



Published in final edited form as:

*J Adolesc Health*. 2021 October ; 69(4): 566–573. doi:10.1016/j.jadohealth.2021.04.032.

## Adolescent and Young Adults' Ability to Self-Screen for Contraindications to Contraception and the Role of Chronic Illness

Tracey A Wilkinson, MD, MPH<sup>1</sup>, Ashley H Meredith, PharmD, MPH<sup>2</sup>, Sally Rafie, PharmD<sup>3</sup>, Amy J Katz, MPH, CCRP<sup>4</sup>, Thomas L Vielott, BS<sup>5</sup>, Carolyn G Meagher, BA, CCRP<sup>5</sup>, Mary A Ott, MD, MA<sup>5</sup>

<sup>1</sup>Indiana University School of Medicine, Department of Pediatrics/Children's Health Services Research, Indianapolis, Indiana.

<sup>2</sup>Purdue University College of Pharmacy, Department of Pharmacy Practice, Indianapolis, Indiana.

<sup>3</sup>Birth Control Pharmacist, San Diego, California.

<sup>4</sup>Indiana University School of Medicine, Department of Pediatrics/Children's Health Services Research, Indianapolis, Indiana.

<sup>5</sup>Indiana University School of Medicine, Department of Pediatrics/Adolescent Medicine, Indianapolis, Indiana.

### Abstract

**Purpose:** Multiple states allow pharmacists to prescribe hormonal contraception but can have age restrictions. The study objective was to examine how age influences adolescents' and young adults' (AYA) ability to self-report potential contraindications to hormonal contraception compared with physician reports (our "gold standard").

**Methods:** Between February 2017-August 2018, women 14–21 years old and their physicians were recruited in outpatient adolescent primary and subspecialty care clinics. Screeners were completed separately for medical conditions that are potential contraindications to hormonal contraception as defined by the Centers for Disease Control Medical Eligibility Criteria. Overall discordance was defined as differences between the patient's and provider's answers; potential unsafe discordance was defined as AYAs under-reporting of contraindications. Multivariable logistic regression was used to examine predictors of overall and unsafe discordance.

**Results:** Of 394 AYA/physician pairs, 45% were from subspecialty clinics, 35% identified as African American, mean age was  $16.7 \pm 1.9$  years, and 38% were sexually active. Fifty percent of patients reported potential contraindications to hormonal contraception. There was only an 18% rate of unsafe discordance, with no statistical difference by age but a higher rate in subspecialty clinics (28% vs. 10%). No variables were predictive of higher rates of unsafe discordance in general or subspecialty clinics.

**Conclusions:** Potential overall and unsafe discordance between AYAs' and physicians' reports of medical contraindications to combined hormonal contraception were not related to younger age and thus support expansion of pharmacy access to adolescents. Pediatric subspecialists need to proactively address hormonal contraceptive needs and safety as pharmacy access expands.

### Keywords

Adolescents; Contraception; Pregnancy; Pharmacy; Access to Health Care; Adolescent Health Services; Young Adult

---

### Introduction

Adolescent pregnancy, defined as a pregnancy before the age of 18 years, is a serious public health issue.(1) Eighty-five percent of the 615,000 adolescent pregnancies per year in the United States (U.S.) are unintended, and unintended adolescent pregnancy is associated with increased medical complications, lower educational attainment, lower earnings, higher repeat pregnancies, and persistent poverty.(2, 3) During the last 10 years, the overall rate of teen pregnancy in the U.S. has decreased, with the primary driver of this decline being increased hormonal contraceptive use.(4–6) However, there exist marked disparities in adolescent pregnancy by geography, education, socioeconomic status, and race/ethnicity.(7, 8) These disparities are due, in large part, to inequities in access to hormonal contraception. There is a need for new policy approaches, such as pharmacist contraceptive prescribing, to expand access to hormonal contraception among adolescents.

Direct pharmacy access to various forms of self-administered hormonal contraception is common internationally (both in developed and developing countries), and one in four U.S. states have passed laws permitting pharmacist contraceptive prescribing. (9–11) The general structure of pharmacist contraceptive prescribing (or pharmacy access) involves a patient completing a self-screener for potential contraindications to hormonal contraception that is then reviewed by a pharmacist and compared with the Centers for Disease Control and Prevention (CDC) Medical Eligibility Criteria (MEC) for Contraceptive Use.(12) As long as the pharmacist is reasonably sure the patient is not pregnant based on responses to screening questions, the pharmacist reviews the available methods based upon the screener results and provides standardized counseling and other protocol-specific information.(13) The patient chooses a method that the pharmacist directly dispenses. With the exception of a blood pressure measurement – which can be done by a pharmacist – no physical exam or laboratory testing are necessary prior to initiating hormonal contraception.(14–16) If a patient is not eligible for a pharmacy-prescribed method based on screener results or blood pressure check, the pharmacist should refer the patient to another healthcare provider for further evaluation.

