

## The 4P's Plus<sup>®</sup> Screen for Substance Use in Pregnancy

The 4P's Plus<sup>®</sup> is a five-question screen specifically designed to quickly identify obstetrical patients in need of in-depth assessment or follow up monitoring. Taking less than one minute, it easily can be integrated into the initial prenatal visit and used for follow up screening through the pregnancy. The questions are broad-based and highly sensitive.

The 4P's Plus<sup>®</sup> has been validated across a variety of populations. The first validity data were collected in a population of 1,884 pregnant women enrolled in community health centers and maternal and child health programs in Alameda County, California. The instrument demonstrated moderately high

sensitivity (83%) and specificity (80%). In addition, the goal of the 4P's Plus<sup>®</sup> is to identify women with risky drinking patterns prior to learning of pregnancy, not just those women drinking once they learned of pregnancy. This was accomplished, as demonstrated by excellent levels of positive and negative predictive validity (50% and 95%, respectively). These levels of predictive validity demonstrate that we are able to identify not only those pregnant women who are drinking heavily or whose alcohol use is at a high enough level to impair daily functioning, but also identifies those women whose pregnancies are at risk from relatively small amounts of alcohol use. Importantly, by identifying women with a positive screen for alcohol use but whose assessment is negative (meaning the woman stopped drinking once she found out she was pregnant), the pregnant woman can receive prevention materials and education regarding the impact of even low levels of alcohol use during pregnancy and be given a strong prevention message.

In 2004, the effectiveness of the 4P's Plus<sup>®</sup> in identifying pregnant women at risk for alcohol or illicit drug use was compared to universal urine toxicology testing. In this study of close to 1,500 pregnant women enrolled in a managed care system in Southern Illinois, urine toxicologies were positive in 2% of the women; however, the 4P's Plus<sup>®</sup> identified 20% of the population as using alcohol or illicit drugs during pregnancy.<sup>3</sup> In a similar study in Baton Rouge, Louisiana, the 4P's Plus<sup>®</sup> was compared to the T-ACE. Among 1,133 pregnant women, 42% of the women with a positive 4P's Plus<sup>®</sup> were negative on the T-ACE. The 4P's Plus<sup>®</sup> was able to identify women who were drinking 2 to 3 days per week and less, while the T-ACE identified only the heavier drinkers.

In 2007 the team at NTI Upstream published a validity study in the *Journal of Perinatology* which confirmed previous findings. This was followed by the completion of a four-year study funded by NIAAA that validated the 4Ps Plus<sup>®</sup> in a population of women enrolled in Kaiser Permanente's managed care plan.

Work to expand the application of the 4P's Plus<sup>®</sup> to include screening for depression and domestic violence was begun in 2000. Preliminary data among a population of approximately 10,000 women in Fresno, California, had demonstrated a 65% correlation between substance abuse and domestic violence. High rates of depression also were found in the clinical populations. It was thus decided to add straightforward, nonjudgmental questions regarding risk for domestic violence and depression to more fully explore these areas and to give the woman an opportunity to talk with her provider about her experiences with abuse or depression. Good predictive validity was achieved.

### Validity Data: The 4P's Plus<sup>®</sup>

Correct classification (1,514/1,884)	80%
Sensitivity (310/375)	83%
Specificity (1,204/1,509)	80%
Positive predictive validity (310/615)	50%
Negative predictive validity (1204/1269)	95%

By incorporating the questions for domestic violence and depression into the original substance abuse screen, The *4P's Plus Screen for Behavioral Health Risk in Pregnancy*® (still called the *4P's Plus*®) is the first validated instrument that has been developed to screen for alcohol, tobacco, and illicit drug use, depression, and domestic violence in pregnant women.<sup>6</sup>

### **Brief intervention**

Brief intervention strategies were integrated into the screening process in 2000. Grounded in motivational interviewing techniques, “*I am concerned...*” is an interactive, multisensory psychoeducational approach that takes about five minutes and is administered to all women who are found through the screening process to be using alcohol, tobacco, or illicit drugs. In San Bernardino County, California, over a period of three years, close to 20,000 women were screened with the *4P's Plus*® and those women with a positive screen underwent the brief intervention in the prenatal care provider’s office. A follow up study demonstrated that among those women receiving prenatal care in offices that used the *4P's Plus*® and “*I am concerned...*”, there was a *decrease* in the low birth weight rate of 18%, a statistically significant drop as compared to the *increase* in low birth weight rate of 1% among women whose physicians did not use the *4P's Plus*®. Similar findings emerged in a study in Solano County, California. It was estimated that use of the *4P's Plus*® and “*I am concerned...*” as a universal screening and brief intervention strategy saved the county \$1.8 million in costs related to low birth weight infants over a two year period.<sup>7</sup>

Finally, the *4P's Plus*® is a successful prevention strategy. Among six California counties who implemented universal screening of pregnant women for substance use, the rate of substance use in pregnancy has *decreased* an average of 27%. This is a statistically greater decrease in rates compared to rates of substance use in pregnancy in California and in the U.S. as a whole, both of which have demonstrated no changes in rates of substance use in pregnancy over the same period of time. From focus groups with providers and patients, it appears that administration of the *4P's Plus*® in the target pregnancy impacts a woman’s use of substances in subsequent pregnancies.

Screening with the *4P's Plus*® has now been instituted in over 100 communities around the nation, and several states have developed state-wide initiatives for universal screening with the instrument. The *4P's Plus*® has been used in a wide range of populations and has been translated into five languages. The research, development and clinical experience with the *4P's Plus*® has shown it to be a viable procedure for instituting universal substance use screening in pregnant women. An outside review of the *4P's Plus*® published in the *Journal of Perinatology* supported the clinical usefulness of the instrument, providing an opportunity for successfully integrating screening into primary prenatal care.

### **References**

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