

SPECIAL ARTICLE

Fulfilling an Unmet Need: Roles for Clinical Pharmacists in Preconception Care

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Preconception care refers to a set of interventions that identify and address biomedical, behavioral, and social risks to a woman's health that may negatively impact a future pregnancy. A great need for preconception care currently exists in the United States, and women's attitudes about discussions with health care providers about healthy and safe pregnancies are positive. Clinical pharmacists are well positioned to work with other health care and public health professionals to ensure that all women of childbearing potential have access to preconception care. As part of the collaborative health care team, clinical pharmacists can directly provide services or support and referrals to other members of the health care team or to community resources through clinical-community linkages. Specifically, clinical pharmacists can provide education, counseling, and/or services to women to address family planning, medication and disease state management, immunizations, screenings, health promotion, and substance use. Clinical pharmacists can also impact preconception care through drug information services, advocacy, and research. Preconception care services can be incorporated into daily pharmacy practice, and there are potential means for reimbursement. Multiple roles exist for clinical pharmacists to fulfill unmet needs in preconception care.

KEY WORDS clinical pharmacist, preconception care, maternal and child health.

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Preconception care refers to a set of interventions that identify and modify biomedical, behavioral, and social risks to a woman's health that may negatively impact a future pregnancy. Through preconception care, health issues that may pose risks to the mother or infant can be prevented or managed. Preconception care includes health promotion, screenings, interventions, and family planning services. Interconception care is a subset of preconception care and involves targeted interventions in women who have previously experienced adverse pregnancy

outcomes.^{1, 2} In this article, the term *preconception care* encompasses both preconception and interconception care.

Preconception care focuses on health issues that must be addressed before conception or very early in pregnancy for maximum impact.^{1, 2} Preconception care should be offered to all women of childbearing potential as part of routine health care and not be considered a single clinical visit.¹⁻⁴ Because rates of unintended pregnancies in the United States are high,⁵ preconception care cannot be reserved only for women planning a pregnancy.^{3, 4} Every woman of childbearing potential should be considered for preconception care,^{3, 4} as the first prenatal visit may be too late to prevent certain risks to the mother or infant.⁴ The care should be personalized for each woman and her particular stage of reproductive life.³ Given their expertise, training, and frequent patient interactions, clinical pharmacists are well positioned to ensure

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that all female patients of childbearing potential receive preconception care consistently.

Preconception Care Interventions

Increased provision of preconception care can improve maternal and infant outcomes. Mortality rates for infants and mothers, adverse infant outcomes, and complications during pregnancy and delivery can be reduced through preconception care.⁶ Because the United States currently has high infant and maternal morbidity and mortality rates,⁷ the need is great for effective interventions to improve health for mothers and babies. Preconception interventions also serve to improve the health of women of childbearing potential (typically defined as 15–45 yrs),^{1, 2} optimizing women's health before and between pregnancies.⁸ In 2006, the Centers for Disease Control and Prevention (CDC) Preconception Care Work Group and the Select Panel on Preconception Care (SPPC) identified 4 goals (Table 1) and 10 recommendations (Table 2) for preconception care in the United States.^{1, 2} Interventions to address health promotion, family planning, immunizations, infectious diseases, medical conditions, psychiatric conditions, parental exposures, family and genetic history, nutrition, environmental exposures, psychosocial risks, medications, reproductive history, and needs of special populations have been identified as key components of preconception care (Figure 1).³ (Refer to Appendix S1 for the specific clinical recommendations and the quality of supporting evidence.⁹) From all of these potential interventions, the CDC and SPPC further identified specific recommendations for which clinical practice guidelines and evidence of effectiveness exist (indicated by an asterisk in Figure 1).^{1, 2} These interventions can be grouped into four

Table 1. Four National Goals for Preconception Care Determined by the Centers for Disease Control and Prevention Preconception Care Work Group and the Select Panel on Preconception Care^{1,2}

Goal 1	Improve the knowledge, attitudes, and behaviors of men and women related to preconception health
Goal 2	Assure that all women of childbearing age in the United States receive preconception care services that will enable them to enter pregnancy in optimal health
Goal 3	Reduce risks indicated by a previous adverse pregnancy outcome through interventions during the interconception period
Goal 4	Reduce the disparities in adverse pregnancy outcomes

Table 2. Recommendations for Preconception Care Determined by the Centers for Disease Control and Prevention Preconception Care Work Group and the Select Panel on Preconception Care^{1,2}