Of the 13 states that permit pharmacist contraceptive prescribing, five states do not permit minors to utilize pharmacy access. Contributing factors may include concern for the minor's ability to self-screen for contraindications and other restrictions related to consent to contraception.(17, 18) The literature on adults' ability to self-screen for medical contraindications to hormonal contraception supports pharmacy access. High rates (>90%)

of concordance between adult women and their medical providers are found when reporting potential medical contraindications; less is known about adolescents. (19–21) A single study of adolescents' ability to understand risks from a prototype label of a progestin only contraception pill showed a high degree of label comprehension.(22)

Advances in pediatric medicine have extended lifespans to include reproductive years and led to increasing numbers of adolescents and young adults (AYA) with chronic illnesses and contraindications to hormonal contraception. It is difficult to assess whether age affects the ability of minors to self-screen for contraindications because most AYA are healthy, with true medical contraindications to hormonal contraception uncommon. (23) In order to adequately study the ability to self-screen among AYAs, it is necessary to recruit a sample with higher rates of chronic illness and contraindications to hormonal contraception. These data can inform the care of young people with chronic illness transitioning from adolescent to adult care.

The objective of this study was to examine the influence of age on rates of concordance and discordance between AYAs and their physicians in a population with high rates of chronic illness. We compared AYA and physician screening questionnaires regarding potential medical contraindications to hormonal (combined and progestin-only) contraception in general and subspecialty clinics.

## Methods

### Participants

Females 14–21 years old and their physicians were recruited from adolescent primary care clinics in a federally qualified health center or from pediatric subspecialty clinics (neurology, rheumatology, and cardiology) in a tertiary children's hospital. We obtained physician approval (10 adolescent, 8 rheumatologists, 10 cardiologists and 3 neurologists) to recruit in their clinics prior to study initiation and physicians reviewed the list of scheduled patients prior to the start of clinic. We used consecutive sampling for all scheduled female patients meeting the study inclusion criteria of age and presenting on a day of recruitment. On the days the research staff were in clinic, all adolescents meeting the eligibility criteria based on age were invited to participate. Refusals were usually due to patient time constraints. We over-recruited individuals with potential medical contraindications by recruiting in pediatric subspecialty clinics and a federally qualified health center. This allowed for measured differences in ability to screen for contraindications between AYAs and physicians. The goal of 400 recruited patients was based on initial power calculations estimating a 25% rate of a positive screener, which would give us 0.90 power to detect a 15% difference between AYA and physician answers.

### Measures

After consent was obtained, participants completed a baseline questionnaire and medical contraindication to hormonal contraception screener. The baseline questionnaire included demographics, reproductive history, and contraception use. We hypothesized that family income, health literacy, and the presence of chronic illness would potentially affect an

AYA's ability to self-screen for medical contraindications. Measures included the Family Affluence Scale II (FAS; range 0–9; higher scores indicate higher affluence), health literacy measured by the Rapid Evaluation of Adult Health Literacy, Short Form (REALM-SF; range 0–7; higher scores indicate higher literacy) validated among adolescents, and the Children with Special Healthcare Needs (CSHCN; range 0–5; higher scores indicate higher burden of chronic illness) screener.(24–26) The CSHCN screener was also created as a numeric rank score (indicating increased utilization of services and/or severity of chronic illness). These scales were chosen to measure various characteristics, including the degree of special healthcare needs (or chronic illness), that could impact a patient's ability to self-screen for hormonal contraception.

Both the AYA and the physician completed screeners consisting of questions regarding potential medical contraindications to hormonal contraception, creating dyads. Physicians could consult the electronic medical record (EMR) to answer questions if needed. We based the screener on questionnaires developed and implemented in California and Oregon.(27, 28) Screeners were based upon the CDC MEC for contraceptive use and include medical conditions that might potentially be rated a category 3 (risks outweigh benefits) or category 4 (contraindicated).(13) To augment the comprehensive screening questions, we additionally asked participants whether a physician had told them not to use hormonal contraception because of medical contraindications. For brevity, screener questions indicated potential, but not always actual contraindications. (For example, diabetes alone is not a contraindication, but could be a potential contraindication, but diabetes with vascular complications is a true contraindication.) Our screener, adapted from those used in California and Oregon, asked only about diabetes. AYAs were given a \$10 gift card and physicians were given a \$5 coffee card, with the option to donate it to clinic social workers or other staff.

The measurement of migraine headache with aura proved particularly complex, and we needed to revise the question half-way through the study when preliminary data analysis began and higher-than-expected rates of migraines with aura were reported. The original migraine with aura question used in our screener was adopted directly from the screener used in the Oregon pharmacist contraception prescribing protocol ("Do you get migraine headaches? If so, have you ever had the kind of headaches that start with warning signs or symptoms, such as flashes of light, blind spots, or tingling in your hand or face that comes and goes completely away before the headache starts?").(28) However, participants with any type of migraines frequently responded yes, and because it was a compound question, we were not able to differentiate between migraines with and without aura. Thus, to adjust for this critical differentiation, the single question for migraine with aura was changed to two questions to capture both migraines in general and migraines with aura. To improve the specificity of the provider reports, we reviewed the EMR for the mention of migraine with and without aura and did sensitivity testing using the combined provider/EMR data to create a more narrow definition of migraine with aura from the provider's perspective. The study self-screener and other materials are available at: [www.pharmacyaccessforms.org](http://www.pharmacyaccessforms.org).

