MASS GENERAL BRIGHAM

VIRTUAL CARE
VISION AND STRATEGY

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ON BEHALF OF THE ENTIRE VIRTUAL CARE TEAM AND OUR DH COLLEAGUES

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DISCLOSURES

Presenter Disclosure Information:

- Scientific consultant for trial design and conduct to
    - Penumbra (data and safety monitoring committee, MIND trial)
    - Medtronic (Stroke AF trials)
    - Genentech (steering committee, TIMELESS trial)
- Scientific consultant for usability and strategic product development
    - LifeImage (a teleradiology company)
- Continuing medical education symposium organizer or lecturer
    - (Medtronic, Boehringer Ingelheim)
- Stroke Systems Consultant, MA Dept of Public Health
- Chair, AHA Stroke Systems of Care for GWTG-Stroke and Target Stroke; Member AHA Board of Directors as Chair of the American Stroke Association Advisory Committee; Member, Joint Commission Expert Panel on Stroke Center Certification; Former Chair, Quality Oversight and Hospital Accreditation Science Committees;

INTRODUCTION: THE STATE OF VIRTUAL CARE PRE-COVID

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7198549/pdf/41746_2020_Article_279.pdf

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OBJECTIVES

- Understand the set of modern virtual care tools

- Delineate the 4 stages of planned evolution of Virtual Care needed after the massive expansion due to COVID to create a stable suite of reliable, accessible and well-supported platforms
  - **Surge-Proof** (harden the solutions for subsequent waves of COVID)
  - **Solidify** (align the solutions with ambulatory operations and recovery)
  - **Integrate** (weave the solutions into the fabric of daily medical care)
  - **Amplify** (support the long-term system strategy to project our expertise)

- Learn about common challenges and rethink the virtual care patient journey

- Reflect on how the IHS is ideally poised to capitalize on the virtual care innovations developed during COVID

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FOUNDATIONAL PRINCIPLES FOR VIRTUAL CARE

1. Virtual Care Mission: "For every patient, enabling access to reliable healthcare whenever, wherever and however it is needed"

2. Virtual Care is a suite of programs in the Digital Health portfolio alongside PeC. It seeks to add value at the interface of medicine and technology for the greatest number of patients and providers by translating the needs of patient care participants into tools that support the delivery of that care

3. The Virtual Care model as deployed for COVID will continue to evolve, leveraging an enterprise approach with intense site and system collaboration. It will use an Epic-first approach and existing Digital Health governance and support structures wherever possible, with alternative pathways as needed

4. To maximize value (=quality/cost), Virtual Care will seek to standardize wherever possible across the enterprise, and seek input dynamically through multiple channels while remaining grounded in the established Digital Health clinical consensus process

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EPIC-INTEGRATED VIRTUAL CARE OFFERINGS

eVISITS

USE CASE + CAPABILITIES

What are eVisits?

Patient-initiated eVisits allow a patient to fill out our questionnaire and follow up with their provider via MyChart/Partners Patient Gateway

BENEFITS
- Minimizes staff and patient exposure
- Allows for asynchronous interaction between patients and providers for routine or COVID-19-related minor issues
- Reduces provider time required to address simple requests/complaints

CHALLENGES / CONSIDERATIONS
- Sites/providers need to determine triage and response workflows for eVisits as well as acceptable conditions for eVisit requests
- "Provider-initiated" eVisits need to be addressed and clinical content vetted broadly

IMPLEMENTATION
- Questionnaire review/vetting by clinical committees
- Provider training materials & tip sheets
- Provider and patient communication as needed

SUPPORT
- Provider technical support
- Patient support

TECHNOLOGY
Cadence | MyChart | Partners Patient Gateway

Summary: Patients and providers (often advanced practice providers) communicate with each other via Partners Patient Gateway. Providers utilize the appropriate Epic applications for additional information.

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eCONSULTS

USE CASE + CAPABILITIES

What are eConsults?

Provider-initiated eConsults allow a provider to request within Epic a simple consultation question from a specialist and avoid unnecessary outpatient specialty visits and cost

BENEFITS
- Avoid unnecessary visits to specialists when the question can be answered simply between providers
- Asynchronous nature increases provider productivity and reduces burden on providers

CHALLENGES / CONSIDERATIONS
- If too complex, eConsults become additive rather than substituting for formal consultation
- Works best when specialists have long wait times and high rates of followup visits
- Sites/providers will need to determine triage workflow for incoming eConsults
- Reimbursement needed to scale requires workflow changes d/t new regulations, consent

IMPLEMENTATION
- Program review/vetting
- Provider training materials & tip sheet
- Ordering provider (PCP) training as needed
- Provider and patient communication as needed

SUPPORT
- Providers: technical support
- Patients: support via Patient Portal

### TECHNOLOGY
Cadence | MyChart | Partners Patient Gateway

Summary: Referring and Specialty providers communicate with each other via Partners Patient Gateway to avoid a formal consultation visit. Providers utilize the appropriate Epic applications for additional information.

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VIRTUAL VISITS

What are Virtual Visits?

Using their personal smartphone or computer, patients can conduct scheduled virtual video appointments with a Partners provider in a secure and private connection
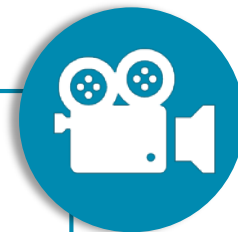
BENEFITS
- Minimizes staff and patient exposure
- Preserves PPE, supports social distancing
- Enables access to needed medical care
- Prioritizes in-person care for those who require it (e.g., procedures/infusions, new patients)

CHALLENGES / CONSIDERATIONS
- Epic-integrated Zoom solution addresses all relevant security, privacy and identity issues
- Requires Epic access via MyChart/PPG (*Patients*) or Hyperspace via computer, smartphone or tablet (*Providers*) and a camera-enabled device
- Standalone solutions requires additional configuration to ensure privacy & secure experience but permit visits prior to MyChart enrollment or for groups of patients

IMPLEMENTATION
- Epic-integrated Zoom & standalone Zoom solutions rolled out via Partners Digital Health team and local sites
- Clinical prioritization and phased rollout of providers and patients onto Epic integrated platform
- Group visits require new standalone workflows

SUPPORT
- Site level support for providers and practices
- Central support for all providers via Tip Sheets
- Live phone support for patients and providers during go live
- Self-guided training documents & videos

TECHNOLOGY
Epic-integrated Zoom Health platform | Standalone Zoom platform | Compatible devices

Summary: Providers schedule and conduct virtual video visits with patients via selected platform. Providers are transitioning to the Epic Integrated virtual visits model to improve security and user experience as we phase out standalone technology solutions over the next few months. Documentation in Epic Telemedicine encounters.

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COVID-19 AS A DRIVING FORCE OF INNOVATION

VIRTUAL CARE SOLUTIONS FROM A DOMAIN PERSEPCTIVE
(PRE-COVID | COVID)

INPATIENT PROVIDER CARE DELIVERY

MACHINE-DRIVEN CARE DELIVERY*

AMBULATORY PROVIDER CARE DELIVERY

- Video Intercom Communication System (VICS)
- Virtual Rounds
- Virtual Consults
- Limited Virtual Consults
  - ID
  - ICU
  - Multi-Spec (SNF)
- PatientConnect
- Inpatient Remote Patient Monitoring (iRPM)

- Robotic Process Automation (HealthBots)
  - IVR via Hotline
  - Patient RPA
  - Occ Health RPA

- Machine Learning/AI
  - Image/Signal Processing
  - Decision-Support
  - Predictive analytics

- Virtual Visits
  - Group Sessions
  - Video vs. Phone
- Ambulatory Remote Patient Monitoring (aRPM)
  - PGHD program with DCT
  - Care Companion (Epic)
- eConsults
- eVisits
- Virtual Urgent Care
 - PHOD for Allways Health
  - PHOD for all PHS patients

* In close collaboration with CCDS, DHI, CIDH, MGB COVID Innovation +++

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VIRTUAL CARE ENCOUNTERS FROM A PARTICIPANT PERSPECTIVE

Virtual Care takes 4 forms: Providers connecting with each other, Provider connecting to Patients,
Patients connecting to friends/family/others, and Machines connecting to Providers or Patients