Recommendation 1: Individual Responsibility Across the Lifespan	Counsel all patients to have a reproductive life plan and to implement the plan via their preferred family planning methods
Recommendation 2: Consumer Awareness	Increase patient education and use of health services
Recommendation 3: Preventive Visits	Provide risk assessment and counseling regarding preconception health to all women
Recommendation 4: Interventions for Identified Risks	Increase proportion of women receiving necessary interventions identified through screening
Recommendation 5: Interconception Care	Intensive interventions targeted to women who experienced adverse outcomes in a prior pregnancy
Recommendation 6: Prepregnancy Check-ups	Before conception, provide a clinical visit to couples planning a pregnancy
Recommendation 7: Public Health Programs and Strategies	Integrate preconception health with existing public health programs
Recommendation 8: Health Care Coverage for Low-Income Women	Improve access to preventive services among those with low incomes
Recommendation 9: Research	Enhance knowledge about preconception care
Recommendation 10: Monitor	Monitor via public health surveillance and other research mechanisms

categories: counseling, maternal assessment, screening, and vaccinations.

Counseling

Folic Acid

Adequate levels of folic acid reduce the risk of neural tube defects, serious and sometimes fatal birth defects of the brain and spinal column. The neural tube closes 28 days after conception; due to high rates of unintended pregnancies and difficulties in receiving sufficient amounts of folic acid through diet alone, all women aged 15–45 years should take at least 400 micrograms (0.4 mg) of folic acid daily in a multivitamin or folic acid tablet.^{1, 2, 10–12} Women with diabetes mellitus, women who had a previous pregnancy affected by a neural tube defect, or women taking antiepileptic drugs should take folic acid 4–5 mg daily.^{10, 11} Women who have a body mass index higher than 35 kg/m² or who smoke may be advised to take higher daily doses of folic acid (5 mg/day) as well because each are risk factors for neural tube defects.¹³

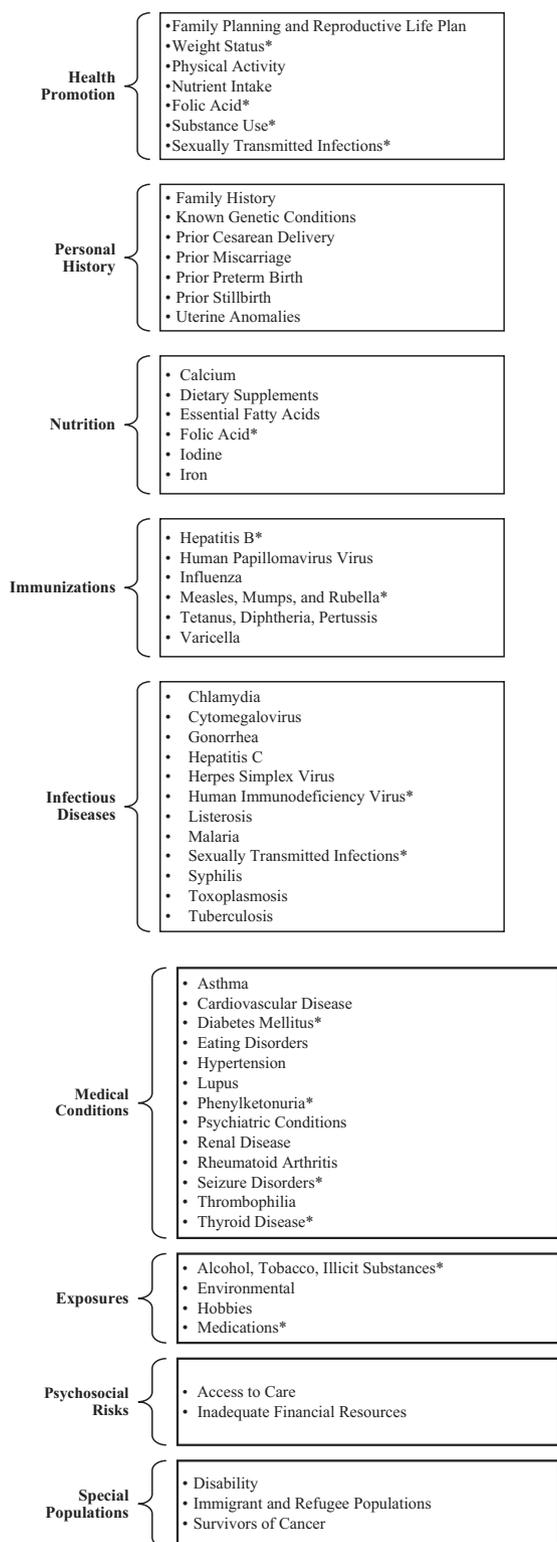


Figure 1. Preconception care interventions.³ Asterisk denotes evidence-based recommendations for preconception care determined by the Centers for Disease Control and Prevention Preconception Care Work Group and the Select Panel on Preconception Care.^{1, 2}

