

# COVID-19

An End Stage Renal Disease (ESRD) National Coordinating Center (NCC)  
Professional Education Webinar

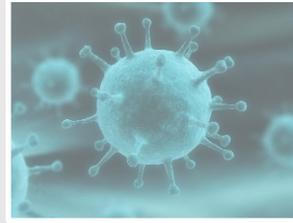


September 2, 2020

COVID-19 = Coronavirus Disease 2019

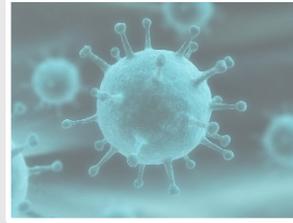


# Agenda



- What is this call about?
- Today's speaker:
  - Jerome Tannenbaum, MD, PhD, FACP  
Chairman and Chief Executive Officer  
Sanderling Renal Services-USA, LLC, Nashville, Tennessee
  - Topic: Telemedicine in Nephrology
- Questions and Answers (Q&As) from chat and Q&A panels

# What Is This Call About?



- Hear from stakeholders and peers in the ESRD community who are adapting to COVID-19.
- Share examples and provide real-world strategies for facilities to use.
- Engage in bi-monthly calls on varying topics.

**Telemedicine in Nephrology**  
**Jerome S. Tannenbaum, MD, PhD, FACP**  
**Nashville, TN**

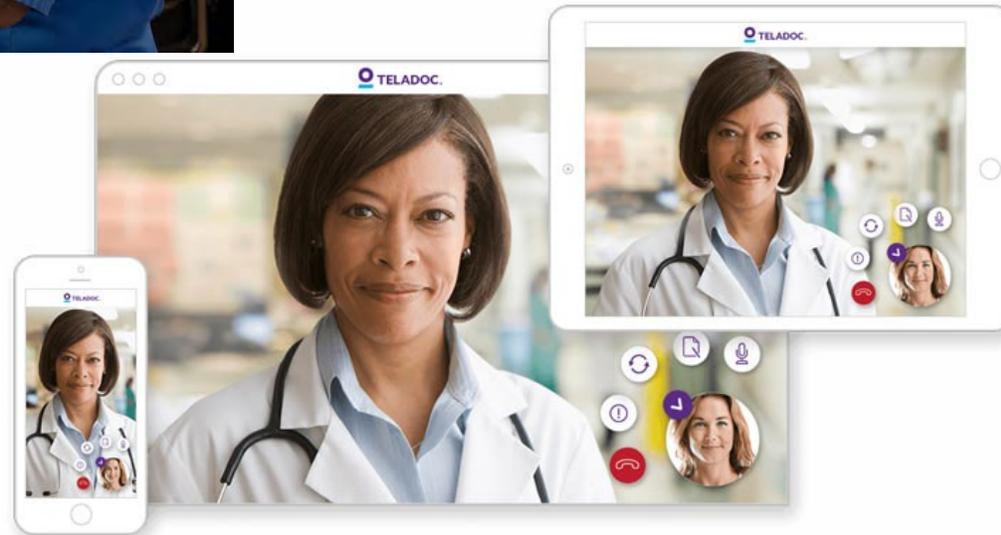
## Disclosures

- Dr. Tannenbaum is Chairman and Chief Executive Officer of Sanderling Renal Services-USA, LLC, a multi-state dialysis and tele-nephrology provider
- Dr. Tannenbaum is not receiving compensation related to this Webinar

# Telemedicine Is Not New

- Interactive video used to deliver medical support in the 1950's.
- Video and physiologic monitoring of astronauts in space (1970's)
- Used by the U.S. military in 1989 to deliver medical care to frontline military personnel
- Texas Telemedicine Project
  - Funded by AT&T and The Meadows Foundation of Dallas, Texas
  - 3 Sites in Austin and 3 Sites in rural Central Texas
  - Under the direction of Dr. Jack Moncrief
  - 1991–1996—13,500 telemedicine encounters
  - 80% of encounters for dialysis evaluations
  - Equipment cost of \$50,000 per site
- University of Texas—Galveston provided healthcare in 93 prisons with telemedicine
  - 1995–Present
  - 90,000 Encounters Per Year
  - 325,000 Inmates at Any Point in Time

# Telemedicine—A Broad Continuum: From Ultra-High Acuity ‘e-ICU’ to an iPhone App For Minor Illness Telenephrology Is Some of Both



ICU = Intensive care unit

# What Is Telemedicine?

## ➤ WHO Definition:

“Telemedicine is the delivery of health care services using information and communication strategies for the exchange of valid information for diagnosis and treatment of disease in order to advance the health of individuals in remote areas.”

## ➤ CMS Definition:

“Telehealth, telemedicine, and related terms generally refer to the exchange of medical information from one site to another through electronic communication to improve a patient’s health.”

