Overview

- Introduction to Jefferson Health System
- History of telemedicine
- Telemedicine Program within Jefferson Health System
- Outline telehealth opportunities in cancer care
- Discuss unique telehealth practice factors
- Delineate potential future directions for developments in telehealth.

Sidney Kimmel Cancer Center
Jefferson Health® | NCI – designated

Until every cancer is cured

Andrew E. Chapman DO, FACP

Adam Binder MD

Ana Maria Lopez MD, MPH, MACP

We Improve Lives.

BEST HOSPITALS
U.S.News & WORLD REPORT
NATIONAL
RANKED IN 10 SPECIALTIES
2018-19

Thomas Jefferson University Hospital is ranked among the Top 5 in the nation in Ophthalmology and Orthopedics.

Nationally Ranked Specialties

OPHTHALMOLOGY
Wills Eye Hospital

ORTHOPEDICS
Rothman Institute at Jefferson

The Philadelphia Hand to Shoulder Center
at Jefferson

CANCER
Sidney Kimmel Cancer Center – Jefferson Health

CARDIOLOGY & HEART SURGERY

EAR, NOSE AND THROAT

GASTROENTEROLOGY & GI SURGERY

GERIATRICS

NEPHROLOGY

NEUROLOGY & NEUROSURGERY
Vickie and Jack Farber Institute for Neuroscience –
Jefferson Health

UROLOGY

Jefferson Health®

14 Hospitals

- Abington Hospital*
- Abington – Lansdale Hospital**
- Jefferson Bucks Hospital
- Jefferson Cherry Hill Hospital*
- Jefferson Frankford Hospital
- Jefferson Hospital
  for Neuroscience*
  – *Vickie and Jack Farber Institute*
    for Neuroscience
- Jefferson Methodist Hospital*
- Jefferson Stratford Hospital*

- Jefferson Torresdale Hospital
- Jefferson Washington
  Township Hospital*
- Magee Rehabilitation Hospital
- Physicians Care Surgical Hospital
- Rothman Orthopaedic
  Specialty Hospital
- Thomas Jefferson
  University Hospital*
  – *Sidney Kimmel Cancer Center*
    (NCI-designated)

* Magnet® designation from the American Nurses Credentialing Center for nursing excellence

** Pathway to Excellence® designation from the American Nurses Credentialing Center for sustaining a
positive practice environment

6,100 physicians/practitioners

7,400 nurses
(full/part time)

40+ outpatient and urgent care locations

Over **4.5 million**
patient interactions annually

Academic Areas of Interest

Architecture   Business   Design   Engineering   Fashion & Textiles   Health   Science   Social Science

Campuses

- Center City
- East Falls
- Abington-Dixon
- Bucks County
- Delaware County at Pennsylvania Institute of Technology
- New Jersey

International Study Locations & Research Centers

Latin America   Ireland   Israel

Italy   India   Japan

10 Colleges + 3 Schools

- College of Architecture and the Built Environment
- College of Biomedical Sciences
- College of Health Professions
- College of Humanities and Sciences
- College of Life Sciences
- College of Nursing
- College of Population Health
- College of Pharmacy
- College of Rehabilitation Sciences

- Kanbar College of Design, Engineering and Commerce
  - *School of Business*
  - *School of Design and Engineering*
- Sidney Kimmel Medical College
- School of Continuing and Professional Studies

Honors

- Philadelphia University Honors Institute

160+ Graduate & Undergraduate programs

63,000 Alumni

7,400 Students (full/part time)

over **$136 million** in public/private research funding.

17 NCAA Division II Teams

1,000 patents for new drugs, software innovations, medical devices and diagnostic tools

Nationally ranked in emergency management, fashion, graphic design, interior design, occupational therapy, physician assistant, primary care, research and strategic leadership.
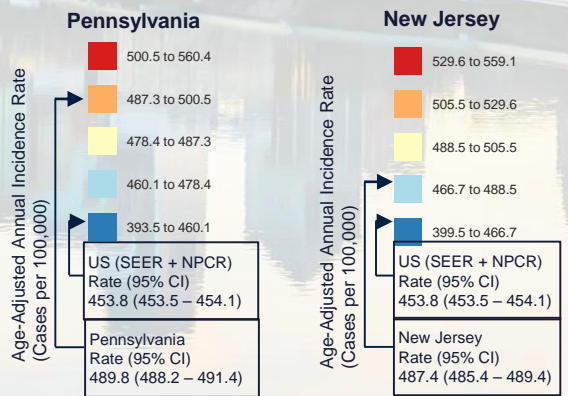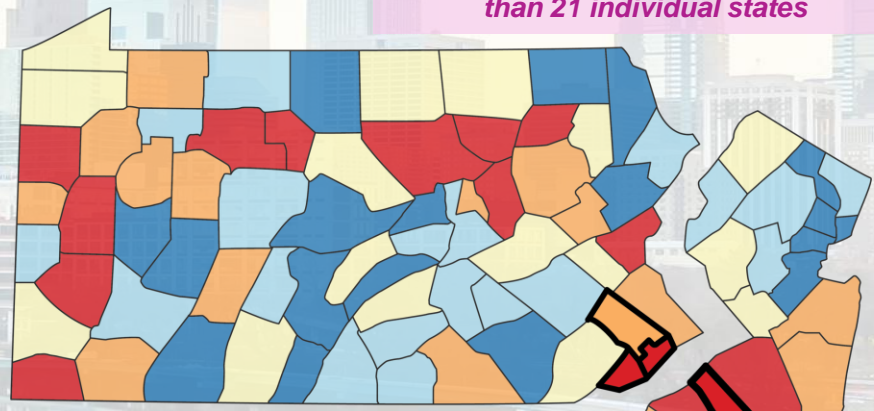

Defining the Primary Catchment Area

Primary Catchment

- Greater Philadelphia region
- 1 hour drive from integral academic site (TJUH)
- Majority patient base
- 4 counties

* Catchment area population greater than 21 individual states

County	FY16 Volume	FY 2016%
Philadelphia County	**63,155**	**43.6%**
Montgomery County	**19,205**	**13.3%**
Camden County	**9,444**	**6.5%**
Delaware County	**8,262**	**5.7%**
Bucks County	6,872	4.7%
Burlington County	6,689	4.6%
Gloucester County	5,626	3.9%
Atlantic County	4,936	3.4%
Chester County	4,034	2.8%
Cape May County	2,713	1.9%
New Castle County	2,583	1.8%
Ocean County	2,563	1.8%
Mercer County	1,856	1.3%
Cumberland County	1,769	1.2%
Berks County	1,567	1.1%
Monmouth County	674	0.5%
Salem County	669	0.5%
Lehigh County	479	0.3%
Northampton County	395	0.3%
Lancaster County	220	0.2%
Middlesex County	220	0.2%
Somerset County	204	0.1%
Kent County	202	0.1%
Cecil County	180	0.1%
Hunterdon County	175	0.1%
Warren County	84	0.1%

Pennsylvania

Age-Adjusted Annual Incidence Rate (Cases per 100,000)

- 500.5 to 560.4
- 487.3 to 500.5
- 478.4 to 487.3
- 460.1 to 478.4
- 393.5 to 460.1

US (SEER + NPCR) Rate (95% CI)
453.8 (453.5 – 454.1)

Pennsylvania Rate (95% CI)
489.8 (488.2 – 491.4)