PROVIDER-TO-PROVIDER

Virtual Consults,
Virtual Rounds
eConsults

PROVIDER-TO-PATIENTS
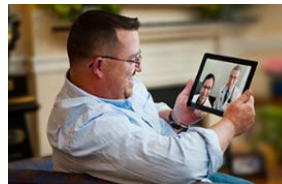
Virtual Visits, Video
Intercom System, Virtual
Urgent Care, Remote
Monitoring, eVisits

PATIENTS-TO-OTHERS

Patient Connect
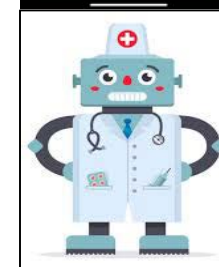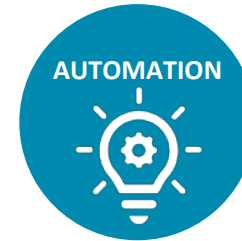
AUTOMATION

Robotic Process
Automation and
ML/AI processes

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VIRTUAL CARE COVID-RELATED SOLUTIONS TOOLKIT

Partners Healthcare has taken a virtual-first approach, expanding our existing portfolio of highly effective solutions and re-tooling solutions across both **INPATIENT AND AMBULATORY** settings
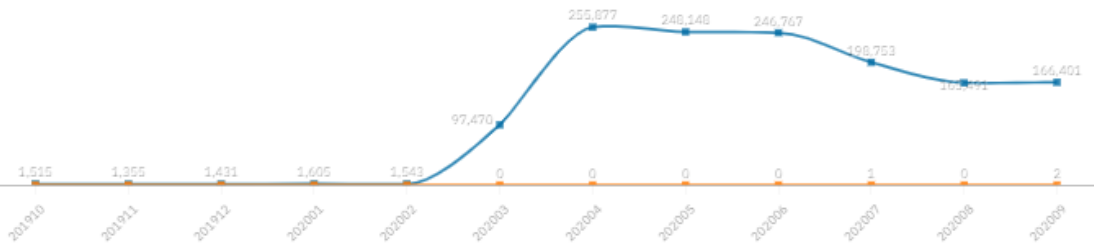
PROVIDER-TO-PROVIDER

PROVIDER-TO-PATIENTS

4 Priority Virtual Care Areas

PATIENTS-TO-OTHERS

AUTOMATION

1 VIRTUAL CONSULTS | *Synchronous (video/phone) and asynchronous (secure messaging/eConsults) for rapid access to expertise on demand*
VIRTUAL ROUNDS | *Collaboration software to de-crowd providers on medical rounds to avoid contagion*

2 VIRTUAL VISITS | *Synchronous video interactions to enable remote care for patients needing access*
VIDEO INTERCOM SYSTEM| *To humanize care while reducing exposure and PPE use through in-room video*
VIRTUAL URGENT CARE | *Video-enabled urgent care visits for mild symptoms of COVID or other conditions*
INPATIENT REMOTE MONITORING | *Monitoring of trends in physiologic data to predict and prevent ~~ATIENT CONNECT~~ (in development)*

3 PATIENT CONNECT | *secure video chat on demand for patients with friends, family, medical interpreters and team members (in scaling phase)*

4 ROBOTIC PROCESS AUTOMATION | *Optimizing COVID-19 screening and triage processes via conversational AI, HealthBots, phone, text messages, IVR & online tools*

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VIRTUAL VISITS MASSIVE EXPANSION: 0.2% TO 62% IN 6 WEEKS OVER 1.38 MILLION VIRTUAL VISITS IN FY20

YTD Completed Virtual Visits

1,386,356

Date of Query: Nov 1, 2020
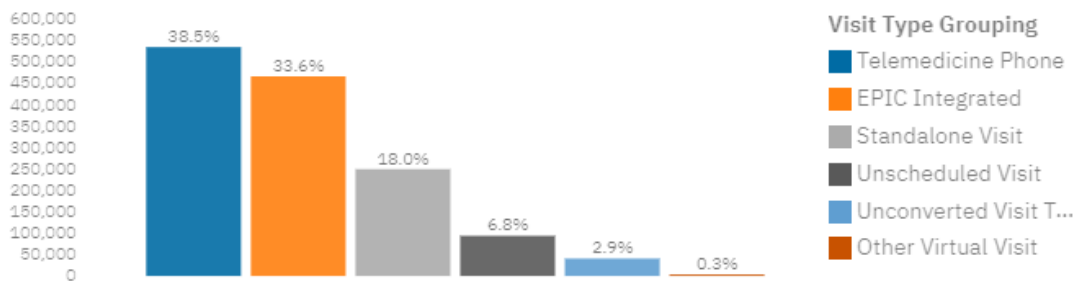W: 78.6%, B/H: 8%, A: 3.6%
7.7% were with LEP patients

Monthly Appointment Trend

255,877 248,148 246,767 198,753 165,491 166,401 97,470

1,515 1,355 1,431 1,605 1,543 0 0 0 0 1 0 2

201910 201911 201912 202001 202002 202003 202004 202005 202006 202007 202008 202009

Measures
- Completed (Sum)
- Scheduled (Sum)

Virtual Visits as a % of Total

255,877 246,767 198,753 165,491
97,470
55.0% 40.9% 29.0% 24.3% 22.3%
18.1%
1,515 1,431 1,543

201910 201911 201912 202001 202002 202003 202004 202005 202006 202007 202008 202009

- Completed/Scheduled Virtual Visits (Calculated)
- VV as % of Total (Calculated)
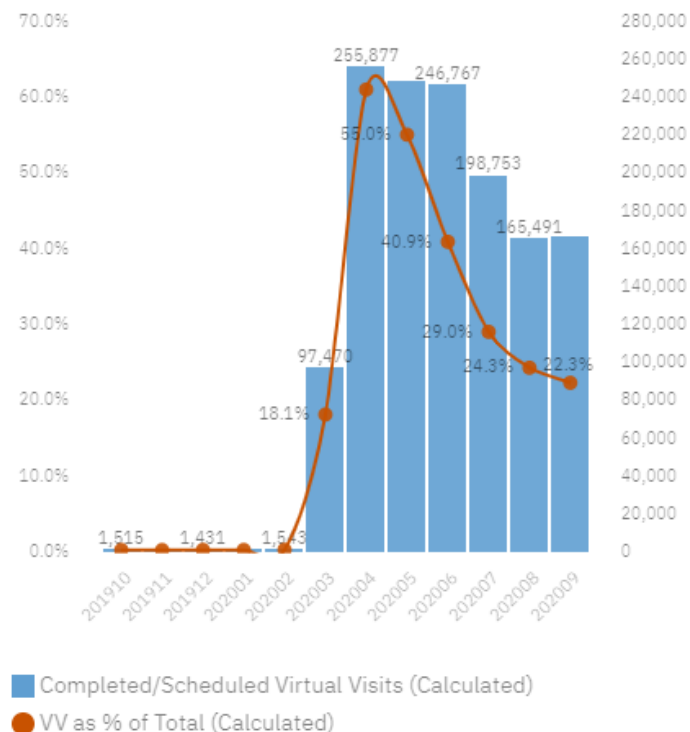
Monthly Appointment Trend by Visit Type

38.5% 33.6% 18.0% 6.8% 2.9% 0.3%

Visit Type Grouping
- Telemedicine Phone
- EPIC Integrated
- Standalone Visit
- Unscheduled Visit
- Unconverted Visit T...
- Other Virtual Visit

VIRTUAL CARE: SHORT TERM VISION = SURGE-PROOF

- Take stock of where we are, and what catch-up work must be done (Tech debt)
  - Prioritize "stability over features" for recently created program solutions
  - Complete and remaining systemwide launch of existing products
  - Prepare for another surge by hardening the existing inpatient solutions, especially the inpatient platform that supports VICS/PatientConnect/Virtual Rounds
  - Complete negotiations on new contracts with multiple video/hardware vendors

- Support and extend functionality
  - Ensure access for affiliated practices in MGB as permitted
  - Address the lingering niche or special use cases that are needed for COVID

- Partner with QPE/QSV and DAO
  - Get advice and guidance on best practices for equity/inclusion efforts to ensure equal access for patients with limited digital health or English proficiency
  - Review our current quality framework
  - Establish priority reporting dashboards for virtual care-related quality monitoring

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VIRTUAL INTERCOM COMMUNICATION SYSTEM (VICS)

What is the Virtual Intercom Solution?

