Access the entire webinar series here:
https://files.asprtracie.hhs.gov/documents/lessons-learned-in-healthcare-operations-during-a-pandemic-speaker-series-summary.pdf

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HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

Healthcare Operations during the COVID-19 Pandemic- Speaker Series

March 2021

ASPR
ASSISTANT SECRETARY FOR PREPAREDNESS AND RESPONSE

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Access speaker bios here:
[Patrick Ryan, MD MPH]
[Rebecca Hanratty, MD]
[Connie Price, MD]

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HEALTHCARE EMERGENCY PREPAREDNESS INFORMATION GATEWAY

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Overview

- About Denver Health
- Overview of Denver Health COVID Surge Plans
- Review Virtual Hospital at Home Goals
- Review Virtual Hospital at Home Workflows
- Review Virtual Hospital at Home Outcomes
- Lessons Learned with Remote Home Monitoring

DENVER HEALTH
est. 1860
FOR LIFE'S JOURNEY

- Urban Safety-Net 550 Bed Hospital
- Level One Trauma Center
- 9 Federally Qualified Community Health Centers

Pre-COVID Capacity

- 227 Adult Med/Surgery/Critical Care beds
  - 47 MICU/SICU and 12 Intermediate Care
- Frequent adult ED boarding
- Typically had available capacity in our Women and Children pavilion

Spring Surge

- Large numbers of sick COVID patients, but hospital still had overall capacity
- Added ICU infrastructure to multiple med/surg units
- Converted a unit that had been partially med/surg and partially intermediate care into a “flexible” unit
  - Med/surg, intermediate, and critical care patients on one unit
- Consolidated lower census pediatric units. Used additional beds for adults
- Created a surge plan
- Developed Virtual Hospital at Home Program

Fall Surge

- Increased non-COVID and COVID patients, so hospital is much fuller
- Permanently converted overflow W&C unit to increase adult med/surg capacity
- Privileged Pediatricians to treat patients up to age 30, placed in Pediatric units
- Availability of heated high flow oxygen on general medicine wards to offload ICU
- Modifications to surge plan
  - No big increases: break down surge levels to allow for staffing recruitment to keep pace with increased capacity
    - Temporary staff recruitment
- Executive Order from Colorado Governor to increase capacity by 50%

Level	Special Pathogen status	Critical Care beds	Intermediate Care beds	Med/Surge beds	VHH†
Level 1 Hospital beds:* 227 (2019)	Special Pathogen +/- *(hybrid)*	MICU - 24	PCU - 12	0	N/A
	Special Pathogen -	SICU - 23	0	9A - 36 8A - 36 7A - 28 6A - 20 4B - 30 3B - 18	
Level 2 Hospital beds:* 255 VHH: 38 (Spring 2020)	Special Pathogen +/- *(hybrid)*	MICU - 24 3B - 4	3B - 21	9A - 36 3B - 5	38
	Special Pathogen -	SICU - 23	0	8A - 36 7A - 28 6A - 31 4B - 30 4C South - 17	
Level 3 Hospital beds:* 255 VHH: 45 (Fall 2020)	Special Pathogen +/- *(hybrid)*	MICU - 24 3B - 6 SICU - 6	3B - 18	9A - 36 3B - 6 4B - 30	45
	Special Pathogen -	SICU - 17	0	8A - 36 7A - 28 6A - 31 4C South - 17	
Level 4 Hospital beds:* 255 VHH: 45	Special Pathogen +/- *(hybrid)*	MICU - 24 3B - 12 SICU - 6	3B - 18	9A - 36 4B - 30	45
	Special Pathogen -	SICU - 17	0	8A - 36 7A - 28 6A - 31 4C South - 17	
Level 5.1 Hospital beds:* 267 VHH: 45	Special Pathogen +/- *(hybrid)*	MICU - 24 3B - 12 SICU - 6	3B - 18	9A - 36 4B - 42 *(12 double rooms)*	45
	Special Pathogen -	SICU - 17	0	8A - 36 7A - 28 6A - 31 4C South - 17	
Level 5.2 Hospital beds:* 279 VHH: 50	Special Pathogen +/- *(hybrid)*	MICU - 24 3B - 18 SICU - 6	3B - 12	9A - 36 4B - 54 *(24 double rooms)*	50
	Special Pathogen -	SICU - 17	0	8A - 36 7A - 28 6A - 31 4C South - 17	
Level 6 Hospital beds:* 323 VHH: 60 - 70	Special Pathogen +/- *(hybrid)*	MICU - 24 3B - 30 SICU - 6	4B - 12	9A - 62 *(double/ triple rooms)* 4B - 36 *(18 double rooms)*	60 - 70
	Special Pathogen -	SICU - 17	PreOp - 10	8A - 36 7A - 28 6A - 31 4C South - 17 5W - 14	
Level 7 Hospital beds*: 352+ VHH: 60 - 70	Special Pathogen +/- *(hybrid)*	MICU - 24 3B - 30 4B - 30 SICU - 6	0	9A - 62 *(double/ triple rooms)* 8A - 36+	60 - 70
	Special Pathogen -	SICU - 17	PreOp - 20 PACU - 17	7A - 28+ 6A - 31+ 4C South - 17 5W - 14 2M - 20	

