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Pitfalls With the New American College of Obstetricians and Gynecologists Task Force on Hypertension in Pregnancy

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Abstract: The American College of Obstetricians and Gynecologists Task Force on Hypertension in Pregnancy was created to evaluate the existing literature, develop practice guidelines, and identify areas for future research focus. Several issues were identified that may not have been initially obvious during the process of developing this document, including limited practical use, a lack of high quality literature, conflicting recommendations, a potential for high resource utilization, need for continually updated information, and little headway in research that is clinically useful. The purpose of this review was to make suggestions to improving these guidelines' overall usefulness and consistency for the busy clinician.

Key words: hypertension, preeclampsia, pregnancy-induced hypertension, gestational hypertension, HELLP syndrome

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Introduction

Pitfall (noun): a danger or problem that is hidden or not obvious at first (Merriam-Webster's Learner's Dictionary, merriam-webster.com).

Hypertensive disorders of pregnancy are increasingly common, complicated to diagnose and manage, and responsible for significant morbidity and mortality for both mothers and children worldwide. The American College of Obstetricians

and Gynecologists (ACOG) Task Force on Hypertension in Pregnancy[1] was convened in 2011 with this in mind and tasked with 3 goals:

(1) Summarize and grade all of the world literature on hypertensive disorders of pregnancy.
(2) Develop practice guidelines for obstetricians based on this information.
(3) Identify where research in hypertension in pregnancy should focus in the future.

A group of 17 experts developed the 99-page *Hypertension in Pregnancy*, which has 60 recommendations and has been endorsed by 9 national societies. In its own words, *Hypertension in Pregnancy* was not meant to serve as a rigid set of rules, but rather as a guideline to be built upon and adapted to improve patient care. On the surface, the stated goals were met. The document is an exhaustive summary of what we do and do not know about hypertensive disorders of pregnancy. Definitions are described. Management strategies for the various iterations of hypertension in pregnancy are outlined, including delivery timing and antihypertensive therapy. The importance of patient and provider education and clinical vigilance is emphasized. Many interesting and relevant areas of research are recommended.

The pitfalls of *Hypertension in Pregnancy* are revealed when one attempts to translate the information presented into day to day obstetrical care. Frequent referencing by these authors (who actually keep *Hypertension in Pregnancy* filed under ''Favorite Articles'') to patients, other physicians, trainees, and the public, have identified several issues that may not have been initially obvious during the process of developing the Task Force document.

The pitfalls of the Task Force document can be summarized as follows:

(1) The goals of the Task Force were an enormous undertaking. In its final iteration, its practical use is limited by its length and organization. The obstetrician in a busy clinic, in the middle of the night on labor and delivery, or on the phone with an emergency medicine physician needs a quick reference for best practice to go with his/her clinical judgment.
(2) The literature on hypertension and preeclampsia is not, as it turns out, always of the highest quality or strength, and rarely is both. Of the 60 recommendations, only 6 have ''High'' quality evidence and a ''Strong'' recommendation, and over half of the recommendations have ''Low'' quality evidence, a ''Qualified'' recommendation, or both.
(3) The guidelines contradict or overlap with both other portions of the main document, or other obstetrical guidelines.
(4) The focus on awareness of postpartum preeclampsia and intensive postpartum hypertension management is novel for many obstetricians, and is potential source of frustration for both patient and physicians due to increased resource utilization.
(5) Any document written, but especially one on such a large and complex topic as hypertension in pregnancy, is almost immediately out of date once it is published. One way around this is to utilize the many additional available resources that could be linked to this document electronically. This could provide easy references for the clinician, active updates as new data become available, and a bridge toward the ideal of a global consensus on management of hypertensive disorders of pregnancy.
(6) Finally, although the research over the last decade or so has elucidated many potential etiologies and predictors of this disease, not much has translated to a change in clinical

outcomes. Prediction of preeclampsia or stratification of risk is unfortunately not helpful when we have little to offer for prevention or treatment for prolongation of pregnancy.

It is our hope that in addressing these issues, we will help build upon this incredible effort to improve outcomes for patients, while improving its overall usefulness and consistency for those on the front line of obstetrics as well as on the forefront of innovation.

Pitfall 1: In its final iteration, the Task Force guidelines' practical use is limited by its length and organization.

