



Health Services
LOS ANGELES COUNTY



Taking Cardiovascular Care HOME: Optimizing Care of Patients with Hypertension

Laura Myerchin Sklaroff, MA

Sandra Gross-Schulman, MD, MPH, RN

Jeffrey G. Guterman, MD, MS

December 15, 2020

Los Angeles County Department of Health Services

- More than 4,700 square miles
- Over 425,000 empaneled patients
 - Diverse (11% are African Americans and 64% are Latino/a/x)
 - High Burden of Illness (> 40% of patients have diabetes, heart failure, or asthma, and one or more other chronic conditions)
- 4 hospital campuses and 27 standalone ambulatory care facilities
- 1 Enterprise-wide EHR

Nurse-Executed, Standardized Procedure-Driven HTN Medication Titration

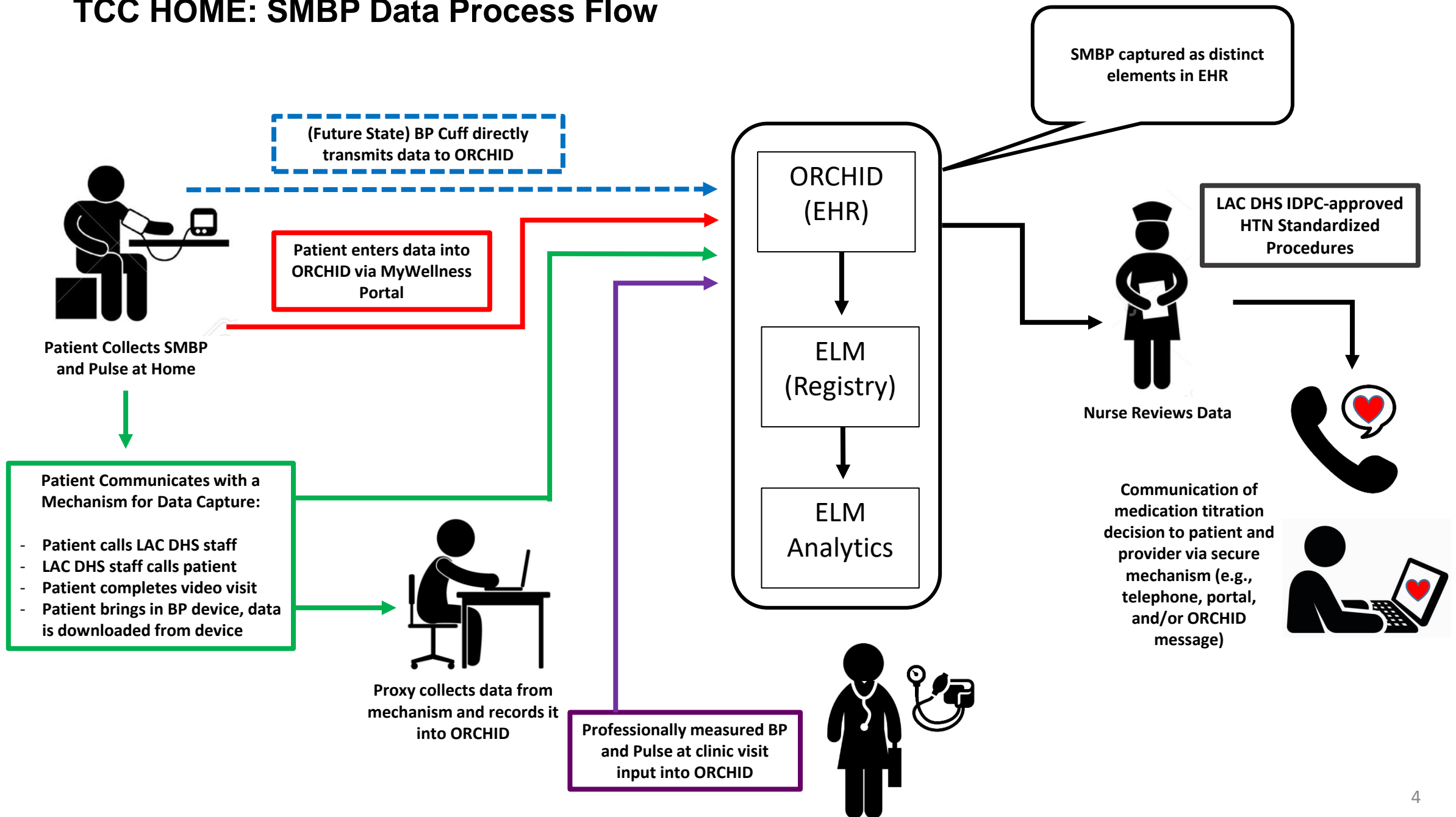
Aims

- Increase the patient percentage and speed to BP goal
- Empower RN Medication Titration independent of specific provider order
- Engage patients as a member of the care team

Approaches

- Home SMBP collection, reporting, and integration into EHR
- Remote and in-person visits
- Decision support built into EHR
- Add elbow support to traditional nurse education

TCC HOME: SMBP Data Process Flow



Hypertension Medication Adjustment: Benazepril

Do not use this standardized procedure for medication titration and consult provider if patient is:

- **Having their hypertension (HTN) managed by a cardiologist or nephrologist**
- **has uncontrolled HTN and on at least 4 antihypertensive medications**
- **has an eGFR less than 30 mL/min**
- **has suspected or confirmed aortic stenosis**
- **is pregnant (or becomes pregnant) or breastfeeding**

If a patient is being actively titrated and is hospitalized for any reason, stop titration and message the provider to re-request nurse titration as appropriate.

If the patient has a rise from their baseline to a BP that is greater than systolic BP 180 mmHg or diastolic BP 120 mmHg, ask about symptoms of possible hypertensive emergency (e.g., headache, confusion, dizziness, blurred vision, facial drooping, slurred speech, numbness, weakness, chest pain, shortness of breath); if patient has symptoms of possible hypertensive emergency, notify provider immediately.