The VICS is an iPad-based interactive audiovisual intercom into a patient room, minimizing clinician entry and PPE use, and humanizing face to face interactions

BENEFITS
- Minimizes staff exposure to COVID
- Preserves PPE
- Allow patients and providers to see each other frequently and unmasked

CHALLENGES / CONSIDERATIONS
- Dedicated equipment is currently used only for VICS program to emphasize stability over features and reduce network strain
- Bedside user engagement/support critical
- Sanitization requirements between cases

IMPLEMENTATION
- Site coordination for deployment prioritization
- Technology coordination
- Technical implementation
- IS coordination
- User training & assembly with local teams
- Central provisioning and configuration of devices and user access

SUPPORT
- Platform support
- Onsite device support
- User support (local IS, including bedside personnel)

TECHNOLOGY
iPad (centrally configured with SBR/Vidyo, user access via PAS) | PHS-managed machines (configured)

Summary: iPad is placed inside the room, mounted on an IV Pole with special hardware. Providers connect via a Partners managed PC, smartphone or personal device located outside the room. An audiovisual link is established between the two devices. In-room device is set to auto-answer which does not require patient participation and enables passive monitoring during sleep or if sedated or confused. Not designed for continuous monitoring

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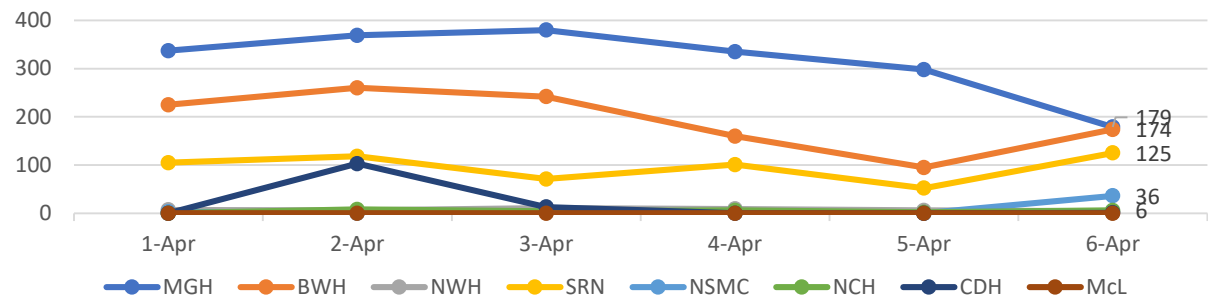PARTNERS HEALTHCARE | DIGITALHEALTH

VIDEO INTERCOM COMMUNICATION SYSTEM

- Provider outside the patient room with an AV device (desktop/laptop/smartphone)
- Patient in the room with an iPad mounted on an IV pole
- Simple, easy to use and quiet connection in a loud chaotic environment
- Reduces clinical staff contact with COVID-19 patients and the use of PPE
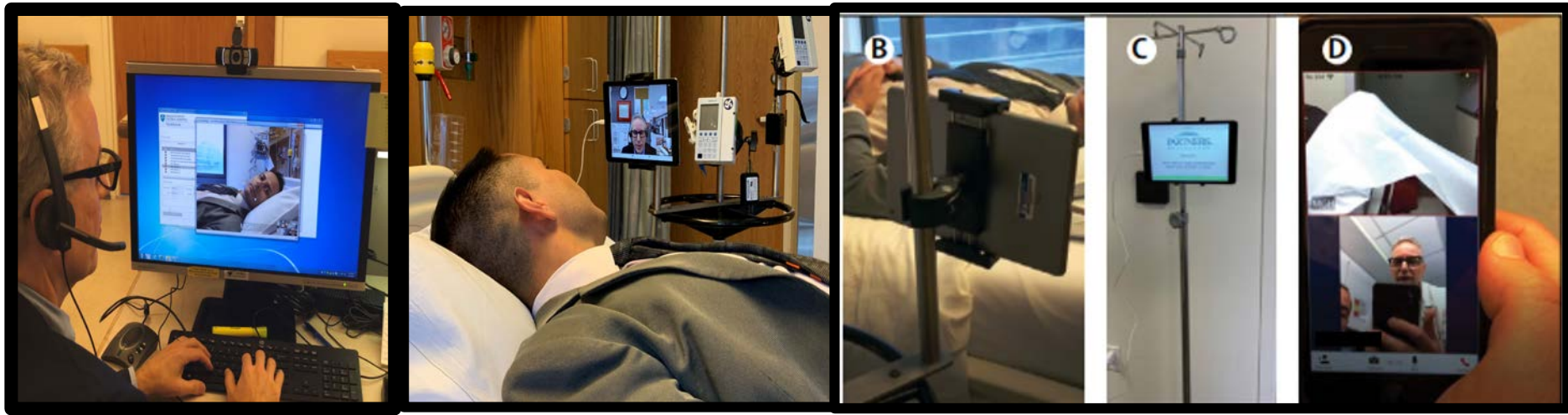
Site	Total iPads Deployed
MGH	207
BWH	189
SRH	131
NWH	20
NSMC	10
MCL	10
CDH	25
NCH	4
Total	**596**

Daily Call Volumes by Site

Legend: MGH, BWH, NWH, SRN, NSMC, NCH, CDH, McL

End values: 179, 174, 125, 36, 6

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VIRTUAL ROUNDS

USE CASE + CAPABILITIES

What are Virtual Rounds?

Virtual rounds supports remotely located team members joining rounds to facilitate social distancing and reduce the number of participants physically present on the unit during rounds, thus decreasing the risk of team member contagion

BENEFITS
- Minimizes staff exposure in large teams
- Engages furloughed/quarantined staff
- Supports education of students/trainees by allowing them to join rounds again

CHALLENGES / CONSIDERATIONS
- One user issues an invite to Group Meeting
- Remote attendees participate virtually
- Attendee identity verification
- All users should enable camera as video + participation improves experience
- Dedicated rounds device with portable configuration required

