James P. Marcin, MD, MPH

Professor, Pediatric Critical Care, UC Davis Children's Hospital; Director, Center for Health and Technology

Dr. James Marcin practices in the Pediatric Intensive Care Unit at the UC Davis Children’s Hospital, directs of the Center for Health and Technology, and leads the telemedicine program. Dr. Marcin is particularly interested in how telemedicine consultations can help in the care of seriously ill pediatric patients in remote hospitals, emergency departments and inpatient wards.

Dr. James Marcin completed his pediatric critical care fellowship at the Children’s National Medical Center in Washington D.C. He also completed a masters degree in public health at the George Washington University. Dr. Marcin conducts research on a variety of public health issues in pediatric emergency and critical care medicine, including quality of care, severity of illness measures and telemedicine. His recent research has focused on how telemedicine can be used to address disparities in access to pediatric subspecialty care, improve the patient-centeredness of care, increase quality of care, and reduce overall healthcare costs. He currently is the director of the largest pediatric tele-emergency network in the country.
Telemedicine – Telehealth

- Digital Health – Virtual Health - eHealth
- Healthcare over distance using telecommunications technology

1. Live interactive
2. Store-and-forward
3. Remote patient monitoring
4. Direct To Consumer - DTP
Regionalization improves efficiency and quality

Telemedicine allows our expertise to be everywhere
Overriding Principles...

- Telehealth is not about the technology
- Telehealth is about the workflows and operations
- Telehealth is a care delivery model
  - The medicine is the same
- The appropriate comparator is the alternative
  - In-person visit versus no care
- You can do a physical exam – and much more
- There are circumstances that in-person is necessary
- The long-term strategy should not be sacrificed
Advantages of Telehealth

- Access
  - Distance barriers
  - Provider shortages; lack of specialists

- Experience
  - Patient centered; more convenient for consumers

- Quality – Effectiveness
  - Improvements in quality (access, education, synergy)

- Value – Costs of Care
  - Potential reduction in health care costs
The Center for Health and Technology

- Founded in 1998: Dr. Tom Nesbitt & Jana Katz-Bell
- Mission: Dedicated to creating, researching, implementing and teaching new models of care using technology-enabled clinical services
## UC Davis Virtual Health Services and Products

<table>
<thead>
<tr>
<th>Service Type</th>
<th>Services</th>
</tr>
</thead>
</table>
| **Outpatient Specialty Telehealth** | - 30 UC Davis specialties  

| **Inpatient Specialty Telehealth (external)** | - 10 UC Davis Specialties  
| **Inpatient Telehealth (internal)** | - Interpreting  
| **MyChart Video Visits (scheduled)** | - Epic-integrated  
| **eConsults** | - External Partners  
| **Acute Care Video Visits (urgent - same-day)** | - Patient self-service  
| **Remote Patient Management** | - Patient-generated data  
| **Telehealth Research/QI/ Education** | - 14+ research grants  

### Key Features

- **Clinician-to-clinician/pt**
- **Clinic-to-clinic**
- **Across organizations**
- **On-the-fly consults**
- **Tele-stroke**
- **Multi-party encounters**
- **Tele-interpreting**
- **Family Link**
- **Team care (e.g. rounds)**
- **Video encounters with providers**
- **Direct to consumer**
- **Asynchronous physician consultations**
- **Internal and external**
- **On-demand video encounters**
- **Self-triage & scheduling**
- **T1 diabetes**
- **Heart failure**
- **COPD**
- **COVID**
- **Chronic disease**
- **Transitions of care**
- **COVID**
- **Cost-effectiveness**
- **ECHO**
UCDH Telehealth Matrix Structure
Proof of concept innovation happens in CHT and DHRC:
- Digital Health Resource Center (DHRC) emphasis is validation of devices and integration with EHR
- CHT focuses on new workflows and clinical use cases using existing infrastructure
Participant Survey

Who/What was the greatest driver of telehealth at your health system?

A. Chief Executive Officer (CEO)
B. Chief Information Officer (CIO)
C. Chief Medical Information Officer (CMO/CMIO)
D. Chief Innovation Officer (CINO)
E. Corona Virus Disease (COVID)
Impact of COVID-19 on Telehealth at UC Davis

- From ~50 to >700 physicians participating in VV
- Implementation of same-day VV
- Tele-interpreting integrated
- Implementation of internal inpatient telehealth
- Use of telehealth to continue research
- EHR, IT, Operations, Education
- Part of “normal” operations
Six UC Health Sites (UCR, UCI, UCLA, UCSF, UCSD, UCD)

UC Health
Daily Ambulatory Patient Visits
2/3/2020 - 5/24/2020

This data includes all 6 UC Health sites (UCSF, UCD, UCSD, UCLA, UCI, and UCR)
Six UC Health Sites (UCR, UCI, UCLA, UCSF, UCSD, UCD)