Smoking

Because tobacco increases the risk of preterm birth, low birthweight, and other adverse fetal outcomes, women should be counseled to stop smoking before conception and aided appropriately.^{1, 2, 10-12}

Alcohol and Other Recreational Drug Misuse

Because exposures to these substances increase the risk of premature birth, low birthweight, birth defects, fetal alcohol spectrum disorder (from alcohol use specifically), or neonatal abstinence syndrome (from illicit drug use specifically), women should avoid alcohol and illicit drugs.^{1, 2, 10, 11}

Obesity

Obesity increases the risk of neural tube defects, preterm delivery, and other complications. Women who are obese should receive counseling regarding appropriate weight loss and nutritional intake before conception.^{1, 2, 10-12}

Maternal Assessment

Pregestational Diabetes

Diabetes and high blood glucose levels at the time of conception increase the risk of birth defects and other complications. Women with pregestational diabetes should have good glyce-mic control (hemoglobin A1c less than 7%, if this can be achieved without hypoglycemia) using preferred medications.^{1, 2, 10-12}

Hypothyroidism

Proper levothyroxine levels reduce the risk of spontaneous abortion, stillbirth, low birthweight, or neurologic problems. Women with hypothyroidism should be monitored more frequently and doses of levothyroxine adjusted as necessary.^{1, 2, 10, 11}

Maternal Phenylketonuria

Lowering phenylalanine levels reduces the risk of mental retardation in the infant; therefore, women with phenylketonuria should resume a low phenylalanine diet before conception and during pregnancy.^{1, 2, 10, 11}

Teratogenic Drugs

Teratogenic drugs increase the risk of spontaneous abortion, miscarriage, fetal death, and/or serious birth defects. Although the CDC and SPPC recommendations focus on antiepileptic drugs, warfarin, and isotretinoin, all drugs (prescription, over-the-counter [OTC], and herbal drugs) that may be harmful to the developing fetus should be addressed as appropriate. Prescription, OTC, or herbal drugs that may cause fetal harm should be identified and exposure should be minimized; patients should be switched to a less teratogenic agent if possible. Women taking these drugs should consistently use effective contraception to avoid inadvertent fetal exposure.^{1, 2, 10–12}

Screening

Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome

Women should be screened for human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome prior to conception because initiation of appropriate drug therapy can reduce the risk of mother-to-child transmission.^{1, 2, 10, 11}

Sexually Transmitted Infections

Women should be screened for sexually transmitted infections prior to conception. Treatment of these infections can prevent complications such as birth defects, fetal death, spontaneous abortion, mental retardation, and blindness.^{1, 2, 10–12}

Vaccinations

Rubella

To prevent congenital rubella syndrome—serious birth defects that result from fetal exposure to rubella—women who are seronegative for rubella should receive the vaccine prior to conception. Conception should be avoided for 28 days after receipt of the live vaccine, and the vaccine should not be administered during pregnancy.^{1, 2, 10–12}

Hepatitis B

Patients at risk for acquiring hepatitis B should be vaccinated to prevent mother-to-child

transmission of hepatitis B and subsequent long-term liver complications.^{1, 2, 10–12}

Preconception Care Interventions for Men

Preconception care recommendations also exist for men that are beyond the scope of this article. Table 3 lists some sources of information regarding potential preconception care interventions for male patients.

The Need for Preconception Care: Patients' Receipt of Services, Knowledge, and Attitudes

Although increasing the number of women who received preconception care services and performed key behaviors is a national priority,¹⁴ recent data indicate that many women are experiencing unmet needs for preconception care. For example, only 18.4% of a representative sample of women aged 18–44 years with a recent live birth in four states were estimated to have received preconception care counseling from a health care professional on at least 5 of 11 preconception lifestyle behaviors and prevention strategies (range 17.7% [in Ohio] to 19.8% [in Maryland]).¹⁵ A recent analysis of nationally representative data on ambulatory visits for women aged 15–44 years indicated that only 14% included either preconception or contraceptive services.¹⁶ In a separate survey of a national sample of women ages 18–45 years performed by the March of Dimes and Gallup organization, only 32% affirmed that a health care provider had talked to them about the benefits of folic acid; the percentage dropped to 7% for women aged 18–24 years.¹⁷

