Society for Maternal-Fetal Medicine
Special Statement: Quality metric for timely postpartum follow-up after severe hypertension

Hypertensive disorders of pregnancy are a leading cause of maternal morbidity and mortality. Because postpartum exacerbation of severe hypertension is common, the American College of Obstetricians and Gynecologists recommends that patients with severe hypertension during the childbirth hospitalization be seen within 72 hours after discharge. In this statement, the Society for Maternal-Fetal Medicine proposes a uniform metric reflecting the rate of timely postpartum follow-up of patients with severe hypertension. The metric is designed to be measured using automated calculations based on billing codes derived from claims data. The metric can be used in quality improvement projects to increase the rate of timely follow-up in patients with severe hypertension during the childbirth hospitalization. Suggested steps for implementing such a project are outlined.

**Key words:** chronic hypertension, eclampsia, gestational hypertension, HELLP syndrome, pre-eclampsia, quality measure, severe hypertension

**Introduction**

Hypertensive disorders of pregnancy are a leading cause of maternal morbidity and mortality both in the United States and throughout the world. Most maternal deaths related to hypertensive disorders are judged to have been preventable. Although prompt recognition, antihypertensive treatment, and early delivery may reduce the risk of severe maternal morbidity or death, patients remain at risk during the early postpartum period, when severe hypertension may worsen or appear de novo. Most people who present with postpartum preeclampsia, eclampsia, and stroke report that they had headaches or other symptoms for hours or days before presentation. Therefore, a short follow-up interval after discharge from childbirth hospitalization may provide an opportunity to promptly identify and treat postpartum hypertension and potentially improve outcomes.

Because of the frequency and potential morbidity of severe postpartum hypertension, the American College of Obstetricians and Gynecologists (ACOG) recommends that patients with hypertensive disorders of pregnancy have blood pressure evaluation no later than 7 to 10 days postpartum and that those with severe hypertension be seen within 72 hours. These standards are challenging to achieve. Indeed, even after implementing a care bundle, 1 center found that many patients with hypertension were not evaluated within 6 weeks after delivery. A 2019 review of 12 studies found an overall lack of awareness among healthcare providers and patients regarding the risks of stroke after hypertensive disorders of pregnancy and poor ability of providers to communicate these risks to patients. A Cooperative Workshop was convened in 2016 by the Society for Maternal-Fetal Medicine (SMFM), the Eunice Kennedy Shriver National Institute of Child Health and Human Development, and ACOG to evaluate potential quality measures for high-risk pregnancies. Four potential measures regarding hypertension and preeclampsia were recommended for further consideration or development: timely treatment of severe hypertension, prevention of preeclampsia, magnesium sulfate for seizure prophylaxis in severe preeclampsia, and follow-up evaluation and education of patients with gestational hypertension or preeclampsia.

The purpose of developing a metric to track the rate of timely follow-up of severe hypertension is to allow facilities and providers to learn whether they have a “quality gap,” that is, a high rate of patients who do not receive care within the 72-hour interval recommended by ACOG. This paper presents our recommendation for a uniform metric reflecting the rate of timely postdischarge follow-up of patients with severe hypertension during the childbirth hospitalization.

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The metric is designed to be measured using automated calculations based on billing codes derived from claims data, and it can be used to demonstrate the need for facility-wide quality improvement initiatives and to track progress toward improvement.

Measure description
The full specification of the proposed metric is detailed in the Table. This process measure is expressed as a simple rate: the percentage of patients with severe hypertension during their childbirth hospitalization who had a follow-up visit within 3 days after hospital discharge.

The denominator defines a childbirth hospitalization by Current Procedural Terminology (CPT) codes for various types of birth procedures, and defines severe hypertension by an International Classification of Diseases, Clinical Modification, 10th Edition (ICD-10) code for severe hypertension, severe preeclampsia, HELLP (hemolysis, elevated liver enzymes, and low platelets) syndrome, or eclampsia. In addition, RxNorm Crosswalk drug codes reflecting treatment with intravenous hydralazine or labetalol during the delivery hospitalization qualify for the denominator because such treatment almost certainly indicates that the patient had severe hypertension. Patients who die during the delivery hospitalization are excluded from the denominator because they cannot have a postdischarge care visit.

The numerator is based on any of several types of patient encounters, either outpatient, inpatient, or emergency department visits. To qualify for the numerator, a visit can be an in-person, face-to-face encounter or a telehealth video visit. Either type of visit is considered to fulfill the ACOG recommendation that a patient be seen within 72 hours. SMFM has advocated for increased access to telehealth to improve access to healthcare and advance equity.