UC Health
Weekly Ambulatory Patient Visits
2/3/2020 - 5/24/2020

<table>
<thead>
<tr>
<th>Date</th>
<th>Telehealth Visits</th>
<th>Face-to-Face Visits</th>
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<tbody>
<tr>
<td>8-Feb</td>
<td>2,036</td>
<td>180,737</td>
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<tr>
<td>15-Feb</td>
<td>2,130</td>
<td>181,826</td>
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<tr>
<td>22-Feb</td>
<td>1,393</td>
<td>144,616</td>
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<tr>
<td>29-Feb</td>
<td>2,214</td>
<td>183,887</td>
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<tr>
<td>7-Mar</td>
<td>2,312</td>
<td>176,925</td>
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<tr>
<td>14-Mar</td>
<td>4,638</td>
<td>146,525</td>
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<tr>
<td>21-Mar</td>
<td>25,186</td>
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<tr>
<td>28-Mar</td>
<td>42,399</td>
<td>44,122</td>
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<td>4-Apr</td>
<td>45,537</td>
<td>41,517</td>
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<td>11-Apr</td>
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<td>25-Apr</td>
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<td>2-May</td>
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<td>53,292</td>
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<td>9-May</td>
<td>51,538</td>
<td>65,498</td>
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<tr>
<td>16-May</td>
<td>49,305</td>
<td>75,207</td>
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<tr>
<td>23-May</td>
<td>40,114</td>
<td>65,188</td>
</tr>
</tbody>
</table>
Six UC Health Sites (UCR, UCI, UCLA, UCSF, UCSD, UCD)

UC Health Ambulatory Patient Visits
2/2/2020 - 4/4/2020

3/19: Statewide Shelter in Place
March 2020 – Telehealth Claims: 7.5% of all claims

Top Five Procedure Codes by Utilization, 2019 vs. 2020

Mar. 2019

- 99441: Physician telephone patient service, 5-10 minutes of medical discussion
- 98950: Education and training for patient self-management, each 10 minutes
- 99213: Established patient office or other outpatient visit, typically 15 minutes
- 99291: New patient office or other outpatient visit, typically 10 minutes
- 99444*: Physician or healthcare professional evaluation and management of patient care by internet (email) related to visit within previous 7 days

Mar. 2020

- 99213: Established patient office or other outpatient visit, typically 15 minutes
- 99214: Established patient office or other outpatient visit, typically 30 minutes
- 90837: Psychotherapy, 60 minutes
- 90834: Psychotherapy, 45 minutes
- 99441: Physician telephone patient service, 5-10 minutes of medical discussion

Top Five Diagnoses, 2019 vs. 2020

Mar. 2019

- Mental Health Conditions: 43.56%
- Acute Respiratory Diseases and Infections: 18.38%
- Urinary Tract Infections: 3.93%
- Eye Infections and Injuries: 2.66%
- Skin Infections and Injuries: 2.50%

Mar. 2020

- Mental Health Conditions: 33.91%
- Acute Respiratory Diseases and Infections: 8.12%
- Urinary Tract Infections: 4.93%
- Eye Infections and Injuries: 3.22%
- Skin Infections and Injuries: 2.94%

Volume of Claim Lines, 2019 vs. 2020

Percent Change (2019-2020): 4346.94%

Urban vs. Rural Usage, 2019 vs. 2020

Urban: 0.18% in Mar. 2019, 4.73% in Mar. 2020
Rural: 0.10% in Mar. 2019, 7.88% in Mar. 2020

* Code deleted at the end of 2019.
Source: FH NRPC® database of more than 31 billion privately billed medical and dental claims records from more than 60 contributors nationwide. Copyright 2020, FAIR Health, Inc. All rights reserved. CPT © 2019 American Medical Association (AMA). All rights reserved.
Use of Telehealth by Community Health Centers

Services Provided at Health Centers via Telehealth

- Primary Care
- Oral
- Substance Abuse
- Mental Health
- Dermatology
- Chronic conditions
- Disaster Mgmt
- Health Education
- Other

% of Health Centers that provided service

Telehealth Technologies Used by Health Centers

- Real-time
- Store and Forward Telehealth
- Remote Patient Monitoring
- Mobile Health

% of Health Centers that use technology

Rural | Urban | Total
Changes in Federal Policies COVID-19

- Expanding the list of eligible providers and eligible services
- Lifting of Originating Site Restrictions (including home)
- Lifting of Distant Site Restrictions (including home)
- Lifting of Technology Requirements
  - Waiving of HIPAA enforcement
  - Telephone allowed and reimbursed
- Lifting of Cost-Sharing Requirements (reduce or waive co-pays)
- Licensing & Credentialing: Still within states’ jurisdiction
- California telehealth support (https://covid19.ca.gov/telehealth/)
- Center for Connected Health Policy (https://www.cchpca.org)
Chronic Disease Management - Remote Patient Monitoring

- 25% of population = 75% of costs
- Patients with special healthcare needs
  - CA, COPD, CHF, DM, Asthma
VA Care Management Process

- 45% of veterans living in rural areas
- 2019: 20% of vets used telehealth >1 million patients;
- ~3 million visits VA Video Connect App
- N=150,000 RPM patients in 2016
- 31% reduction hospital admissions
Remote Patient Monitoring