## Data Analysis

Comparisons between AYA-provider dyads' answers to the self-screener were coded as either concordant (answers were the same) or discordant (different answers). Primary outcomes included discordance between AYA and provider answers for potential category 3 or 4 CDC MEC contraindications. (13) Unsafe discordance was defined as AYA under-reporting (AYA: No / Provider: Yes), meaning that the AYA might be given a combined or progestin-only hormonal contraceptive when they could have a contraindication, putting them at increased risk for pregnancy or other adverse effect. Safe discordance was defined as an AYA over-reporting (AYA: Yes/Provider: No). With safe discordance, an AYA who qualified for pharmacy access might not be able to receive the medication at the pharmacy because they reported a potential contraindication.

Bivariate analysis (chi-squared and t-tests) examined safe and unsafe discordance by screener question. Significant variables from bivariate analysis were included in regression models. Multivariable logistic regressions examined both overall discordance and unsafe discordance (adjusting for age, family affluence, health literacy and chronic illness) to examine predictors of overall and unsafe discordance. Clinic location (primary care vs. subspecialty care) were analyzed both together and separately.

To examine whether the change in the migraine with aura question had an impact on the outcomes, we separately examined the primary discordance outcomes both before and after the question was changed. Furthermore, data analysis was done with both broad and narrow definitions of this variable to assure there was no difference in final outcomes or logistic regressions.

This study was approved by the Indiana University Internal Review Board with a waiver of parental permission.

## Results

A total of 394 females were recruited from primary care clinics (55%) and subspecialty clinics (45%) between February 2017-August 2018. Of this sample, the mean (Standard Deviation [SD]) age was 16.7 (1.9) and 35% self-identified as African American and 42% as White (Table 1). The majority were publicly insured (53%) (as reported by the physician screener), 38% self-reported being sexually active and 42% had a history of previous hormonal birth control use. Chronic illness, as measured by the CHSCN screener, was common with 65% scoring a one or higher with a mean (SD) score of 1.4 (1.4). Potential contraindications were common, as 50% of patients indicated a possible category 3 or 4 CDC MEC contraindication to hormonal contraception.

Both minors and young adults demonstrated discordance and unsafe discordance. Any discordance between the AYA and provider occurred 42% of the time. Unsafe discordance (AYA: No/Provider: Yes) occurred 18% of the time, but no statistical difference exists when comparing those older or younger than 18 years (22% vs. 16%,  $p=0.11$ ). Unsafe discordance occurred more often in those recruited from subspecialty clinics than general clinics (28% vs. 10%,  $p<0.001$ ). When discordance outcomes were examined both before and after the migraine question was changed and using the broad/narrow definitions, there

was no statistical difference by participant age, but more discordance was present in those recruited from subspecialty clinics.

Safe and unsafe discordance examined by individual question showed generally low frequencies between 0–5% —with one exception—migraines (Tables 2 and 3). The question regarding migraines with aura had the highest rates of both safe and unsafe discordance. In general clinics, 17% of AYAs over-reported migraines with aura compared with physicians (safe discordance) and 6% under-reported migraines with aura compared with physicians (unsafe discordance). In subspecialty clinics, 10% of AYAs over-reported migraines with aura and 20% under-reported their migraine with aura headaches.

Significant interactions between clinic location and key variables, such as health literacy and family affluence, were noted leading to separate logistic regressions by clinic location (Table 4). There were no significant variables associated with either outcome among those recruited from general clinic locations. However, for sub-specialty patients higher family affluence (Odds Ratio [OR]=1.23, 95% Confidence Interval [CI] 1.03–1.46), health literacy (OR=1.41, 95% CI 1.04–1.91) and chronic illness (OR=1.34, 95% CI 1.05–1.72) were associated with any discordance between AYA and physician screeners. When examining unsafe discordance in particular, no variables were significantly associated.

## Conclusion

Our study has four key findings that are important to discuss within the context of pharmacist prescribing of hormonal contraception as it is implemented and expanded in additional states. First, in a population with a high number of AYAs with chronic illnesses and known medical contraindications, the majority of young women were concordant with their physicians on issues such as hypertension, heart disease, and diabetes. General populations, with overall lower rates of chronic illness, will have even lower rates of medical contraindications and lower rates of discordance.(29)

Within our highly selected population with extremely high rates of diseases that are contraindications to estrogens, both adolescents and young adults did not complete self-screeners perfectly. Our rates for discordance for young adults were higher than rates of discordance in other studies of adult women's ability to self- screen.(19, 29) We hypothesize that this is for three reasons. First, we recruited a population with very high rates of serious contraindications (pediatric cardiology, rheumatology and headache clinics). Second, we looked at potential contraindications rather than actual contraindications (e.g. patient report of high blood pressure rather than clinical diagnosis of high blood pressure). Finally, patients were in pediatric sub-specialty clinics, where providers generally did not have access to primary care records, so may have under or over-reported contraindications.

When comparing AYAs' answers to their physicians', the medical condition with the highest rate of unsafe discordance was migraine with aura. Survey studies looking at young people have found that 28% suffer from migraines, with 9% of them having an associated aura. (30) The definition of an aura is not always agreed upon by medical professionals and studies examining clinicians' understanding of migraines shows knowledge gaps.(31) In fact, our self-screener question regarding migraines and associated auras had to be edited

mid-study with the consultation of pediatric neurologists to help clarify and describe an aura accurately. This change reflected an important detail of the self-screening process and highlights the importance of clinicians educating patients on their headache types and whether their described symptoms are auras by clinical definition. The overall high rate of both safe and unsafe discordance regarding migraines underscores an important focus as implementation of pharmacy access expands.

