Provider-to-Provider Telehealth

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Learning Objectives

• Future of Provider-to-Provider telehealth in rural areas

• Telemedicine use during the pandemic

• Exemplars and variations in telemedicine use
  • P2P Warmline
  • P2P COVID Grand Rounds
  • COZI-r study
  • Establish other collaborations
Background

• 17% of Americans live in Rural Areas
• 50% higher heart disease; 75% higher respiratory disease
• 20,000 excess disease due to cancer
• 40% more likely to be hospitalized or die due to COVID-19 disparities
• Widening disparities between rural and urban areas
• Access to care, lower insurance, and closure of rural hospitals
• Delays in physical and mental health
High rates of avoidable or excess deaths
• Suicide and drug overdose are on the rise following the pandemic
• Difficulty sleeping and stress during the COVID pandemic
• More likely to be hospitalized or die due to non COVID disease
• Health disparities –
  • Increased mortality
  • More prevalent chronic disease
  • Reduced life expectancy (~ 3 years less)
• Technological developments give us hope
Opioid Epidemic in Rural Communities during a Pandemic

- Pandemic has driven increases in death
- Rural areas have limited infrastructure
- Other substance issues beyond opioids
Regional variation in availability of healthcare resources

Which rural area you live in may affect your access to clinical Resources:

- Critical access hospitals
- Rural Health Clinics
- FQHCs
Current status

- Scientific evidence
- Adoption and workforce training
- Infrastructure
- Specialty care

- Reimbursement (fee-for-service /value based care)
- Access to broadband
- Licensure
Geographic Access
Specialists and Resources

Pulmonologists (n=12,392)

Pulmonary Rehabilitation (n=1,446)

COPD:
Urban – 4.7%
Rural: 8.2%

OSA:
Nationwide is 12%
Questions?

1. What is the uptake of different types of provider-to-provider telehealth in rural areas?
2. What is the effectiveness of provider-to-provider telehealth for rural patients?
3. What strategies are effective and what are the barriers and facilitators to implementation and sustainability of provider-to-provider telehealth in rural areas?
4. What are the methodological weaknesses of studies of provider-to-provider telehealth for rural patients and what improvements in study design (e.g., focus on relevant comparisons and outcomes) might increase the impact of future research?
History of Telemedicine

- Tohono O’odham Nation
- Funded by NASA
- Satellite technology
- Physician consultation
- Newborn
In 2013, when Project ECHO first rolled out Zoom, ECHO had 13 Domestic Hubs, 1 International Hub, and one multi-site VA program. ECHO now has over 220 hubs, more than 135 domestic hubs, and over 80 international hubs in 32 countries.
Provider-to-Provider Consultations $

(Falls outside Telehealth – per CMS*)

- Code 99452 devalues primary care time:
  - 5 min of consultant’s time (code 99451) has the same 0.70 RVU as 30 min of primary care (code 99452)

- For codes 99446-99449, greater than half of the time must be spent in “medical consultive verbal or internet discussion”

- Code 99451 may be billed if more than 50% of time is spent in data review/analysis

- Major issues include perceptions of fraud, and increased burden for primary care

Provider-to-Patient telemedicine:
Patient needs to be in a facility (2020 US Congress)
CMS Support – A major barrier for Adoption
Category 3 codes – Permanence of telehealth codes

2018 CMS; * 1834M Social Security Act; # 14-day rule; @ Patient consent
Provider-to-Patient Telemedicine COVID-19 pandemic

Variations in Telehealth Use by Specialty

Other forms of telehealth surged
- 8-fold increase in eConsults
- 6-fold increase in telepsychiatry in ED
- 3-fold increase in remote patient monitoring
Inexhaustible resource of telehealth to reduce mental health disparities


P2P for Tele-stroke

- ED makes referral
- Video visit for interview and exam along with local provider
- Remote review of CT scan and other imaging

Wilcock et al, JAMA Neurol 2020; May 1;78(5):527-535.
COVID Pandemic

**Acute clinical care**
- Surge line
- Admin triage
- Emergency P2P communication
- Discussion of care/stabilization
- Transfer for management

**Current COVID Management**
- P2P Warmline
- P2P COVID Grand Rounds
P2P For COVID related Information

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Professor, Medicine
Professor, Immunobiology
Professor, BIO5 Institute
Program Director, Infectious Diseases Fellowship

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ADHS; AzCRH; CDC-RFA-OT21-2103
Provider Education

Provider to Provider (P2P)

COVID Grand Rounds

Overall description: The COVID Grand rounds is aimed to be a virtual grand rounds that is held monthly with an innovative format that aims to educate healthcare providers in Arizona regarding the latest developments regarding the SARS-CoV-2 pandemic. Emphasis will be placed on the epidemiology of the disease, public health policies, prevention (including vaccination), and treatment. Ander Health is a sponsor of this educational event.

https://ceal.arizona.edu/provider-education
Triage. Transition. Trust.

