphone = Next-Gen Telemedicine



The Kentucky Doctor

- Online >>>> Mobile >>>> Safe >>>> Efficient
- House Call by Smartphone
- Mobile + Smartphone = Next-Gen Telemedicine

85% U.S. pop mobile phones

(2013 Pew Internet/PewReserchCenter)

81% Adults use internet

(2010 Pew Internet & American Life Project--<http://pewinternet.org/Commentary/2012/February/Pew-Internet-Mobile.aspx>)



EVIDENCE OF COST SAVINGS & QUALITY IMPROVEMENT in the MEDICAL HOME

Barbara Starfield of Johns Hopkins University

- Within the U.S., adults with a primary care physician (rather than a specialist) had 33 percent lower costs of care and were 19 percent less likely to die.
- In both England and the United States, each additional primary care physician per 10,000 persons is associated with a decrease in mortality rate of 3 to 10 percent.
- In the U.S., an increase of a single primary care physician decreases the death rate 1.44/10,000 persons.

Commonwealth Fund has reported:

A medical home can reduce or eliminate racial and ethnic disparities in access and quality for insured persons. The U.S. health care system could reduce health care expenditures by more than \$2 trillion and save U.S. households \$537 billion during the next 10 years by adopting a series of policies that include greater use of primary care and the patient-centered medical home.

Denmark has organized its entire health care system around patient-centered medical homes, achieving the *highest patient satisfaction ratings in the world.* Denmark has among the lowest per capita health expenditures and highest primary care rankings.

Investing in Primary Care Patient Centered Medical Homes:

- Improved quality of care,
- Higher patient satisfaction,
- Savings in Hospital and Emergency room utilization.

Source: PCPCC (www.pcpcc.net)



Patient

AT&T 11:45 PM

Enter the Reason for Your Visit

Please select the reason for your visit from the list below.

OR enter the reason for your visit.

Poison Ivy

(e.g., cough, headache, chest pain, depression) [Help](#)

Next





Patient

AT&T 11:45 PM

Enter the Reason for Your Visit

Please select the reason for your visit from the list below.

OR enter the reason for your visit.

(e.g., cough, headache, chest pain, depression) [Help](#)



AT&T 8:32 PM 91%





Provider



Oct 15, 2012 11:12 PM

Chief Complaint

Jill Atkins is a 42 year old female. Her reason for visit is "poison ivy".

History of Present Illness

#1. "poison ivy"

Location

She reported: Skin rash located on the right arm. Rash confined to one region of body. Itching only in one place.

She denied: Itching over many parts of body.

Media

Continue





Provider

AT&T 8:32 PM 91%

Cases

Oct 15, 2012 11:12 PM

Chief Complaint
Jill Atkins is a 42 year old female. Her reason for visit is "poison ivy".

History of Present Illness
#1. "poison ivy"
Location
She reported: Skin rash located on the right arm. Rash confined to one region of body. Itching only in one place.
She denied: Itching over many parts of body.


Media Continue

Cases Library Closed Cases

AT&T 11:55 PM

Back PHR

Contact Info
jill@myemail.com
Cell: (123)-456-7890



Pharmacy
Pharmacy Rx (111)-123-4567

Allergies
PCN

Add'l Info
I do not tolerate pills well. Prefer capsules.

Meds
MVI 1 QD
Nuva Ring 1 Monthly
Requip 0.5 mg Nightly

Photo Continue

Cases Library Closed Cases



Provider

AT&T 8:32 PM 91%

← Cases

Oct 15, 2012 11:12 PM

Chief Complaint
 Jill Atkins is a 42 year old female. Her reason for visit is "poison ivy".

History of Present Illness
#1. "poison ivy"
Location
 She reported: Skin rash located on the right arm. Rash confined to one region of body. Itching only in one place.
 She denied: Itching over many parts of body.

Media Continue

Cases Library Closed Cases

AT&T 11:55 PM

← Back PHR

Contact Info
jill@myemail.com
 Cell: (123)-456-7890

Pharmacy
 Pharmacy Rx (111)-123-4567

Allergies
 PCN

Add'l Info
 I do not tolerate pills well. Prefer capsules.

