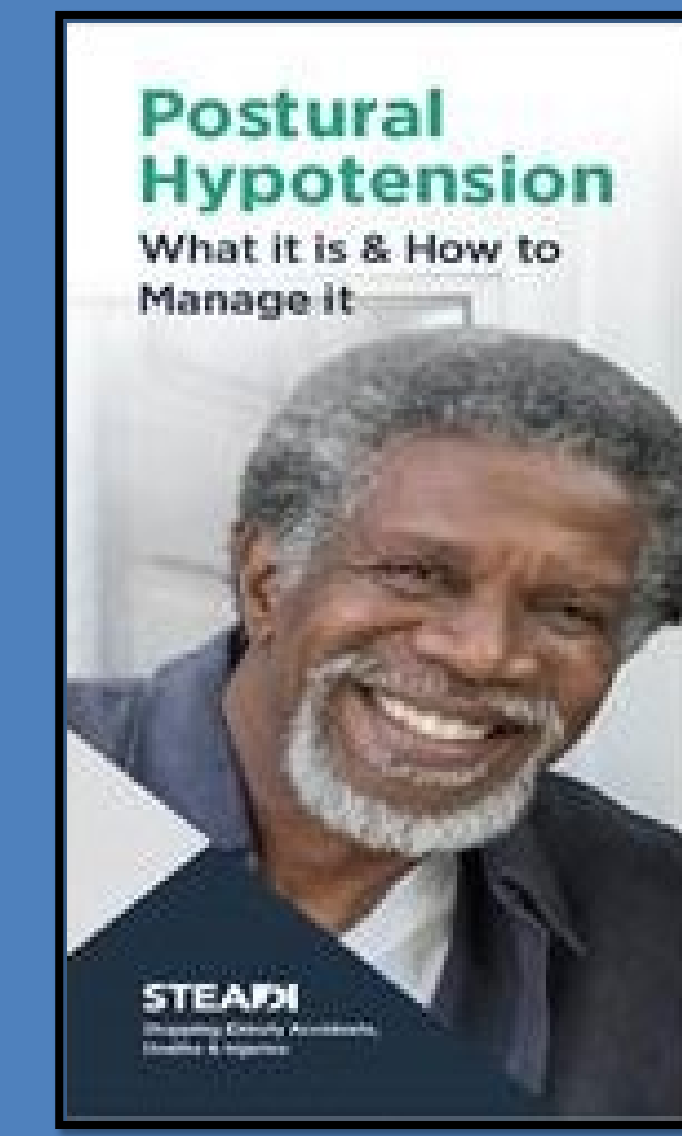


Orthostatic Hypotension Screening A Fall Prevention Quality Improvement Project



U.S. Department of Veterans Affairs
Veterans Health Administration
Central Arkansas Veterans Healthcare System

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Patient Education
Brochure

PROBLEM

- Orthostatic Hypotension (OH) increases the risk for falling.
- A veteran on the dementia unit fell and post fall assessment revealed OH. This prompted a deeper dive into the correlation between falls and OH.
- Chart audits revealed that 35% of the Veterans who fell and had OH measurements completed after the fall while in the CLC units from May to July 2019 were positive for OH.

PICO QUESTION

In the CAVHS inpatient units, how does screening for orthostatic hypotension compared to not screening for orthostatic hypotension affect the fall rate and falls-related major injury rate?

LITERATURE SEARCH

Literature review was performed to determine the prevalence of orthostasis as a cause of falls in the older adults. A Medline and CINAHL search was completed using the terms "orthostatic", "hypotension", and "falls". Out of 139 articles, the studies were narrowed down to 9.

PRACTICE RECOMMENDATIONS

In addition to standard CAVHS falls prevention interventions, develop and implement a standardized tool to screen for OH at admission. If advised to perform postural measurements with positive OH result, notify the provider, consult pharmacist to perform medication reviews, provide patient education and initiate fall prevention interventions to prevent falls and fall-related injuries.

