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## Innovative Acute Care & High-Touch Discharge During a COVID Surge at a Safety Net Hospital

*Natalija Farrell, PharmD, BCPS, DABAT*

*Pharmacy Clinical Coordinator – Emergency Medicine & Toxicology*



*@NatalijaFarrell*

## | Disclosures

- The presenter has no real or perceived conflicts of interest related to this presentation

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## | Learning Objectives

*At the end of this session, participants should be able to:*

1. Describe how Boston Medical Center (BMC) redistributed roles and staff to meet the needs of its patients during a high-volume patient surge
2. Explain integrated workflows with a multi-disciplinary team to support complex patient needs across the continuum of care during a COVID surge
3. Describe solutions created by the pharmacy team to support acute care and post-discharge needs for COVID-19 patients

# Hospitals Frequently Prepare for and Respond to Disasters

Lessons Learned from these Situations Helped a Framework for COVID-19 Planning and Response

- National guidelines on antidote stocking
- Health-system emergency preparedness drills
- Increased staffing needs
- Redistribution of staff
- Increased medication and supply needs
- Complicated transitions of care (TOC) needs for patients
- Resources to support front-line staff



# Healthcare Providers Faced New Challenges with the COVID-19 Pandemic

- As a newly discovered coronavirus, little was known initially on how to optimally treat cases
  - Diagnosis, clinical presentation, complications, and management continue to evolve as new information becomes available
- Required strategies to protect staff, patients, visitors, their families, and the community
  - Provision of personal protection equipment
  - COVID-19 questionnaires for staff and patients
  - Quarantine procedures
- Surge in patient cases created a shortage of healthcare resources
  - Hospital beds
  - Mechanical ventilators
  - Healthcare workers
  - Personal protective equipment
  - Medications
- Spread of misinformation



# Redesign & Redistribution of Staff Roles & Responsibilities



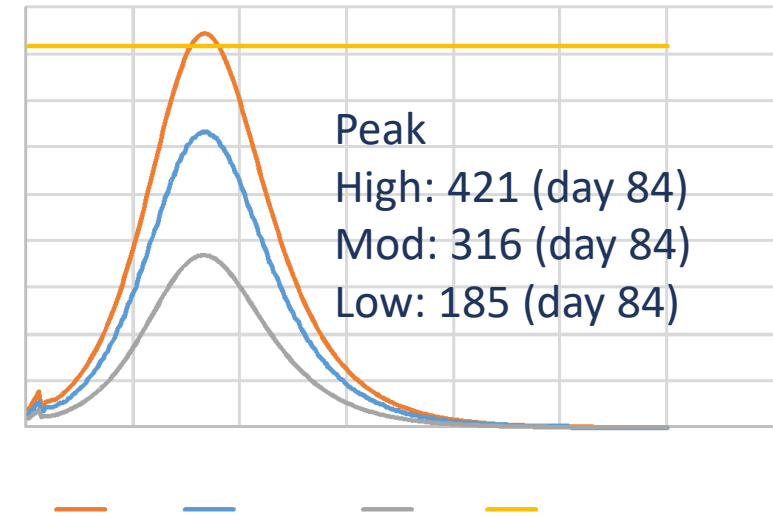
## COVID-19 Impact on Boston Medical Center (BMC)

- 514-bed academic medical center and safety-net hospital that provides care to adult and pediatric patients in Boston, MA
- Busiest level 1 trauma center in the New England
- Consistently ranks in the top 10 busiest Emergency Departments in the U.S.
- Among the hospitals most impacted earliest by COVID-19
  - Followed closely the Seattle and New York City COVID-19 response
  - Developed surge spaces and teams to account for the ~120% and ~140% increase in medical/surgical and intensive care unit (ICU) capacity, respectively
  - Developed plans for surge team capacity that could accommodate over 150% and 200% of standard medical/surgical and ICU patient capacity, respectively
  - With reduced elective procedures, we were able to utilize post-anesthesia care units (PACU) to increase inpatient bedding for admitted patients