Remote blood pressure monitoring with text and telephone visits may be more effective than in-person visits at meeting guidelines for blood pressure follow-up. This may reduce racial disparities and barriers to access, and may improve patient satisfaction. Therefore, CPT codes for telephone and remote monitoring visits also qualify for inclusion in the numerator.

If the measure is used to track progress in a quality improvement initiative, monthly reporting will allow relatively rapid information to track progress over time. If it is used to compare providers or provider groups, a large denominator will be required for the metric to have reasonable statistical precision, thus a reporting period of 1 year may be needed.

Critique of the measure
A major challenge in calculating the metric is that the denominator is based on CPT, ICD-10, and drug codes from the hospital discharge, but the numerator is based on CPT codes from a postpartum encounter that may occur at an outpatient office, emergency department, or different facility altogether. Outside of integrated health systems, hospitals do not have ready access to billing codes from postpartum care providers and vice versa.

Conversely, payers and integrated health systems have access to both inpatient and outpatient billing codes and can readily calculate the metric on the basis of claims submitted from any source, including hospitals, clinics, private offices, and emergency departments. Thus, payers and integrated health systems are the most likely entities to evaluate and track this metric. Moreover, these entities have a vested interest in evaluating whether their members receive care that is within the standard. For this metric specifically, timely postpartum evaluation of patients with severe hypertension has potential benefits, such as reduced readmission for recurrent severe hypertension and reduced major complications such as stroke from inadequately treated hypertension.

A major advantage of the proposed metric is that it is based entirely on CPT, ICD-10, and drug codes that are readily accessible in payers’ claims data. After an initial investment in setting up a system for calculating the metric, payers should be able to calculate the rate with negligible ongoing administrative burden.

We anticipate that the measure will be calculated and reported at the level of the hospital or birthing center. Hospital-level policies and procedures can affect the rate of timely follow-up. The rate will likely improve if hospital staff are trained to make postpartum appointments for patients before discharge and nurses are trained to emphasize to patients the critical importance of keeping these appointments. If the hospital is performing poorly on the metric and its providers do not take steps to improve the rate, the hospital itself can set up a program for timely postpartum visits by establishing an outpatient facility for short-term postpartum follow-up.

Individual providers are likely to have too few cases, even over periods of a year or more, for differences in their rates to be statistically meaningful. Nonetheless, in performing a quality improvement initiative, it may be useful to “drill down” to the level of individual providers or provider groups to provide feedback that may motivate them to be diligent in arranging follow-up care for their hypertensive patients.

