Illinois Perinatal Quality Collaborative
Severe Maternal Hypertension Initiative
Ann Borders, MD, MSc, MPH
Executive Director, OB Lead, ILPQC

NJPQC Perinatal Safety Conference
April 29th, 2019
Illinois Perinatal Quality Collaborative (ILPQC)

- Multi-disciplinary, multi-stakeholder Perinatal Quality Collaborative with 117 Illinois hospitals participating in 1 or more initiative

- Support participating hospitals’ implementation of evidenced-based practices using quality improvement science, collaborative learning and rapid response data

>95% of IL births
<table>
<thead>
<tr>
<th>Year</th>
<th>Milestones</th>
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</table>
| 2012 | • IL Perinatal Advisory Committee Prematurity Task Force Report  
      • Start Up Funding: CHIPRA / HFS  
      • Stakeholder Meetings Begin |
| 2013 | • Consultation with Perinatal Quality Leaders (OH, CA, NC, FL)  
      • Website Launch  
      • ILPQC Kick-Off, 1st Annual Conference |
| 2014 | • ILPQC Data System Launched  
      • CDC Award with IDPH  
      • Launch EED and Neonatal Nutrition Initiatives |
| 2015 | • Launch Golden Hour Initiative  
      • Launch Birth Certificate Initiative  
      • Started yearly spring Face to Face Meetings for OB and Neo Teams |
| 2016 | • Launch Maternal Hypertension Initiative  
      • IDPH Funding  
      • Golden Hour Initiative Ongoing |
| 2017 | • Maternal Hypertension and Golden Hour Initiatives Ongoing  
      • CDC Funding for MNO Initiative  
      • Pritzker Grant Award for IP LARC Initiative |
| 2018 | • Launch Mothers and Newborns affected by Opioids (MNO) Initiative  
      • Launch Immediate Postpartum LARC Initiative  
      • Launch Sustainability for Maternal Hypertension and Golden Hour Initiatives |
ILPQC Central Team

Ann Borders
ILPQC Executive Director, OB Lead

Leslie Caldarelli & Justin Josephsen
Neonatal Leads

Patricia Lee King
State Project Director

Daniel Weiss & Danielle Young
Project Coordinators

Autumn Perrault
Nurse Quality Manager

info@ilpqc.org OR www.ilpqc.org
QI Implementation Model: Building Hospital Capacity to Drive Systems & Culture Change
ILPQC Provides Responsive QI Services to Hospital Teams

**Webinars/ Calls**
- Monthly & quarterly collaborative learning and QI Topic Calls
- QI Support Calls with Perinatal Network Administrators
  - Key players meeting
  - RedCap data training

**Face to Face**
- Spring Face-to-Face Meeting Breakouts
- Annual Conference Breakouts
- Key Player Site Visits
- Grand Rounds speakers group

**ILPQC Resources**
- Paper/online QI toolkits
- Patient-education materials
- Monthly e-newsletters
- Previous months webinar recording

**ILPQC Data**
- Rapid Response data system
- Real-time reports for teams to compare data across time & hospitals

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**Quality Improvement Support Services**
Why we do this work

Severe Maternal Hypertension

Preeclampsia: 4-10% US pregnancies

9% of maternal deaths in the United States

IUGR, oligohydramnios, placental abruption, NICU admission, stillbirth, neonatal death

1/3 of severe obstetric complications

6% of preterm births, and 19% of medically-indicated induced preterm births
Why we do this work

The New York Times  https://nyti.ms/2eShjiS

Maternal Mortality is a Global Crisis
Defying Global Trends
By SABRINA TAVERNISE  SEPT. 21, 2016

Our maternal mortality is a crisis
By Christopher Ingraham

Giving Birth. Shalon Irving's Story Explains Why
December 7, 2017  7:01 PM ET
Heard on All Things Considered

By ALEXANDRA SIFFERLIN  September 27, 2016
Importance of Timely Treatment of Severe Maternal Hypertension