Meds
 MVI 1 QD
 Nuva Ring 1 Monthly
 Requip 0.5 mg Nightly

Photo Continue

Cases Library Closed Cases

AT&T 4:22 PM 78%

← Library **Poison Plant Dermatitis**

I've reviewed your medical information, and it sounds like you've developed a form of dermatitis or rash that commonly occurs when a person comes into contact with certain plants such as poison ivy, poison oak, or poison sumac. The exact cause of the rash is unimportant in such cases, as the treatment for all is the same.

I've sent your pharmacy a prescription for a mild steroid to apply to the affected area until the rash clears. I've also included prescriptions for a short course of oral steroids (cortisone) and an antihistamine, if needed. Applying an over-the-counter drying agent such as Ivy-Dry lotion or calamine lotion over the steroid cream should help as well.

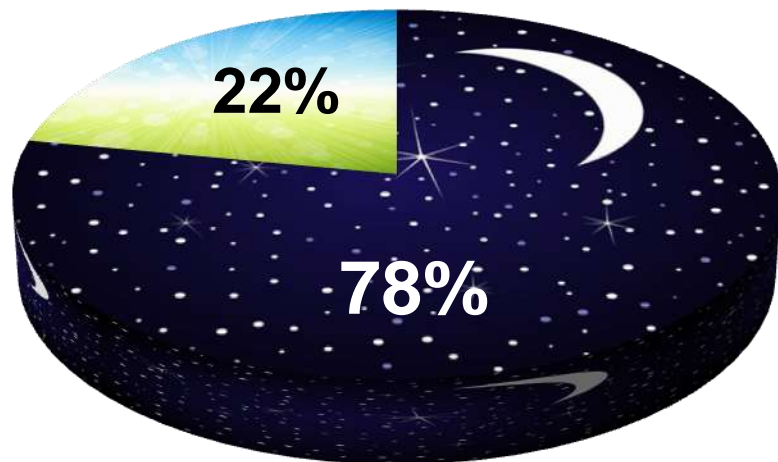
Most dermatitis will respond to treatment rather quickly; however, if you don't improve, if the condition worsens, or if you generally feel unwell, then I'd like to see you in the office for an examination.

Add Lib Item Continue

Cases Library Closed Cases



Primary Care Pilot: Yr 1



188 E-VISITS



9 COUNTIES SERVED

**MEAN AGE: 42.5
YEARS**



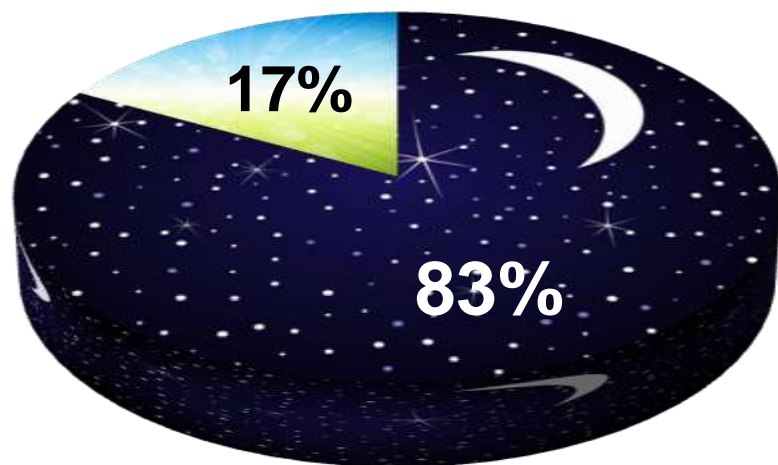
Primary Care Pilot: Yr 1

- 5% Opt-Out by MD
- 26% Repeat-Usage/6 mos
- 90% Occurred before 9:00pm
- 97% Global Patient Satisfaction
- <3 minutes Turnaround