OH Screening Tool Template

ORTHOSTATIC HYPOTENSION SCREENING TEMPLATE

Orthostatic Screening Questions

- Is the Veteran ≥ 65 years of age? Yes or No
- Does the Veteran have history of cardiovascular, liver, or alcohol abuse? Yes or No
- Does the Veteran get dizzy when changing positions? Yes or No

**If the Veteran answered "NO" to any question, the screening is complete.

***If the Veteran answered "YES" to any of these questions, proceed to question 4.

4. Does the Veteran have:

- Diagnosed hypotension? Yes or No
- Strong blood pressure (SBP) 100? Yes or No
- Alute deep vein thrombosis? Yes or No
- Stroke the central location of stroke? Yes or No
- Severe arterial disease? Yes or No
- Possible spinal injuries? Yes or No
- Lower extremity or leg injuries? Yes or No
- Not mobile enough to get out of bed? Yes or No

**If the Veteran answered "YES" to any condition, the screening is complete.

**If the Veteran answered "NO" to all orthostatic Qs.

| Position | Time | BP | Associated Symptoms |
|------------|-----------|----------|---------------------|
| Lying Down | 5 minutes | BP _____ | HR _____ |
| Standing | 1 minute | BP _____ | HR _____ |
| | 3 minutes | BP _____ | HR _____ |

**If the patient is unable to stand, orthostatic may be taken while the patient is sitting with feet dangling.

**If the patient's BP at 20 min is in the normal range (SBP of 120 mm Hg, or diastolic BP of 80 mm Hg, or a significant drop in BP (20 mm Hg or more) indicates positive orthostatic hypotension.

5. Is the Veteran positive for orthostatic hypotension? Yes or No

**If "NO" no further action is needed.

**If "YES"

- Provide orthostatic hypotension education.
- Plan high risk or high fall risk score of 400+ initiate the fall prevention order and interventions.
- Address provider to additional signs of OH: a significant drop in BP (20 mm Hg or more) or diastolic blood pressure and have rate increase of at least 30 beats per minute after 1 minute of standing may suggest orthostatic hypotension.
- symptoms (dizziness, lightheaded, panic, diaphoresis, or fatigue) do not resolve when resting in a supine position.