• Primary cause of maternal death is hemorrhagic stroke caused by untreated severe hypertension

• National guidelines recommend timely treatment of severe hypertension < 60 min to reduce maternal stroke and severe maternal morbidity, endorsed by ACOG

• Alliance for Innovation on Maternal Health (AIM) Severe Hypertension in Pregnancy Maternal Safety Bundle
Aim: Reduce the rate of severe morbidities in women with severe preeclampsia, eclampsia, or preeclampsia superimposed on pre-existing hypertension by 20% by December 2017

Approach: 4 key goals
1. Reduce time to treatment
2. Improve postpartum patient education
3. Improve postpartum patient follow up
4. Improve provider & RN debrief

- 110 hospital teams - May 2016 kick off to December 2017
- 106 Hospitals submitted data for over 17,000 women who experienced severe maternal HTN across the initiative
- Sustainability started January 2018
- 86 teams have submitted sustainability data
Incorporating the AIM Severe HTN in Pregnancy Bundle

- Incorporated AIM Bundle resources in ILPQC Severe Maternal HTN toolkit binder (paper and online) and incorporated into collaborative learning calls

- Adapted IHI Implementation Checklist and AIM Quarterly Measures as structure measures to monitor implementation

- Incorporated AIM eModules across hospitals for provider/nurse education towards culture change
**Project Aims**

By December 2017, for all women with confirmed severe maternal HTN across participating hospitals:

<table>
<thead>
<tr>
<th>Goal</th>
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| Increase the proportion of women treated for severe HTN in < 60 minutes | ≥ 80%  
| Increase the proportion of women receiving preeclampsia education at discharge | ≥ 80%  
| Increase the proportion of women with follow-up appointments scheduled within 10 day of discharge | ≥ 80%  
| Increase the proportion of cases with provider / nurse debriefs | ≥ 50%  
| Reduce the rate of severe maternal morbidity (SMM) | ↓ 20%  

How do we improve care?

• Early recognition of hypertension and correct diagnosis during and after pregnancy
• Reduce time to treatment of severe range blood pressure, 160/110(105)
• Provide patient education and appropriately timed follow up
• Implementation of evidence based protocols for treatment and management of severe HTN / preeclampsia / eclampsia
Controlling blood pressure is the optimal intervention to prevent deaths due to stroke in women with preeclampsia.

The critical initial step in decreasing maternal morbidity and mortality is to administer anti-hypertensive medications as soon as possible (< 60 minutes) of documentation of persistent (retested within 15 minutes) BP ≥160 systolic, and/or ≥105-110 diastolic.

BP ≥ 160/110 (105)

Need To Treat*

*BP persistent 15 minutes, activate treatment algorithm with IV therapy ASAP, < 30-60 minutes
Quality Improvement Focus

• Provider / staff education and standardized BP measurement
• Rapid access to medications
• IV treatment of BP’s ≥ 160mmHg systolic or ≥ 110(105) mmHg diastolic within 30-60 min
• Standardize treatment algorithms / order sets
• Provider / nurse debrief time to treatment
• Early postpartum follow-up
• Standardized postpartum patient education
Quality Improvement Strategy

ILPQC facilitated:

- Development of hospital-based QI teams by April 2016
- **Collaborative learning** through 4 in-person meetings, 21 monthly webinars, and 15 QI topic calls with teams
- **Rapid-response data system** for teams to compare data across time and to other hospitals
- **QI support** through a toolkit, network meetings, and QI coaching calls to individual hospital teams
- Regular communications including twice-monthly e-newsletters to teams and website with resources
Quality Improvement Strategy

Hospital teams facilitated:

• Representatives from each team at twice yearly in-person ILPQC meetings
• Monthly participation in ILPQC webinars
• Collection and submission of monthly QI data and quarterly structure measures to ILPQC Data System
• Monthly QI team meetings to review data and develop and implement QI strategies with Plan Do Study Act (PDSA) cycles
Communication is Key