## Changes to Care Area Coverage

- Elective surgeries were reduced and then halted based on modeling predictions of our local COVID-19 surge
- Ambulatory care clinics halted in-person appointments and switched to telemedicine appointments
- Given the reduced patient volume in some care areas and high patient volume in others, staff was redistributed to areas of need
  - Ambulatory care nurses & providers staffed our new influenza-like-illness clinic
  - Ambulatory care nurses & providers helped with inpatient staffing
  - Ambulatory staff implemented telehealth visits
  - Pediatric providers and nurses began caring for adults on what was previously a pediatric medical/surgical floor
  - Ambulatory care pharmacists assisted the outpatient pharmacy with converting prescriptions to 90 day, mail order
  - PACU nurses and technicians now cared for medical/surgical patients
  - Learners (residents, fellows, and students in a healthcare field) supplemented staffing, inventory, and COVID-19 information needs
  - Medication reconciliation technicians assisted with inpatient, central pharmacy needs





## Additional Staff Support for Environmental Services (EVS) Increased Bed Availability & Help Protect All Staff & Patients at BMC

- Environmental Services (EVS) added 15 fulltime equivalents to support the Emergency Department and COVID-19 patient care units
- Dedicated staff to cleaning high touch points and high traffic areas
- Implemented new workflows to stay ahead of requests:
  - Restocking cleaning supplies and linens in the care areas
  - Restocking N95 machines
  - Purchased chemical sprayers to use in large, public areas
  - Special cleaning products for fogging and terminal cleans
  - Collaboration with case management to rapidly identify and turnover rooms for the next patient



## | Additional Case Management Support to Facility Discharges

- Case Management adjusted their workflows to facilitate discharges as facility requirements shifted throughout the COVID-19 pandemic
- Dedicated case managers for patients with presumed or confirmed COVID-19 being transitioned to the field hospitals, emergency respite care center, and isolation hotels
- Acted as a liaison between medical staff and the patient or their family to determine healthcare proxy
- Worked in conjunction with palliative care services to help patients and families cope with the emotional impact of the illness utilizing portable tablets with video capabilities
- Additional case managers were staffed daily to cover surge care areas

## Audience Assessment Question #1

*What are strategies to provide staff support to care areas experiencing a high-volume surge in patients?*

- a. Reallocate staff to high volume care areas
- b. Incorporate equipment or technology to improve staff efficiency
- c. Utilize residents and students to support patient care needs
- d. All of the above

## Audience Assessment Question #1

*What are strategies to provide staff support to care areas experiencing a high-volume surge in patients?*

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- d. All of the above**



# Move Mountains

## Multidisciplinary Collaboration was Essential for Providing High Quality Care & Safety

- Physicians, nurses, pharmacists, laboratory personnel and epidemiologists collaborated at least weekly to provide our staff with guidance on:
  - COVID-19 treatments
    - Development of an institutional treatment protocol
    - Pharmacist coverage of the approval pager for experimental COVID-19 treatments, especially high-cost agents
  - COVID-19 related coagulopathy treatment
    - Development of an institutional anticoagulation protocol specific to COVID-19
    - Encouragement of direct oral anticoagulants or low molecular weight heparin in stable patients without renal insufficiency
  - Critical care medication shortages
    - Weekly updates to the physician and nursing staff
    - Modifications to our institutional sedation and analgesia in intubated patients protocols based on medication shortages
  - Airway Team
    - Anesthesia, ICU, and emergency medicine providers incorporation of proning to reduce intubations
  - Infection control
    - Institutional quarantine protocol for exposures as well as daily symptomatic screening questionnaire for employees
    - Creation of a COVID-19 specific email address for staff to address their exposure or travel questions

# Development of In-House COVID-19 Testing to Support Earlier Diagnosis

COVID-19 tests and  
diagnostics supplied by the  
state  
(7-14 day turn around)

Implementation of in-house  
COVID-19 diagnostics  
(rapid test = <6 hr; regular  
test = 24-48 hr)



