The role of screening, brief intervention, and referral to treatment in the perinatal period

Tricia E. Wright, MD, MS; Mishka Terplan, MD, MPH; Steven J. Ondersma, PhD; Cheryl Boyce, PhD; Kimberly Yonkers, MD; Grace Chang, MD, MPH; Andreea A. Creanga, MD PhD

Substance use during pregnancy is at least as common as many of the medical conditions screened for and managed during pregnancy. While harmful and costly, it is often ignored or managed poorly. Screening, brief intervention, and referral to treatment is an evidence-based approach to manage substance use. In September 2012, the US Centers for Disease Control and Prevention convened an Expert Meeting on Perinatal Illicit Drug Abuse to help address key issues around drug use in pregnancy in the United States. This article reflects the formal conclusions of the expert panel that discussed the use of screening, brief intervention, and referral to treatment during pregnancy. Screening for substance use during pregnancy should be universal. It allows stratification of women into zones of risk given their pattern of use. Low-risk women should receive brief advice, those classified as moderate risk should receive a brief intervention, whereas those who are high risk need referral to specialty care. A brief intervention is a patient-centered form of counseling using the principles of motivational interviewing. Screening, brief intervention, and referral to treatment has the potential to reduce the burden of substance use in pregnancy and should be integrated into prenatal care.

Key words: alcohol, brief intervention, opioid use, pregnancy, referral to treatment, screening, substance use disorders, tobacco

Introduction

Substance use is common in women of childbearing age. Prior to pregnancy, approximately 55% of women drink alcoholic beverages, 23% smoke cigarettes, and 10% use either illicit drugs or prescription drugs without a prescription.[1] Although most women are able to quit or cut back harmful substances during pregnancy, many are unwilling or unable to stop. National survey data indicate that during pregnancy, 10% of women drink alcohol (4% binge, ie, had ≥5 alcoholic drinks on the same occasion on at least 1 day in the past 30 days), 15% smoke cigarettes,[1] and 5% use an illicit substance. This makes substance use as or more common than many conditions routinely screened for and assessed during prenatal care (PNC), such as cystic fibrosis, gestational diabetes, anemia, postpartum depression, or preeclampsia. Moreover, substance use during pregnancy is both costly and harmful. Substance use during pregnancy is associated with poor pregnancy outcomes, including preterm birth, low birthweight, birth defects, developmental delays, and miscarriage.[4] Long-term effects on the mother and infant include medical, legal, familial, and social problems, some of which are lifelong and costly.[2,3]

The perinatal provider, therefore, has an important medical and ethical role in screening for substance use, counseling women on the importance of avoiding harmful substances, supporting their behavioral change, and referring women with addiction to specialized treatment when needed.[5,6] This process, known as screening, brief intervention (BI), and referral to treatment (SBIRT), represents a public health approach to the delivery of early intervention and treatment services for persons with substance use disorders (SUD)[7] (Table 1). Its use in emergency, general primary care, and obstetric settings for alcohol and tobacco has been recommended by the US Preventive Services Task Force[8,9] as well as by professional societies such as the American Congress of Obstetricians and Gynecologists (ACOG).[10]

Unfortunately, a number of barriers has limited the public health impact of SBIRT, particularly during pregnancy. First, although universal screening for substance use is recommended during pregnancy,[11] many women are not screened[12] or not screened with evidence-based screening tools.[13] Providers are often overwhelmed by the number of disease states for which they

From the Departments of Obstetrics, Gynecology, and Women's Health and of Psychiatry, University of Hawaii John A. Burns School of Medicine, Honolulu, HI (Dr Wright); Behavioral Health System, Baltimore, MD (Dr Terplan); Merrill-Palmer Skillman Institute, Departments of Psychiatry and Behavioral Neurosciences, and Obstetrics and Gynecology, Wayne State University, Detroit, MI (Dr Ondersma); Division of Clinical Neuroscience and Behavioral Research, National Institute on Drug Abuse, National Institutes of Health, Bethesda, MD (Dr Boyce); Departments of Psychiatry and of Obstetrics and Gynecology, and School of Epidemiology and Public Health, Yale University School of Medicine, New Haven, CT (Dr Yonkers); Department of Psychiatry, Harvard Medical School, Boston, MA (Dr Chang); Department of Psychiatry, Department of Veterans Affairs Boston Healthcare System, Brockton, MA (Dr Chang); Department of International Health and International Center for Maternal and Newborn Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD (Dr Creanga); and Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA (Dr Creanga).

Received Feb. 19, 2016; revised May 25, 2016; accepted June 20, 2016.

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention nor the National Institutes of Health.

The authors report no conflict of interest.

Corresponding author: Tricia E. Wright, MD. tewright@hawaii.edu

0002-9378/$36.00 • http://dx.doi.org/10.1016/j.ajog.2016.06.038

TABLE 1
Components of screening, brief intervention, and referral to treatment

Component	Goal	Approach
Screening	Assess substance use and its severity	Patient-/computer-administered instrument or direct provider questions (Table 4)
Brief intervention	Increase intrinsic motivation to affect behavioral change (ie, reduce or abstain from use)	1–5 Patient-centered counseling sessions lasting <15 min using principles of motivational interviewing (Table 2)
Referral to treatment	Provide those identified as needing more treatment access to specialty care	Warm handoff to specialized treatment (eg, provider-to-provider telephone call), which requires practitioner familiarity with community resources and systems of care

Wright. SBIRT in pregnancy. Am J Obstet Gynecol 2016.

are expected to screen and/or feel inadequately trained to screen for substance use.[14] Clinicians may also question the clinical utility of screening and the likelihood that women will reduce substance use or attain abstinence; conversely, they may be under the impression that they do not have patients who use substances in their practices or may not want to "play police" due to mandatory reporting requirements in some states.[15] In addition, providers may be at a loss of what to do if they encounter a patient with a SUD or unsure how to help the patient if unaware of community resources for treatment. Finally, inadequate reimbursement for evaluation and management services is a disincentive to provide preventative care even in the case of pregnant women.[16]

Second, failure to disclose substance use (or incomplete disclosure) is also common, and further complicates efforts to identify at-risk women.[17-21] Pregnant women also have reasons to withhold information about their use of substances in pregnancy. Some states have mandatory reporting requirements with the possibility of incarceration in a minority of states. This may not only create a disincentive for disclosure, but possibly for treatment-seeking itself.[22] Women may also be concerned about prejudicial treatment and stigma from their physicians who should be their advocates, while pregnant youth may fear disclosure to family members and the possible consequences of such disclosure.