When was the last dose adjustment?



What is the target BP?



Provider specified:



Patient has diabetes, chronic kidney disease or cardiovascular disease: less than 130/80 mmHg



All other patients: less than 140/90 mmHg

Systolic/Diastolic BP

mmHg



mmHg



[Go to Symptoms tab](#)

Last Dose Adjust

Symptoms

Orthostatics

BP Used For Titra

Titration Decision

Medication Adher

Orders and Action

Education

Lab View

*Performed on: 11/30/2020 1703 PST

By: AMBRNTITRA, Amb RN with Titration

Are there new Cr and K+ results since the last dose adjustment?

☒ Yes

☐ No

Last Labs Creatinine, eGFR and Potassium

Event Name	Event Result	Date/Time
Creatinine Lvl	0.8 mg/dL	11/12/20 07:41:00

Event Name	Event Result	Date/Time
Potassium Lvl	4 mmol/L	11/12/20 07:41:00

Baseline Cr: 0.75 mg/dL 08/26/2019

Has the latest Cr increased by more than 30% from baseline?

Baseline Cr: 0.75 mg/dL Latest Cr: 0.8 mg/dL Percent Change: 7 %

☐ Yes - do not titrate medication by SP; continue assessment and consult provider

☒ No

Is the latest K+ more than the upper limit of normal (ULN)?

Latest K+: 4.0 mmol/L

☐ Yes - do not titrate medication by SP; continue assessment and consult provider

☒ No

If patient in clinic, order Cr and K+ labs per local policy to obtain rapid results within 90 minutes or less; re-assess patient when results are available. If clinic unable to obtain results within 90 minutes or less or patient not in clinic, order routine Cr and K+ labs; reschedule assessment

☐ Order Cr and K+ labs per local policy to obtain rapid results within 90 minutes or less; re-assess when results are available

Save form till rapid results are available

☐ Order routine Cr and K+ labs and reschedule assessment

Go to Education tab if routine Cr and K+ labs are ordered

Has the Cr increased by more than 30% from baseline?