IMPLEMENTATION
- Workplace Analytics / Office 365
- Technology coordination
- Device coordination & configuration
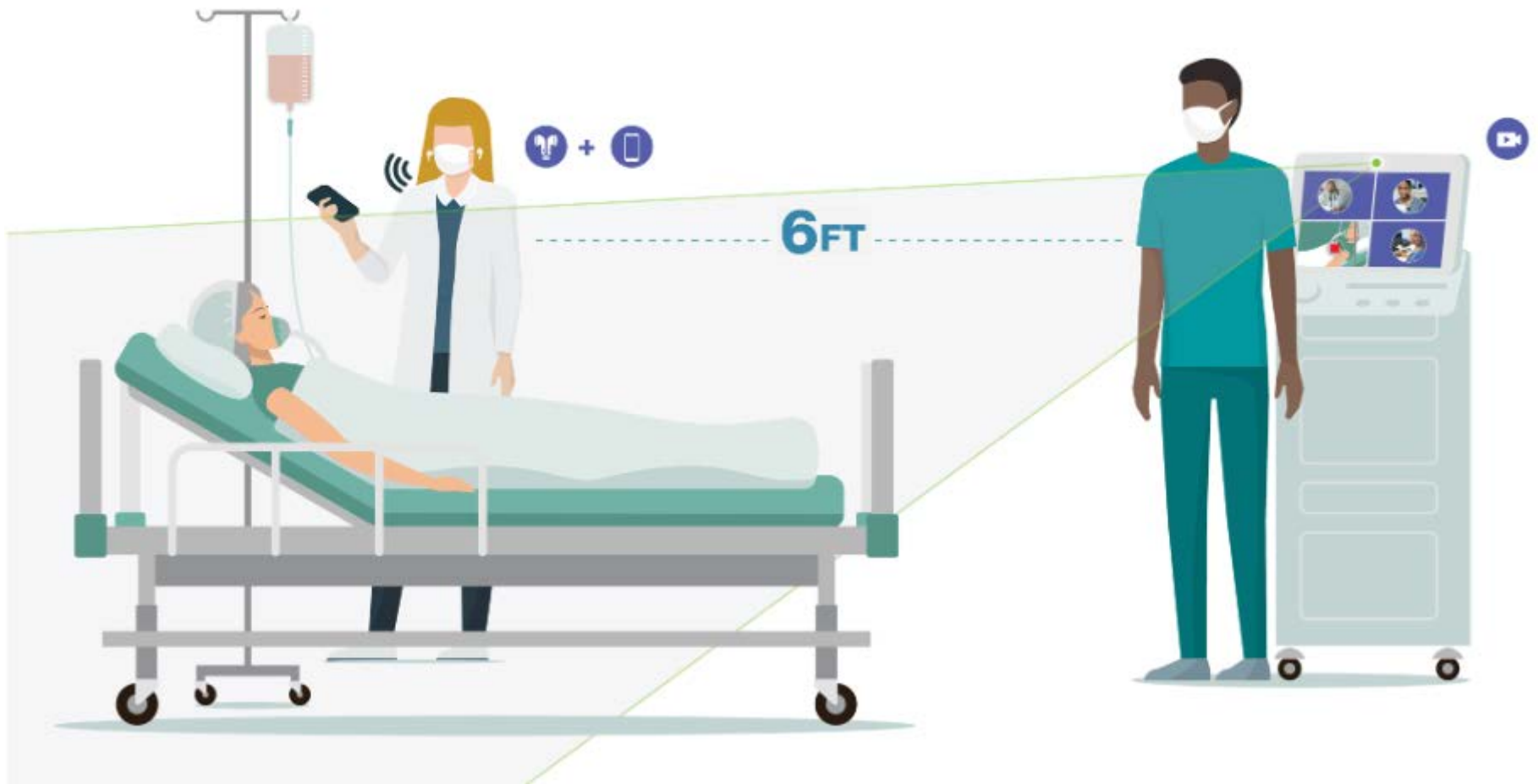- Site operations (*clinical departments and trainee program directors*)

SUPPORT
- Onsite device support
- Microsoft Teams support
- User support

TECHNOLOGY
Microsoft Teams | Portable Workstations | Device with camera/audio I/O for onsite or remote attendance

Summary: Each person attending rounds joins a Teams meeting, leveraging our enterprise license. The person onsite shares audio, video & screen displays. A laptop or other portable configuration is needed on site; others may use managed or personal devices. Some laptop configuration is needed to set up Teams on a clinical build device.

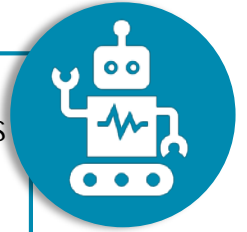# VIRTUAL ROUNDS HELPS ENFORCE SOCIAL DISTANCING

VIRTUAL ROUNDS ON THE NEUROLOGY SERVICE

Figure 1: Screenshot taken during a virtual round

The screenshot is from the perspective of a home-based participant (LHS; lower right video panel) joining rounds, while six other teams members have joined from their own devices and are shown in the lower row of images as icons or actual video capture. A patient with suspected seizures is being reviewed, and an area of frontotemporal phase reversing spikes is highlighted by the on-screen white cursor controlled by the attending physician, indicated here for clarity with the large blue arrow.

https://www.thelancet.com/pdfs/journals/landig/PIIS2589-7500(20)30104-7.pdf

ROBOTIC PROCESS AUTOMATION (RPA) & CONVERSATIONAL AI

What is Robotic Process Automation?

RPA/AI tools ("HealthBots") can transfer the execution of simple protocol driven tasks from human hands to digital automation, enabling information and decisions to reach an unlimited audience of users at scale rapidly and at very low cost

BENEFITS

- Patient access to current health information
- Employee access to Occ Health screening requirements and return to work instructions
- Triage of patients to ambulatory surge clinics for testing, online urgent care or the ED based on severity and risk

CHALLENGES / CONSIDERATIONS

- Need clinical consensus for algorithm protocols and a governance mechanism to ensure HealthBot is always reflecting latest guidance
- Consider IVR and text-based options in multilingual formats to reach widest audience

IMPLEMENTATION

- Staged rollout started within Nurse Triage Phone Hotline, then expanded to public-facing sites
- Occ Health daily Fit for Work Pass
- Occ Health Triage instructions for providers next
- Expanded algorithm output options now include self-quarantine and referral to ambulatory respiratory clinics or virtual urgent care
- Complementary Epic SmartForms for documentation

SUPPORT

- Onsite device support
- Enterprise monitoring software support
- User support for alarm response
- Piloting direct patient visualization for alarm confirmation

TECHNOLOGY

Microsoft ChatBot | Epic Integration

Summary: Readily available chatbot RPA software from Microsoft was easily configurable and includes IVR capabilities. Adapted use from other health systems and rapidly deployed agnostic to most OS and devices.

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VIRTUAL URGENT CARE: PARTNERS HEALTHCARE ON DEMAND

What is Partners HealthCare on Demand?

PHOD

Partners HealthCare on Demand (PHOD) is designed to help patients with low acuity conditions and/or COVID-19-related concerns conduct a virtual urgent care visit

BENEFITS
- Minimizes staff exposure
- Preserves PPE
- Resource for patients who don't meet COVID-19 criteria through nurse line or other mechanisms to reach a provider

CHALLENGES / CONSIDERATIONS
- All existing patients are documented in Epic
- All others are seen and documented by 3rd party vendor
- No direct Epic connection; information available through Care Everywhere/Mass Hlway

IMPLEMENTATION
- Trained providers currently staffing the platform
- Epic-enabled support documentation for patients seen in the PHOD platform

SUPPORT
- Patient support
- Provider support
  - ➤ Training materials available on Epic documentation, as scenarios can vary based on the patient profile
- Technology support

TECHNOLOGY
Teladoc virtual platform

Summary: Patients queue for a virtual urgent care visit. Partners providers see existing Partners patients and AllWays Health Members in MA. Vendor providers see AllWays Health Members outside of MA. Previously available for AllWays-ONLY patients. Patients can access ondemand.partners.org & requests are funneled through the COVID-19 triage line.

PARTNERS HEALTHCARE ON DEMAND VIRTUAL URGENT CARE OFFERING
EXPLOSIVE GROWTH IN VISIT VOLUME TREND (2018-2020)

PHOD Volume Trend
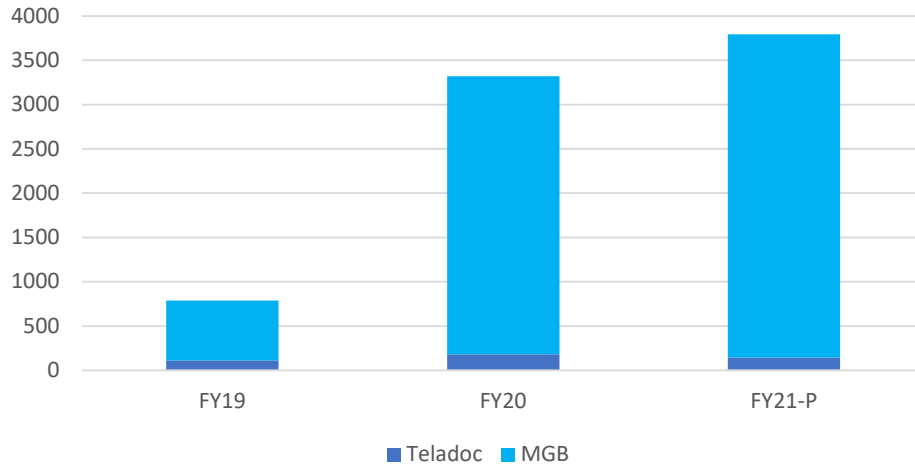
Legend: ■ Teladoc ■ MGB

Partners HealthCare On Demand

Access virtual urgent care during the COVID-19 crisis

AllWays Health Partners members and Partners HealthCare patients in Massachusetts have access to Partners On Demand telemedicine services.

