Contraception

Issues in Adolescent Health and Development

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Preface

There is widespread acknowledgement that although adolescents share many characteristics with adults, their health-related problems and needs are different in a number of significant respects. Following on from this, there is a growing recognition among clinicians and public-health workers alike that the approaches used to prevent and respond to health problems in adults need to be tailored (to a greater or lesser extent) if they are to meet the special needs of adolescents.

The Department of Child and Adolescent Health and Development (CAH), in collaboration with other WHO departments, has initiated a series of literature reviews and discussion papers in order to identify existing recommendations on clinical management, and to assess how appropriate these are for adolescents across a wide range of health issues. This process has also led to the formulation of new recommendations on clinical management where none existed, or where existing ones are inappropriate.

This same process is also contributing to the improvement of existing WHO guidelines and algorithms and to the development of new ones to enable health-care providers to meet better the special needs of adolescents, effectively and with sensitivity. Even though WHO advocacy statements often draw attention to the particular vulnerabilities of adolescents, its guidelines on clinical management still tend to be directed towards meeting the needs of adults.

In addition to the present work, which addresses various issues and aspects of contraception use in adolescence, reviews and discussion papers have also been carried out – and corresponding documents produced – in the areas of:

- Lung health
- Malaria
- Nutrition
- Pregnancy
- Sexually transmitted infections
- Unsafe abortion.

Work is also under way to develop similar documents on HIV/AIDS care; chronic illness; mental health; and substance abuse.

Introduction

Adolescent fertility regulation and pregnancy prevention is one of the most important health-care issues of the twenty-first century. More than 15 million girls between the ages of 15 and 19 give birth every year worldwide, and an additional 5 million have abortions. In Central America, 18% of all births are to women in their teens and in Africa this figure is 23%. Even supposedly "developed" countries are not insulated from these trends. In the United States, there are nearly 1 million adolescent pregnancies each year, with over 450 000 ending in abortion (Alan Guttmacher Institute, 1998; International Planned Parenthood Federation, 1994). Although the full extent of the unmet need for contraception is hard to gauge there is clearly a great need for increased adolescent reproductive and sexual health education (Table 1).

Since research suggests that behaviour in adolescence sets the pattern for the rest of an individual's life, the paucity of existing sexual and reproductive health-care programmes for adolescents is particularly disturbing. Studies show that women who begin childbearing early are more likely to fall into a pattern of having births too closely together, and that these women will tend towards having larger families (International Planned Parenthood Federation, 1994). The consequences of unsafe abortion and unwanted pregnancies are also extremely worrying. In addition, inadequate sexual health care contributes to the spread of sexually transmitted infections (STIs) and may lead to damaging effects on an adolescent's lifelong health and fertility.

In response to this need for increased attention to adolescent fertility, the 1994 International Conference on Population and Development (ICPD) stressed the importance of taking adolescent sexual and reproductive health needs seriously, and emphasized that these needs should be seen as basic human rights. In the ICPD Program of Action, governments, in collaboration with nongovernmental organizations (NGOs), are urged to meet the special needs of adolescents while safeguarding their rights to privacy, confidentiality, respect and informed consent.

Though some progress is being made, many sexual and reproductive health-care programmes continue to ignore the needs of adolescents. Most existing programmes for adolescents are small, and are often initiated by NGOs on an experimental or trial basis. Nevertheless, the lessons learned from such initiatives will be extremely useful in developing large-scale programmes focused on improving adolescent reproductive and sexual health. Evidence has shown that initiatives which focus upon youth development and which respect adolescents as autonomous individuals are more successful in attracting adolescents to health services, thus enhancing STI prevention, and preventing early pregnancy and childbearing (Kirby, 2001a; Fitzgerald et al., 1999; McBride & Gienapp, 2000; Whitaker et al., 2000; Taylor-Seehafer & Rew, 2000). Furthermore, programmes that have the added dimension of adolescent participation, peer counselling and other adolescent-friendly attributes in their programme design tend to be very successful (Kirby, 2001b; Kilbourne-Brook, 1998; Family Health International Network, 2000; Weiss et al., 1996). Additionally if such a programme is administered within the context of a supportive political and cultural environment, adolescent pregnancy, childbearing, and STI rates plummet (Santow & Bracher, 1999).

The purpose of this document is to focus upon factors that influence health-care provider and adolescent client interactions. Once within a clinical setting, the qualities of those interactions further determine whether the provider will help or hinder an adolescent's progress towards responsible reproductive and sexual health behaviours.

This paper's principal aim is to consider the special requirements of adolescents for fertility regulation and pregnancy prevention and to make recommendations on how providers should tailor clinical management practices to meet these special needs. Recommendations made within this document are intended for policy-making and guideline-producing agencies to frame important considerations that should inform development of clinical guidelines for health-care providers. The underlying goal of this document is to define and distinguish between medical care approaches to providing reproductive and sexual health care to adolescents rather than adults.

Table 1: Percentage of adolescent births that are unplanned and percentage of married adolescents aged 15–19 who do not want a child soon in selected countries

Country	% of unplanned adolescent births	% of married adolescents who do not want a child soon
Sub-Saharan Africa		
Botswana (1988)	77	62
Ghana (1993)	64	83
Kenya (1993)	57	66
Namibia (1992)	56	28
Zimbabwe (1994)	50	70
Asia		
Bangladesh (1994)	21	71
Philippines (1993)	44	81
Sri Lanka (1987)	30	76
Thailand (1997)	32	76
Turkey (1993)	24	71
Latin America		
Brazil (1996)	49	88
Colombia (1995)	44	83
Dominican Republic (1991)	40	66
El Salvador	48	82
Peru	52	90

Source: Alan Guttmacher Institute. Into a New World. Young Women's Sexual and Reproductive Lives. New York, 1998.

PART 1:
The nature of the problem – Early and unwanted pregnancy amongst adolescents

Over the past 50 years, the need for specially tailored, sexual health services for adolescents has become more pressing. Societal change caused by industrialization and urbanization has lead to loosening of family ties and erosion of the traditional sanctions that formerly inhibited premarital sexual activity. Younger ages of menarche combined with delayed average age of marriage means that there is a longer time period between the onset of sexual maturity and marriage (International Planned Parenthood Federation, 1994). Adolescents are no longer always able to rely on intergenerational relationships, which in the past might have given them information about responsible sexual behaviour. As the gap between the generations grows, adolescents are increasingly forced to learn about sexual issues from their peers or from the mass media (Alan Guttmacher Institute, 1998).