As the all-encompassing manifesto on hypertension, it was important that the Task Force be thorough in its analysis, requiring the length. For the clinician in the everyday world of obstetrics, a one-time continuing medical education read is reasonable (as opposed to what these authors needed to do), but a main goal of the Task Force was to develop practice guidelines for obstetricians. In the end, practice guidelines need to be straightforward and easy to access in clinic, on labor and delivery, and while consulting on the phone.

We suggest using box E-1 and figure E-1[1] for definition confirmation. We suggest using figures 5-1 and 5-2[1] for the main points of management of the 2 types of preeclampsia (despite a few inconsistencies, see Pitfall 3). Chronic hypertension with superimposed preeclampsia has an entire set of recommendations that are essentially the same as the recommendations for regular preeclampsia; mention of this in the existing algorithm could be added, or a separate algorithm could be developed. Alternatively, the recommendations could be consolidated to avoid repetition (see Pitfall 2).

Chapter 6 is devoted to management of women with prior preeclampsia. Patients with a history of preeclampsia ask 2 questions: What is the chance I will get it again and how do I prevent it from happening? For some patients, how this is answered determines if they consider another pregnancy. This chapter addresses primarily the second question with aspirin for prevention and increased surveillance to identify it more quickly. There is a 2015 meta-analysis that addresses the first question.[2] The recurrence rate for any hypertensive disorder of pregnancy is about 21%. If the index pregnancy had Hemolysis, Elevated Liver Enzymes, Low Platelets (HELLP) syndrome, the recurrence risk is higher (36%) of having any hypertensive disorder. The earlier the gestational age at the index pregnancy, the more likely there is to be a recurrence and to have another premature birth. See Tables 1 and 2 for a brief and usable (in our opinion) summary for clinicians.

TABLE 1. Hypertensive Disorder of Pregnancy and Recurrence Risk Based on Index Pregnancy Disorder

	%				
Index Pregnancy	**Recurrence Risk**	**Recurrence Risk of Preeclampsia**	**Recurrence Risk of Gestational Hypertension**	**Recurrence Risk of HELLP**	**Recurrence Risk of SGA**
Any HDP	20.7	13.8	8.6	0.2	3.4
Preeclampsia	20.4	16.0	6.0	0.2	3.3
Gestational hypertension	21.5	7.1	14.5	0.1	3.6
HELLP	36.3	17.8	18.4	7.2	5.9
SGA	22.2	14.3	12.9	0.6	6.6

HDP indicates hypertensive disorders of pregnancy; HELLP, Hemolysis, Elevated Liver Enzymes, Low Platelets; SGA, small for gestational age.

TABLE 2. Gestational Age at Index Pregnancy and Recurrence Risk of Hypertensive Disorders

	%			
Gestational Age at Index Pregnancy	**Recurrence Risk of Any HDP**	**Recurrence Risk < 37 wk**	**Recurrence Risk < 34 wk**	**Recurrence Risk < 28 wk**
Any gestational age	20.7	3.3	1.2	0.2
< 37 wk	30.8	10.6	4.5	0.7
< 34 wk	36.0	15.4	8.1	1.5
< 28 wk	38.6	20.1	11.4	3.8

Data from Van Oostwaard.[2]

HDP indicates hypertensive disorders of pregnancy.

Keeping blood pressure (BP) goals and delivery timing straight needs to be in a consolidated format, not spread throughout the document. We propose Tables 3 and 4 as our best effort to make this easy, although putting it together was actually not an easy task.

Pitfall 2: The literature on hypertension and preeclampsia is not, as it turns out, always of the highest quality or strength, and rarely is both.

Of the 60 recommendations, only 6 have "High" quality evidence and a "Strong" recommendation:

(1) Do not use vitamin C or vitamin E to prevent preeclampsia.
(2) Administer corticosteroids for fetal lung maturity for women with severe preeclampsia managed expectantly ≤34 weeks.
(3) Administer corticosteroids for fetal lung maturity for women with superimposed preeclampsia managed expectantly ≤34 weeks.
(4) Administer magnesium sulfate to women with eclampsia.
(5) Administer magnesium sulfate to women with severe preeclampsia intrapartum and postpartum.
(6) For women with HELLP syndrome before viability, deliver shortly after maternal stabilization.