PicassoMD instantly connects healthcare providers for clinical decision support, referrals and care coordination.

Learn More
Questions?

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2. What is the effectiveness of provider-to-provider telehealth for rural patients?

3. What strategies are effective and what are the barriers and facilitators to implementation and sustainability of provider-to-provider telehealth in rural areas?

4. What are the methodological weaknesses of studies of provider-to-provider telehealth for rural patients and what improvements in study design (e.g., focus on relevant comparisons and outcomes) might increase the impact of future research?
Provider-to-Provider Telehealth Models

- **ECHO/ECHO like models**
  - Provider presents a case to panel of specialists

- **Store-and-Forward**
  - Capture of information and sent to another provider (specialist)
  - Asynchronous and used to replace a service that would take place in-person

- **eConsult**
  - Information regarding a patient’s condition sent to another provider (specialist) to evaluate
  - Asynchronous and not replacing in-person service, curbside consult
  - Communications Technology-Based Services (CTBS)
P2P for Tele-stroke

Barriers:
- Administrative costs
- Distortions
- Out of pocket costs for patients,

Wilcock et al, JAMA Neurol 2021;78(5):527-535

Richards et al, JAMA Neurol 2020
Setting

<table>
<thead>
<tr>
<th>Setting</th>
<th>Inpatient</th>
<th>Outpatient</th>
<th>Emergency Care</th>
<th>Education/Mentoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>KQ2-Effectiveness</td>
<td>12 (14%)</td>
<td>28 (33%)</td>
<td>25 (30%)</td>
<td>19 (23%)</td>
</tr>
</tbody>
</table>

Study Designs and Risk of Bias

<table>
<thead>
<tr>
<th>Study Design</th>
<th>Number of Studies</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCT</td>
<td>19</td>
<td>23</td>
</tr>
<tr>
<td>Before-After</td>
<td>19</td>
<td>23</td>
</tr>
<tr>
<td>Prospective Cohort</td>
<td>18</td>
<td>21</td>
</tr>
<tr>
<td>Retrospective Cohort</td>
<td>14</td>
<td>17</td>
</tr>
<tr>
<td>Pre-Post</td>
<td>14</td>
<td>17</td>
</tr>
</tbody>
</table>

Risk of Bias

<table>
<thead>
<tr>
<th>Risk of Bias</th>
<th>Number of Studies</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Medium</td>
<td>60</td>
<td>71</td>
</tr>
<tr>
<td>High</td>
<td>19</td>
<td>23</td>
</tr>
</tbody>
</table>

Clinical Topic N studies

<table>
<thead>
<tr>
<th>Clinical Topic N studies</th>
<th>Patient Outcomes: Mortality</th>
<th>Patient outcomes: Hospital use</th>
<th>Patient outcomes: Other clinical</th>
<th>Provider outcomes/Payer outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiple conditions 3</td>
<td>+ Mortality in hospital</td>
<td>~ Transfers</td>
<td>~ Drug prescribing outcomes</td>
<td>+ Communication ratings</td>
</tr>
<tr>
<td>Infection Disease 2</td>
<td>+ Mortality</td>
<td>~ Transfers</td>
<td>+ Improved antimicrobial use or infection rate</td>
<td>None reported</td>
</tr>
<tr>
<td>Stroke 1</td>
<td>None reported</td>
<td>+ Length of stay</td>
<td>None reported</td>
<td>+ Cost</td>
</tr>
<tr>
<td>Spinal Fracture 1</td>
<td>None reported</td>
<td>+ Length of stay</td>
<td>None reported</td>
<td>+ Knowledge, skills, confidence</td>
</tr>
</tbody>
</table>