Baseline Cr: Latest Cr: Percent Change:

☐ Yes - do not titrate medication by SP; continue assessment and consult provider

☐ No

In Progress



*Performed on: 11/30/2020 1703 PST

By: AMBRNTITRA, Amb RN with Titration

- Last Dose Adjust
- Symptoms
- Orthostatics
- ✓ BP Used For Titration
- Titration Decision
- Medication Adher
- Orders and Action
- Education
- Lab View

Blood Pressure

Systolic Blood Pressure	Diastolic Blood Pressure
Systolic Blood Pressure: 160 mmHg (11/20/20 11:02:00)	Diastolic Blood Pressure: 90 mmHg (11/20/20 11:02:00)
Systolic Blood Pressure: 120 mmHg (10/23/20 08:01:00)	Diastolic Blood Pressure: 75 mmHg (10/23/20 08:01:00)
Systolic Blood Pressure: 120 mmHg (06/18/20 08:47:00)	Diastolic Blood Pressure: 78 mmHg (06/18/20 08:47:00)

BP Used For Titration Decision

Is the patient doing Self Measured Blood Pressure (SMBP)?

☒ Yes ☐ No

Does the patient have at least 2 SMBP values measured on 2 different days in the past week? (if there are only 2 SMBP in the past week, use a new SMBP or the lowest clinic-measured BP for 3rd value)

☒ Yes ☐ No

If No, go to Education tab

SMBP 1: 150 mmHg / 92 mmHg

SMBP 2: 164 mmHg / 88 mmHg

☐ SMBP 3 ☒ Clinic-measured BP

SMBP 3: mmHg / mmHg

Or

Clinic-measured BP: 156 mmHg / 94 mmHg

Comments:

Average SMBP: mmHg / mmHg

Average SMBP + Clinic BP: 157 mmHg / 91 mmHg

Clinic-measured BP: mmHg / mmHg

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Last Dose Adjust

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Titration Decision

Is the BP at target?

☐ Yes ☒ No

If Yes, go to Education tab

Is one of the BP's used for this decision a clinic measured BP?

☒ Yes ☐ No

Wait at least 5 minutes and repeat BP

Repeat BP:

150 mmHg / 86 mmHg

Average BP (SMBP 1, SMBP 2 and Repeat BP)

155 mmHg / 89 mmHg

Is the repeat BP in target range?

☐ Yes ☒ No

If Yes, go to Education tab

Has the patient started any new OTC or prescribed medication within the past 7 days and taken a dose in the last 24 hours?

☐ Yes ☒ No

Name of Drug:

Name of Drug:

Did the patient skip any of their BP medications in the last 24 hours?

☐ Yes ☐ No

Have the patient take their medications, wait 30 minutes and re-check BP

Re-checked BP

mmHg / mmHg

Is re-checked BP in target range?

☐ Yes ☐ No

If Yes, go to Education tab



Orders and Actions – Diagnosis: Hypertension

Reminder - do not titrate by SP if:

1. The patient has symptoms of orthostasis and you are not able to obtain orthostatic vital signs now or orthostatic vital signs are consistent with orthostasis

2. The patient developed an intractable cough

3. There new Cr and K+ results since the last dose adjustment and the latest Cr increased by more than 30% from baseline or the latest K+ is more than the upper limit of normal (ULN)

Adherence is Moderate or High. Select current dose for step up order recommendation

Daily dosing:

- ☒ 5 mg PO Daily - step up to 10 mg PO Daily; re-assess in 12-28 days
☐ 10 mg PO Daily - step up to 20 mg PO Daily; re-assess in 12-28 days
☐ 20 mg PO Daily - step up to 40 mg PO Daily; re-assess in 12-28 days
☐

BID dosing:

- ☐ 2.5 mg PO BID - step up to 5 mg PO BID; re-assess in 12-28 days
☐ 5 mg PO BID - step up to 10 mg PO BID; re-assess in 12-28 days
☐ 10 mg PO BID - step up to 20 mg PO BID; re-assess in 12-28 days

- ☒ Step-up dose replaces previous dose; previous dose discontinued; pharmacy and provider notified of both actions
☒ In the 'eRx Note to Pharmacy' box, write the following message: Medication titrated to (dose) mg on (date) and is replacing the (dose) mg dose; pharmacy informed
☐ If patient using outside pharmacy, pharmacy called and notified of change

Labs - check labs 12-28 days after medication titration, prior to next assessment

☒ [Order Cr and K+ Labs](#)

Notes

Segoe UI

9





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Last Dose Adjust

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Education Section

Medication Specific Education

- ☐ Reinforce with pre-menopausal females who have not had a hysterectomy not to become pregnant while taking this medication

