



# Double Exposure:

## A Better Practices Review on Alcohol Interventions during Pregnancy

PREPARED BY

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The British Columbia Centre of Excellence for Women's Health improves the health of women by advancing knowledge on a range of women's health issues to improve care and policy for girls and women.

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# Preface

This report is a review of evidence from peer-reviewed literature on the topic of interventions aimed at supporting women to reduce their use of alcohol in the child-bearing years. The phrase, “Double Exposure” in the title reflects our concern with the effects of alcohol on *both* the woman and the fetus and underlines the importance of addressing women’s health and women’s circumstances during pregnancy to optimize health. The report examines research on the use and effectiveness of three levels of intervention:

1. identification, assessment, and screening for alcohol use in pregnancy;
2. brief interventions with pregnant women and women in their child-bearing years; and
3. intensive interventions for pregnant women and mothers.

The evidence review approach used is based on two frameworks conceived by the UK National Institute for Clinical Excellence (NICE, 2007) and the Canadian Tobacco Control Research Initiative (CTCRI, 2006). This report summarizes the current evidence base (i.e., peer-reviewed literature) to propose a list of better practice program components and approaches. It discusses limitations of the evidence and offers recommendations for practice, research, and policy and structural development.

The review is modelled in some key respects on a similar document, also produced by the British Columbia Centre of Excellence for Women’s Health (BCCEWH), on tobacco use during pregnancy, *Expecting to Quit: A Best Practices Review of Smoking Cessation Interventions for Pregnant and Postpartum Girls and Women* (Greaves et al., 2003). As with *Expecting to Quit*, the findings from the systematic review of alcohol interventions are placed in the context of literature, research, and commentaries on women’s health and women’s substance use. A contextualized approach is essential when appraising an area of research and practice, such as women’s health and alcohol interventions, that has a limited number of published and peer review studies available.

This review has been funded through the ActNow BC Healthy Choices in Pregnancy (HCIP) initiative. The HCIP initiative aims to increase the number of women in British Columbia who are counselled about the risks of alcohol use (and tobacco and other substance use) during pregnancy. One of the main aims of producing this review was therefore to inform professional training and practice by, and for, health care providers and the full range of service providers who assist women of child-bearing years. During HCIP training initiatives undertaken between 2006 and 2008, service providers expressed a keen interest in evidence-based approaches to addressing women’s use of alcohol in the child-bearing years.

Research is an important form of evidence that can guide practice and policy. However, the main goal of this review is to present the findings of a systematic review of the published literature which can then be used in addition to all the other sources of evidence that can inform practice, for example, women's narratives and analyses, service provider narratives and analyses, and other policy and practice commentaries and critiques. This document does not attempt to review or draw upon all sources of evidence. It is intended to assist health care and other practitioners, as well as researchers and decision makers, to navigate this complex terrain and to design and offer services that best support women of child-bearing years in improving their health pre-, during, and postpregnancy.

Due to the relatively small number of published studies in this field, and the particular lack of Canadian research to draw upon, additional practice-to-research-to-practice reflexivity was considered invaluable to ensure the components, approaches, and recommendations from this review were plausible and feasible, as per the better practices model (see CTCRI, 2006). The team considered a number of ways to build in this additional reflexivity. The practice wisdom gathered over the course of the HCIP training sessions across the province offered one such mechanism to further critique the published, peer-reviewed documents. The key findings, program components, better practices, approaches, and recommendations were also presented to a wide audience of service providers and health-system planners in the form of a webcast in March 2008. The final draft document was circulated to a small number of researchers for comments concerning the plausibility and feasibility of identified program components, and the validity and reliability of the work as a whole. Finally, before publication, we received feedback from researchers attending a presentation of the findings at the 34th Annual Alcohol Epidemiology Symposium of the Kettil Bruun Society, held in Victoria BC, 2-6 June 2008.

This review was conducted by researchers at the British Columbia Centre of Excellence for Women's Health (BCCEWH) in Vancouver, British Columbia, Canada. The BCCEWH is committed to advancing women's health and well-being. To achieve this goal, we have established several meaningful collaborations with communities, health care and social service providers, policy-makers, and academics across Canada and around the world. Our mission is to improve the health of women by fostering collaborations on innovative, multidisciplinary research endeavours and action-oriented approaches to women's health initiatives, women-centred programs, and health policy.

The review team encourages readers to use this document alongside other appropriate community-, population-, and culturally and geographically specific resources to inform the development of better practices in working with women to reduce their alcohol use during pregnancy and the child-bearing years.

# 1 Women's Alcohol Use and Approaches to Intervention

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## BACKGROUND TO WOMEN'S ALCOHOL USE

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Alcohol, tobacco and other mood altering drugs touch the lives of most girls and women, whether as users themselves, when affected by family members' or their partner's use, or as mothers and models for children. (POOLE & DELL, 2005)

Concern around women's use of alcohol in child-bearing years and during pregnancy has been increasing in Canadian and global public health agendas. Alcohol is the most common substance used by women, rates of use have been rising steadily (Adlaf, Begin, & Sawka, 2005), and the gap between men and women's drinking is closing (Keyes, Grant, & Hasin, 2008). In the Canadian Addiction Survey (2004) 76.8 percent of women reported drinking in the past year (Ahmad, Poole, & Dell, 2007). Levels and patterns of drinking among some subgroups of women were of particular concern: about 10 percent of women between the ages of 15 and 24 engage in heavy weekly drinking (7.8% of women 15-19 years and 11.8% of women 20-24 years), high-income women were most likely to be light frequent drinkers (38.6%) and lowest-income women were most likely to be heavy frequent drinkers (9.3%) (Ahmad et al., 2007).

While preventing the personal and social costs associated with fetal alcohol spectrum disorder (FASD) is a key rationale for undertaking alcohol interventions with women, preventing the serious toll of alcohol on women's health and well-being overall is also a critical need that can be regrettably overlooked when pregnancy is the sole focus of alcohol discussions with girls and women. We have learned from research on pregnancy and smoking cessation that where interventions have focused on lessening the deleterious effects on the health of the fetus, rather than with lessening the impact of smoking on the health of women, high rates of relapse post pregnancy have occurred (Greaves, Cormier, Devries, Bottorff, Johnson, & Kirkland, 2003). Similar dynamics may be operating for alcohol and other substance use during pregnancy. Cutting down or stopping using alcohol during pregnancy can be key to fetal health, and pregnancy offers an important "window of opportunity" for women. Yet too great an emphasis on the pregnancy period may not give due attention to many other windows of opportunity for reducing risk associated with drinking alcohol in other periods of women's lives.

## Understanding women's alcohol use

Pregnant women's use of alcohol cannot be separated from other issues in their lives, such as violence, trauma history, isolation and socioeconomic status. Their alcohol use is often not easily isolated from other potentially harmful behaviours, including tobacco and other drug use. In general, problematic substance use for women is linked to a range of biological, genetic, psychological, social, cultural, relational, environmental, economic and spiritual factors. These factors describe the circumstances that not only bring some women to alcohol use, but which also make it difficult for them to stop or decrease their use during pregnancy.

(MOTZ, LESLIE, PEPLER, MOORE, & FREEMAN, 2006, P. 15)

Women often use substances to deal with a range of life problems such as experiences of violence and trauma, poverty, homelessness, mental health problems, and the stress of juggling multiple demands (Logan, Walker, Cole, & Leukefeld, 2003; Najavits et al. 2003; Najavits, Sonn, Walsh, & Weiss, 2004; Salomon, Bassuk, & Huntington, 2002). Substance use and mental health problems frequently co-occur among women who are survivors of violence, trauma, and abuse, often in complex, indirect, and mutually reinforcing ways (Logan et al., 2003). As many as two-thirds of women with substance-use problems report a concurrent mental health problem such as post-traumatic stress disorder, anxiety, or depression, often related to their experiences of physical or sexual abuse as children or adults (Ouimette, Kimerling, Shaw, & Moos, 2000). Studies now show strong correlations between sexual and physical abuse and earlier, more frequent, and larger quantities of alcohol and drugs used by girls and young women (National Centre of Addiction and Substance Use [CASA], 2005).

Women's substance use remains highly stigmatized, making women less likely to disclose it or any problems with their use to access services (United Nations Office on Drugs and Crime, 2004). When considering a range of possible interventions with women concerning their alcohol use, this is highly relevant. Women can also encounter significant resistance from partners, friends, and family when they want to enter treatment (Astley, Bailey, Talbot, & Clarren, 2000). Women's roles as mothers and caregivers often create further barriers to accessing care and treatment. Women report being afraid to talk to providers about their use of alcohol due to fear of child apprehension and professional judgments (Poole & Isaac, 2001).

## Understanding alcohol use during pregnancy

Although the majority of women drink alcohol infrequently during pregnancy (Poole, Horne, Greaves, Chovanec, & Watkins, 2004), approximately 14 percent of Canadian women indicate that they consumed alcohol during their last pregnancy (Dell & Roberts, 2006; Statistics Canada, 2002). A number of studies have documented the

**Women's substance use remains highly stigmatized, making women less likely to disclose it or any problems with their use to access services.**

range of individual, situational, relational, and environmental risk factors associated with women drinking heavily in their child-bearing years or in pregnancy. However, different studies stress different risk factors and are not wholly consistent. Research has demonstrated that any alcohol consumption during pregnancy increases the risk of continued drinking during pregnancy (Chang, Williams-Haug, Berman, & Goetz, 1999b) and alcohol use before pregnancy is a risk factor for alcohol use during pregnancy (Hayes, Brown, Hofmaster, Davare, Parker, & Raczek, 2002). Indeed, a study by O'Neill, Parra, and Sher (2001) concluded that heavy drinking during college years strongly predicts alcohol use disorders up to ten years later. This relates to the finding that heavy episodic drinking is also a risk factor because of the association between binge drinking and unintended pregnancy (Naimi, Lipscomb, Brewer, & Gilbert, 2003).

Some studies have shown that older women and women who have higher incomes are more likely to report alcohol use in pregnancy (Burgoyne, Willet, & Armstrong, 2006). Others have found that women who are depressed, or who do not have a positive attitude towards their pregnancy, are more likely to use alcohol, tobacco, and other drugs before and after knowledge of their pregnancies (Hanna, Faden, & Dufour, 1994). Dixit and Crum (2000) report that women with a history of depression have more than two and one-half times the risk of heavy drinking compared to women with good mental health. The U.S. National Maternal and Infant Health Survey (CDC, 1995) described the profile of women most likely to drink prenatally as White, married, more educated women of a higher income level. These characteristics are also associated with less physician detection of drinking (Moore, Bone, Geller, Mamon, Stokes, & Levine, 1989). However, a study by Kvigne, Bad Heart Bull, Wetly, Leonardson, and Lacina (1998) conducted in the U.S. among American Aboriginal women found that the women who drank during pregnancy were more likely to be single, have less education, and be less likely to have access to transportation, than women who did not drink.

Kvigne and colleagues (1998) also highlight that a partner's use and/or drinking by a woman's mother were factors that increased risk. Pregnant women who drank were more likely to smoke cigarettes, use illicit drugs, have parents who drank, feel they drank the same or more than other pregnant women, have more relationship breakups, and have experienced more physical and emotional abuse. Experiencing physical, emotional, and sexual abuse has also been identified as a risk factor for alcohol use in pregnancy by Hayes et al. (2002) and Astley and Clarren (2000). Astley and colleagues' (2000) study revealed that 95 percent of mothers who gave birth to a child affected by alcohol reported a history of physical or sexual abuse.

These studies document a wide range of influences on women's drinking in pregnancy and point to the importance of exploring the particular factors that may be operating for individual women.

### **Impact of alcohol on women's health**

The health consequences associated with alcohol use are more serious for women than men. Women develop alcohol-related liver disease earlier and after a shorter history of use than men (National Institute on Alcohol Abuse and Alcoholism [NIAAA], July 2004). Other specific health risks for women who drink heavily include hypertension, osteoporosis, brain shrinkage and impairment, and gastric ulcers (NIAAA, 2003). Sex-specific risks include links between both moderate and high alcohol consumption and the risk of breast cancer (Chen, Willet, Rosener, & Coldtitz, 2005; Petri et al., 2004; Stolzenberg-Solomon et al., 2006; Terry et al., 2006). The information below, taken from the Alberta Alcohol and Drug Abuse Commission's "Effects Series for Women (Alcohol)," summarizes current knowledge about the health impacts of alcohol for women and highlights the necessity of taking a sex and gendered approach to women's alcohol use:

- The same amount of alcohol affects a woman more than a man.
- Women are more sensitive to the effects of alcohol than men are, and experience its harmful medical complications in a shorter period of time.
- Women who drink heavily tend to develop liver or heart disease after fewer years of heavy drinking than men. These women also experience greater damage to their brain structure after fewer years of heavy drinking than men do who are heavy drinkers.
- Women who consume as few as two drinks per day are at increased risk of developing high blood pressure.
- With as few as two or three drinks a day, a woman is at increased risk of dying from liver disease, cancer, or injury.
- Consumption of as many as four drinks per day increases the risk of stroke among women.
- Higher levels of alcohol consumption may have negative effects on a woman's menstrual cycle. She may have more painful, heavy, or irregular periods as a result.
- Heavy alcohol consumption may lead to the deterioration of female reproductive health. Ovarian wasting (shrinkage) or abnormal function, endometriosis (cysts outside the uterus), infertility, and sexual dysfunction have all been observed in alcoholic women (Watkins & Chovanec, 2006).

- Research indicates that women who are heavy substance users rarely use a single substance (Eustace, Kang, & Coombs, 2003) so it is highly likely that health consequences of women’s alcohol use will be compounded by the health impacts of other substances.

### **Changing alcohol and drug treatment responses**

Alcohol and drug services have undergone enormous changes since their inception in the 1950s. Historically there was a tendency towards a “one-size-fits-all” approach to intervention, characterized by abstinence goals and a top-down, provider-set agenda. New approaches are now being utilized that avoid prescriptive and confrontational approaches and acknowledge a person’s readiness and motivation for change (Miller & Rollnick, 2002). Today client-centred and holistic interventions are more common—they meet people “where they are at,” working alongside them in determining what they want to change, and what their goals and priorities are for change.

Programs are also increasingly available that support harm-reduction goals that do not necessarily require complete abstinence and which focus on mitigating harms associated with substance use such as unstable housing. Visible, welcoming, harm-reduction-oriented programming can positively influence women’s interest in accessing substance-use treatment and support (Poole, 2000). Harm-reduction programming, coupled with respectful approaches that actively address stigma, have been found to increase access (Hume & Bradley, 2007; Motz, et al., 2006; Watkins & Chovanec, March 2006). Because feelings of self-blame, shame, and guilt are especially common among women and mothers with problematic substance use (Poole & Isaac, 2001) substance-use interventions that address stigma, guilt, and shame are warranted (Greaves & Poole, 2007).

Prior to the 1970s there was virtually no research on women with substance-use problems and almost no gender-specific treatment programming. Since then there has been a steady increase in both the quality and quantity of research on women’s substance use and a growth in specialized women’s programming (Poole, 1997). However, women continue to be underserved in both prevention and treatment programs and information about women’s needs remains scarce in many areas (Poole & Greaves, 2007). Even with some encouraging development in this area, there are still very few existing programs that are accessible and appropriate for women, especially for certain groups of women such as mothers, pregnant women, Aboriginal women, disabled women, lesbian women, women offenders, and women with co-occurring mental health or trauma issues (Poole & Greaves, 2007). In terms of access to treatment services there are many barriers for women related to: the visibility of services; confidentiality of information; personal, interpersonal, and structural factors; the fear of child apprehension and coercive treatment; and women’s fears that they

**Harm-reduction programming, coupled with respectful approaches that actively address stigma, have been found to increase access.**

will be blamed and judged for their substance use (Network Action Team on FASD Prevention, 2007). There is an urgent need for women-specific prevention, harm reduction, and treatment approaches (Ad Hoc Working Group on Women, Mental Health, Mental Illness and Addictions, 2006).

Some examples of comprehensive women-centred care are emerging and now successfully guiding certain community-based and acute care policy and programming for women with substance-use problems (see Burgelhaus & Stokl, 2005; Poole, 2004a;). For example, specialized day treatment programming for women has been developed which takes a holistic approach and addresses barriers to access, such as child minding and transportation costs (see the Women's Day/Evening/Weekend Programming in BC). Evaluations of these women-centred programs indicate substantial benefits for women, ranging from increased engagement in treatment to a wide range of health improvements for women and their children (see Abrahams, Kelly, Payne, Thiessen, MacKintosh, & Janssen, 2007; Motz et al., 2006; Poole, 2000; Sword, Niccols, & Fan, 2004; Ney, 1994).

### **Alcohol and drug treatment for pregnant women**

Pregnant women who use substances come under considerable scrutiny in Canadian society. The public discourse on pregnant women as users of alcohol, drugs and tobacco has been fundamentally judgmental, blaming and unsympathetic. (POOLE & DELL, 2005)

Substance-use treatment programs have traditionally not addressed the needs of pregnant women (Boyd & Marcellus, 2007; Klein & Zahnd, 1997). Programs have waiting lists, lack good linkage with obstetric services, limit participation to women in early stages of pregnancy, and/or do not provide for needs such as preparations for delivery or parenting. Treatment-system barriers interact with other system-level barriers such as child apprehension policy and barriers related to pregnant women's particularly high levels of guilt and shame concerning their use of substances. Young Aboriginal mothers with addictions encounter additional barriers created by their experiences of racism, fears of perpetuating stereotypes about Aboriginal people, and coercion from partners, family members, and friends (Salmon, 2005; Tait, 2000). Research shows that pregnant women who are homeless are also particularly unlikely to access treatment services (Nyamathi, Leake, & Gelberg, 2000).

Very little literature concerns the effectiveness of interventions designed to treat problematic substance use in pregnancy. However, there are now more programs that are specifically offering programs for pregnant women and those that provide coordinated and comprehensive approaches over several years seem better able to draw pregnant women into care (Four Worlds Centre for Development Learning,

2003; McGuire, Zorzi, McGuire, & Engman, 2006; Shepard, Kapil, & Shephard, 2008). Evaluations of health services for substance-using mothers have shown that organizing service delivery around principles of women-centred care can be very beneficial (Motz et al., 2006). Women-centred care focuses on a woman's needs in the context of her life circumstances, attends to women's diversity, and requires a holistic or comprehensive view of physical and mental health considerations (Greaves et al., 2003). Respect, single-point access, and walk-in services can also support positive interactions between women and their care providers (Poole, 2000; Watkins & Chovanec, 2006).

One example of such developments in maternity care services is the Fir Square Combined Care Unit at BC Women's Hospital and Health Centre in Vancouver which provides a 12-bed comprehensive antenatal and postpartum stabilization and maternity care service. Through liaison activities with community services such as the Sheway program,<sup>1</sup> and using a harm-reduction approach, the Fir maternity care model provides consolidated support for pregnant women, including addictions support (Payne, 2007a & b).

### **Primary care responses**

Identification, assessment, and intervention tools and programs that address women's alcohol use are underutilized in primary care settings and prenatal services more generally (Floyd, Ebrahim, Tsai, O'Connor, & Sokol, 2006a). Indeed, most studies in this field have indicated that health care providers are challenged by talking with pregnant women about their alcohol use. For example, according to a 2002 survey of physicians and midwives in Canada (Tough, Clarke, Hicks, & Clarren, 2005) while 94 percent knew about FASD, less than half of providers frequently discussed smoking, alcohol use, or addiction history with women of child-bearing age. Only 54 percent felt prepared to care for pregnant women who had substance-use problems. Similarly, a study by Gehshan (1995) asked 181 women using substance-abuse treatment programs about discussions between themselves and their health care providers and found that 35 percent of the women reported not being asked about their alcohol or drug use during their most recent pregnancies. The main reasons for professionals not talking to women about their alcohol use during pregnancy are cited as:

<sup>1</sup> Sheway is an agency in Vancouver, BC, that provides comprehensive health and social services to women who are either pregnant or parenting children younger than 18 months old and who are experiencing current or previous issues with substance use. The philosophy of Sheway is based on the recognition that the health of women and their children is linked to the conditions of their lives and their ability to influence these conditions so Sheway staff work in partnership with the woman as she makes decisions regarding her health and the health of her child (<http://www.vch.ca/women/sheway.htm>).

- lack of time
- lack of familiarity with screening instruments
- lack of training in alcohol and pregnancy issues
- skepticism about treatment
- lack of knowledge and skills to respond to pregnant women who are identified
- lack of knowledge about treatment and referral options and resources
- providers feeling uncomfortable with asking women about their alcohol use
- professionals encountering resistance from women themselves (Handmaker & Wilbourne, 2001; Kennedy, Finelstein, Hutchins, & Mahoney, 2004; Tough et al., 2005).

Obstetrical care providers have also expressed their concern about being overwhelmed by the growing expectations that they screen women for a range of issues such as tobacco and violence without having access to additional resources (Kennedy et al., 2004).