- Monthly hospital team webinars review data, QI focus, Team Talks
- Hospital QI support calls
- Website for resources
- Monthly e-newsletters per initiative
- Face-to-Face meetings / Annual Conference
  - Teams enjoy meeting in-person, sharing, learning from each other and networking
  - Breakout sessions for time to discuss issues
  - Story boards and poster sessions allow teams to share progress
Severe Hypertension Treatment Algorithm

**IV Anti-Hypertension Meds**
First Line Medications

- **IV Labetalol**
  - 20 mg (over 2 min)
  - Repeat BP in 10 min
  - If elevated, administer
  - **IV Labetalol 40 mg**
  - Repeat BP in 10-15 min
  - If elevated, administer
  - **IV Labetalol 80 mg**
  - Repeat BP in 20 min
  - If elevated, administer
  - **IV Hydralazine 10 mg**

- **IV Hydralazine**
  - 5 or 10 mg (over 1-2 min)
  - Per physician’s order
  - Repeat BP in 20 min
  - If elevated, administer
  - **IV Hydralazine 10 mg**

Blood Pressure Triggers
- SBP ≥ 160 and/or DBP ≥ 110
- Repeat in 15 minutes.
- Notify Provider and Proceed

**Blood Pressure Triggers**
- SBP ≥ 160 and/or DBP ≥ 110
- Repeat in 15 minutes.
- Notify Provider and Proceed

**IV Access**
- FHR monitoring
- Labs per PIH Order Set
- Pulse Oximeter

**Seizure Prophylaxis**
- **Magnesium Sulfate**
  - Bolus Dose: 4gm over 20 minutes
  - Maintenance Dose: 2gm per hour

**PO Nifedipine**
- If no IV access
  - Initial Dose: 10 mg
  - May repeat dose at 20 minute intervals for a maximum of 5 doses.
Data Collection

• Process and outcome measures collected by ongoing monthly chart review by hospital teams

• Inclusion criteria
  – All first cases of severe maternal HTN during pregnancy through 6 weeks postpartum in participating hospitals
  – Severe Maternal HTN defined as BP ≥ 160/110 persistent for ≥ 15 minutes

• Timeline
  – Baseline: October – December 2015
  – Initiative Launch May 2016
  – Monthly data collection through December 2017
  – Monthly compliance data collection ongoing
Key Measures

• **Outcome:** Severe Maternal Morbidity
• **Process:** Time to treatment, Patient discharge education, Patient follow up visit < 10 days, Debrief
• **Balancing:** Hypotension, Fetal heart rate
• **Structure:**
  – Facility-wide protocols for timely identification and treatment of severe maternal hypertension
  – Provider /nurse education on HTN protocols
  – Rapid access to IV medications
  – System plan for escalation of care
  – Facility-wide protocols for patient education
ILPQC Data System

Hospital Teams collect data through chart audit and real time data logs.

Hospital Teams enter monthly outcome, balancing and process and quarterly structure measures into REDCap.

Hospital Teams immediately access rapid response web based reports to compare data across time and to other IL hospitals.
ILPQC Data System

ILPQC: Maternal Hypertension Initiative
Percent of Cases with New Onset Severe Hypertension Treated within 60 Minutes
Hospital 044 & Select Comparisons, 2016 - 2018

Percent of Cases

Baseline 2015

Hospital 044 Baseline
All Hosp
Hospital 044
Reducing Time To Treatment

Elements of Maternal Hypertensive Bundle Most Effective in Reducing Time to Treatment

ILPQC Team Survey, 2017
Strategies to Reduce Time to Treatment

- Partner with pharmacy for quicker access to IV HTN meds in all units using: standing orders, availability in PYXIS & override of antihypertensives
- Changing policies on telemetry with IV meds, labetalol
- Facilitate consistent and timely interdepartmental communication using: nurse champions to carry to all units; debriefs, huddles, daily rounds, individual feedback to discuss cases; share REDCap data with staff and providers
- Adapt and implement protocols, checklists, and standard order sets across units
**Structure Measure:**
**Standard Policies / Protocols Across Units**