1.1 Adolescent sexual behaviour

As part of the transition from childhood to adulthood, all adolescents experience sexual feelings. Some act upon these feelings by having sexual intercourse; others don't have intercourse but engage in behaviours stopping short of penile/vaginal intercourse; some engage in anal intercourse or oral sex (Remez, 2000); and others deny their sexual feelings by focusing intensely on non-sexual pursuits. Other adolescents are able to have socially acceptable intercourse through early, sometimes pre-arranged, marriages. Sexual behaviour among adolescents is not new – what is new is the delay in marriage that attends increasing educational attainment, and non-agricultural and increasingly technological free-market societies. Worldwide, as women become more educated and the economic development of their home country advances, there is a trend towards delayed median age at first marriage and median age at first *intended* pregnancy (Population Reports, 1995). In highly developed countries, the gap between age of puberty and the ability of young people to be economically independent (i.e. to take on the responsibilities of marriage and parenthood) has increased (Population Reports, 1995; Zabin, 1994; Zabin, 1990; Kirby, 1997; Moore et al., 1995; Alan Guttmacher Institute, 1999). Although some adults may find the idea disturbing, the reality now is that many adolescents have sexual relations before they are ready for marriage and families (Table 2) and research conducted by the Alan Guttmacher Institute shows that:

- Eight in 10 young women in sub-Saharan Africa have had their first sexual intercourse before the age of 20; four in 10 before marriage.
- Eight in 10 young women in five developed countries have had intercourse as adolescents; seven in 10 before marriage.
- Six in 10 young women in Latin America and the Caribbean have had sex in adolescence; three in 10 before marriage (Alan Guttmacher Institute, 1998).

Additionally, it should be remembered that the number of women married while in adolescence is not insignificant. Eighteen percent of girls in Asia, 16% of girls in Africa and 8% of girls in Latin America are married by age 15 (International Planned Parenthood Federation, 1994).

1.2 Contraceptive use among adolescents

Compounding all the problems associated with the early experience of first sexual intercourse before marriage is the low level of contraceptive use amongst adolescents (Table 3). Among women aged 15–24 surveyed in Latin America and the Caribbean, the levels of contraceptive use at first intercourse ranged

from 4% in Quito to 43% in Jamaica. For men 15–24, the corresponding percentages ranged from 14% in Quito to 31% in Mexico City (Harper, 1988). Studies in the United States and other countries have found that among women there is an average delay of about one year between the onset of coital activity and the use of modern contraceptives (Population Reports, 1995).

1.3 Consequences of early and unwanted pregnancy amongst adolescents

1.3(a) Medical consequences of early pregnancy

Compared to the pregnancies of women in their 20s, adolescent pregnancies may be attended by increased levels of mortality and morbidity. This increase, if it occurs, is usually the consequence of:

- less antenatal care and delayed intrapartum care (Alan Guttmacher Institute, 2002a,b; Anandlakshmy & Buckshee, 1993)
- obstructed and prolonged labour due to an undeveloped pelvis (Alan Guttmacher Institute, 2002b).

The child of an adolescent mother is also at a disadvantage. Several studies indicate that adolescent pregnancies are attended by increased rates of pre-term labour and stillbirth. In addition, the chance of dying in the first year of life is more than 60% higher for babies born to the under-18s than for those born to older mothers. Many studies also show that the babies of adolescent mothers are more likely to be born prematurely and have a low birth weight (International Planned Parenthood Federation, 1994; Alan Guttmacher Institute, 2002b; Anandalakshmy & Buckshee, 1993; Jolly et al., 2000; Treffers et al., 2001; Arkutu, 1978–79; Gosselink et al., 1993; Rosenberg & McEwan, 1991; Phipps & Sowers, 2002; Mesleh et al., 2001).

1.3(b) Sexually transmitted infections (STIs)

WHO estimates indicate that one in every 20 adolescents and young people contract an STI each year. Young people may not seek help for STIs because they do not realize they have an infection or because they are too embarrassed to go to a clinic, or because they may not have access to treatment. Late-treated or untreated STIs can potentially hinder the adolescent's long-term health and fertility.

1.3(c) Unsafe abortion

Safe legal abortion is rarely available and accessible outside the developed world. Unsafe abortion (which is the cause of 13% of global maternal mortality) is common in places where abortion is illegal and tends to be more dangerous for adolescents as they tend to seek abortion later in pregnancy (International Planned Parenthood Federation, 1994). Unsafe abortion is a subject dealt with separately by another of the WHO papers in this series and elsewhere (Olukoya et al., 2001).

1.3(d) Social and personal consequences of early pregnancy

Once a young woman becomes pregnant, whether the pregnancy is continued or not, the effects on her personal, social and educational life are often irreversible. In some societies unmarried young women who become pregnant or who are known to have had an abortion may become social outcasts. Sometimes, young women are forced to give up school because of a fear that they will be a "bad influence" on other girls. Early parenthood, particularly for young women, may limit or preclude social, educational and employment development and the ability to achieve full status in society (UNFPA/WHO/UNICEF, 1989). These consequences reinforce existing gender divisions and can lead to a spiral of low self-esteem, further pregnancies, plus intergenerational early pregnancy, early childbearing and poverty.

Table 2: Percentage of women aged 20–24 from sub-Saharan Africa and Latin American countries who are sexually active by age 20

Country	All	Before marriage
Sub-Saharan Africa		
Botswana (1988)	91	81
Côte d'Ivoire (1994)	95	64
Ghana (1993)	88	69
Liberia (1986)	98	67
Togo (1988)	92	68
Latin America		
Bolivia (1994)	58	28
Brazil (1996)	62	40
Colombia (1995)	62	35
Paraguay (1990)	61	34
Peru (1991)	45	27

Sources: Alan Guttmacher Institute. Into a New World. Young Women's Sexual and Reproductive Lives. New York, 1998.