Partners HealthCare On Demand is a convenient, high-quality urgent care service that allows you to have an interactive video visit with a doctor right from your home, office, or anywhere in the US.

Time of Day	2018 (6 months)		2019 (12 Months)		2020 (7 Months)		Total	
	# of Visits	% of visits	# of Visits	% of visits	# of Visits	% of visits	# of Visits	% of visits
Daytime (7AM - 5PM)	91	71%	110	74%	1,663	70%	1,864	70%
Evening (5PM - 9PM)	22	17%	27	18%	496	21%	545	21%
9PM-10PM	2	2%	4	3%	64	3%	70	3%
Overnight (10PM - 7AM)	14	11%	7	5%	147	6%	168	6%
Total	129		148		2,370		2,647	

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STRIVING TO ACHIEVE EQUITABLE ACCESS TO CARE

- Ensure virtual care dashboards can measure variation in adoption
  - Create traditional SDOH filters to identify vulnerable populations
  - Understand and measure new barriers to digital health access
  - Leverage Tableau's colorblind-friendly palette

- Limited English Proficiency
  - Survey of all available medical interpretation solutions across MGB and work with equity and inclusion leaders to provide smooth and simple addition of interpreters to any virtual visit
  - Accelerate translation of MyChart into multiple languages
  - Create multilingual Zoom interface to connect patients & families

- Limited digital literacy or access to technology or Wi-Fi
  - Provide direct phone support to patients, online video tutorials, loaner devices while hospitalized, phone-based virtual visits, text and IVR for COVID hotline interface. Plans to engage Doximity as an enterprise supported solution for simple 1-click text, phone or video enabled interaction with patients (avoiding need for software download or MyChart)

- Visual/cognitive/physical impairments
  - Enabled close-captioning in Zoom, added support via browser-based video for patients to use pre-existing accessibility features

PATIENT CONNECT

What is PatientConnect?

Using their personal device or a loaner device, patients can video chat with a Partners provider, medical interpreter and/or family members in a secure, private connection
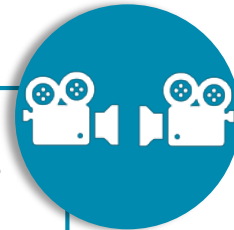
BENEFITS
- Connects isolated patients to loved ones 1:1 or in groups, allows staff to interact with patients (i.e., medical interpreters, consultants, clergy, social workers), and enables family meetings with the medical team
- Minimizes staff and patient exposure & preserves PPE
- Device agnostic across most operating systems

CHALLENGES / CONSIDERATIONS
- Standalone Zoom solution requires unit-based screening of virtual visitors, implementing best practices for security and privacy, cleaning devices and account settings between users
- Managing time spent on loaner devices may be challenging, esp. in end of life discussions

IMPLEMENTATION
- Create Zoom accounts for generic Unit based users to support hosted meetings
- Procure loaner devices via purchase or donation
- Train unit coordinators and nurses in proper use

SUPPORT
- Published Tip Sheets for bedside users
- Patient support provided via Unit Staff with simple URL and 10-digit passcode for phone or video call in within Zoom meeting
- Loaner device support
- Zoom room configurations
- Potential to add live phone support for patients and providers if needed

TECHNOLOGY
Zoom Healthcare Configuration | Secure RedCap multilingual interface | Floor based video capable devices

Summary: Providers schedule and conduct virtual video visits with patients via selected platform. While Zoom is not integrated in Epic, both solutions can be scheduled in Epic. Documentation occurs in Epic via Telemedicine encounter. Note: Some practices are opting to use commercial-grade tools instead (i.e., FaceTime).

THE EQUITY AND PATIENT EXPERIENCE HYDRA: CUT OFF ONE HEAD AND TWO GROW BACK
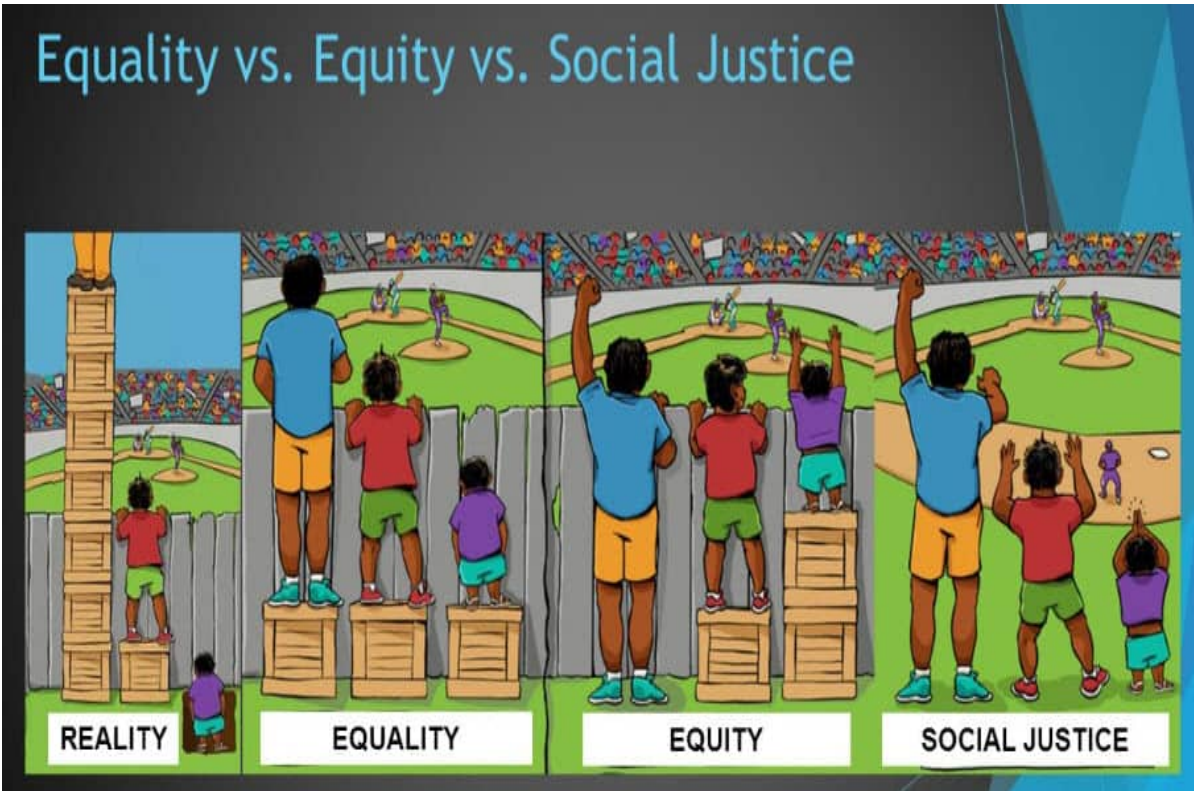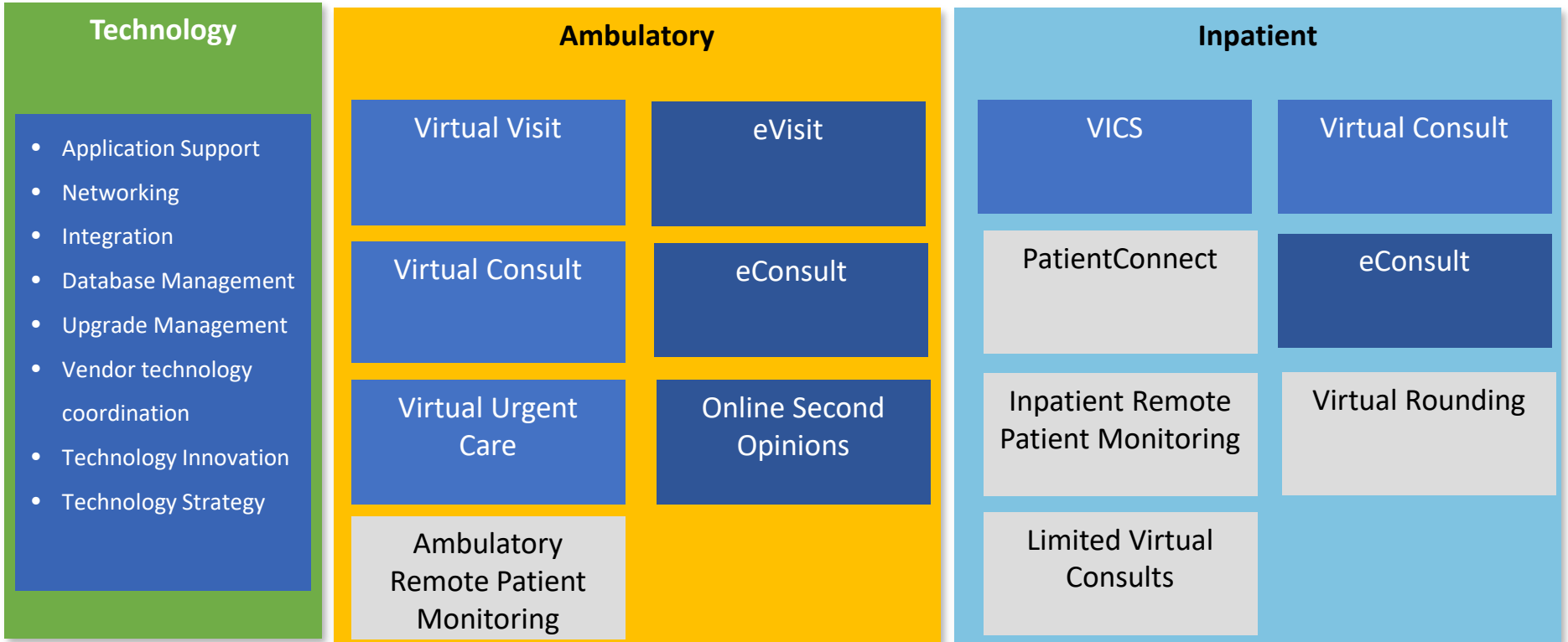
Multilingual Interface for Patient-Family Support