There has also been a lack of research into the role of provider training and education in increasing awareness, recognition, and confidence in making positive interventions with patients. However, several process evaluations have shown that training physicians is an important step in facilitating identification and interventions. For example, a survey of obstetricians-gynecologists by Diekman, Floyd, Decoufle, Schulkin, Ebrahim, and Sokol (2000) showed the doctors' need and desire for more information on effective means for identifying and counselling pregnant women. In terms of the potential for other members of the multidisciplinary team to be involved in this work, Ettlinger (2000) points to the value of providing special training for nurses in addressing alcohol use in pregnancy. Aside from training in identification and brief intervention procedures, Vermont maternal child health nurses were also provided with information on the cultural and contextual influences on heavy drinking, the consequences of prenatal alcohol exposure, the need for implementing prevention and intervention efforts for alcohol use during pregnancy, and the importance of screening for use. The training outcomes increased nurses' understanding of the nature and patterns of alcohol use among women and enhanced their skills in addressing this issue (Ettlinger, 2000).

A training program called ANEW in Australia (Gunn, Hegarty, Nagle, Forster, Brown, & Lumley 2006) taught advanced communication skills and provided more information on common psychosocial issues to midwives and doctors with the aim of improving identification and support of women with psychosocial issues in pregnancy. The goal of the experiential training was to increase the competence of

antenatal staff in delivering women-centred antenatal care through in-depth training in active listening and being able to pick up cues around psychosocial issues of potential concern to the woman during consultations. After the training intervention, participants were more likely to ask directly about domestic violence, past sexual abuse, and concerns about caring for the baby. They were less likely to report that psychosocial issues made them feel overwhelmed and they reported significant gains in knowledge of psychosocial issues and competence in dealing with them. Participants also reported significant improvements in their ability to identify and support women with these issues (Gunn et al., 2006).

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## THE THREE LEVELS OF INTERVENTION

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### 1. Identification, assessment and screening for alcohol use in pregnancy

**Factors shown to increase accurate and truthful responding include enhanced assuredness of confidentiality, conducting the screening in a community setting, use of more than one alcohol consumption measure, and clear wording of the questions.**

A variety of screening instruments exist to identify problematic alcohol use during pregnancy. The T-ACE was the first validated screening tool for risk drinking developed for use in obstetric-gynecologic practices (Sokol, Martier & Ager, 1989). The T-ACE has been shown to identify any alcohol consumption during pregnancy as well as higher amounts of drinking (Chang, 2001). The TWEAK has also demonstrated promise as a screening tool for pregnant women. Both of these tools focus on past drinking rather than questions about current intake with the aim of increasing the likelihood of accurate self-report. Past drinking has been demonstrated to predict drinking levels during pregnancy (Russell, Martier, Sokol, Mudar, Jacobson, & Jacobson, 1996).

Questions have been raised about how useful screening instruments are, given the stigma attached to alcohol use in pregnancy and the associated likelihood that women may deny or minimize their drinking out of embarrassment, shame, or guilt (Morrow-Tlucak, Ernhart, Sokol, Martier, & Ager, 1989). Some commentators view self-reported accounts of alcohol use as limited because they are potentially subject to recall bias (Savage, Wray, Ritchey, Sommers, Dyehouse, & Fulmer, 2003) but there is evidence that prenatal self-reports are a reasonably accurate measure of alcohol consumption during pregnancy (Jacobson, Chiodo, Sokol, & Jacobson, 2002) and can predict cognitive performance in infants postpartum. O'Connor and Whaley (2003) suggest that, when asking people about issues that are socially sensitive, underreporting should always be considered, along with factors that may increase the likelihood of accurate and truthful reporting. Factors shown to increase accurate and truthful responding include enhanced assuredness of confidentiality, conducting

the screening in a community setting, use of more than one alcohol consumption measure, and clear wording of the questions (O'Connor & Whaley, 2003).

Floyd, O'Connor, Bertrand, and Sokol (2006b), suggest that accurate identification and assessment of alcohol-related pregnancy risk factors can be enhanced through the use of reliable screening tools. Indeed, Chang (2001) argues that routine use of screening questionnaires in clinical practice may reduce the stigma associated with asking women about their alcohol use and result in more accurate and consistent evaluation.

One alternative to screening women for psychosocial issues or problems is reported by Gunn and colleagues (2006), and described above. They suggest that while screening for different issues associated with increased risk for the mother's and fetus's health may make sense intuitively, information about associated benefits and harms is lacking. They propose that effective interventions are lacking in almost all of the adverse social issues of concern. Although they do not single alcohol use out for attention (where there may be more effective interventions available than with other psychosocial interventions), in debates about screening it is important to consider the point concerning available interventions once women have been identified as having problems. Indeed a recent Canadian study found that while the vast majority of health care providers were asking about alcohol use in pregnancy, 45% did not feel prepared to care for pregnant women in the area of alcohol use or dependency, and 63% would value receiving referral resources for women of childbearing years with alcohol problems (Tough, Clarke, Hicks & Clarren, 2005).

## **2. Brief interventions with women in their child-bearing years and women who are pregnant**

Brief intervention refers to a collection of methods that use time-limited, self-help, and preventative strategies aimed at promoting reductions in the use of alcohol. One of the main attractions of these methods is that they can be delivered by non-medical personnel and by people who are non-specialists in substance use. Miller and Sanchez (1994) describe six common elements of effective brief interventions known as FRAMES: *feedback* on current status of alcohol use, emphasis on client *responsibility*, clear *advice* to make a change, a *menu* of options, plus *empathy* and *support* toward self-efficacy. More recently, Whitlock, Polen, Green, Orleans, and Klein (2004) have labelled these elements as the 5As: assess, advise, agree, assist, and arrange.

Brief interventions for alcohol use can be classified into three main types: 1) very brief, e.g., one five-minute session, 2) brief, e.g., one session up to fifteen minutes in duration, 3) multicontact brief sessions e.g., an initial session of up to fifteen minutes followed by several time-limited contacts either by phone or in clinics (Mengel,

Searight, & Cook, 2006). Generally the multicontact interventions are associated with greater risk reductions than single-contact treatment (Mengel et al., 2006). There is also some evidence that brief interventions may be more effective with women than with men (Fleming, Barry, Manwell, Johnson, & London, 1997).

According to Hankin, McCaul, and Heussner (2000), most pregnant women are highly motivated to change their behaviours. Brief interventions might therefore be particularly effective with this population. Mengel and colleagues (2006) suggest that because pregnant women are scheduled for multiple, closely spaced office visits, brief multicontact alcohol counselling can be readily incorporated into prenatal care.

Motivational Interviewing (Miller & Rollnick, 2002) is recognized as an effective brief intervention for reducing alcohol use and can be used successfully by non-specialists (Dunn, Deroo, & Rivara, 2001; Rubak, Sandboek, Lauritzen, & Christensen, 2005; Vasilaki, Hosier, & Cox, 2006). It has recently been described as a “person-centred, goal directed counseling method for resolving ambivalence and promoting positive change by eliciting and strengthening the person’s own motivation for change” (Miller, 2008). Emphasis is placed on working collaboratively with clients to draw out their own reasons for change and developing awareness of the discrepancy between their current behaviour and their core values, desires, hopes, and goals. For example, the desire to have a healthy baby has been found to be a powerful motivating factor in reducing alcohol consumption (Rosett, Weiner, & Edelin, 1983). Readiness to change is viewed as a dynamic state that can be influenced by interactions. Readiness is affected by both how important a change is to someone as well as their confidence in being able to make the change.

Many strategies are utilized within Motivational Interviewing such as exploring the pros and cons of changing or not changing behaviour and assessing readiness to change, however the style of the interaction is paramount to the actual strategies. The interaction is empathetic, respects individual autonomy, and fosters a sense of self-efficacy. The counsellor maintains an optimistic attitude towards their client and towards change, is compassionate, and avoids arguments or confrontations that may increase resistance. Therapist style has been shown to be an important variable in intervention outcomes. The foundational work of Carl Rogers (1959) outlined three critical conditions needed for change: accurate empathy, non-possessive warmth, and genuineness. Therapist empathy has been identified as a predictor of outcomes among problem drinkers up to two years post-treatment (Miller & Baca, 1983). Conversely, a directive-confrontational style has been shown to evoke more resistance from clients and poorer outcomes (Miller, Benefield, & Tonigan, 1993).

In terms of effectiveness, clinical studies have shown that Motivational Enhancement Therapy (Motivational Interviewing plus assessment feedback) is as effective in

reducing drinking and related problems as more extensive alcohol treatments such as Cognitive-Behavioural Therapy and 12-Step Facilitation, and in a briefer, cost effective way (Project MATCH, 1997).

Many brief interventions draw upon the trans-theoretical model of change (Prochaska & DiClemente, 1984). In this model, change is viewed as a process, not an event. Readiness is identified according to stages of change which in turn guide the intervention. Identifying what stage a person is means that much more tailored interventions can be made with information and support, ensuring congruency between client readiness and intervention. The stages are: Pre-contemplation, Contemplation, Preparation, Action and Maintenance (Connors, Donovan, & DiClemente, 2001).

When applying the stages of change to alcohol use in pregnancy, there are a few important considerations that need to be taken into account:

- Other social determinants of health have an effect on women's ability to change. For example, a woman may present as not interested in changing her alcohol use and be assessed as pre-contemplative when the reality of her situation may be that she lives with a violent partner who does not want her to quit drinking.
- Sustained change often requires numerous cycles through the stages of change and people can remain in contemplation for years (Connors et al., 2001). When a woman becomes pregnant, an external and foreshortened timeline is established and there is an expectation that she will immediately stop drinking and maintain the changes postpartum. For some women this is possible whereas other women will require more time and support to work through the stages of change.
- The shift to action and decision to change during pregnancy may not reflect a woman's decision postpartum. This has been noted in women's experiences of quitting smoking during pregnancy and high rates of relapse postpartum (Greaves et al., 2003) reflecting "temporary abstinence" (Stotts, DiClemente, Carbonari, & Mullen, 1996) and not a quit decision.

### **3. Intensive or in-depth interventions for pregnant women and mothers**

Pregnant women using substances are marginalized from health and social supports by psychological, structural and systemic barriers that jeopardize their health and the health of the fetus. (MOTZ ET AL., 2006: P. 21)

For many women brief interventions will not be enough to help them to reduce their alcohol use. This is primarily due to the complexity of their lives and to the other psychosocial issues and concerns that they will be experiencing. Given the multiplicity of challenges commonly experienced by women with alcohol-use problems and other

health, social, and economic problems, many researchers have suggested the need for comprehensive, holistic, and coordinated programs that integrate health and social services (Hankin et al., 2000) and go beyond a focus on alcohol alone (Poole, 2004b). The need for the inclusion of cultural and spiritual components of support has also been highlighted (Salmon & McDiarmid, 2006).

**Many researchers have suggested the need for comprehensive, holistic, and coordinated programs that integrate health and social services and go beyond a focus on alcohol alone.**

There are now a small number of treatment programs in Canada and the USA offering such intensive, comprehensive, and integrated services to pregnant women with alcohol-use problems. Most of these programs focus on both drug and alcohol treatment and recovery. Different models underpin the treatment approach of these services but they are likely to emphasize harm-reduction and relational models in their approach to intervention. Comprehensive and integrated programs vary in treatment components but often provide single-access points for women to access a number of services such as individual and group addiction treatment, parenting programs, child care, child developmental services, health and medical services, mental health counselling, case management, parent-infant counselling, home visitation, and support around instrumental needs such as food, clothing, and transportation (Motz et al., 2006). The positive impact of early engagement by pregnant women using substances on a range of maternal, fetal, and child outcomes is increasingly being described in evaluations of these programs (Fiocchi & Kingree, 2001; Motz et al., 2006; Pepler, Moore, Motz, & Leslie, 2002). Early intervention provides, for example, the opportunity to introduce health information and education about resources in the community, the health and treatment interventions, and the receipt of food supplementation (Motz et al., 2006).

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# 2 Methodology

A systematic review of the literature identified evidence related to the effectiveness of identification tools and brief and intensive alcohol interventions in helping women to reduce their drinking in pregnancy or in the child-bearing years.

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## LITERATURE SEARCH

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Literature searches were carried out by two members of the research team between April and May 2006 in the standard bibliographic search databases and imported into the EndNote bibliographic program. The search terms and databases used are listed in Appendix 1. Key websites were also searched for relevant documents (e.g., Health Canada, WHO). Priority was given to locating papers published after 1995. Studies not published in English were excluded from the review. While a number of European studies were included, only one Canadian study fit the inclusion criteria. The search was updated between August and September 2007 following exactly the same procedures. In October 2007 reference lists of selected papers were hand-searched to ensure that all relevant papers had been identified and included in the review. Four more relevant articles were identified using this method, which were subsequently rated and summarized for the review.

## INCLUSION CRITERIA

The key interventions of interest were studies evaluating the efficacy or effectiveness of alcohol interventions aimed at pregnant and postpartum women or women of child-bearing age. Interventions and programs tested in or targeted at specific subpopulations of this group (e.g., African-American women, Aboriginal women, low-income women) were also included. Studies in three distinct categories were the focus of this review:

1. studies on the effectiveness of identification and screening tools to detect perinatal alcohol use;
2. studies on the efficacy of brief interventions in reducing the use of alcohol among pregnant women or women of child-bearing age; and
3. studies on the efficacy of intensive or in-depth interventions in reducing the use of alcohol among pregnant women or women of child-bearing age.

## OUTCOME MEASURES

The key outcome of interest for studies related to screening tools was self-reported alcohol usage. For brief and intensive interventions, changes in self-reported alcohol use were the primary outcome of interest. In addition, many other secondary outcome measures, such as a reduction in alcohol-exposed pregnancies and an increase in contraceptive behaviour, were also examined.

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## SELECTING RELEVANT STUDIES

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Before entering citations into EndNote, we carried out a preliminary screening of retrieved items. Titles were scanned so that those outside the topic area could be eliminated. The remaining abstracts were then independently scrutinized by two team members to ascertain which ones met the inclusion criteria — paper copies of the selected studies were acquired for assessment. This was the procedure for both literature searches in 2006 and 2007. Thirty-eight papers were identified as fitting the inclusion criteria and used in the review.

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## QUALITY APPRAISAL

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The studies that met the inclusion criteria were rated by two independent reviewers in order to determine the strength of the evidence. Where differences occurred, a third reviewer from the team resolved the rating. A rating system devised by the UK National Institute for Health and Clinical Excellence (NICE, 2007) was used for this review. Studies were assessed for their methodological rigour and quality based on the critical appraisal checklists provided in Appendix B of the NICE *Public Health Guidance Methods Manual* (NICE, 2007). Each study was categorized by study type (categorized as type 1-4) and graded on the basis of criteria such as suitable control group(s), appropriate measures, outcomes, statistical analyses, attrition rates, and other sources of bias which are traditional indicators of methodological rigor for intervention studies (see Table 1).

**TABLE 1. Level and quality of evidence**

<b>Type and quality of evidence</b>	
1++	High-quality meta-analyses, systematic reviews of randomized controlled trials, or RCTs (including cluster RCTs) with a very low risk of bias
1+	Well-conducted meta-analyses, systematic reviews of RCTs, or RCTs (including cluster RCTs) with a low risk of bias
1-	Meta-analyses, systematic reviews of RCTs, or RCTs (including cluster RCTs) with a high risk of bias
2++	High-quality systematic reviews of these types of studies, or individual, non-RCTs, case-control studies, cohort studies, controlled-before-and-after (CBA) studies, interrupted time series (ITS), and correlation studies with a very low risk of confounding, bias, or chance and a high probability that the relationship is causal
2+	Well-conducted non-RCTs, case-control studies, cohort studies, CBA studies, ITS, and correlation studies with a low risk of confounding, bias, or chance and a moderate probability that the relationship is causal
2-	Non-RCTs, case-control studies, cohort studies, CBA studies, ITS and correlation studies with a high risk — or chance — of confounding bias, and a significant risk that the relationship is not causal
3	Non-analytic studies (for example, case reports, case series)
4	Expert opinion, formal consensus
<b>Grading the evidence</b>	
++	<b>All or most of the quality criteria have been fulfilled</b> Where they have been fulfilled the conclusions of the study or review are thought very unlikely to alter
+	<b>Some of the criteria have been fulfilled</b> Where they have been fulfilled the conclusions of the study or review are thought unlikely to alter
-	<b>Few or no criteria fulfilled</b> The conclusions of the study are thought likely or very likely to alter

The grading code, "++," "+," or "-" was based on the extent to which the potential sources of bias were minimized. Using this method, we combined study design and quality. For example, a type 1 study fulfilling most criteria and a type 2 study fulfilling very few criteria would appear in the format (1++) and (2-) respectively.

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## DATA EXTRACTION AND SYNTHESIS

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Once all of the relevant experimental literature was identified and rated, we developed a narrative synthesis of key results. Data were extracted from the studies into summary table form for comparison purposes. A data collection form, originally developed by a research team for a better practices review of tobacco interventions for pregnant and postpartum women (Greaves et al., 2003), was modified and used for this purpose. This form is divided into four broad sections:

1. **Identification information.** This section included the authors of the study, its location, and information regarding the design and quality of the study.
2. **Study population.** This section describes the sample size and the demographic characteristics of the participants in the study who were testing the intervention/screening tool.
3. **Screening tool or intervention information.** This section provides details about the intervention or screening tool. For intervention studies, the timing of the intervention, a description of the service provider, and details about the intervention itself were provided. For studies on screening tools, details are outlined about the timing of the screen and the type of screen used.
4. **Results.** This section outlines the results of the study and describes its limitations.

The summary tables for all the papers reviewed can be found in Appendix 2.

Because the studies included in the review were heterogeneous in design and in the type and range of outcomes reported it was not possible to conduct a meta-analysis.

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## THE BETTER PRACTICES APPROACH

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While the UK National Institute for Health and Clinical Excellence (NICE) guidelines for systematic reviews (2007) were closely followed for the process of selecting and appraising relevant studies, the research team also drew on the Canadian Better Practices Model, as described by the Canadian Tobacco Control Research Initiative (CTCRI) (2006), to guide the later process of producing program components, approaches, and recommendations from the review.

Knowing what will not only have a positive impact but that can be implemented effectively and efficiently depends on understanding a full range of research evidence as well as the true challenges of practice. What works well in one situation or at one point in time may have no effect—or worse, a negative effect—in a situation where the population is demographically different, where geography or environments vary,

**Community, population, and culturally appropriate tools and interventions are vital to avoid “top-down” solutions to specific social issues or health problems.**

where timelines and resources differ, and so on. Furthermore, even the best options of today may be inferior to the options of tomorrow, when new knowledge has emerged from science and practical experience. “Best” practices, therefore, are subjective, situational, and time-sensitive. More precisely, “best” can only be determined by those responsible for implementing an intervention or activity at the time when it will be implemented... Better recognizes that effective health practice is not a single endpoint, is not prescriptive, and is not “one size fits all.” Rather, better practices are the full range of activities and processes, carried out vigilantly, that are associated with developing or identifying, implementing, evaluating and improving interventions aimed at positively impacting health. It represents ongoing reflection and improvement throughout a dynamic, iterative, evolutionary cycle. And it recognizes the contributions of current practice and experience, valuing context-specific decision-making. (CTCRI, 2006, P. 2)

As the CTCRI describes, the better practices approach takes into consideration population, geographic, and environmental factors that make crucial differences to what is the most appropriate intervention in any given context or situation. Community, population, and culturally appropriate tools and interventions are vital to avoid “top-down” solutions to specific social issues or health problems. The better practices model was deemed most appropriate in guiding the team in producing broad-based suggestions for development in health care practice and policy, while ensuring that these are not privileged above contextual and community-based solutions. This document aims for the review findings, summaries, components, approaches, and recommendations to be used alongside community-based and community-specific ways of knowing to better inform the development of a range of improvements in women’s health.

The final stage of the review involved the research team thoroughly examining all the studies to identify a set of program components that have the support of research evidence, in keeping with the better practices model. In order to evaluate and contextualize the findings of the systematic review, we also drew upon broader theoretical and practice-based literature which contributes to the understanding of women’s substance use. We then created a set of better practices approaches and recommendations, based on both the systematic review findings and an appraisal of these findings in the light of this broader literature. The final report was reviewed by a small number of experts in the field (as per CTCRI, 2006) whose comments were incorporated in the review.

# 3 Results of the Systematic Review

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## SUMMARY OF STUDIES REVIEWED

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A total of 38 studies were included in our review: 18 rated studies on screening instruments, 11 rated studies on brief interventions, and 9 rated studies on intensive interventions. The results of studies on each topic are discussed separately.

This chapter gives short synopses of all of the studies reviewed, making this part of the report detailed and lengthy. Because we found no other publication that reviewed the literature in this way we thought it would be helpful to provide the study material in this form rather than summarizing further.<sup>2</sup>

All of the studies incorporated in this review were deemed to be of either medium or high quality by the reviewers. However, the studies we've included incorporate a range of research designs, some of which are limited in their ability to yield causal attributions. The methodological limitations of the studies are detailed in each summary section. There is one issue to keep in mind while reading these results: given that the field is dominated by U.S. studies, this research may not apply to Canadian contexts. Only one study in this review was Canadian (Motz et al., 2006) and there was only one study explicitly looking at the experience of Native American women; no study examined interventions with Aboriginal women who live in Canada.