EVIDENCE TABLE

Orthostatic Hypotension Evidence Table

| Author/Year | Study Objectives | Level/Design | Intervention | Results | Limitations | Implications for EBP |
|--|---|--|---|---|---|---|
| Shields, Quill, Dicenso/2020 | Decreased falls on inpatient pilot units by 20% | Quality improvement project, CQI Model, Plan Do Study Act (PDSA)/Data Collection | Two Med Surg units obtained orthostatic vitals on each patient on admission. If positive implement fall precautions. | One unit decreased falls by 29%. One unit decreased 10%. | Not implemented in ICU and surgery units. R/T change in electronic documentation. | Immediate and sustained decreased falls on pilot unit. (They used weighted blanket, calendar, and competency.) |
| Moi, Hoang, Sharmir, et al/2020 | Address the association between orthostatic hypotension and falls in adults age 65+ | Systematic Review/Meta-Analysis | Systematic Review 63 studies, Meta-analysis 50 studies | OH, positively associated with falls in older adults independent of population, study design, study quality, OH definition, and blood pressure measurement method | Insufficient studies adjusted for age, sex, and other potential confounders. Most studies were moderate/low quality | Clinically relevant to test for OH to investigate treatment to decrease falls in those 65+. |
| Ooi, W. L., Hossain, M., Lipsitz, L.A. (2000) | To determine if falls in elderly were related to hypotension | Level III/ Prospective | 844 Nsg home pts <60yr in multiple states. Any subsequent falls over 1.2 years | OH, was an independent risk factor for recurrent falls. The timing of OH didn't affect the risk of falls. | Too many variables. History of falls places pts at risk. 50% of pts with hx of falls and OH will fall again (95% confidence level) | There are multiple factors that place pts at risk for fall and precautions must be taken. |
| Testa G; Ceccoglio A; et al. (2018) | Determine if hypotensive drugs play a pivotal role inducing OH-related syncope | Level III/ quasi-experimental | 65+ yrs. with dx of dementia and 1 or more episodes of syncope event | In elderly dementia pts, OH-related syncope falls are related to treatment with Nitrates, combinations of ACE-I's & diuretics, and combos of ACE-I's and Nitrates | Population study wasn't randomized. | Certain meds can cause syncope and falls. |
| SHELL, K.; LYONS, D.; BOOT, B. (2021) | Determine the prevalence of OH among those hospitalized older adults for whom OVS were measured. | Level IV/Retrospective study | Unlicensed assistive personnel measure OVS upon patients' admissions to the ACE units using the Welch Allyn oscillometric blood pressure monitor and OVS procedure in Lipincott Procedures and document in EMR. | According to this study's results, about 40% of the sample of hospitalized elderly patients experienced orthostatic hypotension, but less than 1% fell during the study period. Neither orthostatic hypotension nor demographic variable explained the falls. | Retrospective chart review prohibited the ability to assess accuracy of the caregivers' BP measurement procedures. | Consistent measurement of fall risk and strict adherence to OVS procedures will strengthen future studies. |
| Gray-Miceli, Deanna; Ratcliffe, Sarah J.; et al. (2020) | To determine salient demographic and patient level factors increasing risk for OH among a sample of elderly. | Level III/ Retrospective cohort study | This study analyzed existing fall data from a parent study (3-year quality improvement initiative) 12 conducted at a 110-bed Continuing Care Retirement Community with 51 assisted living and 59 skilled nursing beds in the northeastern United States. Falls had completed data for this secondary analysis of OH data. | In this sample of older adult patients, 47 patients experienced a total of 117 falls. The falls resulted in 18 cases of OH. Among those with OH, the mean number of falls was slightly lower at 2.2 compared with 2.8 for those without OH (Table 1). There were no statistical differences between falls with OH and falls without comorbidities or use of cardiac and diabetic medications. | None declared. | Orthostatic hypotension is potentially modifiable once detected. Evidenced-based protocol for assessment and management of OH among patients with gait and balance impairment is presented. |
| S. Brett H. Shaw, Dave Borrel, Kimiya Sabbaghan, Colton Kim, Yijian Yang, Stephen N. Robinovitch, Victoria E. Claydon 2019 | evaluate the relationships between OH, frailty, falling and mortality in elderly care home residents. | IV data study/chart review | From the Minimum Data Set (MDS) document, a frailty index (FI-MDS) was generated from 0 (no deficits) to 1.0 (58 deficits). | Older adults who are both frail and have impaired orthostatic blood pressure control have a particularly high risk of falling and should receive tailored management to mitigate this risk. | MDS was not designed for this purpose. The approach has not been fully validated -small sample size | Frailty is related to susceptibility to orthostatic hypotension, falling risk and 3-year mortality |
| L.C. Hartog, M. Cizmar-Sweelssen, A. Klippscheer, K.H. Groenier, N. Kleefstra, H.J.G. Bilo and K.J.J. van Hateren 2015 | to determine the prevalence of orthostatic hypotension in frail, elderly NH residents -Assess orthostatic hypotension assoc with falling and chances of successful rehab | Prospective observational cohort study (290 patients) in Netherlands | -All pts from NH a) psychoger dept (106 pts with severe to very severe dementia) b) somatic dept (56 pts) c) rehab dept (128 pts) -All pts had questionnaires & BP measurements (2x in supine position and 2x in postural change) -Rehab pts was assessed for successful discharge | -Average age 80.9 -OH present in 106/290; prevalence of 36.6% -For rehab pts no significant relation found btw orthostatic hypotension (OH), orthostatic complaints, or symptomatic OH -Assoc btw orthostatic hypotension and previous falling was not significant -Pts with OH higher chance of successful discharge | -Observational & establishing a causal relation is not possible -Selection bias; many pts in a NH on a rehab unit were admitted due to fall or fracture which creates bias with respect to falls and OH | Orthostatic hypotension is highly prevalent in nursing home residents |
| Matthew S. Maurer MD, Samantha Cohen MD, Hui Cheng MD, MPH, MS 2004 | Define timing and degree of orthostatic changes in BP in elderly NH residents -If orthostatic changes in blood pressure with noninvasive beat-to-beat technology would predict falls better than standard def of OH | Prospective, time-to-event analysis | -All residents of same NH -Measured orthostatic BP changes during active standing for up to 3 min using a real-time, beat-to-beat, continuous device (CBM-7000) placed on non-dominant wrist & arm then arm placed in a sling to stabilize | -Mostly women -Average age 88 -41% (46 pts) fell -Standard definition of OH was not predictive of subsequent falls (hazard ratio 1.03 at 1 minute and 1.32 at 3 minutes, P = not significant) | -Small sample size (111 pts) -Pt's arm had to be stabilized at the same height relative to the heart during measurement and high use of assist devices (walkers and canes), -Measurements only taken in the morning (8am-noon) | -Neither standard nor beat-to-beat tonometry were independent predictor of falls in frail NH residents -The timing and degree of orthostatic changes in BP does not significantly enhance risk prediction of falls |