Percent of hospitals with standard protocols for early warning signs, updated diagnostic criteria, monitoring and treatment of severe preeclampsia/eclampsia (include order sets and algorithms)

<table>
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<th>Quarter</th>
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<td>Jul-Sep</td>
<td>N=30</td>
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</table>

Legend:
- **L&D**
- **Ante/postpartum**
- **Triage/ED**
Strategies to Implement Protocols / Order Sets

• Develop interdisciplinary committee to review algorithms and order sets for implementation using Plan/Do / Study / Act = small test of change = test 1 provider, 1 patient, 1 day or test 1 unit for 1 week

• Integrate into EMR

• Develop easily accessible printed algorithms & order sets (e.g. bedside clipboard, pocket card order sets)

• Use key words in nurse provider communications: “your patient has severe range hypertension”, report BPs, “I would like to activate severe HTN protocol”

• Post severe HTN time to treatment sign across units
Effective Steps to Implement Standard Protocols

We reiterate what the goal is at physician OB department meetings and work closely with OB chair to promote an overall culture of safety where the chain of command is used and event reporting is done to determine trends.

We use common order set for all units. ED knows that they have the full support of the OB unit and can call at anytime for us to facilitate the treatment of possible patient.

We have updated policies and created a protocol for management of severe HTN that is posted in all rooms with other visual aides.
Culmulative percent of OB providers and nurses completed (within the last 2 years) implementation education on the Severe HTN/Preeclampsia bundle elments and unit-standard protocol
Education Tools for Physician/Nurse Buy In

AIM eModules

Available on AIM website. Quiz at end with certificate - can ask providers/staff to submit certificate. View eModules [here].

Severe Maternal HTN Grand Rounds

Available to download from ILPQC website (or click [here]). Speakers group available to provide Grand Rounds across the state. Email [info@ilpqc.org](mailto:info@ilpqc.org) for more information.
Effective Steps to Implement Education Program

1. We identified RN and MD champions for the whole hospital along with unit champions and have the support of nursing administration.

2. We used consistent reminders after education in huddles and unit meetings and audited charts.

3. We incorporated HTN education as part of nursing skills day yearly. All new staff and physicians will be educated using the comprehensive slide set.

4. We have included the education into our computer modules and have made it an annual requirement. We have also included maternal hypertension simulations.
Hospital X is committed to improving the quality of care for moms and babies.

“I truly believe this was a great initiative that brought awareness and management of this disease starting from the clinic visits until 6 weeks postpartum. Time of treatment is crucial and this initiative has brought attention to all the staff managing these patients.”
Maternal Hypertension Data: Patient Education

ILPQC: Maternal Hypertension Initiative
Percent of Women with New Onset Severe Hypertension Who Received Discharge Education Materials and Proportion of Hospitals in Collaborative Giving Discharge Education to Women
All Hospitals, 2016-2018

Legend:
- Green: Proportion of Hospitals with 80% of women who received discharge materials
- Orange: Proportion of Hospitals with 0-79% of women who received discharge materials
- Blue: Percent overall women in collaborative who received discharge materials
Maternal Hypertension Data: Patient Follow-up

ILPQC: Maternal Hypertension Initiative
Percent of Women with New Onset Severe Hypertension Where Follow-up Appointments were Scheduled within 10 Days and Proportion of Hospitals in Collaborative Where Follow-Up Appointments were Scheduled within 10 Days All Hospitals, 2016-2018
Severe Maternal Hypertension
Time To Treatment Debriefed

ILPQC: Maternal Hypertension Initiative
Percent of Women with New Onset Severe Hypertension with Cases Debriefed and Proportion of Hospitals in Collaborative with Cases Debrief
All Hospitals, 2016-2017
Maternal Hypertension Outcome Data: Severe Maternal Morbidity