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## IDENTIFICATION AND SCREENING

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In this section we report some studies in more depth than others because they contain information that adds to the overall understanding of identification issues. This is a complex terrain and providing the additional information can help to navigate issues such as:

- the relevance of confidentiality;
- staff training and support;
- links to other substance use such as tobacco; and
- subpopulations that the studies have sampled.

<sup>2</sup> For those with limited time we recommend moving directly to the summaries of each section: identification and screening (page 29), brief interventions (page 42) and intensive interventions (page 53), and to chapter 4 which contains the better practices approaches and recommendations.

### **Reliability and validity of self-report**

One of the key questions concerning the utility of assessment and screening for alcohol in pregnancy is whether asking women about their use of alcohol in pregnancy is likely to generate accurate information. Some commentators (see O'Campo, de Boer, Faden, Gielen, Kass, & Chaisson, 1992, for example) have raised concerns about the validity of self-report data when measuring women's substance use. However, a study by Jacobson and others (2002) (rating 2+) addressed this important question and found that "there is no systematic tendency for women generally to understate the amount they drink during pregnancy" (p. 823). Interviews were undertaken with 354 inner-city African-American women regarding their alcohol, drug use, and smoking during pregnancy and again, retrospectively, at 13 months postpartum. The women's infants were also assessed using a large number of neurobehavioral tools to determine their substance exposure in the womb. Findings suggest that although higher levels of alcohol were reported retrospectively, the correlations of prenatal alcohol exposure with infant outcome were as strong or stronger for the antenatal measures. In fact, only the antenatal reports predicted poorer cognitive performance in infants: "when interviewed retrospectively about a typical week during pregnancy, many of these mothers do not recognize or have forgotten the degree to which they reduced their alcohol intake during pregnancy. Thus their postpartum drinking patterns seem to influence their retrospective recall" (p. 822).

This study challenges the prevailing belief that denial is prevalent among women who drink alcohol in pregnancy. Overall, these findings suggest that antenatal alcohol interviews can provide valid information and therefore demonstrate the importance of assessing alcohol use during pregnancy.

### **Reliability and validity of screening tools**

Other studies we reviewed examined the general question of whether or not screening tools can improve the identification of alcohol use among pregnant women. To aid in the interpretation of these findings see the table containing descriptions of all the screening instruments included in Appendix 3.

Flynn, Marcus, Barry, and Blow (2003) (rating 2+) conducted a brief self-administered survey of 1131 pregnant women who were screened while waiting for their prenatal care appointments in eight obstetrics clinics in southeastern Michigan. The women were informed that their responses would be kept confidential from their health care provider. Of the women screened, 15.1 percent reported alcohol use during pregnancy and 13 percent had scores indicating possible harmful drinking on the TWEAK screening tool. Among the women who reported use of alcohol during pregnancy, just over half (54%) said that their health care provider had talked with them about

drinking while pregnant. The study also gives a helpful account of links with tobacco smoking and stresses that cigarette smoking during pregnancy appears to be an effective predictor of higher risk drinking. Flynn and colleagues (2003) suggest that “prenatal clinical encounters should consistently include assessment of tobacco use both as an independent risk to the infant as well as an indicator for co-occurring high risk alcohol use” (p. 85).

Women’s responses were kept confidential. “It is possible that women would be less likely to report alcohol use during pregnancy if they knew that their providers would be given the information.” (p. 86). Confidentiality can be very important when asking women about their use of alcohol during pregnancy. Its effect may also highlight the absence of safety in standard methods of asking women about alcohol (which is addressed to some extent when confidential self-report methods are used). Flynn and colleagues conclude that screening in busy obstetric clinics is an effective and feasible way of identifying alcohol use during pregnancy and could be usefully coupled with brief interventions. When interpreting this conclusion however, we suggest carefully considering the role that confidentiality played in creating safety for women who found it easier to accurately disclose their alcohol use. This confidentiality would not be present in ordinary clinical screening situations where information would be passed on to health care professionals for discussions with women. It would be interesting to know whether the results would have been different if there had been no assurance of confidentiality: this would have been a more accurate reflection of the utility of the screening tool for use in “real-life” settings.

Chasnoff, Neuman, Thornton, and Callaghan (2001) (rating 2++) examine the efficacy of a standardized screening tool (in this case a structured interview) in identifying prenatal alcohol use and endorse the potential use of a screening protocol in prenatal clinics to identify alcohol use in pregnancy. In a later study, Chasnoff and others (2005) (rating 2+) evaluate the so-called 4P’s Plus in identifying alcohol use in five diverse populations of pregnant women enrolled in prenatal care in different parts of the USA. The 4P’s Plus uses a relational format for asking about alcohol use (parents’ use, partner’s use, past use, and present use in the month prior to pregnancy) which is seen to be less threatening than specific questions about current use. The study concludes that this instrument effectively identifies pregnant women at highest risk for substance use who may require further education or treatment intervention.

### **Comparing different screening tools<sup>3</sup>**

While screening tools generally appear to increase the identification of alcohol use among pregnant women, “research on the use and effectiveness of different

<sup>3</sup> Note all of the screening tools mentioned in this section of the report are summarized for easy reference in a table in Appendix 3

approaches to screening is still in its initial stages” (Hankin et al., 2000, p. 1279). Thirteen studies identified in the literature search compare the efficacy of available instruments for screening alcohol use in pregnancy in comparison to, for example, direct questioning by health care staff (following “usual care” methods) and/or the examination of medical records.

**Thirteen studies identified in the literature search compare the efficacy of available instruments for screening alcohol use in pregnancy in comparison to, for example, direct questioning by health care staff (following “usual care” methods) and/or the examination of medical records.**

Whaley and O’Connor (2003) (rating 1+) compare the reported rates of prenatal alcohol use among low-income women in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). They adopted a self-report method to see whether this would increase the numbers of women who felt comfortable reporting their usage. The Alcohol Screening Tool developed for this study incorporated two methods found in previous research to accurately assess alcohol intake: quantity and frequency measures and the Timeline Followback (TLFB) method. Findings suggest that brief self-report screening tools, supported by comprehensive staff training on the importance of screening methods, increased women’s reporting of prenatal alcohol use over face-to-face questioning about it. The factors most relevant to this increase were the simplicity of the tool, integrating the questions with less negatively valued questions about health and pregnancy, and the identification of participant by number and not by name.

Budd, Ross-Alaolmolki, and Zeller (2000) (rating 2+) compare the effectiveness of PAUI (Prenatal Alcohol Use Interview) and the ACOG Antepartum Record (a medical history record) with a physiological measure, the CDTest (carbohydrate-deficient transferrin), a measure of recent heavy drinking. The study reports that inner-city women identified as drinkers by the CDTest were more likely to be identified as drinkers by the PAUI (59%) than by their ACOG Antepartum Record (19%). The PAUI also had a lower false negative rate (41%) than the ACOG Antepartum Record (80%). The researchers therefore conclude that the PAUI is a more effective method for screening prenatal alcohol use in comparison to patient medical records.

Göransson, Magnusson, Bergman, Rydberg, and Heilig (2003) (rating 2++) undertook a cross-sectional study that investigated the AUDIT’s effectiveness in identifying drinking behaviours prior to conception as predictors of postconception drinking. (AUDIT refers to the Alcohol Use Disorders Identification Test.) The study sample identified 17 percent of Swedish women reporting hazardous alcohol use before pregnancy. Thirty percent reported alcohol use postconception, with 6 percent drinking twice a month or more. The study found frequency of alcohol use, as identified by item 1 in the AUDIT (“how often do you have a drink containing alcohol?”), to be the most significant risk factor for alcohol use during pregnancy.

A randomized controlled trial by Magnussen, Göransson, and Heilig (2005) (rating 1++) looked at the effectiveness of an intensive screen at Swedish antenatal clinics

comparing the AUDIT, Timeline Followback (TLFB), and biomarkers, with regular antenatal care. The TLFB tool showed that 15 percent of women in the study had potentially harmful alcohol use during pregnancy. The AUDIT was found to be effective, in combination with the TLFB tool, in clearly identifying women in need of intervention. These were women with higher risk overall of alcohol consumption, binge drinking, psychiatric problems, and other substance use. Meanwhile, the authors found that biomarkers “appeared to be the least useful to identify hazardous alcohol use during pregnancy” and reported that “the results were negative in a majority of subjects with consumption above cut-off in the TLFB, even when very high consumption levels were reported” (p. 162). Overall, women with positive biomarkers had negative AUDIT and TLFB screens. Somatic illness was the only factor that correlated with positive biomarker results.

In another randomized controlled trial, the same researchers (Göransson, Magnusson, & Heilig, 2006) (rating 1++) investigated the efficacy of implementing AUDIT and TLFB into “naturalistic conditions and within available resources” (p. 657) in a standard Swedish antenatal clinic. Midwives in the intervention arm of the study received a one-day training session on alcohol use in pregnancy and on the two screens. Continuous expert support was also provided to the midwives. The AUDIT was used to collect data about alcohol use during the year preceding pregnancy and the TLFB was used to assess actual consumption during the first trimester. The study found that systematic screening using the AUDIT and TLFB methods was able to detect moderate to heavy use of alcohol by women in pregnancy which regular antenatal care did not. The authors conclude that, considering the relatively short training requirement and limited need for resources, these were both effective screens in identifying alcohol use in pregnancy.

Chang, Wilkins-Haug, Berman, and Goetz (1999b) (rating 2++) also compare the effectiveness of the TWEAK with the MAST, alcohol and drug-abuse models from the DSM-III-R, the AUDIT, the Timeline Followback (TLFB), and obstetric staff assessment of alcohol use by pregnant women. After these assessment tools were administered to 135 pregnant women, the study found that the TWEAK had the best overall predictive ability for lifetime alcohol diagnoses and risk drinking. In contrast, medical record assessment was the least sensitive means of identification.

Dawson, Das, Faden, Bhaskar, Krulewitch, and Wesley (2001) (rating 2+) also explore the effectiveness of TWEAK by comparing it with nine alternative screeners for predicting high-risk and moderate-risk drinking during pregnancy. The researchers concluded that the TWEAK, in either its original or modified form, can be effectively used to test for risk drinking during pregnancy. The finding that the addition of

current smoking to the screening instrument appeared to increase both sensitivity and specificity for high-risk drinking is also helpful.<sup>4</sup>

A cross-sectional study by O'Connor and Whaley (2003) (rating 2++) used the TWEAK alongside two other methods—quantity-frequency (QF) measures and a brief Timeline Followback method (TLFB)—to examine prevalence rates of prenatal alcohol consumption. The results suggest that approximately 24 percent of women using the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) services drank alcohol postconception. Findings also showed that high-risk drinking, as identified by the TWEAK, was a good predictor of alcohol consumption during pregnancy. Women who had high TWEAK scores were three times more likely to be postconception drinkers than were women who had low TWEAK scores. The authors conclude that the TWEAK is an effective, inexpensive screen for busy prenatal clinics to identify women at risk of using alcohol at harmful levels during pregnancy.

Gupman, Sviki, McCaul, Anderson, and Santora (2002) (rating 2+) compared the utility of the T-ACE, MAST, and CAGE in detecting alcohol and other substance-use problems in women seeking gynecological care in comparison to the ability of physicians to detect this use. Three hundred and sixty predominantly African-American women of low socioeconomic status were screened prior to a physician visit. More women scored positive on T-ACE and MAST (24% and 23%) than on CAGE (5%). Only 3 percent of women reported ever having alcohol problems. Physicians identified the fewest cases, noting alcohol problems in 1 percent of cases.

Chang and colleagues (1998) (rating 2++) compared the effectiveness of T-ACE with a number of other diagnostic tools including MAST, alcohol and drug-abuse models from the DSM-III-R, AUDIT, Timeline Followback, the Alcohol Craving Scale, and obstetric staff assessment of alcohol use by pregnant women. They conclude that the T-ACE was the most sensitive screen for lifetime alcohol diagnoses, risk drinking, and current alcohol consumption.

In their attempt to validate a modified version of the T-ACE screening instrument among Northern Plains Indian women, Bad Heart Bull, Kvigne, Leonardson, Lacina, and Welty (1999) (rating 2+) compare the efficacy of this self-administered tool to structured in-depth interviews with a research nurse and medical record abstraction postpartum. When utilized in the context of comprehensive prenatal care, the modified T-ACE was more sensitive in identifying women who who drank during pregnancy than the more time-consuming methods. The researchers conclude that the

<sup>4</sup> The sensitivity of a screening tool measures the proportion of actual positives that are correctly identified as such. The specificity of the tool measures the proportion of negatives that are correctly identified.

modified T-ACE was a useful screening tool for alcohol use among pregnant Northern Plains Indian women.

McNamara, Orav, Wilkins-Haug, and Chang (2005) (rating 2+) explore the relative utility of self-reports using the T-ACE screen and medical records in identifying women at risk for prenatal alcohol use. The majority of participants (82.2%) not considered at-risk by the physicians actually did consume alcohol during their pregnancy. The researchers speculate that the low numbers of women identified by doctors might result from participants' reluctance to disclose alcohol use to their obstetric clinicians, or they may have modified their consumption on receiving obstetric care. Researchers also identify the issue of confidentiality: "Perhaps the participants were more willing to disclose their drinking in a research setting, where more detailed information was obtained but would be kept confidential" (p. 1984). The researchers also found that physicians were more likely to correctly identify women at risk for prenatal alcohol consumption if those women were non-White. Given women with the same income, education, and pre-pregnancy alcohol consumption, physicians were more than three and one-half times more likely to correctly recognize a non-White woman as at risk for alcohol consumption.

Finally, Kesmodel and Olsen (2001) (rating 2+) compare the effectiveness of four different measures of alcohol intake during pregnancy: 1) interview regarding current intake, 2) interview on intake the previous week, 3) a two-week diary on alcohol intake and, 4) a self-administered questionnaire with one item on alcohol intake (average current maternal alcohol intake). They conclude that when assessing the distribution of alcohol intake in pregnancy for pregnant women with low to moderate alcohol intake, diaries, interviews, and questionnaires yielded comparable distributions of intake.

### **Measuring alcohol consumption**

Hankin and colleagues (2000) point out that it is crucial to establish the best way to measure alcohol consumption once usage has been identified. This is an important issue because there is evidence that estimates of alcohol use may vary dramatically from the alcohol quantities assumed by standardized measures (e.g., "one standard drink"). For example, Kaskutas and Graves (2001) (rating 2+) found that for most beverages, the difference in millilitres between self-selected drink size and standard-size drink was significant, with mean self-selected drink sizes ranging from 49 percent above the standard size (for beer) to 307 percent above the standard size (for spirits).

For women whose pre-pregnancy average daily volume (ADV) was at the risk level of  $\geq 1$  standard drink per day, ADV increased from four to almost ten standard drinks per day when self-defined drink sizes were considered. The authors conclude that “if risk levels have been based on underestimates that assume women with alcohol-affected infants have standard drink sizes, then true risk levels may be higher than previously thought” (p. 1199). They also highlight that women drinking at harmful levels who present at prenatal clinics may be missed if screening protocols do not ask about drink size. This information has obvious implications for education and prenatal work with women.

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### **SNAPSHOT: THE ISSUES RELATING TO IDENTIFICATION AND SCREENING**

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**Women drinking at harmful levels who present at prenatal clinics may be missed if screening protocols do not ask about drink size.**

The majority of the studies we reviewed conclude that screening tools are more effective than usual care, or than not using any screening tool in identifying potential alcohol use among pregnant women.

The available evidence indicates that the T-ACE and the TWEAK tools appear to be the most sensitive validated screening instruments for lifetime alcohol diagnoses, risk drinking, and current alcohol consumption among pregnant women.

The evidence reviewed also indicates that self-administration screening methods produce a more accurate description of alcohol usage than screening through direct questioning by staff, particularly when women are assured confidentiality of their responses. However, the utility of self-report methods may be limited in populations with low levels of literacy.

As Hankin and colleagues (2000) point out, questions remain about which screening instrument works best for particular populations or subgroups of women. It may be the case, for example, that the TWEAK is more effective in identifying some women and the T-ACE is more effective for others. While the majority of studies on screening tools were conducted with pregnant subpopulations such as low-income women, African-American, or American Indian women, they often test only a single instrument or else do not disaggregate results by demographic variables such as income level or ethnicity. Given that levels of moderate alcohol use are particularly high among middle-class White women (Chang et al., 1999b), questions must also be raised about why so many studies focus on low-income and minority ethnic groups.

The study of screening tools to identify women who use alcohol in pregnancy dominates in research. All the studies we found on identifying alcohol use in pregnant women evaluated the efficacy of screening tools as an intervention. While screening

efficacy seems to be proved from the studies reviewed here, other findings reported in the studies draw attention to additional and alternative methodologies that may also be beneficial.

In other areas of health care practice, screening is contentious (e.g., screening in health care settings for violence against women in relationships). While we are aware of critiques of screening methodologies in women's health more generally, the review team also identified problems with assumptions that screening is the only approach for how best to identify pregnant women who may benefit from alcohol-related interventions.<sup>5</sup>

Figures reported in Handmaker, Miller, and Manicke's (1999) brief intervention study are relevant to note here. The women in their sample reported consuming a mean of 20.48 drinks in the past month when responding to a self-administered screening questionnaire but reported threefold higher levels of drinking during subsequent non-judgmental personal interviews. When asked by their health care providers just before delivery about alcohol use, most of the women denied drinking even once during their entire pregnancies. This was the only study that reported results comparing a screening questionnaire with a non-judgmental personal interview. The comparison demonstrates the variability of women's responses depending on the methodology of the approach. So while screening has been evaluated by the studies reported here as better than usual care or usual practice, the argument cannot be extended that screening is necessarily the best or better than all approaches that could be used. Certainly, the use of non-judgmental personal interviews, as described by Handmaker and others (1999), seems to be an approach that deserves further inquiry.

One of the limitations of the papers reviewed on identification and screening tools concerns how little this research is informed by wider literature from the field of women's substance use. This literature points to the importance of acknowledging and actively working with the social context of women's use of alcohol and other substances, in warm, non-confrontational ways. And although screening gives the potential for further discussion with a woman and for identifying a need for intervention or referral to other services and treatment, in practice screening is not always tied into referral. This can be for a number of reasons: staff may not feel equipped to have these conversations, or staff may not know what services exist. Opponents of the use of screening tools in women's health care question the use of screening if the the information gathered is not used to constructively help women. (Cory & Dechief, 2007).

5 See MacMillan and Wathen (2003) for a review of the debates concerning screening women for violence in relationships.

The studies also point to a number of issues that alert us to women's priorities and concerns. One of the central issues is confidentiality (see Flynn et al., 2003) which raises questions about commitments to trust-building and safety when women are being asked about alcohol use, and the ethical implications embedded in this interaction.

**There are other ways of identifying pregnant women's alcohol use that do not involve screening. One such approach is to invite discussion about alcohol use in the context of a respectful, supportive conversation guided by a health care professional.**

There are other ways of identifying pregnant women's alcohol use that do not involve screening. One such approach is to invite discussion about alcohol use in the context of a respectful, supportive conversation guided by a health care professional. Gunn and colleagues' (2006) description of the ANEW program gives one possible direction for this work (see chapter 1 for details). The relational approach is also identified as key in other published work in the field of women's substance use (see chapter 4). For example, the Alberta Alcohol and Drug Commission's (AADAC) evaluation of their Enhanced Services for Women (ESW) program with pregnant women who use substances emphasizes the central importance of relationships with staff for the women involved in the program (Watkins & Chovanec, 2006). The mandate of the ESW program is to provide an enhanced level of services to pregnant and postpartum women and women at risk of becoming pregnant while using substances. The program also provides links to addictions treatment where appropriate. By using a harm-reduction approach, Motivational Interviewing techniques, and non-judgmental support, ESW staff provided relationships that were highly valued by women. The evaluation of the ESW project (Watkins & Chovanec, 2006) indicated that working with pregnant women who used substances required staff to use creative and non-traditional ways of reaching out, incorporating the following elements: outreach, recognizing complexity, case management, harm reduction, focusing on the counselling relationship, flexibility, and a holistic approach.

A final point in relation to screening for alcohol use is the lack of literature and associated interest in screening women for alcohol use outside of pregnancy, for example, screening of high-risk groups such as college-age women. As studies have demonstrated with other substance-use issues in women, general interest in women's substance use is heightened during pregnancy, apparently motivated by fetal health concerns. When we know the risk of heavy alcohol use for women across the lifespan, this interest should manifest at other stages, motivated by an ongoing interest in women's health.

Various program components have been identified as effective in the identification and screening studies reviewed above.

## PROGRAM COMPONENTS FOR IDENTIFICATION AND SCREENING

- Screening tools can be helpful in identifying women who use alcohol in pregnancy, especially the use of self-administered questionnaires.
- Certain screening tools are more effective with pregnant women than others (such as the T-ACE, TWEAK, AUDIT, Alcohol Screening Tool, and 4 P's Plus).
- Other aids are tracking tools (visual aids, drink size measures, and quantity and frequency measures).
- The simplicity of the tool, use of plain language, use of woman's first language, and integrating screening questions with less negatively valued questions about health, all increase the effectiveness of a tool.
- Some questions on screening tools are more significant than others (e.g., how often do you have a drink containing alcohol?).
- Screening tools are most effective when used alongside practitioner training, support, and supervision.