Adapted from Godshall, M. (2016). *Fast Facts for Evidence-Based Practice in Nursing* (2nd ed.). New York, NY: Springer Publishing Company

SUMMARY

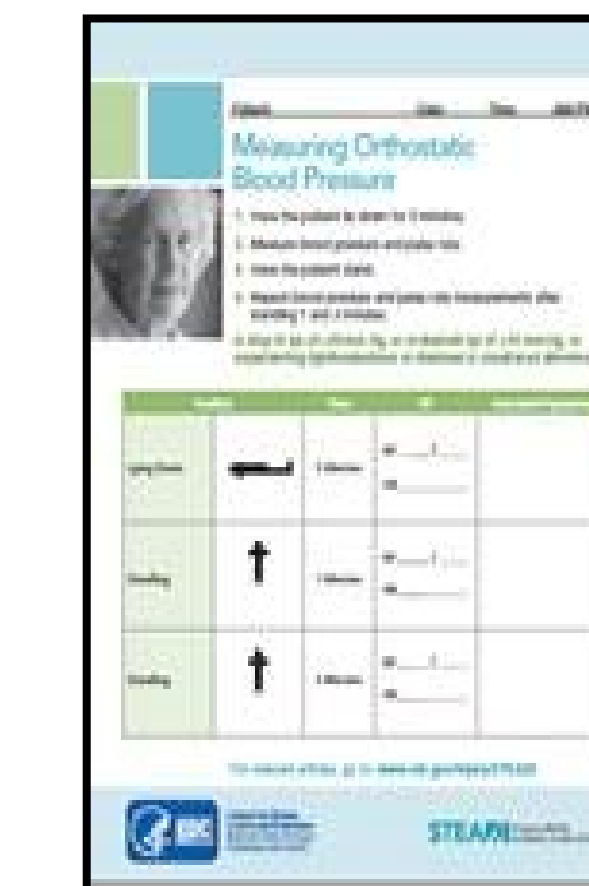
The articles showed support for the monitoring of OH in all ambulatory older adults given its prevalence and association with falls. However, there were no studies specific to OH screening as an intervention to prevent falls in the inpatient setting.

IMPLEMENTATION

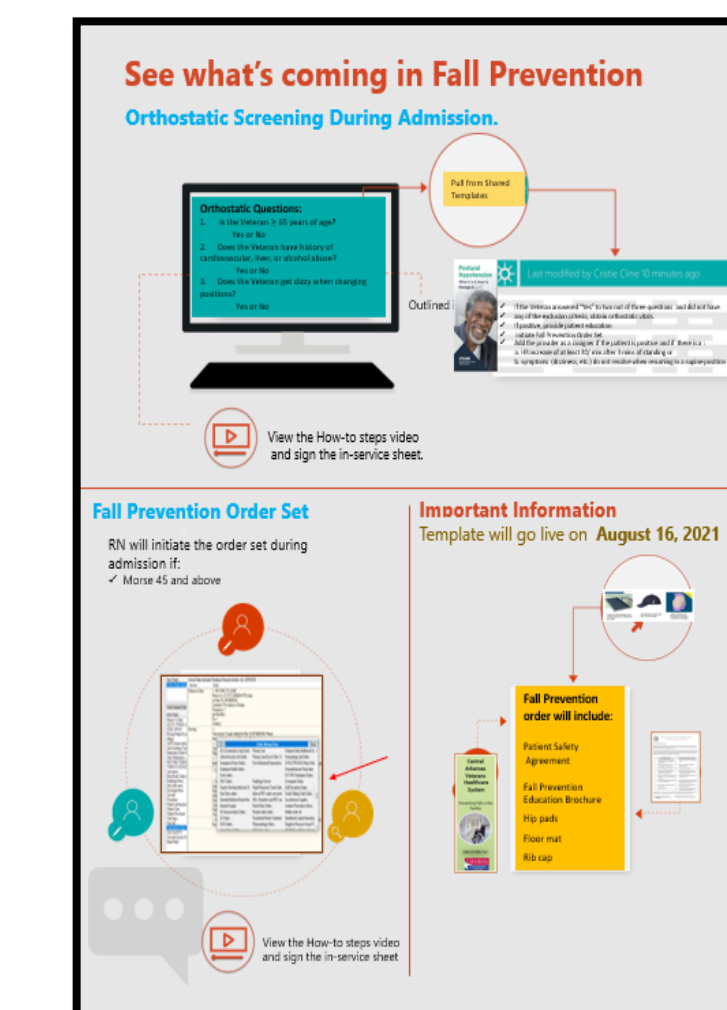
AIM: By October 4, 2021, orthostatic hypotension screening is implemented in all CAVHS inpatient areas.