New Jersey

Age-Adjusted Annual Incidence Rate (Cases per 100,000)

- 529.6 to 559.1
- 505.5 to 529.6
- 488.5 to 505.5
- 466.7 to 488.5
- 399.5 to 466.7

US (SEER + NPCR) Rate (95% CI)
453.8 (453.5 – 454.1)

New Jersey Rate (95% CI)
487.4 (485.4 – 489.4)

	SKCC Employees	SKCC Physicians	Private Practice
Center City region	633	81	0
South Jersey region	70	14	12
Northern region	113	21	32
Northeast region	50	8	15
Total	866	124	59

SKCC at a glance:

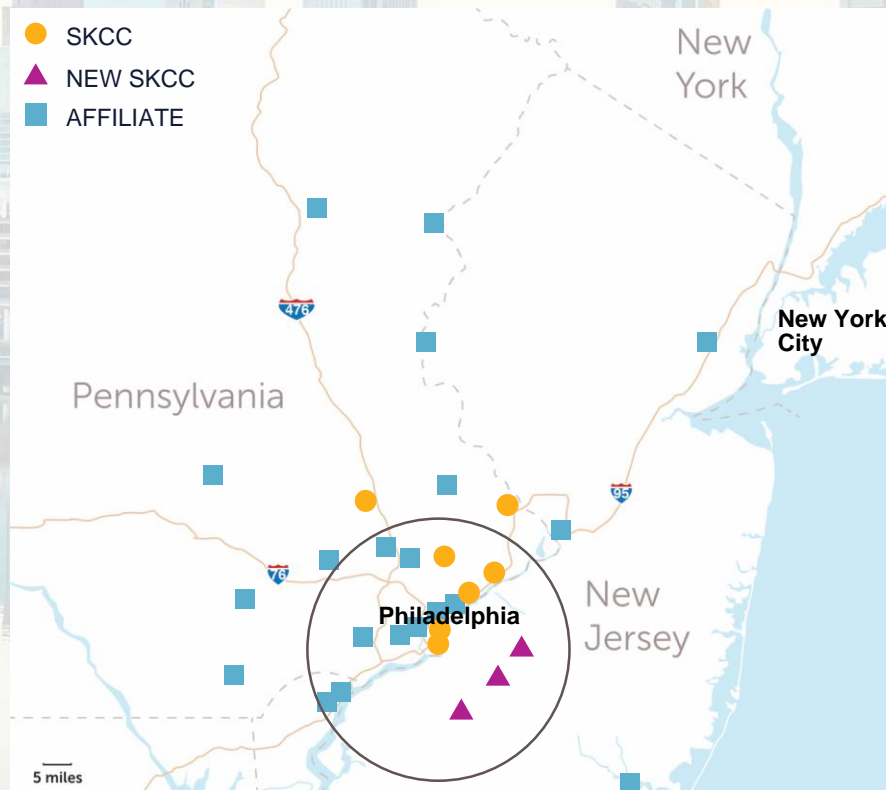Clinical Portfolio: SKCC as an enterprise sees approximately 8,900 new index cases annually.

- Center City region - ~ 4,800 new cancer patients with ~19% on interventional clinical trial

- Northern region - ~ 2,300 cancer patients

- Northeast - ~ 1,100 cancer patients

- South Jersey - ~ 700 cancer patients

1 HOUR DRIVE

Lansdale Hospital
Aria-JH Bucks County
Einstein Medical Center
Abington Hospital
Fox Chase Cancer Center
Aria-JH Torresdale
Einstein Medical Center
Aria-JH Frankford
Einstein Medical Center
Thomas Jefferson University
Methodist Hospital
Philadelphia
Jefferson Cherry Hill
Jefferson Stratford
Jefferson Washington Township

PA

NJ

Legend:
- TJU
- ★ TJU with infusion services
- ▲ New TJU
- ■ FYI

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Community Outreach and Engagement

Affiliate Network

SKCC Network Partners currently accruing to SKCC trials	# Cases	Current # Interventional Trials Active
Brandywine	188	0
Delta Medix	n/a	0
Doylestown	757	0
Easton	367	0
Einstein Phila	1163	9
Holy Redeemer	635	0
Jennersville	100	0
Nemours	n/a	0
Nazha	n/a	2
Phoenixville	276	0
Reading	1669	2
St. Francis	198	1
Suburban	202	8
Trinitas	542	5
Wills Eye	n/a	0
Mercy (3 sites of care)	692	16
Pocono	563	21
Kennedy	1253	6
Riddle	n/a	0
Hem & Onc Assoc of NE PA	n/a	31
Hudson Valley	n/a	6
NE Rad Onc Ctr	n/a	23
Sparta	n/a	28
Total	8605	158

Telemedicine

The Institute of Medicine defines telemedicine as "the use of electronic information and communications technologies to provide and support health care when distance separates the participants."

History – Telemedicine is not a new phenomenon

- 1906: Dutch Willem Einthoven developed an electrocardiograph that using a string galvanometer and telephone wires was able to transmit and EKG from 1.5km away.

- 1920's: Norwegian physicians provided medical advice to sick ship crew members at sea via a radio link.

- 1967: Dr. Kenneth Bird established a clinic at Mass General Hospital to treat patients at Logan International Airport through an audio-visual microwave circuit.

- 1970's: Term Telemedicine coined. Literally means "healing at a distance."

Am J Public Health. 1974 February; 64(2): 113-119
Arch Dis Child. 2006 Dec; 91(12): 956-959.

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History Cont.

- 1990s-2000s: Broadband internet and telecommunications infrastructure expands throughout the world connecting remote areas to large medical centers.
  - Video Conferencing between physicians discussing difficult cases (i.e. ECHO model from University of New Mexico).
  - Tele-Stroke model (real time interactive video/monitoring).
  - Tele-ICU model (physician monitoring data from distant site in real time).
  - Teledermatology (store and forward of images).
  - E-Consultation through EMR or third party platform (VA hospital; San Francisco General).

Arora et al. N Engl J Med 2011; 364:2199-2207.
Silva et al. Stroke. 2012; 43:00-00.
Warshaw E, et al. Teledermatology for Diagnosis and Management of Skin Conditions: A Systematic Review of the Evidence [Internet]. Washington (DC): Department of Veterans Affairs (US); 2010 Jan.

Telemedicine

- Telemedicine is about how to optimize use of technology into daily work flows and operations.

- Telemedicine is a care delivery model.

- The medicine is the same.
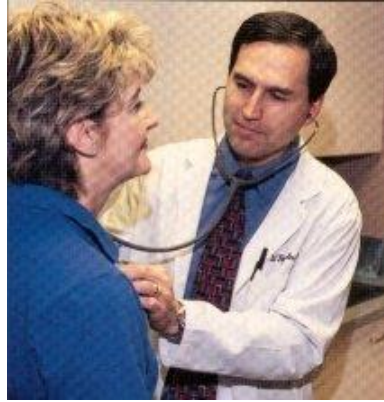
Medical Consultation

Teleconsultations
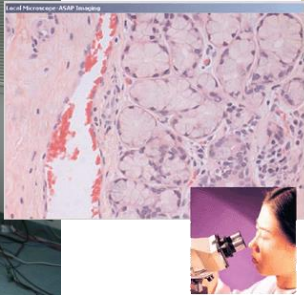
Telemedicine

- You can do a physical exam.

- You might actually get different information than in an office visit.
  - It is about actionable information.