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## BRIEF INTERVENTIONS

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This section discusses studies pertaining to pregnant women and studies concerned with women of child-bearing age separately because of the differences in provision of interventions to these two groups of women. Eleven studies on brief interventions were examined; seven of these studies were undertaken with pregnant women and the other four were undertaken with women of child-bearing age. One of the studies has two papers that discuss different aspects of the research but these papers will be considered as one study (Chang et al., 1999b; and 2000). Another study by Chang and colleagues also has two papers discussing the study findings (Chang et al., 2005 and Chang et al., 2006) but these two papers are rated and discussed separately because each has a different intervention element.

The most common type of intervention across the whole sample was Motivational Interviewing (MI), with the remaining studies utilizing self-help and educational materials or physician advice. Each study described examines a different approach to intervention so the findings are specific to that particular intervention, rather than generalizable to brief interventions more broadly. In some studies the treatment effect varied between different cultural groups and between women with different levels of alcohol use (light, moderate, or heavy use). Some of the samples used in these studies may also mean that the effectiveness of the intervention is specific to that group of women and needs to be researched with different groups of women before wider statements can be made about its general effectiveness.

## **Interventions with pregnant women**

Reynolds, Coombs, Lowe, Peterson, and Gayoso (1995) (rating 1++) tested the effectiveness of a cognitive behavioural, self-help intervention in reducing alcohol consumption among 78 predominantly African-American (67%) pregnant women assigned to either the intervention condition (n=32) or usual clinic care. The women were of low income and attended the public health clinics because of limited access to care from other sources. The intervention was based on Bandura's Social Cognitive Theory (1997, 2001). The main components of this theory used in the intervention included goal setting, self-monitoring, perceived self-efficacy, negative outcome expectancies of drinking, positive outcome expectancies of cessation, and skills for cessation. The approach for the intervention was built on the ideas that both specific and general skills are needed to reduce or quit drinking, that perceived self-efficacy to engage in these skills and to stop drinking is extremely important, and that such skills can be acquired through direct practice, persuasion, and observation of role models.

The intervention included a ten-minute educational session and a nine-step self-help manual to be completed by women at home over nine days. The educational session involved an educator describing the effects of alcohol on the fetus and explaining the use of the manual. The manual provided information on FAS, building motivation to quit, diary-keeping, removing alcohol stimuli, self-monitoring, and reward. Each step in the manual targeted a particular behaviour that would enhance the likelihood of cessation. Exercises were included that were intended to stimulate thought about key ideas, build alcohol-cessation skills, and provide practice related to these skills.

The study found that a higher alcohol quit rate was observed among intervention participants (88%) than controls (69%). A related finding was that the treatment effect was strongest among light to moderate drinkers (less than 8 drinks per month), African-American, and non-Protestant women. The women who quit drinking were more likely to complete four or more steps in the self-help manual. Pregnant women least likely to quit drinking were those who linked drinking with positive outcomes such as stress reduction. The authors commented that positive outcome expectancies for drinking were related to quitting: the more a woman believes that drinking will lead to positive outcomes (i.e., stress reduction), the less likely she is to quit. According to the authors, the findings suggest three courses of action: to utilize the self-help approach with women who drink at light or moderate levels, to revise the educational session and self-help manual to increase their effectiveness with heavier drinkers, and to add components to the intervention (e.g., social support) to increase its impact. The evaluation process indicated that this intervention could be used in busy maternity clinics as a low-cost supplement to counselling because of the short time required and the ease of the intervention's delivery.

Chang and others (1999b) (rating 1++) report the results of a brief intervention involving 250 pregnant women initiating prenatal care at a Boston hospital who had screened as positive on the T-ACE instrument. One hundred and twenty-three participants were randomly assigned to receive the 45-minute brief intervention which was structured as follows:

1. Review the woman's general health and pregnancy course to date.
2. Review the woman's lifestyle changes made since pregnancy including work schedule, exercise, diet, cigarette smoking, and alcohol consumption.
3. Request that the woman articulate her drinking goals while pregnant.
4. Have the woman identify circumstances when she might be tempted to drink.
5. Identify alternatives to drinking when she is tempted to drink.
6. Summarize the session by emphasizing four key points (drinking goal, motivation, risk situations for drinking, and alternatives to alcohol) and noting them in the take-home manual given to the woman.

They found that both the intervention and control groups reduced alcohol consumption. The differences in reduction by group were not statistically significant which indicates that the brief intervention approach offered no additional benefit to the assessment-only intervention.

In a later paper focusing on the same study's intervention group, the same authors (Chang et al., 2000) (rating 1++) indicate that women who named abstinence as their antepartum drinking goal were more likely to be abstaining from alcohol at the time of study enrolment, than those without such a goal. And once current drinkers named abstinence as their goal, they did reduce their subsequent prenatal alcohol use. Moreover, all current drinkers who indicated FAS as a reason not to drink reduced their subsequent alcohol consumption. One further aspect to this study deserves mention: the role of social support in modifying prenatal alcohol consumption. The study showed a trend associating social support to reduce drinking with a woman's goal of abstinence. The authors suggest that this indicates a need to involve the partners of women and other members of their support networks in education or intervention programs to enhance their effectiveness.

Chang and others' (2005) (rating 1++) randomized controlled trial of a brief intervention to prevent prenatal alcohol use continues this theme by demonstrating the importance of women's support systems during pregnancy. This study tested the effectiveness of a brief intervention in the reduction of prenatal alcohol consumption enhanced by including a partner chosen by the pregnant woman. The partner could be the woman's spouse, father of the child, or any other supportive adult who would be knowledgeable about her health habits. Inclusion criteria for this study

**The authors suggest that this indicates a need to involve the partners of women and other members of their support networks in education or intervention programs to enhance their effectiveness.**

were: women who tested positive for the T-ACE, who drank alcohol while pregnant in the three months before study enrolment, and who were less than 28 weeks pregnant. Participants were primarily White (78.6%) and married (80.5%) with some postsecondary education. In the treatment group, 118 partners participated in the brief intervention. Following diagnostic interviews, couples in the treatment group (118) received a single-session brief intervention from a nurse practitioner or the principal investigator. The intervention consisted of knowledge assessment and feedback, contracting and goal setting, behavioural modification, and a summary. A postpartum follow-up interview involved women and their partners completing similar measures as in the diagnostic interviews.

The investigators found that the brief intervention was significantly related to decreased alcohol use during pregnancy, particularly among women who consumed more at the beginning of the study. Variables associated with increased risk of drinking during pregnancy included the amount women consumed before study enrolment, number of years of regular alcohol use, their temptation to drink in social situations, and their education levels. For women who drank heavily, the brief intervention was more effective when their partner was involved. Overall, the authors found that “the effects of the brief intervention are significantly enhanced when a support partner of the woman’s choice also participates in the brief intervention” (p. 996).

Drinking goal selection was the main variable examined in Chang and colleagues’ (2006) (rating 1+) review of data from a previous trial (see Chang et al., 2005 reported above). The authors investigated the intervention group of expectant women and their partners (n = 118) from the previous study to measure the effect of the drinking goal selected by the couple (abstinence or cutting down) on antenatal drinking levels. Women were categorized into three groups based on their drinking at study enrolment and their drinking goals: 1) women who were abstinent at enrolment and chose to continue to be abstinent during pregnancy (n = 66); 2) women who were not abstinent at enrolment but chose abstinence as a goal (n = 24); and 3) women who were not abstinent at enrolment and chose cutting down as their goal (n = 25).

The study found that goal selection was highly predictive of subsequent drinking behaviour. The women who were abstinent at enrolment and chose to remain abstinent had the highest rates of subsequent prenatal abstinence (75%). Fifty percent of those in the second group achieved abstinence and 25 percent were cutting down at follow-up. In the third group, none of the women were abstinent and only 16 percent achieved their goal of cutting down on their alcohol consumption. The three groups of women also differed significantly in terms of perceived risk for prenatal alcohol use. The women who were abstinent at enrolment and had an abstinence goal listed fewer

risk situations than did the other groups of women. Women in the third group were most able to identify risk situations for alcohol use, as well as alternatives to drinking, but were nonetheless the least likely group to be abstinent or cut down on drinking. The authors conclude that “recognizing more risks and ways to manage such risks was not necessarily protective against prenatal alcohol use” (p. 423). The findings showed that older women were less likely to be abstinent at enrolment and more likely to choose cutting down as their prenatal drinking goal.

Partners involved in the study were asked to describe the behavioural changes that they had undertaken as a result of the pregnancy in terms of modelling, encouragement, or supportive activities. Overall, more partners chose to cut down on their alcohol consumption (modelling) rather than give it up entirely. Few partners offered specific support (encouragement) to the pregnant woman to abstain with more taking on extra duties at home or other activities to encourage general well-being (supportive activities).

Handmaker and colleagues (1999) (rating 1++) conducted a pilot study involving a brief intervention based on Motivational Interviewing with pregnant drinkers. The study included 42 pregnant women from obstetric clinics who reported consuming at least one drink in the past month, with 20 participants randomized to the intervention condition and 22 to the control condition (although by the end there were 18 controls and 16 in the intervention group). Both groups received an initial assessment consisting of a structured interview, the Brief Drinker Profile (Miller & Marlatt, 1987), supplemented by a calendar for timeline reconstruction of drinking during the previous two months. For each drinking day, the number and strength of drinks and the duration of drinking episodes were estimated and then converted into standard ethanol content (SEC) units. Computer projections of peak blood alcohol concentrations (BAC) were then calculated from this because BAC are considered to be a better measure of fetal exposure than serving size or quantity of drinks.

The control group received letters informing them of the potential risks of drinking during pregnancy and referring them to their health care providers. Those in the intervention group received a one-hour Motivational Interview asking what they already knew about the effect of drinking during pregnancy, providing feedback on the severity of the woman’s drinking, and presenting a chart of fetal development by gestational week to personalize the potential impact on the fetus. The interview was conducted in an empathic client-centred yet directive style, as described by Miller and Rollnick (2002). The goal was to increase the mother’s perceptions of the health risks to the fetus associated with her current drinking, while supporting her perceived ability to change.

**The goal was to increase the mother’s perceptions of the health risks to the fetus associated with her current drinking, while supporting her perceived ability to change.**

At the end of the two-month follow-up period there were no differences between treatment and control groups on total alcohol consumption and abstinent days. However, among women with the highest initial intoxication levels, those in the intervention group showed significantly lower blood alcohol concentrations than did controls. Despite significant reductions in drinking across both control and intervention groups following their assessments, many (67% of control and 56% of the intervention group) of the women were still drinking alcohol, albeit at very low levels. The authors found that continued drinking in pregnancy was related to family history of drinking among female relatives and to past illicit drug use. According to the authors, the study findings suggest a three-tiered approach to prevention of FAE through prenatal care:

1. *sensitive screening* in prenatal clinics, followed by
2. a *thorough assessment* conducted in a warm and empathic style for those who report either drinking in pregnancy or alcohol-related problems in the past year, and
3. the provision of *brief advice* for those who are identified as lighter drinkers and the provision of *Motivational Interviews, treatment referrals, and monitoring* for those identified as higher-risk heavier drinkers.

The limitations of this study are significant—it was a small sample size for a randomized study, and a pilot study (the study was done by the first author as a doctoral dissertation). The study also seems to have been affected by the phenomenon reported by Chang and others (1999b) where the assessment process itself seems to have an impact on women's drinking levels. This assessment effect seems to involve control group members making changes in their drinking behaviour that almost mirror the intervention group's changes and can lead to non-significant statistical differences in randomized controlled trials (RCT). This study had a particularly thorough assessment phase before participants were randomized into the two groups which could have led to a reduced intervention effect. The potential effect of screening and assessment among female participants has been replicated in other studies (Scott & Anderson, 1990) and is thought to be caused by the increased awareness and problem recognition processes that are stimulated when women are asked questions in a reflective, non-judgmental style.

Jones-Webb, McKiver, Pirie, and Miner (1999) (rating 2+) reported on the impact of physician advice on tobacco and alcohol use during pregnancy. They found that women who received advice from a physician to abstain from alcohol during their pregnancy reported a lower lifetime prevalence of smoking and drinking during pregnancy than women who did not receive such advice. Interestingly, this was not the case for women who received advice only about smoking during their pregnancy. An

additional finding of the study was that the age of a woman's first drink was associated with an increased odds of alcohol use during pregnancy, with women who reported having their first drink at age 15 years or younger reporting the greatest use of alcohol during pregnancy.

O'Connor and Whaley (2007) (rating 1+) undertook a randomized controlled trial to compare a brief intervention to support low-income women in maintaining abstinence during pregnancy with an assessment-only control group. Newborn outcomes from both groups were also measured. Investigators trained nutritionists from the clinics on scoring a screening questionnaire and the Health Interview for Women; those in the brief intervention group were also trained extensively on how to administer the brief intervention. Three hundred and forty-five women of the 4,084 who enrolled in the study were currently drinking and randomized into control (n = 183) and intervention (n = 162) groups. In the control group, participants were administered a comprehensive alcohol-use assessment and were advised not to drink during their pregnancy. Women in the intervention group received the same assessment and a screening questionnaire, with quantity-frequency measures and the TWEAK five-question scale, at monthly prenatal visits. Those who screened positive for alcohol use were given the Health Interview for Women and a workbook-based intervention that included education and feedback, cognitive-behavioural procedures, goal-setting, and contracting.

The investigators found that "women in the brief intervention condition were 5 times more likely to be abstinent by the third trimester" (p. 255). Improved birth outcomes were at clinically significant levels for women with high alcohol consumption. Newborns in the high-consumption intervention group weighed an estimated average of 180.45 g more than the high-consumption control group. Similarly, birth lengths for infants of women consuming two or more drinks in the intervention group were on average 1.69 cm more than for the assessment-only condition.

### **Interventions with women of child-bearing age**

The Project Choices Intervention Research Group (2003) (rating 2++) conducted a study on the role of Motivational Interviewing in reducing the risk of alcohol-exposed pregnancies (AEP). The study was conducted with 190 women of child-bearing age. The intervention consisted of four Motivational Interviewing (MI) sessions and one contraceptive counselling session. The goal of the MI sessions was to provide personalized feedback of risk, motivate the woman to change one or both of the target behaviours (reduction of alcohol use and improved contraception), decrease her temptation to engage in risk behaviour and increase her confidence to avoid it, facilitate goal setting, develop change plans, and encourage her to attend contraceptive counselling. Discussions in the individual sessions were tailored to

each participant's self-rated readiness to change and interest in discussing alcohol use or contraception. The contraceptive counselling included taking a medical history, discussion of options for contraception and concerns about particular methods, a physical examination and pregnancy test if requested, and provision of contraception prescription or contraceptives if requested. A total of 15 counsellors conducted the MI sessions—all were educated to masters or doctoral level in clinical and counselling psychology or were trainees, and most had experience of previous clinical research. They were all trained in the study protocol, in MI by experienced MI trainers, and received ongoing supervision. Four obstetrician-gynecologists and three family-planning clinical specialists gave contraception counselling.

The findings of this study were significant: among the women who completed the six-month follow-up, 68.5 percent were no longer at risk of having an alcohol-exposed pregnancy. A little over 12 percent (12.6%) of women who completed the intervention reduced their drinking only; 23.1 percent used effective contraception only; and 32.9 percent reported both. The results were consistent across the study sites. The success of the intervention did not seem to be dependent on the participants attending all four sessions. The authors contend that incorporating a dual focus of alcohol reduction and contraception in the intervention was important, in part because it offered the women the opportunity for personal choice. This is based on the theory that people are more committed to change when they focus on goals that they have established for themselves. Also of significance to this review was the finding from the Project Choices study (2003) that women who felt least able to control their drinking behaviour, and experienced more temptation to drink, were least successful in changing their behaviour. This finding relates to literature on self-efficacy and personal beliefs about the perceived ability of a person to change their behaviour (Bandura, 1977; Bandura, Adams, & Byer, 1977; Clark & Dodge, 1999; Hyde, Hankins, Deale, & Marteau, 2008; Strecher, Devellis-McEvoy, Becker, & Rosenstock, 1986).

In their follow-up RCT from the feasibility study we summarize here, Floyd and others (2007) (1++) investigated a brief intervention to prevent alcohol-exposed pregnancies (AEP) by addressing risky drinking and ineffective use of birth control. The intervention focused on increasing participants' commitment to change through the use of Motivational Interviewing. The participants, 830 non-pregnant women at risk of AEP, received either information plus a brief intervention (n = 416), or information only (n = 414). Control group participants received brochures on alcohol use and women's health in general and a referral guide to local services. Study participants were predominantly African American, had never been married, and had annual incomes of less than \$20,000. Fifty-six percent met the criteria for alcohol dependence on a DSM-IV checklist, and illicit drug use (>90%) and tobacco smoking (>70%) were highly prevalent in the population.

**The authors contend that incorporating a dual focus of alcohol reduction and contraception in the intervention was important, in part because it offered the women the opportunity for personal choice.**

The intervention consisted of four motivational counselling sessions and one session on birth control and services. Although both contraception and drinking were targeted, counsellors could emphasize the target behaviour favoured by the participant. Counsellors with a post-graduate level of education delivered the intervention and were supervised by contraceptive care providers and the study research team. Outcome measures were risky drinking, ineffective contraceptive use, and risk of AEP as measured by a TLFB method modified and refined to include daily vaginal intercourse and contraceptive use, for the purposes of the study. The TLFB data was taken in interviews at baseline, three-, six-, and nine-month intervals.

The authors found that the intervention “considerably decreased the risk of AEP in high-risk women by altering targeted behaviours of risky drinking and ineffective contraception use” (p. 7). Binge drinking episodes were reduced from 30.1 in the past 3 months at baseline to 7.1 at follow-up in the intervention; in the control group, the reduction was from 29.1 to 9.8 over the same phases. Number of drinks per week and the number of women drinking at risk levels were similarly reduced, with the average overall risk of AEP in the intervention group reduced by 16.6 percent. Risk behaviours associated with both alcohol and contraceptive use in the intervention group were reduced by 10 percent more than the control group at three months, and by 13 percent at nine months. The authors report that “women receiving the intervention were more likely to adopt changes in both targeted behaviours simultaneously, thereby maximizing the likelihood of avoiding an AEP” (p. 7). Although significantly more women in the intervention group reduced their risk of an AEP, many women in the control group also reduced their risk over the course of the study.

Ingersoll and colleagues (2005) (rating 1++) also conducted a brief intervention with female college students at risk of alcohol-exposed pregnancy. Rates of binge drinking among young women are very high and a key risk factor for many consequences, including alcohol-exposed pregnancy as a result of ineffective use of contraception or failure to use it altogether. Two hundred and twenty-eight female students enrolled in the study, with 114 randomized to the intervention and an equal number acting as controls. All the participants received a comprehensive assessment that took between an hour and an hour and a half and covered, for example, demographic characteristics, sexual behaviour history, contraception history, drinking history, and attitudes towards multivitamin use, knowledge of folic acid functions, and belief that drinking daily has health benefits.

The intervention group were administered the BALANCE (Birth Control and Alcohol Awareness: Negotiating Choices Effectively) intervention. This involved a single 60 to 75-minute session of personalized feedback and Motivational Interviewing counselling. The session followed a semi-structured counselling manual containing

a series of activities such as information on drinking and contraception, recording 90 days of Timeline Followback, and undertaking exercises using decisional balance, temptation, and confidence charts. After a ten-minute break when the counsellor computerized the woman's feedback information, the woman then received personalized feedback of risk and then worked with the counsellor to fill out importance, confidence, and readiness to change rulers for both behaviours. Lastly they worked to develop goal statements and change plans for both drinking and contraception — if the women did not want to change either of the behaviours, the plan was aimed at maintaining current behaviours rather than to increase the risk behaviours.

This brief intervention led to a reduction in risk of alcohol-exposed pregnancy (AEP) at the one-month follow-up. Fifteen percent of the control subjects and 25 percent of the intervention women reported “no risk drinking,” a significant effect size. Significantly fewer control subjects (48%) used effective contraception at one-month follow-up compared with intervention women (64%). Significantly more intervention women (74%) were no longer at risk of AEP at one month compared with control subjects (54%). An additional finding from this study was that women responded most to the contraceptive part of the intervention and showed more change in this area than in their drinking behaviour. The authors propose that this may have to do with the strong motivation college women had to avoid pregnancy while having much less motivation to reduce their drinking. Indeed, most of the women retained a pattern of binge drinking following the intervention. Similarly to the Project Choices Intervention Research Group (2003) study, the dual focus of the intervention was seen to be very positive because it allowed women to choose which change they wanted to make while conveying risk-reduction messages for both areas that could reduce the risk of AEP and unplanned pregnancy.