+ = Improved outcome with telehealth; ~ = Similar outcome with telehealth; - = Worse outcome with telehealth. M = Outcomes were not consistent across studies.
# Education / Mentoring

<table>
<thead>
<tr>
<th>Modality</th>
<th>Clinical Topic # of Studies</th>
<th>Provider outcomes</th>
<th>Patient outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotic therapy</td>
<td>+ Antibiotic prescribing&lt;sup&gt;142&lt;/sup&gt;</td>
<td>~ In-hospital mortality&lt;sup&gt;142&lt;/sup&gt;</td>
<td>~ Mean length of stay&lt;sup&gt;142&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>+ Self-efficacy in patient coaching/education; identification of psychosocial treatment barriers&lt;sup&gt;128&lt;/sup&gt;</td>
<td>+ A1c&lt;sup&gt;141&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>ECHO Videoconference</td>
<td>Liver disease 2</td>
<td>+ Hepatitis C Virus awareness, knowledge, abilities and intention to recommend screening for at-risk patients&lt;sup&gt;125&lt;/sup&gt;</td>
<td>~ Sustained viral response&lt;sup&gt;125&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>+ Change in prescribing&lt;sup&gt;130, 132&lt;/sup&gt;</td>
<td></td>
<td>~ Serious adverse events&lt;sup&gt;125&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>+ Provider knowledge and self-efficacy&lt;sup&gt;140&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Autism-specific screening&lt;sup&gt;126&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Pediatric behavioral health management&lt;sup&gt;132&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>+ Satisfaction with sessions&lt;sup&gt;132, 140, 143&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental health</td>
<td>5</td>
<td></td>
<td>None Reported</td>
</tr>
</tbody>
</table>

+ = Improved Outcome with telehealth; ~ = Similar outcome with telehealth; - = Worse outcome with telehealth, M = Outcomes were not consistent across studies
Summary of Evidence

- Provider to Provider Telehealth to support direct patient care may provide benefits for:
  - Inpatient care
  - Neonates in rural hospitals
  - Outpatient management of depression and diabetes
  - Emergency care for stroke/heart attack/ chest pain as well as trauma

- Telehealth for provider education and mentoring (including ECHO programs/video for instruction and collaboration) may
  - improve patient outcomes
  - change provider behavior
  - increase provider knowledge and confidence in treating specific conditions

- Other uses, outcomes or populations: Insufficient evidence to support conclusions

- Harms or unexpected negative outcomes: Not reported
What if the evidence for effectiveness?

Need RCTs to drive health policy!

Which condition?

Which Patient?

What type of telehealth?

Outcomes?

Mixed methods?

Qualitative + Quantitative

Replacement: RCT telehealth vs in-person

Complement: RCT (telehealth + in-person) vs. in-person
Non-inferiority study of telemedicine vs in-person CBTi for insomnia

Hospitalized patients screened by partial PHI waiver

Excluded for not meeting selection criteria

Screened

Excluded for not meeting selection criteria

Consented

Office-based CBT-I

Telemedicine CBT-I (n=25)

Completed Office-based CBT-I

Completed Telemedicine CBT-I

Baseline | Week 2 | Week 6
---|---|---
Telemed CBT-I | 18.7 (5.3) | 12.5 (4.3) | 8.3 (8.0)
CBT-I | 20.7 (4.4) | 16.6 (4.0) | 14.5 (7.1)

Berryhill et al [Unpublished]
Comparing Three Ways to Treat Insomnia in Adults Living in Rural Areas – COZI-R study

Seeks adult volunteers, ages 18 – 80 with chronic insomnia for a research study.

The purpose of the study is to learn which type of treatment is most effective at treating chronic insomnia; 1) Cognitive Behavioral Therapy (CBT-i), 2) Medication (Trazadone or Zolpidem), or 3) Combination of both, CBT-I + Medication.

Study involves filling out online questionnaires, sleep diaries, and follow up assessments AFTER 9 weeks, 6 months, and 12 months and surveys at 1 and 9 months, after taking medication and completing internet based cognitive behavioral therapy, or both. All visits/questionnaires are completed online. There are no in-person clinic visits.

Cognitive Behavioral Therapy is provided free of charge.

Participant’s insurance company will be billed for medication.

Compensation for study completion is ($75.)