Pitfalls: Recommendation 1 has been established since 2008.[3] Recommendations 2 and 3 are essentially the same thing and a common practice given the proven benefit of antenatal steroids. Recommendations 4 and 5 have been standard practice for almost a century. Recommendation 6 may offer some controversy when it comes to the definition of "before viability," but again is not

TABLE 3. Blood Pressure Goals for Hypertensive Disorders of Pregnancy (All in mm Hg)

	Antepartum	**Postpartum**
Normal pregnancy	< 140/90	< 150/100
Gestational hypertension	< 160/110	< 150/100
Preeclampsia w/or w/o SF	< 160/110	< 150/100
Chronic hypertension no meds	< 160/105	< 160/100
Chronic hypertension on meds	120-160/80-105	< 160/100
Chronic hypertension w/end organ dysfunction	< 140/90	< 140/90
Chronic hypertension w/superimposed preeclampsia	< 160/110	< 160/100

TABLE 4. Delivery Timing Recommendations*

Gestational hypertension	37 wk
Preeclampsia w/o SF	37 wk
w/FGR < 5%	34 wk
Preeclampsia w/SF	34 wk
w/FGR < 5%	After corticosteroids
w/worsening symptoms	After corticosteroids
Chronic hypertension	38-39 wk
w/complication	36-37 6/7 wk

*Delivery timing must take into account the clinical picture, with earlier delivery for deterioration in maternal or fetal status.

new. These are the highest level of recommendation within this document, but do not address the real issues of hypertensive disorders of pregnancy, which how to separate the severely ill from the stable, when to deliver, and how to treat hypertension.

With this in mind, we turn to the next set of recommendations, labeled "Moderate" quality of evidence with "Strong" recommendation, which is a mix of fairly standard management strategies, some confusing changes, and some repetitive/redundant recommendations:

(1) Screening to predict preeclampsia (except by history) is not recommended.

- Considering the extent to which research and industry have focused on biomarkers, ultrasound indices and algorithms to predict risk of preeclampsia, this recommendation cancels out decades of work-at least for now. It does help the clinician to forgo these potentially expensive and unnecessary tests.

(2) Umbilical artery Dopplers are recommended as an adjunct antenatal test with fetal growth restriction in patients with preeclampsia.

- This is not really anything new; this is standard care for fetal growth restriction, so it does not really need to be defined in this context.

(3) Delivery is recommended for severe preeclampsia ≥ 34 weeks or if maternal or fetal condition is unstable.

- Not new, but a solid management recommendation.

(4) Stable severe preeclampsia ≤ 34 weeks should be managed at facilities with adequate maternal and neonatal intensive care services.

- Another solid management recommendation and a case for tertiary-level care.

(5) Antihypertensive therapy is recommended for preeclampsia with sustained hypertension $\geq 160/110$ mm Hg.

- This recommendation seems like it should have more evidence to support it, but there are no randomized trials to determine the treatment level in pregnancy.

(6) Proteinuria (amount or change) should not be used in delivery decision making.

- This is a major change. A total of 5 g of protein in 24 hours has also been eliminated from the definition of severe preeclampsia. Therefore, protein no longer determines the severity of preeclampsia (and hence need for delivery) and once the threshold is met, it no longer needs to be evaluated. No repeat 24 hour urines are needed, or any at all if one uses a protein/creatinine ratio.
- The use of the urine protein/creatinine ratio as an alternative to the 24 hour urine makes diagnosis of proteinuria more efficient, yet common practice is to use the 24 hour urine as the standard of care. The validity of this, as well as the controversy regarding the cutoff level for the protein/creatinine ratio are not discussed in the document.
- What can be confusing about the whole protein thing is that gestational hypertension requires the absence of proteinuria, but preeclampsia does not actually need proteinuria in order for it to be preeclampsia. This further emphasizes that the most important thing is to evaluate and reevaluate the patient (as these diseases can progress rapidly) to maximize maternal and fetal safety.

(7) Expectant management is not recommended for severe preeclampsia before fetal viability.

- This is essentially the same as recommendation 6 from the High/Strong category.

(8) Corticosteroids for lung maturity should be given but delivery after maternal stabilization should not be delayed in severe preeclampsia with uncontrolled hypertension, eclampsia, pulmonary edema, abruption, disseminated intravascular coagulopathy, nonreassuring fetal status or intrapartum fetal demise.