Virtual Hospital at Home (VHH)

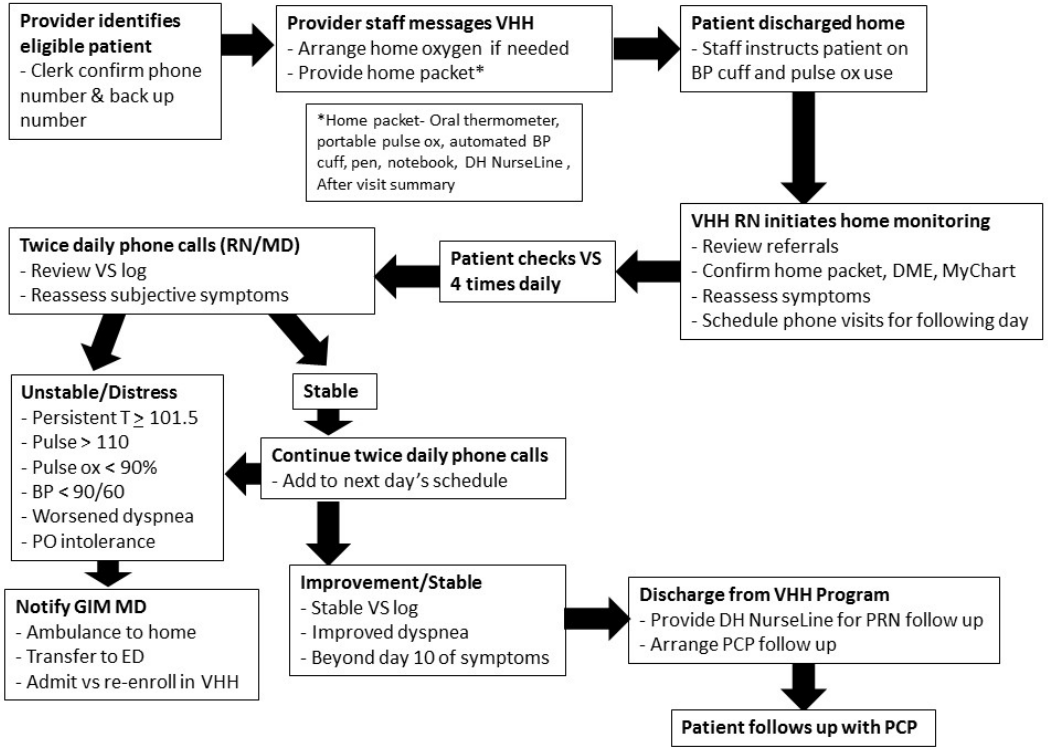
- Developed in March 2020 through interdepartmental collaboration
- Program goals:
  - Provide care to COVID patients in event of surge
  - Decrease length of stay
  - Reduce ED visits and rehospitalization

