Management of Postpartum Hypertension/Preeclampsia

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AT THE FOREFRONT
UChicago Medicine

STAMPP-*htn*

Systematic Treatment And Management of PostPartum *hypertension*

Clinical guidelines and protocols

Hospital level initiatives for management of postpartum hypertension

Funding : Department of OB/GYN, CLI Board, Women's Board, Omron

POINTS TO DISCUSS

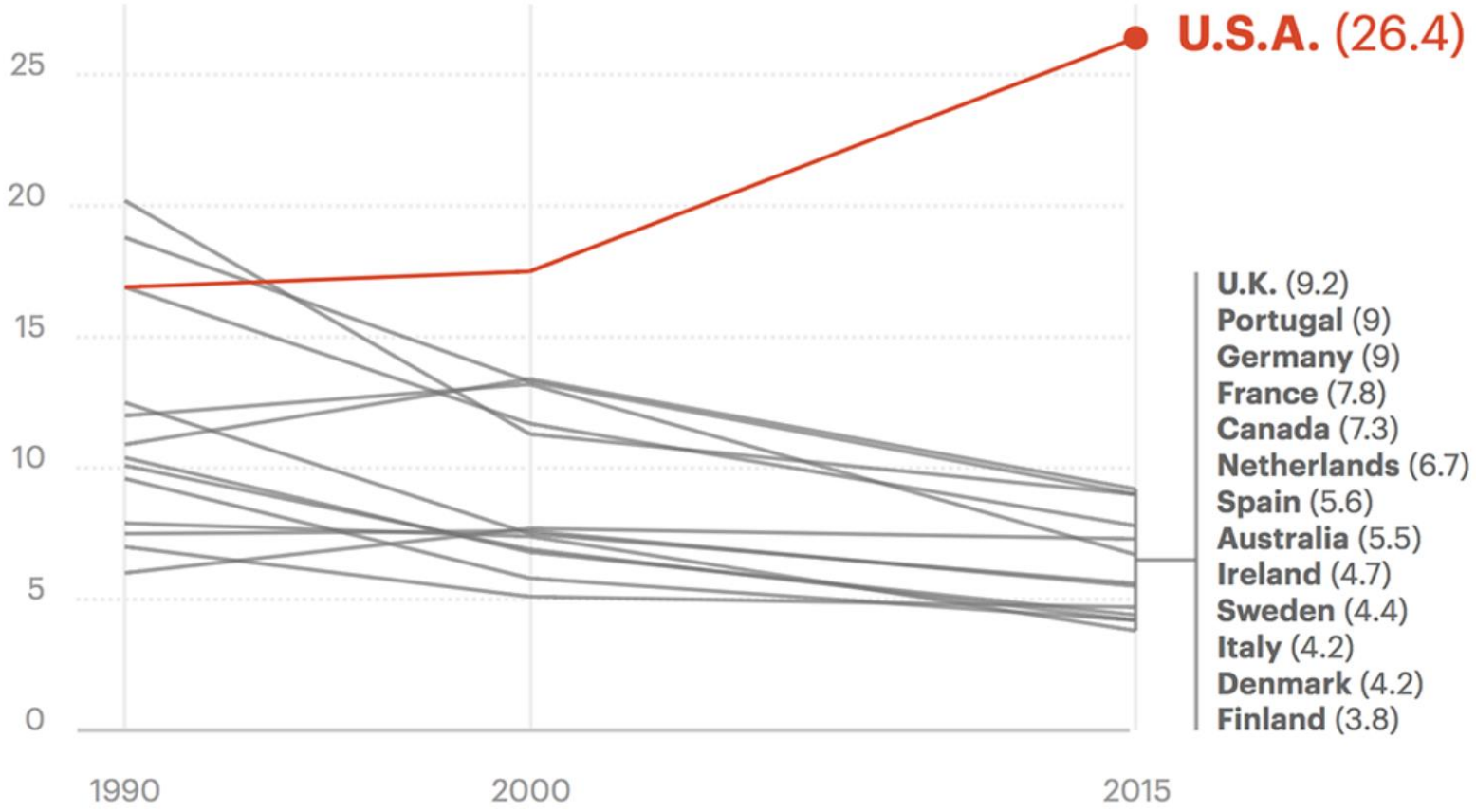
- What is preeclampsia
- Why is it important to worry about preeclampsia
- Why worry about BP after delivery
- What are some local measures one can take to identify preeclampsia to mitigate risk to mothers and babies

PREECLAMPSIA

- Common hypertensive disorder of pregnancy
- 5-7 % of pregnancies
- 70,000 maternal deaths and 500,000 fetal deaths/year worldwide
- Associated with long term cardiac and renal complications
  - HTN, CVD risk, stroke, dementia and death
  - Lack of physician awareness
    - 56% of internists and 23% of ob-gyns were unsure or did not know whether preeclampsia is associated with ischemic heart disease
    - Only 9% of internists counseled women who had preeclampsia about cardiovascular risk reduction
  - AA women 3-4 times at higher risk of dying from pregnancy related complications and preeclampsia a common cause of serious maternal morbidity and death