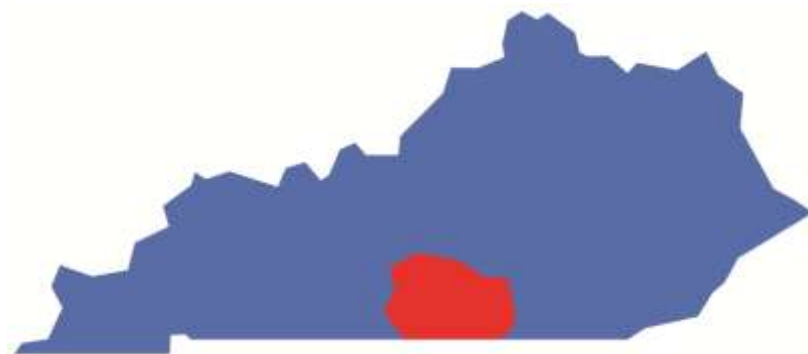




Primary Care Pilot: Yr 2



283 E-VISITS



10 COUNTIES SERVED



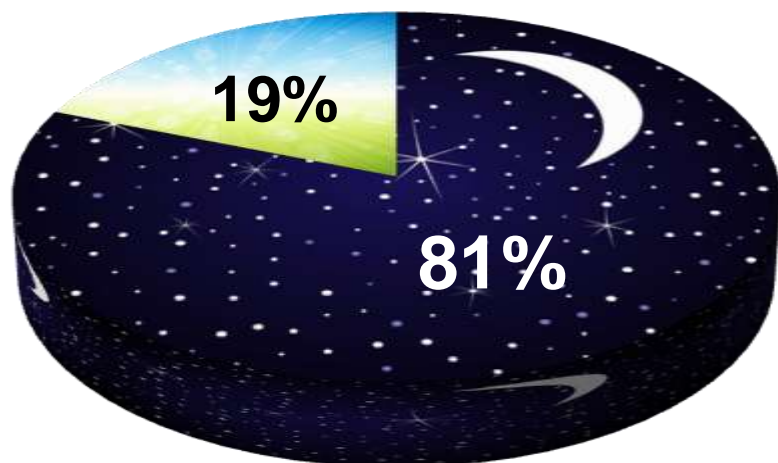
Primary Care Pilot: Yr 2

- **80% Acute / 20% Chronic**
- **2% Opt-Out by MD**
- **1.7:1 Female : Male**
- **40yr Avg Age**





2 Year Combined



16 89

**MEAN AGE:
41 YEARS**

471 E-VISITS

Opt-Out: 3%



14 COUNTIES SERVED



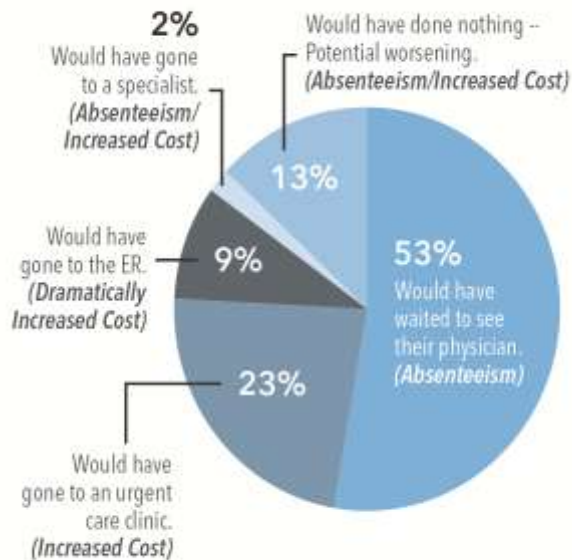
14.92% Increase
Practice Capacity

BASELINE

14.93% Decrease
Per-Capita Costs



Primary Care After-Hours Savings



Avg after-hour visit = \$ 205
 Online care fee = \$ (40)
 Avg savings after-hrs = \$ 165/visit

After-hours care/yr = 190
 Avg Savings/yr = \$31,350
 Primary Care MD = 300,000

PCP After-hours Savings = \$9.4 Bil/Yr



Estimated Health System Savings

1.2Bil Pt Visits/Yr (0.4) = 480 Mil

Avg Savings \$60/visit

U.S. Health System Savings/Yr = **\$28.8 Bil/yr**

(>1% Tot HC Budget U.S.)

mHealth will save U.S. healthcare industry \$305B/10yr

The Deloitte Center for Health Solutions 1/13 (Brookings Institution Study)



The Triple Aim

1. Improving patients healthcare experience
2. Reducing per-capita cost of care
3. Improving overall population health

Institute for Healthcare Improvement



Are the Benefits of Telehealth a Myth?

