Taking Cardiovascular Care HOME: Optimizing Care of Patients with Hypertension

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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
Patient Collects SMBP and Pulse at Home

(Future State) BP Cuff directly transmits data to ORCHID

Patient enters data into ORCHID via MyWellness Portal

Nurse Reviews Data

Proxy collects data from mechanism and records it into ORCHID

Professionally measured BP and Pulse at clinic visit input into ORCHID

SMBP captured as distinct elements in EHR

LAC DHS IDPC-approved HTN Standardized Procedures

Communication of medication titration decision to patient and provider via secure mechanism (e.g., telephone, portal, and/or ORCHID message)

TCC HOME: SMBP Data Process Flow

Patient Communicates with a Mechanism for Data Capture:
- Patient calls LAC DHS staff
- LAC DHS staff calls patient
- Patient completes video visit
- Patient brings in BP device, data is downloaded from device
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? 10/01/2023

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 140/80 mmHg

Systolic/Diastolic BP
- 140 mmHg
- 70 mmHg
HTN Med Titration: Benazepril - ZZZZ/TEST, SANDRA

Performed on: 1/30/2020 1739 PST

By: AMBRNTIRA, Amb RN with Titration

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

- Yes
- No

Last Labs: Creatinine, eGFR, and Potassium

<table>
<thead>
<tr>
<th>Event Name</th>
<th>Event Result</th>
<th>DateTime</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creatinine Lvl</td>
<td>0.8 mg/dl</td>
<td>1/1/2020 07:41:00</td>
</tr>
<tr>
<td>Potassium Lvl</td>
<td>4 mmol/L</td>
<td>1/1/2020 07:41:00</td>
</tr>
</tbody>
</table>

Baseline Cr: 0.79 ng/mL 08/26/2019

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

- Yes
- No

Baseline Cr: 0.79 ng/mL 08/26/2019
Latest Cr: 1.0 ng/mL
Percent Change: 30%

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

Latest K+:

- Yes
- 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:

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

Order routine Cr and K+ labs and recalculate assessment:

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

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

- Yes
- No

Baseline Cr: 0.79 ng/mL 08/26/2019
Latest Cr:
Percent Change: 0

- Yes: do not titrate medication by SP; continue assessment and consult provider
- No: do not titrate medication by SP; continue assessment and consult provider
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:  
- Systolic: 120 mmHg  
- Diastolic: 80 mmHg

SMBP 2:  
- Systolic: 150 mmHg  
- Diastolic: 75 mmHg

SMBP 3:  
- Clinic-measured BP

Or

Comments:

Average SMBP:

Average SMBP + Clinic BP:

Clinic-measured BP:
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:
90/60

Average BP (SMBP 1, SMBP 2 and Repeat BP)
120/80

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 2 days and taken a dose in the last 24 hours?  
☐ Yes  ☐ No  
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

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 are 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 vicinity, note to pharmacy, fax, write the following message: Medication replaced (dose mg on date) due to an increase in (dose mg), 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
**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
- [ ] Filing and using their pill box as specified
- [ ] Setting up reminders such as a calendar, alarm, color-coded medication reminders, using a smart phone app, adding 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, diarrhea, 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**
- [ ] Patient trained on use of BP device and cuff
- [ ] Patient has then own BP device and proper use reinforced
- [ ] Hypertension patient packet (log, education materials) given and reviewed with patient
- [ ] Patient scheduling a follow-up appointment to monitor
- [ ] Inform Provider that patient is on a revenue tolerated dose per standardized procedure
- [ ] Inform Provider that patient’s BP is at target

**Additional Comments**
- [ ] Segue UI
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

Symptoms
Does the patient have symptoms of orthostasis?: Yes
Description: (e.g., feel the room is spinning, dizziness, lightheadedness or feeling of fainting, fainting): dizziness
Symptom onset: 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

Orthostatics
BP Position 1: Sitting
Systolic BP Position 1: 150 mmHg
Diastolic BP Position 1: 92 mmHg (H)
Pulse BP Position 1: 64 bpm

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

Processes

Outcomes

Key Outcome

HTN Standardized Procedures

Nurse Education and Elbow Support

HTN Medication Titration

EHR Integration

BP Cuff Distribution and SMBP Collection

Remote Visits

Patient Education and Self Management

Improved Clinic Workflow and Team Morale

Nurse Satisfaction

Better Patient Outcomes

HTN (% and speed to control) and COVID-19 Safety
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
What Frontline Staff Are Saying

“This has been a really positive experience both for me and the nurses. The level of autonomy and confidence in the RNs has been wonderful.”

“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.”

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

“I am confident that with SPs we can do great with a diabetes titration clinic too.”

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

“Nurses are developing better relationships with the patients which only can improve overall outcomes.”
Questions?

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