Despite the ACOG recommendation that a patient should “be seen” within 72 hours, the metric numerator includes both in-person and telehealth visits, with or without video. Although in-person visits have the advantage of direct blood pressure measurement, patient-measured ambulatory blood pressure is generally reliable. Furthermore, the purpose of the encounter extends beyond mere blood pressure assessment to include a review of urgent warning symptoms, a discussion of long-term implications of hypertension, planning for transition to long-term care providers, and an opportunity to address any questions the patient may have. These activities can be done with similar effectiveness in a voice-only telephone encounter or audio-video telehealth encounter. To qualify for the numerator, providers will need to ensure correct billing for telehealth and telephone visits.
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<tr>
<th>Characteristic</th>
<th>Description</th>
<th>Notes, critique</th>
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<tr>
<td><strong>Brief title</strong></td>
<td>Severe hypertension in pregnancy, timely postpartum follow-up</td>
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<tr>
<td><strong>Narrative description</strong></td>
<td>Percentage of patients who were evaluated within 3 d after hospital discharge from a childbirth hospitalization complicated by severe hypertension, severe preeclampsia, HELLP syndrome, or eclampsia</td>
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<td><strong>Denominator</strong></td>
<td>Number of patients during the measurement period who had a delivery hospitalization (defined by the CPT codes listed below) and who had a diagnosis of a severe hypertensive disorder of pregnancy during that hospitalization (defined by the ICD-10 codes listed below)</td>
<td>ACOG recommends follow-up within 72 h, but claims data are reported in whole days, not hours</td>
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<td><strong>Numerator</strong></td>
<td>Number of patients included in the denominator who had at least 1 visit (defined by the CPT codes listed below) occurring within 3 d after discharge from the hospitalization defined in denominator. Visits with or without a telemedicine modifier (-C095) can be included in numerator</td>
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<tr>
<td><strong>Measure calculation</strong></td>
<td>Numerator divided by denominator, expressed as a percentage</td>
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<tr>
<td><strong>Type of measure</strong></td>
<td>Process</td>
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<td><strong>Ideal performance</strong></td>
<td>100%</td>
<td>Challenging to achieve unless follow-up evaluation is available over weekends and holidays</td>
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<td><strong>Improvement reflected by</strong></td>
<td>Increasing percentage</td>
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<td><strong>Suggested measurement period</strong></td>
<td>For the denominator: discharges occurring in a calendar month, quarter, or year For the numerator: same as denominator period plus 3 d after the end of the denominator period</td>
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<td><strong>Suggested level of evaluation</strong></td>
<td>Hospital or birthing center</td>
<td>Individual providers could be assessed in “drill-down” reports</td>
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<td><strong>Exclusions from denominator</strong></td>
<td>Patients who died during delivery hospitalization</td>
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<tr>
<td><strong>Exclusions from numerator</strong></td>
<td>None</td>
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<tr>
<td><strong>CPT codes qualifying for denominator</strong></td>
<td>Any 1 or more of the following: Vaginal delivery: 59400, 59409, 59410 Cesarean delivery: 59510, 59514, 59515 VBAC: 59610, 59612, 59614 Cesarean after TOLAC: 59618, 59620, 59622</td>
<td>Excludes management of spontaneous abortion: 59812, 59820, 59821, 59830 Management of induced abortion: 59840, 59841, 59850, 59851, 59852, 59855, 59856, 59857, 59866 Management of hydatidiform mole: 59870, 59100 Management of ectopic pregnancy: 59120, 59121, 59130, 59135, 59136, 59140, 59150, 59151</td>
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<td><strong>ICD-10 codes and drug codes qualifying for denominator</strong></td>
<td>Severe preeclampsia: 014.10, 014.12, 014.13, 014.14, 014.15 HELLP syndrome: 014.20, 014.22, 014.23, 014.24, 014.25 Eclampsia: 015.00, 015.02, 015.03, 015.1, 015.2, 015.9 Severe hypertension: I16.0, I16.1, I16.2 Injectable hydralazine: RxCUI 966571 Injectable labetalol: RxCUI 896771</td>
<td>ICD-10 does not include a specific code for severe preeclampsia superimposed on preexisting hypertension</td>
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Facilities may find it challenging to arrange timely follow-up when the 3-day postdischarge interval ends on a weekend or holiday. The metric does not allow a grace period to extend the interval to the next business day because there are potential hazards in allowing unrecognized hypertension to remain untreated for extended periods. Facilities must have alternative venues and strategies for assuring timely postpartum follow-up of hypertension because outpatient offices and clinics are not typically open 7 days per week. Alternatives may include telehealth remote monitoring, use of the labor triage unit for postpartum blood pressure checks, a system that prompts an on-call provider to contact patients, a visit on postdischarge day 1 or 2 rather than day 3, or other novel approaches. Each facility should evaluate its resources to create a solution that best serves its needs.

Providers may be reluctant to submit claims for postpartum visits under the presumption that they are bundled into “global” care packages; if claims will not be reimbursed, there is little reason to invest the effort to prepare and submit them. However, coding guidance from ACOG indicates that global maternity codes are appropriate only for routine postpartum care and should therefore not include management of complications such as severe hypertension.

Future steps for metric development
This metric may ultimately meet criteria for endorsement by the National Quality Forum (NQF). However, before endorsement, the NQF assesses potential metrics on the basis of specific measure evaluation criteria, which include importance, scientific acceptability, feasibility, usability and use, and the existence of any related or competing measures. Of critical importance are the usability and use criteria, which reflect whether facilities are using the metric for performance improvement activities, whether progress is being made, and whether the benefits of such progress are shown.

The SMFM Patient Safety and Quality Committee has had preliminary discussions with 1 payer and 1 integrated health system interested in running pilot programs to evaluate this metric. Evaluation will require development of software to query the required ICD-10, CPT, and drug codes for the numerator and denominator. Because these codes should all be readily available in the billing system, the initial calculations should be relatively straightforward. The initial query will need to be scrutinized for patterns and potential errors and biases. If the data seem valid, feedback can be given to individual facilities that can then determine whether quality improvement efforts should be directed toward improving the metric.

There is a paucity of published data regarding timely postpartum follow-up of severe hypertension. Effective as of January 2021, The Joint Commission has new maternal safety standards focused on the treatment of severe hypertension, including a requirement to provide printed education to patients regarding when to schedule a postdischarge follow-up appointment. These standards will likely motivate future studies evaluating the rate of timely follow-up. Ideally, future publications will use a common operational definition of “timely follow-up,” based on criteria such as the metric proposed here, so that their findings can be compared.