Additional disparities are seen among racial-ethnic groups and age groups for many preconception health behaviors. In the United States, approximately half of all pregnancies are unintended.⁵ However, among a representative sample of women aged 18–44 years in 29 states, young women and African-American women had significantly higher rates (estimated prevalence of 61.6% for women aged 18–24 years reporting that the pregnancy was unintended compared with 35.4% of those aged 25–34 years and 29.2% of those aged 35–44 years; estimated prevalence of 65.2% for non-Hispanic black women reporting that the pregnancy was unintended compared with 37.3% of non-Hispanic white women, 45.9% of Hispanic women, and 37.9% of women who identified themselves as

other race/ethnicity). Significant differences were also seen in smoking before pregnancy (smoking 100 or more cigarettes in the preceding 2 years of a recent live birth and on average smoking part or more than one cigarette during the 3 months before pregnancy) among women aged 18–44 years in the same reporting areas. Although the overall estimated prevalence was 25.1% (range 12.8% [in Utah] to 42.9% [in West Virginia]), younger women and non-Hispanic white women had an estimated prevalence of 35.8% and 30.8%, respectively. Finally, less than a third of women aged 18–44 with a recent live birth from the same reporting areas reported taking folic acid supplementation in the month prior to pregnancy (estimated prevalence 29.7%, range 21.7% [in West Virginia] to 38.2% [in Vermont]). Only 16.1% of women aged 18–24 years took folic acid preconceptionally; older women reported more folic acid use, although reported use was still below 50% (age 25–34 years: 34.5%; age 35–44 years: 42.4%). Among racial and ethnic groups, non-Hispanic black women reported the lowest rates of folic acid use (19.5%), followed by Hispanic women (22.5%), women of other races or ethnicities (33.0%), and non-Hispanic white women (34.2%).¹⁵

Deficiencies in knowledge as well as behaviors exist among women of childbearing potential. For instance, focus groups were conducted with 72 nonpregnant women aged 20–45 years (median 34 years) with chronic medical conditions (diabetes, hypertension, and/or obesity); 70.8% reported a previous live birth, with 51% of those women reporting a pregnancy-related complication defined as gestational diabetes (among those without diabetes preconception), pregnancy-associated hypertension (among those without hypertension preconception), preterm birth, low birthweight, or birth defect/disorder. Participants

were predominantly white (73.2%); 15.5% of participants were black, and 11.2% indicated they were “multiple” or “other” races. Women participating in these focus groups showed limited knowledge about preconception health optimization and potential risks due to chronic medical conditions during pregnancy. In addition, these women possessed limited knowledge that contraceptive options may be potentially restricted by their medical condition(s).¹⁸ Another example relates to gaps in knowledge of folic acid. Of the women who participated in the March of Dimes and Gallup organization survey, 84% recalled hearing or reading about folic acid, 20% knew it could help prevent birth defects, and 11% knew that folic acid should be taken daily prior to conception.¹⁷

Data also indicate a willingness among women of childbearing potential to discuss preconception topics with health care providers and to change certain behaviors. For example, 73% of the women surveyed by the March of Dimes and Gallup organization reported that if during an appointment with a health care provider for an unrelated reason, they “would not mind” if their health care provider addressed topics related to pregnancy. In addition, 89% indicated that if a health care provider advised them to do so, they would make an appointment “to talk about ways to have a safe pregnancy and a healthy baby.” Finally, among women not currently taking a folic acid supplement, 89% reported that they would be willing to do so if a health care provider recommended it.¹⁷

Potential Roles for Clinical Pharmacists in Preconception Care

The discrepancies seen in preconception knowledge, behaviors, and services support the notion that preconception care needs to be consistently provided to all women of childbearing potential.¹⁵ Many potential opportunities exist for clinical pharmacists to satisfy the CDC and SPPC recommendations for preconception care. As part of the collaborative health care team, pharmacists can directly provide services or provide support and referrals to other members of the health care team or to community resources through clinical-community linkages, whereby clinical providers and community-based services are coordinated within and across institutions and organizations.^{10, 11, 19, 20} Specifically, there are roles for clinical pharmacists to reduce the number of unintended pregnancies;

Table 3. Brief List of Resources Containing Preconception Care Recommendations for Men

Centers for Disease Control and Prevention. Preconception health and health care: clinical content of care for men. Available from http://www.cdc.gov/preconception/careformen/
Centers for Disease Control and Prevention. Preconception health and health care: information for men. Available from http://www.cdc.gov/preconception/men.html
Frey KA, Navarro SM, Kotelchuck M, Lu MC. The clinical content of preconception care: preconception care for men. <i>Am J Obstet Gynecol</i> 2008;199(6 Suppl 2):S389–95.
Warner JN, Frey KA. The well-man visit: addressing a man's health to optimize pregnancy outcomes. <i>J Am Board Fam Med</i> 2013;26(2):196–202.

provide education, counseling, and medication management to prevent and mitigate health issues; administer needed vaccinations to patients according to state law; interpret literature and provide drug information regarding medication use and drug toxicity during pregnancy; raise awareness and advocate for preconception care; and conduct research.