VHH Target Population

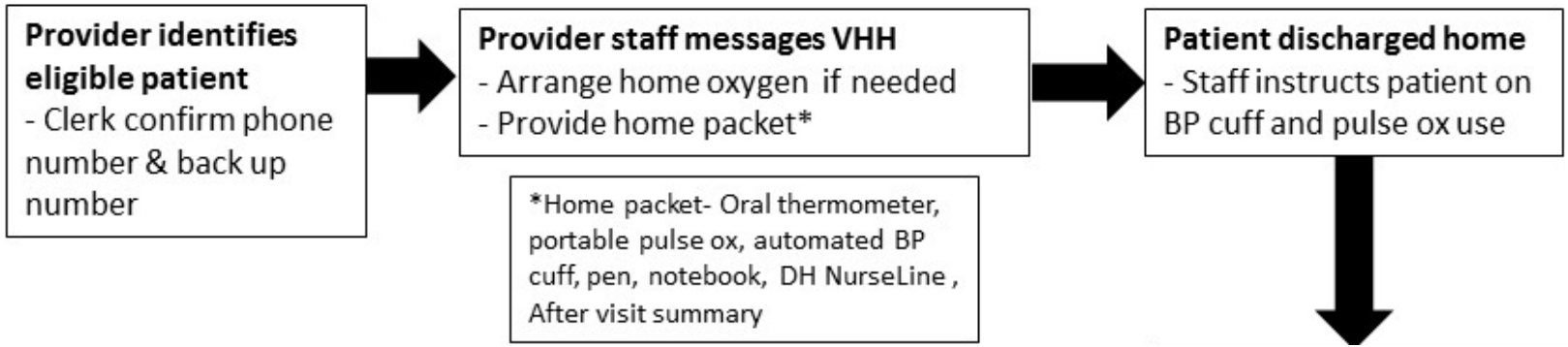
- Risk factor based for severe disease course
- Patients need ≥ 2 risk factors:

• Age ≥ 65	• COPD/Asthma
• CKD	• Malignancy
• CAD	• Obesity
• CHF	• Diabetes
• HTN	• Immunocompromised
• ESLD/cirrhosis	