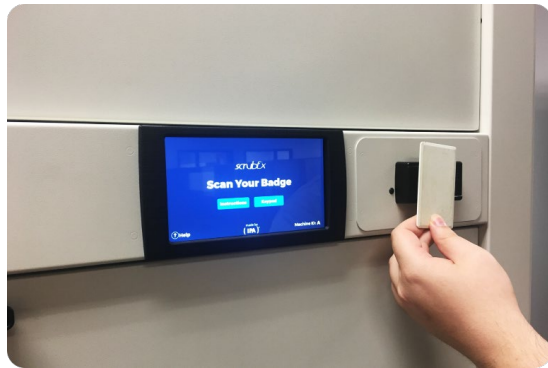


## Daily Departmental Dashboards to Anticipate Needs & Alternative Plans

	Current Supply	150 Days Projected Supply	High Demand Scenario			Moderate Demand Scenario			Low Demand Scenario		
			Demand	Excess	Days	Demand	Excess	Days	Demand	Excess	Days
Gloves	3,690,750	19,508,250	13,399,531	6,108,719	>300	13,055,006	6,453,244	>300	12,671,299	6,836,951	>300
Gown	195,974	295,974	804,432	(508,458)	68	689,590	(393,616)	73	561,688	(265,714)	82
N95	79,920	99,920	559,872	(459,952)	54	435,879	(335,959)	60	311,886	(211,966)	68
Surgical masks	68,300	1,098,300	1,199,013	(100,713)	133	1,093,322	4,978	156	961,511	136,789	180
Face shields	800	142,800	470,082	(327,282)	45	355,240	(212,440)	53	227,338	(84,538)	64

- Surgical mask demand reflected the new policy of 1 mask per all on-campus employees
- Evaluated reusable products, use of UV radiation to re-use N95 masks, and options for additional supplies
- Supply status shared at daily huddles

# Incorporating Technology into N95 Distribution to Staff



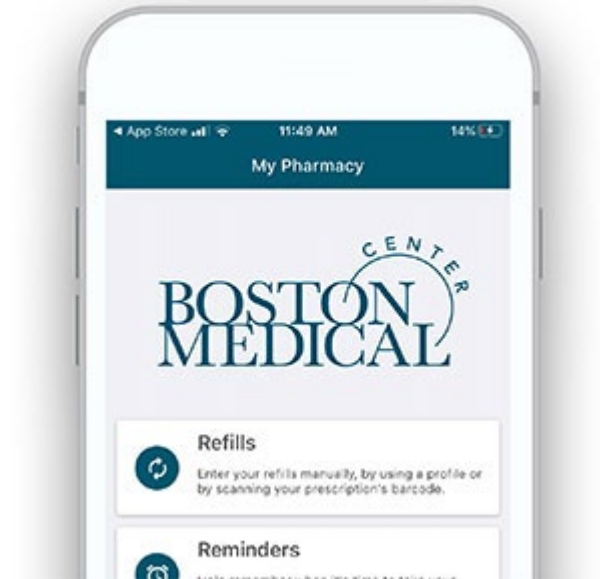
<b>SCAN</b>	<b>OPEN</b>	<b>TAKE</b>
Scan your hospital ID	Open the door	Take your mask

Dispenses the correct PPE mask as quickly as 2.1 seconds

Each user receive one mask per day – mask credits are refreshed back to one credit every night at 12:00am