Reducing Unintended Pregnancy

Unintended pregnancies refer to pregnancies that occurred in women before they desired to be pregnant (a “mistimed” pregnancy) or in women who indicate they never desired to become pregnant (an “unwanted” pregnancy). Among the nearly 50% of pregnancies in the United States that are unintended, approximately half occur among couples using some form of contraception in the month prior to conception.⁵ Pharmacists have multiple traditional and emerging roles to implement recommendation 1 from the CDC and SPPC.

Well-established roles for pharmacists include assisting patients with selection of nonprescription contraceptives and dispensing hormonal contraception prescription products.²¹ Patient education and counseling on correct and consistent use of contraception is paramount and may need to be performed more often, given the high rate of unintended pregnancies among couples using contraception. Pharmacists can partner with patients to help them develop a reproductive life plan (Table 4 lists resources). Reproductive life plans encourage patients to consider the number and spacing of future pregnancies intentionally and use preferred methods of family planning to accomplish their plan.³ When meeting with patients regarding their reproductive life plans, pharmacists should counsel patients on optimal birth spacing (18–59 mo from woman’s last delivery to conception of next pregnancy) to reduce complications for the infant and mother.²² Pharmacists can provide counseling and referrals to patients needing prescription contraception including long-acting reversible contraception.^{21, 23} Pharmacists also have important functions in providing recommendations and education to patients requesting emergency contraception. In some states, pharmacists have the ability to prescribe and dispense emergency contraception as part of collaborative practice agreements and/or after completed continuing education.²⁴

Pharmacists at certain sites have participated in innovative programs to increase accessibility of contraception to women. For example, pilot programs have examined the feasibility and acceptance of community pharmacist initiation and continuation of prescription contraceptives as part of collaborative practice agreements²⁵ and administration of depot medroxyprogesterone acetate reinjections.^{26, 27} Most recently, California and Oregon were the first states in the nation to permit women without a prescription to obtain hormonal contraceptives directly from pharmacists. In California, 1 hour of continuing education is required of the participating pharmacists; although still being finalized, it is likely that proof of continuing education will be required of pharmacists in Oregon as well.²⁸ In addition, pharmacists have opportunities to collaborate with health departments and private or public family planning clinics.²¹

Preventing and Managing Health Risks

Clinical pharmacists can directly provide preconception care services or refer patients to needed services to meet CDC and SPPC recommendations 3, 4, and 5. Pharmacists can provide counseling and patient education to prevent health risks and encourage healthy behaviors. For example, pharmacists can promote folic acid use. Pharmacists can query for tobacco use and initiate cessation services. Use of substances such as alcohol and illicit drugs can be identified and referred as appropriate. Pharmacists can recommend necessary vaccines or may be able to administer the vaccines according to state law.^{10–12} Pharmacists can also provide or refer patients for necessary screening tests, such as for HIV and sexually transmitted infections. Pilot programs have explored the practicality of point-of-care testing in community pharmacies.²⁹ Pharmacists can use their expertise to manage disease states and drug risks during the preconception period. Pharmacists can advise on how to best manage chronic conditions at a time when drug therapy options can be limited. Pharmacists can recognize teratogenic medications and recommend appropriate alternatives.^{10–12}

Preconception care recommendations should be patient specific and focus on relevant issues for the patient given her specific life stage and medical and behavioral risks.³ Pharmacists should also recognize that the approach to patient education and counseling regarding preconception health and behaviors should be

patient specific and take into account whether the patient is considering pregnancy in the near future (“contemplator”) or not (“noncontemplator”). Counseling and educational strategies will differ based on whether the patient is contemplating a pregnancy or not. When working with a patient who is a noncontemplator, potential health benefits to the patient should be highlighted; whereas when working with a contemplator, potential health benefits to the infant should also be accentuated.³⁰ For example, if recommending the hepatitis B vaccine to a noncontemplator, counseling points should include the prevention of contraction of the disease and liver sequelae. In addition, the prevention of vertical transmission of the disease should be discussed with contemplators.