VIRTUAL CARE: AMBULATORY RECOVERY VISION = SOLIDIFY

- Establish clear governance and organizational structure
  - Shift from massive innovation phase to more traditional governance
  - Align within existing DH governance structures to ensure enterprise input and transparency of decision-making
  - Reorganize for efficiency and transparency to conventional service delivery domains

- Identify gaps in care and tailor virtual solutions where needed
  - Group visits
  - Need for recording

- Increase revenue capture and new billing mechanisms
  - Build standard language for consent to virtual care
  - Explore billing for eConsults and Chart Consults

- Increase adoption of MyChart/PPG where possible
  - Provide easy to use (text/phone/video)alternatives when appropriate
  - Multilingual, multi-user interface emphasis

- Superior user experience and other enhancements
  - Use CCG for each domain to gather enterprise consensus
  - Major focus on virtual visits and defining virtual care best practices, training and competency guidelines, CRICO PSO risk reduction taskforce

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VIRTUAL CARE – ORGANIZATIONAL ALIGNMENT

HOW WE ALIGN

Technology

- Application Support
- Networking
- Integration
- Database Management
- Upgrade Management
- Vendor technology coordination
- Technology Innovation
- Technology Strategy

Ambulatory

Virtual Visit	eVisit
Virtual Consult	eConsult
Virtual Urgent Care	Online Second Opinions
Ambulatory Remote Patient Monitoring	

Inpatient

VICS	Virtual Consult
PatientConnect	eConsult
Inpatient Remote Patient Monitoring	Virtual Rounding
Limited Virtual Consults	

Communications and Analytics

| Synchronous Care Delivery *(real time)* | Asynchronous Care Delivery *(not time bounded)* | Process Improvement & Innovation Phase of Development |

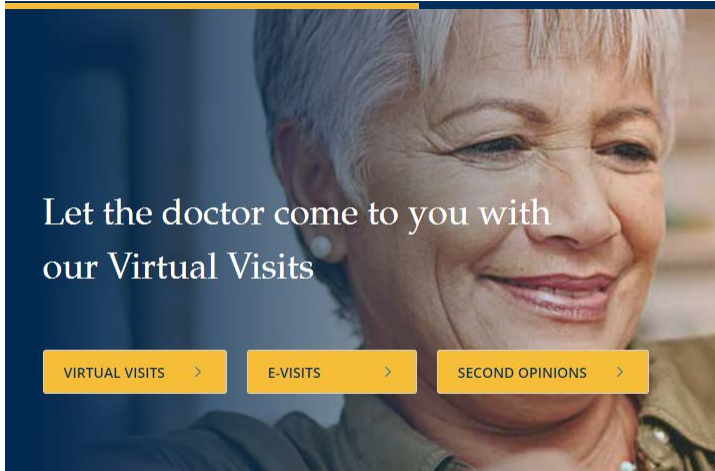PARTNERS® HEALTHCARE | DIGITALHEALTH

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VIRTUAL CARE: LONG TERM VISION = INTEGRATE

- Deepen collaborations and seamless integration between the various MGB functional entities of Digital Health (PeC), Data and Analytics (DAO), Information Systems (IS), Quality, Patient Experience and Equity (QPE)

- Build an effective and dynamic interface to the individual RSOs

- Envision the future state of virtual ambulatory and inpatient care delivery that endures beyond COVID, taking an EPIC-first and system-first approach where appropriate, but leveraging 3rd party applications when needed

- Advocate for payment reform and coverage parity

- Develop a quality measurement framework that aligns with the overall MGB approach and be a relentless force for equity in access to digital healthcare

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MAKING INFORMATION ABOUT VIRTUAL CARE EASILY ACCESSIBLE TO PROVIDERS AT POINT OF CARE

DEVELOP AND DEPLOY A CENTRAL PATIENT-FACING ENTERPRISE SITE

VIRTUAL CONSULTS

USE CASE + CAPABILITIES

What are Virtual Consults?

Virtual Consults is an existing program of high-resolution, in-depth consultations between referring community providers and AMC experts, with offerings such as TeleStroke/TeleNeurology/Tele-NeuroCritical Care, Tele-PICU and others

BENEFITS
- Maximizes access to expert opinion in time critical conditions such as stroke and critical care across a wide geography at low cost
- Supports specialty staffing across the enterprise
- Leverages TeleHealth software Portal to capture documentation and support triage, quality measures, reimbursement, knowledge transfer and clinical workflows

CHALLENGES / CONSIDERATIONS
- Requires dedicated cart (pan/tilt/zoom camera, high-res microphone/speaker) and imaging transfer
- Need for licensure/credentialing is major barrier

IMPLEMENTATION
- Central contracting and credentialing
- Technology coordination at remote sites
- Device Cart coordination & configuration
- Routine preventive testing

SUPPORT
- Remote site device support
- Enterprise radiology, video software, consultant device and TeleHealth portal support
- User support

TECHNOLOGY
Vidyo | Dedicated High-Quality Video Carts at Remote Sites | Internally developed TeleHealth Portal Software

Summary: TeleConsultants at AMCs have access to the TeleHealth portal for consult tracking and documentation. Sites bring dedicated cart to the bedside of scheduled or unscheduled consults on patients. Experts connect to Video using managed devices or personal devices from any location.

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# MGH INPATIENT TELENEUROLOGY CONSULTATION

LIMITED VIRTUAL CONSULTS

USE CASE + CAPABILITIES

What are Limited Virtual Consults?