Table 3: Percentage of sexually active married and unmarried women aged 15–19 using modern contraception* in selected countries (two countries with the highest and two with the lowest level of use selected)

Country	% Married	% Unmarried
Sub-Saharan Africa		
Botswana (1988)	12	29
Cameroon (1991)	0	1
Namibia (1992)	17	30
Senegal (1993)	0	0
Asia		
India (1993)	3	N/A
Indonesia (1994)	32	N/A
Pakistan (1991)	1	N/A
Thailand (1987)	39	N/A
Latin America		
Bolivia	8	5
Brazil	40	31
Colombia	30	16
Guatemala	2	N/A

**Pill, injectable, IUD or implant*
Source: Alan Guttmacher Institute. Into a New World. Young Women's Sexual and Reproductive Lives. New York, 1998.

Part 2
Personal and social issues affecting adolescents

2.1 Exploring the terrain of adolescence

Although adolescents are often viewed as a homogenous group in much of the published literature, they are not. Very often the precise age parameters are documented inconsistently, or an age segment of this group is completely overlooked. In a joint statement in 1998, WHO, UNICEF and UNFPA established the categories of "adolescent" (those aged 10–19 years) and "youth" (15–24). For the purposes of designing appropriate interventions, the use of this international age designation for adolescence is recommended. Adolescence is typically a period of transition between childhood and adulthood with the major psychological tasks being to: determine identity; develop power to make decisions and be in control; and develop a mature sexuality. Mature sexuality is defined as a "comfort with oneself and the ability to enter into a relationship in a giving and mutually trusting way" (Strasburger & Greydanus, 2000). In countries where there is no such prolonged social transition into adulthood and individuals within the adolescent age group are expected to assume adult roles and responsibilities, the common health needs that transcend those social roles will be addressed in this paper.

Adolescence is customarily divided into three phases (WHO, 1995, Unpublished document WHO/FHE/ADH/95) – early adolescence (from 10–14 years of age); middle adolescence (14–17); and late adolescence (17–19 and sometimes extended to ages 21 or 22) (www.gktged.sask.com/cni/instres/food/147; www.nursingworld.org/mods/mod4/ceah5.htm; Scales, 1991; Davis, 1995). Each phase has its own specific characteristics and developmental tasks. Consequently, "adolescents" cannot be considered as a homogenous group, and interventions for information, education and health services have to be tailored to their specific capabilities and levels of readiness.

Early adolescence is characterized by the developmental tasks of physical and cognitive maturation; emotional expressiveness; increased need for belonging and peer membership; and experimentation with social relationships. Body image is of great concern as is a preoccupation with normality. This phase is also characterized by concrete thinking – namely an inability to see beyond the immediate or to deal with remote, future or hypothetical problems.

Sexuality during early adolescence is characterized by individuals being shy and modest. They may also have a greater interest in privacy, experiment with their body (masturbation), and worry about being normal. Adolescents in this group do not usually interact in romantic relationships but when they do, the encounters tend to be awkward, self-conscious and filled with doubt. Relationships tend to be short-lived.

In ***middle adolescence,*** the developmental tasks and physical changes tend to become more settled with an emphasis on emotional control, intimacy, moral development, social justice and spirituality. The focus is also on improving appearance and attractiveness, and socializing occurs in mixed-sex peer groupings, if culturally appropriate. It is during this phase of adolescence that more realistic career goals are considered and limitations recognized. Adolescents in disadvantaged situations may begin to feel hopeless at this point.

Sexuality during middle adolescence tends to be focused on sexual attractiveness, with individuals frequently changing relationships, if culturally acceptable. Fear and discomfort may be shown towards the opposite sex (or same sex) as well as feelings of tenderness, love and passion.

Late adolescence sees an increased involvement in acquiring the practical skills necessary for functioning independently of parents, making critical decisions related to occupation, marriage or partnering, as well as consolidating a moral code and sociopolitical ideology. At this point there is an increased ease with self. Adolescents during this phase can usually handle delayed gratification, although this is not always achieved even into adulthood.

In late adolescence, sexuality focuses on serious relationships, clear sexual identity, and capacities for tender and sensual love (American School Counsellors Association, www.familyeducation.com). Although the possibility of abusive and exploitative behaviours remains, relationships at this point tend to be characterized by concern for the feelings and well-being of the partner.

It is important to remember that it is during adolescence that sexual identification with homosexuality and/or bisexuality begins. Adolescents who recognize that they have a differing sexual preference from society at large may feel isolated or may fear sharing their true feelings. This has significant implications for adolescent sexual and mental health and for helping adolescents to develop life-affirming health behaviours.

During the course of maturation, the adolescent also develops some degree of "formal operational thinking" (Piaget, 1969) characterized by thinking on one's own, transferring information from one situation to another, the ability to deal with complex issues involving reasoning, planning realistically for the future, and conceptualizing abstract ideas. Some individuals never achieve this level of thinking even into adulthood as this capacity must be nurtured skilfully by the significant adults in the adolescent's life.

Moral psychosocial development shows adolescents moving from the level of moral thinking and judgement characterized by persons motivated by external factors, opinions of others and existing laws, and simplistic concepts of what is right, to embracing more universal and abstract principles of justice (www.nursingworld.org/mods/mod4/ceah5.htm). As with the development of formal operational thinking, such moral development is not an absolute progression, and some individuals never embrace universal and abstract principles of justice even in adulthood.

2.2 Gender and cross-cultural influences

Gender stereotypes and role expectations often put adolescents at serious health risk. Very often adolescent men are taught that being sexually active is a very important part of being a "man". The messages and practices that they learn from their social environment (peers, fathers, uncles, male associates) may be inaccurate and counter to healthy practices. For example, adolescent men might be ridiculed for not being sexually active, or teased as being homosexual; they might be encouraged to obtain sexual initiation from a sex worker without using condoms; and sexually transmitted infections may be regarded as a "rite of passage" for masculinity.

Female adolescents on the other hand are often socialized to be non-aggressive, and to abstain from sexual activity until marriage. Female adolescents therefore receive positive reinforcement for being quiet, innocent and unaware of sexual matters. This can place them in a difficult position, and can impede their participation in (or initiation of) meaningful communication, or reduce their ability to refuse unwanted sexual advances and/or to negotiate condom use or safer sexual practices when sexual intercourse is desired.