Manwell, Fleming, Mundt, Stauffer, and Barry (2000) (rating 1+) reported the findings of a brief intervention conducted with 205 women of child-bearing age. One hundred three women were randomized to the intervention group with the remaining 102 in the control group. The brief intervention consisted of a workbook that contained feedback on current health behaviours, a review of the prevalence of problem drinking, a list of the adverse effects of alcohol, a worksheet on drinking cues, and a drinking agreement in the form of a prescription and drinking diary cards. Two 15-minute visits with the physician were scheduled one month apart (one at the brief intervention and the second as a reinforcement session) and the intervention group received a supportive follow-up phone call from the clinic nurse two weeks after each physician visit.

The study found a significant treatment effect in reducing both seven-day alcohol use and binge-drinking episodes over a 48-month follow-up. Women in the experimental group who became pregnant during the follow-up period had the most dramatic decreases in alcohol use. Participants in the experimental group decreased their alcohol use within six months and maintained these reductions over the follow-up period with little variation. They decreased their mean alcohol intake over the full 48 months by 48 percent and reduced the weekly amount consumed from 14 to 7.5 drinks. The number of women reporting binge-drinking episodes also decreased from 93 percent to 68 percent of the sample and decreased from five times in the previous thirty days to three. The number of women drinking more than 13 drinks a week also decreased from 47 to 15. These figures represent significant decreases and the study seems to provide evidence that physician-delivered brief counselling can result in sustained reduction in alcohol use in women of child-bearing-age.

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## **SNAPSHOT: THE ISSUES RELATING TO BRIEF INTERVENTIONS**

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The studies reviewed provide evidence that brief interventions can help to reduce alcohol consumption among pregnant women and women of child-bearing age. However, the findings were mixed in the studies looking at pregnant women. Two studies failed to find a statistically significant difference between control and intervention groups in relation to total alcohol consumption (Chang et al., 1999b; Handmaker et al., 1999). Despite this overall finding, within both studies there were other changes detailed which are important to note. For example, Chang, Goetz, Wilkins-Haug, and Berman (2000) report that within their original study (reported in Chang et al., 1999b), current drinkers who named abstinence as their goal did in fact reduce their subsequent prenatal alcohol use and all current drinkers who indicated FAS as a reason not to drink reduced their subsequent alcohol consumption. In Handmaker and colleagues' (1999) study, women with the highest initial intoxication levels in the intervention group showed significantly lower blood alcohol concentrations than did similar women in the control group. So it appears that the interventions being trialled have had different effects on different subgroups of women (in these cases women who were drinking but wanting to quit during pregnancy, women who indicated FAS as a reason not to drink, and heavier drinkers).

The issue of differing impacts for different subgroups of women deserves further exploration. For example, one significant limitation of the studies reviewed is that while a number contain a significant proportion of low-income and minority women, it is seldom clear whether the interventions have been specifically tailored to meet the needs of these subpopulations (c.f. Greaves et al., 2003). In fact, in almost all cases

the intervention effect is not disaggregated by ethnicity or income level. Results were broken down by ethnicity in only one study (Reynolds et al., 2005), which found that the intervention had a larger effect for African-American women than women of other ethnicities. In the case of subgroups of women with low, moderate, or heavier drinking, the impact of the intervention is, again, not specifically targeted to meet their different needs. None of the studies reported here satisfactorily tackle the issue of tailoring for subpopulations for women despite some of the findings being specifically relevant to certain groups of women.

**The conclusion of O'Connor and Whaley (2007) that “women in the brief intervention condition were 5 times more likely to be abstinent by the third trimester” is particularly significant.**

The other five studies described here found that brief interventions did reduce women's use of alcohol during pregnancy. Chang and others (2005) reported that their brief intervention seemed to be particularly effective among women who were consuming more alcohol at the beginning of the study. The conclusion of O'Connor and Whaley (2007) that “women in the brief intervention condition were five times more likely to be abstinent by the third trimester” (p. 255), is particularly significant. In this study, improved birth outcomes were also at clinically significant levels for women with high alcohol consumption. Overall, the evidence from these five studies clearly supports the efficacy of a variety of brief interventions to reduce women's use of alcohol during pregnancy.

Brief interventions were successful in reducing the risk of alcohol-exposed pregnancies among women of child-bearing age in all four of the studies reviewed. All four studies reviewed were of a high quality and included three randomized controlled trials. The three studies that included contraceptive as well as alcohol counselling found that the effective use of contraception increased among the treatment group, alongside a reduction in risk drinking. Indeed, in two of the three studies more women chose the goal of increasing the effectiveness of contraception rather than reducing their drinking. In the work by Floyd and colleagues (2007) women made significant changes in both their use of contraception and their use of alcohol. The dual focus on alcohol reduction and contraception seemed to be an important element of the intervention's success in all three cases, probably due to the aspect of choice that it created for women who had some control over what goals they could establish for themselves. Despite these results, Ingersoll and colleagues' (2005) findings showed that most of the women in their study retained a pattern of binge drinking following the intervention. These findings indicate that these types of interventions are optimally integrated into public health or primary care settings to enhance early intervention and treatment options for child-bearing-age women at risk of an AEP.

In the Floyd et al. (2007) study, although significantly more women in the intervention group reduced their risk of an AEP, many women in the control group also reduced

their risk over the course of the study. This phenomenon has been present in a number of the brief intervention studies reviewed here (Chang et al., 1999b; Handmaker et al., 1999). The “screening effect,” as it is sometimes known, means that merely asking women about their use of alcohol during pregnancy seems to create a measurable (significant) difference in women’s drinking behaviour. This is thought to be due to increased awareness and problem-recognition processes that are stimulated when women are asked questions in a reflective, non-judgmental style. Floyd and colleagues (2007) comment that reductions in risk behaviours among control group participants are not uncommon in women’s alcohol studies and explanations from other studies (Richmond, Heather, Wodak, Kehoe, & Webster, 1995; Wampold, Minami, Tierney, Baskin, & Ghati, 2005) include reactivity to research protocols, regression to the mean, reporting bias, assessment effects, and a placebo effect. However, rather than viewing the screening effect as a factor that disrupts the significance of our statistical analyses, it may be more beneficial to examine this phenomenon more closely and seek to utilize this effect explicitly by asking women about their alcohol use in a safe and non-judgmental way.

In terms of stability of behaviour change, it is also hard to tell from the three contraception/drinking studies whether the intervention effect was stable over time because follow-up was limited to nine months at the most. In the case of Floyd and others (2007) who followed up until nine months, the effect was more pronounced in the nine-month follow-up compared to the three-month follow-up. In the Manwell et al. (2000) study, the intervention effect continued through the 48-month follow-up period with little variation.

Finally, it is worth noting that in all the studies on identification and most of the studies on brief interventions, the reported findings concerning alcohol use are not set in the context of women’s wider lives and known influences on women’s alcohol use such as experiences of violence. These studies tend to view women who drink during pregnancy as “the problem” in a way that is individualized and decontextualized. This issue will be revisited in our discussion of better practices approaches in the next chapter.

In summary, the following program components have been identified as effective in the studies we reviewed.

#### PROGRAM COMPONENTS FOR BRIEF INTERVENTIONS

- Providing choice in the intervention (e.g., between using contraception and reducing alcohol use)
- Using Motivational Interviewing practices
- Use of partners/support network to help women
- Education (e.g., use of a self-help guide)
- Relational approach (e.g., trust building and creation of safety)
- Harm-reduction approach (e.g., focus on contraception as well as alcohol)
- Goal setting consistent with readiness.

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### INTENSIVE INTERVENTIONS

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Eight intensive interventions were evaluated in this review. These interventions were all aimed at reducing substance use more broadly in pregnant and postpartum women and therefore were not aimed solely at women who used alcohol during pregnancy. While this speaks to the complexity of women's lives with regard to substance use, it makes the disaggregation of findings specific to alcohol impossible. It is a substantial limitation of research in this area that there are no studies that examine intensive interventions for women's alcohol use specifically.<sup>6</sup> It is unfortunate to have a much stronger research focus on screening tools than on intensive interventions when many women often require intensive support with their alcohol use. The findings are organized into subsections based on the predominant mode of delivery of the intervention: treatment programs, enhanced prenatal programs, and home-visiting programs, despite the fact that most studies report on programs that have multiple elements to them. We also included the findings from a systematic review examining the use of home visits, bringing the total number of studies reported in this section to nine.

#### **Effectiveness of treatment programs**

In a case-control study of Project Link, a five-year, hospital-based, intensive outpatient substance-use treatment program for pregnant and postpartum women, Sweeney, Schwartz, Mattis, and Vohr (2000) (rating 2++) found the program was successful

<sup>6</sup> A study by May and colleagues (2007) was published on an intensive alcohol intervention for pregnant women after the second search was complete so could not be added to the review.

in engaging and retaining women in substance-use treatment for an average of 11 months. The study compared the outcomes of infants born to women who enrolled in Project Link while pregnant, to the infants of women who did not receive Project Link services until after delivery. Women who voluntarily enrolled when pregnant “received a comprehensive package of substance abuse treatment services including individual and group counselling and case management” (p. 220). The services offered to the women prenatally included crisis intervention, psychosocial and substance-use assessment, individualized treatment plan development, individual and group therapy, child and family therapy, home visiting, parenting education and support, and infant development assessment. Other practical support was provided such as transportation and on-site child care in order to address the “numerous psychosocial disadvantages experienced by these women” (p. 223).

**The authors conclude that providing easily accessible, gender-specific substance-abuse treatment, in conjunction with prenatal care, can significantly improve birth outcomes for pregnant women who are willing to engage in treatment.**

The research concludes that those women who receive substance-abuse treatment concurrent with prenatal care have significantly improved neonatal outcomes. For example, infants born to women who enrolled prenatally had a longer gestational age, were one-third as likely to be born with a low birth weight, and half as likely to be admitted to the neonatal intensive care unit. They also had higher Apgar scores and shorter hospitalizations. Postpartum enrollees were more likely to have infants whose toxicology screens were positive. In summary, the study suggests that “the improved neonatal outcomes could be the combined result of decreased maternal drug use, better prenatal nutrition, or a variety of other improvements in general maternal health status and lifestyle” (p. 223). The authors conclude that providing easily accessible, gender-specific substance-abuse treatment, in conjunction with prenatal care, can significantly improve birth outcomes for pregnant women who are willing to engage in treatment.

Eisen et al. (2000) (rating 2+) explore the effectiveness of the Pregnant and Postpartum Women and their Infants (PPWI) treatment programs in reducing substance use in pregnant women in comparison to pregnant women who chose not to enrol in the programs. The study assessed the effectiveness of community-based drug prevention, education, and treatment targeted to adult pregnant women. Intervention programs employed either (a) case management with provision or referral to individual and group counselling and other services or (b) day treatment with direct provision of services such as individual and group counselling. Study measures assessed the reduction or deterrence of subsequent drug and alcohol use by the women, during pregnancy and postpartum, as well as the development of healthy babies up to 24 months postpartum, and compared the treatment group to a control group who did not receive the PPWI services.

Data were collected from individual participants (both the treatment group and control group) at three points: Time 1 – prior to the mother’s exposure to the intervention and to her delivery, Time 2 – within 30 days of the birth, and Time 3 – about six months after the birth. The study results showed significant reductions in recent drug and alcohol use in the treatment group from Time 1 to Time 2 and to a lesser extent from Time 1 to Time 3 (only drug use, not alcohol, was significant in this time frame). Comparison group women, on the other hand, did not show reduced drug/alcohol use. However, by Time 3, drug-use-services-mediated effects of being a treatment group member were not sustained and the study authors offer two factors to help explain this finding. First, the treatment group women reported less drug-use-session exposure between Time 2 and Time 3 than they did between Time 1 and Time 2, and second, the overall sample size/power of the study was substantially reduced through differential attrition from Time 2 to Time 3. In summary, the paper concludes that the strong intake to delivery substance-use outcome findings provide “substantial empirical basis and encouragement for continuing to provide federally funded substance use education, prevention and treatment programming to high-risk pregnant and post-partum women” (p. 120).

Zlotnick, Franchino, St. Claire, Cox, and St. John (1996) (rating 2++) evaluate the CARE model (Chemical Addiction Recovery Efforts), a drug-free outpatient program for pregnant and postpartum women combining a family-focused, one-stop-shopping, early intervention with an intensive case management approach. Most women entered treatment due to crack cocaine use, but the vast majority also used nicotine and alcohol. Many of the women had histories of social problems such as poverty, incarceration, and involvement with child protection services. In the CARE model, the whole family is the focus of care, not just the mother. The early intervention focuses particularly on providing medical, developmental, and social intervention to young children who were exposed to drugs in utero and are living with parents who are or were using drugs. Case management support included practical supports such as food, clothing, shelter, child care supplies (i.e., diapers), transportation, and counselling or referrals for financial, occupational, legal, physical, and mental health services. The program goal was to address the drug use and associated behaviours of both parents but recognized that this was not always possible or desirable, particularly if the male partner was a threat to the mother’s treatment, recovery, or her or the family’s safety.

Services were either provided in the treatment setting or where the client lived and often involved a combination of services including: individual therapy, group therapy, family therapy, drug treatment, life skills, parenting instruction and modelling, sexual abuse treatment involving individual counselling and a six-week support group and, if necessary, referrals to incest survivor meetings, mental health services, physical abuse

individual and group therapy, and job-related services such as literacy and vocational services. Of particular note was the CARE program's focus on family therapy and helping women explore their relationships and family dynamics. The program viewed women's roles as mothers or as potential mothers as central to their identities and to their fears and hopes for their recovery: "The consequences of substance use for women become more forbidding when they threaten their role as parents. In fact, upon entering treatment, one frequent concern women had was how to parent... Therapy that focuses on the dynamics of relationships and effectively illustrates to clients the impact their substance use has on their roles as parents and partners is particularly germane to their needs" (p. 200).

**The program viewed women's roles as mothers or as potential mothers as central to their identities and to their fears and hopes for their recovery.**

The findings of the study showed that 37.5 percent of women abstained from substance use for the first month of treatment, 33.3 percent for the first two months of treatment, and 29 percent maintained three or more months of abstinence from substance use. In comparing those who remained abstinent with those who didn't, the one significant difference that emerged was that the children's father was significantly less likely to use drugs in the abstinent group compared to the non-abstinent group. The researchers also found that women who received family therapy were more than four times as likely to maintain one or two months of abstinence. The study concludes that many mothers benefited from aspects of the family therapy designed to help them explore their parenting and to make connections with their own experiences of being parented. From the infant-parent psychotherapy, in particular, the mothers were able to observe and articulate connections between the present and the past, recognize childhood losses and injuries, and identify perceptual distortions of their children and themselves.

### **Effectiveness of enhanced prenatal care programs**

Tavris, Healy-Haney, and Anderson (2000) (rating 2+) assessed the effectiveness of the Waukesha County Public Health Department's Prenatal Care Coordination Program (PNCC) in reducing self-reported risk factors for adverse pregnancy outcomes in pregnant clients. In this program public health nurses assess risk factors for adverse pregnancy outcomes and attempt to reduce risk by preventive counselling and follow-up. One hundred and sixty-six women were seen in the program and received up to three follow-up visits. Standardized prenatal behavioural health messages and materials were delivered by nurses during the pregnancy directed at various risk factors such as poor nutrition, alcohol and drug intake, smoking, and the lack of vitamin supplements. These are delivered and reinforced at specified intervals along the pregnancy continuum. The effect of each of the behavioural risk factors on fetal outcome (e.g., impact on fetal growth and weight, potential for impairments) was discussed and appropriate reading material was given and reviewed at each visit.

The results of the study showed that 53 patients (31.9%) gave a history of at least some alcohol intake in the three months prior to pregnancy and the mean alcohol intake was 9.6 drinks per month. By the time of the first prenatal visit, alcohol intake was a fraction of baseline levels with only two patients reporting current alcohol intake with a mean alcohol intake of .08 drinks per month. By the time of the 38-week prenatal visit there was no reported alcohol intake in any of the 74 patients seen. Mean cigarette smoking also decreased, reducing by 10.4 cigarettes per day over the 151 women who were seen at least one prenatal visit after baseline. Street-drug use was markedly reduced by the end of the study, dropping to almost no reported use. Over-the-counter-drug use also markedly decreased, but only in early pregnancy. There were very encouraging findings reported in terms of changes in the women's nutritional intake and in the taking of supplementary prenatal vitamins. These findings are of note given the potential "added value" of these combined changes on the overall health and well-being of these mothers and their newborns, especially given new research findings on the preventive impact of good nutrition in FASD (May et al., 2005).

Corse and Smith (1998) (rating 2+) report the results of the ANGELS program, an enhanced prenatal care program to reduce substance use (alcohol and drugs) and maximize participation in prenatal care among pregnant women. The program involved longer appointment times, assessment of substance-use patterns, urine toxicology screen at initial prenatal visit, preventive education, follow-up on all substance-use issues at each visit, and more frequent visits for women with substance use during pregnancy. The specialized intervention was offered to women in need of enhanced support, including on-site group and/or individual addictions counselling, referrals to social services and/or intensive drug and alcohol treatment programs, home visiting for those who needed it, childcare during workshops/groups/ counselling sessions, and transportation vouchers. The paper describes a cohort of 77 pregnant women who were identified as alcohol and drug users at the start of pregnancy.

The model of care used in the ANGELS Program "was built upon the holistic nature of nurse-midwifery care to move the care of substance-using pregnant women beyond standard screening and referral practices" (p. 460) and involved comprehensive assessment, education, intervention, and referral. Substance-abuse intervention was targeted to the needs of the women involved and their readiness to change using the "Stages of Change" model (Prochaska, DiClemente, & Norcross, 1992). The nurse-midwives focused their work with the women on building trusting relationships, continuity, and coordination of care. Work on substance-use issues was addressed throughout the course of prenatal visits in an integrated way. To implement the program, changes were made in the delivery of prenatal care involving new care

coordination by the nurse-midwives, longer and more frequent appointments, new addiction counsellors being hired, and good collaboration between these staff and the nurse-midwife care coordinators. Six-month staff training delivered in weekly half-day sessions was implemented addressing many aspects of drug, alcohol, and cigarette use, theories of addiction and recovery, and interviewing and intervention techniques.

The authors report that following the intervention, 51 percent of women were able to be largely abstinent during their pregnancy, 35 percent had reduced their use somewhat, and 14 percent showed no change in use. The women with no change or some reduction of drug or alcohol use were identified as in need of more intensive treatment than the ANGELS program offered but only 11 percent followed through on referral to such treatment. The essence of the intervention seemed to be offered by the nurse-midwife whose special training enabled her to address substance-use issues during regular prenatal visits. The study's authors summarize their findings in this way: "Women are not knocking down the doors of the drug and alcohol facilities, yet they are presenting for prenatal care. Thus, programs such as the ANGELS can facilitate early steps toward recovery by encouraging prenatal care and addictions counselling. When reductions in substance use are achieved, the risks to fetal health can be reduced" (p. 465). They suggest an expanded role for prenatal providers, the provision of on-site addictions services, and the use of assertive outreach programs to engage pregnant women in prenatal care in geographic areas with known high rates of drug use.

Motz et al. (2006) (rating 2+) report on a five-year evaluation of the Breaking the Cycle Pregnancy Outreach Program (BTC POP), delivered as part of the Canada Prenatal Nutrition Program (CPNP). The evaluation was designed to assess the efficacy of a pregnancy-outreach model to engage homeless, pregnant women using substances, including the impact of early engagement on maternal, fetal, and child outcomes and on maternal isolation. Evaluation data was collected from 160 women who participated in the program during the period between April 2001 and May 2005. At the time of their enrolment in the program 89.4 percent of women were using substances, with crack cocaine (72%) and alcohol (32%) the most common substances used. Alcohol was the primary addiction reported in 12 percent of women. Ninety percent of the women also smoked cigarettes at program enrolment.

Findings of the evaluation showed that many women became engaged with services early in their pregnancy with 31 percent engaged in their first trimester and 47 percent within the first four months of pregnancy. The program's target of decreasing isolation by facilitating increased use of other services was achieved with 80 percent of women following through with at least one referral. Of women referred to services, 29 percent were related to physical/emotional and sexual abuse and 14 percent were referred

to drug treatment services. The evaluation also reports that “there were trends for pregnant women who entered through the BTC POP to be more likely to complete treatment/intervention plans” and “to be more likely to have custody of their children at discharge from BTC” than women who entered BTC prior to the POP being established (Motz et al., 2006, p. 51). No data is collected or reported on reductions in substance use among the women. In focus groups held with women participants, various factors were identified as facilitating their involvement with the program: respect, understanding, authenticity, mutual empathy, and reciprocity, recognition, and acknowledgement. As one of the participants put it in her description of the outreach facilitator:

“She really does listen to you. She listens to what you say. And she remembers. And I assume that she probably talks to all of us, but when she comes to talk to you, she remembers what you said last week and it’s not written down in a book. She knows you as a person.” (p. 53)

### **Effectiveness of home visiting**

Grant (2005) (rating 2+) explores the effectiveness of the Parent-Child Assistance Program (PCAP), a three-year home visitation intervention aimed at preventing subsequent alcohol- and drug-exposed births among mothers who used alcohol and/or drugs during an index pregnancy. PCAP case managers worked individually with women, linked them with community resources, helped them to identify personal goals, facilitated integrated service delivery among providers, offered regular home visitation, and transported clients and children to appointments. A priority of the service was facilitating integration in service delivery among providers. The case managers were paraprofessionals who shared certain life experiences with their clients but had managed to overcome obstacles and achieved significant successes, enabling them to be credible role models for clients. This is significant for clients who have trust issues, particularly with health and social service professions. The case managers received training and weekly individual supervision.