Limited Virtual Consults is a new program leveraging phone consults and screen sharing to provide rapid access to expert advice on infectious disease and critical care management in our community hospitals and post-acute facilities
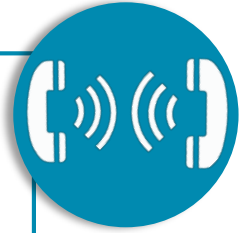
BENEFITS
- Nimble just-in-time access to expert opinion on infection control and critical care across a wide geography at very low cost
- Supports keeping care local in community sites
- Leverages TeleHealth Software Portal to capture documentation and support triage
- Avoids need for burdensome staff credentialing at sites inside our health system

CHALLENGES / CONSIDERATIONS
- Leverage dedicated virtual pagers
- Licensure/credentialing is avoided
- Leverages MS Teams for screen sharing within Epic or other EHR as needed

IMPLEMENTATION
- Central staffing model of AMC experts
- Minimal or no technology coordination
- Leverage the Virtual Rounds model if community provider wants AMC expert to join at bedside
- Expansion to Field Hospitals underway

SUPPORT
- Remote site device support for MS Teams under an enterprise license
- Minimal user support needs

TECHNOLOGY
Telephony +/- Microsoft Teams | TeleHealth Software Portal (Internal Software Application)

Summary: Simple telephone paging and dialogue between referring provider and expert, requested, tracked and documented in the TeleHealth Portal. Leverage MS Teams only if screen sharing is desired

REMOTE PATIENT MONITORING (RPM)

What is Ambulatory Remote Patient Monitoring?

aRPM leverages Epic's Care Companion to allow COVID-19 patients to frequently enter patient reported outcomes (e.g., changes in health, sense of smell) and vital signs (e.g., temp, oxygen saturation, pulse) into MyChart/PPG for disease monitoring

TECHNOLOGY
Providers & Nurses: Epic triage line(s) | Patients: Partners Patient Gateway (mobile preferred)

Summary: Patient is discharged with Care Companion COVID-19 order and followed for 14 days by the nurse triage line. Any abnormal entries or worsening symptoms will trigger an InBasket message for the nurse/provider to follow up on via a telephone encounter with the patient.

What is Inpatient Remote Monitoring?

iRPM is designed to identify trends in physiologic monitoring that predicts risk of imminent clinical deterioration and issues early safety alerts. This is needed for all clinical units but especially those outside traditional ICU/step down areas

TECHNOLOGY
BedMaster | GE CareScape | Epic

Summary: Alerting software will access all available data by using Epic flowsheet rows at sites/beds with no central feed of physiologic data, as well as direct bedside monitor feeds when available. This supports a network of field hospitals and pop-up ICUs as well as general med/surg beds in COVID units

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ENSURING THE QUALITY OF VIRTUAL CARE

- COVID-19 placed unprecedented demands on virtual care to restore the delivery of care that was interrupted by the need for social distancing in medicine. This included inventing new virtual care solutions to new problems and expanding existing programs to massive scale. Throughout our strategy and implementation, we have aimed for virtual care to adhere to the **6 domains of quality** as outlined by the Institute of Medicine in their "Crossing the Quality Chasm" report.
- While virtual visits restored access to care for many patients that were not longer able to access in-person care, it also created barriers to access for a large group of patients who were not able to take advantage of this new digital path to healthcare.

Virtual care should be ...

Safe: maintain security and privacy while still being easily accessible for all
**Timely**: reduce harmful delays in accessing care, be available on demand
Effective: provide services based upon evidence and avoid services of no benefit
Efficient: lower the cost of care for patients and providers, including the hidden costs of transportation, missed work by patients and caregivers
Equitable: deliver care and access that does not vary in quality because of the personal characteristics of the patient or provider, including age, sex, race or ethnicity, primary language, geographic location, digital literacy and socioeconomic status, visual/cognitive/physical impairments or other social determinants of health
Patient-Centered: deliver care that is respectful and responsive to individual patients' preferences, needs, and values and that includes patients' values in clinical decision making

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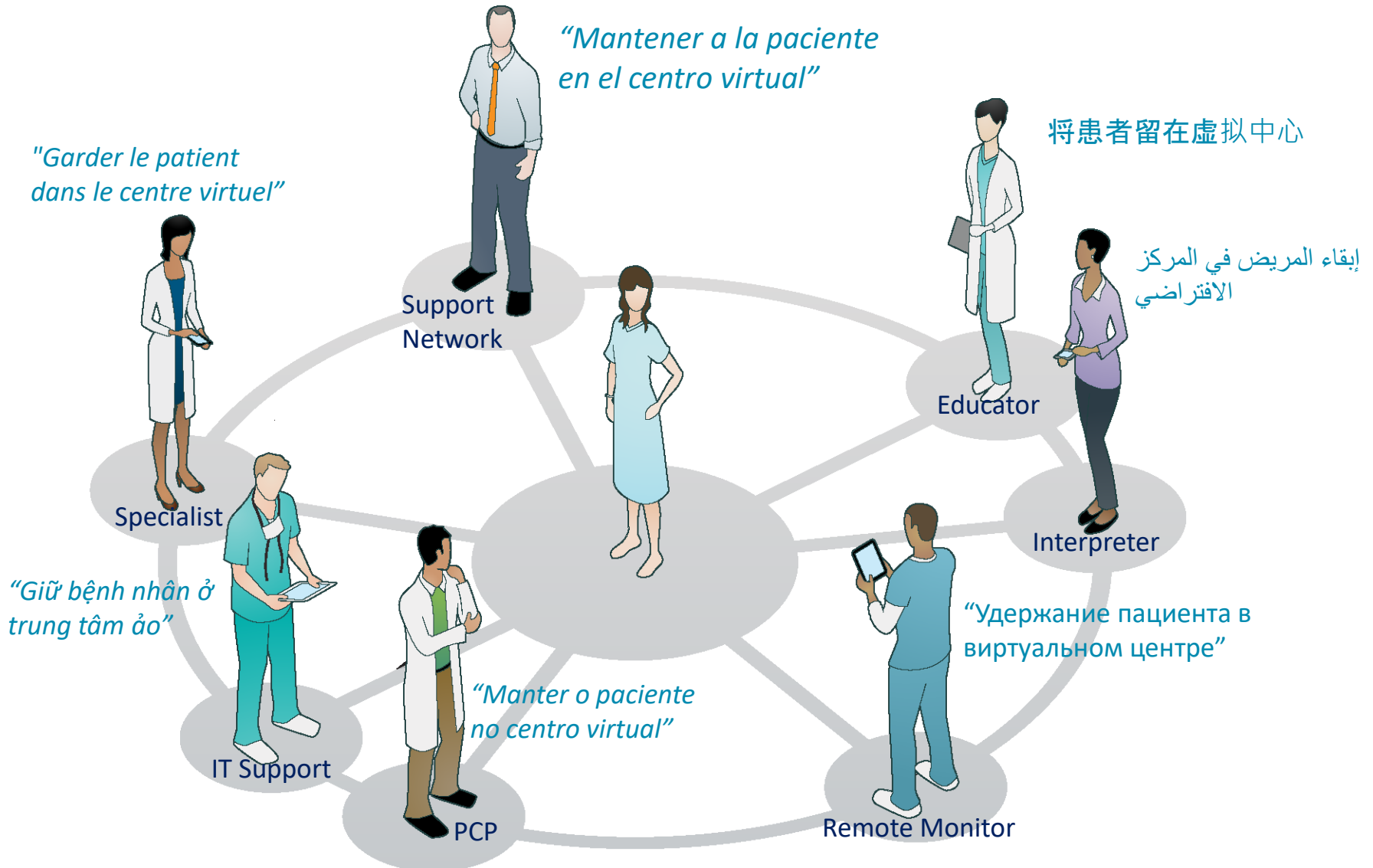
BRINGING EXPERTS TOGETHER TO DRIVE CONSENSUS

https://www.virtualcarecompetency.com
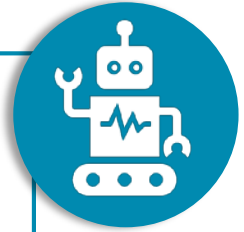
VIRTUAL CARE: LONG TERM VISION = AMPLIFY

- Support the MGB system strategy as it relates to specific virtual care offerings and activities

  - Reinforce for patients that we are the "go to" place for care and develop cross-academic medical **centers of excellence**
  - Consolidate and expand our **national and international** impact on health
  - Build on our strong track record for **innovations** in diagnostics, therapeutics, devices and **data analytics** for leading patient care and impact on the health of the communities we serve
  - Focus on a **value-based** model that delivers affordable primary care, secondary care and **behavioral health** care in the community and makes patient-centered programs and services central to delivering better outcomes for our patients
  - Further serve our communities by working to address a leading **community health** issue

Robotic Process Automation (RPA)

USE CASE + CAPABILITIES

What is Robotic Process Automation?