Virtual physical exam
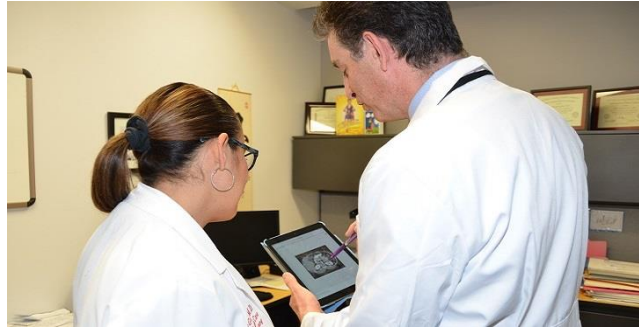
JeffConnect – Scope of Telemedicine at Thomas Jefferson University
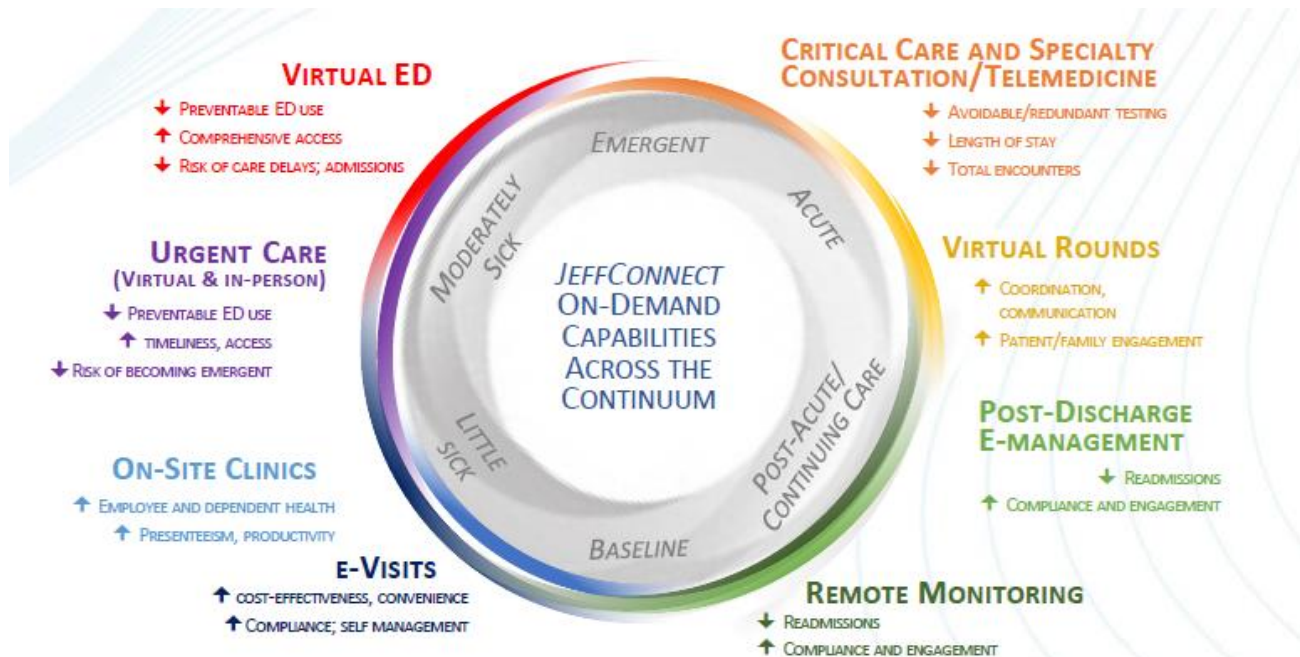
Metrics Now Aligned with NQF Measure Framework

Creating a Framework to Support Measure Development for Telehealth

FINAL REPORT
AUGUST 31, 2017

NATIONAL QUALITY FORUM

TABLE 2. DOMAINS AND SUBDOMAINS OF THE TELEHEALTH MEASUREMENT FRAMEWORK

Domain	Subdomain(s)
Access to Care	• Access for patient, family, and/or caregiver • Access for care team • Access to information
Financial Impact/Cost	• Financial impact to patient, family, and/or caregiver • Financial impact to care team • Financial impact to health system or payer • Financial impact to society
Experience	• Patient, family, and/or caregiver experience • Care team member experience • Community experience
Effectiveness	• System effectiveness • Clinical effectiveness • Operational effectiveness • Technical effectiveness

JeffConnect Programs

- Health professional training
  - Mandatory and optional modules
- Telehealth facilitator program
  - Nonprovider support staff
- Pre-health professionals
  - PACU Ambassador & Virtual Rounds
  - Fellowship program

- Undergraduate (medical student) elective
- Graduate medical education (resident) elective
- Fellowship program
- Continuous Medical Education
 - Physical examination skills, simulation
- Institute for Digital Health

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Best Practices - Telemedicine training

- Essential, multi-step process
- Overview didactics program
- Hands-on training
- On-site – reference number
- Single point of contact
- Intermittent updates
- Checklist

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On-Demand (Direct to Consumer) Care

- Access To Care (24/7/365 Jefferson providers)
  - 40% of visits new patients
  - 83% would have sought care elsewhere

- Financial Impact/Cost
  - Savings of approx $100 per encounter

- Experience
  - Net Promoter Score > 70
  - Time saved over one hour = 87%
  - *Already* recommended JeffConnect = 81%

- Effectiveness
  - Antibiotic stewardship for sinusitis equal or better than ED/UC
  - Health complaint addressed as hoped the overwhelming majority of the time
  - Most received no further care
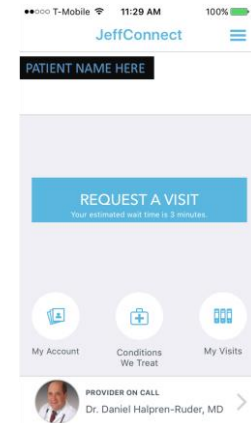
Scheduled Appointments (including Post Discharge)

- Access To Care
  - Over 1000 providers trained
    - \> 400 providers regularly engaged

- Experience
  - Net promoter score = 59
  - 85% reported time savings > 1 hour
  - 86% said they were better able to receive care when/where needed
  - *Already* recommended JeffConnect = 43%

