COVID19 Series
July 21, 2020

Tele-Health:
A Nursing Perspective

Nurses Transforming Healthcare
Through Informatics
Acknowledgement

This program is presented to you by NENIC and Boston Children’s Hospital
Disclaimers

- The speakers have no potential conflicts of Interest.

- There is no commercial support for this program.
Welcome

Teresa A. Rincon PhD, RN
Director of Clinical Operations and Innovation
Virtual Medicine, UMass Memorial Health Care (UMMHC)
Teresa.rincon@umassmemorial.org

Lisa C. Dutton, MSN, RN-BC, NE-BC
Professional Development Manager, Ambulatory Nursing
Brigham and Women’s Hospital
ldutton@bwh.harvard.edu

Laura MacLean MS, RN-BC
Nursing Program Director of Ambulatory Informatics
Brigham and Women’s Hospital
lamaclean@bwh.harvard.edu
Welcome
COVID19 Series: Tele-Health from a Nursing Perspective

Teresa A Rincon PhD, RN, CCRN-K, FCCM
Objectives/ Content Outline

• Describe various applications of telehealth: past, present and emerging
• Identify benefits and challenges to delivering telehealth services
• Understand modifiable factors that influence adoption and effectiveness of telehealth services
• Recognize innovations that can be used to deliver telehealth services that enhance access, timeliness, and effectiveness of care
• Review the use and impact of telehealth during the Coronavirus Disease 2019 (COVID-19)
In 1999 the Institute of Medicine’s (IOM) Committee on Quality of Health Care in America wrote the *To Err is Human: Building a Safer Health System*. An estimation of at least 44,000 and possibly as many as 98,000 Americans die in hospitals annually as a result of medical errors.

A recent Johns Hopkins study reported that more than **250,000 people** in the U.S. die every year due to medical errors while others claim the numbers to be as high as **440,000**.

Whether we count deaths in tens of thousands or hundreds of thousand per year, too many people are dying from medical errors.
The 6 “Aims for Improvement,”
To Err Is Human report asserted that the problem is that good people are working in bad systems and those systems need to change.

1999
5 Ways Telehealth Is Taking Modern Healthcare to the Next Level

• Telehealth Brings Expertise to All Areas
• Telehealth Assists People with Limited Access to Specialized Care
• Telehealth Is Practical and Relatively Inexpensive for Patients
• Telehealth Maximizes Access to Mental Health Care
• Telehealth’s Benefits Set to Grow

Evolution of Telehealth

1905 Telephone Orders Questioned
1906 First EKG transmitted by telephone
1924 Teledactyl envisioned
1948 First radiologic images transmitted by telephone
1959 Nebraska hospitals establish first interactive video link
1960s NASA takes on telemedicine
1963 MGH opens remote medical outpost at Logan Airport
1964 Norfolk State Hospital provided telehealth services
1960s Telehealth Programs piloted with Dept of Public Health, DOD, Health & Human Services
1964 First radiologic images transmitted by telephone
1974 First Telenursing Article Published
1974 Dawn of the modern Internet
1984 First TeleICU opens Norfolk VA
1980 MIT Media Lab pioneers “Talking Heads” telepresence
1989 Dawn of the modern Internet
1993 American Telemedicine Association (ATA) founded
1999 CMS begins reimbursing for telehealth consults in under-served rural areas
2000 First TeleICU opens Norfolk VA
2003-2006 First Wave of TeleICUs open across the US
2007-2011 AACN established CCRN-E
2013-2018 AACN TeleICU Nursing Guidelines & Consensus Statement
2018-2019 Expansion of mobile apps, eVisits and mHealth