## ➤ Other Terminology:

- Asynchronous (Store and Forward). Data or Images are transmitted intermittently; Not necessarily at the time of capture.
- Synchronous Bi-Directional: Real Time (can be audio, or audio- and visual).
- B-2-C—Consumer-based telemedicine—Most Patients have no prior relationship with the physician
- B-2-B—Established patients or a referral of a hospitalized patient by another provider

# Impact of COVID-19 on Reimbursement and Regulatory Issues

- **Historically**, Reimbursement was only available if:
  - The patient was located in a rural or medically-underserved area
  - The 'Originating Site' was a hospital, critical access hospital, Rural Health Clinic, Federally Qualified Health Clinic, Indian Health Service Facility, a physician's office, or a hospital-based ESRD facility.
  - Notably, a dialysis clinic which is located at a rural hospital was not a qualified site if the hospital was not the owner of the facility.
  - Required real-time synchronous bi-directional audio-visual communication
- **COVID Waivers** now allow reimbursement without geographic or originating site limitations, including, but not limited to:
  - Urban areas
  - Dialysis clinics (regardless of location or ownership)
  - The patient's home
- **Expanded Services**: 135 additional services permitted for telemedicine
- **Technology**: Phone conversations now qualify for reimbursement (without a "Visual" component)
- **HIPAA Relaxed**:
  - OCR will waive potential penalties for HIPAA violations against healthcare providers that serve patients through everyday communications technologies.
  - Applies to widely available communications apps, such as FaceTime or Skype, regardless of whether the telehealth service is directly related to COVID-19.

# Utilization

Medicare Virtual Visits increased from 13,000 per week pre-COVID to 1.7 million per week in April 2020.

Location	%
Rural	22%
Urban	30%

Type of Service	Approx %
Audio Only (Phone)	33%
Telemedicine Platform	33%
Widely Available A/V	33%

Age Range	%
<65	34%
65-74	25%
75-84	29%
85+	28%

Race	%
White	28%
Black	25%
Asian	29%
Hispanic	27%
Other	26%

A/V = audio visual

# Sustainability-CMS—Considering Permanent Changes

- **Headwinds, based on comments by Seema Verna, the Administrator of CMS, include:**
  - **Pre-conceived notions:** “Telehealth will never replace the gold-standard, in-person care, (but it does serve) as an additional access point for patients, providing convenient care from their doctor and health care team and leveraging innovative technologies that could improve health outcomes and reduce overall health care spending,”
  - “Further analysis could be done to determine the level of resources involved in telehealth visits outside of a public health emergency, and to inform the extent to which payment rate adjustments might need to be made”
  - “For example, supply costs that are typically needed to enable safe in-person care (for, e.g., patient gowns, cleaning, or disinfectants) and built into the in-person payment rate are not needed in a telehealth visit. On the other hand, there are new processes that clinicians must create for telehealth visits, with associated costs.”
  - “How these services might be used for fraudulent activities, such as practitioners who bill for more visits than they’re conducting or who are shortening their telehealth visits while still billing for the maximum payment.”
- **Tailwinds: A lot of support in Congress to make these changes permanent—** 35 Senators co-signed a letter to HHS in July asking for more details on addressing the extension of telehealth freedoms.

# Bipartisan Champions for Telemedicine in the Senate

Senators Bill Cassidy (R-LA), Tina Smith (D-MN), Michael Bennet (D-CO), Marsha Blackburn (R-TN), Patrick Leahy (D-VT), Cory Gardner (R-CO), Angus S. King, Jr. (I-ME), Lisa Murkowski (R-AK), Robert P. Casey, Jr. (D-PA), John Boozman (R-AR.), Jacky Rosen (D-NV), Cindy Hyde-Smith (R-MS), Bernie Sanders (I-VT), Shelley Moore Capito (R-WV), Amy Klobuchar (D-MN), Ted Cruz (R-TX), Richard Blumenthal (D-CT), John Thune (R-SD), Elizabeth Warren (D-MA), Todd Young (R-IN), Dianne Feinstein (D-CA), Steve Daines (R-MT), Benjamin L. Cardin (D-MD), Kelly Loeffler (R-GA), Tammy Baldwin (D-WI), Marco Rubio (R-FL), Chris Van Hollen (D-MD), David A. Perdue (R-GA), Kamala D. Harris (D-CA), Mitt Romney (R-UT), Cory Booker (D-NJ), Lindsey Graham (R-SC), Jeffrey A. Merkley (D-OR), Joni Ernst (R-IA), Edward J. Markey (D-MA), Dan Sullivan (R-AK), John Hoeven (R-ND), and Pat Toomey (R-PA).