In social settings where adolescent females marry early, they are typically married to older men who very often have the financial ability to support them. Marriage confers on the adolescent the status of adulthood. However, by virtue of differences in age, education, income-generating capacity, and the non-assertive role expectations of the adolescent woman and her older husband, a relationship imbalance exists. This imbalance makes it very difficult for her to discuss matters such as the desired timing and number of children, contraceptive use and protection from sexually transmitted infections. In societies

where childbearing is highly valued, young couples are pressured to begin childbearing within the first year of marriage, often overriding their own desire to postpone child bearing and making the discussion of life planning a futile exercise.

2.3 Sociocultural influences

Few countries in the world address the sexual and reproductive health needs of adolescents due to great controversy over the issue of adolescent sexuality, and the inability (or unwillingness) to consider adolescents as individuals with rights. Cultures can be categorized as being one of four basic types (Strasburger & Greydanus, 2000) according to the permitted expression of adolescent sexuality, namely:

- Sexually repressive – where attempts are made to block the expression of adolescent sexuality; sexual behaviour is associated with guilt, fear, anger, and sexual pleasure or expression may be associated with evil.
- Sexually restrictive – where cultures attempt to limit sexuality; premarital abstinence is required for at least one of the sexes, usually women.
- Sexually permissive – where cultures tolerate sexuality; sexuality among adolescents is considered normal and a valued part of life.
- Sexually supportive – where sex is seen as indispensable for human happiness, and sexuality is encouraged among the young; customs and social structures provide information for responsible behaviour.

These characteristic cultural parameters on sexuality must be taken into consideration when developing strategies for interventions to support healthy behaviours among adolescents. As global mobility increases, governmental systems are increasingly challenged by culturally diverse codes of behaviour that influence whether health services for adolescents will be effective.

Nonetheless, the most basic needs of adolescents, regardless of culture, age and marital status, are for accurate and complete information about their body functions, sex, safer sex, reproduction, and sexual negotiation and refusal skills. Without information, adolescents are forced to make ill-informed decisions that will potentially have profoundly negative effects on their lives. Since adolescents do not usually have disposable income, affordable health services are crucial for them to access needed services, including access to pregnancy-related services.

In many settings where adolescents and their unique health needs are not seen as different from children, significant attitudinal, policy and environmental barriers exist. Yet adolescents are greatly concerned about privacy and confidentiality related to sexual matters. Unmarried adolescents are at particular risk of experiencing negative attitudes from parents, teachers and health-care providers. Sometimes even married adolescents face unsupportive attitudes from health-care providers when they seek information regarding contraception before beginning childbearing. These attitudinal barriers create a major disincentive to adolescents interested in receiving sexual and reproductive health information and services. In settings where adolescent health needs are not addressed, the following factors can lead to serious health problems (Center for Reproductive Law and Policy, 1999):

- Lack of access to health information and services (services do not exist, negative staff attitudes are a barrier, and/or services are not affordable).
- Disparity in educational access for boys and girls leaves girls disadvantaged when trying to access information; early marriage for girls results in their withdrawal from school; pregnant adolescent girls are expelled from school.
- Lack of sexual and reproductive health education within the educational system.
- Lack of laws or their enforcement to prevent early marriage, particularly for girls.
- Lack of (or no access to) safe abortion services (unmarried adolescents decide to terminate their pregnancies more frequently than other groups, resulting in 1–4 million adolescents undergoing

unsafe abortions, and the attendant consequences). Legal and policy restrictions on safe abortion persist in parts of Latin America, Africa and the Middle East.

- Adolescent women are more vulnerable to HIV/AIDS and other STIs than adolescent men and restrictions on sexual and reproductive health information and services makes it very difficult for adolescents to protect themselves.
- Lack of laws and/or their enforcement against violence including rape, sexual assault, incest, commercial sexual exploitation and sexual slavery.
- Lack of policies, laws, enforcement and multidisciplinary approaches for eliminating female genital mutilation.
- Lack of economic structures for adolescents to generate income to help protect them from sexual exploitation.

In emphasizing the provision of sexual and reproductive health information and services it is recognized that additional strategies will need to be developed to facilitate the attitudinal shifts necessary to create educational, social, legal and health structures that are proactive and responsive to adolescent needs within the specific cultural context. The rights to health, reproductive health, and to the information and services to secure these rights, are enshrined in several international human rights instruments. These include the International Covenant on Economic, Social and Cultural Rights, the Convention on the Elimination of All Forms of Discrimination Against Women, and the UN Convention on the Rights of the Child. Preventing adolescents from accessing sexual and reproductive health information and services is a violation of their human rights.

PART 3
Contraceptive methods

3.1 Introduction

In general, with the exception of male and female sterilization, all methods that are appropriate for healthy adults are also potentially appropriate for healthy, post-pubertal adolescents. Once puberty has been achieved, methods that are physiologically safe for adults are also physiologically safe for adolescents. However, as with adults, informed contraceptive decision-making entails consideration of more than just medical safety. Before discussing contraceptive options, adolescents must be given the opportunity to express their needs and to decide freely whether they want to protect against pregnancy or need to protect against STI/HIV. Once a decision is made for protection, sexually active adolescents should be presented with options that, if used consistently and correctly, will prevent pregnancy and, depending upon an individual's circumstances, prevent sexually transmissible diseases. As discussed in PART 4, counselling dialogue between the adolescent and members of the health-care team should be structured to assist the adolescent in making a decision that is informed, voluntary and appropriate to the adolescent's particular circumstances. When selecting a method, each adolescent should consider the nature of his/her sexual relationship(s), sexual behaviours engaged in, frequency of intercourse, risk of STIs/HIV, efficacy of the method, ability to comply with use, ability to tolerate side-effects, services available, cost, convenience, religious beliefs, partner(s) attitudes, and additional personal factors that may influence the decision and method compliance. When sexual activity is infrequent or if multiple partners are likely, condoms may be a priority option. Emergency contraceptive pills are an option in the event of condom breakage, slippage, or other causes of unprotected intercourse. Adolescents who engage in frequent intercourse may opt for methods that are not coitally related to protect against pregnancy, but will still require routine condom use for STI/HIV prevention. These generalizations, while derived from population-based evidence of adolescent sexual behaviours, do not preclude client and provider dialogue that specifically seeks to explore the adolescent's personal circumstances, and their desires regarding pregnancy prevention, future fertility plans and protection of personal health.