- This is a confusing one for clinicians; do we just give steroids and then immediately deliver? Is the mother stable with any of these conditions? Is there any benefit to the steroids with such a short course? Why would we give steroids if there is a demise?

(9) Magnesium sulfate administered to women with preeclampsia should be continued intraoperatively during cesarean delivery.

- This is to dispel concern that magnesium will interfere with uterine tone, but in favor of continuing it so that the seizure threshold is not lowered during the most dangerous time, postpartum. It is therefore imperative that plans are made before going into the operating room regarding potential treatment for uterine atony that are appropriate for a patient with preeclampsia.

(10) Women with HELLP syndrome ≥ 34 weeks should be delivered once stabilized.

- No argument here.

(11) Regional anesthesia is recommended for labor or cesarean delivery if feasible, but special attention must be given to avoid hypotension in this BP labile population.

- No argument here either.

(12) Women with chronic hypertension with BP $\geq 160/105$ mm Hg should be treated with antihypertensives.

- This is a nitpicky point, but the diastolic level is different than the recommendation for pregnant women with severe hypertension (110 mm Hg). For the clinician this inconsistency is confusing. The postpartum recommendations for treatment change yet again to 150/100 (unless the patient has chronic hypertension ($< 160/100$) or chronic hypertension with end organ damage, where the target BP is $< 140/90$) (Table 3).

(13) Labetalol, nifedipine, or methyldopa are the recommended antihypertensive drugs in pregnancy.

- These are well described in the document, and commonly used by clinicians, although of the 3 drugs methyldopa is probably the least useful.

(14) Angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, renin inhibitors and mineralocorticoid receptor antagonists are not recommended.

- These are not new data.

(15) Umbilical artery Doppler velocimetry should be used as an adjunct antenatal test in women with chronic hypertension and fetal growth restriction.

- This is repetitive from recommendation 2.

(16) Women with otherwise uncomplicated chronic hypertension should not be delivered before 38 weeks gestation.

- It is not entirely clear in this document whether medication use counts as a complication that may necessitate

delivery before 38 weeks. Well-controlled hypertension on medication seems reasonably uncomplicated, yet just a few paragraphs above is the recommendation for antenatal testing for "chronic hypertension complicated by issues such as the need for medication." Of note, ACOG recommendation for chronic hypertension well controlled on medications is 37-39 6/7 weeks (which is not that helpful).[4]

(17) Women with chronic hypertension with superimposed preeclampsia with severe features should receive magnesium sulfate for eclampsia prophylaxis.
(18) Women with superimposed preeclampsia and uncontrollable severe hypertension, eclampsia, pulmonary edema, abruption, disseminated intravascular coagulopathy, or nonreassuring fetal status should be stabilized and delivered.
(19) Women with superimposed preeclampsia with severe features ≤ 34 expectantly managed should be at facilities with adequate maternal and neonatal intensive care resources.
(20) Women with superimposed preeclampsia with severe features should not be managed expectantly beyond 34 weeks.

- Recommendations 17 to 20 are all the same as management of preeclampsia with severe features; these could be consolidated for ease of use and remembrance for the clinician.

After this, although many of the remaining recommendations are useful (low-dose aspirin for reduction of risk of preeclampsia), reasonable (patient education should be done, do not use angiotensin converting enzyme inhibitors in women of reproductive age, and straightforward (BP in chronic hypertension should be maintained 120-160/80-105), the evidence to support and strength of the recommendation are considerably limited. A major pitfall is that the majority of the recommendations in this document are not supported by good evidence.

Pitfall 3: The guidelines contradict or overlap with both other portions of the main document or other obstetrical guidelines.

Fetal Growth Restriction (FGR)

FGR was removed from the definition of severe preeclampsia "because fetal growth restriction is managed similarly in pregnant women with and without preeclampsia." This is not consistent with the ACOG Committee Opinion 560, which states that FGR with maternal comorbidities (preeclampsia, chronic hypertension) are delivered at 34-37 6/7 weeks as opposed to 38-39 6/7 weeks if otherwise uncomplicated.[4]

Another issue with management of FGR in preeclampsia is seen in figure 5-1 (management of mild gestational hypertension or preeclampsia without severe features),[1] which states that if fetal weight $< 5\%$, delivery is indicated at 34 weeks as opposed to 37 weeks. This does not have a specific recommendation, but the one that suggests delivery at 37 weeks unless there is an indication for delivery (p. 34) is Low/Qualified. Figure 5-2 (management of severe preeclampsia at < 34 wk)[1] if fetal weight $< 5\%$ ("severe" fetal growth restriction), delivery is indicated after corticosteroids as opposed to waiting until 34 weeks (Moderate/Qualified, p. 39).