1905 Telephone Orders Questioned
1906 First EKG transmitted by telephone
1924 Teledactyl envisioned
1948 First radiologic images transmitted by telephone
1959 Nebraska hospitals establish first interactive video link
1960s NASA takes on telemedicine
1963 MGH opens remote medical outpost at Logan Airport
1964 Norfolk State Hospital provided telehealth services
1960s Telehealth Programs piloted with Dept of Public Health, DOD, Health & Human Services
1964 First radiologic images transmitted by telephone
1974 First Telenursing Article Published
1974 Dawn of the modern Internet
1984 First TeleICU opens Norfolk VA
1980 MIT Media Lab pioneers “Talking Heads” telepresence
1989 Dawn of the modern Internet
1993 American Telemedicine Association (ATA) founded
1999 CMS begins reimbursing for telehealth consults in under-served rural areas
2000 First TeleICU opens Norfolk VA
2003-2006 First Wave of TeleICUs open across the US
2007-2011 AACN established CCRN-E
2013-2018 AACN TeleICU Nursing Guidelines & Consensus Statement
2018-2019 Expansion of mobile apps, eVisits and mHealth
Acknowledgement: Supported with the 1st AACN Impact Grant

What do TeleICU Nurses Do?
Benefits of using Tele-ICU

- Vital sign trending: 15%
- Prevent self extubations: 7%
- Prevent falls: 9%
- Medical management: 15%
- Enhance patient safety: 14%
- Physiologic instability detection: 13%
- Arrhythmia detection: 13%
- IV maintenance: 5%
- Watch patient when nurse is out of the unit: 9%
AACN TeleICU Nursing Consensus Statement 2018

- TeleICU nurses are described as critical care nurses who use technological tools to participate in nursing care for patients.
- They are nurse experts with advanced knowledge, situational awareness, skills and abilities in critical care who also should possess advanced skills in communication, collaboration, mentoring, surveillance, decision-making, systems thinking and use of technology.
Example: Sepsis Surveillance

- Leading cause of death globally
  - + 5 million deaths

- High rates annually
  - + 31 million sepsis cases

- Very expensive condition to treat
  - + 24 billion annually in the U.S.

- Difficult to detect, define, and treat
  - Each hour delay = 4% increase of death
Increased complexity demands an increase in expertise.

Sutter Health Experience

We saw sepsis care as a phenomena of concern in 2004.

Initially we tried to train hundreds of inpatient and emergency department (ED) nurses to identify sepsis.
Knowledge Management Conceptual Framework

• Knowledge Management (KM) focuses on acquisition, sharing, translation and application of knowledge

• Knowledge translation is used to close the gap between knowledge and practice in order to improve:
  • adherence to evidence
  • outcomes
  • clinician effectiveness

Rincon T. Integration of Evidence-Based Knowledge Management in Microsystems: A Tele-ICU Experience. Critical Care Nursing Q 2012; 35:335-40
TeleICU Nurse Sepsis Surveillance

A centralized, remote team of expert nurses used a software application to identify and advance clinical decision-making for sepsis patients

Assessed patients for sepsis upon admission to the ICU and every 12 hours

Influenced repetitive, continual, and routine diffusion of evidence-based practices at multiple hospitals in a large healthcare system

Collected data on incidence of and compliance to the bundle through an electronic form that supported near-real time auditing and feedback.
Increased documentation of ICD-9-CM CODES 995.92 and 785.52 with template-oriented monitoring and screening by a Tele-ICU

- Reported incidence per ICU admission:
  - ICD-9-CM 785.52 for 2007-2008: 846/16,359 (5.2%) and 2009: 297/4057 (7.3%) p-value 0.0001.
  - ICD-9-CM 995.92 for 2007-2008: 473/16,359 (2.9%) and 2009: 202/4057 (5.0%) p-value 0.0001.

- Reported actual mortality:
  - ICD-9-CM 785.52 for 2007-2008: 350/846 (41.4%) and 2009: 102/297 (34.3%) p-value 0.03.
  - ICD-9-CM 995.92 for 2007-2008: 149/473 (31.5%) and 2009: 42/202 (20.8%) p-value 0.03.

- Conclusions: These data suggest that a Tele-ICU-based process increases the documentation of severe sepsis and septic shock and reduces reported mortality rates.

Rincon T, Seiver A, Farrell W et al. Increased Documentation of ICD-9-CM Codes 995.92 and 785.52 with Template-oriented Monitoring and Screening by a Tele-ICU. 8 Crit Care Med 37(12) Abstract Supplement A4
“Human factors and ergonomics must play a more prominent role in health care if we want to increase the pace in improving patient safety.”