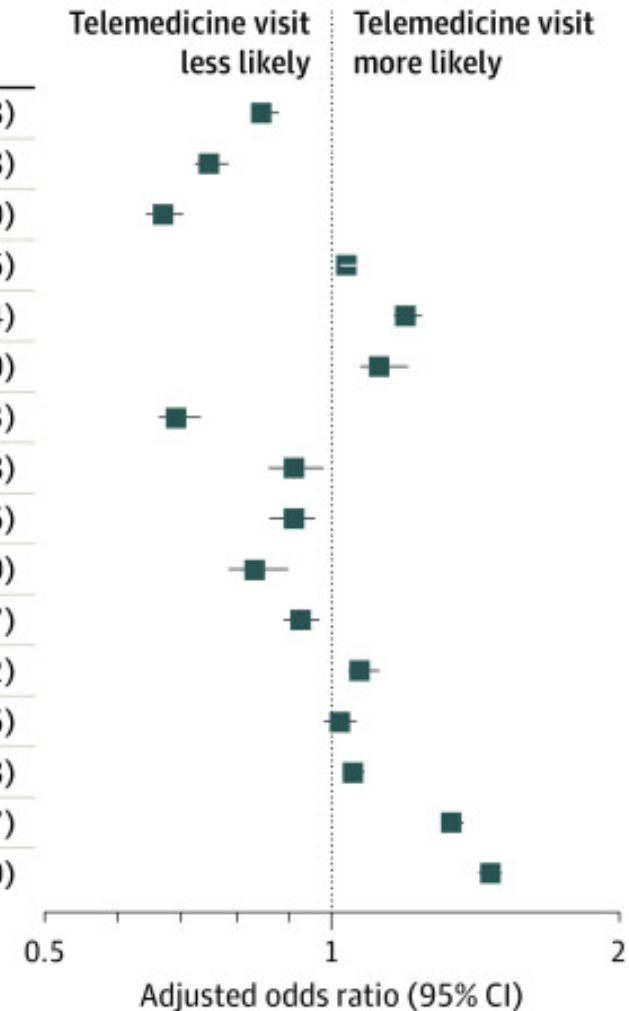
# Telemedicine

- Prior to the COVID-19 pandemic, only 11% of patients reported using telehealth in 2019
- Due to the COVID-19 pandemic, providers are 50–175x more likely offer telehealth services
  - Primary care
  - Specialty ambulatory care
  - Substance use disorder clinics
  - Ambulatory care pharmacy services



# Disparities in Telemedicine Use

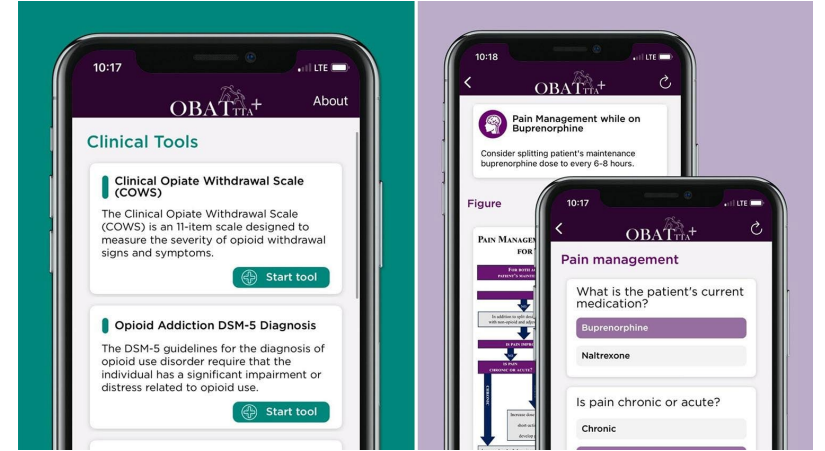
Characteristic	Adjusted odds ratio (95% CI)
Aged 55-64 y vs <55 y	0.85 (0.83-0.88)
Aged 65-74 y vs <55 y	0.75 (0.72-0.78)
Aged >75 y vs <55 y	0.67 (0.64-0.70)
Female	1.04 (1.02-1.06)
Black vs White	1.20 (1.16-1.24)
Latinx vs White	1.13 (1.07-1.20)
Asian vs White	0.69 (0.66-0.73)
Other race/ethnicity vs White	0.92 (0.86-0.98)
Unknown race/ethnicity vs White	0.91 (0.86-0.96)
Non-English language	0.84 (0.78-0.90)
Medicaid vs commercial insurance	0.93 (0.89-0.97)
Medicare vs commercial insurance	1.08 (1.04-1.12)
Median household income <\$50 000 vs >\$100 000	1.02 (0.98-1.06)
Median household income \$50 000-\$100 000 vs >\$100 000	1.05 (1.03-1.08)
Charlson Comorbidity Index score 1-2 vs 0	1.34 (1.31-1.37)
Charlson Comorbidity Index score $\geq$ 3 vs 0	1.46 (1.42-1.50)



# Strategies Adopted by BMC to Combat Healthcare Inequities



Mobile Clinicians



Free App to Guide Treatment of Opioid Use Disorder



Prepaid Cell Phone Distribution



# Field Hospitals Help Reduce Emergency Department & Hospital Surge Volume

- COVID-19 pandemic overwhelmed hospitals across the globe
- The United States and many other countries established field hospitals to increase healthcare capacity
- Field hospitals were established rapidly in locations most afflicted by COVID-19
- Workflows were established for physicians, nurses, pharmacists, technicians and students
- Limited medication “formularies” were established to support the patient care needs
- Established field hospital admission patient inclusion and exclusion criteria
- Partnered with government, military and local healthcare organizations