Finally, pharmacists have additional opportunities to use their drug information skills to further preconception care. Clinical pharmacists can retrieve and interpret relevant literature regarding risks of drug use in the preconception period and put it in context for other clinicians and patients. Pharmacists can also provide recommendations to other health care providers regarding appropriate disease management in the preconception period.³¹

Raising Awareness and Advocating for Preconception Care

To accomplish CDC and SPPC recommendation 2, clinical pharmacists can raise awareness about preconception care among patients and other health care providers and advocate for preconception care. New and expanded programs and policies are needed to address existing gaps in preconception care.⁶ Pharmacists can work with elected officials, the media, and community organizations and can provide information when laws and regulations are under consideration and implementation.³² Pharmacists can collaborate with health care and public health professionals with similar goals to expand preconception care.²¹ Clinical pharmacists can also advocate for policies that will increase patient access to preconception care. For example, expert groups, including the American College of Clinical Pharmacy (ACCP) Women’s Health Practice and Research Network (PRN), endorse provision of oral hormonal contraception without a prescription when a pharmacist is available.³³ The American Congress of Obstetricians and Gynecologists, American Medical Association, and American Academy of Family

Physicians also support making oral contraception available without a prescription.^{34–36} Clinical pharmacists can engage in dialogue with policymakers on this and other issues related to preconception care.

Conducting Research

Consistent with ACCP’s expectations,³⁷ clinical pharmacists can conduct research related to preconception care to fulfill recommendations 9 and 10 from the CDC and SPPC. Currently, few published reports are available that document pharmacists’ impact in this area in the United States. However, as pharmacists become more involved in preconception care, they can record and share good preconception care practices^{6, 38} Continual monitoring of pregnancy and infant outcomes, women’s health status, and health disparities can document the impact of preconception care.¹⁵ Ongoing opportunities are available with groups such as the ACCP Women’s Health PRN to collaborate in research projects focused on preconception care.³⁹

Incorporating Preconception Care into Daily Pharmacy Practice

Clinical pharmacists can assume more active roles in provision of patient-centered preconception care consistent with their practice responsibilities and scope of practice³⁸ as members of interdisciplinary teams and clinical-community linkages. Examples of ways pharmacists can incorporate preconception care into daily practice are provided, but these are not intended to be exhaustive or dogmatic. Based on the health care setting and associated institutional policies as well as applicable laws, the functions and accountability of the pharmacist may vary.

There are numerous ways within existing practices that pharmacists can provide preconception care or referrals. Figure 2 shows one algorithm that can be used to discuss preconception care systematically with all female patients of childbearing potential in nearly any practice site.⁴⁰ Many of the resources in Table 4 also provide algorithms and checklists that clinicians can adapt and apply to their practices as appropriate. Routinely asking women of childbearing potential, “Are you considering pregnancy in the next year, or could you possibly become pregnant?” can lead to multiple preconception care interventions based on patient health status and response.⁸ For example, pharmacists provid-

ing comprehensive medication management (CMM)³⁷ can incorporate questions regarding preconception health and behaviors while assessing the patient and then evaluate and implement appropriate medication therapy in the context of patient-specific needs. Likewise, pharmacists performing medication therapy management (MTM) may use it as a means to provide preconception care. Certain aspects of preconception care such as management of teratogenic medications, recommendations for folic acid supplementation, or administration of (or referral for) immunizations may be addressed through targeted medication reviews; more complicated issues such as diabetes management in the preconception period may warrant a comprehensive medication review.^{10, 11} Pharmacists should provide follow-up to CMM or MTM encounters to ensure implementation of recommendations and patient receipt of any additional required services and to monitor patient outcomes.^{10, 11, 37} Similarly, pharmacists participating in collaborative practice agreements⁴¹

may be able to broaden the extent of care to include preconception considerations. Pharmacists practicing in newer models of care such as accountable care organizations or patient-centered medical homes⁴¹ may recognize even greater value to patients and payers by addressing preconception health risks.

Documenting and Billing for Services

Clinical pharmacists should document preconception health services and referrals provided to patients in the same fashion as they document other patient encounters.³⁷ They may be able to bill directly or indirectly given their practice setting and state scope of practice.^{10, 42, 43} Reimbursement may be possible for preconception care services from multiple venues. Coverage of services such as well-women visits; screening and counseling for sexually transmitted infections, interpersonal or domestic violence, alcohol use, or obesity; contraceptive methods and counseling; tobacco use screening and cessation