Second, there were not age-related issues with capacity to self-screen for hormonal contraception. Minors' ability to self-screen was the same or better than young adults' in both general and subspecialty settings and supports the notion that AYAs can accurately self-screen for medical contraindications for hormonal contraception within a pharmacy setting. Rather than age, the presence of a chronic illness was more indicative of screening inaccuracies. Therefore, policies should support all women with chronic illness, rather than having specific restrictions for contraception access for minors.

These data are consistent with decision-making studies which show that AYAs have the capacity to make medical and research decisions similar to adults.(32–35) Currently, states are moving forward with legislation to expand access to contraceptives through pharmacy access.(36, 37) While there are often age limits to directly access hormonal contraception through pharmacies, our data provides evidence that AYAs can self-screen for hormonal contraception with reasonable safety. Our data augments what is known about adult women's ability to self-screen for hormonal contraception by including those under 18 years.(19, 20)

Third, when AYAs are discordant, they are mostly over-reporting contraindications—what we deemed safe discordance. While discordance is not ideal, hormonal contraception is lower risk than a pregnancy for these medical conditions. In particular, AYAs in general clinics over-reported the presence of migraines with aura. An important note to make, based on the self-screener results of our study population, almost half (42%) of the participants would have had one discordant result. This means there would have been a high turn-away rate by the pharmacist if the self-screener alone was used. While it is clear the self-screener is not perfect and may be over-screening patients out of this form of access, we believe that it is a vital starting point that can help lead to focused in-person conversations with both pharmacists and other healthcare providers.

Data from states where pharmacy access laws are already implemented have also provided information on rates of contraindications that lead to a referral to another healthcare provider to obtain hormonal contraception rather than pharmacy access.(38) Lu et al. found that for patients utilizing pharmacy access who required a referral, the highest rate was for elevated blood pressure (45%), with migraine with aura and inability to rule-out pregnancy both at 14%.(38) While our participants did not have high rates of hypertension, that is most likely due to their younger age.

With a screener that has a high rate of false-positives, it is important to simultaneously make access to safe hormonal (i.e. progestin-only) and non-hormonal contraception (i.e. barrier methods) options available that day. In particular, progestin-only methods have fewer

contraindications and are options in patients with possible contraindications to estrogen-containing hormonal contraception. With most pharmacy access protocols, this also includes a referral to a clinician, which should be as coordinated and seamless as possible.

Fourth, we found no predictors of unsafe discordance with general or subspecialty patients. Hypothesized factors such as age, health literacy, prior birth control experience, insurance status or family affluence were not associated with higher rates of unsafe discordance. (22, 39) Older AYAs within subspecialty clinics had higher rates of overall discordance, likely related to the presence of medical complexity and the desire (of both patients and providers) to delay transition to adult specialists due to the increased complexity of their chronic illness.(40, 41) AYAs cared for by subspecialty providers frequently have little contact with primary care providers who would provide contraceptive counseling. These data suggest that the subspecialty teams themselves need to educate their patients about potential medical contraindications to hormonal contraception and work in tandem with primary care providers to communicate these medical contraindications. Several models have been used, from broad education focused on subspecialty physicians and advanced practice providers (APP), to identifying a single team member (e.g. a nurse or APP) to counsel all AYAs, to automatic preventive counseling referrals to adolescent medicine or pediatric gynecology for patients with complex medical conditions.

Our study has some limitations. We recruited close to half our study from pediatric subspecialty clinics and thus had a very high number of AYAs with potential contraindications. Given the low rate of prevalence of contraindications among AYAs, some conditions (i.e. blood clot) were rarely reported. Also, only patients that sought healthcare were included and those that declined participation (usually due to time constraints) could have been demographically different than those that participated. Second, our screening questions for migraine with aura was changed halfway through our study recruitment. The study team utilized EMRs to help complete the data set, but this could also have inflated the true number of reported migraines with aura in our sample. Third, our self-screener had an overall high rate of discordance for at least one question. Our original intent was not to examine the efficacy of these screeners, but our results show that additional studies would be helpful moving forward.

In summary, our data show that minor AYAs can self-screen for hormonal contraception similarly to or better than young adults, with chronic illness a significant factor in self-screening. In our population with high rates of chronic illness, both adolescents and young adults reported relatively high rates of discordance. These findings suggest that both primary and subspecialty clinicians taking care of patients with a medical contraindication to hormonal contraception, especially estrogen, should take time to specifically educate and counsel their patients regarding their contraindications and impact on birth control options as access to contraception expands. Furthermore, this can serve as an opportunity to discuss both pregnancy and contraception through the lens of an AYA's medical condition. As pharmacy access programs expand throughout the country, there is additional evidence that all women of reproductive age can partake and that age restrictions should be strongly reconsidered.