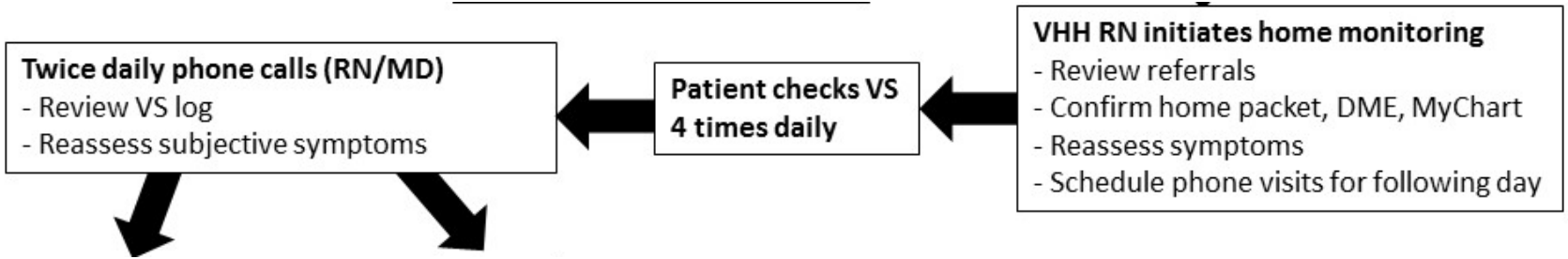
VHH Workflows



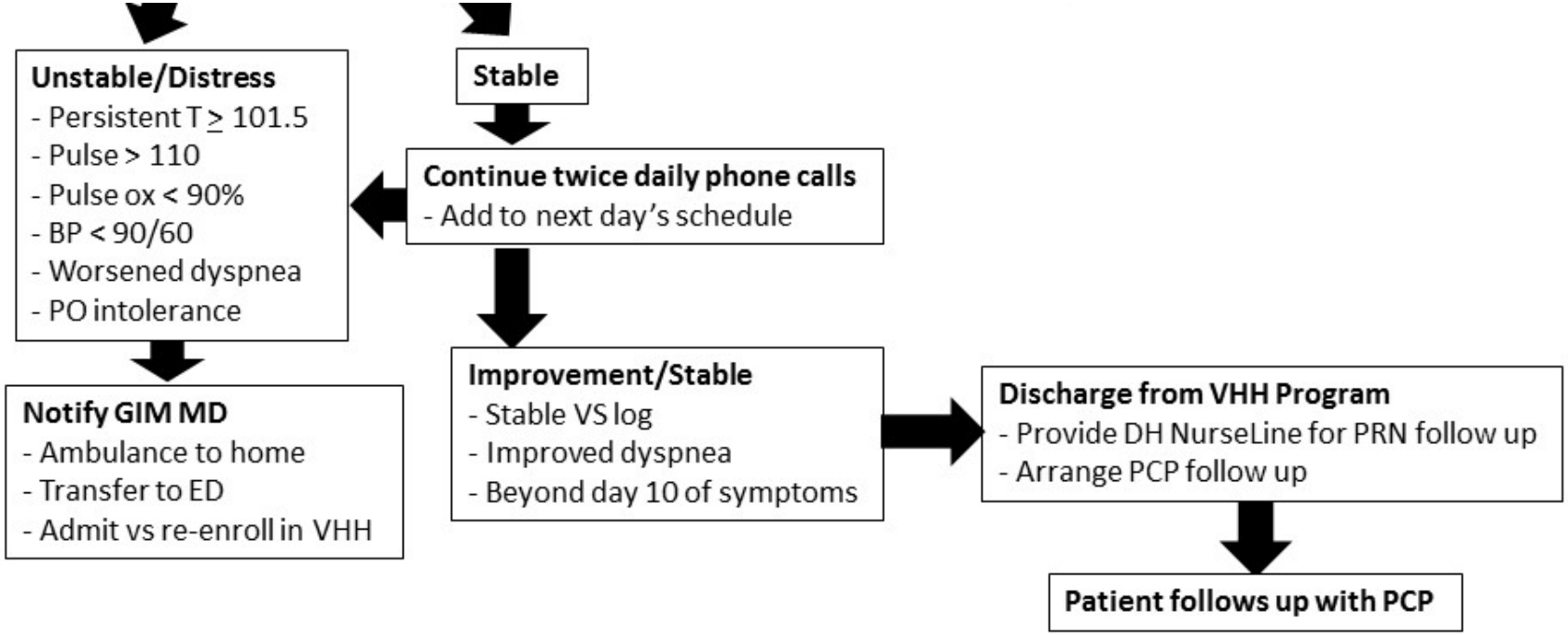
VHH Workflows



VHH Workflows



VHH Workflows



VHH Staffing

- Primary Care and Urgent Care Providers
- Clinic Based RN's
- Clinic Based MA and Care Navigators
- Occasional Resident Physicians

VHH Data (as of November 25, 2020)

Demographics	N = 668 (%)
Mean Age (std dev)	51.4 (15.4)
Age ≥ 65	137 (20.5)
Female	391 (58.5)
Has a PCP	573 (85.8)
Race/Ethnicity	
Hispanic	460 (68.9)
White	122 (18.3)
African American	55 (8.2)
Other/Unknown	31 (4.6)
Preferred Language	
English	360 (53.9)
Spanish	283 (42.4)
Non-English/Non-Spanish	25 (3.7)

VHH Data (as of November 25, 2020)

Referral Source	N = 668 (%)
PCP	223 (33.4)
Urgent Care	187 (27.9)
Emergency Department	157 (23.5)
Post-Discharge	95 (14.2)
Other	6 (1)