The following sections briefly review all modern contraceptive options. In addition, traditional approaches such as fertility-awareness methods, lactational amenorrhoea and withdrawal will be briefly discussed. The text will focus specifically on aspects of the method that, based on currently available evidence, may be important to adolescents, or deserve emphasis when in dialogue with adolescents.

While the primary emphasis presented here is upon information unique to adolescents, information critical to the understanding of a particular method (or to providing counselling about it) is also provided, even though such information may be equally applicable to adults and adolescents.

Where guidance and data are the same as for adults, the reader is referred to the relevant sections of:

- *Improving Access to Quality Care in Family Planning: Medical Eligibility Criteria for Contraceptive Use*. Second Edition. WHO/RHR/00.02, World Health Organization, Geneva, 2000 – abbreviated throughout to "**IAQCFP**".
- *The Essentials of Contraceptive Technology: A Handbook for Clinic Staff*. Third Printing. Population Information Program, Center for Communication Programs, Baltimore, Maryland, 2001 – abbreviated throughout this section to "**ECT**".

In the rare instances where the information provided by these two sources conflicts, preference should be given to the information found in *Improving Access to Quality Care in Family Planning: Medical Eligibility Criteria for Contraceptive Use* (**IAQCFP**).

3.2 Contraceptive methods available for use by adolescents

a: Dual protection and dual method use
b: Barrier methods
c: Emergency contraception
d: Low-dose combined oral contraceptives (COCs)
e: Combined injectable contraceptives (CICs)
f: New hormonal delivery systems
g: Progestogen-only pills (POPs)
h: Progestogen-only injectables
i: Progestogen-only implants
j: Intrauterine devices (IUDs)
k: Natural family planning/fertility awareness based methods
l: Lactational amenorrhoea method (LAM)
m: Withdrawal
n: Male and female sterilization – *although adolescents are medically eligible for this, these methods should only be rarely recommended.*

3.2(a) Dual protection and dual method use

There are two approaches (other than abstinence) to simultaneous protection against pregnancy and STIs. One approach is the exclusive use of condoms to provide such "dual protection". However to ensure maximum contraceptive efficacy, condom use also requires a willingness and ability to use emergency contraception in the event of condom slippage, breakage or failure to use. Alternatively, adolescents and adults can practise "dual method use", which involves always using a condom plus another method that has a lower contraceptive typical-use failure rate.

There is no rigorous clinical research available on service-delivery considerations and typical effectiveness rates of dual method use. An American study reported that only 7% of sexually active adolescent females and 5% of sexually active males reported having simultaneously used condoms along with another method (Santelli et al., 1997). Another study suggests that dual method use by adolescents may improve if providers tailor counselling to the adolescent's perceived risk of STIs and pregnancy, and if providers address the prevention of both as different but related decisions (Otta et al., 2002). Most dual method use recommendations are based on theory and extrapolations from HIV/AIDS prevention and contraceptive research.

3.2(b) Barrier methods

[See *Barrier methods*, pages 1–9, **IAQCFP**; and chapter 11, pages 11-3 to 11-18, and chapter 13, pages 13-2 to 13-19, **ECT**]

Types available

Barrier methods include spermicidal foams, jellies, creams, films and suppositories; male condom; female condom; diaphragm; contraceptive sponge, and cervical cap. With the exception of diaphragms and cervical caps all of these are generally available over the counter, and may be available from community-based distribution workers. These methods prevent pregnancy through the provision of a physical and/or chemical barrier to sperm. An important practical aspect of the use of all barrier methods is whether the method provides simultaneous protection against pregnancy and STIs (dual protection). As indicated below, this important advantage currently applies only to condoms, and evidence of the effectiveness of condoms in preventing HIV infection and other STIs is substantially greater for male condoms than for the female condom. In addition, both the typical-use effectiveness rate and the perfect-use effectiveness rate for pregnancy prevention are greater with the male condom. Pregnancy rates with typical use of male condoms approach 2–3% in the first 12 months of use in highly motivated adult couples (Hatcher et al., 1998). For all barrier methods, use effectiveness tends to increase with increasing age. Given the transience of many adolescent relationships and the high probability of multiple, sequential sexual partners prior to marriage (Alan Guttmacher Institute, 1999; Santelli et al., 1998), a condom is the single best protective option for many adolescents. However barrier-method failure rates are higher in

adolescents than in adults. In addition, barrier-method continuation rates are usually low among adolescents (Hatcher et al., 1998; Speroff & Darney, 1996; Goldman et al., 1985; Kulig, 1989). Hence before recommending any method to adolescents, each method needs to be judged on its own merit as well as against the adolescent's requirements. Moreover the advance provision of emergency contraception may be particularly useful in helping to prevent pregnancy in the event of inconsistent use or method failure such as condom slippage or breakage. Additionally, if a barrier method other than the male or female condom is used (not recommended, see below) the adolescent couple should also be encouraged to use male condoms simultaneously for STI protection. The advice for simultaneous male condom use, therefore, is no different from advice for any other form of contraception, excepting the female condom.