# Why Is Telemedicine Feasible?

- Availability of high-speed cellular and WiFi networks
- Ubiquitous deployment of electronic medical records
- Remote access to EMR
- iPads with Apple FaceTime™, Zoom™, Skype™, etc.
- Web-enabled electronic stethoscope (EKO™, Littman™)
- Remote monitoring of dialysis (Hemo and CCPD)
- Remote physiologic monitoring devices (BP/P; pulse oximeters, Apple Watch, Wifi-enabled scales)
- Multi-channel meetings (inter-disciplinary teams)
- All devices now affordable

EMR = electronic medical record; CCPD = Continuous cycling peritoneal dialysis; BP/P = blood pressure/pulse

# Applications of Tele-Nephrology

- **Outpatient:**
  - Outpatient CKD clinic
  - Outpatient nephrology consultations
  - Patient education, including modality education
- **Inpatient:**
  - Emergency in-patient consultations
  - Emergency room consultations
  - Routine or urgent inpatient consultations
  - Daily follow-up consults and visits
  - Oversight of acute in-patient dialysis
- **Outpatient Dialysis Clinic:**
  - Outpatient dialysis clinic rounds
  - Inter-disciplinary team meetings
  - QAPI meetings
- **Home Dialysis:**
  - Home dialysis monitoring and interventions
  - Monthly home patient visits
  - Urgent and emergency home patient visits

# Benefits Related to Telemedicine

- **Inpatient:**
  - Near-immediate availability of a nephrologist 24/7
  - Nephrologist and other consultants can readily coordinate a virtual 'in-person' meeting
  - Nephrologist is virtually present at multiple hospitals
  - Eliminate drive time between hospitals, clinics, and office
  - Eliminates the nephrologist as a vector of infection
  - Reduces the nephrologist's exposure to infections
- **Outpatient Clinic:**
  - Nephrologist is readily available to evaluate a patient
  - Reduce transfers to the Emergency Room that can be evaluated via telemedicine
- **In General:** More time for clinical interaction; eliminate non-productive transit time; cover more locations with fewer nephrologists.

# Pre-Requisites for Effective Telemedicine

- In-Patient, Outpatient Dialysis Clinic, Physician's Office:
  - Remote access to the EMR
  - Real-time monitoring of dialysis with secure, instant alerts (e-Dialysis™)
  - Staff to assist with positioning of the patient and camera
  - Availability of an electronic stethoscope
  - Quiet room with good, ambient lighting
  - A high-speed WiFi connection (3 Mb/s is very adequate)
  - Access to the 'business' network (not the guest network).
- Home Patient:
  - Reliable Internet connection
  - Patient has iPad or iPhone
  - Quiet room with good, ambient lighting
  - Accurate home BP cuff and scale
  - Household member who can assist with positioning of camera
  - Nice to have: Electronic stethoscope with a member of the household who can assist with positioning

# Limitations

- Cannot palpate across the Internet
  - Limited ability to perform an abdominal exam
  - No ability to perform percussion of the chest or feel for the cardiac PMI
  - Cannot palpate fistula or graft
- Cannot perform urine microscopy in home settings
- Need to coordinate blood draw
- Some patients may not like remote (However, our experience is that patients are very happy with telemedicine)

# Technology Evolution

# Remote Patient Monitoring: Can Be Reimbursed If Devices Are FDA-Approved—Look For Devices With Audible Reminders



FDA = Food and Drug Administration

# Electronic Stethoscope and Single-Channel EKG Real-Time Auscultation and Rhythm Evaluation



EKG = Electrocardiogram

# EKO 'DUO'—Combined Heart Sounds and Single Lead EKG + FDA-Approved AI

<b>AFib Detection</b>	<b>Sens (%)</b>	<b>Spec (%)</b>
Cardiologists reading single lead ECGs <sup>1</sup>	71.0	—
General Practitioners reading a chest lead <sup>2</sup>	81.0	86.0
General Practitioners reading a limb lead <sup>3</sup>	83.0	89.0
Kardia Mobile using single lead ECG <sup>4</sup>	98.5	91.4
Microlife WatchBP using opportunistic pulse assessment <sup>5</sup>	94.9	89.7
<b>EKO FDA-Approved AI</b>	<b>98.9</b>	<b>96.9</b>

1. Hannun et al., 2019

2,3 Mant et al., 2007

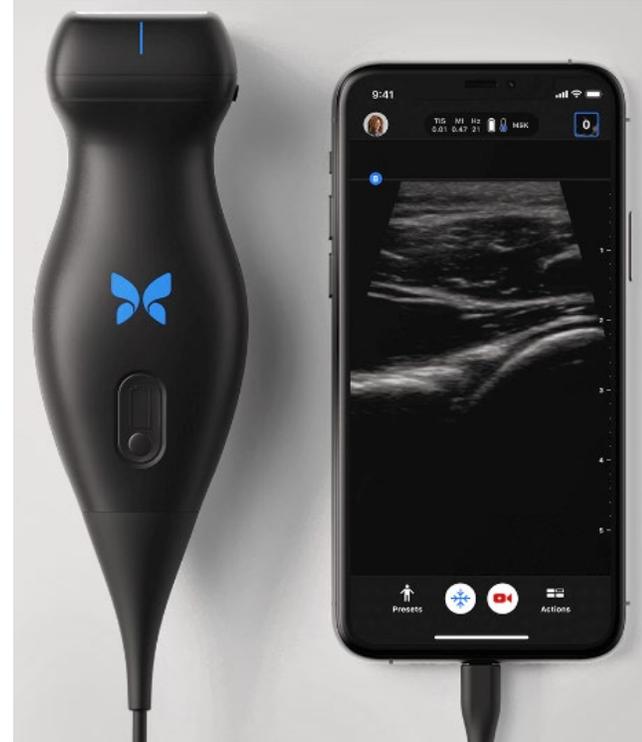
4 Lowres et al., 2014

5 Kearley et al., 2014

ECG = Electrocardiogram  
 AI = artificial intelligence  
 Afib = Atrial fibrillation