Effect of telehealth on quality of life and psychological outcomes over 12 months (Whole Systems Demonstrator telehealth questionnaire study): nested study of patient reported outcomes in a pragmatic, cluster randomised controlled trial

OPEN ACCESS

Marlin Cartwright *research associate in health services research*¹, Shashivadan P Hirani *senior lecturer in health services research*¹, Lorna Rixon *research associate in health services research*¹, Michelle Beynon *research assistant in health services research*¹, Helen Doll *senior research associate*², Peter Bower *professor of health services research*³, Martin Bardsley *head of research*⁴, Adam Stewart *senior research analyst*⁵, Martin Knapp *professor of social policy*⁶, Catherine Henderson *research officer*⁷, Anne Rogers *professor of health systems implementation*⁸, Caroline Sanders *lecturer in medical sociology*⁹, Ray Fitzpatrick *professor of public health and primary care*⁷, James Darlow *professor of technology and innovation management (healthcare)*¹⁰, Stanton P Newman *principal investigator, professor, dean*¹, for the Whole Systems Demonstrator evaluation team

¹School of Health Sciences, City University London, London E1 6A 7YU, UK; ²University of East Anglia, Norwich, UK; ³The Hubbell Unit, London, UK; ⁴London School of Economics and Political Science, London, UK; ⁵University of Southampton, Southampton, UK; ⁶University of Manchester, Manchester, UK; ⁷University of Oxford, Oxford, UK; ⁸Imperial College Healthcare School, London, UK

Abstract

Objective To measure the effect of nested, patient, home-based telehealth on health related quality of life, anxiety, and depression. **Design** A study of patient reported outcomes (the Whole Systems Demonstrator telehealth questionnaire study) based on 1200 user-reported data from a pragmatic, cluster randomised trial of telehealth with the Whole Systems Demonstrator (WSD) (N=5000). Clinical practice was the use of an demonstrator, and telehealth was compared with usual care. Data were collected at baseline, four months (short term), and 12 months

(long term). Primary results are mean change scores (mean and 95% confidence interval) for anxiety, depression, and quality of life, stratified by patient profile and a range of covariates. Analyses were conducted for 709 participants who completed questionnaires at baseline (the baseline population) and 501 who completed the baseline questionnaire plus at least one other questionnaire (available data cohort). Secondary pre-protocol analyses investigated anxiety and depression (SD) and 1100 participants in the complete data and available data cohorts, respectively.

Correspondence to: S P Newman stanton.newman.1@city.ac.uk

Relevant material supplied by the author (<http://www.bmj.com/content/344/bmj.f5576/bmj.st044663>)

Web appendix 1: Whole Systems Demonstrator (WSD) technology

Web appendix 2: Description of the telehealth intervention

Web appendix 3: Pre-protocol criteria

Web figure 1: Position of peripheral telehealth devices to intervention participants in the WSD Telehealth Questionnaire Study

Web figure 2: Early removal of telehealth for reasons other than death across the 12 month trial period

Web table 1: Unadjusted mean change scores (Complete Case Cohort)

Web table 2: Unadjusted mean change scores (Available Case Cohort)

Web table 3: Means and estimated marginal means at each assessment point (intention-to-treat)

Web table 4: Means and estimated marginal means at each assessment point (per protocol)

Web appendix 4: Comparison of characteristics of participating and non-participating practices

No commercial reuse: See rights and options (<http://bmj.com/permissions>)

Subscribe (<http://bmj.com/subscribe>)

Cost effectiveness of telehealth for patients with long term conditions (Whole Systems Demonstrator telehealth questionnaire study): nested economic evaluation in a pragmatic, cluster randomised controlled trial

OPEN ACCESS

Catherine Henderson *research officer*¹, Martin Knapp *professor of social policy, director of personal social services research unit*^{1,2}, José-Luis Fernández *deputy director of personal social services research unit, principal research fellow*¹, Jennifer Beecham *professional research fellow*¹, Shashivadan P Hirani *senior lecturer in health services research*³, Martin Cartwright *research associate in health services research*³, Lorna Rixon *research associate in health services research*³, Michelle Beynon *research assistant in health services research*³, Anne Rogers *professor of health systems implementation*⁴, Peter Bower *professor of health services research*⁵, Helen Doll *senior research associate*⁶, Ray Fitzpatrick *professor of public health and primary care*⁷, Adam Stewart *senior research analyst*⁸, Martin Bardsley *head of research*⁹, Jane Hendy *senior lecturer in healthcare management*⁹, Stanton P Newman *dean, professor, principal investigator*¹⁰, for the Whole System Demonstrator evaluation team

¹London School of Economics and Political Science, London WC2A 2TE, UK; ²King's College London, London, UK; ³School of Health Sciences, City University London, London, UK; ⁴University of Southampton, Southampton, UK; ⁵University of Manchester, Manchester, UK; ⁶University of East Anglia, Norwich, UK; ⁷University of Oxford, Oxford, UK; ⁸The Nuffield Inst, London, UK; ⁹University of Surrey, Guildford, UK

Abstract

Objective To measure the costs and cost effectiveness of telehealth in addition to standard support and treatment, compared with standard support and treatment.