ILQPC: Women with New Onset HTN with Severe Maternal Morbidity
All Hospitals, 2016-2017

15%

40% Change! 9%

13,263 patients included
Severe Maternal Morbidity Rate Deliveries with Hypertension, Hospital Discharge Data, All Illinois Hospitals

Between 2015-Q4 and 2017-Q4, the SMM rate among women experiencing hypertension at delivery was cut in half.
Hypertension Sustainability

- Sustainability Plan
- Compliance Monitoring
- New Hire Education
- Ongoing Staff/Provider Education

IL PQC
Illinois Perinatal Quality Collaborative
Building HTN Sustainability Post-Initiative:

All teams submit a Severe HTN Sustainability Plan

1. Compliance tracking for all cases severe HTN in ILPQC Data System, plan for monitoring & response
   - Time to treatment severe HTN under an hour
   - Magnesium provided
   - Early follow up for BP check within 7-10 days
   - Patient education at discharge

2. Ongoing education for providers and nurses (drills, simulations, e-modules)

3. Education plan for new hires
Compliance Monitoring for HTN

- Mentorship Model
- Hospital Teams
  Monthly Data Reporting and Review at Meetings
- Perinatal Network Administrators
  Outreach
- ILPQC
  QI Support and Quarterly Team Check in Calls
- Sustained Improvements
HTN Goals in 2019

- Every hospital maintain Time to Treatment above goal – benchmark and review data
- Maintain sustainability plan
  - Continue compliance monitoring
  - New hire education
  - Continued education
- Review missed opportunities with providers/staff
- ILPQC will maintain RedCap Data Reports
- 2 HTN webinars in 2019 with Team Talks to discuss ongoing sustainability work
Questions?

Email: info@ilpqc.org
Website: www.ilpqc.org
THANKS TO OUR FUNDERS

IDPH
Illinois Department of Public Health

CDC
Centers for Disease Control and Prevention

DHS
Illinois Department of Human Services

JB & MK PRITZKER
Family Foundation
ADDITIONAL INFORMATION
Role of Nurses & Staff

- Know best practices for accurate blood pressure management
- Identify severe range BP >160/105-110, notify provider and repeat with in 15 minutes.
- If repeat BP remains elevated, notify provider of BP and need to activate severe range BP treatment protocol for IV therapy
- Have easy access to protocol / order set to ensure correct intervals for repeating BP and redose medications.
- Systems in place for easy rapid access to medications
- Follow protocols to start Magnesium for seizure prevention
- Ensure all patients with hypertension have appropriate follow up with in 7-10 days, if home on meds f/u 72 hours for BP.
- Ensure all patients are given standard education on postpartum preeclampsia
- Remember to Debrief “How did we do on Time to Treatment?”
Role of OB providers

• If notified of severe range BP
  – Follow ACOG treatment guidelines for IV therapy and BP reassessment and escalation of therapy
  – Goal is therapy ASAP within 30-60 minutes of confirmed elevated BP
  – Magnesium for seizure prevention for new onset severe HTN
  – Determine need for immediate evaluation
  – Participate in Debrief with nurse (How did we do on Time to Treatment? Any barriers? What went well?)
Role of OB providers

- Discharge Management
  - All postpartum patients with chronic HTN/ gest HTN / preeclampsia need early postpartum follow up within 7-10 days to evaluate BP
  - For patients on BP medication consider follow up within 72 hours to confirm BP controlled
  - Standardize preeclampsia education for prenatal and postpartum patients
Toolkit

Toolkit includes example:

• Protocols
• Checklists
• Provider education modules
• Patient education materials
• Order sets
• Drills and simulations
**GOAL:** To reduce preeclampsia maternal morbidity in Illinois hospitals