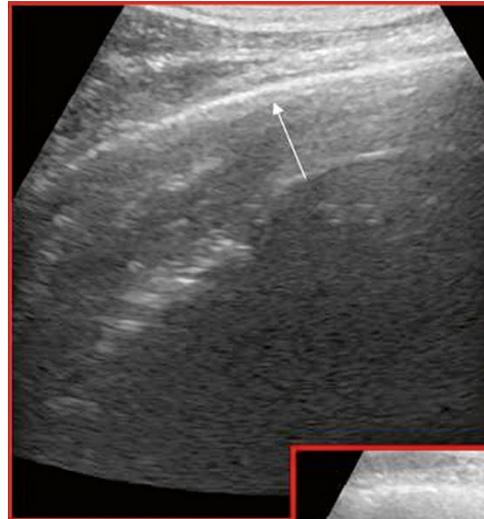
# Point-of-Care Lung Ultrasound: A Telemedicine Game Changer

- Hand-held, Web-enabled devices
- Remote real-time viewing
- RN or Patient Care Technician can be trained to position the device
- Positioning can be remotely guided through virtual reality
- Immediate interpretation by nephrologist, cardiologist, or radiologist
- Pulmonary congestion appears as ‘B-Lines’ (‘Rocket Lines’)
- Allows detection of pleural effusions, infiltrates, pulmonary edema
- More precise than auscultation for evaluating pulmonary congestion

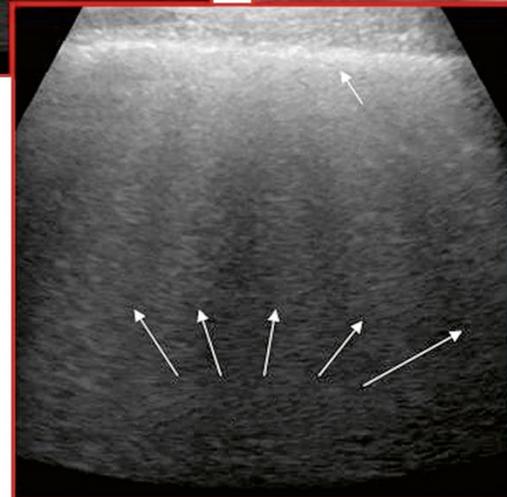
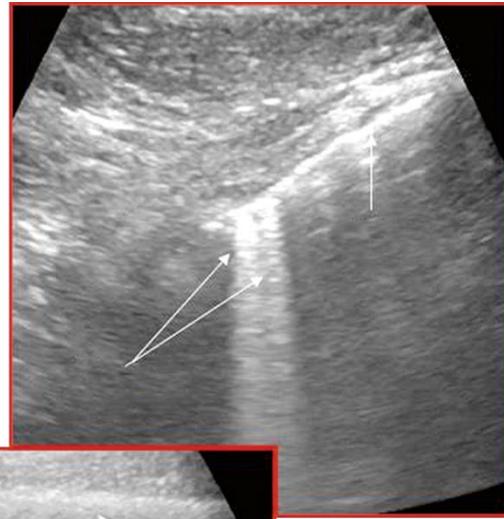


RN = registered nurse

Normal appearance of lung surface with a clearly identifiable pleural line; B-lines are absent.