- Effectiveness
  - Same level of care as inperson visit = 83%

Telehealth Growth at Jefferson

Telehealth Volume

Legend: ■ Total JNN ■ Total JeffConnect

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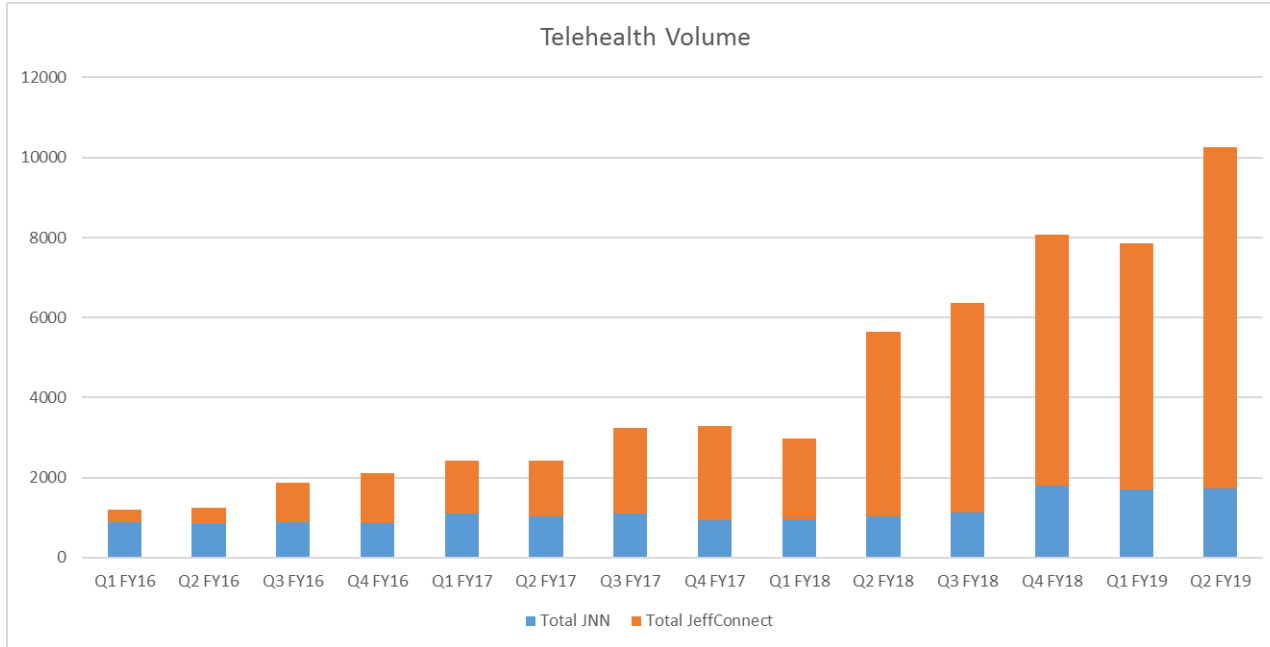
Tele-oncology

Tele-Oncology

- Definitions
- Outline telehealth opportunities in cancer care
- Discuss unique telehealth practice factors
- Delineate potential future directions for developments in telehealth.

What is telemedicine?

- Telemedicine utilizes telecommunications technology as a tool to deliver health care to populations with limited access to care

Telemedicine approaches

- Synchronous:
  - Videoconference, fully interactive
  - Real-time
  - Specific attachments for the exam
  - Schedule: teleconsultant, telepresenter, pt
- Asynchronous
  - Store-forward
  - Review of clinical data at an alternate time
  - Schedule: teleconsultant
- Combination

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What Makes a Good Teleconsultation?

- Understand the goal of the consultation
  - Increase access to specialty care
  - Confirm diagnosis
  - Assist in triage
- Assure complete data and diagnostic images
- Build in quality review

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Teleoncology

Use of telehealth technology in cancer care.

- Multidisciplinary in nature:
  - Prevention, early detection, diagnostic consultation, surgical oncology, medical oncology, radiation oncology evaluation, clinical trial education and evaluation, supportive care and follow-up, palliation, tumor board and chart review models of care.

Why telemedicine? Why telehealth? Why tele-onc?

- Space Technology Applied to Rural Papago Advanced Health Care (STARPAHC)

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Populations that benefit from tele-oncology

- Remote:
  - Rural
  - Frontier
  - Incarcerated
- Difficult access
  - Urban

Is telemedicine as effective as in-person care?

- Overall, studies demonstrate equivalency
    - HIPAA compliant technology
- Some studies show improved outcomes
- Fairly uniform high level of patient and clinician satisfaction
- How can we best use tele-applications in oncology care?

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Rationale for tele-oncology

- Virtually redistribute oncology workforce to meet healthcare needs:
  - Shortage of oncologists
  - Maldistribution of health care
  - Greying of the population
  - Direct to "consumer" care
- Provide care when needed
- Consider: diagnostic question dictates technology use
  - Transmission of images/sounds
  - Where the "talk is the treatment"
  - The right technology for the diagnostic question

Tele-genetics, Tele-survivorship, Tele-behavioral health

Bundling of tele-oncology services

- Oncology care is multidisciplinary
- Evaluate:
  - Rash, Supportive care (nutrition, physical activity, support group), Pain, Medication review, Hospice care
  - Technology to fit the diagnostic question
- Bundled services: may include in-person
  - Tele-radiology
  - Tele-pathology
  - Tele-oncology
    - Tele-nursing: patient education
    - Tele-navigation
    - Tele-symptom management

Digital Mammography

Teleradiology
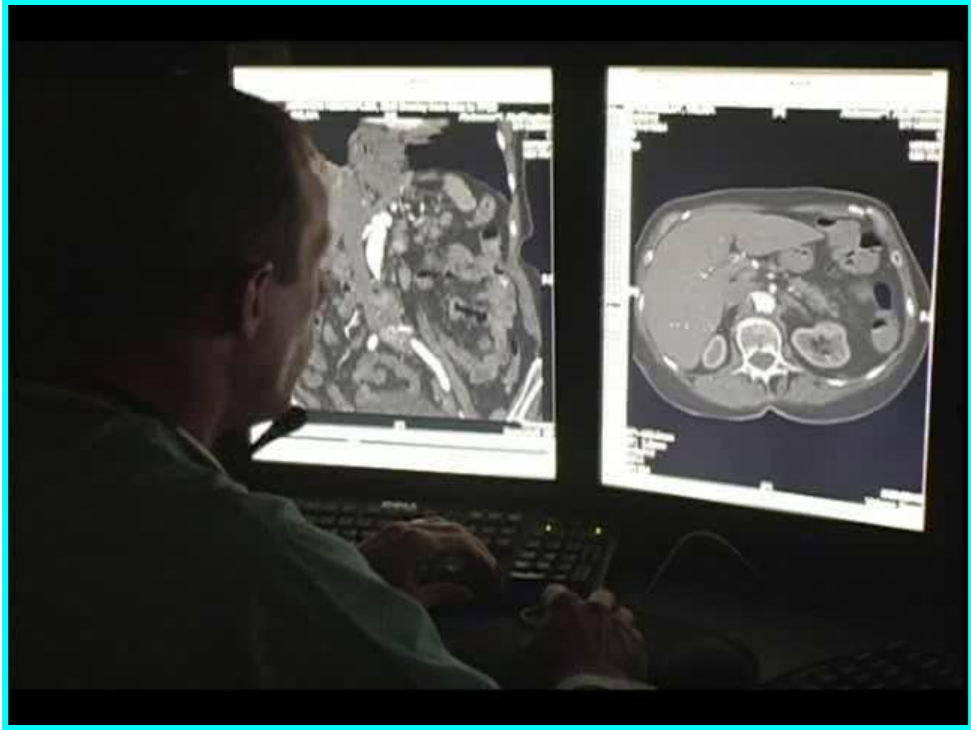
Telepathology

- Common area of need
- Barriers:
  - Inability to review all the tissue
  - Length of fixation
  - Cumbersome nature of robotic microscopy
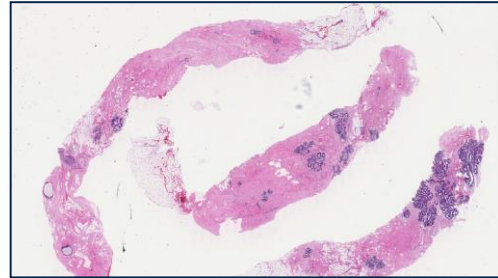
Virtual Slide

Digital Scanning

"array microscope"