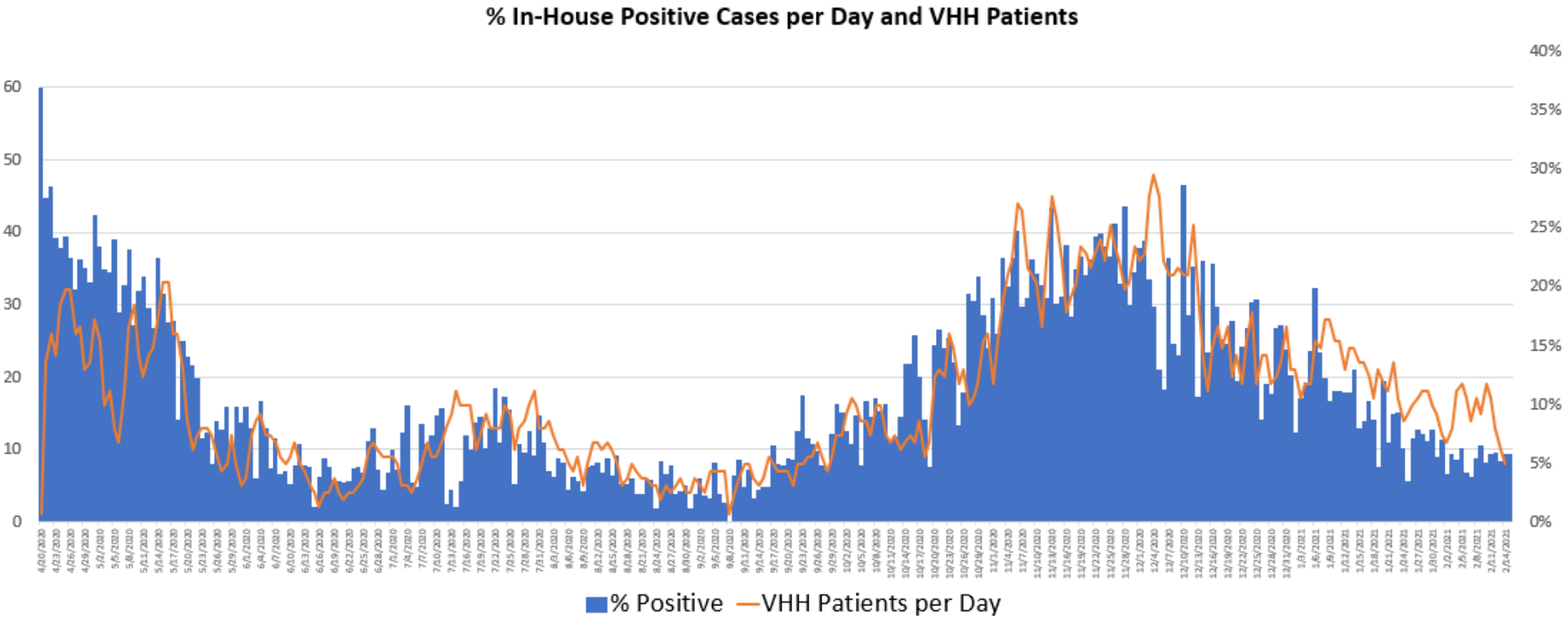
VHH Data (as of November 25, 2020)

Comorbid Conditions	N = 668 (%)
HTN	290 (43.4)
Obese BMI	288 (43.1)
COPD/Asthma	227 (34)
CAD	29 (4)
CHF	17 (2.5)

VHH Outcomes (as of May 28, 2020)

VHH Outcomes	N = 233 (%)
Discharged from VHH	202 (86.7)
ED Visit	19 (8.2)
Floor Admission	10 (4.3)
ICU Admission	2 (0.9)

VHH Outcomes



Patient Experience

- “The care team had communication with me, and they explained and answered all my questions. It was a good program, because they were concerned abut my health. I'm glad it will help others.”

- “I just want to tell everybody thank you, it (the pandemic) has been tough for a lot of people. My mom had a difficult time with her symptoms, but the doctors were there to help me care of my mom. The program was really good.”

VHH Lessons Learned

- Teamwork
- Flexibility
- Adaptability

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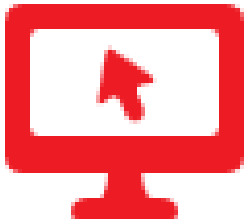

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