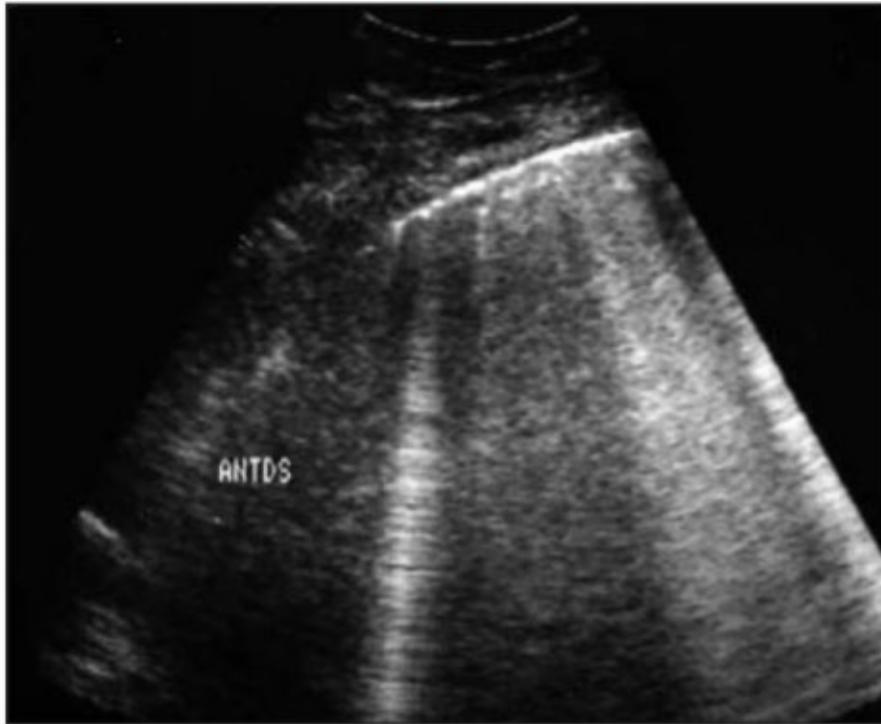
The detection of up to 2 B-lines per single intercostal space may be physiological.



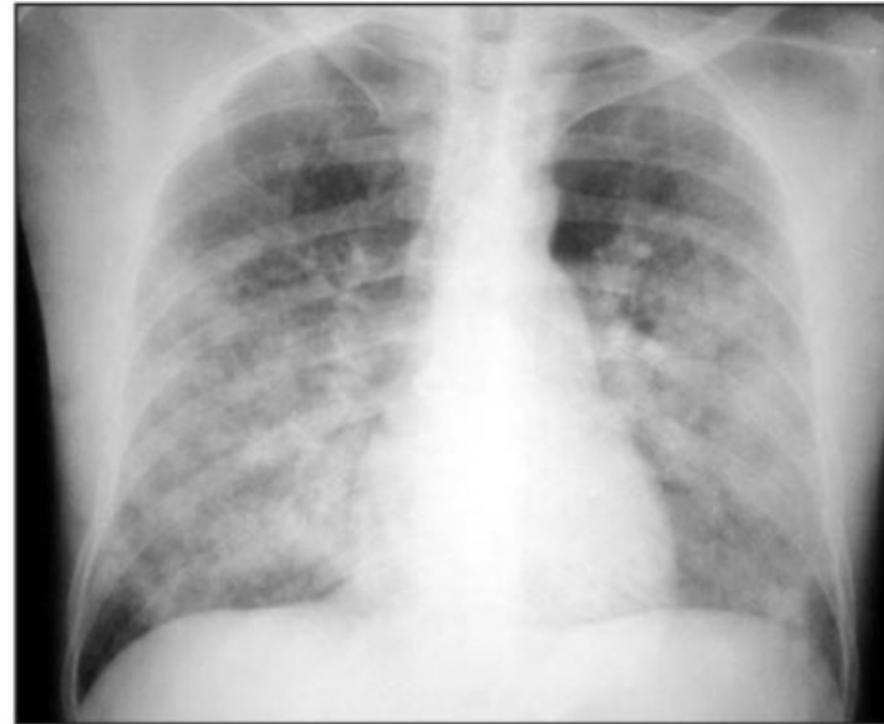
Several lung '**rockets**' indicative of interstitial lung fluid, a sign of fluid overload.

# Excellent Correlation With CXR

Pulmonary Interstitial Edema is diagnosed by diffuse lung rockets  
**Lung rockets are defined as at least 3 B lines between two ribs**



LUS



Chest x-ray

CXR = Chest x-ray  
LUS = lung rockets

# e-Dialysis™—Real-Time Monitoring of Dialysis

- Provides real-time observation of patient vital signs, dialysis blood flow and dialysate flow rates, ultrafiltration rates, venous pressure, dialysis alarms
- Acute or home dialysis nurse can supervise CCHT's providing bedside treatments in hospital, home, and SNF locations
- Nephrologist can review flow sheet data remotely in real-time from a secure cloud-based system with an iPhone or iPad
- Secure messaging notifications can alert RN and/or nephrologist if a parameter falls outside the acceptable range for that patient
- A method for alleviating the shortage of Experienced dialysis RNs and nephrologists

Date	BP	PULSE	QB	Processe d	QD	Dial Temp	VP	UFR	Net Vol	Tot Vol
08/10/2020 12:34 PM	157/93	93 (0)	350	37	800	35	214	1130	2170	2170
08/10/2020 12:02 PM	131/67	83 (0)	350	27	800	35	267	1130	1607	1607
08/10/2020 11:32 AM	118/90	72 (0)	350	19	800	35	249	1130	1054	1054
08/10/2020 11:01 AM	131/75	85 (0)	350	11	800	34.20	240	1130	586	586
08/10/2020 10:29 AM	205/81	92 (0)	400	0	800	35.40	171	1130	10	10
08/10/2020 10:20 AM	205/81	92 (0)								
08/10/2020 02:47 PM	173/83	90 (0)	200	74	800	35	115	300	4508	4508
08/10/2020 02:47 PM	173/83	90 (0)	200	74	800	35	115	300	4513	4513
08/10/2020 02:31 PM	171/74	92 (0)	300	70	800	35	161	1130	4239	4239
08/10/2020 02:01 PM	126/69	92 (0)	300	61	800	35	164	1130	3680	3680
08/10/2020 01:31 PM	127/75	93 (0)	350	53	800	35	204	1130	3162	3162
08/10/2020 01:05 PM	173/90	97 (0)	300	46	800	35	168	1130	2733	2733
08/10/2020 01:03 PM	157/93	93 (0)	300	45	800	35	167	1130	2696	2696