The study found that the intervention was effective in achieving its goal of reducing alcohol-exposed pregnancies by encouraging women to complete alcohol/drug treatment and abstain from alcohol/drugs, or by increasing the regular use of contraception. At the end of the three-year program, researchers found that 65 percent of PCAP heavy drinkers were no longer at risk of having an alcohol-exposed pregnancy by the time they were leaving the PCAP program. The rate of subsequent pregnancies in the treatment group was noticeably lower than in the control group with treatment subjects also accruing a longer duration of abstinence from alcohol and drugs. Among those who gave birth in the treatment group during the intervention, the proportion of babies unexposed to alcohol or drugs throughout

the pregnancy doubled. The researchers therefore argue that without the PCAP intervention, about 30 percent of women would have delivered another highly exposed child. The intervention also led to increased maternal employment, more permanent child custody placements, and increased connection with services.

Corrarino and colleagues (2000) (rating 2+) report the results of a pilot study that linked substance-using pregnant women with treatment using an intervention based on home visits and multidisciplinary support. The intervention specifically worked to target plans and interventions to the needs of the families and to the women's readiness to change using the "Stages of Change" model (Prochaska et al., 1992). It provided specialized outreach and other services to women who were identified upon entry to prenatal care as having a problem with substance use (alcohol or illicit drugs). The sample size for this study was very small with just ten pregnant women enrolled but this was relevant to the study which was partly looking at the importance of small caseloads. The study was based on the premise "that a public health nurse who had specific supports could assist families to improve their health and obtain needed substance abuse treatment" (p. 371).

The "model of care" used by the Perinatal Outreach Project was to first recognize the woman's self-identified needs and create a trusting relationship and then to move towards addressing the substance-use-related issues and develop a plan for change. The home visits allowed for flexible visiting as needed. Health education was given at each contact visit concerning pregnancy-related preventive health care such as nutrition, and signs and symptoms of pre-term labour. The other members of the multidisciplinary team were used as consultants by the nurse and for direct outreach and intervention. A day program for substance-using pregnant and parenting women was identified for the women to attend. This program was family focused, located in a poor neighbourhood, and had on-site childcare and transportation. A substance-use counsellor made home visits with the public health nurse.

Findings showed that nine out of the ten women proceeded through the whole program, contrasting very favourably with the 10 percent success rate for referral-based treatment programs (Corse & Smith, 1998). However, it is important to note the authors' comment that the women's entry into treatment was often the result of sustained effort over several months by different team members. The Alcohol Severity Index was administered to the participants six months after the initial assessment and a marked improvement was noted in alcohol and drug use as well as psychiatric status. In addition, all nine women delivered full-term newborns and eight out of ten retained custody. The study identifies that the development of the interdisciplinary team was core to the program. The team met at least monthly to coordinate services, discuss and implement outreach, therapeutic, and treatment strategies for each family,

remove barriers to entering treatment, and address needed changes in the health and human services system in the targeted area. Medical social workers were available for social needs. Some of the key elements dictating the success of the project were the development of a trusting relationship and a non-judgmental attitude on the part of staff.

**Some of the key elements dictating the success of the project were the development of a trusting relationship and a non-judgmental attitude on the part of staff.**

Home visits are a key component of many intensive interventions. However, a recent Cochrane Review (Doggett, Burrett, & Osborn 2005) (rating 1++) on the effect of home visits during pregnancy and after birth, for women with an alcohol or drug problem, failed to find evidence that home visits reduce the risk of continuing drug or alcohol use. The review found that there were some benefits to home visits including “increased enrolment in and attendance for drug and alcohol treatment services from an intense program of trained counsellor home visits, improved contraception use and a trend to a reduction in non-voluntary foster care or non-accidental injury from a postnatal midwife home visiting program” (p. 12). However, the authors point out that there were substantial methodological limitations to the studies incorporated into the review; moreover, many studies did not report ongoing risk of drug or alcohol use, and no study incorporated drug and alcohol interventions as part of the home-visiting interventions. The authors therefore conclude that there is insufficient evidence to recommend the routine use of home visits for women with a drug or alcohol problem and that further research is needed in this area. While in many of the intensive interventions home visits appear to have been a sensitive response to the social and economic pressures that research participants faced, such as transportation and childcare issues, it is possible that home visits may be perceived by women as invasive.

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## **SNAPSHOT: THE ISSUES RELATING TO INTENSIVE INTERVENTIONS**

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Overall, the intensive interventions we’ve outlined appear to be very successful in reducing substance use, including alcohol, in pregnancy and improving maternal and fetal outcomes. The research reports that women who receive substance-use treatment concurrent with prenatal care had improved neonatal outcomes for their infants. Other significant outcomes from these intensive interventions were increased referrals for women into a range of other health and welfare services, increased take-up of these referrals among women, more permanent child custody placements, enhanced physical and nutritional health status of women, improved contraception use, decrease in smoking and over-the-counter drugs, improved nutritional status and intake of pregnancy vitamins, and in some cases improvements in the lives of the children of women with substance-use concerns.

Despite the considerable variation in the content of the intensive interventions considered in this review, several themes are apparent. First, in many of the

interventions the focus was not only on the woman but her significant others such as her partner and children. In fact, one of the studies shows a strong connection between a woman's ability to abstain and her partner's substance-using habits. Second, in several of the interventions the focus was on the woman's broader social environment and there was a clear recognition of the role that factors such as housing, childcare, and transportation issues play in affecting pregnant women's ability to attend treatment, as well as reasons for their substance use.

There was a model of care in most of the programs that specifically addressed the traditional barriers that usually prevent pregnant women engaging with services (as detailed in chapter 1), by providing increased coordination, continuity, flexibility, and accessibility and that aimed to support women over a longer period of time than regular prenatal or treatment programs. The value base of staff seems to be critical to the success of these programs too, with an emphasis on a non-judgmental and respectful approach to women that focused on building trust between staff and clients. Overall, the varied aspects of the interventions that seem to be most relevant to the success of these projects include:

- the inter- and multidisciplinary team working
- the improved integration, continuity, and coordination of services
- the flexibility of the services to respond to individual needs
- small caseloads
- a focus on self-identified needs
- the family focus of the programs, including working with children
- the ability of the programs to build trusting relationships with the women
- having a health education and prevention focus
- an enhanced role for nurses and midwives instead of, or in addition to, specialist addiction workers
- specialized training for health care staff involved, allowing them to address substance use during regular prenatal visits
- the increased accessibility of the services through provision of home visits, child care, or transportation
- individualized work with women and their families
- a non-judgmental, patient, warm, and respectful attitude among providers towards women and families

- a focus on removing barriers to entering treatment
- a focus on the broader social context and environment of women's lives
- emphasis on creating systemic change as well as changes in women's lives
- time and effort invested by program staff.

One considerable limitation of the studies is that it is not clear whether these intensive interventions lead to permanent reductions in women's substance use: the one study that focuses on outcomes after the birth notes that the treatment effect was not apparent six months following childbirth. In research on smoking interventions it is now clear that many women who stop smoking during pregnancy relapse after their baby is born (Greaves et al., 2003). It would be important for studies in the field of alcohol and pregnancy to investigate whether this phenomenon is occurring for use of substances as well as for smoking.

Another limitation is the very small sample sizes in some of the studies, partly due to the nature of the interventions and the programs, which makes the findings more difficult to generalize beyond the studies themselves. It is often difficult to develop comprehensive outcome measures to judge the effectiveness of the interventions because researchers are typically unable to separate the effects of treatment from naturally occurring changes brought about during pregnancy and to pull out specific components of the intervention that might have caused the change(s) to occur.

As mentioned in the section on brief intervention, a further limitation of the studies reviewed is that while they contain a significant proportion of low-income and minority women, it is not always clear whether the interventions have been specifically tailored to meet the needs of these subpopulations (c.f. Greaves et al., 2003). The intervention effect is disaggregated by ethnicity in only one study (Zlotnick et al., 1996), although in this instance the researchers failed to find any demographic differences between abstinent and non-abstinent women. A final limitation of some of these studies is that the use of alcohol is subsumed under the use of substances more generally. In some of the studies only a minority of women also used alcohol. It is not always reported in the studies what the specific effect has been on alcohol consumption which makes drawing conclusions specifically regarding alcohol use impossible.

In summary, the following program components have been identified as effective in the studies reviewed.

## PROGRAM COMPONENTS FOR INTENSIVE INTERVENTIONS

- Intensive, individualized support via workers with small case loads
- Integrated, coordinated, comprehensive, flexible, local, accessible, and responsive services
- Focus on women's self-identified needs, including their social needs
- Focus on the range of issues facing women with alcohol problems (not only on the alcohol) and helping them with reducing these related harms and influences on use
- Stigma reduction
- Parenting support (e.g., working with women as mothers in ways that break intergenerational cycles of family disruption)
- Health education and prevention focus
- Addressing multiple-substance use.

# 4 Contextualizing the Findings

The research team decided that the results of the systematic review would be best placed within a context of broader literature, in order to create a set of better practices approaches and recommendations (as per CTCRI, 2006 and Moyer, Garcia, Cameron, & Maule, 2001). While scientific evidence is weighted heavily, in the better practices model, both theory and expert opinion may be used to supplement evidence. As Kirkham, Baumbusch, Schultz, and Anderson (2007) argue, health care practice needs to be informed by many different types of evidence, particularly evidence that addresses contextual understandings, the complexity of practice settings, and the importance of professional knowledge and clinical judgment. This contextualization was also warranted due to gaps found in the literature and because the majority of studies relating to alcohol and pregnancy appeared to have been undertaken in isolation from this wider literature on women's substance use.

A particular limitation of the majority of studies reviewed was the lack of acknowledgement of the social context of women's use of alcohol and other substances. For example, a wide literature has revealed the connections between women's substance use and experiences of violence and mental health problems. While papers focusing on intensive interventions for women who use substances acknowledged these interconnections, the majority of screening and brief interventions studies failed to demonstrate an appreciation for these social contexts of women's alcohol use. Additionally, as the discussion of results identified, gaps in the research exist for:

- non-screening-based identification methods;
- approaches with different subgroups of women;
- comparison between brief and intensive interventions for women; and
- stability of outcomes for women over time.

The contextualization lead to four better practices approaches, outlined below. These approaches were then interwoven with the components identified in the systematic review on alcohol interventions to create a contextualized set of recommendations for practice, research, knowledge translation, and policy.

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## BETTER PRACTICES APPROACHES

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From the wider literature it is possible to name four better practices approaches closely linked to the findings of the systematic review and to the wider field of women's health care and gender-specific treatment for substance use:

1. Integrating research and practice wisdom on women-centred care;
2. Integrating knowledge about the interconnections between women's substance use and other health, financial, and social concerns;
3. Addressing diversity by tailoring interventions to the needs of different subgroups of women;
4. Applying harm-reduction philosophy and practice.

### Women-centred care

Key elements of the research-and practice-driven agenda for women-centred care (Ballem & Women's Health Planning Project Steering Committee, 2000; BC Women's Hospital & Health Centre and British Columbia Centre of Excellence for Women's Health, 2004; Boyd & Marcellus, 2007; Cory, 2007; Payne, 2007b) are relevant to improving interventions for women of child-bearing years who have alcohol problems.

*Focus on both women's and children's health* — In the past health care providers often encouraged women to stop drinking during pregnancy “for their baby's sake.” Newer evidence shows the importance of bringing the focus to the woman, to empower her to change for her own health as well as the health of her child (Greaves et al., 2003; Greaves & Poole, 2007; Hume & Bradley, 2007; Poole, 2000). Helping women to fully explore all the benefits and drawbacks to alcohol use in their lives, for themselves and their children, can be very helpful in the resolution of ambivalence about change (Miller & Rollnick, 2002; Velasquez, von Sternberg, Dodrill, Kan, & Parsons, 2005). Bringing the focus to women's health and capacity to change, rather than focusing on the pregnancy only, also serves to support reduction in postpartum relapse that affects women's long-term health as well as the health of their children.

*Participatory, reciprocal, relationally based communication*— Interventions with women concerning their alcohol use can be particularly effective when based in safe and trusting relationships. This has been articulated well by the AADAC Enhanced Services for Women (ESW) evaluation report (Watkins & Chovanec, 2006) and the Breaking the Cycle evaluation report (Motz et al., 2006), both of which comment on the qualities of the providers and the quality of the relationships built. Key attributes are the ability of staff to be non-judgmental, patient, warm, respectful, and understanding. Women-centred care models emphasize how women know their own

**Newer evidence shows the importance of bringing the focus to the woman, to empower her to change for her own health as well as the health of her child.**

reality best. The role of the practitioner is to create the conditions for, and listen to, women describing their situation and interests in their own ways.

*Recognize and address gender differences in stigma*— Women who drink during pregnancy are highly stigmatized in Canadian society, and this judgment often continues in health and social service contexts (Boyd & Marcellus, 2007; Greaves et al., 2004; Greaves & Poole, 2005). Few of the studies in the systematic review acknowledged the role that stigma plays in preventing women from coming forward to health care services and talking openly about their alcohol use/problems. Few, other than the intensive interventions, discussed the role that health care professionals might play in proactively addressing stigma and women's fears of the consequences of discussing their alcohol use. Health care providers need to understand how women may be afraid to talk about their alcohol use in health and social care services because of their fears of prejudicial care, reporting to child welfare, and child removal (Poole & Isaac, 2001). Interestingly, none of the rated intervention studies carried out in the U.S. explicitly addressed this as an issue, despite the punitive policy climate often enacted in relation to substance use in pregnancy in some U.S. states (Dailard & Nash, 2000).

Other aspects of women-centred care, care that is holistic, safe, and respectful of diversity, are emphasized below.

### **The interconnections between women's substance use and other health, financial, and social concerns**

Women's use of alcohol is strongly interconnected to other social, environmental, structural, economic, and relational stressors (Boyd & Marcellus, 2007; Poole & Greaves, 2007). Most women who drink at levels that affect their own health and the health of their children face multiple stressors. Many have experienced, or are experiencing, problematic alcohol use in their families as children or as adults with a partner's substance use (Kvingne et al., 1998). Many have experienced, or are experiencing, violence or trauma in the context of family or intimate relationships, poverty, and hardship of many kinds (Motz et al., 2006).

However, only a small number of studies identified in the systematic review mention the role violence plays in women's lives and relationships. This is a serious omission when we consider the literature that indicates how widespread violence towards women is, including violence during pregnancy (Lutz, 2005; Lutz et al., 2006; Parsons, Goodwin & Petersen, 2000; Rodriguez et al., 2008; Sharps, Laughon & Giangrade, 2007; Shoffner, 2008; MacMillan & Wathen, 2003). In the 1993 *Violence Against Women Survey*, 12,300 Canadian women over 18 years of age were randomly selected and interviewed by telephone about their experiences of violence. The primary

**Twenty one percent of these women had been assaulted by their partners during pregnancy and forty percent of the women who were abused during pregnancy reported that the abuse began during pregnancy.**

objective of this nationwide survey was to provide reliable estimates of the nature and extent of male violence against women in Canada. The survey found that of those women who had ever been married or had lived with a man in a common-law relationship, 29 percent reported having been physically or sexually abused by their partner at some point during the relationship. Twenty-one percent of these women had been assaulted by their partners during pregnancy and 40 percent of the women who were abused during pregnancy reported that the abuse began during pregnancy (Statistics Canada, 1993). Women abused during pregnancy were four times as likely as other abused women to report having experienced very serious violence, including being beaten up, choked, threatened with a gun/knife or sexually assaulted (Johnson, 1996). Of the women who were abused during pregnancy, approximately 18 percent reported that they had suffered a miscarriage or other internal injuries as a result of the abuse (Johnson, 1996).<sup>7</sup> While all women are at risk of experiencing violence in their intimate relationships, some women are particularly at risk, for example, First Nations and Aboriginal women (McGillivray & Comaskey, 1999), women with mental health problems (Amaro, Fried, Cabral, & Zuckerman, 1990; Bacchus, Mezey, & Bewley, 2004; Dunn & Oths, 2004), women with lower household incomes (Pottie Bunge & Locke, 2000), younger women (Silverman, Raj, Mucci, & Hathaway, 2001) and women in the sex trade (Cory & Dechief, 2007).

According to Wilsnack, Vogeltanz, Klassen, and Harris (1997), substance use in women is strongly associated with childhood and adult exposure to interpersonal violence. Research indicates that high rates of interpersonal violence exist across the lifespan in clinical samples of substance-using women. For example, Miller and colleagues (1997) found that women in treatment for alcohol problems were significantly more likely to have histories of child sexual abuse than women in a general household sample. Kaufman and Asdigian (1997) document that women who experience partner violence are at increased risk for problematic alcohol, illicit drugs, and prescription medication use.

Links between women's experiences of abuse and their use of substances become stronger when women become pregnant (Martin, Beaumont, & Kupper, 2003). A Canadian study showed that women abused during pregnancy were significantly more likely to use cigarettes, alcohol, and illicit drugs regularly (Stewart & Cecutti, 1993). Women experiencing partner violence are also significantly more likely to use multiple substances than women who do not experience such violence (Martin et al., 1996). Continuation of substance use during pregnancy is also significantly more likely among women experiencing abuse (Martin et al., 1996). The experience of

<sup>7</sup> These statistics are limited to physical and sexual abuse and do not include other forms of emotional and mental abuse which can be as or more detrimental to women's health.

violence will affect women's pregnancies, pregnancy-related decisions, how women seek and attend prenatal care, their perceptions of health care providers' interventions, and abuse disclosure (Lutz, 2005). It is therefore essential that researchers and health care professionals understand how violence is a part of many women's lives and often escalates in pregnancy, how it affects a woman's ability to make changes in her use of substances, and influences her ability to receive partner support for her goals.

There is also a critical need to address women's experiences of violence and trauma as part of substance-use support and treatment for women (Finkelstein, VandeMark, Fallot, Brown, Cadiz et al., 2004). Misidentified or misdiagnosed trauma or violence-related symptoms can interfere with help-seeking, hamper engagement in treatment, lead to early drop-out, and make relapse more likely (Browne, Fiske, & Thomas, 2000). A study by Greaves, Chabot, Jategaonkar, Poole, and McCullough (2006) shows the benefits of providing support to women who experience violence and have problematic substance use. This study was undertaken with women using transition houses across British Columbia and explored changes in use of alcohol and other substances by women as they moved into shelters for abused women and then again three months later. The study found significant reductions in women's use of alcohol and stimulants across this time period and their levels of stress decreased. The research concludes that both brief and more substantive interventions assisted women in reflecting on and making changes to their substance use. The findings also suggest that women's increased safety plays a significant role in creating positive opportunities for women to reduce their substance use.

Trauma-informed care is a model specifically designed to help health care providers better respond to women who are experiencing, or have experienced, violence, abuse, and trauma. Trauma-informed care is based on the understanding that more than half of the women who access health care will have experienced trauma at some point in their child or adult lives. According to Harris and Fallot (2001), service providers should take into account knowledge of the impact of trauma and violence against women, and integrate this knowledge into all aspects of service delivery. If women in abusive relationships feel cared for and included in decisions in health care settings, they are much more likely to view the health care system as a place where they can find care and support and seek assistance (Cory & Dechief, 2007).

Considering the entire context of social and economic factors pertaining to a woman's health is a tremendous challenge but if interventions do not attend to the "whole woman" and to women's lived circumstances they are at risk of failing to help women make sustainable changes and placing further shame and stigma on them for failing to create the changes expected. Treating alcohol use in a vacuum belies the opportunity to reframe health care interventions within an integrated framework that places women's general social welfare, health, and well-being firmly at the centre. Addressing

the specific needs of substance-using pregnant women requires a gender-specific and holistic approach to helping women with childcare, education, housing, prenatal care, substance-use treatment, and woman-abuse interventions, thereby addressing structural factors as well.

### **Tailoring interventions to the needs of different women**

One of the main critiques of the studies we reviewed is the lack of explicit attention paid to tailoring alcohol interventions to particular subgroups and subpopulations of women. There is clearly no profile of a woman who drinks in pregnancy that can be used by health care professionals, despite the interest in research that tries to map such risk factors. From the commentary in chapter 1 of this review, we can see that the risk factors are many and varied and range across socio-economic classes, age, race and culture, and life experiences. Relying on stereotyped assumptions about risk factors (such as Aboriginal heritage, low socio-economic status, lower educational attainment) has been the predominant response to women's drinking during pregnancy. But research now indicates that some of the women at highest risk for drinking during pregnancy are older, White, and college-educated with moderate to high incomes (Dell & Roberts, 2006).