Regarding the choice of estimated fetal weight (EFW) $< 5\%$ dictating management above: FGR $< 5\%$ has a 2.5% risk of fetal death (as opposed to 1.5% for EFW $< 10\%$).[5] The choice of $< 5\%$ as "severe" fetal growth restriction is not discussed, nor is it used standardly in any other practice guideline in obstetrical care. The data are limited but SMFM[6]

recommended individualizing expectant management of severe preeclampsia with fetal growth restriction (defined as EFW < 10% or abdominal circumference < 5%) with a bias toward delivery once steroids administered (level II to III evidence, level B recommendation). The management of preeclampsia with fetal growth restriction at an EFW of 5% to 9% may be a bit of a nail-biter. Luckily, for the nonrisk takers, ACOG provides a delivery option at 34 weeks if desired.

Delivery Timing

Delivery timing for women with preeclampsia without severe features is suggested at 37 0/7 weeks. This is touted as one of the "biggest changes" in preeclampsia management; yet the data to support this delivery timing has been present at least since the Hypertension and Preeclampsia Intervention Trial At Term trial was published in 2009.[7] We have not changed our practice for preeclampsia delivery timing due to these recommendations. Mild gestational hypertension is included in the delivery timing at 37 weeks in the Task Force (Moderate/Qualified). This is somewhat confusing since the ACOG Committee Opinion on medically indicated early term/late preterm deliveries uses the time frame 37 to 38 6/7 weeks.[4]

Thrombophilias

History of thrombophilia is listed as a risk factor for preeclampsia in box 3-1.[1] Per ACOG, inherited thrombophilias do not have a proven association risk of preeclampsia.[8] It is time to put this to rest, especially since it may lead to unnecessary and expensive testing. If one wants to make an argument for antiphospholipid antibodies' association with preeclampsia, then it should be specified as such, but screening for antiphospholipid antibody syndrome in patients with a history of early-onset preeclampsia has not demonstrated improvement in patient outcomes.[9]

Timing of the Treatment of Severe Hypertension

The necessity of treating acute-onset hypertension during pregnancy or the postpartum period is not up for debate, nor is the level at which treatment is to be initiated (systolic BP ≥ 160 or diastolic BP ≥ 110). How quickly the practitioner is to act is not consistent in the available guidelines, which potentially leads to inconsistency in practice and potential medicolegal implications. Although the Task Force has specific recommendations for the antihypertensive medications to be used for "urgent blood pressure control," (table 7-1)[1] the timing of administration of these drugs is not explicitly discussed. Under the diagnostic criteria for preeclampsia (table E-1), severe range BP "can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy."[1] The ACOG Committee Opinion on Emergent Therapy for Acute-Onset Severe Hypertension states "Acute-onset severe hypertension that is accurately measured using standard technique and is persistent for 15 minutes or more is considered a hypertensive emergency."[10] The therapeutic algorithms outlined in this bulletin center around this timing. The "Emergency Department Postpartum Preeclampsia Checklist" from the Safe Motherhood Initiative (ACOG District II, available at http://www.acog.org), recommends antihypertensive therapy within 1 hour for persistent severe range BP, with the caveat "May treat within 15 minutes if clinically indicated."[11] Finally, the California Maternal Quality Care Collaborative Antihypertensive Agents in Preeclampsia toolkit (available at http://www.cmqcc.org) recommends the following "Initiation of therapy within 60 minutes is recommended. However, every attempt should be made to initiate therapy within 30 minutes after confirmation of severe range BPs if possible."[12] Although all of these seem reasonable, a

single unified recommendation is essential to the practicing clinician and at present none exists.

Inconsistencies and Need for Clarification

Figure 5-1[1] is an algorithm that is likely to be frequently accessed and is not consistent with the text. Abruption is listed separately an indication for delivery on its own or only if >34 weeks. Oligohydramnios is listed in the text, but not in the algorithm (abnormal maternal or fetal tests likely encompass this, but a specific definition or legend would be helpful.) "Persistent" oligohydramnios is not defined. Task Force recommendation for close monitoring leaves out creatinine and non-stress tests (p. 33).