Patients
Chart Update
Create Msg
Tools
Logout

Inbox
Alerts
OrdersToSign
PhoneMsg

Select All
Sign All
Pat/Srv Date/Doc... ▾

- 07/17/2020--UFR
- 07/17/2020--Weight Gain
- 07/17/2020--Weight Gain Pct
- 07/15/2020--UFR
- 07/13/2020--UFR
- 07/13/2020--UFR
- 07/13/2020--UFR

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The patient's nephrologist was notified of the following events associated with a dialysis performed on 07/13/2020 11:00:00 AM

The UFR was 1070 which exceeds the prescribed limit for this patient, which is 708.5

Electronically Signed by HAVILL, JOHN M.D. on 07/15/2020 11:05:42.  
##And No Others##

**Excellent Outcomes With Tele-Nephrology and e-Dialysis™**

# Presented at the American Society of Nephrology 2016

## Telenephrology: A 2 Year (1978 Visits) Experience Caring for Hospitalized Patients in a Rural Community Hospital

Brenda R. C. Kurnik, MD, Jerome Tannenbaum, MD, PhD



### BACKGROUND TELEMEDICINE AND NEPHROLOGY

- Remote monitoring of dialysis patients
- Remote care for CKD patients
- There are no published experiences using telemedicine to perform nephrology consultations and inpatient dialysis on hospitalized patients

### METHODS

- Retrospective, Descriptive Study Of Patients At A Rural Community Hospital
- April 2014 to April 2016
- Consultations Requested By On-site Physicians
- Consults performed by:
  - Reviewing patient EMR
  - Performing Real-time
    - Audio-Visual History
    - Audio-Visual Examination
    - Auscultation

### METHODS CONTINUED

- The Examination Was Performed With The Help Of Either An RN Or LPN At The Bedside
- The Consultation And Follow-up Notes Were Typed Into The Hospital EMR
- Local Physicians Were Called As Needed To Discuss The Patient And Recommendations

### RESULTS

- A Total Of 1978 Visits
  - 427 Initial Consults
  - 1551 Follow Up Visits
- Patient Location
  - ICU - 154
  - PCU - 36
  - Floor Bed - 237
- 213 Females; 214 Males
- 25 To 99 Years Old
- Average LOS 6.8 Days
- Disposition:
  - 360 Home/Rehab,
  - 28 Transferred
  - 21 Hospice
  - 18 Deceased

### RESULTS – REASON FOR CONSULTATION

- Patients With ESRD – 186
  - 165 HD
  - 21 PD
- Patients Without ESRD – 241
  - AKI - 193
  - Overdose - 2
  - CKD - 26
  - Electrolyte Disorder - 20

### RESULTS DIALYSIS TREATMENTS

- ESRD Related – 475 Treatments
  - HD - 405 Treatments
  - PD - 70 Treatments
- AKI Related – 123 Treatments
  - 15 Patients (45 HD Treatments)
    - 12 Regained Renal Function
    - 1 Transfer to Hospice
  - 2 Discharged to Outpatient Dialysis
- AKI On CKD That Progressed To ESRD
  - 15 patients received 77 HD treatments
- Overdose: 1 patient - 1 HD - Recovered

### RESULTS DIALYSIS COMPLICATIONS

- No Access Issues
- 4 Patients Had Hypotension And Shortened HD
- 2 Patients Had Hypertension

### RESULTS – DISPOSITION

- Disposition For ESRD Patients (186)
  - 171 Home/Rehab
  - 7 Transferred
  - 5 Deceased
  - 3 Hospice
- Disposition For Non-ESRD (241)
  - 189 Home/Rehab
  - 21 Transfer
  - 18 Hospice
  - 13 Deceased

### CONCLUSION

- The Use Of Tele-Nephrology For The Co-management Of Patients With Renal Diagnoses At A Rural Community Hospital Is Both Feasible And Safe
- Tele-nephrology Included:
  - Initial Renal Consultations
  - Follow Up Visits
  - Hemodialysis
  - Peritoneal Dialysis .

## Outcomes of Using Telemedicine to provide Nephrology care in Rural Hospitals.

Janice P. Lea<sup>1</sup>, MD, Jason Cobb, MD, Tahsin Masud, MD, Jose Navarrete, MD, Jerome Tannenbaum, MD<sup>2</sup>

### Background

Telemedicine has recently permeated into the nephrology space allowing patients in rural hospitals without access to in-house nephrologists to receive nephrology care including dialysis, management of CKD, AKI, and electrolyte disorders.