Various clinical and treatment methods may therefore need to be incorporated to properly address women's varied and diverse needs. Effective interventions need to account for a number of factors including a woman's level of use and her dependence, if any. Chang, McNamara, Wilkins-Haug, and Orav's work (2007) on using the "Stages of Change" model is one example of tailoring interventions to where a woman is in her readiness to make changes in her life. A number of the intensive interventions also tailored their interventions to women with heavier alcohol use and considerable social and economic challenges. Other studies have shown that programs tailored to women's economic status can be more responsive to their needs (Kelly, 2004).

In terms of culturally appropriate support, Westernized approaches to prenatal care, substance-use interventions, and woman abuse often neglect Aboriginal women's specific needs (Long & Curry, 1998, British Columbia Perinatal Health Program, 2006; Kornelsen & Grzybowski, 2004; Masotti, Szala-Meneok, Selby, Ranford, & Van Koughnett, 2003; Poole & Trainor, 2000). Without making assumptions about Aboriginal women's use of alcohol, it is important to understand the specific context of Aboriginal women's health and social circumstances. Aboriginal women experience extreme poverty (Romanow, 2003), higher rates of partner violence (Brownridge, 2003), unemployment (Durst, 1990), homelessness (Baskin, 2007), poor education (Nicholas et al., 2005), poor housing conditions (Baskin, 2007; Nicholas et al., 2005), higher rates of imprisonment (Martel & Brassard, 2008), threats to their cultural identity (Dieter & Otway, 2001; Martel & Brassard, 2008;

**One of the main critiques of the studies we reviewed is the lack of explicit attention paid to tailoring alcohol interventions to particular subgroups and subpopulations of women.**

Walmsley, 2005), lack of familial and social support (Walmsley, 2005), racism and discrimination (Martel & Brassard, 2008; Romanow, 2003) and the effects of ongoing colonization (Amnesty International, 2004; Mann, 2005; Smye & Browne, 2002; Callaghan, Farha, & Porter, 2002; Hull, 2006; Lavell-Harvard & Corbiere Lavell, 2006; Mann, 2005; Razack, 1994; Varcoe & Dicks, 2007). Aboriginal women also experience additional barriers to health care in the form of discriminatory attitudes of health care providers, marginalization from the health care system, and shame and embarrassment concerning their needs, all of which leave them to cope on their own rather than seeking help (Browne, Fiske, & Thomas, 2000; Tait, 2000). These and other psychosocial stressors faced by Aboriginal women must therefore be viewed in a historical, cultural, and social context (Smye & Browne, 2002) and taken into consideration in the development of appropriate substance-use interventions.

An initiative that demonstrates a collaborative and empowering approach to helping women to make changes in their lives, including changes in substance use, is the Honouring Ourselves and Healing Our Pasts resource (Salmon & McDiarmid, 2006). This resource was created to support Aboriginal mothers in the Downtown Eastside of Vancouver who wanted to make changes in their substance use. The approach involves a woman creating a Wellness Plan with the help of a support person, based on the teachings of the Medicine Circle/Wheel. Medicine Circle/Wheel teachings include recognition that individual and community wellness have four inter-related aspects: physical, mental, emotional, and spiritual wellness and require a balance between all of these four aspects. The approach is built upon relationships of trust and respect between an Aboriginal woman and her support person (Salmon & McDiarmid, 2006).

The work of this and other projects (see Salmon, 2005; 2007) has indicated that Aboriginal mothers often value opportunities to connect with indigenous cultural practices in ways that they perceive as relevant and meaningful. However, a strong caution should also be stressed when thinking about tailoring interventions to specific cultures. There is often incredible diversity within cultural and ethnic groups so that a "one-size-fits-all" approach to culturally appropriate service design and delivery is not the answer. In addition, Salmon (2005; 2007), and others in this area have learned that anti-racist perspectives are as important to embrace as "culturally responsive" ones. The effects of colonization on contemporary Aboriginal peoples are such that many Aboriginal women/families have grown up disconnected from their culture, and have been taught to devalue their cultural practices (for example, as a legacy of residential schooling). Such women may appreciate opportunities to be gently introduced to cultural/spiritual practices, but this must be done with sensitivity. It should not be assumed that just because a "First Nations cultural component" is included that the program/activity/agency it will be automatically welcoming to Aboriginal women/families.

## Applying harm-reduction philosophy, policy, and practice

Harm reduction is a philosophy and approach utilized in the broader practice of women’s and men’s substance-use intervention and policy (Hunt, Trace, & Bewley-Taylor, 2004; MacPherson, 2001; Pinkham & Malinowska-Sempruch, 2007) but is far less common in the studies examining women’s use of alcohol in pregnancy (Payne, 2007a). A harm-reduction approach acknowledges that most people struggle to make changes in their lives, even when faced with negative consequences for their safety, health, and well-being, and accepts ambivalence about change as normal. It focuses on harms associated with substance use, rather than the substance use itself, enabling much wider “windows of opportunity” to be created both for those who use substances and their supporters.

### HARM REDUCTION PRINCIPLES

- Pragmatism
  - Human rights
  - Focus on harms — not only the substance
  - Provide a variety of options and support
  - Priority of immediate goals
  - Involvement of those who use substances
- (Government of British Columbia, 2005).

**Harm-reduction-oriented services are provided in a non-judgmental way, respecting the pace and extent of change people are able to make.**

Through a harm-reduction lens substance use is seen on a continuum rather than in a dualistic way as beneficial or highly problematic. This continuum view of substance use recognizes that people can change their use of substances at any point, not only when they “hit bottom” (when use is causing significant problems). Even brief support can be helpful to a person at any point on the continuum of substance use (Miller, 2006). Harm-reduction-oriented services are provided in a non-judgmental way, respecting the pace and extent of change people are able to make. Also characteristic of a harm-reduction approach is creating safety for people to be able to discuss the benefits of substance use, or the “positive intentions” (Kasl, 1992) underlying their use, as well as the drawbacks or negative aspects of their use, and to find alternative ways of getting the benefits met.

Employing a pragmatic approach and prioritizing immediate goals often brings the focus to a pregnant women’s needs for increased financial support and food security, affordable housing, reducing violence in relationships, reducing barriers to health and prenatal care, and minimizing the negative impact of punitive mothering policies (Boyd & Marcellus, 2007; Flavin, 2002; Leslie & Roberts, 2004; Martin, Beaumont, & Kupper, 2003; Motz, Leslie, Pepler, Moore, & Freeman, 2006; Poole, 2000; Rutman,

Callahan, Lundquist, Jackson, & Field, 2000; Sales & Murphy, 2000). These needs, and their interactions, must be recognized in harm-reducing service provision and policy frameworks.

Because of the many “entry points” available for women to access services and interventions, service providers using a harm-reduction approach work with all pregnant women, not just those who are able to abstain. It encourages creativity and the individualization of support with the woman at the centre of her care. Women are supported to access a range of support in key life areas and any avenue that a woman may choose is considered a viable route to positively intervene to reduce harms in her life.

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## RECOMMENDATIONS

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The following recommendations integrate the systematic review findings and the better practices approaches we’ve detailed.

### **Recommendations for practice**

when discussing alcohol use, health care providers should:

1. Ask women about their use of alcohol throughout their child-bearing years rather than just during pregnancy. Discussing drinking should be part of a “well woman” approach to care that includes a pre-conception and postpartum focus.
2. Discuss alcohol use with all women to avoid under- or overidentifying certain women as using alcohol in pregnancy and to avoid stereotyping based on race/ethnicity, age, or socio-economic status.
3. Establish safety and trust in conversations, regardless of the woman’s circumstances or problems. Brief discussions between women and providers based on respect and unconditional regard for the woman can serve to effectively link identification and intervention. Providing choices and respecting readiness for change are important considerations in these conversations.
4. Give consideration to ways to build in safety, trust, and respect, if a formal screening tool is utilized. Ensure that staff using screening tools have received training and can access ongoing support and advice from those with expertise in the area of substance use and addictions, especially with regard to referrals to support and treatment for women who want it.
5. Include discussions about drink size as well as number of drinks when having conversations with women. There are visual tools that can help with this work. Educational resources in general can be utilized effectively to dispel myths and promote discussion of risks and options.

6. Consider ways to increase confidentiality for women to disclose their use of alcohol safely. This may mean finding ways, such as agency policy information sheets, to assure women that their information is being protected.
7. Tailor education and interventions for subpopulations of women and specifically what works for women with low, moderate, and higher alcohol use.

When contextualizing alcohol use, it's important to:

1. Acknowledge the role of multiple stressors and the impact of these stressors on alcohol use. When working with all women, consider the entire context of social and economic factors pertaining to health, attending to the “whole woman” and to their lived circumstances.
2. Address women's multiple substance use, including tobacco use, as well as alcohol. Emphasize how learning from change in one substance can be applied to others.
3. Provide support to reduce harms related directly and indirectly to substance use. Work with her to identify her own goals for change.
4. Acknowledge women's family roles as mothers and partners and how this affects their ability to focus on their own needs and desires and on getting support and treatment for their problems.
5. Appreciate how common violence against women in relationships is. Make the connections between women's experiences of current/historic violence, abuse, and trauma and use of alcohol and other substances, and consequently their ability and power to make changes in many areas of their lives, including their substance use.

In providing, and helping women access, a continuum of services:

1. Clearly link the process of identifying women who use alcohol during pregnancy to supportive action. Ensure that identification is not separated from discussions with women about what interventions they would find helpful and, where needed, from referral to brief and intensive interventions, support, and treatment.
2. Use evidence-based approaches such as Motivational Interviewing that help service providers guide women to articulate for themselves the changes and type(s) of services they are interested in accessing.
3. Increase accessibility of care for pregnant women with alcohol problems through such efforts as: an expanded role for prenatal providers to integrate discussion of alcohol in their work, ensuring good communication between specialist staff and services and regular prenatal staff and services, expanded delivery of prenatal and postpartum outreach services, provision of outpatient addictions services in primary care settings, provision of one-stop community-based services, as well as

expanded access to residential treatment that takes women's needs as mothers into account.

4. Recognize common barriers to treatment and support, and actively assist women with overcoming the barriers that are relevant to them.

### **Recommendations for research**

1. More study in the area of women and alcohol use in the child-bearing years is needed, specifically more research on
  - identification methods other than screening such as non-judgmental personal interviews;
  - comparisons between brief and intensive interventions;
  - examining the utility of approaches with different subpopulations/subgroups of women;
  - the stability of outcomes for women over time; and
  - the ethical, relational, and contextual dimensions of work in this area.
2. Better estimates of the prevalence of women's alcohol use in pregnancy are needed and more questions need to be incorporated in the full range of surveys that are conducted on addictions and population health and population health issues.
3. More research is needed on the effectiveness of promising Canadian intensive intervention initiatives to come to a better understanding of common, multifaceted outcomes being achieved for women using these services. Support for evaluation of research is crucial. There is also a need for more Canadian evaluations to be published in peer-reviewed journals so that they can be used more formally in reviews such as this, rather than included as contextual pieces.

### **Recommendations for knowledge translation, policy, and structural change**

1. Develop ongoing, specific training for health care staff that enables them to address substance use during regular prenatal visits. Training should
  - be comprehensive (including theories of addiction and recovery, sex and gender differences in the experience of alcohol use, and interviewing and intervention techniques);
  - involve experiential training methods (such as role-play, and strategies for incorporating the use of identification and educational tools into standard practice); and
  - connect with training on other social and health issues affecting pregnant women (e.g., violence towards women, child protection, and mental health problems).

2. Identify a range of mechanisms for ongoing learning and discussion of promising practices, including virtual methods such as communities of practice.
3. Enhance opportunities for collaboration on the part of child welfare, prenatal, and addictions systems to address the very significant barrier to access created by apprehension-focused approaches.
4. Undertake broad-based public and professional education designed to reduce stigma and promote compassionate understanding of women's substance use on the part of the public, service providers, policy-makers, health system planners, the legal system, and others in a position to assist women with substance-use problems.
5. Allocate more resources to address the structural factors that influence women's substance use.

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## Appendix 1: List of search terms

DATABASE	KEYWORDS
ASSIA (Applied Social Science Index and Abstracts)	1) alcohol and pregnan*
Australasian medical index*	2) substance use and pregnan*
CDSR (Cochrane Database of Systematic Reviews)	3) pregnancy and alcohol and (cessation or quit or reduction)
CINAHL (Cumulative Index of Nursing and Allied Health Literature)	4) pregnan* and alcohol and cessation/ reduction and (program or intervention)
CINCH-Health*	5) pregnan* and alcohol and tobacco and (program or intervention)
DARE (Database of Abstracts of Reviews of Effectiveness) (DARE)	6) pregnan* and alcohol and cocaine and (program or intervention)
Drugscope	7) pregnan* and alcohol and heroin and (program or intervention)
Ebsco Host	8) pregnan* and alcohol and methamphetamines and (program or intervention)
ERIC	9) pregnan* and alcohol and opiates and (program or intervention)
Ingenta	10) pregnan* and alcohol and methadone and (program or intervention)
MD Consult	11) pregnan* and alcohol and (benzo* or tranquilizers or sedatives) and (program or intervention)
Medline	12) Motivational Interviewing and pregnancy
PsycINFO	13) solution focused therapy and pregnancy
PubMed	14) alcohol and pregnan* screening tool
Sociofile	15) harm reduction and alcohol and pregnan*

### Key Websites

Australian Department of Health and Aged Care

Ministry of Health Services, British Columbia

Best Start

Health Canada

MotherRisk

National Institute on Alcohol Abuse and Alcoholism (NIAAA)

National Institute on Drug Abuse (NIDA)

Substance Abuse and Mental Health Services Administration (SAMHSA)

United Nations

World Health Organization

## Appendix 2: Results summary tables

IDENTIFICATION AND SCREENING						
Author/Year Study Type/ Study Rating	Country	N <sub>sample</sub>	Study Population	Timing of Screen	Screening Tool(s) Administered	Results
Bad Heart Bull et al. (1999) Cross- sectional 2+	USA	208	Prenatal patients: 85% American Indian; 15% Caucasian or African American carrying an American Indian baby.	On their first prenatal visit, all patients were approached to do the questionnaire.	Modified T-ACE.	Compared to extensive interview and medical record data, the self-administered questionnaire was sensitive (76.6%) and specific (92.8%) in detecting pregnant women who had consumed alcohol during pregnancy.
Budd et al. (2000) Case-control 2+	USA	56	Inner-city pregnant women aged 18 to 42 years. 92% were African American, 85% were single, and 42% had completed high school.	All newly registered patients were approached at their first prenatal visit.	PAUI (Prenatal Alcohol Use Interview). ACOG Antepartum record – containing information related to past and current pregnancies and medical history. CDTest – a physiological measure that identifies recent heavy drinking.	Women identified as drinkers by the CDTest were more likely to be identified as drinkers by the PAUI (59%) than by the ACOG Antepartum Record (19%). Also, the PAUI had a lower false negative rate (41%) than the ACOG record (80%).
Chang et al. (1998) Case-control 2++	USA	350	250 T-ACE-positive pregnant women and 100 T-ACE negative women from diverse backgrounds.	T-ACE given to pregnant women initiating prenatal care at the hospital. 250 T-ACE-positive and 100 T-ACE-negative women were then scheduled for comprehensive assessment (where other screening tools were administered).	1) T-ACE, 2) MAST, 3) alcohol and drug-abuse modules from the structured clinical interview in the DSM-III-R, 4) Addiction Severity Index, 5) Alcohol Use Disorders Identification Test, 6) Timeline Followback, 7) Alcohol Craving Scale.	T-ACE was the most sensitive screen for lifetime alcohol diagnoses, risk drinking, and current alcohol consumption. It outperformed medical staff assessment of alcohol use by pregnant women enrolled in the study.

Two additional screening papers were identified in the final stages of producing this document that had not been located in the key word search. They were not added to the review. The papers are: Chang, Goetz, Wilkins-Haug & Berman 1999c. Identifying prenatal alcohol use: screening instruments versus clinical predictors. *American Journal on Addictions*, 8(2): 87-93 and Russell, Martier, Sokol, Mudar, Jacobson & Jacobson, 1996. Detecting risk drinking during pregnancy: a comparison of four screening questionnaires. *American Journal of Public Health*, 86(10): 1435-9. The findings of these papers do not contradict the conclusions, components or recommendations of this review.

Author/Year Study Type/ Study Rating	Country	Nsample	Study Population	Timing of Screen	Screening Tool(s) Administered	Results
Chang et al. (1999) Case-control 2++	USA	135	Pregnant/prenatal T-ACE-positive pregnant women.	Prenatal, early gestation.	1) TWEAK, 2) MAST, 3) alcohol and drug-abuse modules from the structured clinical interview in the DSM-III-R, 4) Addiction Severity Index, 5) Alcohol Use Disorders Identification Test, 6) Timeline Followback, 7) Alcohol Craving Scale.	The TWEAK, using the first tolerance question with the cut-off point set at more than two drinks, had the best predictive ability for life-time alcohol diagnoses and risk drinking. The sensitivity of the TWEAK can be increased if the cut-off point for the first tolerance question is set at two drinks, with some loss of specificity and predictive ability. Medical record assessment was the least sensitive but most specific method of identifying alcohol use by pregnant women.
Chasnoff et al. (2001) Cross-sectional 2++	USA	2002	Pregnant, Medicaid-eligible with <2 visits to prenatal clinics. 2 Research Sites: 1) South Carolina (43% of total; Hispanic 0.8%, Black Non-Hispanic 76.1%, White Non-Hispanic 20.6%, Native American 0%) 2) Washington (57% of total; Hispanic 58.3%, Black Non-Hispanic 0.9%, White Non-Hispanic 39.3%, Native American 1.3%)	Women were screened as part of routine prenatal care.	Tailored self-administered questionnaire. Three sets of questions about alcohol and drug use: 1) whether the respondent had ever used drugs, 2) whether she had used any illicit drugs in month before pregnancy 3) whether drugs were used in past month.	Approximately 9% of the sample reported current use of either drugs or alcohol or both. Past use of alcohol or cigarettes, including during the month before pregnancy, most differentiated current drug or alcohol users from current nonusers. Analysis suggests that primary care physicians can ask three questions in the context of prenatal care to target women for referral to full clinical assessment.
Chasnoff et al. (2005) Cross-sectional 2+	USA	7818	Pregnant women of diverse ethnicities and classes from five U.S. sites: Chicago; Southern Illinois; Camden, New Jersey; San Luis Obispo County, California; and Ventura County, California.	Women were screened as part of routine prenatal care in obstetric clinics in five regions.	4 P's Plus screening instrument.	Among 7818 women in five communities, 2555 (32.7%) had a positive screen for substance use in pregnancy. Four of the communities conducted a follow-up assessment on all women with a positive screen (N = 1548). Among these women, 717 (15%) had continued use after learning of the pregnancy. The 4P's Plus effectively identifies pregnant women whose drinking is high enough to impair functioning and provides an opportunity for early intervention for women who are at risk.

Author/Year Study Type/ Study Rating	Country	N <sub>sample</sub>	Study Population	Timing of Screen	Screening Tool(s) Administered	Results
Dawson et al. (2001) Cross-sectional 2+	USA	404	Pregnant, 18 years of age or older, resident of District of Columbia, able to understand and answer in English. 92% African-American women, 29% received public assistance.	Initial visit at prenatal clinic.	TWEAK vs. a series of nine modified TWEAK-based instruments that were constructed by adding selected other risk indicators to the standard TWEAK.	Using thresholds of 2 points for high-risk drinking and 1 point for moderate-risk drinking, the TWEAK demonstrated a sensitivity and specificity of 70.6% and 73.2% for high-risk drinking and a sensitivity and specificity of 65.6% and 63.7% for any (high- or moderate-) risk drinking during pregnancy. None of the alternative screeners resulted in significant improvement.
Flynn et al. (2003) Cross-sectional 2+	USA	1131	Pregnant women 18 years of age or older from diverse backgrounds. Mean age 28.7 72% Caucasian, 13% African American, 9.1% Asian, 2.3% Latino, 0.4% Native American..	During prenatal visits to obstetrics clinics.	TWEAK	15.1% of total sample (N = 169) reported any alcohol use during pregnancy, with the majority of women reporting relatively low levels of alcohol use. 147 women (13%) scored above the cut-off on the TWEAK. Based on multivariate analyses, higher-risk alcohol use was predicted by smoking and earlier stage of pregnancy.
Goransson et al. (2003) Cross-sectional 2++	Sweden	1101	Consecutive pregnant women in antenatal care and registered for parenting classes.	Pregnancy, generally in week 30.	AUDIT	Pre-pregnancy drinking found to be a significant risk factor for drinking during pregnancy (p < .00001).
Göransson et al. (2006) RCT 1++	Sweden	292	Middle- and high-income pregnant women.	Pregnancy	AUDIT and TLFB	Screening in the intervention group found much higher identified cases of alcohol use in pregnancy: the control group found no reported cases, while the intervention found risky consumption/binge drinking in 17% of cases.
Gupman et al. (2002) Cross-sectional 2+	USA	360	Predominantly African-American women (83%) of low socio-economic status. 57% of women had insurance coverage by medical assistance (Medicaid). Mean age: 35.7.	Prior to physician visit at gynecology clinic.	T-ACE, MAST, CAGE, vs. physician detection.	Rates of alcohol and illicit drug use varied across assessment instruments; physician documentation, however, yielded the lowest prevalence estimates.