Design Implications of a Sepsis Alert Used by Tele-ICU Nurses: A Human Factors Evaluation

What is Surveillance?

• “Surveillance has been defined as the purposeful on-going collection, interpretation, synthesis, and analysis of individual patient or population data with the purpose to support clinical decision making.”

• “Dissemination of and/or acting on these data can reduce morbidity and mortality and improve overall health in three ways:
  • through early warning of impending clinical or public health emergencies,
  • documentation of impact of interventions, and
  • tracking the progress towards specific healthcare goals.”

Cognitive processing: response to stimuli is impacted by

- Limitations of human cognition
- Ability to problem solve
- Access to long-term memory
- Level of working memory
- Situational awareness or lack thereof
Human Information Processing

https://www.skybrary.aero/index.php/Information_Processing
The Problem with Alerts and Alarms

Biomedical devices can produce as many as one critical alert every 92 seconds with less than 15% being clinically relevant.

Alerts are alarm notification systems that are built within software applications alerts.

Desensitization, Misses, Fatigue, Sensory Overload
Discussion

Screening for severe sepsis is resource intensive process and requires high level cognitive processing using working memory

Expert nurses working in a controlled environment with a specific role to observe and respond to clinical alerts may enhance appropriate responses

HF engineering can support system designs that control for and enhance the latent contributors that impact complex tasks such as screening for severe sepsis.
Exemplars from seven health systems using Advanced Practice Providers (APPs) within various telehealth service-lines

Figure 1. Tele-ICU Coverage Areas of Sites Described in Exemplars
### Table 1. APP Consultation and Management Models

<table>
<thead>
<tr>
<th>Originating Site</th>
<th>Distant Site</th>
<th>Where Telehealth Services are Provided</th>
<th>When Tele-APPs Work</th>
<th>APP Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>BayCare Health System</td>
<td>Yes</td>
<td>Yes</td>
<td>ICU, ED, RRT, SNF, Home</td>
<td>Night Shift Only</td>
</tr>
<tr>
<td>Emory Healthcare</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>APRNs/PAs</td>
</tr>
<tr>
<td>Intermountain Healthcare</td>
<td>Yes</td>
<td>Yes</td>
<td>ICU, RRT, SNF, Home</td>
<td>Day Shift Only</td>
</tr>
<tr>
<td>Northwell Health</td>
<td>Yes</td>
<td>Yes</td>
<td>ICU, ED, SNF</td>
<td>24/7</td>
</tr>
<tr>
<td>Ochsner Health System</td>
<td>Yes</td>
<td>No</td>
<td>NA</td>
<td>APRNs/PAs</td>
</tr>
<tr>
<td>UMass Memorial Healthcare</td>
<td>Yes</td>
<td>Yes</td>
<td>ICU, PACU</td>
<td>24/7</td>
</tr>
<tr>
<td>VA Medical Center</td>
<td>Yes</td>
<td>Yes</td>
<td>ICU, ED, SDU</td>
<td>24/7</td>
</tr>
</tbody>
</table>

Originating site, where the patient is located at the time of service; Distant site, location of the provider at the time of service; APRN, advanced practice nurse; PA, physician assistant; ICU, intensive care unit; ED, emergency department; RRT, rapid response team; SNF, skilled nursing facility; PACU, post anesthesia care unit; 24/7, 24 hours per day/7 days per week. Rincon et al. Describing Advanced Practice Provider Roles within Critical Care Teams with Tele-ICUs: Exemplars from Seven U.S. Health Systems. Under Review.
Medicaid Policy Trends

Many of the reimbursement policies that do exist continue to have restrictions and limitations, creating a barrier to utilizing telehealth services. At the same time, programs reimburse for some type of Telehealth service. In addition, some states have implemented policies indicating that such policy has been implemented in some cases due to the COVID-19 pandemic.