RPA tools ("HealthBots") can transfer the execution of simple protocol driven tasks from human hands to digital automation, enabling information and decisions to reach an unlimited audience of users at scale rapidly and at very low cost

BENEFITS

- Patient access to current health information
- Employee access to Occ Health screening requirements and return to work instructions
- Triage of patients to ambulatory surge clinics for testing, online urgent care or the ED based on severity and risk

CHALLENGES / CONSIDERATIONS

- Need clinical consensus for algorithm protocols and a governance mechanism to ensure HealthBot is always reflecting latest guidance
- Consider IVR and text-based options in multilingual formats to reach widest audience

IMPLEMENTATION

- Staged rollout started within Nurse Triage Phone Hotline, then expanded to public-facing sites
- Occ Health daily Fit for Work Pass
- Occ Health Triage instructions for providers next
- Expanded algorithm output options now include self-quarantine and referral to ambulatory respiratory clinics or virtual urgent care
- Complementary Epic SmartForms for documentation

SUPPORT

- Onsite device support
- Enterprise monitoring software support
- User support for alarm response
- Piloting direct patient visualization for alarm confirmation

TECHNOLOGY

Microsoft ChatBot | Epic Integration

Summary: Readily available chatbot RPA software from Microsoft was easily configurable and includes IVR capabilities. Adapted use from other health systems and rapidly deployed agnostic to most OS and devices.

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MACHINE LEARNING AND ARTIFICIAL INTELLIGENCE (ML/AI)

What is Machine Learning/AI?

Machine Learning is the process in which a machine can learn a task on its own from data sources without being explicitly programmed for the task. It is an application of AI in which systems can automatically learn and improve from experience.

BENEFITS

- New insights into health and disease
- Increased consistency and efficiency of healthcare operations by automating repetitive tasks
- Unified pipeline for scaling innovation
- Extract value from Epic infrastructure, EDW, Biobank and other clinical data sources

CHALLENGES / CONSIDERATIONS

- Need clinical governance for ML/AI implementation and dissemination
- Ensure that ground truth source data is accurate, equitable and generalizable

IMPLEMENTATION

- Develop partnerships with established groups at Partners to facilitate enterprise scale and adoption of validated solutions as they emerge
- Focus initially on imaging, decision support and predictive analytics
- Epic inference scores with alerts for clinical deterioration

SUPPORT

- Onsite device/sensor support
- Enterprise monitoring software support
- User support for adoption and integration into existing workflows

TECHNOLOGY

CCDS | MGB COVID Innovation Center| AMC Innovation Centers | Industry Partners | Epic Integration

Summary: Validated commercial software, in-house solutions, on-premises and cloud computing resources are used to access curated data sources for creation of deep learning algorithms

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SUMMARY

- Defined Virtual Care and the impact of COVID on adoption
  - Existing solutions
  - New products

- Delineated the 4 stages of planned evolution of Virtual Care
  - **Surge-Proof**
  - **Solidify**
  - **Integrate**
  - **Amplify**

- Reviewed several overarching themes
  - Defined quality and competence in various domains of Virtual Care
  - Emphasized the crucial need for digital tools to promote health equity
  - The patient journey is being redefined

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OPEN DISCUSSION

CITED WORKS AND ADDITIONAL READINGS

- **Telehealth**: seven strategies to successfully implement disruptive technology and transform health care. Schwamm LH.Health Aff (Millwood). 2014 Feb;33(2):200-6.

- Digital triage: Novel strategies for population health management in response to the COVID-19 pandemic. Lai L, Wittbold KA, Dadabhoy FZ, Sato R, Landman AB, Schwamm LH, He S, Patel R, Wei N, Zuccotti G, Lennes IT, Medina D, Sequist TD, Bomba G, Keschner YG, Zhang HM. Healthc (Amst). 2020 Oct 26;8(4):100493.

- What Drives Greater Assimilation of Telestroke in Emergency Departments? Uscher-Pines L, Sousa J, Zachrison K, Guzik A, Schwamm L, Mehrotra A.J Stroke Cerebrovasc Dis. 2020 Sep 20;29(12):105310.

- Virtual care: new models of caring for our patients and workforce.Schwamm LH, Estrada J, Erskine A, Licurse A. Lancet Digit Health. 2020 Jun;2(6):e282-e285.

- A digital embrace to blunt the curve of COVID19 pandemic. Schwamm LH, Erskine A, Licurse A.NPJ Digit Med. 2020 May 4;3:64

- Trends Among Rural and Urban Medicare Beneficiaries in Care Delivery and Outcomes for Acute Stroke and Transient Ischemic Attacks, 2008-2017. Wilcock AD, Zachrison KS, Schwamm LH, Uscher-Pines L, Zubizarreta JR, Mehrotra A.JAMA Neurol. 2020 Jul 1;77(7):863-871.

- Trends in Telestroke Care Delivery: A 15-Year Experience of an Academic Hub and Its Network of Spokes. Sharma R, Zachrison KS, Viswanathan A, Matiello M, Estrada J, Anderson CD, Etherton M, Silverman S, Rost NS, Feske SK, Schwamm LH.Circ Cardiovasc Qual Outcomes. 2020 Mar;13(3):e005903.

- Establishment of an internationally agreed minimum data set for acute telestroke. Cadilhac DA, Bagot KL, Demaerschalk BM, Hubert G, Schwamm L, Watkins CL, Lightbody CE, Kim J, Vu M, Pompeani N, Switzer J, Caudill J, Estrada J, Viswanathan A, Hubert N, Ohannessian R, Hargroves D, Roberts N, Ingall T, Hess DC, Ranta A, Padma V, Bladin CF.J Telemed Telecare. 2020 Jan 14:1357633X19899262.

- Teleneurology Consultations for Prognostication and Brain Death Diagnosis. Girkar UM, Palacios R, Gupta A, Schwamm LH, Singla P, May H, Estrada J, Whitney C, Matiello M.Telemed J E Health. 2020 Apr;26(4):482-486.

- Adjusted cost analysis of video televisits for the care of people with amyotrophic lateral sclerosis. Paganoni S, van de Rijn M, Drake K, Burke K, Doyle M, Ellrodt AS, Nicholson K, Atassi N, de Marchi F, Babu S, Estrada J, Schwamm LH, Berry JD.Muscle Nerve. 2019 Aug;60(2):147-154.

- What Drives Greater Assimilation of Telestroke in Emergency Departments? Uscher-Pines L, Sousa J, Zachrison K, Guzik A, Schwamm L, Mehrotra A.J Stroke Cerebrovasc Dis. 2020 Sep 20;29(12):105310.

- Assessment of Telestroke Capacity in US Hospitals. Richard JV, Wilcock AD, Schwamm LH, Uscher-Pines L, Zachrison KS, Siddiqui A, Mehrotra A.JAMA Neurol. 2020 Aug 1;77(8):1035-1037.

- Patient and clinician experiences with **telehealth** for patient follow-up Care. Donelan K, Barreto EA, Sossong S, Michael C, Estrada JJ, Cohen AB, Wozniak J, Schwamm LH.Am J Manag Care. 2019 Jan;25(1):40-44.

- Virtual Visits Partially Replaced In-Person Visits In An ACO-Based Medical Specialty Practice. Shah SJ, Schwamm LH, Cohen AB, Simoni MR, Estrada J, Matiello M, Venkataramani A, Rao SK.Health Aff (Millwood). 2018 Dec;37(12):2045-2051

- AAMC brief report on telehealth competencies

- https://www.virtualcarecompetency.com

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