## References

- [1]. Souza JP. The World Health Organization Multicountry Survey on Maternal and Newborn Health project at a glance: the power of collaboration. *BJOG* 2014;121 Suppl 1:v–viii. [PubMed: 24641542]
- [2]. Maddow-Zimet I KKaFS. *Pregnancies, Births and Abortions in the United States, 1973–2016: National and State Trends by Age*. New York: Guttmacher Institute; 2020.
- [3]. Hoffman SD, Maynard RA. *Kids having kids: economic costs and social consequences of teen pregnancy*. Washington, DC: Urban Institute Press; 2008.
- [4]. Lindberg L, Santelli J, Desai S. Understanding the Decline in Adolescent Fertility in the United States, 2007–2012. *J Adolesc Health* 2016;59:577–583. [PubMed: 27595471]
- [5]. Secura GM, Allsworth JE, Madden T, et al. The Contraceptive CHOICE Project: reducing barriers to long-acting reversible contraception. *Am J Obstet Gynecol* 2010;203:115.e111–115.e1157. [PubMed: 20541171]
- [6]. Secura GM, Madden T, McNicholas C, et al. Provision of No-Cost, Long-Acting Contraception and Teenage Pregnancy. *N Engl J Med* 2014;371:1316–1323. [PubMed: 25271604]
- [7]. Romero L, Pazol K, Warner L, et al. Reduced Disparities in Birth Rates Among Teens Aged 15–19 Years - United States, 2006–2007 and 2013–2014. *MMWR Morb Mortal Wkly Rep* 2016;65:409–414. [PubMed: 27124706]
- [8]. Sedgh G, Finer LB, Bankole A, et al. Adolescent Pregnancy, Birth, and Abortion Rates Across Countries: Levels and Recent Trends. *J Adolesc Health* 2015;56:223–230. [PubMed: 25620306]
- [9]. Grindlay K, Burns B, Grossman D. Prescription requirements and over-the-counter access to oral contraceptives: a global review. *Contraception* 2013;88:91–96. [PubMed: 23352799]
- [10]. Kennedy CE, Yeh PT, Gonsalves L, et al. Should oral contraceptive pills be available without a prescription? A systematic review of over-the-counter and pharmacy access availability. *BMJ Glob Health* 2019;4:e001402–e001402.
- [11]. Pharmacist Prescribing of Hormonal Contraception. Available at: <https://birthcontrolpharmacist.com/policies/> Accessed November 9, 2020 2020.
- [12]. Curtis KM, Jatlaoui TC, Tepper NK, et al. U.S. Selected Practice Recommendations for Contraceptive Use, 2016. *MMWR Recomm Rep* 2016;65:1–66.
- [13]. Curtis KM TN, Jatlaoui TC, et al. U.S. Medical Eligibility Criteria for Contraceptive Use, 2016; 2016.
- [14]. Tepper NK, Curtis KM, Steenland MW, et al. Physical examination prior to initiating hormonal contraception: a systematic review. *Contraception* 2013;87:650–654. [PubMed: 23121820]
- [15]. Tepper NK, Steenland MW, Marchbanks PA, et al. Laboratory screening prior to initiating contraception: a systematic review. *Contraception* 2013;87:645–649. [PubMed: 23040133]
- [16]. Tepper NK, Curtis KM, Steenland MW, et al. Blood pressure measurement prior to initiating hormonal contraception: a systematic review. *Contraception* 2013;87:631–638. [PubMed: 23063336]
- [17]. *Minors' Access to Contraceptive Services*. New York: Guttmacher Institute; 2021.
- [18]. Joslin C, Greenhut S. *Birth Control in the States: A Review of Efforts to Expand Access*: R Street; 2018 Nov 2018.
- [19]. Grossman D, Fernandez L, Hopkins K, et al. Accuracy of self-screening for contraindications to combined oral contraceptive use. *Obstet Gynecol* 2008;112:572–578. [PubMed: 18757654]
- [20]. Shotorbani S, Miller L, Blough DK, et al. Agreement between women's and providers' assessment of hormonal contraceptive risk factors. *Contraception* 2006;73:501–506. [PubMed: 16627034]
- [21]. Doshi JS, French RS, Evans HE, et al. Feasibility of a self-completed history questionnaire in women requesting repeat combined hormonal contraception. *J Fam Plann Reprod Health Care* 2008;34:51–54. [PubMed: 18201408]
- [22]. Manski R, Kottke M. A Survey of Teenagers' Attitudes Toward Moving Oral Contraceptives Over the Counter. *Perspectives on sexual and reproductive health* 2015;47:123–129. [PubMed: 26098283]