23
Medicaid programs reimburse for RPM

16
Medicaid programs reimburse for S&F

50
States and D.C. now reimburse for Telehealth service to the home

19
States and D.C. now reimburse for live video

States and the District of Columbia (D.C.) have a variation of Telehealth.
Using Telehealth to Expand Access to Essential Health Services during the COVID-19 Pandemic

Purpose of this Guidance

To describe the landscape of telehealth services and provide considerations for healthcare systems, practices, and
Telehealth: Delivering Care Safely During COVID-19

HIPAA flexibility • Waivers from the Centers for Medicare & Medicaid Services • Cost-sharing for patients in federal health care programs • Billing and reimbursement • Additional flexibilities

Editorial: Telemedicine and the COVID-19 Pandemic, Lessons for the Future

With the onset of COVID-19 and almost within days, it has become obvious that:

• Outpatient visits in various settings can be clinically managed effectively from a distance.

• The infrastructure for connectivity is widely available at both ends of the clinical encounter (smart phone technology).

• The necessary training where needed, staffing and workflow development can be implemented rapidly with minimal disruptions or dislocations.

• Little or no resistance is encountered because it is protective for providers and patients.

• “Government has relaxed all restrictive regulations for telemedicine deployment, including interstate licensing, data confidentiality issues, and most significantly reimbursement.”

Per the CDC, it is only a matter of time before widespread transmission of coronavirus disease 2019 (COVID-19) occurs.
**WEAKNESSES**
- Resource capacity planning was poor prior to crisis
- Not enough appropriately skilled resources were provided during crisis
- Schedules/deadlines were unrealistic
- Resources were assigned inconsistently
- Too many unplanned requests for resources and tools
- Shifting resources to respond to problems
- Role and Scope Creep abounded

**STRENGTHS**
- Best place to give care, best place to get care vision
- Established foundation for telehealth
- Established relationships with 2 telehealth technology vendors

**OPPORTUNITIES**
- In a position to be the provider of telehealth and telecommunication solutions within our health system, for Central MA, and beyond.
- Telehealth is now mainstream.

**THREATS**
- The Covid—19 crisis forced us to act faster than we were prepared to act.
- Competition for hardware, software and human capital with a limited supply in all areas.
- Other health systems are rapidly becoming experienced in providing telehealth services

Created by T. Rincon 4.26.20
SMART GOALS:

• **Minimize exposure and improve provider efficiency** Lean methods for measuring adoption and data analytics will include the all telehealth visits pre and during the height of the COVID-19 pandemic period March-June 2020.

• Measure and report the number of video visits and telephone visits:
  • Goal: increase the ratio of video visits to telephone visits. Target 15% with stretch goal of 25% of total number of ambulatory setting visits and Target 15% with stretch goal of 25% of all specialty consults for inpatient/ED.

• Measure and report the number of billed video visits and telephone visits:
  • Goal: improve charge capture of video and telephone visits to match charge capture organizational goals. Target and stretch goal to be determined.

• Measure and report the number of video visits and telephone visits paid by third party payers:
  • Goal: improve revenue of video and telephone visits to match organizational goals for percent of paid visits. Target and stretch goal to be determined.
COUNTERMEASURES (PLAN)

• Develop a lean, reproducible plan that includes training, support and deployment schedule to implement telehealth technologies throughout the health system in a 3 to 4-week period.

• Standup a telehealth health support center (TSC) team, standard processes, knowledge articles, and engage NTT in knowledge transfer (see Appendix).

• Create a dashboard that uses data from multiple data bases to measure and report video and telephone visits pre and post Covid-19.

• Use lean and qualitative methods to collect, analyze and report data related to user satisfaction with and adoption of telehealth technologies.

• Work with UMMHC government relations to address important State level barriers to provision of telehealth: payment parity, state licensure, and credentialing by proxy.
Unique Multi-Line Sessions by Group and Week

CHL and Psych remain the largest users, relative usage by groups remains fairly constant.
Video Visits

Number of Visits by Appointment...