Maternal Mortality Is Rising in the U.S. As It Declines Elsewhere

Deaths per 100,000 live births



IMMEDIATE COMPLICATIONS OF PREECLAMPSIA

- Placental abruption
- HELLP syndrome
- Eclampsia
- Liver and kidney damage
- Fetal growth restriction
- Preterm birth
- Cardiomyopathy
- Maternal /fetal death

LONG TERM RISKS OF PREECLAMPISA

- Increased risk of cardiovascular disease (CVD) such as hypertension, myocardial infarction and congestive heart failure, cerebrovascular event (stroke), peripheral arterial disease and cardiovascular mortality later in life
- Women with a hypertensive disorder of pregnancy have 12- to 25-fold higher rates of hypertension than women with a normotensive pregnancy in the year after delivery
- Increased risk of end stage renal disease, stroke and dementia
- Lack of physician awareness
  - 56% of internists and 23% of ob-gyns were unsure or did not know whether preeclampsia is associated with ischemic heart disease
  - only 9% of internists counseled women who had preeclampsia about cardiovascular risk reduction

ACOG practice Bulletin, Gestational hypertension and preeclampsia, 2019.
Rana S. Physicians' knowledge of future vascular disease in women with preeclampsia. Pregnancy HTN, 2012;31(1):50-8

LIFE SAVING INTERVENTIONS

- What can you do at your hospital level

Our hospital journey

- Participate in ILPQC- treatment of acute severe HTN , huddle and discharge instructions
- STAMPP- HTN- Systematic Treatment And Management of PostPartum *hypertension*
- **>85% of patients are AA and majority are obese**

Illinois Perinatal Quality Collaborative (ILPQC):

Severe Hypertension in Pregnancy and Improving Time to Treatment

Goals of the Program

- Improve the timely delivery of antihypertensive therapy for severely elevated blood pressures
- Document potential barriers to care
- Develop potential strategies to improve delivery and quality of care
- Allows for individual hospital and statewide assessment

What is the program?

- Timely administration of IV anti hypertensives for severe range blood pressures in pregnancy
  - Defined as: SBP > 160 or DBP > 110
  - Within 1 hour of identification
    - The sooner the better (within 30 minutes)
- Standardized form outlining recognition and delivery of care
  - Process and timing of initial delivery of care
  - Debriefing process for barriers to care
  - Additional complications and issues encountered during an admission
  - Discharge planning and follow-up

Potential for intervention

- Prior CMQCC Analysis
  - 60% of maternal deaths from preeclampsia had “good to strong chance” of altering outcomes with intervention
  - In cases of maternal mortality:
    - Delayed response to warning signs in 90%
    - Ineffective care in 70%
    - Misdiagnosed in 40%

Main EK, McCain CL, Morton CH, Holtby S, and Lawton ES. Pregnancy-related mortality in California. Obstet Gynecol 2015;125:938-47.

Severe Maternal Morbidity

- Severe maternal morbidity more frequent in women with severe HTN compared to non-severe HTN
- Frequency of severe morbidity did NOT increase with worsening BP values
  - Suggests that once severe range BPs occur, they require intervention
- Higher rates of maternal morbidity seen with:
  - Lower hospital NICU care levels (Level 3 vs Level 4)
  - Lower delivery volumes (Low vs High)

Kilpatrick SJ, Abreo A, Greene N, et al. Severe maternal morbidity in a large cohort of women with acute severe intrapartum hypertension. Am J Obstet Gynecol 2016;214:1.e1-1.e7.

Call to Action

- ACOG has developed Safety Bundles for Severe Hypertension in Pregnancy
  - Risk Assessment and Prevention
    - Diagnostic Criteria
    - When to Treat
    - Agents to Use
    - Monitoring
  - Readiness and Response
    - Complications and escalation process
    - Further evaluation
    - Change of status
    - Postpartum surveillance
- Bundle
  - A way to describe a collection of processes needed to effectively care for patients undergoing particular treatments with inherent risks

Recognition of Hypertensive emergency

- Measurement of severe hypertension with the patient in either the seated upright position
  - SBP > 160
  - DBP > 110
- Persistent > 15 min from initial measurement
- Recognized as occurring:
  - Antepartum
  - Intrapartum
  - Postpartum

Antihypertensive Agents

- Intravenous medications preferable
  - Labetalol
  - Hydralazine
- Nifedipine (short-acting) has shown effectiveness as an oral agent
  - Less experience with the medication
- Magnesium sulfate and epidurals are NOT considered antihypertensive agents

Discharge and Follow Up

- Discharge instructions
  - Should include review of warning signs and symptoms for severe manifestations of hypertension in pregnancy
- When planning discharge for hypertensive patient
  - Within 3-7 days if discharged without medication
  - < 72 hours if discharged with medication

REDCap Hospital ID: _____

SEVERE HYPERTENSION DATA FORM

Topic: Maternity service team review and document sequence of events, successes with and barriers to swift and coordinated response to preeclampsia with severe features.
Goal: Reduce time to treatment (< 60 minutes) for new onset severe hypertension (≥160 systolic OR ≥110 diastolic) with preeclampsia or eclampsia or chronic/gestational hypertension with superimposed preeclampsia (include patients from triage, L&D, Antepartum, PP, ED) in order to reduce preeclampsia morbidity in Illinois.
Instructions: Complete within 24 hrs. after all cases of new onset severe hypertension (≥160 systolic or ≥110 diastolic) event in pregnancy up to 6 wks postpartum. Debrief should include primary RN and primary MD to identify opportunities for improvement in identification and time to treatment of HTN.