Boston Hope Medical Center:  
1,000 Bed Field Hospital

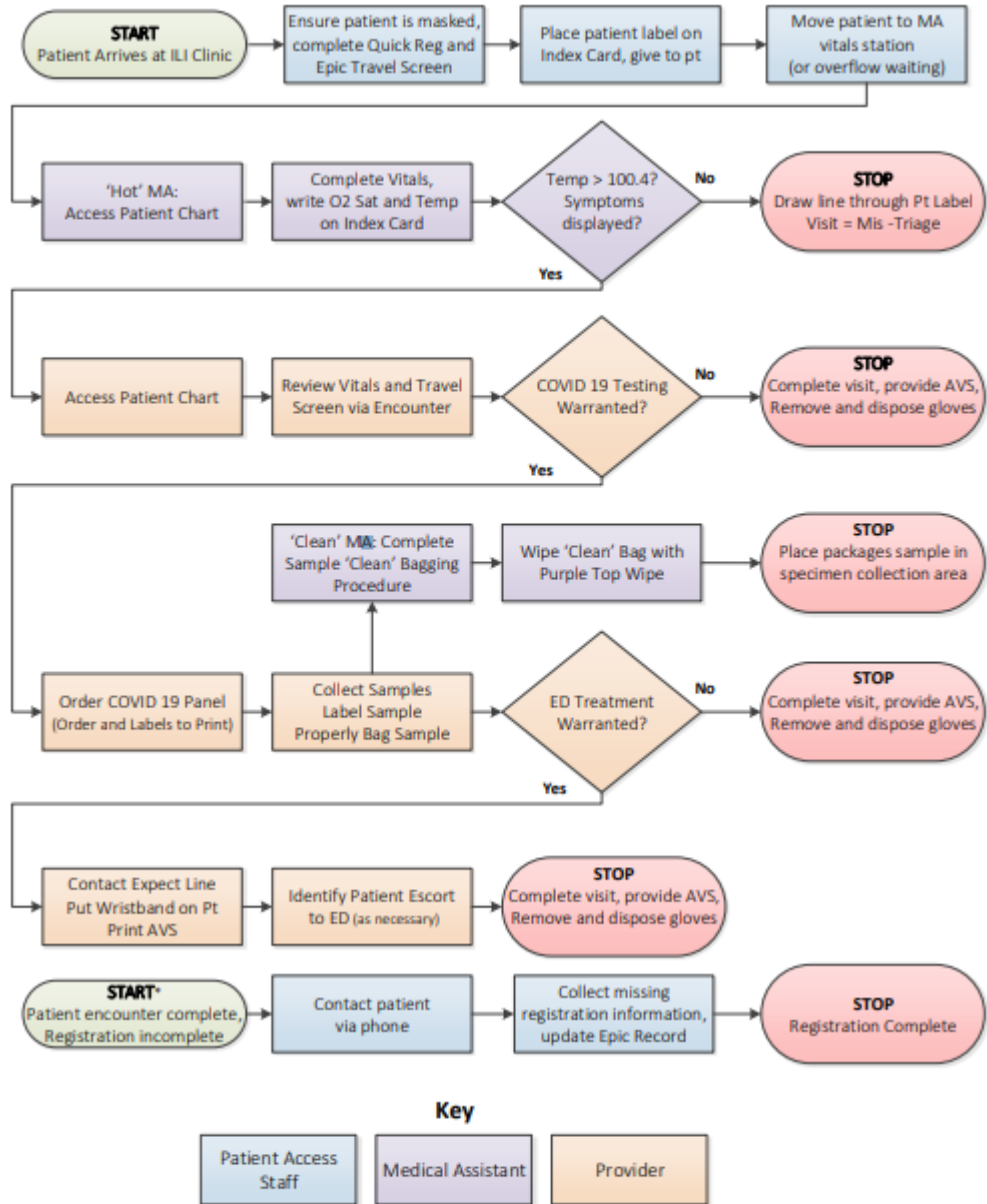
# BMC Continuum of Care for Homeless Patients with COVID-19

- BMC collaborated with the state to transform a vacant, former hospital building into an emergency respite center for the homeless patients with COVID-19
- BMC inpatient pharmacy supplied an automated dispensing cabinet
- BMC outpatient pharmacy supplied and delivered over 2,000 prescriptions
- Allowed for reduced spread during the first COVID-19 surge and allowed for local plans to house patients experiencing homelessness in hotels to be established for the rest of the pandemic





# BMC Influenza-Like-Illness Clinic Reduces Emergency Department Patient Volume



## Audience Assessment Question #2

*True or False: When preparing for a surge in patient volume due to the COVID-19 pandemic, hospitals only need to focus on the inpatient management of patients.*