- 80 tiny lens systems
- staggered rows
- transparent disc
- size of a quarter: 1" diameter
- 24-megapixel camera
  - most digital cameras: 3-5 megapixels

Scans a tissue sample and produces a precise diagnostic image with a resolution of up to 54,000 dots per inch: 700x that of a picture made on a home printer

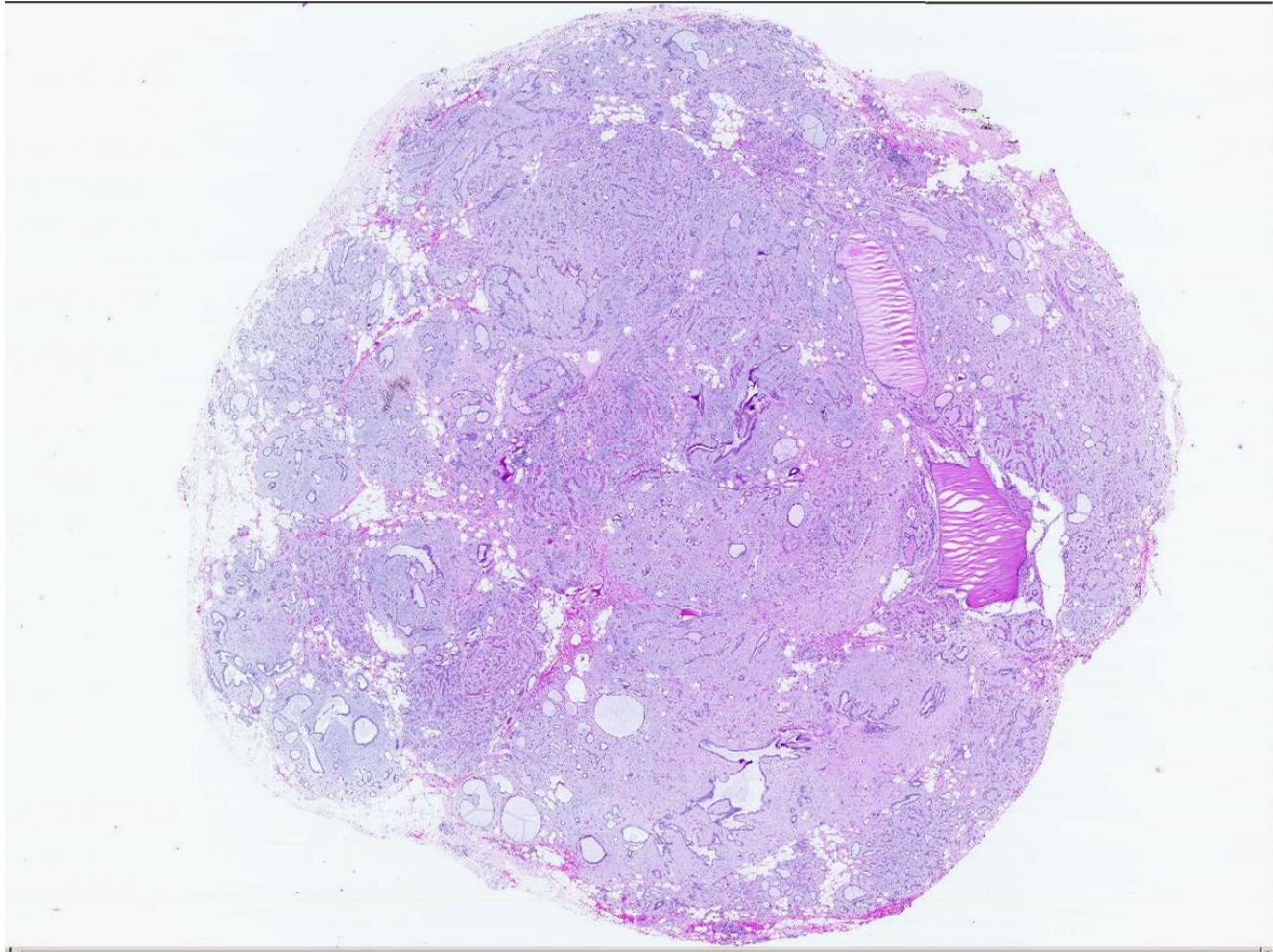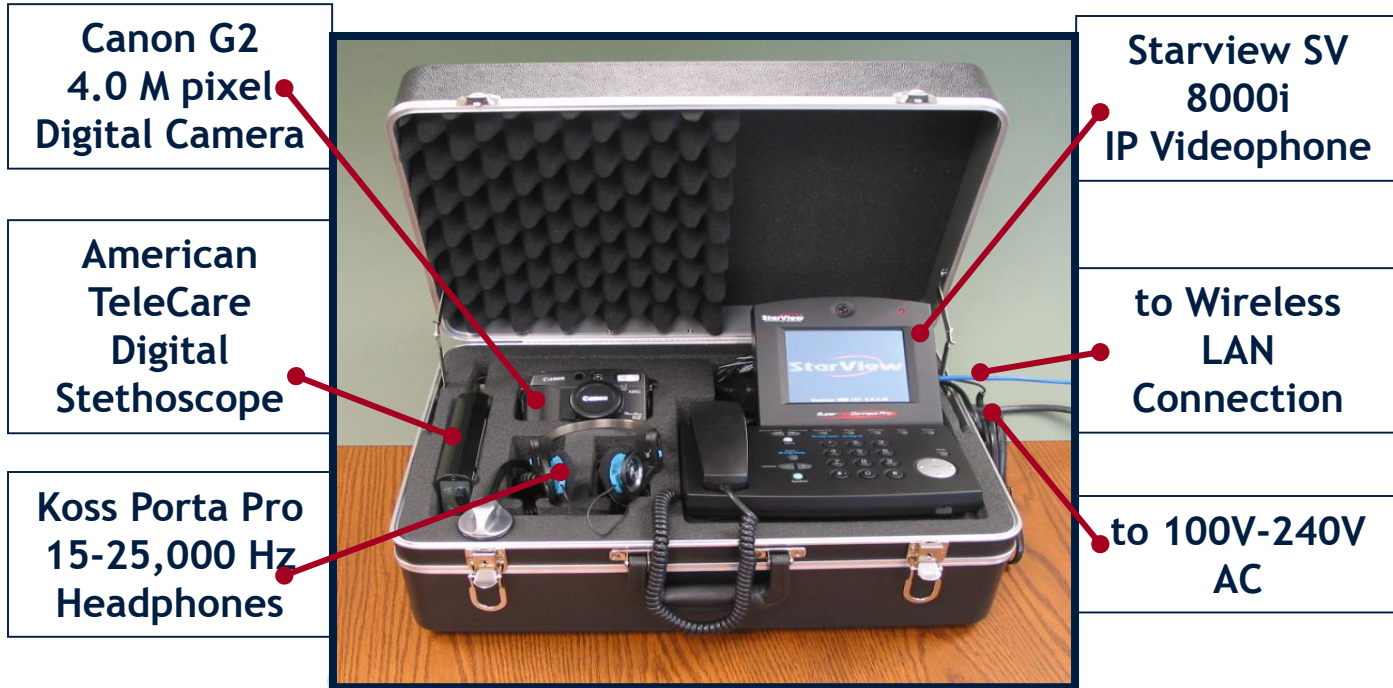Process takes less than a minute.