Date:_____ **GA at Event (weeks & days) OR # Days PP:**_____
Patient Location ***(check all that apply)*** ☐ Triage ☐ L&D ☐ Postpartum ☐ Antepartum ☐ ED

Maternal Age: _____ **Height:**_____ **Current Weight:**_____
Diagnosis: ☐ Chronic HTN ☐ Gestational HTN ☐ Preeclampsia ☐ Superimposed Preeclampsia ☐ Postpartum Preeclampsia ☐ Other _____

PROCESS MEASURE (P1): Medical Management

Time: hh:mm	Measure
	BP reached ≥160 or diastolic ≥110 (sustained >15 min)
	First BP med given
	BP reached <160 and diastolic BP <110

Medications (check all given)

Medications	Dosage(s) given	Reason not given
☐ Labetalol		
☐ Hydralazine		
☐ Nifedipine		
Magnesium Sulfate **Bolus**	☐ 4gm ☐ 6gm ☐ Other	
Magnesium Sulfate **Maintenance**	☐ 1gm/hr ☐ 2gm/hr ☐ 3gm/hr ☐ Other	
Any ANS (if <34 wks)?	☐ Partial Course ☐ Complete Course ☐ Not Given	

BALANCING MEASURE (B1,B2): Monitor Medical Management
B1. Did diastolic pressure fall to <80 within one hour after meds given?
☐ YES ☐ NO
B2. If yes, was there corresponding deterioration in FH rate (Category 3)?
☐ YES ☐ NO

OB Complications ***(check all that apply)*** Transport In? ☐ YES ☐ NO Date:_____
GA at Delivery (weeks & days):_____ Transport Out? ☐ YES ☐ NO Date:_____
Adverse Maternal Outcome: **Date:**_____
☐ OB Hemorrhage with transfusion of ≥ 4 units of blood products
☐ Intracranial Hemorrhage or Ischemic event
☐ Pulmonary Edema ☐ ICU admission ☐ HELLP Syndrome
☐ Oliguria ☐ Eclampsia ☐ DIC
☐ Renal failure ☐ Liver failure ☐ Ventilation
☐ Placental Abruption ☐ Other _____ ☐ None
Adverse Neonatal Outcome: **Date:**_____
☐ NICU/SCN admission ☐ IUFD ☐ Other _____ ☐ None
Maternal Race/Ethnicity ***(check all that apply)*:**
☐ White ☐ Black ☐ Hispanic ☐ Asian ☐ Other

PROCESS MEASURE (P2) Discharge Management
A. Discharge Education: Education materials about preeclampsia given?
☐ YES ☐ NO
B. Discharge Management: Follow-up appt scheduled within 3-10 days (for all women with any severe range hypertension/preeclampsia)
☐ YES ☐ NO
Was patient discharged on meds?
☐ YES ☐ NO
If YES: Was follow up appointment scheduled in <72 hours?
☐ YES ☐ NO
COMMENTS about Medical Management, Monitoring, Discharge

Opportunities for improvement to reduce time to treatment (identification severe HTN to treatment goal <60 minutes): De-brief

Debrief Participants: Primary MD: ☐ YES ☐ NO Primary RN: ☐ YES ☐ NO

TEAM ISSUES	Went well	Needs improvement	Comment
Communication			
Recognition of severe HTN			
Assessing situation			
Decision making			
Teamwork			
Leadership			

SYSTEM ISSUES	Went well	Needs improvement	Comment
HTN medication timeliness			
Transportation (intra-, inter-hospital transport)			
Support (in-unit, other areas)			
Med availability			
Any other issues:			

Adapted from CMQCC's Preeclampsia: Debrief and Chart Review Tool


Death can happen up to a year after delivery.
33%
1 week to 1 year after delivery
31%
During pregnancy
36%
During delivery and up to 1 week afterward

CDC 2019

PROBLEMS AT THE LEVEL OF THE HOSPITAL

- At the time of admission and discharge
  - General lack of knowledge among patients about long term effects of preeclampsia
  - No organized effort for education to patients
  - Discharge instructions not universally given
  - No dedicated postpartum clinic for easy access to care
- Problems with readmissions in ED
  - Identifying post partum patients
  - Incorrect Treatment of PP HTN
  - Poor knowledge about definition of severe for PPHTN
  - Calling medicine or cardiology instead of OB
  - Delayed transfer to L/D
  - Delay in recognition and treatment of severe PPHTN
- No standardized management for readmissions for PPHTN

Preeclampsia Educational Video

https://www.youtube.com/watch?v=hVPxFZDEFZI

STAMPP-HTN program

- FBC Video- Care network
- Nursing- FBC
  - Written instructions- EVS
  - Tear pad
  - Bracelets
  - BP cuff and monitors
  - Preeclampsia discharge checklist
  - Postpartum preeclampsia care
- Standardized all protocols
  - Management of PP HTN
  - PPHTN clinics
  - Readmissions
  - ED workflow