The major disadvantage of barrier methods is that they are coital-related and require user comfort/familiarity with his/her genitalia. In addition, self-assurance is needed to purchase/acquire condoms, especially in over-the-counter situations. The cost of barrier methods can be prohibitive unless the adolescent gives the need for the method a high priority. Adolescents with allergies to material components or with an inability to use these methods consistently and correctly, are not suitable candidates for these methods.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 11 page 11-4, and chapter 13, page13-4, **ECT**]

Although male condoms are made of a variety of materials and membranes, only latex, and probably polyurethane and Tactylon® (a synthetic latex) condoms are effective in reducing STI transmission (Donovan, 1996; Lytle et al., 1997; Bounds, 1997). Although laboratory studies show that latex condoms are impermeable to STI pathogens, published epidemiological data have been insufficient to draw definite conclusions about the effectiveness of male latex condoms for reducing the risk of HPV, chlamydia or genital ulcerative disease transmission (Lytle et al., 1997; Lytle et al., 1999, National Institute of Allergy and Infectious Diseases, 2000). In contrast to the weaknesses of epidemiological and clinical studies on genital ulcerative disease, chlamydia and HPV transmission, studies of HIV transmission prove that the consistent and correct use of male condoms is highly effective in preventing HIV transmission to both men and women (National Institute of Allergy and Infectious Diseases, 2000; Davis & Weller, 1999). Similarly, there is consistently strong epidemiological data to support the effectiveness of condom use in the reduction of gonorrhoea transmission (National Institute of Allergy and Infectious Diseases, 2000; Barlow, 1977; Pemberton et al., 1972; Schwartz et al., 1997).

When male latex condoms are used correctly and consistently failure rates as low as three pregnancies per 100 women in the first 12 months of use may be achieved. For typical use a failure rate of 14% is usually quoted. Some latex condom products are lubricated with spermicide (most commonly nonoxynol-9) which increases contraceptive effectiveness.

With correct and consistent use failure rates as low as 5.1% have been estimated for the female condom (Trussell et al.,1994). However, its contraceptive efficacy typically is comparable to the diaphragm and cervical cap, which may have high typical-use failure rates (see below).

When diaphragms in conjunction with spermicides are used correctly and consistently, failure rates at one year of use as low as 6% may be reached. For typical use, the rate is 20% (Hatcher et al., 1998; Speroff & Darney, 1996). It is unclear to what degree the diaphragm, when used with a spermicide, provides protection against STIs.

With perfect use, one-year failure rates for cervical cap use are 9% for nulliparous women and 26% for parous women, while typical failure rates are as high as 40% (Hatcher et al., 1998). Although there are no contraindications to cervical cap use in adolescents, their fitting (by providers) and use (by clients) is problematic even for many adults. As a result, few adolescents are good candidates for this method. The contraceptive sponge is also associated with similarly high one-year, perfect-use, and typical-use failure rates, and although available over the counter, requires considerable comfort with the genitalia to ensure

correct use (Hatcher et al., 1998). For these reasons, few adolescents are again likely to be good candidates. As in the case of diaphragm use, the degree of protection afforded by both the cervical cap and contraceptive sponge from STIs (especially viral STIs) is unclear.

There are no reliable data on the effectiveness for pregnancy prevention of spermicides used alone, either in adults or adolescents. Some commonly quoted figures for correct and consistent use and for typical use are 6% and 26%, respectively (Hatcher et al., 1998). However, recent studies have found failure rates of over 40% (Raymond & Dominik, 1999). Thus, adolescents should be encouraged to use more effective methods of contraception than spermicides alone.

By the same mechanism that they are active against sperm, spermicides have also been shown to be effective against bacteria and viruses *in vitro* and theoretically may afford some degree of protection against STIs (Hatcher et al., 1998; Speroff & Darney, 1996; Cook & Rosenberg, 1998). Spermicides containing nonoxynol-9 do not appear to protect against chlamydial infection or gonorrhoea (Roddy et al., 2002). Moreover, use of nonoxynol-containing spermicides by commercial sex workers has been associated with damage to vaginal mucosal surfaces and increased risk of HIV acquisition (Roddy et al., 1998; Van Damme et al., 2000). Women at high risk of HIV infection should avoid spermicides containing nonoxynol-9, nonoxynol-9-lubricated condoms and diaphragms, and cervical caps to which nonoxynol-9 is added. The contraceptive effectiveness of diaphragms and cervical caps without nonoxynol-9 has been insufficiently studied and should be assumed to be less than that of diaphragms and cervical caps with nonoxynol-9.

Side-effects and their management

[See chapter 13, pages 13-15 to 13-16, **ECT**]

Vaginal irritation has been reported as a result of frequent spermicide use (several times a day) which disappears upon discontinuation of spermicide use (Roddy et al., 1993). An increased risk of urinary tract infections has been reported with the use of the diaphragm (Hooton et al., 1991; Gillespie, 1984; Filn et al., 1985; Foxman & Frerichs, 1985).

Long-term safety and benefits

[See chapter 13, pages 13-5 to 13-6, and chapter 11, pages 11-5 to 11-6, **ECT**]

In addition to increased HIV susceptibility among women using nonoxynol-9 and engaged in frequent intercourse, spermicides can cause shifts in the vaginal flora leading to bacterial vaginosis and possibly urinary tract infection (Hooton et al., 1991). The male condom is proven to protect against HIV infection and some other STIs, and the female condom is also expected to provide protection. Diaphragms may reduce the risk of some STIs (Kost et al., 1991). Consistent use of all mechanical barrier methods should reduce the risk of infertility due to STIs.

Medical eligibility criteria

[See *Barrier methods*, pages 1–9, **IAQCFP**; and chapter 11, pages 11-3 to 11-8, and chapter 13, pages 13-2 to 13-19, **ECT**]

The only conditions under which the use of barrier methods is not recommended are the presence of allergy to component materials (latex, polyurethane or Tactylon®) or a history of toxic shock syndrome during diaphragm use.

Procedures required for initiation

[See chapter 4, page 4-21, and chapter 11, pages 11-8 to 11-11, and chapter 13, pages 13-9 to 13-13, **ECT**]

Counselling is the only procedure considered mandatory for the initiation of condom use. Pelvic examination and adherence to infection-prevention practices during fitting procedures are necessary prior to diaphragm and cervical cap use.

Counselling

[See chapter 11, pages 11-8 to 11-11, and chapter 13, pages 13-9 to 13-13, **ECT**]
The main areas to be covered by counselling include:

- Type of male condom to be used (latex, polyurethane, or Tactylon®)
- The need for correct and consistent use to obtain sufficient protection against pregnancy and STIs
- Explicitly detailed instructions regarding correct placement/application of male condoms, female condoms and all other barrier methods
- Dual protection and dual method use.

Manual dexterity and coordination are required for correct diaphragm, cervical cap and contraceptive sponge placement. These devices should not be used by those who cannot demonstrate the ability for correct placement.