STRATEGY: Implemented OH screening in a stepwise method. Nursing staff were educated regarding the OH screening template, how to measure orthostatic BP, initiate the fall prevention order, and provide patient education if positive for OH.

| Inpatient Areas | Education Date | Implementation Date |
|---|-------------------|---------------------|
| Community Living Center *Long term / acute rehab units | July 6, 2021 | August 16, 2021 |
| Mental Health Units | August 1, 2021 | September 1, 2021 |
| Acute and Critical Care Units | September 6, 2021 | October 4, 2022 |

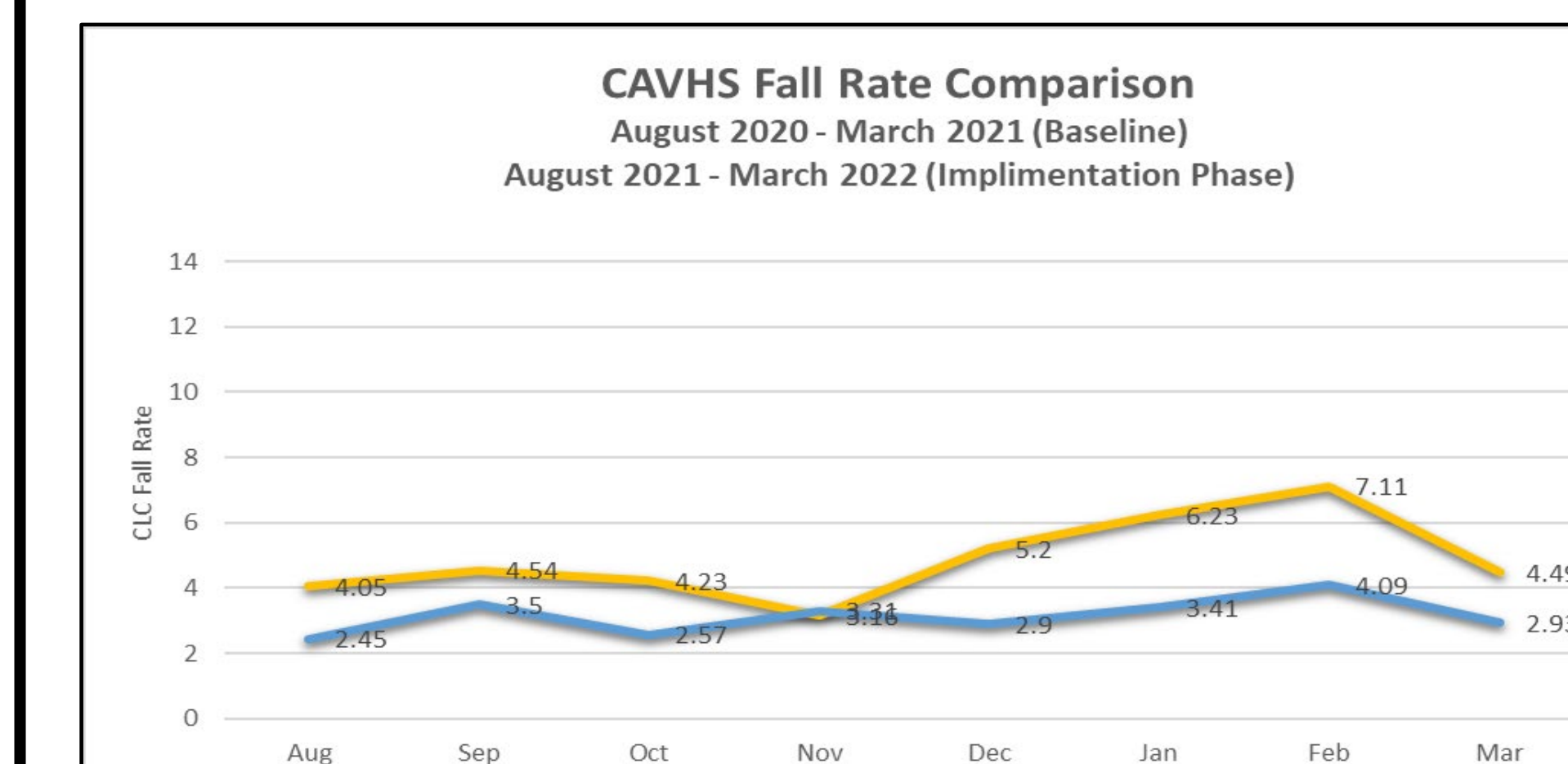


How to measure
OH BP

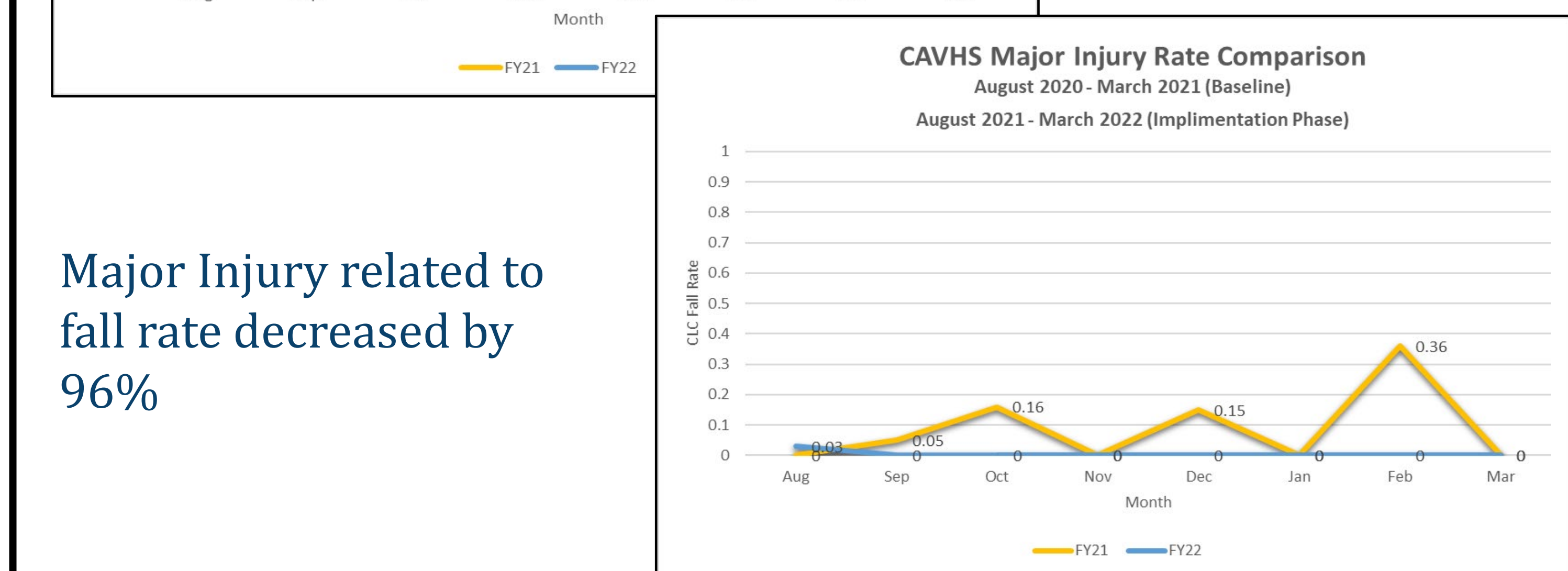


Flyer

OUTCOMES



CAVHS Fall rate
decreased by 36%



Major Injury related to
fall rate decreased by
96%