

Evaluating the Inappropriate Use of Intravenous Anti-Hypertensive Agents in Setting of Inpatient Hypertensive Urgency

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INTRODUCTION

According to ACC/AHA guidelines, hypertensive urgency is defined as blood pressure (BP) of $\geq 180/\geq 110$ in the absence of end-organ damage (EOD). Signs and symptoms of EOD include AKI, aortic dissection, HF, MI, stroke, etc. There is limited data regarding how to appropriately treat asymptomatic elevated BP, particularly in an inpatient setting. It is a common practice to use IV antihypertensive agents to decrease BP; however, this leads to increased adverse events (AE) due to an acute drop in SBP $>25\%$ within the first two hours. There is significant data supporting oral agents for elevated BP readings, as this is less likely to lead to adverse events than IV therapy. It is also imperative to treat secondary causes of HTN such as pain or anxiety.

AIM

- Decreased the use of IV antihypertensive agents for hypertensive urgency within hospitalist teaching service (HTS), as this leads to an increased risk of adverse events, defined by SBP drop $>25\%$ within the first two hours.

Measures:

- Outcome measure: monitoring use of oral and IV antihypertensive medication
- Process measure: Instituting an order set to evaluate the need for treating elevated reading and providing safer oral alternative options

Changes:

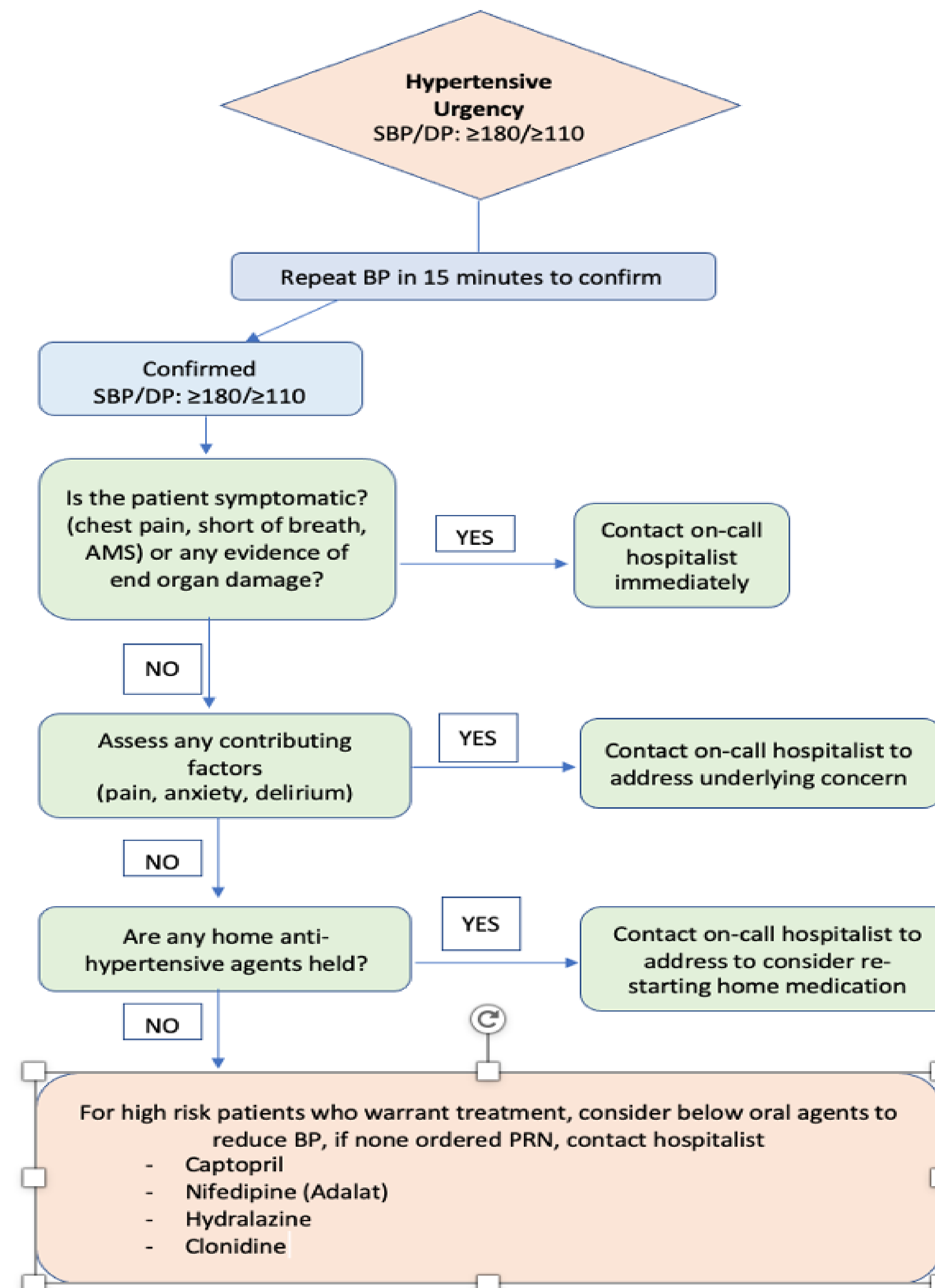
- Institutionalize order set
- Nursing education
- Resident education

PLAN

- Per research review, it is evident that IV antihypertensive medications provide more risk than benefit by leading to increase adverse events in the setting of hypertensive urgency
- The goal of this project is to decrease the overall use of IV BP medication and encourage monitoring BP or oral antihypertensive medications.
- An order set was implemented 10/2020 to help rule out other etiologies of elevated BP, as well as provide safer oral antihypertensive options, should a physician choose to treat
- Resident education within HTS to increase awareness regarding the risk of IV medications
- Nursing education to define parameters of hypertensive urgency and breakdown of order set