Third, SBIRT research and practice has traditionally focused on the more commonly used substances such as alcohol and tobacco, with relatively less focus on illicit drugs.[23] This gap has become particularly apparent and troubling as rates of prescription drug misuse in pregnancy have risen steadily in recent years, leading to almost 3-fold increases in the incidence of neonatal abstinence syndrome from 2000 through 2009.[3] This increase has prompted calls for urgent action to help limit prescription opioid use and misuse during pregnancy.

In response to these calls, the US Centers for Disease Control and Prevention (CDC) convened an Expert Meeting on Perinatal Illicit Drug Abuse in Atlanta, GA, in September 2012. The expert panel participants were chosen based on their experience and past work specifically related to the use of the SBIRT approach in pregnant women. About 40 clinicians, scientists, and public health professionals representing academia (Johns Hopkins University, Harvard Medical School, Yale University, University of North Carolina, University of Maryland, University of Hawaii, and Wayne State University), professional organizations (ACOG and American Academy of Pediatrics [AAP]), states (Massachusetts, Washington, Georgia, and Indiana) and federal agencies (CDC, National Institutes of Health [NIH], Substance Abuse and Mental Health Services Administration [SAMHSA], Human Resources and Services Administration, and the Food and Drug Administration) were present at the meeting. This article represents the formal conclusions from that meeting, presented below within each of the 3 major elements of SBIRT for drug use in the perinatal period.

Screening

Screening for substance use should be universal, as SUDs occur in every socioeconomic class, and racial and ethnic group. Moreover, screening based on risk factors such as late entry to PNC or prior poor birth outcome potentially leads to missed cases and can exacerbate stigma and stereotyping.[11] Universal screening is recommended by many professional organizations, including ACOG,[5] AAP,[24] American Medical Association (AMA),[25] and CDC.[6] Screening should be done at the first prenatal visit, and repeated at least every trimester for individuals who screen positive for past use (Table 2). In addition, screening for tobacco use, at-risk drinking, illicit drug use, and prescription drug misuse should occur on an annual basis as a part of routine well-woman care. Women should be asked at medical exams if they are planning to get pregnant in the next year, so that adequate contraception and preconception care can be provided. Conclusions regarding screening are summarized in Table 3.

Most of the studies looking at screening have focused on using instruments, such as TWEAK, T-ACE, 4P's, or AUDIT-C (Table 4). These instruments have the advantage of being validated and most are fairly sensitive. Also, preliminary screening can be done by anyone in the practice, with follow-up by the provider. Barriers to implementing instrument-based screening include patient discomfort and lack of literacy, staff resistance due to time pressures, and organizational issues such as lack of administrative support.[26] Integration

FLA 5.4.0 DTD ■ YMOB11175_proof ■ 18 July 2016 ■ 4:14 pm ■ ce

into practice flow can be eased by incorporation into electronic medical record systems or by using a computer-based approached, which may diffuse the discomfort women feel in disclosing a behavior about which they are embarrassed, but this has not been compared to clinician-administered screening in pregnant women.[28] All positive screens require follow-up by the provider.

To counteract some of the institutional barriers to instrument-based screening, some experts encourage simply asking 3 open-ended questions regarding use of tobacco, alcohol, and other drugs (NIDA Quick Screen)[29]: "In the past year how many times have you drunk >4 alcoholic drinks per day? Used tobacco? Taken illegal drugs or prescription drugs for nonmedical reasons?" Among the expert panel, the consensus was that these questions are likely sensitive with fairly good specificity. Women are also more likely to report lifetime use or use before pregnancy than they are to disclose use during pregnancy because of the risks and stigma involved.

Regardless of which method is used and how the screening is delivered, it is essential that conversations around substance use be nonjudgmental. Prefacing screening with statements such as "I ask all my patients about substance use" can help normalize the enquiry and increase patient comfort with disclosure. The process of screening is only the first step in a conversation with the patient that may lead to treatment referral or provision of other treatment resources.

Urine drug testing is a common practice for many obstetricians and family practice physicians. It does have the advantage of detecting use in cases where the woman does not disclose her use and may help in diagnosing neonatal abstinence syndrome. Toxicology testing is a useful adjunct for individuals in SUD treatment[30] and has utility at the time of delivery[6] in case of complications of pregnancy, where knowing the substance used informs management decisions. Toxicology testing of pregnant women also has a number of limitations and negative consequences and should therefore never be done without the woman's knowledge or consent. For example, it greatly increases the risk of legal or child welfare involvement, particularly in states with mandated reporting requirements that include mention of drug use during pregnancy. This places physicians in a difficult ethical position, and raises the likelihood that women will fail to disclose potential health risks or avoid recommended medical care.[22] Further, the reporting of drug use during pregnancy to child welfare—made more likely or even mandated as a result of positive toxicology—is strongly biased against racial and ethnic minorities,[11] even following concerted efforts to prevent such bias.[31] A positive toxicology test also shows evidence of use, but does not provide any information about the nature or extent of that use; similarly, a negative test does not rule out substance use, which is often sporadic.[32] Additionally, the consequences of false-positive results can be devastating to the woman and her family.