- a. True
- b. False

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- a. True
- b. False**



# Pharmacy Initiatives to Optimize Patient Care Across All Stages of Care

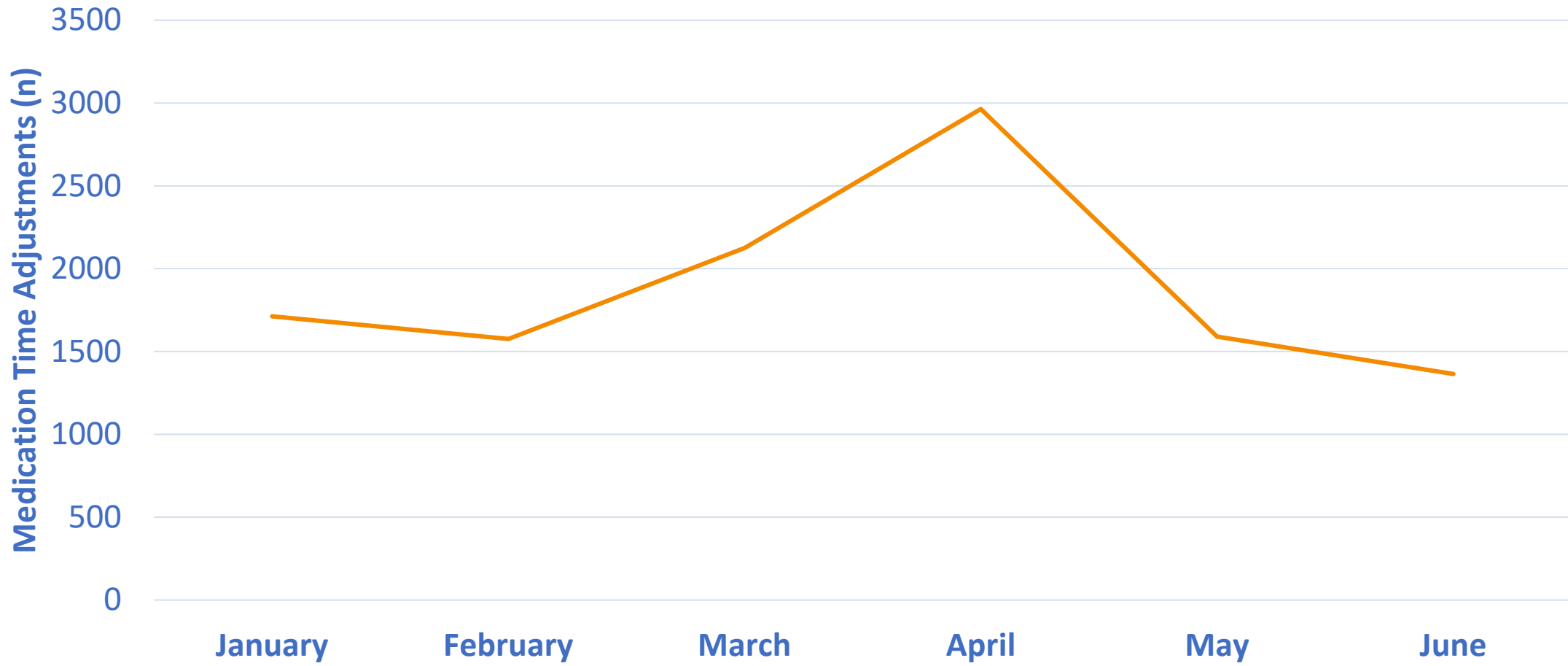
# Pharmacists Wear Many Hats When Providing Patient Care



# Utilization of Pharmacy Residents to Expand Clinical Coverage & Support Operations

- BMC altered its 12 pharmacy residents' rotations from preceptor-directed learning experiences to more independent learning experiences
  - Clinical coverage
  - Operation needs
  - Pharmacy to dose protocols
  - Antimicrobial stewardship
- Reallocation of staff to provide an additional medicine evening shift and 24/7 ICU coverage
- Overtime pay was also available to ensure adequate staffing coverage during the COVID-19 surge

# Pharmacist Adjustment of Medication Times to Allow for Bundling





## Ensuring Adequate Medication Stock in the Care Areas

- Centralized pharmacists and technicians reconfigured 17 automated dispensing cabinets to meet their new needs for ICU, telemetry, medical/surgical, or adult patients
- After the COVID-19 surge, all 17 automated dispensing cabinets needed to be converted back to their original contents
- Automated dispensing cabinet biometric access needed to be added and later removed for thousands of nursing, physician and pharmacy staff