Author/Year Study Type/ Study Rating	Country	N <sub>sample</sub>	Study Population	Timing of Screen	Screening Tool(s) Administered	Results
Jacobson et al. (2002) Cohort 2+	USA	354	Pregnant, postpartum, and parenting inner-city African-American mothers.	First prenatal visit to 13 months postpartum.	MAST and interview.	Although higher levels of alcohol were reported retrospectively, the correlations of prenatal alcohol exposure with infant outcome were as strong or stronger for the antenatal measures.
Kaskutas & Graves (2001) Cross-sectional 2+	USA	321	Pregnant and postpartum women. Predominantly African American (58%) and Native American (32%).	Before and during pregnancy.	Drink size as a measure of risk assessment.	Difference between self-selected and standard drink sizes $p < .0001$ . Self-selected beer 49% above standard; spirits 307% above standard; malt liquor 183% above; fortified wine 153% above. Ethanol content of self-selected drink and absolute alcohol standard at $p < .0001$ level for all beverages except wine.
Kesmodel & Olsen (2001) Cross-sectional 2+	Denmark	441	Pregnant, first prenatal visit, 15-16 weeks gestation (general population).	15-16 weeks gestation.	Diary of alcohol intake, interview 1, interview 2, self-administered questionnaire.	Three of four measures yielded comparable distributions of average alcohol intake but reports of intake within past seven days was an inappropriate measure of average intake, yielding three times as many abstainers as expected when combining methods. Measure of intake for previous week was relevant measure only when studying adverse pregnancy outcomes caused by binge-like exposure.
McNamara et al. (2005) Cross-sectional 2+	USA	278	Pregnant women with $\geq 2$ T-ACE, consumed alcohol while pregnant, < 28 weeks gestation, intending to carry to term (general population).	During pregnancy	T-ACE vs physician assessment	Physicians identified only 10.8% of women recognized as at risk for alcohol consumption by the T-ACE screening measure. Physicians were significantly more likely to correctly identify non-White participants as being at risk for prenatal alcohol use (odds ratio = 3.59, $p = .026$ ), compared with their White counterparts.

Author/Year Study Type/ Study Rating	Country	N <sub>sample</sub>	Study Population	Timing of Screen	Screening Tool(s) Administered	Results
Magnusson et al. (2005) RCT 1++	Sweden	303	Women attending regular antenatal care.	During pregnancy	AUDIT, TLFB, and biomarkers (from venous blood sample).	TLFB early in pregnancy found 15% of women drank at risky levels; regular antenatal screening identified only 2.5%, demonstrating a clear inferiority of the regular screening to identify high-risk levels of alcohol use (p = .0001).
O'Connor and Whaley (2003) Cross-sectional 2++	USA	826	Low-income pregnant women in prenatal care.	At enrolment	Specially designed self-administered alcohol screen.	TWEAK's high-risk drinking score was the best predictor of drinking during pregnancy (sensitivity = 70.1%. specificity = 88.5%, p < .001).
Whaley & O'Connor (2003) RCT 1+	USA	I: 12 sites C: 41 sites	Low-income pregnant women. Mean age 26.3 years in intervention sites and 26.9 years in control sites. Percent Hispanic: 62% in intervention sites, 66% in control sites.	Delivered to pregnant women visiting the Public Health Foundation Enterprises Women, Infants and Children (WIC) site.	Alcohol-screening tool was developed for study (included quantity-frequency measures inquiring about typical consumption patterns). Timeline Followback method was also used on alcohol-screening tool.	Rate of reported alcohol use at intervention sites increased significantly, whereas rate of reported alcohol use by the control group did not change. This effect was significant from the 8th month through to the end of the study (2 years): 8th month (t <sub>22</sub> = 2.53, p < .05) end of study (t <sub>22</sub> = 4.71, p < .001).

## BRIEF INTERVENTIONS

Author/Year Study Type/ Study Rating	Country	N <sub>sample</sub>	Study Population	Timing of Intervention Sessions/Follow-up	Deliverer	Intervention Components	Results
Chang et al. (1999b/2000: 2 papers reporting findings from 1 study) RCT 1++	USA	250	Pregnant women (up to 28 weeks pregnant) from a diverse range of backgrounds who had screened as positive on the T-ACE screening instrument.	At 28 weeks gestation. Intervention group received a session one week after brief intervention and both groups were assessed after delivery.	First author.	45-minute interview including: setting goals, identifying triggers, identifying alternatives to drinking, and a take-home manual.	Both groups had reductions in antepartum alcohol consumption, but differences in reductions by group were not statistically significant (p > .05). Risk of antepartum drinking for either group increased nearly threefold if the subject had any prenatal alcohol consumption before assessment (p = .0001). However, for those subjects who were abstinent pre-assessment, those who received the BI maintained higher rates of abstinence (86% vs. 72%, p = .04).

Author/Year Study Type/ Study Rating	Country	N <sub>sample</sub>	Study Population	Timing of Intervention Sessions/Follow-up	Deliverer	Intervention Components	Results
Chang et al. (2005) RCT 1++	USA	304	Pregnant women and their partners.	During pregnancy and postpartum.	Study nurse or principal investigator.	Knowledge assessment and feedback; contracting and goal setting; behavioural modification; summary.	The intervention was most effective for women with highest drinking at outset ( $p < .01$ ). BI was significantly improved with partners' participation ( $p < .05$ ).
Chang et al. (2006: same study as Chang et al. 2005 above but paper rated and described separately). RCT 1-	USA	115	Pregnant, mostly married, middle-class White (78.4%) and African-American (8.6%) women and their partners.	Single 25-minute brief intervention session during pregnancy with postpartum follow-up interview. Partners provided collateral report of prenatal alcohol use independently.	Trained master's level nurse practitioner or principal investigator.	Knowledge assessment and feedback; contracting and goal setting; behavioural modification; summary.	Women who were abstinent at enrolment and chose to maintain abstinence had the highest rates of abstinence (75%), reported the fewest risk situations ( $p = .01$ ), and the fewest cravings for alcohol ( $p = .046$ ).
Floyd et al. (2007) RCT 1++	USA	830	Non-pregnant, single, mainly low-middle-income African-American women.	Four motivational intervention sessions at three-, six-, and nine-month intervals and one contraceptive counselling session.	Trained counsellors, contraceptive care providers.	Motivational Interviewing sessions, one 45-to -60-minute contraception consultation, and services visit.	Both control and intervention groups demonstrated reduced risk for alcohol-exposed pregnancy (AEP) between the three- and nine-month follow-ups. The intervention group showed an average of 16.6% lower risk for AEP over the control group.
Handmaker, Miller, & Manicke (1999) RCT 1++	USA	42	Pregnant women: 53% Hispanic, 38% White and 9% African American. Mean age of 24 with 12 years of education. 62% were unmarried and half were unemployed.	During pregnancy, one counselling session, one follow-up interview.	Researcher	One-hour Motivational Interview involving discussion of the effect of drinking during pregnancy, feedback on the severity of the woman's drinking, and a chart of fetal development by gestational week to personalize the potential impact on the fetus.	At the end of the two-month follow-up period, there were no differences between treatment and control groups on total alcohol consumption ( $F = .01$ , 1.31 df, $p = .94$ ) and abstinent days ( $F = 1.25$ , /31 df, $p = .27$ ). However, among women with the highest initial intoxication levels, those in the intervention group showed significantly lower blood alcohol concentrations than did controls.

Author/Year Study Type/ Study Rating	Country	Nsample	Study Population	Timing of Intervention Sessions/Follow-up	Deliverer	Intervention Components	Results
Ingersoll, et al.(2005) RCT 1++	USA	228	U.S. college women: average age 20. Majority Caucasian: 73-67%, 17-20% African American. 88% single.	One 60 to 75-minute counselling session.	Research counsellor.	Counselling session focused on Motivational Interviewing. Activities included: recording 90 days of timeline follow- back, data on drinking and contraception, providing personalized feedback of risk, using exercises to improve confidence, and development of goal statement and change plans for drinking and contraception.	15% of the control subjects and 25% of the intervention women reported no risk drinking— a significant effect size. Significantly fewer control subjects (48%) used effective contraception at one-month follow-up compared with intervention women (64%), $\chi^2(1) = 5.1, p<.03$ ). Significantly more intervention women (74%) were no longer at risk of AEP at one month compared with control subjects (54%), $\chi^2(1) = 8.15, p<.005$ .
Jones-Webb et al. (1999) Cross- sectional 2+	USA	683	Pregnant women.	5 months gestation, 1 session.	Physician	Physician advice.	57% of women received advice on alcohol during pregnancy from a physician. Women who received advice from a physician to abstain from alcohol during their pregnancy reported a lower lifetime prevalence of smoking and drinking during pregnancy than women who did not receive such advice.
Manwell et al. (2000) RCT 1+	USA	205	Problem-drinking women of child- bearing age.	Women attending regularly scheduled appointments at general practice sites ranging from rural solo clinics to large urban health maintenance organization (HMO) groups. Follow-up phone calls.	Physicians	Information; workbooks and worksheets; follow-up phone calls.	The study found a significant treatment effect in reducing both seven-day alcohol use ( $p = .0039$ ) and binge drinking episodes ( $p = .0021$ ) over 48-month follow up. Women in the experimental group who became pregnant during the follow-up period had the most dramatic decreases in alcohol use.

Author/Year Study Type/ Study Rating	Country	Nsample	Study Population	Timing of Intervention Sessions/Follow-up	Deliverer	Intervention Components	Results
O'Connor and Whalley (2007) RCT 1+	USA	345	Pregnant, mostly low-income women.	Monthly sessions to third trimester. Infant birth outcomes also measured.	Nutritionists with training from study investigators.	10- to 15-minute counselling from nutritionist using a scripted manual.	Women who received brief interventions were five times more likely to report abstinence than those who had assessments only ( $p < .04$ ). Newborns from BI women had higher birth weights ( $p < .06$ ) and lengths ( $p < .03$ ) and an infant mortality rate three times lower (0.9%) than the AO group (2.9%).
Project Choices Intervention Research Group (2003) Cohort 2++	USA	190	Women at risk for alcohol-exposed pregnancy. Mean age: 30.87, mean education: 12.65 years, 37% White, 45% African American, 9% Hispanic, 4% American Indian. 52% single.	Women were recruited through community-based settings including drug and alcohol treatment centres, hospital-based gynecology practices, and community-based primary care centres. Follow-up at three and six months following intervention.	Mental health clinician and family-planning clinician.	Four motivational counselling sessions and one contraceptive counselling session.	68.5% no longer at risk for alcohol-exposed pregnancy; 12.6% reduced drinking only; 23.1% used effective contraception only; 32.9% did both.
Reynolds et al. (1995) RCT 1++	USA	78	Pregnant women who drink and who are 25 weeks or less pregnant. 67% were African American, 88% were low income, 65% were single or divorced, and on average they were 12.3 weeks pregnant at recruitment.	During pregnancy. Self-help intervention group was seen one additional time one week after recruitment. Usual clinic care group had no follow-up.	Educator	Self-help intervention group received a ten-minute educational session and a self-help manual. Usual clinic care group received usual care.	A higher alcohol quit rate ( $x2(1)$ ; $3.6 p < .058$ ) was observed among the intervention participants (88%) than controls (69%). The effect was strongest for light drinkers, African Americans, and non-Protestants.

## INTENSIVE INTERVENTIONS

Author/Year Study Type/ Study Rating	Country	N <sub>sample</sub>	Study Population	Timing of Intervention	Sessions/ Follow-up	Provider	Intervention Components	Results *stat sig Cessation Reduction
Corrarino et al. (2000) Cohort 2+	USA	10	Pregnant, substance-using low-income women. Six White women, three African-American women, and one Hispanic woman.	During pregnancy.	Regular contact throughout pregnancy.	Public health nurse.	Flexible home visit plan: health education at each contact concerning pregnancy-related preventive health care; services of substance-abuse counsellor; follow-up at each contact of needs identified; availability of medical social worker for social needs; referral to substance-abuse treatment.	Findings showed that nine out of the ten women proceeded through the whole program. All nine women delivered full-term new-borns, and 80% retained custody. Alcohol Severity Index (ASI) – marked improvement was noted in alcohol and drug use as well as psychiatric status. More than 88% of the women had “no problem” or a “slight” psychiatric problem on reassessment after project interventions and entry into treatment.
Corse & Smith (1998) Cohort 2+	USA	77	Pregnant women who have problematic substance use. 69% White, 84% unmarried, 94% without private insurance. Average age: 26 years.	During pregnancy.	Not specified.	Nurse- midwives.	Enhanced prenatal care including: assignment to care coordinator; longer appointment times; assessment of substance-use patterns; urine toxicology screen at first prenatal visit; preventive education; follow-up on substance- abuse issues; frequent visits for women with substance- abuse issues; addictions counselling; referral to social services; home visiting for women noncompliant with prenatal care; childcare; transport vouchers.	51% of women were able to be largely abstinent during pregnancy, 35% had reduced their use somewhat, and 14% showed no change in use. Baseline variables that differentiated groups included severity of cocaine and cannabis use, psychosocial stressors, and initiation of prenatal care. Significant process variables included number of prenatal visits and contact with addictions counsellors. Meta-analysis 1++

Author/Year Study Type/ Study Rating	Country	Nsample	Study Population	Timing of Intervention	Sessions/ Follow-up	Provider	Intervention Components	Results *stat sig Cessation Reduction
Doggett et al. (2005) Meta- analysis 1++	Inter- national	Six studies	Pregnant or postpartum women with an alcohol or drug problem. Study participants: low- income women, Black women, teenagers.	Prenatal and postpartum.	All studies were of predominately postpartum home visits. Only one study provided any antenatal home visits. The other studies commenced home visiting in postpartum period.	Teams or individuals consisting of doctors, nurses, social workers, counsellors, or trained lay people.	Home visits that commenced during pregnancy and/ or after birth. May include outreach visits to non-health care facilities.	Conclusions: there is insufficient evidence to recommend the routine use of home visits for women with a drug or alcohol problem. Further large, high- quality trials are needed, and women's views on home visiting need to be assessed
Eisen et al. (2000) Case- control 2+	USA	T = 370 C = 288	Pregnant and women up to six months postpartum. Mostly White, over 25.	Pregnancy to six months postpartum.	Prior to delivery (time 1), 30 days after birth (time 2), six months after birth (time 3).	N/A (evaluation of program).	Case management and/or referral to services or day treatment.	Significant reductions in recent drug and alcohol use in the treatment group from Time 1 to Time 2 and to a lesser extent from Time 1 to Time 3 (only drug use not alcohol was significant in this time frame); comparison group women, on the other hand, did not show reduced drug/alcohol use. By Time 3, drug-abuse-services- mediated effects of being a treatment group member were not sustained.

Author/Year Study Type/ Study Rating	Country	Nsample	Study Population	Timing of Intervention	Sessions/ Follow-up	Provider	Intervention Components	Results *stat sig Cessation Reduction
Grant (2005) Cohort 2+	USA	Site 1: N = 96 Sites 2 and 3: N = 184	Pregnant and postpartum women who heavily use drugs or alcohol during pregnancy. 38% White, 42% African American. 79% on public assistance.	From pregnancy or postpartum for three years.	Over the course of three years, specific number not reported.	Parent-Child Assistant Program Case Managers; Para- professionals.	Home visitations to: assist women to obtain alcohol and drug treatment; set goals; provide resource referral; monitor progress; provide transportation to appointments.	Intervention was effective in achieving goals of reducing alcohol-exposed pregnancies by encouraging women to complete alcohol/drug treatment and abstain from alcohol/drugs (outcome measure: subsequent delivery unexposed to alcohol or drugs) or by increasing the regular use of contraception (outcome measure: reduction in number of subsequent deliveries during program). At end of three-year program, researchers found 65% of heavy drinkers no longer at present risk of having alcohol- exposed pregnancy at program exit.
Motz et al. (2006) Cohort 2+	Canada	160	Pregnant women in pregnancy outreach program.	During pregnancy.	Brief survey upon entry to program; detailed questionnaire after 5 to 10 visits; and postnatal questionnaire.	Pregnancy- outreach worker and therapists.	Pregnancy outreach; child care, parenting, and basic needs support; mental health and addictions counselling; developmental and FASD diagnostic clinics; health/ medical services; probation and parole services.	Project evaluation— no data is collected or reported on reductions in substance use among the women. Other findings of the evaluation showed that many women became engaged with services early in their pregnancy with 31% engaged in their first trimester and 47% within the first four months of pregnancy. The program's target of decreasing isolation by facilitating increased use of other services was achieved with 80% of women following through with at least one referral. 29% of women were referred to services related to physical/emotional and sexual abuse and 14% were referred to drug treatment services.

Author/Year Study Type/ Study Rating	Country	Nsample	Study Population	Timing of Intervention	Sessions/ Follow-up	Provider	Intervention Components	Results *stat sig Cessation Reduction
Sweeney et al.(2000) Case-control 2++	USA	174: 87 pregnant and 87 postpartum. 10% used alcohol three times a week during pregnancy. 22% used cocaine more than once per/ week during pregnancy.	Women enrolled in integrated substance-abuse treatment. Pregnant women: 54% White, 33% African American. 84% unemployed. Postpartum women: 51% White, 39% African American. 91% unemployed.	During pregnancy or postnatal.	Throughout the pregnancy.	Project director, clinical coordinator, clinical social workers, case managers, office coordinator, program assistant.	Individualized to participants: crisis intervention, comprehensive psychosocial and substance-use assessment, therapy, parenting education and support, home visits, infant assessment.	Birth outcomes significantly better for those who enrolled in the program during pregnancy than those who enrolled postpartum.
Tavris et al. (2000) Cohort 2+	USA	166	Pregnant women on medical assistance; 85% single, 84% White.	During pregnancy	Ongoing/ three-month follow-up	Public health nurses	Risk assessment, preventative counselling, and follow-up	Alcohol: reduction from 9.6 drinks/month at baseline to 0. Tobacco: 12.8 cigarettes/day to 2.4. Street drugs: almost complete decrease.
Zlotnick et al. (1996) Cohort 2++	USA	48	Pregnant and parenting women with children aged three years and under. 87.5% African American, 12.5% White. 95.8% on public assistance	Over a five-month period.	Existing monthly reports were analyzed.	Case managers.	Treatment services: individual therapy; group therapy; family therapy; drug treatment; life skills; parenting; sexual and physical abuse treatment; mental health services; job-related services.	The findings of the study showed that 37.5% of women abstained from substance use for the first month of treatment, 33.3% for the first two months of treatment, and 29% maintained three or more months of abstinence from substance use.

## Appendix 3: Screening tools descriptions

Instrument	Author & Year	Number of Items	Pregnancy Specific Measure?	Description of Measure
ACOG Antepartum Record	American College of Obstetricians & Gynecologists, 1989.	3 items	Yes	Provides information related to women's past and current pregnancies and medical history. Documents three categories of alcohol use: amount per day prenatal, amount per day during pregnancy, number of years of alcohol use.
Alcohol Screening Tool	O'Connor, & Whaley, 2003	Composite measure	Yes	The Alcohol Screening Tool incorporates the quantity/frequency measure and the TLFB (see below). The tool is written in simple language for women of lower education levels.
Alcohol Use Disorders Identification Test	World Health Organization, 1989	10 questions	No	The AUDIT was designed specifically for primary care settings as a screen for detecting at-risk or hazardous drinking. It includes questions about frequency of drinking, quantity per occasion, difficulty stopping drinking, failure to do what was expected, eye-opener, guilt, blackouts, injury (to self or others), and concern by others.
CAGE	Ewing, 1984	4 items	No	The CAGE tool was designed for the purpose of identifying alcoholism. The questions relate to cutting down, annoyance, guilt, and eye-opener.
Michigan Alcohol Screening Test	Selzer, 1971	22 items	No	The MAST is one of the oldest screening tools and is designed to screen for lifetime alcohol-related problems and alcoholism.
Penn Alcohol Craving Scale	Flannery, Volpicelli, & Pettinati, 1999	5 items	No	The PCAS measures the frequency, intensity, and duration of craving, and assesses the ability to resist drinking.
Prenatal Alcohol Use Interview	Weiner, Rosett, & Edelin, 1982	13 items	Yes	The PAUI is an expansion of the Ten Question Drinking History (TQDH) which identifies women at risk of giving birth to a child with FASD. In addition to the TQDH the PAUI asks questions about family and personal history.
T-ACE	Sokol, Martier, & Ager, 1989	4 items	Yes	The T-ACE includes three questions from the CAGE and a question about alcohol tolerance.
Timeline Follow-back	Sobell, & Sobell, 1992	Retrospective self-reports	No	The TLFB employs a calendar method to aid in the recall of drinking behaviour over the past three months.
TWEAK	Russell & Bigler, 1979	5 items	Yes	TWEAK includes the T-ACE questions (with a modification of two of the questions including the concern question to say "worried") and adds a question regarding blackouts.
4P's Plus	Chasnoff, & Hung, 1999	5 items	Yes	The 4 P's Plus uses a relational format for asking pregnant women about alcohol use (parents' use, partner's use, past use, and present use in the month prior to pregnancy).