Finally, the use of toxicological testing for illicit drugs encourages a focus on substances such as cocaine, opiates, and marijuana that is not justified by their prevalence or the risk that they pose. Other substances such as tobacco and alcohol pose as much or more risk[33] and are far more prevalent[1]; similarly, other risk factors such as inadequate PNC, depression, or violence exposure present significant unique risks that should be acknowledged—and that are not amenable to toxicology testing. If drug testing is used, a discussion of all substances and medications taken is mandatory as it will allow the clinician to order the correct test(s). Many substances including synthetic opioids such as oxycodone, fentanyl, buprenorphine, and some benzodiazepines[34] are not routinely captured by standard urine tests, and, if suspected, must be ordered separately. In addition, regular urine

TABLE 2
Components of brief interview (modified[65])

Raise subject	• "Thank you for answering my questions—is it ok with you if we talk about your answers?" • "Can you tell me more about your past/current drinking or drug use? What does a typical week look like?"
Provide feedback	• "Sometimes patients who give similar answers are continuing to use drugs or alcohol during their pregnancy." • "I recommend all my pregnant patients not to use any alcohol or drugs, because of risk to you and to your baby."
Enhance motivation	• "What do you like and what are you concerned about when it comes to your substance use?" • "On a scale of 0—10, how ready are you to avoid drinking/using altogether? Why that number and not a ____ (lower number)?"
Negotiate plan	• Summarize conversation. Then: "What steps do you think you can take to reach your goal of having a healthy pregnancy and baby?" • "Can we schedule a date to check in about this next time?"

Wright. SBIRT in pregnancy. Am J Obstet Gynecol 2016.

TABLE 3
Key screening conclusions by expert group

- Screening for substance use should be done on all pregnant women at first prenatal visit and subsequently throughout pregnancy on those women at higher risk;
- Screening can be done either by using validated instrument with follow-up by provider or by asking standardized questions during interview;
- Screening should be nonjudgmental and questions should be open-ended;
- Urine toxicology testing should not be used in place of substance use screening questions.

Wright. SBIRT in pregnancy. Am J Obstet Gynecol 2016.

FLA 5.4.0 DTD ■ YMOB11175_proof ■ 18 July 2016 ■ 4:14 pm ■ ce

TABLE 4
Examples of screening instruments for use in pregnancy

Instrument	Substance	Validated in pregnancy	Subjects identified
CAGE[14]	Alcohol	No	At-risk drinking
Cut down			
Annoyed			
Guilt			
Eye opener			
T-ACE[66]	Alcohol	Yes	At-risk drinking
Takes			
Annoyed			
Cut down			
Eye opener			
TWEAK[67]	Alcohol	Yes	At-risk drinking
Tolerance			
Worry			
Eye opener			
Amnesia			
Cut down			
4Ps[a68]	Any substance	Yes	Any affirmative answer is considered positive screen
Past			
Present			
Parents			
Partner			
Substance Use Profile-Pregnancy[69]	Alcohol Illicit drugs	Yes	Any drinking or illicit drugs

[a] Modifications of 4Ps screener are available; eg, 5Ps (adding smoking) and 4Ps Plus,[27] which is copyrighted and requires yearly fee to use.

Wright. SBIRT in pregnancy. Am J Obstet Gynecol 2016.

drug screens do not pick up alcohol use, and tests for alcohol metabolites, such as ethyl glucuronide and ethyl sulfate, are not routine, nor well studied in pregnant women. For these reasons, the expert panel did not endorse using urine drug testing as a primary means to screen women for drug use during pregnancy.

Clinicians who do use urine drug testing should ensure that all positive drug tests are followed by confirmatory testing by mass spectrometry. The health care provider should be aware of the potential for false-positive and false-negative results of urine toxicology for drug use, the typical urine drug metabolite detection times, and the legal and social consequences of a positive test result. It is incumbent on the health care provider, as part of the procedure in obtaining consent before testing, to provide information about the nature and purpose of the test to the patient and how the results will guide management.[32]

The overarching purpose of screening for substance use is to stratify women into zones of risk given their pattern of use. Based on the consensus of the group and available literature on drug use in pregnancy, we developed the risk pyramid shown in Figure 1. The majority of women will fall into the low-risk zone (ie, no past use of tobacco, alcohol, or other drugs, or low levels of substance use that stopped prior to or immediately following knowledge of pregnancy) and will need only brief advice/reinforcement. Moderate-risk women are those who have used high quantities of (any) substances in the past (including those who have been recently treated for SUDs), those who stopped during pregnancy, and those with sporadic, low-level use during pregnancy. Per the consensus of the group, these are the women who benefit most from BI. Only about 4-5% of women will fall into the high-risk zone of continued use of illicit drugs during pregnancy.[1] Women in the high-risk zone meet criteria for SUD. While these women can benefit from BI, most need referral to specialized addiction treatment. Figure 2 illustrates the [F2] flow of SBIRT in clinical practice.