Between 3/1/2020 and 6/30/2020 by week

Population
Base: All Visits
Any of Visit Type: TELEHEALTH VIDEO
15, TELEHEALTH VIDEO 20,
TELEHEALTH VIDEO 30

Slices
4 Slices by Appointment Status

Measures
Number of Visits

Visual Options
Y-Position: Number of Visits
Point Color: 4 Slices by Appointment...
Y-Axis Range: 0 to 5000
Telehealth Optimization
“Voice of Caregiver” Summary

June 2020

Lead: Teresa Rincon, RN, PhD, CCRN-K, FCCM,
Director of Clinical Ops & Innovation | Virtual Med

Adarsha Bajracharya, MD
Abraham Lin, Medical Student
Kimberly McGuigan, Master Black Belt

Best Place to Give Care -
Best Place to Get Care
Methodology Details

1. General categories of factors were established (INSTEP model)
2. Recorded focus groups were transcribed and notes were taken in optimization huddles
3. Specific points from the first focus group transcription were added to each of the categories
4. Initial topics were reviewed and refined by multiple people to add clarity and consistency
5. Key points from each focus group were coded, grouped and counted in each category
6. Points from individual focus groups were consolidated into a master list by category
7. Key points were rated:
   a. High: 4 or more providers mentioned it, substantial emphasis
   b. Medium: 2-3 providers mentioned it, some emphasis
   c. Low: 1-2 providers mentioned it, little to no emphasis
8. Multiple reviewers reached consensus on the categorization and ratings to enhance accuracy
9. Points mentioned with the most frequency and emphasis were further analyzed and summarized for presentation
Represented Caregiver Groups

- Primary Care (Hospital-based & CMG)
- ENT
- Pediatrics
- Sleep Medicine
- Pulmonology
- Cardiology
- Emergency Medicine
- Nursing Informatics
- Psych / EMH
- CHL
- Neonatology
- Hospitalists / Inpatient Nursing
- Surgery (multiple disciplines)
- Dermatology
- Palliative Care
- Critical Care

* Note: other groups were invited, but did not attend
Telehealth Adoption Factors: the INSTEP Model

**NATURE OF WORK**
- Check in/pre-visit workflows
- Exam requirements
- Care giver benefits

**TOOLS & RESOURCES**
- Tools and platform need to work
- Ease of use/simplicity
- Optimal set (equipment & workflow design)
- Better training & support

**PHYSICAL**
- Lighting/noise/ventilation
- General work area layout
- PPE/Social distancing

**INDIVIDUAL**
- Readiness of technology or environment
- Motivation
- Technical skill/expertise
- Psycho-social & physical factors

**SOCIAL**
- Leadership support
- Clear direction and Communication

**EXTERNAL**
- Payment parity (or close to it)
- State licensure
- Network reliability (ISP/cellular)
Elements of Satisfaction

**Delighters: “Bonus!”**

- Just click a link: don’t want to download an app
- Waiting room functionality
- Integrated patient data (e.g. questionnaires directly linked to EHR with no scanning)

**Performance: “More is Better”**

- Clear, streamlined, workflows that integrate smoothly with technology
- Tech savvy patient and caregiver *
- Payment parity
- Pre-visit and post-visit staff support *
- Accessible training and resources *
- Ease of documentation
- Clear expectations & accountability
- Appropriate patient selection *

**Basic Expectations: “Get these right or else”**

- Simple, reliable, accessible platform *
- Quality of network connection *
- Patients and caregivers have compatible equipment that they are familiar with *
- Patient not physically or cognitively impaired
- Interpreter services integration *

* Applies to patients AND caregivers
Recommended next steps

• Provide a simple, reliable platform & network: easy for patients & caregivers!
• Clear, consistent, timely leadership messaging on expectations
• More staff support for patient preparation
• Clarify equipment requirements and make equipment readily available
• Communicate and enhance interpreter services integration

Keep doing / do more of

• Too many options: clearly focus on 1 – 2 platforms
• Mixed messages
• Reduce complexity

Stop doing / do less of

• Broad, simple patient and family communications
  o Telehealth availability
  o How to get set up (all platforms)
  o How to get support
• Enhanced EHR integration

Start doing
“Urging clinicians to “try harder” or “be more careful” will not safeguard them against errors. Likewise, efforts to improve care solely through education often have minor and fleeting improvements, if any. To reduce or prevent such harms, the health care environment must be designed with human limitations and abilities in mind.

Armstrong Institute for Patient Safety and Quality (2020); Human Factors Engineering; Human Factors in Health Care

Additional References

• Rincon TA. How NPs can help expand telehealth services. The Nurse Practitioner. 44(11):30-35. (2019)