### Methods

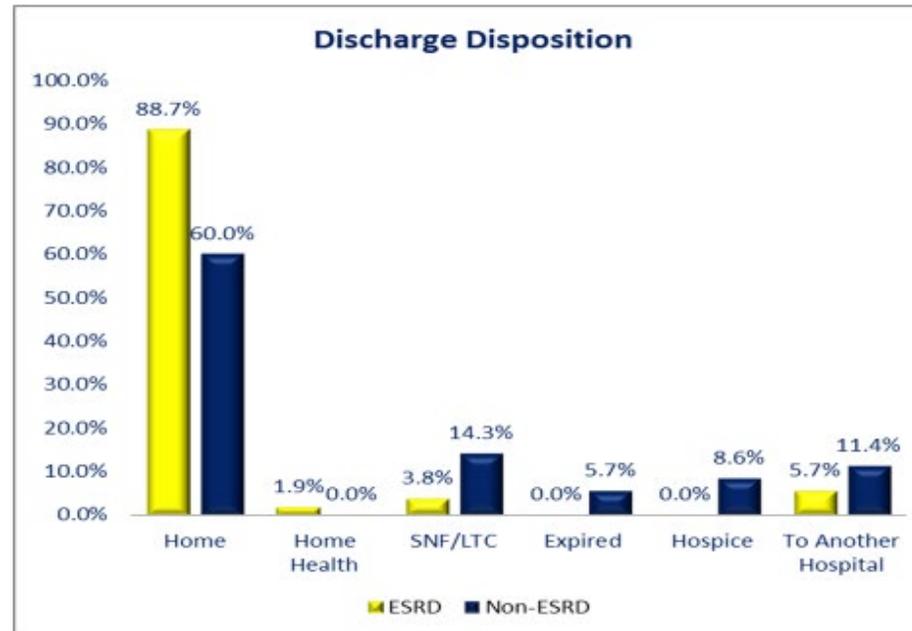
A retrospective, descriptive study of patients receiving tele-nephrology consults and chronic dialysis services between September 2017 and May 2019 in three South Georgia (GA) rural hospitals. Consults requested by on-site physicians and performed by Emory University Tele-nephrologists based in Atlanta, GA. We reviewed the patient's hospital electronic medical record (EMR) and performed a real-time history and physical exam with audio-video technology and Littman electronic stethoscope. Nephrologists documented treatment plan in the hospital's EMR including dialysis orders.

### Objective

To determine outcomes of patients in rural hospitals treated by Telenephrologists.

### Results

- ESRD- 76 pts, age-59, non-ESRD- 52 pts, age- 66
- non-ESRD- 25% AKI- 71% renal recovery, length of stay (LOS)- 7 days
- ESRD- 42%- CHF, length of stay (LOS) - 4 days
- 34% of overall renal consult patients (both ESRD and non-ESRD) were treated in the ICU with 8.3% requiring pressor support. .



### Summary

LOS was longer in the non-ESRD pts while AKI patients had high levels of renal recovery before discharge.

The majority of Hemodialysis patients were treated for CHF and were able to return home with only 6% transferred out.

### Conclusions & Implications

Both ESRD and non-ESRD patients in rural hospitals who received nephrology care via telemedicine were effectively managed in their local hospitals, had low mortality rates, and had similar LOS to larger healthcare systems. Telemedicine is an innovative and feasible option to provide specialty care in rural hospitals.

### Contact Information

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<sup>2</sup>Jerome S. Tannenbaum,  
MD, PhD, FACP  
[jst@sanderlingllc.com](mailto:jst@sanderlingllc.com)

# In-Patient Tele-Nephrology – 5 Year Experience

Type of Encounter	N=
Number of Hospitals	28
Initial Consults	4,361
Follow-Up Consults	22,808
In-Patient Dialysis	2,728
Average Length of Stay (Days)	6.22
% of Patients With ESRD on Admission	43%
% of Patients Without ESRD on Admission	45%
% of Patients With 'Other' Renal Issues	12%
% Mortality (In-Hospital) ESRD	2.7%
% Mortality (In-Hospital) AKI	5.3%

# Summary

- Telemedicine is now readily available and the technology is affordable
- Technology allows the providers to remain highly mobile
- Telemedicine is facilitated by the ubiquitous availability of high-speed Internet and electronic medical records in the U.S.
- Recent government actions allow reimbursement for telemedicine in almost any venue
- Patient satisfaction level is high
- Telemedicine reduces potential for spread of contagious diseases
- Clinical outcomes are equivalent to in-person interactions
- Tele-nephrology and e-Dialysis™ are tools that will allow highly-trained dialysis nurses and nephrologists to serve more patients in more locations