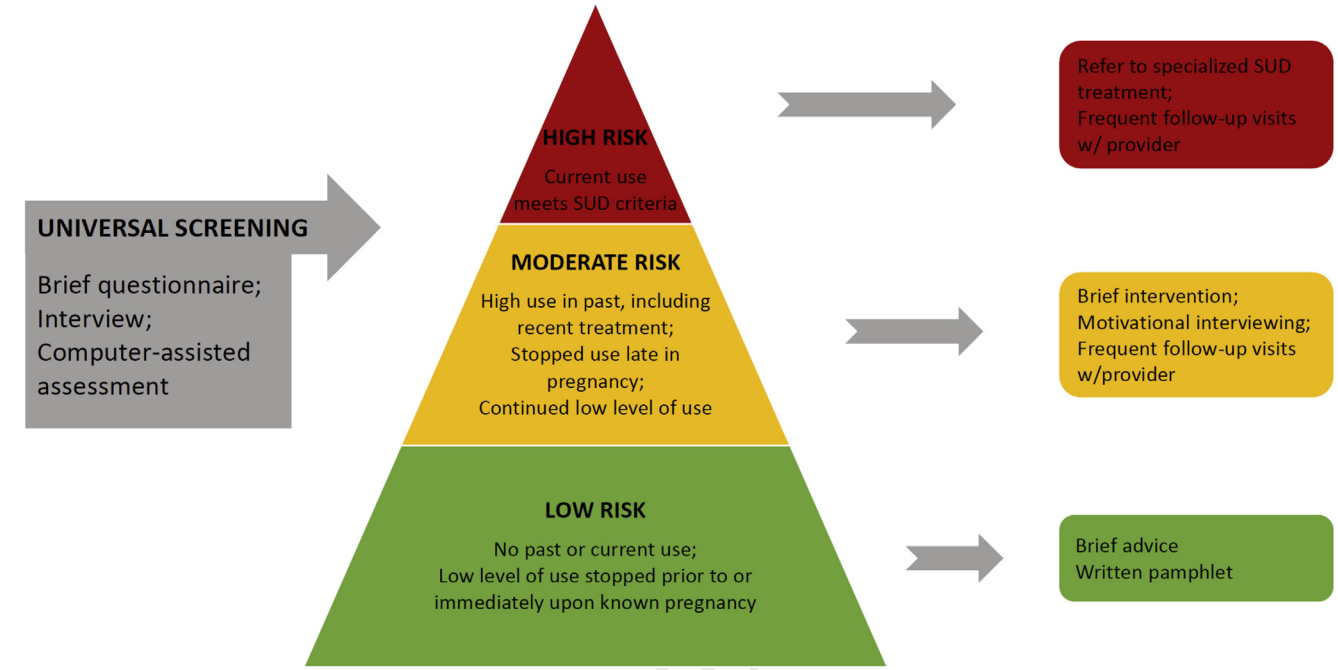
Brief intervention

Women who did not use substances prior to pregnancy or those who used at low levels in the past and report cessation of all substance use (often due to pregnancy) are considered to be in the low-risk group. For this group, brief advice can be given. The simplest form of such intervention is reinforcement to remain abstinent (eg, "That's great you do not use drugs or alcohol, as drug use has been shown to cause many complications in pregnancy and problems with your baby, and there is no safe amount of alcohol use in pregnancy").[35] Providing written handouts to all women can reach those who are afraid to disclose use, but who may be at risk and need treatment.

Individuals who screen positive for any substance use in pregnancy and fall into the moderate-risk group should receive a BI. This type of intervention is a patient-centered form of counseling using the principles of motivational interviewing (MI) to effect behavioral change. MI was first described by Miller and Rollnick[36] in 1990 and has been [Q3] adapted to various interventions in health care settings.[37] The purpose of MI is not to cure the patient, but to instill in her a desire to change by pointing out [F1]

FLA 5.4.0 DTD ■ YMOB11175_proof ■ 18 July 2016 ■ 4:14 pm ■ ce

FIGURE 1



Risk pyramid for assessment of substance use during pregnancy.

SUD, substance use disorder.

Wright. SBIRT in pregnancy. Am J Obstet Gynecol 2016.

discrepancies between her current behavior and her future goals. This is facilitated in pregnancy because the overwhelming majority of women desire a healthy pregnancy and healthy baby. Principles of MI include using an empathetic counseling style, asking open-ended questions, developing rapport and trust, expressing empathy, and rolling with resistance. MI must be nonjudgmental and works best if the patient adopts the motivation and develops a plan to change her behavior.[36]

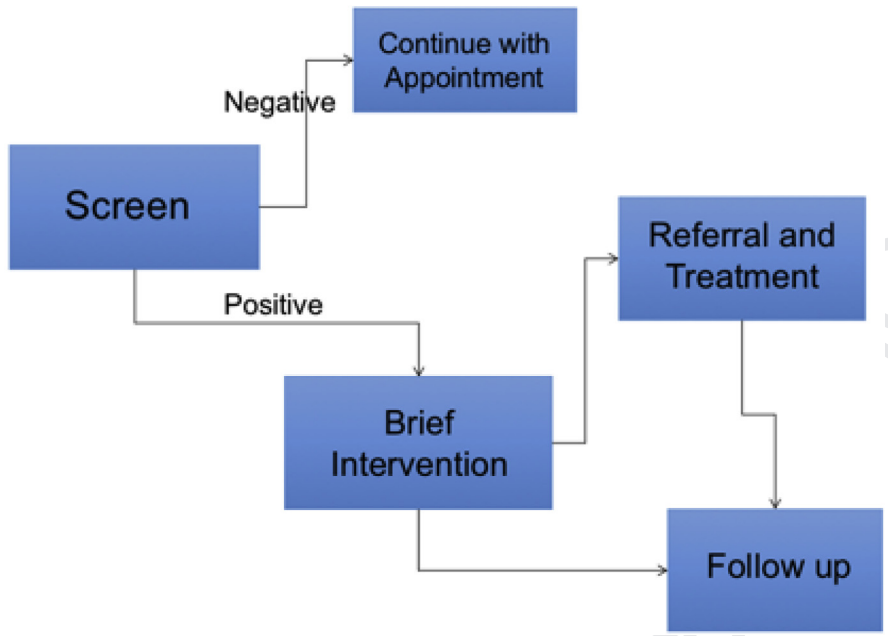
For the provider, the 3 tasks of an effective BI are to: (1) provide feedback of personal responsibility (eg, "As your doctor, I recommend you stop using cocaine for your health and the health of your baby, but it's your decision on what you want to do."); (2) listen and understand a patient's motivation for using ≥1 substances (eg, "I hear that you use drugs to deal with the stress of your life at home"); and (3) explore other options to address patient's motivation for substance use (eg, "Are there other ways you deal with stress in a more healthy way?"). Yet, the provider's objective is not to warn the patient as strong warning statements are often met with resistance from the patient. For example, stating: "Your baby could have a birth defect if you continue to drink alcohol" can be countered with: "I drank in my last pregnancy and that baby is fine." Resistance is a sign that the provider has pushed too hard. Rolling with resistance is a technique to redirect the conversation to a less threatening area. For example: "I'm not saying that your baby will definitely have a birth defect, but as your doctor, I'm concerned that your baby may be affected by your drinking. Babies who are exposed to alcohol in the womb can have lifelong medical and psychological problems."