General HTN Patient Education - Educate patient on:

- ☒ Importance of medication adherence and possible side effects of abrupt cessation of therapy (e.g., angina, myocardial infarction, worsening heart failure); confirm that patient has enough medication to last until the next visit
- ☒ Refilling their prescriptions before they run out by using a calendar reminder note
- ☒ Filling and using their pill box as specified
- ☒ Setting up reminders such as a calendar, chart, alarm, color-coded medication reminders, using a smart phone app, asking friends or family, or trying to link taking their medication with something they do regularly at the same time each day
- ☒ Symptoms of possible hypertensive emergency (e.g., headache, confusion, dizziness, blurred vision, facial drooping, slurred speech, numbness, weakness, chest pain, shortness of breath)
- ☒ To contact staff for any perceived side effects, especially dizziness or lightheadedness

BP device and cuff given to patient on 10/28/2020

- ☒ Patient trained on use of BP device and cuff
- ☐ Patient has their own BP device and proper use reinforced
- ☒ Hypertension patient packet (log, education materials) given and reviewed with patient
- ☒ Confirm that patient has an upcoming appointment for titration
- ☐ Inform Provider that patient is on maximum tolerated dose per standardized procedure
- ☐ Inform Provider that patient's BP is at target

Additional Comments

Segoe UI

9



HTN Med Titration: Benazepril Entered On: 12/05/2020 14:37 PST
Performed On: 12/05/2020 14:25 PST by AMBRNTITRA, Amb RN with Titration

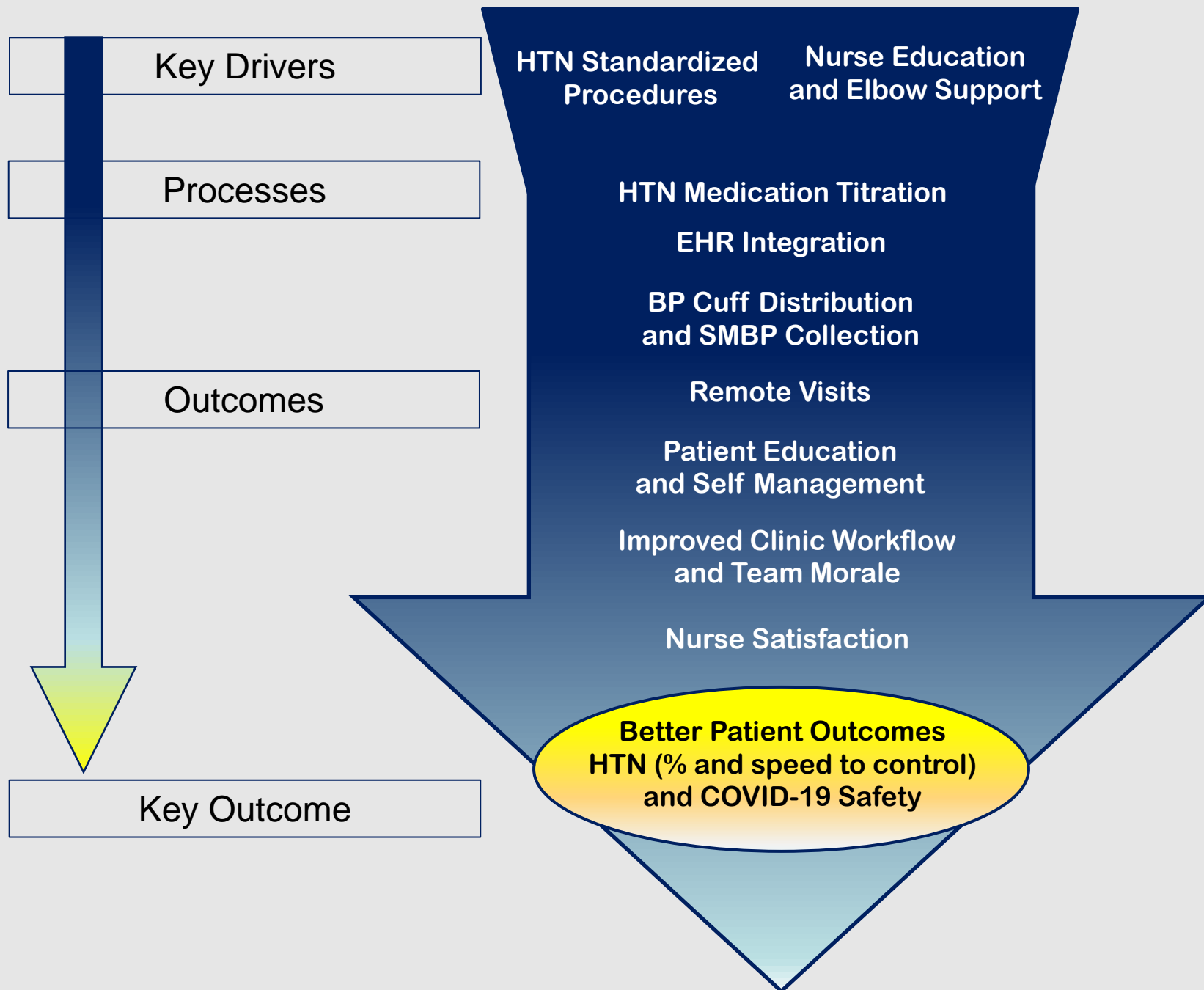
Last Dose Adjustment and Target BP*When was the last dose adjustment?:* 10/1/2020 PDT*What is the target BP?:* Provider specified:*Systolic Blood Pressure:* 140 mmHg*Diastolic Blood Pressure:* 70 mmHg