- [23]. Xu H, Eisenberg DL, Madden T, et al. Medical contraindications in women seeking combined hormonal contraception. *Am J Obstet Gynecol* 2014;210:210.e211–210.e2105. [PubMed: 24246525]
- [24]. Arozullah AM, Yarnold PR, Bennett CL, et al. Development and validation of a short-form, rapid estimate of adult literacy in medicine. *Med Care* 2007;45:1026–1033. [PubMed: 18049342]
- [25]. Boyce W, Torsheim T, Currie C, et al. The Family Affluence Scale as a Measure of National Wealth: Validation of an Adolescent Self-Report Measure, 2006.
- [26]. Bethell CD, Read D, Stein RE, et al. Identifying children with special health care needs: development and evaluation of a short screening instrument. *Ambul Pediatr* 2002;2:38–48. [PubMed: 11888437]
- [27]. Self Administered Hormonal Contraception Protocol Information. Available at: [https://www.pharmacy.ca.gov/licensees/hormonal\\_contraception.shtml](https://www.pharmacy.ca.gov/licensees/hormonal_contraception.shtml).
- [28]. Hormonal Contraceptive Self-Screening Questionnaire In: Pharmacy OBo, ed., 2018.
- [29]. Shortridge E, Miller K. Contraindications to oral contraceptive use among women in the United States, 1999–2001. *Contraception* 2007;75:355–360. [PubMed: 17434016]
- [30]. Split W, Neuman W. Epidemiology of migraine among students from randomly selected secondary schools in Lodz. *Headache* 1999;39:494–501. [PubMed: 11279934]
- [31]. Verhaak AMS, Williamson A, Johnson A, et al. Migraine diagnosis and treatment: A knowledge and needs assessment of women’s healthcare providers. *Headache* 2020.
- [32]. Hein IM, De Vries MC, Troost PW, et al. Informed consent instead of assent is appropriate in children from the age of twelve: Policy implications of new findings on children’s competence to consent to clinical research. *BMC Med Ethics* 2015;16:76. [PubMed: 26553304]
- [33]. Grootens-Wiegers P, Hein IM, van den Broek JM, et al. Medical decision-making in children and adolescents: developmental and neuroscientific aspects. *BMC Pediatr* 2017;17:120–120. [PubMed: 28482854]
- [34]. Weithorn LA, Campbell SB. The Competency of Children and Adolescents to Make Informed Treatment Decisions. *Child Dev* 1982;53:1589–1598. [PubMed: 7172783]
- [35]. Weithorn LA. Children’s capacities to decide about participation in research. *IRB* 1983;5:1–5.
- [36]. Yang YT, Kozhimannil KB, Snowden JM. Pharmacist-Prescribed Birth Control in Oregon and Other States. *JAMA* 2016;315:1567–1568. [PubMed: 27019133]
- [37]. What’s the law in your state? Available at: <http://freethpill.org/statepolicies/> Accessed July 12th 2019.
- [38]. Lu S, Rafie S, Hamper J, et al. Characterizing pharmacist-prescribed hormonal contraception services and users in California and Oregon pharmacies. *Contraception* 2019;99:239–243. [PubMed: 30562478]
- [39]. Kilfoyle KA, Vitko M, O’Conor R, et al. Health Literacy and Women’s Reproductive Health: A Systematic Review. *J Womens Health (Larchmt)* 2016;25:1237–1255. [PubMed: 27564780]
- [40]. Britto MT, DeVellis RF, Hornung RW, et al. Health care preferences and priorities of adolescents with chronic illnesses. *Pediatrics* 2004;114:1272–1280. [PubMed: 15520107]
- [41]. Hardin AP, Hackell JM. Age Limit of Pediatrics. *Pediatrics* 2017;140.

**Implications and Contributions Statement:**

Pharmacy access to hormonal contraception depends upon adolescent and young adults (AYA) adequately screening for medical contraindications. For most minor adolescents, current age restrictions for self-screening access to hormonal contraception may be unnecessary. Pediatric subspecialists should anticipate contraceptive needs and counsel those with potential medical contraindications in advance.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 1:** Sample Characteristics, Differences by Age and Differences by Clinic Location

	Sample	Differences by Age		Differences by Clinic	
		<18yrs	>=18yrs	General	Sub-Specialty
	Total	N (%) or Mean ± SD			
<b>Participants</b>	394	268 (68)	126 (32)		
<b>Clinic Location</b>					
General	216 (55)	135 (50)	81 (64)		
Sub-Specialty <sup>^</sup>	178 (45)	133 (50)	45 (36)**		
<b>Age (years)</b>	16.7 yrs ±1.9	15.7 yrs ±1.1	19.0 yrs ±1.0***	16.9 ± 2.0	16.6 ± 1.7
<b>Race/Ethnicity</b>					
African American	137 (35)	87 (33)	50 (40)	126 (59)	11 (6)
White	164 (42)	113 (43)	51 (41)	21 (10)	143 (83)
Latinx	55 (14)	38 (14)	17 (14)	51 (24)	4 (2.3)
Asian, Pacific Islander, Not otherwise listed (self-described)	32 (8)	25 (10)	7 (6)	17 (8)	15 (9)***
<b>Health Literacy<sup>‡</sup> (0-7)</b>	5.9 ± 1.3	5.8 ± 1.3	6.2 ± 1.2**	5.7 ± 1.4	6.2 ± 1.0***
<b>Family Affluence Scale (0-9)</b>	5.5 ± 2.0	5.6 ± 1.9	5.4 ± 2.1	4.8 ± 1.8	6.4 ± 1.8***
<b>Children with Special Health Care Needs (yes/no)</b>	255 (65)	170 (63)	85 (68)	95 (44)	160 (90)
<b>CSHCN (mean/SD) (0-5)</b>	1.4 ± 1.4	1.4 ± 1.4	1.4 ± 1.3	0.8 ± 1.1	2.1 ± 1.2***
<b>Insurance Status</b>					
Public	209 (53)	155 (58)	54 (43)	159 (74)	50 (28)
Private	166 (42)	108 (40)	59 (46)	39 (18)	127 (71)
None	19 (4.8)	5 (1.9)	14 (11)***	18 (8)	1 (0.6)***
<b>Ever Sexually Active</b>	147 (38)	63 (24)	84 (68)***	102 (49)	45 (26)***
<b>Ever Used Any Contraception</b>	200 (51)	99 (37)	101 (80)***	120 (56)	80 (45)*
<b>History of Hormonal Contraception Use</b>	167 (42)	83 (31)	84 (67)***	101 (47)	66 (37)
<b>Currently Using Any Hormonal Contraception</b>	161 (41)	79 (30)	82 (65)***	96 (44)	65 (37)