Figure 5-2[1] has "severe" oligohydramnios listed under "additional expectant complications," but this is not defined, nor is "significant renal dysfunction." Premature rupture of membranes <34 weeks is listed as a reason to deliver after 48 hours; if the patient is 30 weeks and stable why not follow the algorithm from ACOG practice bulletin 160?[13]

On page 39, under "fetal assessment" there is no evidence presented that a biophysical profile needs to be performed twice weekly when daily non-stress tests are being performed.[1] In addition, "severe oligohydramnios" is defined 2 different ways on the same page (maximum vertical pocket <2 cm and amniotic fluid volume <5 cm).

The above issues highlight both the breadth of the information that the document tried to encompass as well as the need to consolidate and unify the guidelines available to clinicians.

Pitfall 4: The focus on awareness of postpartum preeclampsia and intensive postpartum hypertension management is novel for many obstetricians, and is potential source of frustration for both patient and physicians due to increased resource utilization.

The increased awareness includes the recommendation (Moderate/Qualified) to monitor all women with hypertensive disorders of pregnancy for at least 72 hours postpartum in the hospital or outpatient and again 7 to 10 days after delivery (or earlier if symptoms). For one thing, this timing is interesting in that the BP increase postpartum actually peaks at days 3 to 6 postpartum so 7 to 10 day seems outside the most dangerous window. Seventy-two hours is usually longer than most vaginal delivery patients stay, although some cesareans may stay this long. Keeping patients longer than is necessary in the hospital is expensive and not desired by most patients or physicians. This could be addressed with home nursing visits, outpatient clinic visits, or home BP monitoring. Although not unreasonable, all of these options require more resources and time during difficult transition for many patients. The Task Force makes a point of stating that postpartum preeclampsia may occur up to 4 weeks postpartum, a time frame when obstetricians are not accustomed to managing hypertension. Finally, the Task Force briefly mentions a later postpartum hypertension phenomenon between 2 week and 6 months, but no recommendations regarding management are suggested.

Postpartum antihypertensive therapy is recommended (Low/Qualified) if hypertension is persistently 150/100 mm Hg. This is expert opinion only, without trials to support treatment level, target BPs, or length of treatment. For some patients, this may increase their hospital stay or frequency of outpatient visits, place them on a medication with significant side effects, and potentially interfere with infant bonding. Without more specific guidelines, obstetricians, who are not usually trained to take care of chronic hypertension long term, will understandably have some frustration in caring for these patients who otherwise would have been seen at 6 weeks postpartum when the BP naturally normalizes.

Magnesium sulfate is recommended for 24 hours in patients with postpartum preeclampsia or hypertension in association with neurologic symptoms, epigastric pain or shortness of breath (Low/Qualified: there are no studies of placebo vs. magnesium in these patients). Other signs of HELLP syndrome or workup for such are not mentioned. This is NOT recommended if severe features or severe hypertension are not present, but it is not explicitly explained nor is how to treat patients with postpartum preeclampsia without severe features. This type of treatment requires hospitalization, a high level of nursing, a drug with significant side effects, and potential separation from the infant.

Another topic mentioned several times as a change in postpartum management is the restricted use of "commonly used postpartum pain relief agents," ie, nonsteroidal anti-inflammatory agents (NSAIDs). This is not an official recommendation, but it is mentioned no fewer than 3 times in passing that these agents can cause hypertension in the postpartum period. The vasoconstrictive and sodium/water retention actions of NSAIDs are suggested as potential causes of this severe hypertension in the postpartum period.[14] This is really only based on a case report of 2 patients by Makris et al,[15] both of whom received indomethacin (not the more commonly used ibuprofen or ketorolac), and only 1 had antepartum hypertension. The most recent Cochrane review (2013) on postpartum hypertension merely suggests that further research include the use of pain medications in the postpartum period, as the data are limited.[16]

The issue with this subtle suggestion/not really a real recommendation is that this sometimes leads to an all-or-nothing phenomenon of no NSAIDs for patients with any kind of hypertension. The actual statement is that if women have persistent hypertension >1 day postpartum to consider a different agent. Blanket withholding of NSAIDs, especially in the immediate postpartum period may lead to inadequate pain control, which can lead to multiple other postpartum complications such as delay in ambulation and interference with neonatal bonding. Clinical judgment and prudent use of NSAIDs with discontinuation as needed must be considered before we withhold pain relief for postpartum women.