• COVID-19+ patients (pre/post admission)
• Streaming continuous vitals
• Overlay of symptoms
Telemedicine Research

- IDEA Randomized Trial
  - Adults with BMI between 25 - 40, addition of a wearable technology to a standard behavioral intervention association with weight loss
  - N=471 patients all received
    - Low calorie diet
    - Prescribed increases in physical activity
    - Group counseling sessions
  - Randomized at 6 months
    - Self-monitoring of diet and physical activity using a website
    - Self-monitoring of diet and physical activity using a website + fitbit
  - Weight change at 24 months:
    - Control group: mean weight loss = 5.9 kg [95% CI, 5.0-6.8]
    - Intervention group: mean weight loss = 3.5 kg [95% CI, 2.6-4.5]
Telemedicine Research

- **BEAT HF Randomized Trial**
  - 1,437 patients hospitalized with CHF randomized to:
    - Usual care: Health coaching telephone calls
    - Intervention: Health coaching telephone calls + telemonitoring
      - Daily BP, HR, symptoms, weight
  - No difference in 180 day readmissions: 49.2% vs 50.8%
  - No difference in 30 day readmission or 180 day mortality
Video Visits
Telemedicine: Research

- Implementing Direct to Consumer Care Access
  - 12% of DTC telehealth visits replaced visits
  - 88% represented new utilization
  - Net annual spending on ARI increased $45/telehealth user

- Direct to Consumer – adherence to guidelines for pediatric URI
  - 4,604 DTC; 38,408 urgent care; 485,201 PCP visits matched
  - Antibiotic prescribing
    - 52% of DTC visits  42% urgent care visits  31% PCP visits
  - Guideline-concordant antibiotic management
    - 59% of DTC visits  67% urgent care visits  78% PCP visits
Telemedicine: Research

- Tele-ICU: Generally favorable, but mixed results

- Mayo Clinic: 6 ICUs, Rochester, MN
  - Implementation of tele-ICU was associated with
  - Increase in interhospital transfers to Mayo
  - No difference in LOS or mortality
Quality Metrics Aligned with NQF Measure Framework

Creating a Framework to Support Measure Development for Telehealth

FINAL REPORT
AUGUST 31, 2017

TABLE 2. DOMAINS AND SUBDOMAINS OF THE TELEHEALTH MEASUREMENT FRAMEWORK

<table>
<thead>
<tr>
<th>Domain</th>
<th>Subdomain(s)</th>
</tr>
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<tbody>
<tr>
<td>Access to Care</td>
<td>• Access for patient, family, and/or caregiver</td>
</tr>
<tr>
<td></td>
<td>• Access for care team</td>
</tr>
<tr>
<td></td>
<td>• Access to information</td>
</tr>
<tr>
<td>Financial Impact/Cost</td>
<td>• Financial impact to patient, family,</td>
</tr>
<tr>
<td></td>
<td>• Financial impact to care team</td>
</tr>
<tr>
<td></td>
<td>• Financial impact to health system or payer</td>
</tr>
<tr>
<td></td>
<td>• Financial impact to society</td>
</tr>
<tr>
<td>Experience</td>
<td>• Patient, family, and/or caregiver experience</td>
</tr>
<tr>
<td></td>
<td>• Care team member experience</td>
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<tr>
<td></td>
<td>• Community experience</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>• System effectiveness</td>
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<tr>
<td></td>
<td>• Clinical effectiveness</td>
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<tr>
<td></td>
<td>• Operational effectiveness</td>
</tr>
<tr>
<td></td>
<td>• Technical effectiveness</td>
</tr>
</tbody>
</table>
Barriers to Adoption

- Traditional: Reimbursement, Licensure, etc.

- Operations:
  - Busy clinicians
  - Skepticism and fear of change
  - Lack of dedicated project management
  - Patient engagement and support
  - Technology and software problems
  - Partnerships - integration with health system
  - Funding of operations and long-term strategic plan
Figure 2.
Clinical Transformation in Technology™ Framework: The 5 Ls

**LOGISTICS**
Legally and technically prepare the clinical environment for the adoption, implementation or expansion of a health technology/telehealth innovation.

**LANDSCAPING**
Gain deeper understanding and knowledge about the current clinical environment and state of affairs, including how the proposed health technology/telehealth solution will address or impact workflow and clinical or process gaps.

**LOOPING**
Collate and assemble all of the findings, learnings and feedback from prior phases, and use this as the foundation for the development of a customized plan.

**LAUNCHING**
Kick off the initiative with the end users and other staff, leading training efforts that familiarize them with the health technology/telehealth solution, reflecting adult learning and change management needs.

**LEVERAGING**
Leverage all of the learnings from previous phases to better understand the impact of the health technology/telehealth solution on clinical, performance, patient, clinician/staff and user experiences.

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Patient Centered
Efficient
Safe
Responsive
Effective
Equitable
Right Care Initiative
Telehealth & COVID-19 Pandemic

James Marcin, MD, MPH
Professor, Pediatric Critical Care
Director Center for Health and Technology
June 8, 2020