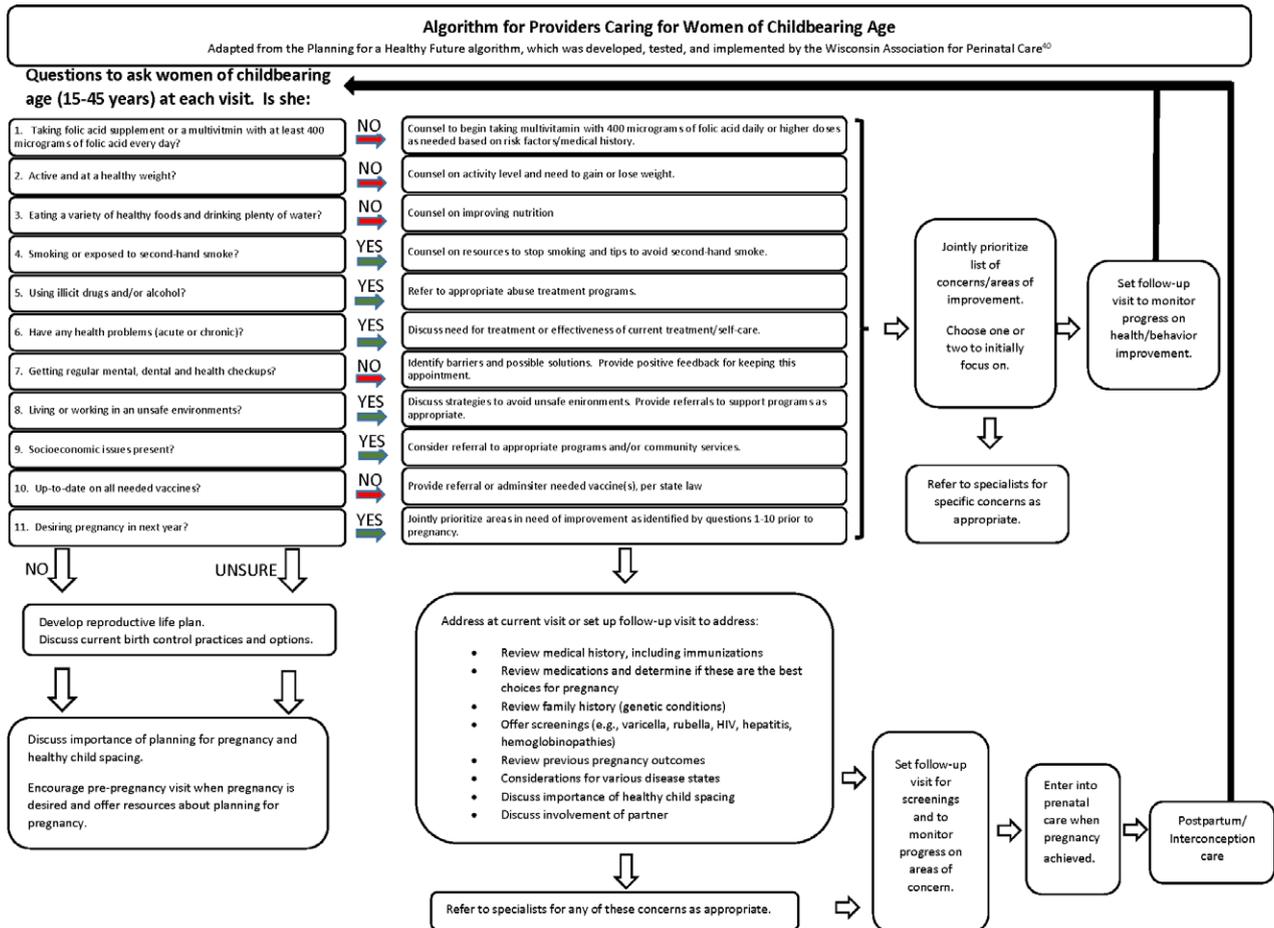


Figure 2. Algorithm for providers caring for women of childbearing age. HIV = human immunodeficiency virus. (Adapted from reference 40.)

services; immunizations; and other U.S. Preventive Services Task Force (USPSTF) A or B recommendations is required of new insurance plans by the Affordable Care Act (ACA).⁴⁴

Family planning is a mandatory Medicaid benefit. In addition, through the ACA, states are now incentivized to cover USPSTF A or B recommendations and vaccines recommended by the Advisory Committee on Immunization Practices.⁴⁵ Some managed care plans, including some contracted to administer Medicaid programs, allow pharmacists to bill for MTM or CMM ser-

vices,^{46, 47} giving enrolled patients access to such services in their childbearing years.