Being judgmental, shaming, and/or using sarcasm are not effective ways of motivating people to implement behavioral changes. Finding a "hook" or reason for which the patient would like to change their harmful behavior is more effective (eg, "How would your life be better if you didn't use opioids?"). One technique used often to discover this hook is to ask open-ended questions (eg, "What do you like about…?" or "What don't you like about…?") followed by summary statements (eg, "I hear that you smoke cigarettes to calm you down, but you don't like how much they cost and how they make you smell [ie, reflecting the patient's own words], and you're worried about the effects they could have your baby. It sounds like having a healthy baby is very important to you." Examples of language that can be used in a BI are illustrated in Table 2.

The BI can be followed with an oral or written "contract" in which the patient states what she plans on doing to reach readiness, abstinence, or interim goals toward eliminating substance use and the provider arranges for follow-up visits. This way, the patient remains responsible for her treatment and outcome, not the provider. Given that BIs are for patients with moderate-risk substance use, closer follow-up

FLA 5.4.0 DTD ■ YMOB11175_proof ■ 18 July 2016 ■ 4:14 pm ■ ce

FIGURE 2



Flow chart of screening, brief intervention, and referral to treatment (SBIRT) in practice.

Wright. SBIRT in pregnancy. Am J Obstet Gynecol 2016.

(generally every 2 weeks) is recommended. Patients who are unable to make any behavioral change or whose use increases during pregnancy should be referred for specialized addiction treatment. To help physicians implement SBIRT systems, the Oregon Health and Science University, with funding from SAMHSA, developed an online portal[65] that provides many excellent online resources including pocket cards and sample language that can be downloaded.

Referral to treatment

Only a minority of patients will screen into the high-risk category and require specialty treatment for substance use. These women are likely to meet criteria for having a SUD. It is not the responsibility of the obstetric provider to deliver specialty treatment, however his/her knowledge of appropriate referral resources is essential. Provision of addiction treatment in the same location as the PNC may be preferable as there is increased compliance with the behavioral health component and evidence of improved birth outcomes such as decreased rates of preterm labor and low birthweight following implementation of these services.[38] If such clinics are not available, good contacts for local specialty treatment services include state and local health departments, insurance-preferred provider listings, as well as national World Wide Web sites such as the SAMHSA treatment locator (www.findtreatment.samhsa.gov). The referral should be made via a "warm handoff," that is, via direct communication between the PNC clinic and the SUD treatment site. Communication is key for the continued care of the pregnant patient in specialty substance use treatment. All patients should sign Health Insurance Portability and Accountability Act waivers such that clinical information can be shared. The PNC provider can utilize BIs to support the SUD treatment progress during PNC, as there are some studies that show increased effect with increased dosages (better treatment outcomes with more MI sessions).[39]

Barriers to SBIRT implementation in obstetric practice

Reimbursement for the components of SBIRT exists through private insurers (*Current Procedural Terminology* codes 99408 and 99409) and Medicaid (H0049 and H0050). Payment for these codes do have relative value units assigned to them, but not all payers will pay and there may be limitations on the number of SBIRT-related visits that qualify and are approved for reimbursement. In addition, they may not be reimbursed outside of the global obstetrics reimbursement schedule. For reimbursement, screening/assessment instruments such as AUDIT and DAST should be used (SAMHSA http://www.samhsa.gov/sbirt/coding-reimbursement). Of note, SBIRT can be done by ancillary staff under the direction of the physician and added on to other E/M procedure codes. If the specific SBIRT code is not covered by insurance, generally a billable provider can use a corresponding E/M code for time-based counseling if the provider is the one providing the counseling. Generally, one would use the *International Statistical Classification of Diseases, 10th Revision* code for alcohol or specific SUD to obtain reimbursement.

Requirements of reporting pregnant women with SUD vary by state. The federal Child Abuse Prevention and Treatment Act requires states to have policies and procedures in place to notify child protective services agencies of substance-exposed newborns and to establish a plan of safe care for newborns identified as being affected by illegal substance abuse or withdrawal symptoms resulting from prenatal drug exposure.[40,41] Individual state statutes vary in what constitutes a substance-exposed newborn, when reporting should occur, and what constitutes a plan of safe care for the newborn. Specifics of each state statutes were not discussed during the expert meeting and are beyond the scope of this article, but it is imperative that physicians caring for substance-using pregnant women know their individual state's requirements.[40]

FLA 5.4.0 DTD ■ YMOB11175_proof ■ 18 July 2016 ■ 4:14 pm ■ ce

In practice, these policies, while important to ensure the safety of newborns/infants, often result in women being afraid to obtain PNC in fear that they may be reported to child welfare agencies and lose custody of their infant. Counseling patients that obtaining PNC and treatment for SUD improves their chances of maintaining custody can provide an important incentive for women to stay in treatment.

Many areas of the country, especially rural counties, lack treatment centers for SUD and especially services for women.[42] Transportation to urban areas for treatment, which often necessitates the woman being separated from her other children, represents a large barrier to treatment. Having more primary care providers certified in providing medication-assisted treatment with buprenorphine as well as expanding training in addiction medicine could help offset this treatment need, as could greater access to telemedicine and telepsychiatry.

Women who are accessing the health care system in any capacity (including treatment for SUD) should have their reproductive health care needs met at that time to help prevent substance-exposed pregnancies.[43] Substance use during pregnancy does not occur in isolation. It is often combined with a multitude of adverse life circumstances, such as poverty, interpersonal violence, psychiatric comorbidity, and lack of access to adequate health care.[44] Women often enter medical care only when they are pregnant, and thus, it is important to address contraception during PNC, so that additional pregnancies are not substance exposed. Barriers to both obtaining and using contraception that can effectively prevent pregnancy should be addressed. The postpartum period is a vulnerable time for relapse back to substance use.[45,46] Continuing access to treatment and support services beyond the traditional 6-week postpartum period can help prevent relapse.[47,48] Identifying risk factors for relapse and employing prevention techniques, such as dietary counseling, psychosocial care, and medical-assisted treatment, can improve future pregnancy outcomes.[44] These services are ideally provided in a medical home environment, as the woman and infant remain at risk for the remainder of their lives, her from relapse to her substance use disorder, which endangers not only her health, but the health and safety of her entire family. Communication between the obstetric provider and the pediatric provider is imperative so that the infant can be provided with early interventions to identify and treat medical and behavioral problems, which can be lifelong and costly if not treated early.