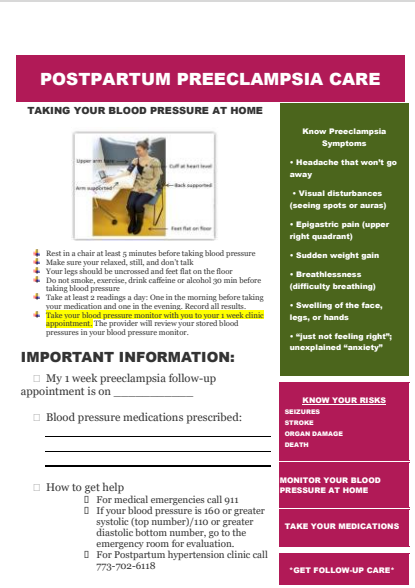
Preeclampsia Educational Video
https://www.youtube.com/watch?v=hVPxFZDEFZI

Preeclampsia Discharge Checklist

- Patient watched Preeclampsia Education Video on GetWell network? Yes or No _____
- Nurse provided Postpartum Preeclampsia Care education sheet and reviewed it with patient? Yes or No _____
- ILPQC form is completed/ILPQC flowsheet is completed? Yes No NA _____

- Blood pressure cuff is given to patient and instructions are reviewed? Yes or No _____
- Preeclampsia medical alert band is given to patient _____
- 1week postpartum hypertension clinic appointment is made? Appointment date and Time _____
  If no appointment is noted, page Ante Resident or Amina Ghalyoun pager x 0055.

Discharge RN: _____
Date and Time of D/C: _____

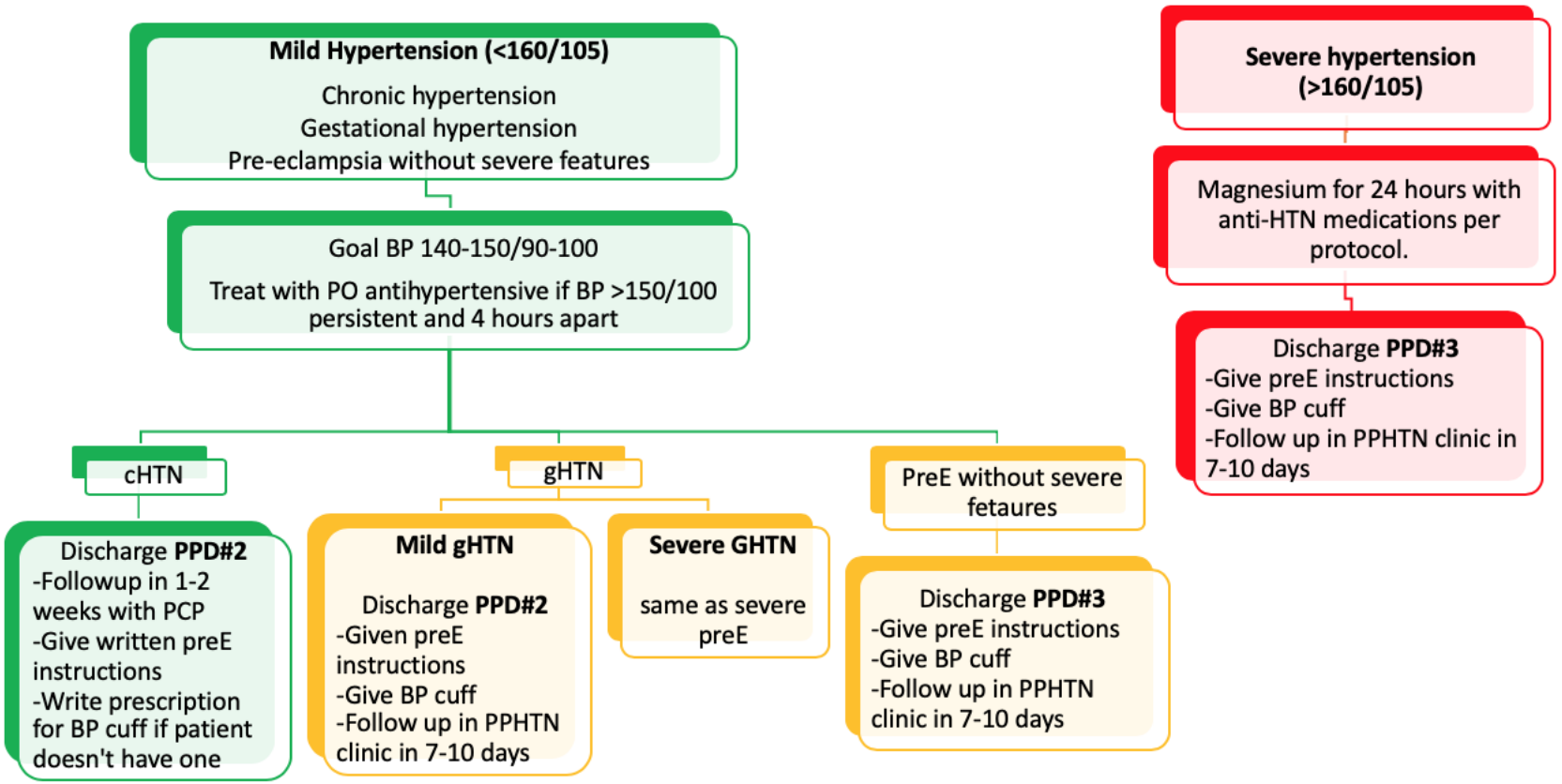


STANDARDIZED PROTOCOLS FOR MANAGEMENT OF PPHTN

PPHTN clinics

- Follow up in PPHTN clinic
  - Appointments before discharge
  - Standardized Protocol for treatment of HTN
  - Patient to be sent to L/d for severe HTN
  - Long term follow up with cardiology