Contact Information:
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Principal Investigator: Sairam Parthasarathy, MD sparth1@arizona.edu
PCORI-CER-2018C2-13262

https://cozi.medicine.arizona.edu/
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Definitions

**Telehealth:**
Use of information and telecommunications technology to provide health care across time and/or distance; many possible combinations:
- Modes (asynchronous, real-time video, and many others)
- Functions (consultations, mentoring)
- Clinical indications (from mental health to remote surgery)

**Provider-to-Provider:**
Any form of interactive support using telecommunications technology provided to health care professionals while they are caring for patients and populations.
Barriers

• Not reimbursable (R)
• Regulatory limitations (R)
• Not covered
• Patient location ineligible
  • Alaska and Hawaii for CTBS [Medicare])
  • 17 states for eCpnsults
  • ECHO - NM
• Provider ineligible
• Low fees
Disparities by race/ethnicity and region

- Accessible technology (e.g., disability, language access)
- Initial investment and upgrades
- Training and maintenance
- Where you live matters
- Provider availability for distant sites
- Reimbursement
- Patient needs
- Data collection, analysis and reporting
Barriers - Summary

• Facilitators and Barriers are similar across settings and uses

• 2 Most frequently cited barriers
  • Level of resources available for implementation and on-going operations
  • Access to digestible information and knowledge about the intervention and how to incorporate it into work-flow

• Unique to rural P2P telehealth
  • Lack of consulting providers’ familiarity with limitations in rural areas
  • Resources and commitment required may be difficult to rural provider
  • Technology and support must be tailored for frequency of use
Real-time Automated Sampling of Electronic Medical Records Predicts Hospital Mortality

Kaplan-Meier Graph by EMR-based Automated Alert

Khurana et al, Am J Med 2016; 129(7); 688-698
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Challenges Researching Telehealth

- Telehealth can facilitate a wide range of very different health services and interventions
  - Example: remote ICU vs. SMS remote education
  - Comparisons across uses may not be appropriate
- Limited outcomes
  - Studies are often designed to assess impact on access
  - Not as frequently designed to assess
    - impact on patient, provider or payer outcomes
    - quality of services provided via telehealth
- Individual study design
  - RCTs versus other designs
  - Sample sizes
  - Single-site versus multi-site studies
  - Biases not addressed or minimized
  - Examples: selection, performance, detection, attrition and analysis bias
- Individual study conduct
  - Clarity and fidelity of telehealth intervention and comparator
- Confidence in a body of evidence
  - Across studies
  - Not about whether telehealth works; about whether the conclusion seems stable—will it change with future studies?
Study Design Considerations

- RCT considered the gold standard design for reducing risk of bias
  - 23% RCTs
  - 38% cohort studies (prospective or retrospective)
  - 39% pre-post/before-after design

- Use strongest possible research designs
  - Adequate sample sizes for primary, important outcomes
  - Multisite, cluster-randomization if appropriate

- Detailed descriptions of telehealth interventions and comparators

- Clear agreement on telehealth goals and corresponding outcomes
  - If ‘as good as’, use noninferiority (equivalence) design
  - What are the most important outcomes?
    - Is access sufficient or must clinical outcomes improve?

- Outcomes measurement and analysis
  - at multiple time points and/or contemporary comparison groups
  - long-term sustainability of outcomes
Methodological Weaknesses - Summary

- Studies of provider-to-provider telehealth for rural areas could be improved by addressing methodological weakness
- Key weakness: Difficult to attribute impact to telehealth because
  - Most common: Weaker study designs are common
    - Lack of control for confounders
  - Next most frequent: small sample sizes
    - lack of power to detect differences or confirm equivalence
- Data limitations
  - use of retrospective data
  - data produced for care delivery and billing purposes and not research may be incomplete or coded differently across organizations
Thank you

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Dan Derksen, MD, Uarizona site-PI
Mona Arora, PhD
Michelle Moore, PhD
Brenda Lambert

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Theresa Cullen, MD - PI
Adrianne Ackerman, PhD
Ada Wilkinson-Lee, PhD

NIH – CEAL (OT2-HL-156812 and OT2-HL-158287)
Chyke Doubeni, MD
Samantha Sabo, Dr.PH
Sabrina Oesterle, PhD

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Janko Nikolich, MD, PhD
Kenneth Knox, MD
Eric Reiman, MD, PhD