AMBRNTITRA, Amb RN with Titration - 12/05/2020 14:25 PST

Symptoms*Does the patient have symptoms of orthostasis?:* Yes*Description: (e.g., feel the room is spinning, dizziness, lightheaded or feeling of fainting, fainting):* dizziness*Symptom onset:* 4*Symptom onset time:* Days ago*Pattern of symptoms:* Episodic: how long does each episode last*Episode time:* 10*Episode duration:* Minutes*Provoking factors:* head movement*Associated symptoms:* none*Are you able to obtain orthostatic vital signs now?:* Yes - perform orthostatic vital signs (if patient unable to stand safely, use sitting position)*Are the orthostatic vital signs results consistent with orthostasis?:* No - continue assessment, inform provider of patient complaints*Is the patient pregnant or wants to become pregnant?:* No*Has the patient developed an intractable cough?:* No*Are there new Cr and K results since the last dose adjustment?:* Yes*Baseline Creatinine:* 0.75 mg/dL*Baseline Creatinine Date:* 8/26/2019 PDT*Latest Cr:* 0.8 mg/dL*Creatinine Percent change:* 7 %*Baseline Creatinine 2:* 0.75 mg/dL*Has the latest Cr increased by more than 30% from baseline?:* No*Potassium Level:* 4.0 mmol/L*Is the latest K more than the upper limit of normal (ULN):* No

AMBRNTITRA, Amb RN with Titration - 12/05/2020 14:25 PST

Orthostatics*BP Position 1:* Sitting*Systolic BP Position 1:* 150 mmHg*Diastolic BP Position 1:* 92 mmHg (Ht)*Pulse BP Position 1:* 64 bpm*Time BP Position 1:* 12:00 PST



Implementation by the Numbers

- 4 Sites Live (4 on deck for TC3, becoming standard of care in LAC DHS)
- 13 RNs Trained (~13 on deck)
- 10 Hypertension Standardized Procedures (so far)
- October and November 2020 (from 3 sites and 6 SPs)
 - 67 Patients Referred and Enrolled
 - 60 (90%) Had a visit
 - 37 (62%) already at BP goal

Lessons Learned

- PDSA Cycles
 - Virtual and In-Person
- The Devil is in the Details
 - Taking paper-based SMBP Logbooks into our EHR
- Managed care assigned members vs engaged patients

[illegible]

“This clinic reduces the burden on the limited clinic slots available for providers.”

“It’s great that we are acknowledging that our RNs are capable of running these clinics.”

“I am confident using HTN Protocols. Giving patients blood pressure machines for self monitoring is very effective. I think this is great so far for patient outcomes.”

Questions?

Contact Info:

Laura Myerchin Sklaroff

Project Coordinator

Lsklaroff@dhs.lacounty.gov