DO

Cycle 1: Order set implementation 10/2020



Cycle 2

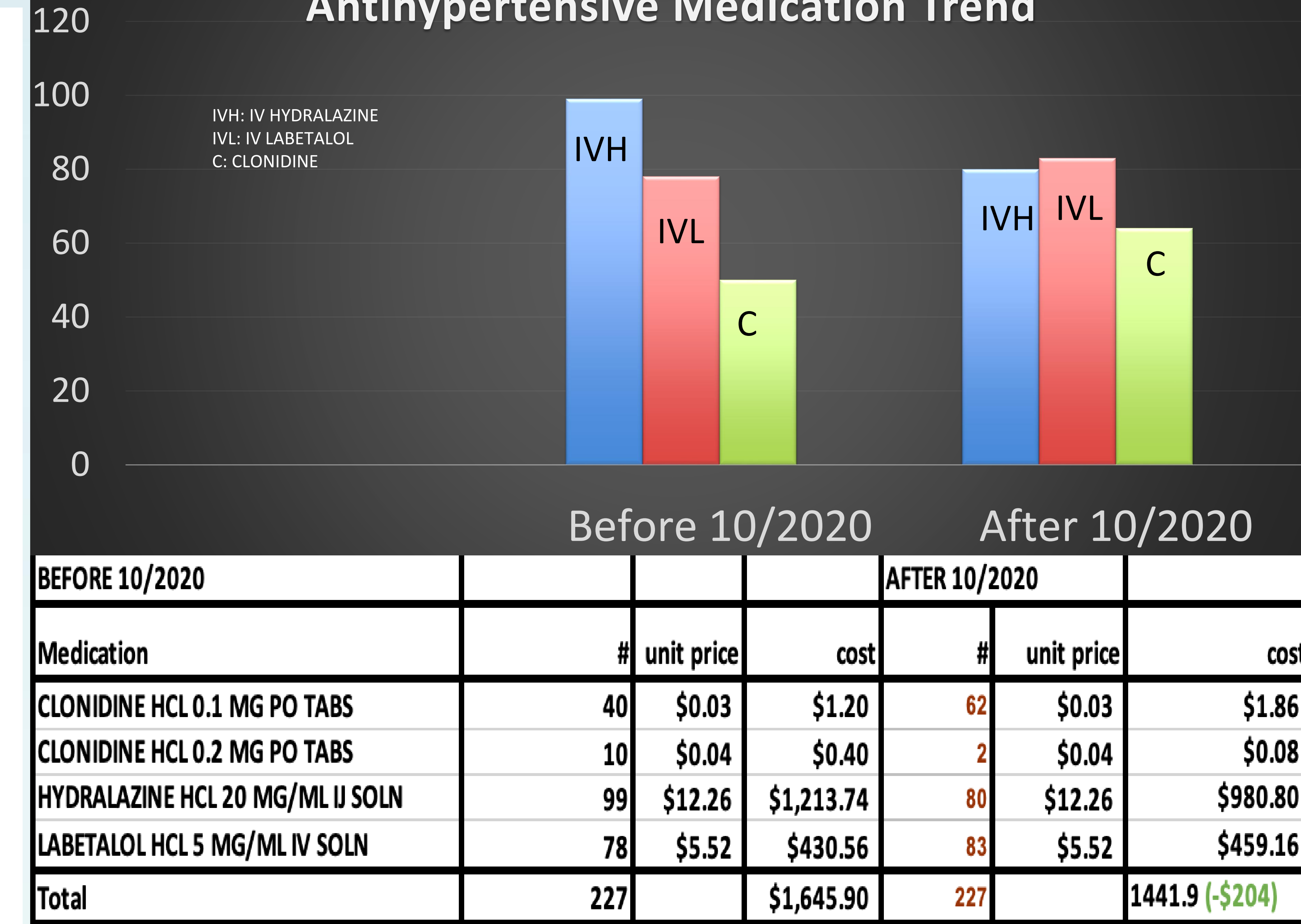
- Resident education during morning lecture, dedicated evidence-based morning report, and bedside teaching rounds

Cycle 3

- Nursing education provided via sharing an informative document with information on hypertensive urgency, and order set instructions, emailed to charge nurse and discussed in person with the nursing staff
- Education provided on medicine floors (15AB, 15 CD, 14 AB, 14 CD, 12 AB, 12 CD, 11 AB, 11 CD, 8Q), after implementation of order set (10/2020)

CHECK

Antihypertensive Medication Trend



- There was a total of 20 risks of adverse events (SBP drop $>25\%$ in the first two hours) noted after administration of IV or oral antihypertensive medication, **90%** was post IV antihypertensive, and **10%** post oral antihypertensive agent administration.

ACT

- There continues to be a significant number of IV antihypertensive medications used for elevated BP readings, which ideally can be decreased further
- Continued resident education and increasing nursing awareness is necessary to achieve this goal
- Future steps will include evaluating the number of times order set was utilized to track compliance

VALUE IMPACT

- As IV antihypertensive agents in the setting of hypertensive urgency have been associated with increased risk of adverse events, the benefit does not outweigh the risk for its use. The need for treating elevated blood pressure should be evaluated per the order set instruction.
- From a cost perspective, IV antihypertensive medication is more costly as opposed to oral agents. Therefore, decreasing and eventually eliminating IV medication for hypertensive urgency will improve patient safety and increase cost-effectiveness.