Management of BP's postpartum and discharge after delivery- IMMEDIATE PP



ALL patients with gHTN or PreE

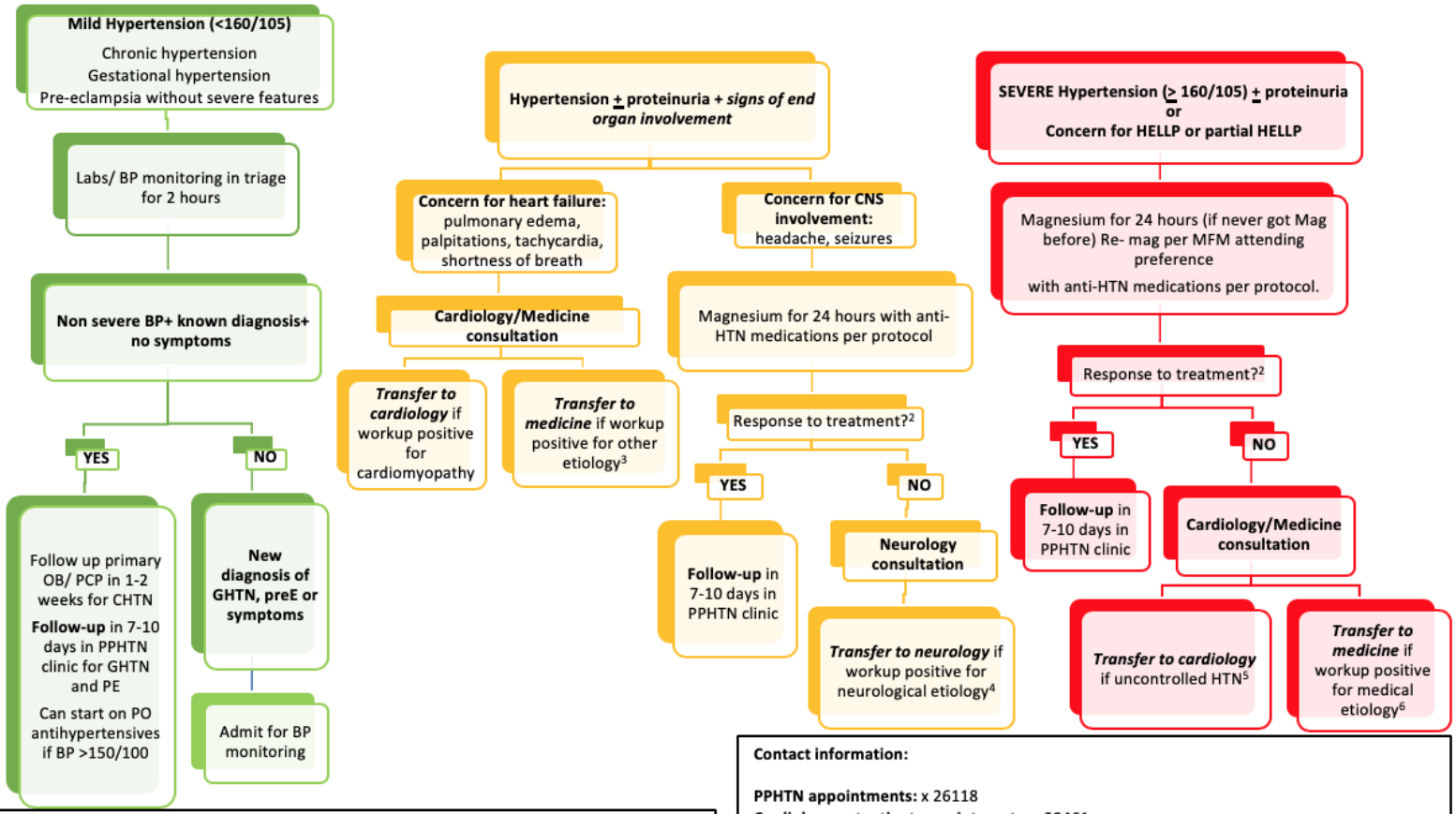
- **Watch the preE video on the care network**
- **Give written preE instructions- tearpad sheet**
- **Give BP cuff**
- **Follow up in PPHTN clinic in 7-10 days**

READMISSIONS

The **PRICE** study: **P**re-eclampsia **R**eadmission **I**npatient **C**are **E**valuation

Postpartum hypertension (>140/90) measured twice at least 4 hours apart, between delivery and six weeks postpartum

All patients should be admitted to MFM



[1]All patients admitted with post-hypertension should have at least 24 hours of BP monitoring, with exception being certain chronic hypertensives.
Treat BP if > 150/100 if persistent or 4 hours apart with PO antihypertensives

[2]Response to treatment should be defined by at least 12 hours of blood pressures <150/100 prior to discharge.