Comment

This article provides an overview of SBIRT for illicit drug use in the perinatal period. SBIRT is an important health intervention that should be integrated into PNC so as to reduce the burden of both undiagnosed and untreated substance use in pregnancy. Identifying women with substance use and SUD during pregnancy allows providers to identify women at risk for having a substance-exposed newborn and tailor counseling and intervention to the women at risk. Pregnancy is the ultimate teachable moment, when motivation for behavioral change is high.

There are several studies showing the efficacy for SBIRT in pregnant women especially as it relates to alcohol use and tobacco use, arguably the most harmful substances used during this period. Several studies, including randomized controlled trials examining the effect of BIs for alcohol use by Chang et al[49,50] and O'Connor and Whaley,[51] have shown that screening with and without BI can be efficacious in decreasing drinking during pregnancy and improving pregnancy outcomes. Montag et al[52,53] showed that screening with and without BI decreased alcohol-exposed pregnancies among Native American and Alaskan Native women. Recent pilot studies have looked at using computer-based screening and BI with good initial acceptability and success in terms of abstinence prevalence and healthy pregnancy outcomes.[54,55] For smoking cessation, several trials have shown the efficacy of BI during pregnancy with higher quit rates than for non-BI comparison groups.[56] Ferreira-Borges[57] showed a 33% quit rate in the MI group vs 8% in the control (non-MI) group.

In addition, a recent systematic literature review looking at the efficacy of BIs for illicit drug use in pregnancy found limited, but promising results in randomized clinical trials.[58] SBIRT programs have been shown to improve pregnancy outcomes, including the incidence of low birthweight, preterm labor, and neonatal intensive care unit admissions, as well as the number of infants exposed to maternal substance use with and without strong mechanisms for referral to specialized addiction treatment in place. The Center for Substance Abuse Prevention has now implemented >147 projects with a BI component targeting pregnant and postpartum women and their children/infants,[59] and there are now several successful models for prevention and treatment of substance use in these subpopulations (eg, AR-Cares,[60] Choices,[61] SafePort,[62] Early Start,[38] and the Mom/Kid Trial[63]). These trials have demonstrated efficacy and, in the case of Early Start[38] at least, cost-effectiveness.[64]

Limitations of SBIRT include a strong need to identify the optimal screening instrument, as well as a menu of best models and implementation strategies for addressing substance use during the perinatal period. These should rely less on busy clinicians and employ broader public health approaches to the problem. Promising techniques rely on ancillary staff and/or computer-based screening[28] paired with systematic approaches to BI and a referral to treatment system that offers continuity of care for pregnant and postpartum women.

A limitation of this article is the delay between the expert meeting and the submission of this article. One priority identified at the expert meeting in September 2012 was a systematic review of BI for illicit drug use in pregnancy. It was believed that this systematic review should occur before an article on SBIRT could be submitted, thus this article was put on hold, and in fact the systematic review of BI informed the content and development of this article. This review

FLA 5.4.0 DTD ■ YMOB11175_proof ■ 18 July 2016 ■ 4:14 pm ■ ce

was published in October 2014[58] and 2 of the authors on the review are also authors on this article (S.J.O. and A.A.C.). The authors have been in constant communication since the meeting in 2012 and have used current literature to update the recommendations developed at the meeting, thus believe that the recommendations expressed here remain valid. Additional delays between the publication of the systematic review in October 2014 and the initial submission of this article in February 2016 were due in part to the somewhat lengthy back-and-forth clearance process with both the NIH and the CDC.

Conclusion

Pregnancy is a state of individual biological and social transformation. From a public health perspective, it is a window of opportunity for addressing substance use, including SUDs, as all pregnant women manifest interest in and care for the health of their baby-to-be. Therefore, most women can be helped to quit or cut back on substance use.

Given how common substance use is as well as the evidence supporting BIs in reducing such use during the perinatal period, the expert group concluded that universal screening, ideally at PNC intake, is key to addressing substance use in pregnancy; of note, universal screening is recommended by ACOG,[5] the AAP,[24] and the AMA.[25] Screening will determine an individual's risk stratification: low-risk women should receive brief advice, those with moderate risk should receive a BI, whereas those who are high risk need referral to specialty care. Patients who are unable to make any behavioral change or whose use increases during pregnancy should be referred for specialized addiction treatment. Irrespective of risk stratification and where they are during the SBIRT process, it is imperative that pregnant and postpartum women who use $\geq$1 substances be treated with respect and compassion by their providers. ■

ACKNOWLEDGMENT

The authors would like to thank Sarah Heil and Carol Bruce for CDC workgroup participation and manuscript review.