Provider options

One of the main advantages of male condom use is that they may be easily accessible to adolescents. A variety of options should be in place to make condoms easily and inexpensively available to adolescents, including through social marketing, workers who are involved in community-based distribution and provision by other adolescents.

3.2(c) Emergency contraception

[See *Emergency contraceptive pills*, pages 1–2, and *Copper-IUD for emergency contraception*, page 1, **IAQCFP**; and chapter 5, pages 5-20 to 5-25, and chapter 6, page 6-18, **ECT**]
Emergency contraception (EC) is the use of an emergency contraceptive regimen in the first few days following unprotected intercourse, in order to prevent pregnancy.

Types available

Three main types of EC are available, namely:

- combined oral contraceptives (COCs) at a higher dose than that used for continuous contraception
- Progestogen-only pills (POPs) at a higher dose than that used for continuous contraception
- Copper intrauterine devices (IUDs).

The first two regimens are referred to as emergency contraceptive pills (ECPs). This approach requires two equivalent doses of ECPs, 12 hours apart, preferably within 72 hours of unprotected intercourse. Each dose of COCs should contain at least 100 μg of EE and at least 300 μg of levonorgestrel (LNG). Each dose of POPs should contain 750 μg of LNG. There are pills specially packaged for EC; however, levonorgestrel pills commonly available for continuous contraception may also be used for this purpose. A copper IUD inserted within five days of unprotected intercourse is another option for emergency contraception. In instances where an adolescent is at low risk for STIs and desires a long-acting contraceptive method, this may be an appropriate emergency contraceptive choice. In most situations, because of the eligibility requirements for IUDs (see IUD section below), ECPs present a more realistic option.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCF**; and chapter 4, page 4-19, and chapter 5, page 5-20, **ECT**]
The effectiveness of ECPs is estimated by comparing the number of expected pregnancies that would occur if no method were used with the actual number of pregnancies that occur after ECP use. It is estimated that 8 out of 100 women would get pregnant if each had a single act of unprotected intercourse in the second or third week of the menstrual cycle. Recent studies have shown that when correctly used COCs prevent 75% and POPs 85% of the expected pregnancies (Barfai, 2000; Trussell & Raymond, 1999; Glasier, 1997; WHO, 1998a; ACOG Practice Bulletin, 2002; Trussell et al., 1996; Creinin, 1997). Importantly, ECP effectiveness is substantially influenced by the time elapsed after intercourse prior to

using the method; ECPs are more effective the earlier they are taken after unprotected intercourse (WHO Task Force on Postovulatory Methods of Fertility Regulation, 1998). Copper-bearing IUDs are the most effective form of emergency contraception. When inserted within five days of unprotected intercourse, 99% of expected pregnancies are prevented (Glasier, 1997; Trussell & Ellertson, 1995). However, the risk of STIs and the desire to avoid using the IUD in the long term are two reasons that limit the use of copper-bearing IUDs in most adolescents.

Mechanism of action

[See chapter 5, page 5-20, **ECT**]

The precise postcoital mechanism of action of ECPs and copper-bearing IUDs is not known. In the case of ECPs, the mechanism may also vary according to the point in the menstrual cycle at which they are used. The main effect is inhibition or delay of ovulation (Swahn et al., 1996) but it is also possible that ECPs and the IUD may have effects on the genital tract that affect the survival or motility of sperm and the transport function of fallopian tubes, or prevent fertilization (DeJonge, 1998; Brucker & Lipford, 1995). Some studies have also shown that when ovulation occurs, ECP use results in an insufficient corpus luteum. In addition, the type of endometrium that develops after ECP use might not be appropriate for normal implantation. Current evidence points to a pre-implantation effect of ECPs. Once a fertilized egg is implanted, ECPs are not efficacious (American Medical Women's Association, 1996); and because ECPs do not interrupt pregnancy, they are not a form of abortion.

Return of fertility

The contraceptive effect of ECPs is transitory, and return of fertility is immediate. The need for a regular method of contraception therefore needs to be discussed. Return of fertility after IUD use is also immediate, and an IUD should only be chosen if the prospective user is an appropriate candidate and wants the IUD for continuous contraception.

Side-effects and management

[See chapter 5, page 5-23, and chapter 12, pages 12-18 to 12-24, **ECT**]

Nausea and vomiting are frequent and sometimes severe side-effects of ECP use, especially with the COC regimen. About 19% of COC and 6% of POP users vomit during use (Barfai, 2000; Glasier, 1997; Trussell et al., 2001; Ho & Kwan, 1993). Dizziness, breast tenderness, headaches and fatigue may also be experienced. In addition, bleeding irregularity may occur in the cycle during which ECPs are used. If treatment is taken before ovulation, the onset of bleeding may be 3–7 days earlier than expected; if taken after ovulation, bleeding may be at the expected time or delayed (Glasier, 1997; ACOG Practice Bulletin, 2002). Where circumstances permit, anti-emetic drugs could be used prophylactically, but once nausea and vomiting has begun, anti-emetics are ineffective (ACOG Practice Bulletin, 2002). As with adults, when vomiting occurs within two hours of ECP administration, a second dose of ECPs and the prophylactic use of anti-emetics is recommended. If vomiting continues, a repeat dose of ECPs can be given vaginally.

Long-term safety

ECPs are not recommended for long-term use.

Benefits

The only benefit of ECP use is the reduced risk of an unwanted pregnancy following unprotected intercourse.

Medical eligibility criteria

[See *Emergency contraceptive pills*, pages 1–2, and *Copper-IUD for emergency contraception*, page 1, **IAQCFP**; and chapter 5, pages 5-20 to 5-21, and chapter 12, pages 12-7 to 12-9, **ECT**]

The amount of hormone administered during the sporadic use of ECPs is considered too small to cause chronic or acute, serious adverse events. Therefore, there are no medical conditions that restrict the use of ECPs other than pregnancy. ECPs should not be used as a regular or frequent method of contraception.

Procedures required for initiation

[See chapter 5, pages 5-24 to 5-25, and chapter 12, pages 12-11 to 12-12, **ECT**]

Counselling, especially regarding a regular contraceptive method, is the only procedure considered mandatory for the use of ECPs. In particular, pelvic and breast examination, blood-pressure determination, and vaginal cytology are not mandatory prior to emergency contraception use.