[3] Examples of etiologies that would be appropriate for ***transfer to medicine***: thyrotoxicosis, pheochromocytoma arterial stenosis, adrenal tumors

[4]Examples of etiologies that would be appropriate for ***transfer to neurology:*** intracranial process, stroke, non-eclamptic seizures

[5] Examples of appropriate ***transfer to cardiology:*** inability to control blood pressures despite high doses of Procardia and Labetalol OR requiring IV anti-hypertensive drip

[6] Examples of appropriate ***transfer to medicine:*** if workup positive for HUS, TTP, exacerbation of lupus, acute fatty liver

Contact information:

PPHTN appointments: x 26118
Cardiology outpatient appointments: x 29461
Cardiology consult: x 3547
Dr. Tamar Polonsky pager: x 9189

ALL patients with GHTN or PreE

- **Watch the preE video on the care network**
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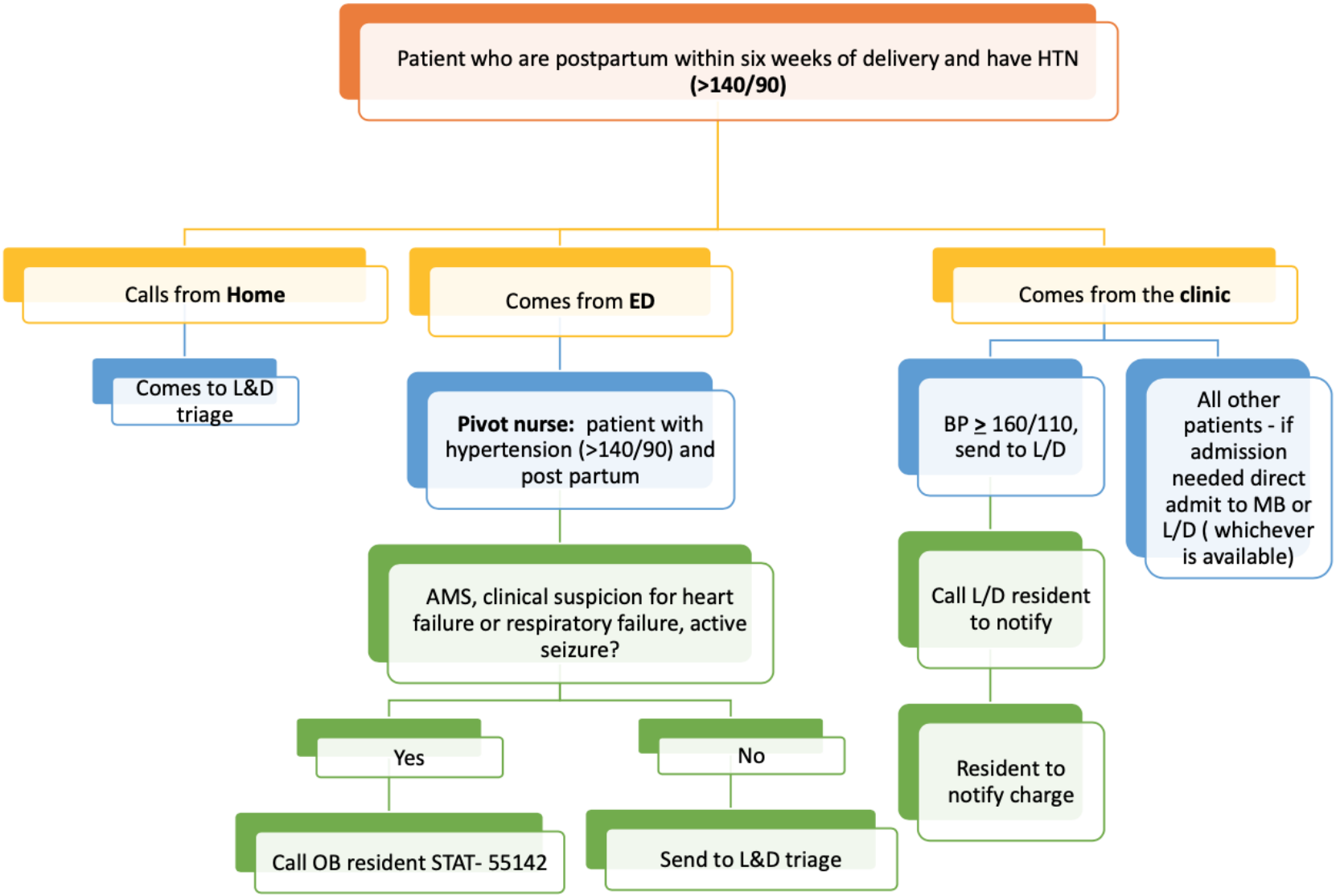
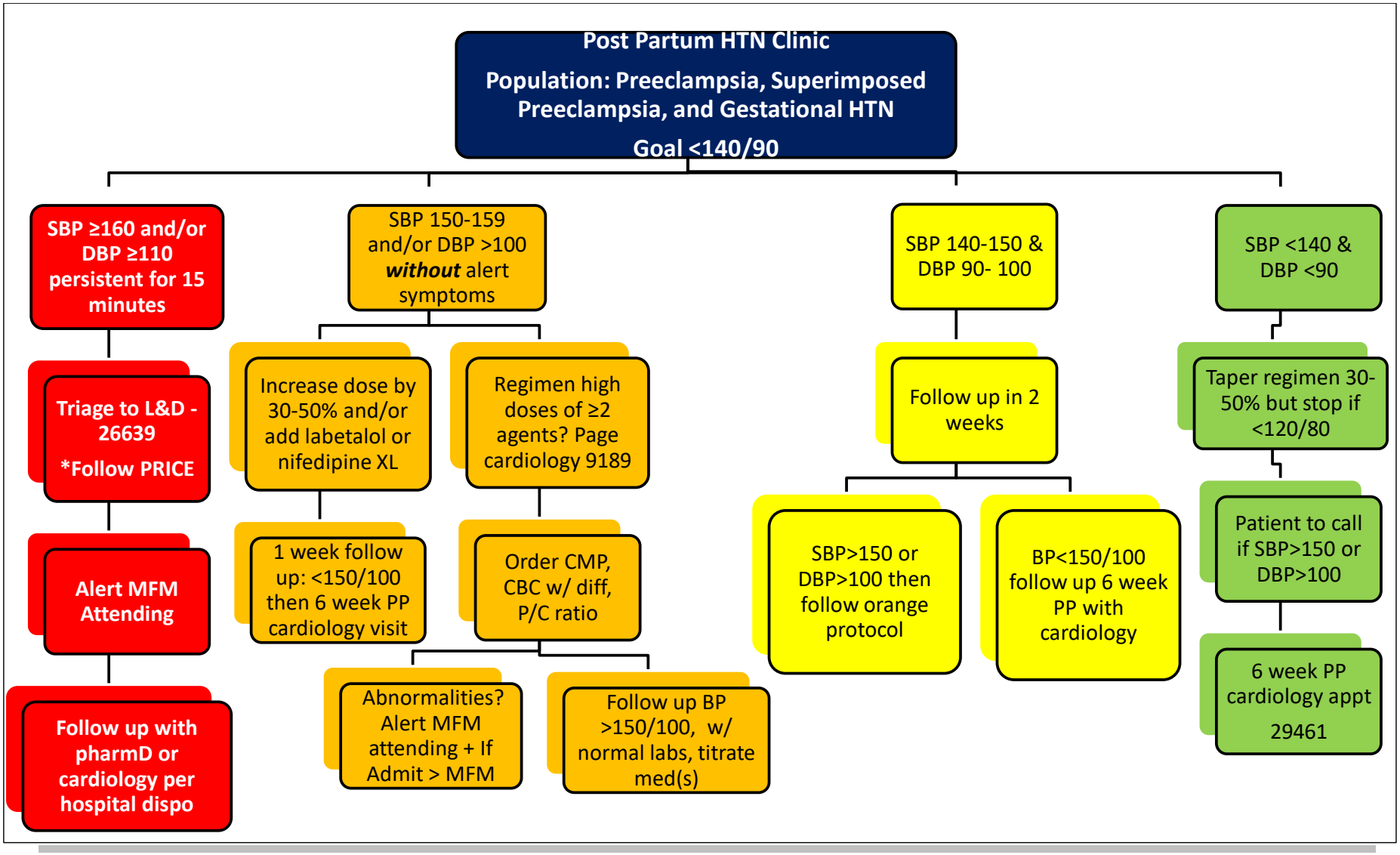
Postpartum re-entry into the hospital with hypertension (>140/90)