<table>
<thead>
<tr>
<th>Key Drivers</th>
<th>Interventions</th>
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</table>
| GET READY IMPLEMENT STANDARD PROCESSES for optimal care of severe maternal hypertension in pregnancy | - Develop standard order sets, protocols, and checklists for recognition and response to severe maternal hypertension and integrate into EHR  
- Ensure rapid access to IV and PO anti-hypertensive medications with guide for administration and dosage (e.g. standing orders, medication kits, rapid response team)  
- Educate OB, ED, and anesthesiology physicians, midwives, and nurses on recognition and response to severe maternal hypertension and apply in regular simulation drills |
| RECOGNIZE IDENTIFY pregnant and postpartum women and ASSESS for severe maternal hypertension in pregnancy | - Implement a system to identify pregnant and postpartum women in all hospital departments  
- Execute protocol for measurement, assessment, and monitoring of blood pressure and urine protein for all pregnant and postpartum women  
- Implement protocol for patient-centered education of women and their families on signs and symptoms of severe hypertension |
| RESPOND TREAT in 30 to 60 minutes every pregnant or postpartum woman with new onset severe hypertension | - Execute protocols for appropriate medical management in 30 to 60 minutes  
- Implement a system to provide patient-centered discharge education materials on severe maternal hypertension  
- Implement protocols to ensure patient follow-up within 10 days for all women with severe hypertension and 72 hours for all women on medications |
| CHANGE SYSTEMS FOSTER A CULTURE OF SAFETY and improvement for care of women with new onset severe hypertension | - Establish a system to perform regular debriefs after all new onset severe maternal hypertension cases  
- Establish a process in your hospital to perform multidisciplinary systems-level reviews on all severe maternal hypertension cases admitted to ICU  
- Incorporate severe maternal hypertension recognition and response protocols into ongoing education (e.g. orientations, annual competency assessments) |

**AIM:** By December 2017, to reduce the rate of severe morbidities in women with preeclampsia, eclampsia, or preeclampsia superimposed on pre-existing hypertension by 20%
# 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 Preclampsia
- □ Postpartum Preclampsia
- □ Other

**PROCESS MEASURE (P1): Medical Management**

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<tr>
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<td>BP reached ≥160 or diastolic &gt;110 (sustained &gt;15 min)</td>
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<tr>
<td></td>
<td>First BP med given</td>
</tr>
<tr>
<td></td>
<td>BP reached &lt;160 and diastolic BP &lt;110</td>
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</table>

**Medications (check all given):**

- □ Labetalol
- □ Hydralazine
- □ Nitroprusside
- □ Magnesium Sulfate Bolus
  - □ 4gm
  - □ 6gm
  - □ Other
- □ Magnesium Sulfate Maintenance
  - □ 1gm/hr
  - □ 2gm/hr
  - □ 3gm/hr
  - □ Other
- □ Any ANS (if <4 wks)?
  - □ Partial Course
  - □ Complete Course
  - □ Not Given

**Adverse Maternal Outcome:**

<table>
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<tr>
<th>Date:</th>
<th>Adverse Maternal Outcome:</th>
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<tbody>
<tr>
<td></td>
<td>OB Hemorrhage with transfusion of ≥4 units of blood products</td>
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<tr>
<td></td>
<td>Intracranial Hemorrhage or Ischemic event</td>
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<tr>
<td></td>
<td>Pulmonary Edema</td>
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<tr>
<td></td>
<td>Oliguria</td>
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<td></td>
<td>Ophthalmia</td>
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<td>Ventilation</td>
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**OB Complications (check all that apply):**

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<tbody>
<tr>
<td>Transport Out?</td>
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</tr>
<tr>
<td>Transport Out Date:</td>
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**Adverse Neonatal Outcome:**

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<td>Other</td>
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**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 apt 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): Debrief**

**Debrief Participants:** Primary MD: □ Yes □ No  Primary RN: □ Yes □ No

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**ILPQC DATA FORM**

*Modified 4/26/16*