Automated Dispensing Cabinet		
Action	Before COVID-19	COVID-19
Average Refills/Day	2064	1731
Average Loads/Day	65	87
Average Unloads/Day	62	81

## Medication Counseling Prior to Discharge

- Our BMC Pharmacist documentation of TOC activities remained consistent with our pre-pandemic numbers
- To conserve PPE when possible, our pharmacists would counsel patients over the phone or through portable tablets with video capabilities
- Decentralized pharmacists worked closely with the care teams to coordinate prescribing to our BMC outpatient pharmacies to facilitate medication to bedside delivery at discharge or coordination of care at the emergency respite center
- Arrangements were also made to have our ambulatory care pharmacists provide a telehealth follow-up visit about discharge medications with patients being discharged to home



# Outpatient Pharmacy Initiatives to Support our BMC Patients

- Our BMC outpatient pharmacies converted over 12,000 prescriptions in 1,979 individual patients to mail order delivery
  - Whenever possible, the prescriptions were filled for a 90-day supply
  - 56 individual prescriptions were medications for opioid use disorders
- Provided up to 14-day supplies of medications for patients with COVID-19 housed in our emergency respite care center at East Newton during the first COVID-19 surge
- Provided up to 14-day supplies of medications for patients experiencing homelessness that were housed temporarily in local hotels
- Prevent stockpiling of medications (e.g., hydroxychloroquine)
- Combat COVID-19 medication misinformation



## Ambulatory Care Pharmacist Appointments via Telehealth

- Ambulatory care pharmacists also supported the outpatient pharmacy efforts by staffing 1 to 2 days per week in the outpatient pharmacy instead of providing telehealth appointments
- Ambulatory care pharmacists switched from 100% in-person appointments to 100% telehealth visits
- Telehealth visits enabled our pharmacists to see at least 100% of their historical weekly patient volume
  - Visit volume per pharmacist increased by an average of 138%
  - Following the first COVID-19 surge, ambulatory care pharmacist telehealth appointments increased to 163% of their historical weekly volume
- Billing for services remained consistent despite the switch from in-person to telehealth visits
- Combat COVID-19 medication misinformation



## Audience Assessment Question #3

*How can pharmacists provide patient-care during a pandemic?*

- a. Continuing to care for patients with chronic diseases through telehealth appointments
- b. Collaborating with inpatient medical teams on patient-specific medication regimens
- c. Dispensing prescription medications to patients via in-person or mail-order delivery
- d. All of the Above

## Audience Assessment Question #3

*How can pharmacists provide patient-care during a pandemic?*

- a. Continuing to care for patients with chronic diseases through telehealth appointments
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- c. Dispensing prescription medications to patients via in-person or mail-order delivery
- d. All of the Above**



## Conclusion

- Multidisciplinary collaboration is needed to successfully care for both the influx of and existing patients during the COVID-19 pandemic
- Staff flexibility and adaptability to take on new roles and utilize new resources allows for hospitals to meet the needs of the patients
- Post-discharge TOC services with continued care through telehealth or mobile clinicians are needed to help reduce readmissions and prevent additional COVID-19 exposures in the community



## References (1)

- Alexander GC, Tajanlangit M, Heyward J, Mansour O, Qato DM, Stafford RS. Use and content of primary care office-based vs telemedicine care visits during the COVID-19 pandemic in the US. *JAMA Netw Open*. 2020;3:e2021476
- Baughman AW, Hirschberg RE, Lucas LJ, et al. Pandemic care through collaboration: lessons from a COVID-19 field hospital. *J Am Med Dir Assoc*. 2020;21:1563-7
- Bazzell B, Wagner D, Durant KM, Callahan B. Insights on developing a field hospital formulary and medication distribution process in preparation for a second surge of COVID-19 cases. *Am J Health Syst Pharm*. 2020;77:1763-70
- Bestsenny O, Gilbert G, Harris A. “Telehealth: a quarter-trillion-dollar post-COVID-19 reality?” *McKinsey & Company*; 2020 Jun 1, <https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/telehealth-a-quarter-trillion-dollar-post-covid-19-reality#>
- Bhat S, Kehasse A. Additional clinical pharmacists roles during COVID-19. *J Am Coll Clin Pharm* [online ahead of print]. 2020;doi:10.1002/jac5.1243
- Blackwell T, Bosse M. Use of an innovative design mobile hospital in the medical response to Hurricane Katrina. *Ann Emerg Med*. 2007;49:580-8
- Caputo ND, Strayer RJ, Levitan R. Early self-proning in awake, non-intubated patients in the emergency department: a single ED's experience during the COVID-19 pandemic. *Acad Emerg Med*. 2020;27:375-8