Field of view

Scanning simulation
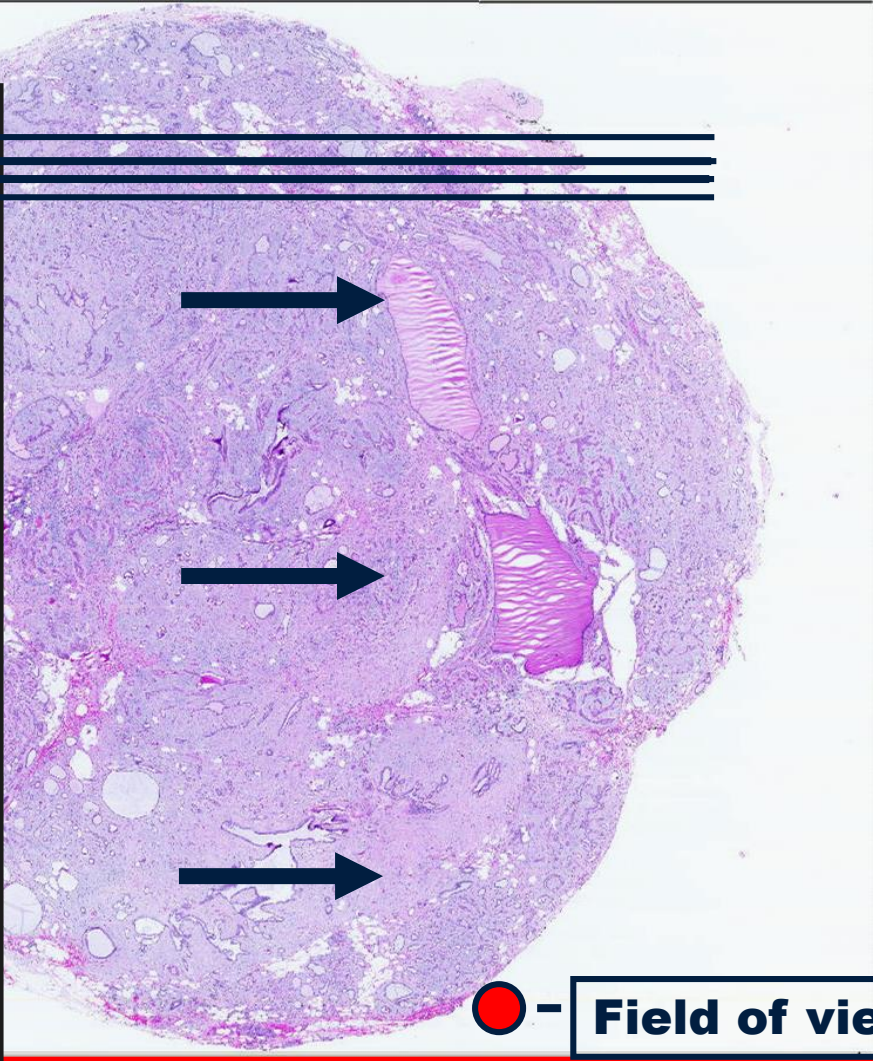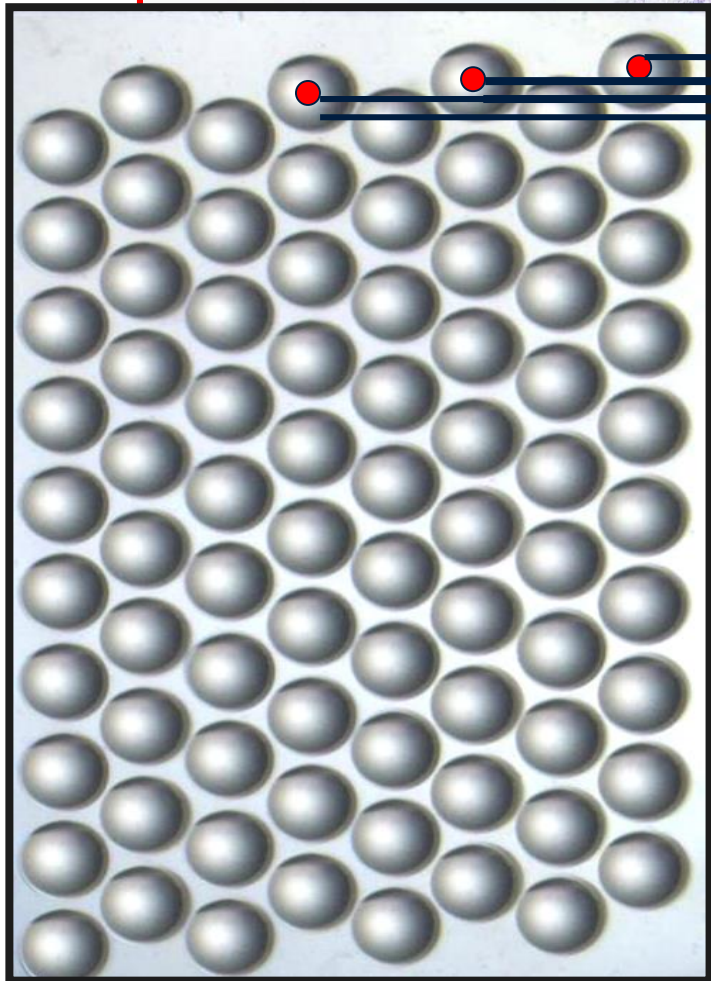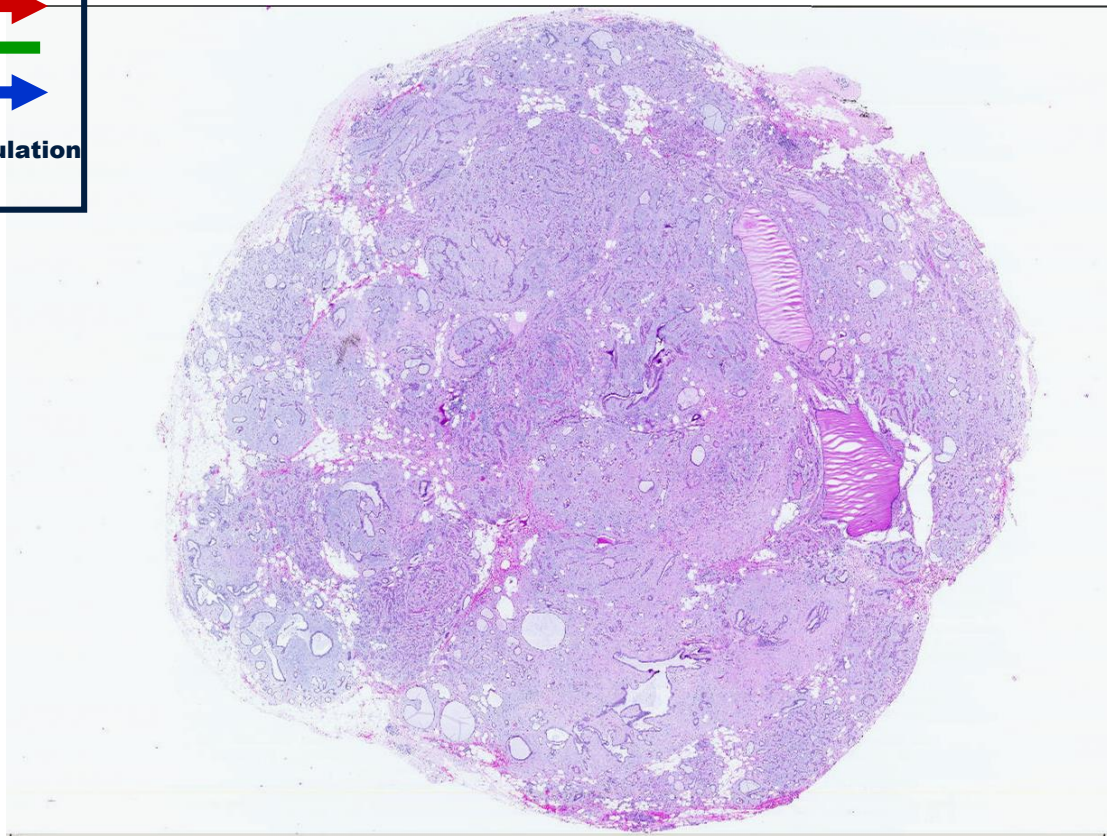
Virtual Slide Image Acquisition