	Sample	Differences by Age		Differences by Clinic	
		<18yrs	>=18yrs	General	Sub-Specialty
N (%) or Mean ± SD					
<b>Has Any MEC Category 3 or 4 Condition (patient report)</b>	196 (50)	136 (51)	60 (48)	75 (35)	121 (68)***
<i>Outcomes</i>					
<b>Any Discordant Screener Result</b>	166 (42)	112 (42)	54 (43)	79 (37)	87 (49)*
<b>Any Unsafe Discordant Screener Result (Adolescent N/Provider Y)</b>	70 (18)	42 (16)	28 (22)	21 (10)	49 (28)***

\* p < .05,

\*\* p < .01,

\*\*\* p < .001

<sup>‡</sup>REALM-SF: Rapid Estimate of Adult Literacy in Medicine-Short Form

<sup>^</sup>Sub-Specialty Clinics: Pediatric Neurology, Rheumatology and Cardiology

CSHCN: Children with Special Health Care Needs

MEC: Medical Eligibility Criteria

**Table 2:**

Safe and Unsafe Discordance by Condition in General Clinics (N=216)

	Patient Y N (%)	Patient N N (%)	Provider Y N (%)	Provider N N (%)	Concordance		Discordance		
					Concordant Patient: Y Provider: Y N (%)	Concordant Patient: N Provider: N N (%)	Safe Patient: Y Provider: N N (%)	Unsafe Patient: N Provider: Y N (%)	
<b>Medical Eligibility Criteria (MEC) Screening Questions</b>									
Have you given birth in the past 6 weeks?	1 (1)	215 (99)	0 (0)	215 (100)	0 (0)	214 (99)	1 (1)	0 (0)	0 (0)
Are you currently breastfeeding	2 (1)	214 (99)	0 (0)	215 (100)	0 (0)	213 (99)	2 (1)	0 (0)	0 (0)
Do you think you might be pregnant now?	1 (1)	215 (99)	0 (0)	216 (100)	0 (0)	215 (99)	1 (1)	0 (0)	0 (0)
Do you have diabetes?	4 (2)	212 (98)	2 (1)	213 (99)	1 (1)	211 (99)	2 (1)	1 (1)	1 (1)
Do you get migraine headaches? If so, have you ever had the kind of headaches that start with warning signs or symptoms, such as flashes of light, blind spots or tingling in your hand or face that comes and goes completely away before the headache starts?	47 (22)	169 (78)	23 (11)	193 (89)	11 (5)	157 (73)	36 (17)	12 (6)	12 (6)
Do you have high blood pressure, hypertension or high cholesterol? (please indicate yes even if it is controlled by medication)	10 (5)	206 (95)	8 (4)	207 (96)	1 (1)	198 (92)	9 (4)	7 (3)	7 (3)
Have you ever had a heart attack or stroke, or been told you had any heart disease?	3 (1)	213 (99)	2 (1)	214 (99)	0 (0)	211 (98)	3 (2)	2 (1)	2 (1)
Have you ever had a blood clot?	8 (4)	208 (96)	0 (0)	214 (100)	0 (0)	206 (96)	8 (4)	0 (0)	0 (0)
Do you have lupus, rheumatoid arthritis, or any blood disorders?	6 (3)	210 (97)	1 (1)	215 (99)	0 (0)	209 (97)	6 (3)	1 (1)	1 (1)
Have you had bariatric surgery or stomach reduction surgery?	1 (1)	215 (99)	0 (0)	216 (100)	0 (0)	215 (99)	1 (1)	0 (0)	0 (0)
Do you have or have you ever had hepatitis, liver disease, liver cancer or gall bladder disease, or do you have jaundice (yellow skin or eyes)?	0	215 (100)	0 (0)	216 (100)	0 (0)	215 (100)	0 (0.0)	0 (0)	0 (0)
Have you had recent major surgery or are you planning to have surgery in the next 4 weeks?	5 (2)	211 (98)	1 (1)	213 (99)	1 (1)	209 (98)	4 (2)	0 (0)	0 (0)
Do you have or have you ever had breast cancer?	0 (0)	216 (100)	0 (0)	215 (100)	0 (0)	214 (100)	0 (0)	0 (0)	0 (0)
Do you take medication for seizures, tuberculosis (TB), fungal infections or human immunodeficiency virus (HIV)?	2 (1)	213 (99)	1 (1)	213 (99)	1 (1)	211 (98)	1 (1)	0 (0)	0 (0)
<b>Additional Risk Screening Questions *</b>									
Have you ever been told by a medical professional that you are at a risk of developing a blood clot?*	1 (1)	215 (99)	3 (1)	211 (99)	0 (0)	210 (98)	1 (1)	3 (1)	3 (1)
Have you been told by a medical professional not to take hormones?*	14 (7)	202 (93)	3 (1)	210 (99)	0 (0)	196 (92)	14 (7)	3 (1)	3 (1)
Do you have allergies or bad reactions to medications?*	25 (12)	191 (88)	22 (10)	194 (90)	8 (4)	177 (82)	17 (8)	14 (6)	14 (6)

\* Not classified as a Category 3 or 4 contraindication to hormonal contraception

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 3:**

Safe and Unsafe Discordance by Condition in Specialty Clinics (N=178)