Quality improvement opportunities
Even if they cannot calculate and track the proposed metric, providers may recognize the need to improve performance simply on the basis of the casual observation that many patients with severe hypertension do not have follow-up

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### TABLE

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Notes, critique
ACOG recommends that patients be evaluated within 72 h. Telephone-only encounters are included in numerator although patient is not physically seen, under the assumption that the purpose of the encounter is to evaluate blood pressure (patient report) and warning symptoms.


within 3 days. W.E. Deming stated, “It is wrong to suppose that if you can’t measure it, you can’t manage it — a costly myth.” In this section, several steps are suggested that facilities can take to improve their rates of timely postpartum follow-up for hypertensive patients, regardless of whether or not they can track the proposed metric.

Planning and implementation

A formal quality improvement (QI) project will likely be needed to achieve a meaningful facility-wide increase in the rate of timely follow-up; however, motivated individual providers may make small improvements on their own. Implementing a QI project is a complex task for most care system, with each system presenting unique challenges and barriers. Helpful toolkits and resources for QI projects are presented by the Agency for Healthcare Research and Quality and the Council on Patient Safety in Women’s Health Care. Typical steps include the following:

1. Obtain buy-in from hospital administration and ambulatory practices. QI projects involve significant investments of resources, especially personnel time from individuals in management, clinical staff, and the quality department. Before approving resource allocation, hospital leadership and ambulatory practices must be convinced that a project will lead to important improvements in clinical care and outcomes.

2. Organize a multidisciplinary stakeholder team. Relevant participants include diverse representatives from all groups involved in coordinating care between hospital and ambulatory practices, including physicians, midwives, managers, hospital and office nurses, hospital clerical staff, and office scheduling staff. A member of the hospital quality department may be experienced in QI projects and serve as a coordinator. A patient advocate may provide useful “voice of the customer” insights. It is recommended that the team have a least 1 “champion” from hospital staff and 1 from the ambulatory side; champions should be people with vision and commitment to the project who will be able to communicate, educate, and motivate change among the diverse members of their constituency. The team should meet to understand the current workflow for follow-up of severe hypertension and develop workable solutions to improve the rate of timely follow-up.

3. Assess baseline data. If the facility receives data from a payer or health system to track the specified metric (Table), obtaining baseline data will be simple and automated. Otherwise, the team will need to obtain a sample of cases via a manual audit. A sample of approximately 20 cases will likely yield a reasonable estimate of the rate of timely follow-up and may provide insights into the common reasons for the failure of follow-up. Cases can be identified by searching the hospital discharge codes for severe hypertension (Table) or the pharmacy database for patients receiving intravenous labetalol or hydralazine. Discharge notes can be reviewed to determine whether an appointment was made or recommended within 3 days, although telephone calls to provider offices will be needed to determine whether the appointment was kept. The manual work required is likely too burdensome to allow a complete audit of all eligible patients. However, there is a general notion in the QI field that the right amount of data to collect for a QI project is “just enough” data. A sampling of cases is often sufficient to garner insights and drive improvement.

4. Develop “SMART” goals. SMART stands for specific, measurable, achievable, relevant (or realistic), and time-bound. A sample goal for this project might be, “Patients with severe obstetric hypertension should have a follow-up within 72 hours after hospital discharge. We will increase the rate of such follow-up from 30% currently to at least 70% by December of this year.” Setting a realistically achievable target will position the team for likely success; a target rate of 100% will more likely set them up for failure. Setting a time limit motivates the team to act expeditiously and reassures the administration that the project has a defined endpoint.

5. Plan-do-study-act (PDSA) cycles. After studying the baseline rate and sampling charts to determine common reasons for failure of timely follow-up, the team should agree on 1 specific intervention that will likely improve the rate (the Plan phase). The intervention is then deployed (the Do phase), and new data are obtained to determine whether the rate has changed (the Study phase). The team then determines what additional intervention is needed to drive further improvement (the Act phase) and starts a new PDSA cycle. Several small interventions deployed sequentially are usually more successful than an all-encompassing project that attempts to introduce several big changes all at once. Several small, short-duration PDSA cycles may be needed to reach a given SMART goal, which can have a longer time frame. Interventions that are easily implemented and that have a high probability of success should be chosen first so that the team has early successes to help keep them motivated. Possible interventions and a logical order to introduce them might include the following sequence:

- Education of the physician and midwife staff regarding the ACOG recommendation for follow-up within 72 hours.
- Education of the nursing and hospital clerical staff regarding the ACOG recommendation and warning symptoms that should alert the patient to seek prompt attention.
- Introduction of standardized patient education tools for nurses to teach all patients about warning symptoms in addition to tools to teach the recommended follow-up intervals for patients with severe hypertension (within 72 hours after discharge) and other hypertension (7–10 days after birth). The tools should be culturally, linguistically, and literacy-level appropriate.
The education should be documented to enable the team to determine how often it is being done.