REFERENCES

1. Substance Abuse and Mental Health Services Administration. Results from the 2013 national survey on drug use and health: summary of national findings, NSDUH series H-48, HHS publication no. (SMA) 14-4863. Rockville (MD): Substance Abuse and Mental Health Services Administration; 2014.
2. Substance Abuse and Mental Health Services Administration. Prevention of substance abuse and mental illness. 2014.
3. Patrick SW, Schumacher RE, Benneyworth BD, Krans EE, McAllister JM, Davis MM. Neonatal abstinence syndrome and associated health care expenditures: United States, 2000-2009. JAMA 2012;307:1934-40.
4. Viteri OA, Soto EE, Bahado-Singh RO, Christensen CW, Chauhan SP, Sibai BM. Fetal anomalies and long-term effects associated with substance abuse in pregnancy: a literature review. Am J Perinatol 2015;32:405-16.
5. American College of Obstetricians and Gynecologists. At-risk drinking and illicit drug use: ethical issues in obstetric and gynecologic practice. ACOG Committee opinion no. 422. Obstet Gynecol 2008;112:1449-60.
6. Jones HE, Deppen K, Hudak ML, et al. Clinical care for opioid-using pregnant and postpartum women: the role of obstetric providers. Am J Obstet Gynecol 2014;210:302-10.
7. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and six months. Drug Alcohol Depend 2009;99:280-95.
8. US Preventative Services Task Force. Counseling and interventions to prevent tobacco use and tobacco-caused disease in adults and pregnant women: US Preventive Services Task Force reaffirmation recommendation statement. Ann Intern Med 2009;150:551-5.
9. Jonas DE, Garbutt JC, Amick HR, et al. Behavioral counseling after screening for alcohol misuse in primary care: a systematic review and meta-analysis for the US Preventive Services Task Force. Ann Intern Med 2012;157:645-54.
10. ACOG Committee on Ethics. At-risk drinking and illicit drug use: ethical issues in obstetric and gynecologic practice. ACOG Committee opinion no. 422. Obstet Gynecol 2008;112:1449-60.
11. Chasnoff IJ, Landress HJ, Barrett ME. The prevalence of illicit-drug or alcohol use during pregnancy and discrepancies in mandatory reporting in Pinellas County, Florida. N Engl J Med 1990;322:1202-6.
12. Mengel MB, Searight HR, Cook K. Preventing alcohol-exposed pregnancies. J Am Board Fam Med 2006;19:494-505.
13. Anderson BL, Dang EP, Floyd RL, Sokol R, Mahoney J, Schulkin J. Knowledge, opinions, and practice patterns of obstetrician-gynecologists regarding their patients' use of alcohol. J Addict Med 2010;4:114-21.
14. Ewing JA. Detecting alcoholism. The CAGE questionnaire. JAMA 1984;252:1905-7.
15. American College of Obstetricians and Gynecologists. Substance abuse reporting and pregnancy: the role of the obstetrician-gynecologist. Committee opinion no. 473. Obstet Gynecol 2011;117:200-1.
16. O'Brien PL. Performance measurement: a proposal to increase use of SBIRT and decrease alcohol consumption during pregnancy. Matern Child Health J 2014;18:1-9.
17. Garg M, Garrison L, Leeman L, et al. Validity of self-reported drug use information among pregnant women. Matern Child Health J 2016;20:41-7. Q5
18. Grekin ER, Svikis DS, Lam P, et al. Drug use during pregnancy: validating the drug abuse screening test against physiological measures. Psychol Addict Behav 2010;24:719-23.
19. Markovic N, Ness RB, Cefilli D, Grisso JA, Stahmer S, Shaw LM. Substance use measures among women in early pregnancy. Am J Obstet Gynecol 2000;183:627-32.
20. Ostrea EM Jr, Knapp DK, Tannenbaum L, et al. Estimates of illicit drug use during pregnancy by maternal interview, hair analysis, and meconium analysis. J Pediatr 2001;138:344-8.
21. Ostrea EM Jr, Brady M, Gause S, Raymundo AL, Stevens M. Drug screening of newborns by meconium analysis: a large-scale, prospective, epidemiologic study. Pediatrics 1992;89:107-13.
22. Poland ML, Dombrowski MP, Ager JW, Sokol RJ. Punishing pregnant drug users: enhancing the flight from care. Drug Alcohol Depend 1993;31:199-203.
23. Farr SL, Hutchings YL, Ondersma SJ, Creanga AA. Brief interventions for illicit drug use among peripartum women. Am J Obstet Gynecol 2014;211:336-43.
24. Levy SJ, Kokotailo PK. Substance use screening, brief intervention, and referral to treatment for pediatricians. Pediatrics 2011;128:e1330-40.
25. Blum LN, Nielsen NH, Riggs JA. Alcoholism and alcohol abuse among women: report of the Council on Scientific Affairs. American Medical Association. J Womens Health 1998;7:861-71.
26. Bentley SM, Melville JL, Berry BD, Katon WJ. Implementing a clinical and research registry in obstetrics: overcoming the barriers. Gen Hosp Psychiatry 2007;29:192-8.
27. Chasnoff IJ, Wells AM, McGourty RF, Bailey LK. Validation of the 4P's Plus screen for substance use in pregnancy. J Perinatol 2007;27:744-8.
28. Tzilos GK, Sokol RJ, Ondersma SJ. A randomized phase I trial of a brief computer-delivered intervention for alcohol use during pregnancy. J Womens Health (Larchmt) 2011;20:1517-24.
29. National Institute on Drug Abuse. The NIDA quick screen. Resource guide: screening for drug use in general medical settings. March 2012. Available at: https://www.drugabuse.gov/publications/resource-guide-screening-drug-use-in-general-medical-settings/nida-quick-screen. Accessed April 9, 2016.

FLA 5.4.0 DTD ■ YMOB11175_proof ■ 18 July 2016 ■ 4:14 pm ■ ce

30. Jacobs WS DR, Gold MS. Drug testing and the DSM-IV. Psychiatric Ann 2000;30: 583-8.

31. Roberts SC, Zahnd E, Sufrin C, Armstrong MA. Does adopting a prenatal substance use protocol reduce racial disparities in CPS reporting related to maternal drug use? A California case study. J Perinatol 2015;35: 146-50.

32. American College of Obstetricians and Gynecologists. Patient testing: ethical issues in selection and counseling. ACOG Committee opinion no. 363. Obstet Gynecol 2007;109: 1021-3.

33. Janisse JJ, Bailey BA, Ager J, Sokol RJ. Alcohol, tobacco, cocaine, and marijuana use: relative contributions to preterm delivery and fetal growth restriction. Subst Abus 2014;35: 60-7.

34. Tenore P. Advanced urine toxicology testing. J Addict Dis 2010;29:436-48.

35. Yonkers KA, Forray A, Howell HB, et al. Motivational enhancement therapy coupled with cognitive behavioral therapy versus brief advice: a randomized trial for treatment of hazardous substance use in pregnancy and after delivery. Gen Hosp Psychiatry 2012;34: 439-49.

36. Miller WR, Rollnick S. Motivational interviewing: helping people change, 3rd ed. New York (NY): Guildford Press; 2012.

37. Rollnick S, Miller WR, Butler CC. Motivational interviewing in health care: helping patients change behavior, 1st ed. New York (NY): Guilford Press; 2007.