	Patient Y N (%)	Patient N N (%)	Provider Y N (%)	Provider N N (%)	Concordance		Discordance		
					Concordant Patient: Y Provider: Y N (%)	Concordant Patient: N Provider: N N (%)	Safe Patient: Y Provider: N N (%)	Unsafe Patient: N Provider: Y N (%)	
<b>Medical Eligibility Criteria (MEC) Screening Questions</b>									
Have you given birth in the past 6 weeks?	2 (1)	176 (99)	0 (0)	177 (100)	0 (0)	175 (99)	2 (1)	0 (0)	0 (0)
Are you currently breastfeeding	0 (0)	178 (100)	0 (0)	178 (100)	0 (0)	178 (100)	0 (0)	0 (0)	0 (0)
Do you think you might be pregnant now?	2 (1)	176 (99)	2 (1)	176 (99)	2 (1)	176 (99)	0 (0)	0 (0)	0 (0)
Do you have diabetes?	2 (1)	175 (99)	1 (1)	176 (99)	1 (1)	174 (99)	1 (1)	0 (0)	0 (0)
Do you get migraine headaches? If so, have you ever had the kind of headaches that start with warning signs or symptoms, such as flashes of light, blind spots or tingling in your hand or face that comes and goes completely away before the headache starts?	74 (42)	103 (58)	91 (51)	87 (49)	56 (32)	68 (38)	18 (10)	35 (20)	
Do you have high blood pressure, hypertension or high cholesterol? (please indicate yes even if it is controlled by medication)	14 (8)	163 (92)	12 (7)	164 (93)	8 (5)	157 (90)	6 (3)	4 (2)	
Have you ever had a heart attack or stroke, or been told you had any heart disease?	12 (7)	165 (93)	12 (7)	166 (93)	6 (3)	159 (90)	6 (3)	6 (3)	
Have you ever had a blood clot?	7 (4)	170 (96)	5 (3)	172 (97)	3 (2)	167 (95)	4 (2)	2 (1)	
Do you have lupus, rheumatoid arthritis, or any blood disorders?	41 (23)	137 (77)	37 (20)	141 (80)	32 (18)	131 (74)	9 (5)	5 (4)	
Have you had bariatric surgery or stomach reduction surgery?	0 (0)	177 (100)	0 (0)	175 (100)	0 (0)	174 (100)	0 (0)	0 (0)	
Do you have or have you ever had hepatitis, liver disease, liver cancer or gall bladder disease, or do you have jaundice (yellow skin or eyes)?	5 (3)	172 (97)	4 (2)	174 (98)	1 (1)	169 (96)	4 (2)	3 (1)	
Have you had recent major surgery or are you planning to have surgery in the next 4 weeks?	11 (6)	166 (94)	4 (2)	171 (98)	2 (1)	161 (93)	9 (5)	2 (1)	
Do you have or have you ever had breast cancer?	0 (100)	177 (100)	0 (0)	178 (100)	0 (0)	177 (100)	0 (0)	0 (0)	
Do you take medication for seizures, tuberculosis (TB), fungal infections or human immunodeficiency virus (HIV)?	8 (5)	168 (95)	0 (0)	174 (100)	0 (0)	164 (95)	8 (5)	0 (0)	
<b>Additional Risk Screening Questions *</b>									
Have you ever been told by a medical professional that you are at a risk of developing a blood clot?*	10 (6)	167 (94)	9 (5)	163 (95)	5 (3)	157 (92)	5 (3)	4 (2)	
Have you been told by a medical professional not to take hormones?*	11 (6)	166 (94)	10 (6)	162 (94)	5 (3)	155 (91)	6 (3)	5 (3)	
Do you have allergies or bad reactions to medications?*	60 (34)	117 (66)	55 (31)	123 (69)	45 (25)	107 (61)	15 (9)	10 (6)	



\* Not classified as a Category 3 or 4 contraindication to hormonal contraception

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

**Table 4:** Logistic Regressions for Outcomes of Any Discordance and Unsafe Discordance

<i>General</i>	<b>OR (95 CI)</b>	<b>OR (95 CI)</b>
Age > 18 years	0.80 (0.45–1.42)	1.96 (0.80–4.86)
Family Affluence	0.95 (0.81–1.10)	0.97 (0.76–1.25)
Health Literacy <sup>‡</sup>	0.89 (0.71–1.05)	1.06 (0.76–1.47)
CSHCN	1.23 (1.00–1.62) <sup>§</sup>	1.10 (0.75–1.61)
<i>Specialty</i>		
Age > 18 years	1.83 (0.92–3.63) <sup>§</sup>	1.92 (0.93–3.95) <sup>§</sup>
Family Affluence	1.23 (1.03–1.46) <sup>*</sup>	1.20 (0.98–1.46) <sup>§</sup>
Health Literacy <sup>‡</sup>	1.41 (1.04–1.91) <sup>*</sup>	1.19 (0.84–1.70)
CSHCN	1.34 (1.05–1.72) <sup>*</sup>	1.27 (0.97–1.66) <sup>§</sup>

<sup>§</sup> p < .10,

<sup>\*</sup> p < .05,

<sup>\*\*</sup> p < .01,

<sup>\*\*\*</sup> p < .001

OR = Odds Ratio, CI = Confidence Interval

<sup>‡</sup> REALM-SF: Rapid Estimate of Adult Literacy in Medicine-Short Form

CSHCN: Children with Special Health Care Needs