# Let Us Hear From You

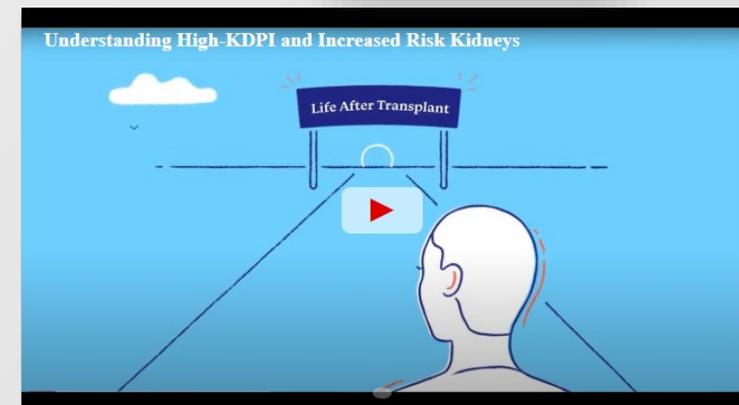
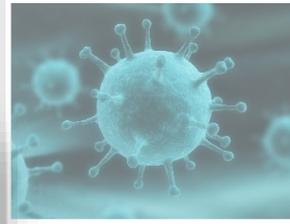
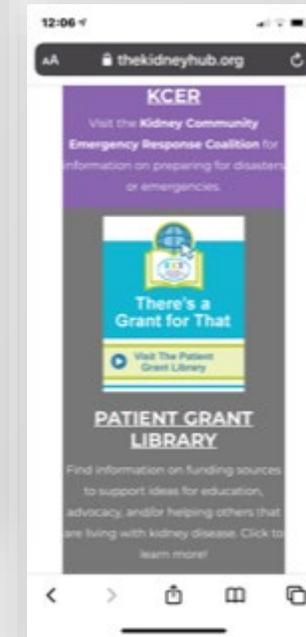
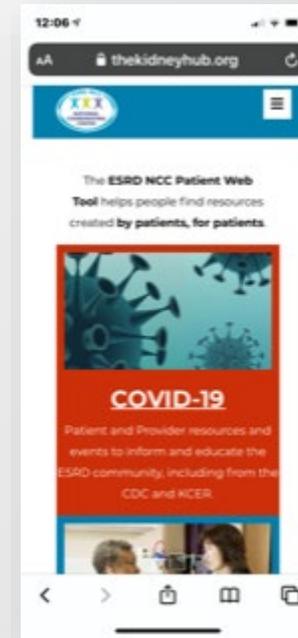
Q&As from chat and Q&A panels



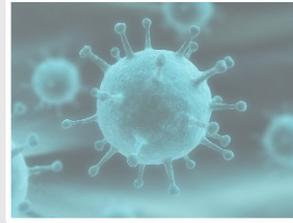
# TheKidneyHub.org

## Introducing TheKidneyHub.org.

- Secure, mobile-friendly web tool for patients and professionals.
- Developed by the ESRD NCC with assistance from patient subject matter experts.
- Links to important resources, such as:
  - COVID-19, infection prevention, transplant, home dialysis, and new ESRD patient education.
  - **New features include access to the Patient Grant Library, an informative Understanding High-KDPI and Increased Risk Kidneys video, and more.**
- Visit today and bookmark to your device's home screen.



# Our Next COVID-19 Webinar Events



- Save the dates for our next events.
  - Patient-focused event:  
September 8, 2020, at 4 p.m. ET
  - Provider-focused event:  
September 16, 2020, at 3 p.m. ET
- Visit [www.kidneyCOVIDinfocenter.com](http://www.kidneyCOVIDinfocenter.com) for information and to register.

**CORONAVIRUS COVID-19**

**COVID-19**

**“Quickinar” Events**

The ESRD NCC works with the Centers for Medicare & Medicaid Services (CMS) and other agencies to ensure the safety and continued treatment of dialysis patients and transplant recipients in the United States. Below is a list of resources to help you protect yourself from and stay informed of COVID-19.

**For Patients**

**For Healthcare Providers**

**COVID-19**

- For Healthcare Providers
- For Patients
- COVID-19 Quickinar Events
- Share the COVID-19 Quickinar Events On Your Site

# Thank You!

[NCCinfo@hsag.com](mailto:NCCinfo@hsag.com)

844.472.4250

813.865.3545

[www.esrdncc.org](http://www.esrdncc.org)

Additional COVID-19 resources for patients and providers:



<https://www.kcercoalition.com/en/covid-19/>



[www.kidneyCOVIDinfocenter.com](http://www.kidneyCOVIDinfocenter.com)

This material was prepared the End Stage Renal Disease National Coordinating Center (ESRD NCC) contractor, under contract with the Centers for Medicare & Medicaid Services (CMS), an agency of the U.S. Department of Health and Human Services. The contents presented do not necessarily reflect CMS policy nor imply endorsement by the U.S. Government. Publication Number FL-ESRD NCC-7N5TCO-08242020-02

