Rural HIT Coalition Discussion – Quality Measures in Telehealth

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- The HRSA Federal Office of Rural Health Policy (FORHP) Office for the Advancement of Telehealth (OAT) funds the Rural Telehealth Research Center (RTRC) through a cooperative agreement.
- **RTRC's mission is to help expand the evidence base for telehealth**.
- RTRC works with FORHP/OAT to identify multiple research projects each year.
- Our collaboration consists of three partners:
  - **University of Iowa**
  - **University of North Carolina – Chapel Hill**
  - **University of Southern Maine**

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HRSA FORHP/OAT-funded TeleED Project

- Small rural hospitals face challenges in providing 24/7 ED coverage and Emergency Department telehealth (**TeleED**) can help provide this coverage.
- Evidence-Based Tele-emergency Network Grant Program (**EB TNGP**)
- **FORHP/OAT funded 6 Networks** in 2014-2019 to implement **TeleED**. They did so in 65 rural hospitals across 13 states.

RTRC collected data on quality measures

- We identified quality measures and other data elements pertinent to TeleED including:
  - Care processes for 4 specific serious ED conditions – chest pain, AMI, stroke, sepsis (using CMS ED core measures)
  - Timing of consultations and care processes
  - Patient demographics
  - Presenting complaint and diagnosis
  - Disposition
- The 6 grantees collected and submitted data on all TeleED patients over a 26-month period (N = 4,324).
- The 6 grantees also collected data on a matched set of patients for whom TeleED was not used.

Chest Pain and AMI Analysis

- This analysis evaluated the impact of TeleED on the timeliness of acute myocardial infarction (AMI) care for patients presenting to rural EDs with chest pain
- Of the 1,220 patients presenting with chest pain, 27% received TeleED consults
- On average, **time-to-ECG was 0.39 times** (95% CI -0.26 to -0.52) **faster for TeleED cases**
- Among eligible patients, **TeleED was associated with higher odds of fibrinolysis administration** (adjusted odds ratio = 7.17; 95% CI 2.48–20.49)

Miller AC, Ward MM, Ullrich F, Merchant KAS, Swanson MB, Mohr NM. Emergency department telemedicine consults are associated with faster time-to-ECG and time-to fibrinolysis for myocardial infarction patients. *Telemedicine and e-Health.* 2020 Feb 28.

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Stroke Symptom Analyses

- This analysis identified the impact of TeleED on patients presenting to rural EDs with stroke symptoms
- Of the 932 patients presenting with stroke symptoms, 36% received TeleED consults
- **TeleED was associated with higher odds of interpretation of computed tomography (CT) of the head within 45 minutes** (adjusted odds ratio = 3.03; 95% CI 1.69–5.46)
- Among eligible patients, **TeleED was associated with faster time to administer tissue plasminogen activator (tPA)** (adjusted hazard ratio=1.81; 95% CI 1.31–2.50)

Swanson MB, Miller AC, Ward MM, Ullrich F, Merchant KA, Mohr NM. Emergency department telemedicine consults decrease time to interpret computed tomography of the head in a multi-network cohort. *Journal of Telemedicine and Telecare*. 2019 Nov 4. doi: 10.1177/1357633X19877746.

Sepsis Analyses

- This analysis examined the association between TeleED and adherence with the sepsis bundle
- Of the 655 patients presenting with sepsis, 5.6% received TeleED consults
- **TeleED was associated with higher odds of total sepsis bundle adherence** (adjusted odds ratio = 17.27; 95% CI 6.64–44.90)
- **TeleED consultation was associated with higher adherence with three of the individual bundle components**: lactate, antibiotics, and fluid resuscitation, but not blood culture before antibiotics

Mohr NM, Campbell KD, Swanson MB, Ullrich F, Merchant KAS, Ward MM. Provider-to-provider telemedicine improves adherence to sepsis bundle care in community emergency departments. *Journal of Telemedicine and Telecare*. 2020 Jan 5. doi: 10.1177/1357633X19896667.

Other Key Findings

- **The TeleED consultation began before the local clinician exam in 38% of patients** for the networks who served a general patient population.

Heppner S, Mohr MN, Carter KD, Ullrich F, Merchant KAS, Ward MM. HRSA's Evidence-Based Tele-Emergency Network Grant Program: Multi-site prospective cohort analysis across six rural emergency department telehealth networks. *PLOS One*, in press.

- **20% of TeleED patients met specific criteria for an averted transfer**
- Of the averted transfer cases, 53% were admitted to the local inpatient facility, and **44% were discharged**
- Average estimated transport savings were $2,673 for each averted transfer. with 64% of these cost savings accruing to public insurance

Ward MM, Carter KD, Ullrich F, Merchant KAS, Natafgi N, Zhu X, Weigel P, Heppner S, Mohr NM. Averted transfers in rural emergency departments using telemedicine: Rates and costs across six teleED networks. *Telemedicine and e-Health*, in press.

What do these findings contribute?

- These research findings:
  - **Show significant improvements in quality measures** for TeleED in multiple serious conditions – chest pain and AMI, stroke, sepsis.
  - **Indicate that TeleED services are frequently activated before the local provider reaches the ED**.
  - **Demonstrate that TeleED consultation can avert transfer in 20% of cases where transfer is being seriously considered** and that almost half of these patients are discharged.
  - Are generalizable across TeleED services because we analyzed data from all TeleED activations across a 26-month period from six regional networks using various approaches to TeleED.

Research Team & Funding

- Knute Carter, PhD
- Kimberly Merchant, MA
- Clint MacKinney, MD
- Nicholas Mohr, MD
- Fred Ullrich, BA
- Paula Weigel, PhD
- Xi Zhu, PhD

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