Design A randomised controlled trial comparing, cluster randomised controlled trial.

Setting Community based telehealth intervention in the whole system demonstrator.

Participants 5233 people with long term conditions (heart failure, chronic obstructive pulmonary disease, or diabetes) were recruited into the Whole Systems Demonstrator telehealth trial between May 2010 and December 2011. 33 participants took part in the Whole Systems Demonstrator telehealth questionnaire study measuring acceptability, effectiveness, and cost effectiveness. 149 were recruited to telehealth and 121 to usual care.

Correspondence to: C Henderson C.Henderson@lse.ac.uk

Intervention Interventions participants received a personal telehealth equipped and monitoring service for 12 months, in addition to the standard health and social care services available in their area. Controls received usual health and social care.

Main outcome measure Primary outcome was the total effectiveness (healthcare and personal care) per quality adjusted life year (QALY) gained.

Results We conducted two benefit analyses of costs and outcomes for 305 patients (54 receiving telehealth, 431 usual care). The unadjusted mean effectiveness (QALY) gain between groups at 12 months was 0.12. Total health and social care costs (including direct costs) of the intervention for the three months follow 12 months follow-up was £100 (95% CI, \$2780) and £1500 for the usual care and telehealth groups, respectively. Cost effectiveness acceptability curves were presented to assess the decision acceptability in the analysis according to the value of



Implications



Patient Market Value

- Convenience: Care wherever/whenever
- Convenience: Less disruption of work/daily life
- Care from your own provider
- Easy to use



Hospital System Market Value

- Competitive market advantage
- Improves Hospital-Owned Practice ROI
- Reduce readmissions (25% min)
- Lower ER losses (Turn to gain)
- Communication/PR tool for the hospital
- Provides true mobility in the health system.
- Improves efficiency home health/palliative care
- Makes Medicaid profitable



Employer Market Value

- Lowers healthcare costs
- Less absenteeism (Acute/Chronic/Family surrogates)
- Less presenteeism (Decreased acuity/complications)
- No out-of-pocket cost for technology (Expense of 1st Gen)
- Improves morale/productivity



Insurance Carrier's Market Value

- Lowers global acuity
- Only telehealth model within the Medical Home
- Modern approach to healthcare



Governmental Market Value

- Improves access
- Lowers cost of care
- Improves provider shortages
- Addresses disparate populations
- Addresses multi-lingual cultures
- Increases patient engagement



Disruption Sustainable?

1. Market Test: Timing - Fulfill an unmet need?

Adapted from *Exploiting Chaos*, J Gutshce, Gotham Books 2009



Disruption Sustainable?

1. Market Test: Timing - Fulfill an unmet need?
2. Dynamic Test: "I've got to tell someone about this."

Adapted from *Exploiting Chaos*, J Gutshce, Gotham Books 2009



Disruption Sustainable?

1. Market Test: Timing - Fulfill an unmet need?
2. Dynamic Test: "I've got to tell someone about this."
3. Simplicity Test: "House Call by Smartphone."

Adapted from *Exploiting Chaos*, J Gutshce, Gotham Books 2009



mHealth Telemedicine *Will it work?*

1. Solve a problem?

- Addresses Access
- Patient Inconvenience
- Clinician Manpower

2. Does it cut costs?

- Decreases per-capita costs
- Decreases institutional costs
- Decreases global system costs



Blockbuster or Netflix?





Kindle : Book Sales

Online Banking : Finance

iTunes Music : Recording Industry



Kindle : Book Sales

Online Banking : Finance

iTunes Music : Recording Industry

mHealth/e-Visits : Healthcare



Summary

1. mHealth e-Visits are possible, safe, effective--- and, they are the public's preference.
2. Mobility in the Medical Home represents a positive disruptive model of healthcare delivery.
3. True mobility can bend the cost-curve.
- 4. *Distance dose not diminish care.***



Mobility Will Forever Change the Delivery of Healthcare

Thank You!

Contact

William C. Thornbury, Jr., M.D.

wctmd@glasgow-ky.com