Overcoming Potential Barriers

Clinical pharmacists may need to overcome several potential barriers to incorporate preconception care into their practice site. Although clinical pharmacists are familiar with the elements of preconception care and may hold certificates that facilitate providing preconception care (such as to provide vaccines or smoking

Table 4. Selected Free Resources for Clinicians and Patients about Preconception Care

Selected Resources for Clinical Pharmacists

- Association of Maternal and Child Health Programs. Using the Community Guide to improve preconception health efforts. <http://www.amchp.org/Calendar/Webinars/Womens-Health-Info-Series/Documents/AMCHP%20Issue%20Brief%20Preconception%20Health%20and%20the%20Community%20Guide.pdf>
- Centers for Disease Control and Prevention. Preconception health and health care. <http://www.cdc.gov/preconception/index.html>
- Centers for Disease Control and Prevention. Show Your Love campaign. <http://www.cdc.gov/preconception/showyourlove/index.html>
- Centers for Disease Control and Prevention. Reproductive life plan tool. <http://www.cdc.gov/preconception/rlptool.html>
- DiPietro NA, Bright DR. Medication therapy management and preconception care: opportunities for pharmacist intervention. *Innov Pharm*. 2014;5(1):Article 141
- DiPietro Mager NA, Bright DR. Delivering preconception medication therapy management services in the community pharmacy (free continuing education program accessible after registration). www.raabecollegeofpharmacy.org/mtm
- El-Ibiary SY, Raney EC, Moos MK. The pharmacist's role in promoting preconception health. *J Am Pharm Assoc* 2014;54:e288-e303
- Interconception care algorithms and patient handouts. http://www.everywomancalifornia.org/content_display.cfm?categoriesID=120&contentID=359
- March of Dimes. <http://www.marchofdimes.org/>
- The National Preconception/Interconception Care Clinical Toolkit. <http://beforeandbeyond.org/toolkit/>
- Oregon Foundation for Reproductive Health One Key Question[®] Initiative. <http://www.onekeyquestion.org/>
- Preconception health and health care environmental scan: report on clinical screening tools and interventions. <http://www.cdc.gov/preconception/documents/environmental-scan-report.pdf>
- Providing quality family planning services: recommendations of CDC and the U.S. Office of Population Affairs. <http://www.cdc.gov/mmwr/pdf/rr/rr6304.pdf>
- Smoking cessation for pregnancy and beyond. <https://www.smokingcessationandpregnancy.org/resources>

Selected Resources for Patients

- Boston University. Project Preconception Care. The "Gabby" system. <http://www.bu.edu/familymed/programs-and-research/project-preconception-care/>
- Centers for Disease Control and Prevention. Ten things you need to know about birth defects. <http://www.cdc.gov/ncbddd/birthdefects/documents/10ThingsFlyerEng.pdf>
- Centers for Disease Control and Prevention. Fetal Alcohol Spectrum Disorders (FASDs). <http://www.cdc.gov/ncbddd/fasd/freematerials.html>
- Centers for Disease Control and Prevention. Folic acid. <http://www.cdc.gov/pubs/CDCInfoOnDemand.aspx>
- Centers for Disease Control and Prevention. Got diabetes? Thinking about having a baby? http://www.cdc.gov/pregnancy/documents/Got_diabetes_508.pdf
- Centers for Disease Control and Prevention. My reproductive life plan. <http://www.cdc.gov/preconception/reproductiveplan.html>
- Centers for Disease Control and Prevention. Preconception health and health care: health education materials for women and men. <http://www.cdc.gov/preconception/freematerials-health-edu.html>
- Food and Drug Administration. Birth control: medicines to help you. <http://www.fda.gov/ForConsumers/ByAudience/ForWomen/FreePub>
- Smoking cessation for pregnancy and beyond. <https://www.smokingcessationandpregnancy.org/resources>

cessation services), the key is to organize all of the topics to assess and address risks systematically for “every woman, every time.” Figure 2 provides a framework to evaluate preconception topics with each female patient of childbearing potential, and Table 4 lists resources that may be useful to clinicians wanting additional tools or information to facilitate preconception care and practice. Time and space to deliver new services is a common barrier experienced by clinical pharmacists across many practice settings; space, however, is not much of an issue if pharmacists can find ways to incorporate preconception care into routine or established patient encounters. Finally, as recognized by the CDC and SPPC (recommendation 2), patients may not perceive the need for preconception care. Clinical pharmacists can raise awareness among patients about its importance and may use patient education materials (Table 4) to initiate conversations with patients on specific topics.

Conclusion

Despite potential barriers, many potential opportunities exist for clinical pharmacists to advance preconception care and improve pregnancy outcomes. It is hoped that this article will stimulate additional ideas in the pharmacy community about ways to become more involved in maternal and child health through interdisciplinary collaboration.

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Supporting Information

The following supporting information is available in the online version of this paper:

Appendix S1. Strength of the recommendations and the quality of the evidence for preconception clinical interventions to improve maternal or the infant health.