The true incidence of postpartum preeclampsia is not known, but its potentially devastating consequences are not in question. The above recommendations, which are not based on high quality evidence, require a considerable amount of health care utilization both inpatient and outpatient. The clinician and patient will be significantly affected by this type of management plan. It is therefore prudent to consider further study of these interventions to determine their true worth to justify the expenditure, monetary, or otherwise.

Pitfall 5: Any document written, but especially one on such a large and complex topic as hypertension in pregnancy, is almost immediately out of date once it is published. One way around this is to utilize the many additional available resources that could be linked to this document electronically. This could provide easy references for the clinician, active updates as new data become available, and a bridge toward the ideal of a global consensus on management of hypertensive disorders of pregnancy.

Chapter 4 is devoted to prevention of preeclampsia. The recommendation regarding the use of low-dose aspirin was updated in July 2016 with "Practice Advisory on Low-Dose Aspirin and Prevention of Preeclampsia: Updated Recommendations" (http://www.acog.org).[17] This new recommendation greatly expands the patient population in which low-dose aspirin may benefit for the prevention of preeclampsia, in keeping with the US Preventative Services Task Force recommendations.

There are multiple resources available through ACOG that are related to the topics covered in the document and can serve as quick references for clinicians (eg, ''Emergent therapy for acute-onset, severe hypertension during pregnancy and the postpartum period. Committee Opinion No. 623,'' ''Emergency Department Postpartum Preeclampsia Checklist'' from the Safe Motherhood Initiative, both available at http://www.acog.org).[10–11]

Chapter 7 is devoted to chronic hypertension, the treatment of which can be complex. The Task Force recommendation on page 58 (Low/Qualified) was reaffirmed with the most recent literature in the SMFM Statement: ''Benefit of antihypertensive therapy for mild-to-moderate chronic hypertension during pregnancy remains uncertain,'' released in 2015.[18,19]

Patient education is the topic of Chapter 9 as well as mentioned in other chapters (Chapter 5, p. 44), with suggestions to the clinician of how to incorporate the patient into the vigilance necessary for early preeclampsia recognition. It is important that this is done without causing undue anxiety and inappropriate use of medical resources, which is why standardization is important. Many types of materials such as discharge instructions, tear sheets, and posters are available (examples include but are not limited to The Preeclampsia Foundation and the ACOG Safe Motherhood initiative, http://www.preeclampsia.org, http://www.acog.org). The Task Force could incorporate some of these ideas into a standard set of documents that can then be used by clinical offices and hospitals as part of an education program.

There are World Health Organization guidelines for preeclampsia (2011) that are somewhat different than the Task Force recommendations, although these are in the process of being updated. This guideline focuses on more resource-limited areas, which offers a different perspective on management and treatment of preeclampsia.[20]

The above are just examples of how the Task Force document can serve as a springboard for improving patient care; it may be the quintessential reference, but in a digital world, rapid change is the norm, and this may be a way to keep up with it.

Pitfall 6: Finally, although the research over the last decade or so has elucidated many potential etiologies and predictors of this disease, not much has translated to a change in clinical outcomes.

''Chapter 10: State of the Science and Research Recommendations'' is 8 pages long but can be summarized in 1 recommendation:

''All of these recommended studies should focus not only on clinical usefulness but how they directly affect obstetrician's management decisions, improve health outcomes, and reduce costs to the health care system.''

The pitfall of research in preeclampsia is that there is still no treatment for this disease. This needs to be the focus of research until that goal is achieved.

Conclusions

There is no question that *Hypertension in Pregnancy* is the most comprehensive summary of the literature and management recommendations to date. Identifying the pitfalls was not meant to criticize the worth of this undertaking, but rather help identify how to make this a more useful practice guideline for the clinician. Guidelines are there to supplement clinical judgment, and cannot replace the value of being at the patient's bedside, examining her, and making decisions based on that individual mother-baby pair. However, clinical outcomes improve when evidence is used to standardize practice, which was the goal of this document. This can be built upon to

improve clinical management, outcomes, and the future of research in the field.

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