Raster scanning
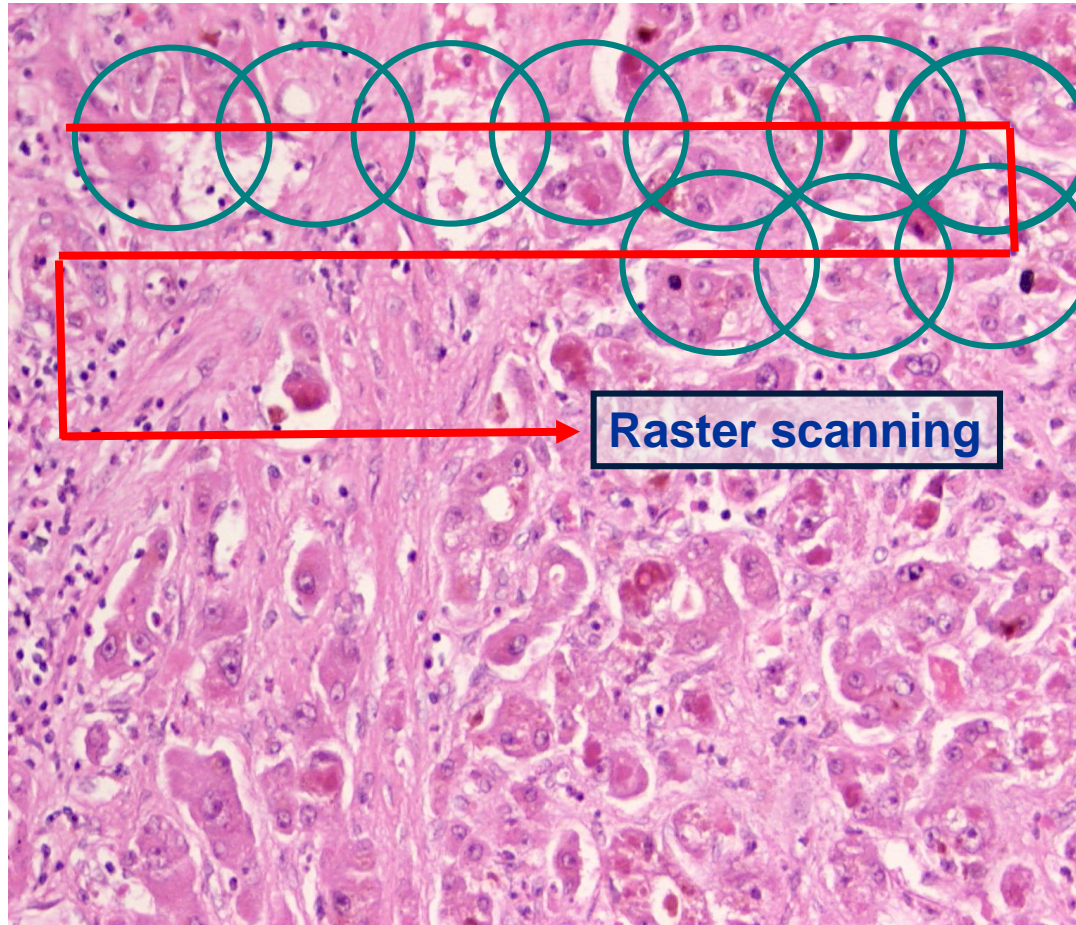
The *Virtual* House Call

Portable Telemedicine System

Canon G2
4.0 M pixel
Digital Camera

American TeleCare Digital Stethoscope

Koss Porta Pro
15-25,000 Hz
Headphones

Starview SV
8000i
IP Videophone

to Wireless LAN Connection

to 100V-240V AC

Home Health Care Applications

- Wound care
- Post-operative care
- Pre-organ transplantation
- Physical therapy

- Tele-geriatrics
- Tele-palliative care

Facilitate access to cancer clinical trials

- Eligibility assessment
- Consent
- Follow-up
  - Symptom assessment

Newest Health Care Tool

Symptom Monitoring

Limitations

Virtual Reality Palpation
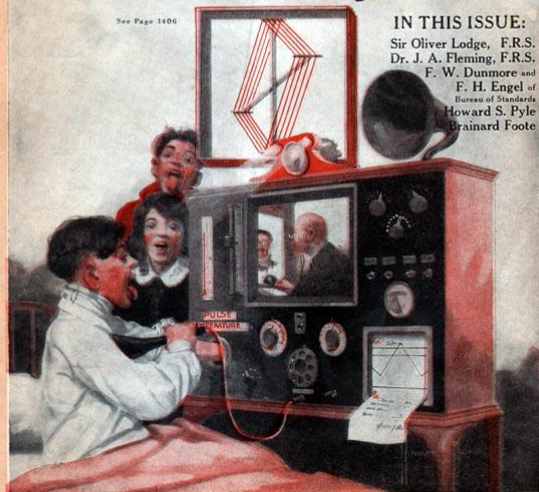
National survey of telemedicine uptake (ACP)

- Random sample of internal medicine specialists and subspecialists

- 51% have access to a telehealth technology

- Most common use: connect with another physician

- Nearly 20% have access to video technology
  - Of which nearly 20% use the system regularly

Jefferson Tele-Oncology Engagement

- Breast: 14
- Head and neck/Lung: 28
- GI: 22
- GU: 3
- GYN: 5
- Skin: 2

- Malignant heme: 90
- Geri: 5
- Genetics: 2
- Palliative: 56
- Tele-nursing: 7
- Tele-social work: 1

Jefferson Tele-Oncology Engagement

E-PRO Application Pilot
71 Patients Approached
43 Eligible
21 Registered

Post Discharge Video Visits
56 Post Discharge Video Visits
22 Visits resulted in Medication Reconciliation/Education
13 Visits resulted in Symptom Management

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Patient reported outcomes study (NIMHHD)

- Reporting vital signs from a distance
- Reporting of symptoms from a distance
- Tele-oncology nursing contact when initiated by
  - Patient symptom prompt
- Tele-oncology contact initiated by nursing
- Feasibility, clinical/cost efficacy

Future work

- Use of telehealth technology to support
  - Transitions of care
    - Prevent hospitalization
    - Support patient at home for:
      - Symptom management/Palliation
    - Provide the right care at the right time to the right patient *always*