- Education of outpatient office clerical staff about the ACOG—recommended follow-up intervals for patients with hypertension.
- Provision of devices and teaching for ambulatory blood pressure measurement in patients with hypertensive disorders.
- Development of text-messaging—based systems or other semiautomated systems to remind patients to check blood pressure and review warning symptoms and remind providers to follow up after discharge of patients with severe hypertension.
- Introduction of standardized processes for scheduling follow-up postpartum appointments, including systems that will function after-hours, on weekends, and on holidays. Developing such systems will require concerted effort and coordination between hospital and ambulatory settings.
- Development of a hospital-based postpartum blood pressure assessment and follow-up program, open 7 days a week, where all patients can return for timely postpartum hypertension follow-up, relieving ambulatory offices from the burden of scheduling. The program should be staffed by personnel familiar with severe hypertension and trained in the appropriate triage of patients with hypertensive emergencies. It could be an ancillary service provided on a postpartum unit or other appropriate location within the hospital.

This suggested list of interventions is neither complete nor mandatory. The team at each facility should select the interventions and the order of introduction that is most relevant and realistic for their resources and patient population.

**Identifying and addressing barriers**

Barriers to success should be anticipated, including staffing constraints, limited financial resources for the provision of blood pressure cuffs, lack of supportive technology, difficulty identifying qualifying patients, and lack of a reliable system for scheduling and tracking follow-up appointments. If appointments are in-person, there may be patient-specific challenges such as unreliable transportation or lack of childcare. If appointments are via telehealth, there may be technological or communication barriers to making or keeping appointments. During the PDSA cycles, the team should discuss barriers encountered and brainstorm methods to overcome them.

**Resetting goals and maintenance**

Once the QI project has achieved its SMART goals, the team should consider whether further improvement is possible. If the initial goal was 70%, could a rate of 80% or 90% be attained? How much effort and resources would need to be invested? Would it be worthwhile to aim for a higher target? If so, then further PDSA cycles can be implemented. If further improvement is not practical or realistic, the team should move the project into a maintenance phase. Maintenance involves periodically rechecking the rate of timely follow-up to determine whether it remains stable. Again, if the specified metric is being tracked (Table), maintenance can be simple and automatic using monthly data provided by a payer or health system. Otherwise, periodic sampling of cases may be needed to determine the approximate rate in a manner similar to the previously described process applied in determining the baseline rate.

These suggestions provide some ideas for planning and performing a QI project using proven tools and strategies. However, each facility is unique and should develop the tools and strategies that best suit its own needs. Nevertheless, regardless of the precise methods chosen, every facility should be able to improve their rate of timely follow-up of severe hypertension and thereby reduce the associated maternal morbidity and mortality.

**REFERENCES**


All authors and committee members have filed a disclosure of interests delineating personal, professional, business, or other relevant financial or nonfinancial interests in relation to this publication. Any substantial conflicts of interest have been addressed through a process approved by the Society for Maternal-Fetal Medicine (SMFM) Board of Directors. SMFM has neither solicited nor accepted any commercial involvement in the specific content development of this publication.

This document has undergone an internal peer review through a multilevel committee process within SMFM. This review involves critique and feedback from the SMFM Publications and Document Review Committees and final approval by the SMFM Executive Committee. SMFM accepts sole responsibility for the document content. SMFM publications do not undergo editorial and peer review by the American Journal of Obstetrics & Gynecology. The SMFM Patient Safety and Quality Committee reviews publications every 36 to 48 months and issues updates as needed. Further details regarding SMFM Publications can be found at www.smfm.org/publications.

SMFM recognizes that obstetrical patients have diverse gender identities and is striving to use gender-inclusive language in all of its publications. SMFM will be using terms such as “pregnant person” or “pregnant individual” instead of “pregnant woman” and will use the singular pronoun “they.” When describing study populations used in research, SMFM will use the gender terminology reported by the study investigators.

All questions or comments regarding the document should be referred to the SMFM Patient Safety and Quality Committee at smfm@smfm.org.

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