38. Armstrong MA, Gonzales Osejo V, Lieberman L, Carpenter DM, Pantoja PM, Escobar GJ. Perinatal substance abuse intervention in obstetric clinics decreases adverse neonatal outcomes. J Perinatol 2003;23:3-9.

39. Burke BL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: a meta-analysis of controlled clinical trials. J Consult Clin Psychol 2003;71:843-61.

40. Child Welfare Information Gateway. Parental drug abuse as child abuse. Washington (DC): US Department of Health and Human Services, Children's Bureau; 2012.

41. National Center on Substance Abuse and Child Welfare. Available at: https://www.ncsacw.samhsa.gov/aboutus/default.aspx. Accessed April 16, 2015.

42. Terplan M, Longinaker N, Appel L. Women-centered drug treatment services and need in the United States, 2002-2009. Am J Public Health 2015;105:e50-4.

43. Terplan M, Hand DJ, Hutchinson M, Salisbury-Afshar E, Heil SH. Contraceptive use and method choice among women with opioid and other substance use disorders: a systematic review. Prev Med 2015;80:23-31.

44. Wright TE, Schuetter R, Fombonne E, Stephenson J, Haning WF III. Implementation and evaluation of a harm-reduction model for clinical care of substance using pregnant women. Harm Reduct J 2012;9:5.

45. Forray A, Merry B, Lin H, Ruger JP, Yonkers KA. Perinatal substance use: a prospective evaluation of abstinence and relapse. Drug Alcohol Depend 2015;150:147-55.

46. El-Mohandes AA, El-Khorazaty MN, Kiely M, Gantz MG. Smoking cessation and relapse among pregnant African-American smokers in Washington, DC. Matern Child Health J 2011;15(Suppl):S96-105.

47. Niccols A, Milligan K, Sword W, Thabane L, Henderson J, Smith A. Integrated programs for mothers with substance abuse issues: a systematic review of studies reporting on parenting outcomes. Harm Reduct J 2012;9:14.

48. Barlow A, Mullany B, Neault N, et al. Paraprofessional-delivered home-visiting intervention for American Indian teen mothers and children: 3-year outcomes from a randomized controlled trial. Am J Psychiatry 2015;172: 154-62.

49. Chang G, McNamara TK, Orav EJ, et al. Brief intervention for prenatal alcohol use: a randomized trial. Obstet Gynecol 2005;105:991-8.

50. Chang G, Wilkins-Haug L, Berman S, Goetz MA. Brief intervention for alcohol use in pregnancy: a randomized trial. Addiction 1999;94:1499-508.

51. O'Connor MJ, Whaley SE. Brief intervention for alcohol use by pregnant women. Am J Public Health 2007;97:252-8.

52. Montag AC, Brodine SK, Alcaraz JE, et al. Effect of depression on risky drinking and response to a screening, brief intervention, and referral to treatment intervention. Am J Public Health 2015;105:1572-6.

53. Montag AC, Brodine SK, Alcaraz JE, et al. Preventing alcohol-exposed pregnancy among an American Indian/Alaska Native population: effect of a screening, brief intervention, and referral to treatment intervention. Alcohol Clin Exp Res 2015;39:126-35.

54. Ondersma SJ, Beatty JR, Svikis DS, et al. Computer-delivered screening and brief intervention for alcohol use in pregnancy: a pilot randomized trial. Alcohol Clin Exp Res 2015;39: 1219-26.

55. Pollick SA, Beatty JR, Sokol RJ, et al. Acceptability of a computerized brief intervention for alcohol among abstinent but at-risk pregnant women. Subst Abuse 2015;36:13-20.

56. Bowden JA, Oag DA, Smith KL, Miller CL. An integrated brief intervention to address smoking in pregnancy. Acta Obstet Gynecol Scand 2010;89:496-504.

57. Ferreira-Borges C. Effectiveness of a brief counseling and behavioral intervention for smoking cessation in pregnant women. Prev Med 2005;41:295-302.

58. Farr SL, Hutchings YL, Ondersma SJ, Creanga AA. Brief interventions for illicit drug use among peripartum women. Am J Obstet Gynecol 2014;211:336-43.

59. Rosensweig MA. Reflections on the Center for Substance Abuse Prevention's pregnant and postpartum women and their infants program. Womens Health Issues 1998;8:206-7.

60. Whiteside-Mansell L, Crone CC, Conners NA. The development and evaluation of an alcohol and drug prevention and treatment program for women and children. The AR-CARES program. J Subst Abuse Treat 1999;16:265-75.

61. Project CHOICES Intervention Research Group. Reducing the risk of alcohol-exposed pregnancies: a study of a motivational intervention in community settings. Pediatrics 2003;111: 1131-5.

62. Metsch LR, Wolfe HP, Fewell R, et al. Treating substance-using women and their children in public housing: preliminary evaluation findings. Child Welfare 2001;80:199-220.

63. Peterson L, Gable S, Saldana L. Treatment of maternal addiction to prevent child abuse and neglect. Addict Behav 1996;21:789-801.

64. Goler NC, Armstrong MA, Osejo VM, Hung YY, Haimowitz M, Caughey AB. Early start: a cost-beneficial perinatal substance abuse program. Obstet Gynecol 2012;119: 102-10.

65. Department of Family Medicine, Oregon Health and Science University. SBIRT Oregon. Available at: www.sbirtoregon.org. Accessed April 9, 2016.

66. Sokol RJ, Martier SS, Ager JW. The T-ACE questions: practical prenatal detection of risk-drinking. Am J Obstet Gynecol 1989;160: 863-70.

67. Russell M. New assessment tools for risk drinking during pregnancy: T-ACE, TWEAK and others. Alcohol Health Res World 1994;18: 55-61.

68. Ewing H. A practical guide to intervention in health and social services, with pregnant and postpartum addicts and alcoholics. Martinez (CA): Born Free Project, Contra Costa County Department of Health Services; 1990.

69. Yonkers KA, Gotman N, Kershaw T, Forray A, Howell HB, Rounsaville BJ. Screening for prenatal substance use: development of the Substance Use Risk Profile-Pregnancy scale. Obstet Gynecol 2010;116:827-33.