Telehealth payer rules vary by state

- Medicaid and private insurance coverage for telehealth
- Medicaid coverage for telehealth
- Private insurance coverage for telehealth
- No required coverage for telehealth
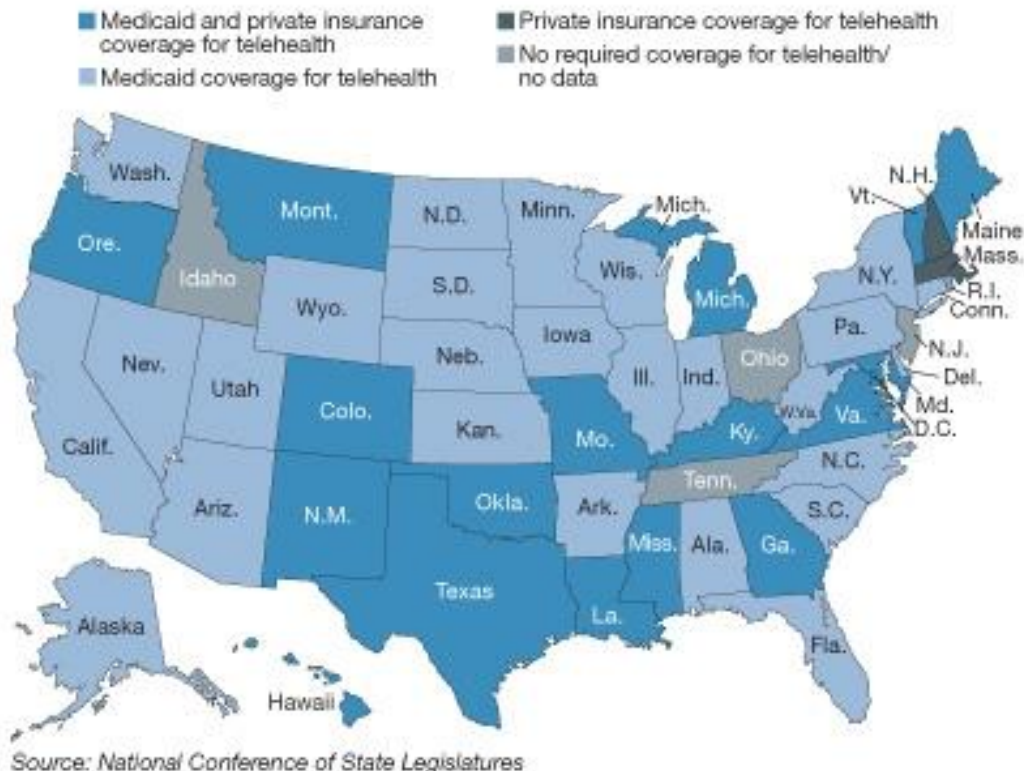- May not apply to all health care services

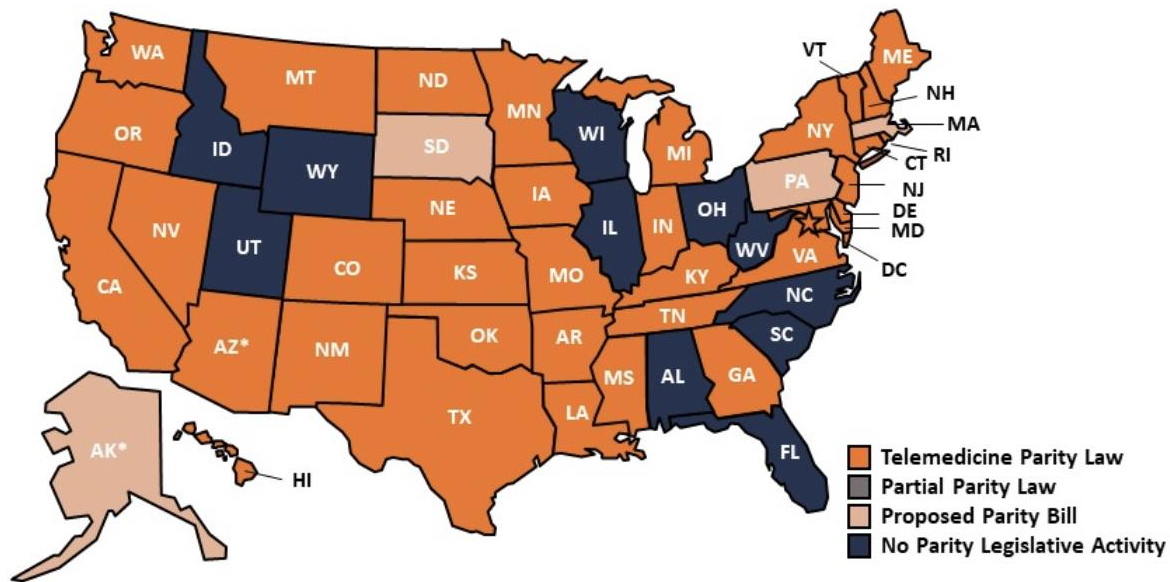American Telemedicine Association: State Policy Resource Center
http://www.americantelemed.org/policy-page/state-policy-resource-center

Payer rules on telehealth vary by state

- Medicaid and private insurance coverage for telehealth
- Medicaid coverage for telehealth
- Private insurance coverage for telehealth
- No required coverage for telehealth/ no data

Source: National Conference of State Legislatures

http://cqrcengage.com/aacu/file/LumAGoog2s7/Telehealth-map.jpg

States with Parity Laws for Private Insurance Coverage of Telemedicine (2018)

States with the year of enactment: Alaska (2016)*, Arizona (2013)*, Arkansas (2015), California (1996), Colorado (2001), Connecticut (2015), Delaware (2015), Georgia (2006), Hawaii (1999), Indiana (2015), **Iowa (2018)**, Kentucky (2000), Louisiana (1995), Maine (2009), Maryland (2012), Michigan (2012), Minnesota (2015), Mississippi (2013), Missouri (2013), Montana (2013), **Nebraska (2017)**, Nevada (2015), New Hampshire (2009), **New Jersey (2017)**, New Mexico (2013), New York (2014), **North Dakota (2017)**, Oklahoma (1997), Oregon (2009), Rhode Island (2016), Tennessee (2014), Texas (1997), Vermont (2012), Virginia (2010), Washington (2015) and the District of Columbia (2013)

States with proposed legislation: In 2018, Alaska, Massachusetts, Pennsylvania, and South Dakota

*Coverage applies to certain health services.

AMERICAN TELEMEDICINE ASSOCIATION

http://legacy.americantelemed.org/policy-page/state-policy-resource-center

And so you want to do tele-health...

Find Your TRC

NATIONAL **POLICY** CENTER   NATIONAL **TECHNOLOGY** CENTER

https://www.telehealthresourcecenter.org/   https://nrtrc.org

Acknowledgements:

Arizona Telemedicine Program

https://telemedicine.arizona.edu/

Huntsman Cancer Institute

University of Utah Health Sciences

https://healthcare.utah.edu/huntsmancancerinstitute/

Thank You to...

- The participants
- The collaborators/partner sites
- The funders:
  - Better Than Ever
  - Health Resources and Service Administration
  - Arizona Biomedical Research Commission
  - National Cancer Institute
  - National Institute of Minority Health and Health Disparities

We will now take questions for our presenters. Please use the question box on the lower right to submit a question. Questions will be answered as time permits.

Thank you for joining this Association of American Cancer Institutes Physician Clinical Leadership Webinar. Information about this and other webinars can be found on our website at www.aaci-cancer.org.