Post Partum HTN Clinic
Population: Preeclampsia, Superimposed Preeclampsia, and Gestational HTN
Goal <140/90
SBP ≥160 and/or DBP ≥110 persistent for 15 minutes
Triage to L&D - 26639
*Follow PRICE
Alert MFM Attending
Follow up with pharmD or cardiology per hospital dispo
SBP 150-159 and/or DBP >100 without alert symptoms
Increase dose by 30-50% and/or add labetalol or nifedipine XL
1 week follow up: <150/100 then 6 week PP cardiology visit
Regimen high doses of ≥2 agents? Page cardiology 9189
Order CMP, CBC w/ diff, P/C ratio
Abnormalities? Alert MFM attending + If Admit > MFM
Follow up BP >150/100, w/ normal labs, titrate med(s)
SBP 140-150 & DBP 90- 100
Follow up in 2 weeks
SBP>150 or DBP>100 then follow orange protocol
BP<150/100 follow up 6 week PP with cardiology
SBP <140 & DBP <90
Taper regimen 30-50% but stop if <120/80
Patient to call if SBP>150 or DBP>100
6 week PP cardiology appt
29461

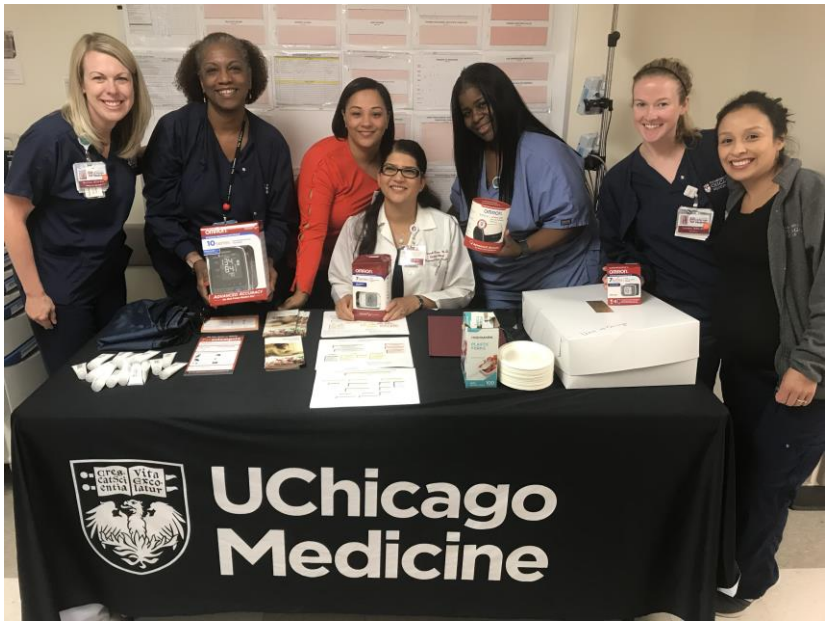
Goals

- ✓ Improve knowledge among providers and patients
- ✓ Appropriate and timely management of HTN
- ✓ Reduced rates HTN related complications
- ✓ Improve rates of PP follow up
- ✓ Appropriate management of readmissions for HTN
- ✓ Improve long term BP control
- ✓ Follow up with cardiology

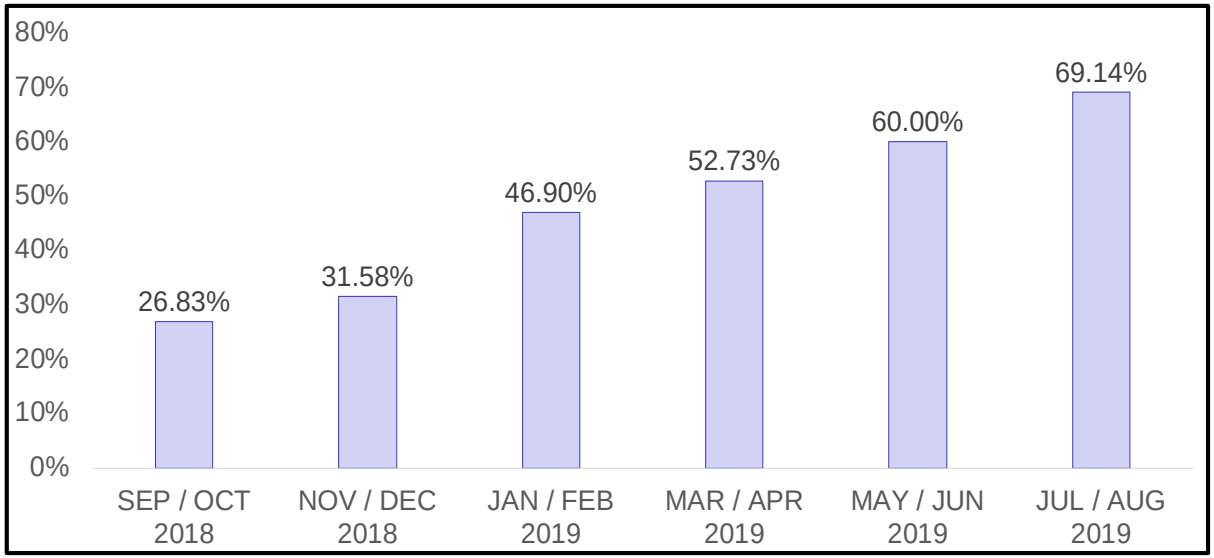
Sustainability/ Future

- Nurses involvement
- Education of all care providers and competency training (world preeclampsia day, facebook live, webinars)
- Data collection to show quality improvement

TEAMWORK



Results



N= 495 patients
80% were African-American
68% had Medicaid
Median age was 28 years

- Median [IQR] systolic BPs immediately post-delivery were higher in the beginning of the study period as compared to the end (152 [139,161] vs 139 [133,150]; p=0.0001).
- A significant increase in PP antihypertensive use was also observed (34.2% vs 45.6%, p=0.04).

- Assess engagement with healthcare at 6 weeks and 1 year

First Trimester

After 20 weeks

Postpartum

Education to patients

WHERE TO BEGIN……

- Create a team with diverse members (OB physicians, nurses, anesthesiologist, pharmacist, managers)
- Compare your hospital with the bundle elements
  - Gap analysis
  - Focus on areas that may be easiest to implement (get an easy win)
  - Identify potential barriers and honestly address them
- Communication, Response & Reliable Processes
  - High risk huddles and debriefing
- Simple debrief
  - Timely and easy to do
  - Should provoke awareness and ideas
  - Identifies problem areas, confirms best practices
  - Plan for follow-up and reporting back to staff
- Post the process- pocket note book, bulletin boards, posters, food/networking

Our team

- Colleen Duncan, RN
- Macaria Solache- RN
- Jamila Pleas, RN
- Melissa Benesh , FBC
- Macaria Solache- RN
- Natali Horab, DCAM
- Elizabeth Delgado, RN
- Samantha D Reyes- Fellow
- Victoria Oladipo- MS II
- Heba Naseem, RA
- Harjot Kaur, RA
- Sarosh Rana- MFM
- Funding:
  - CLI Board
  - Women's Board
  - Omron

- Thoughts
- Questions