## References (2)

- Castillo M, Conte B, Hinkes S, et al. Implementation of a medical student-run telemedicine program for medications for opioid use disorder during the COVID-19 pandemic. *Harm Reduct J* [online ahead of print]. 2020;doi:10.1186/s123954-020-00438-4
- COVID-19 Treatment Guidelines Panel. Coronavirus Disease 2019 (COVID-19) Treatment Guidelines. National Institutes of Health. Available at <https://www.covid19treatmentguidelines.nih.gov/>. Accessed [February 2, 2021]
- D'Andrea SM, Goralnick E, Kayden SR. 2013 Boston Marathon bombings: overview of an emergency department response to a mass casualty incident. *Disaster Med Public Health Prep.* 2013;7:118-21.
- Dart RC, Goldfrank LR, Erstad BL, et al. Expert consensus guidelines for stocking of antidotes in hospitals that provide emergency care. *Ann Emerg Med.* 2018;71:314-325.e1
- Eberly LA, Kallan MJ, Julien HM, et al. Patient characteristics associated with telemedicine access for primary and specialty ambulatory care during the COVID-19 pandemic. *JAMA Netw Open.* 2020;3:e2031640
- Elson EC, Oermann C, Duehlmeyer S, Bedsoe S. Use of telemedicine to provide clinical pharmacy services during the SARS-CoV-2 pandemic. *Am J Health Syst Pharm.* 2020;77:1005-6
- Farrell NM, Hayes BD, Linden JA. Critical medication shortages further dwindling hospital resources during COVID-19. *Am J Emerg Med.* 2020;S0735-6757(20)30404-6
- Harris M, Johnson S, Mackin S, Saitz R, Walley AY, Taylor JL. Low barrier tele-buprenorphine in the time of COVID-19: a case report. *J Addict Med.* 2020;14:e136-e138

## References (3)

- Hayden JC, Parkin R. The challenges of COVID-19 for community pharmacists and opportunities for the future. *Ir J Psychol Med.* 2020;37:198-203
- Jiang LG, LeBaron J, Bodnar D, et al. Conscious proning: an introduction of a proning protocol for nonintubated, awake, hypoxic emergency department COVID-19 patients. *Acad Emerg Med.* 2020;566-9
- Marwitz KK. The pharmacist's active role in combating COVID-19 medication misinformation. *J Am Pharm Assoc (2003).* 2021;61:e71-74
- Niska RW, Burt CW. Bioterrorism and mass casualty preparedness in hospitals: United States, 2003. *Adv Data.* 2005;364:1-14.
- Ranney ML, Griffeth V, Jha AK. Critical supply shortages – the need for ventilators and personal protective equipment during the COVID-19 pandemic. *N Engl J Med.* 2020;382:e41
- Sanford C, Jui J, Miller HC, Jobe KA. Medical treatment at Louis Armstrong New Orleans International Airport after hurricane Katrina: the experience of disaster medical assistance teams WA-1 and OR-2. *Travel Med Infect Dis.* 2007;5:230-5
- Sylvester KW, Rocchio MA, Belisle C, Matta L, Goralnick E. Pharmacy response to the Boston Marathon bombings at a tertiary academic medical center. *Ann Pharmacother.* 2014;48:1082-5
- Verni C. A hospital system's response to a hurricane offers lessons, including the need for mandatory interfacility drills. *Health Aff (Millwood).* 2012;31:1814-21
- Weiner DL, Manzi SF, Briggs SM, Fleisher GR. Response to and lessons learned from Hurricanes Katrina and Rita: a national perspective. *Pediatrics.* 2011;128:S31-3

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# Thank you...

Natalija Farrell, PharmD, BCPS, DABAT  
([Natalija.Farrell@bmc.org](mailto:Natalija.Farrell@bmc.org))

Twitter: [@NatalijaFarrell](https://twitter.com/NatalijaFarrell)

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