Initiation

[See *Emergency contraceptive pills*, pages 1–2, and *Copper-IUD for emergency contraception*, page 1, **IAQCFP**; and chapter 5, pages 5-21 to 5-22, and chapter 12, pages 12-10 to 12-12, **ECT**]

Since the use of ECPs must be initiated as soon as possible, services providing ECPs for adolescents must be sufficiently organized to allow for their prompt and efficient provision. Advanced information, education and communication (IEC) initiatives on the method, oriented to adolescents, are essential. Some programmes provide ECPs at the time of initiation of a continuous-use method such as OCs and barrier methods. If the adolescent is a candidate for a copper-bearing IUD for emergency contraceptive and for continuous, long-term use, the IUD should be inserted within five days of unprotected intercourse. If the IUD is used, all procedural and eligibility requirements for continuous IUD use must be satisfied (see IUD section below).

Correct use

[See chapter 5, pages 5-20 to 5-21, and chapter 12, pages 12-10 to 12-28, **ECT**]

The correct use of ECPs requires the use of two doses of ECPs, 12 hours apart and within 72 hours of the first act of unprotected intercourse. Correct use of the copper-bearing IUD requires that all the recommendations shown below for long-term IUD use are followed.

Counselling

In some circumstances, because of the time-sensitive nature of this method, the use of ECPs may be initiated without complete counselling. However, additional counselling should be arranged. Method-specific counselling points include:

- the emergency aspect of the method
- absence of an abortifacient effect
- correct use
- side-effects
- possible need for the medical management of vomiting
- need for a second dose of ECP when vomiting occurs within two hours of ECP administration
- the need for prompt initiation of a regular contraceptive if the risk of pregnancy is ongoing
- menstrual cycle changes.

Follow-up

[See chapter 5, pages 5-22 to 5-25, and chapter12, pages 12-17 to 12-24, **ECT**]

A follow-up visit within three to four weeks of use is recommended to rule out possible pregnancy and to discuss any subsequent problems when using a continuous contraceptive. If treatment has failed and pregnancy has occurred, pregnancy options and management should be discussed.

Provider options

At present, service-delivery experience in the provision of ECPs to adolescents is limited. Most of the services for adults are part of (or have a direct link with) an established health-care organization. The challenge is to meet the requirement of providing the method within 72 hours of unprotected intercourse. Several service-delivery studies have shown that the advance provision of ECPs enhances the likelihood of properly timed dosing, reduces unintended pregnancy, and does not result in abuse of this contraceptive safeguard (Glasier & Baird, 1998). To facilitate easy access to this method by adolescents and adult women, ECPs can be supplied over the counter by retailers or through other innovative distribution systems by providers who have received some training in counselling, and in the correct use of this method.

Although there is no reported experience of the use of IUDs for EC in adolescents, important considerations for their use in this way include:

- IUDs are not usually recommended if the individual is at increased risk of STIs, or unless other more appropriate methods are not available or acceptable. Studies indicate that some adolescents who are sexually active engage in multiple risky behaviours, including multiple, concurrent partners (Taylor-Seehafer & Rew, 2000; Santelli et al., 1998; Centre for Disease Control and Prevention, 1998; Rwenge, 2000). Other studies show that many adolescents engage in serial and short-term monogamous relationships, which also places them at higher risk for STIs (Santelli et al., 1998). Historical data indicate that the earlier an adolescent engages in sexual intercourse, the more partners he or she is likely to come into contact with, either directly through direct sexual contact or indirectly through the polygamous behaviour of the partner. For these reasons, few adolescents will be candidates for IUD use.
- The insertion of an IUD in a young, nulliparous woman could be technically difficult.

In particular circumstances, such as sexual assault (rape), where EC is required, there may not be a suitable opportunity to conduct properly appropriate IUD risk assessment and counselling. Based on the concerns mentioned above, IUDs may not be an appropriate choice for EC in adolescents. However, in monogamous, married adolescents who want to use IUDs as a regular contraceptive method, IUDs may be an appropriate method of EC.

3.2(d) Low-dose combined oral contraceptives (COCs)

[See *Low-dose combined oral contraceptives*, pages 1–10, **IAQCFP**; and chapter 5, pages 5-2 to 5-28, **ECT**]

Types available

The term "low-dose" refers to COCs containing 35 μg or less of the synthetic estrogen, ethinyl estradiol. COC formulations also contain one of many different synthetic progestogens. The most widely available COCs in the public sector contain the progestogens levonorgestrel (LNG) or norethisterone (NET) which is also known as norethindrone. In the late 1980s, three new "third-generation" progestogens were introduced (norgestimate, desogestrel and gestodene) which were designed to have less androgenic side-effects (such as adverse effects on the lipid profile, acne, hirsutism, and androgenic weight gain). More recently a low-dose pill (Yasmin®) has been developed containing the progestogen drospirenone, which has mineralocorticoid activities. **Any** low-dose COC available to a programme can be prescribed safely to adolescents; and **any** low-dose COC will result in mild to moderate acne improvement. Two of the newer progestogens, (desogestrel and gestodene) have been associated with a small increase in the risk of venous thromboembolism (Farmer et al., 1997; Farmer et al., 1998; WHO Collaborative Study of Cardiovascular Disease and Steroidal Hormone Contraception, 1995a,b; Jick et al., 1995; Bloemenkamp et al., 1995).

All the above statements are based upon population data. While such data may not distinguish the side-effects experienced by a single individual, each individual user may experience side-effects with one formulation that are not experienced with another. As with adult women, switching an adolescent to another pill formulation is recommended if the individual is experiencing side-effects that may lead to discontinuation, and that may be ameliorated through the use of another formulation (see section on side-effects and their management below).

Anecdotal evidence tends to suggest that adolescents are more compliant with 28-day pill packaging (which does not require a 7-day pill-free interval between packs) than with 21-day packaging (Cullins & Huggins, 2000). Regardless of packaging, however, the type of COCs provided for adolescents should be formulations that are most easily available or commonly used locally.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 4, page 4-19, and chapter 5, page 5-13, **ECT**]

As with adults, the perfect-use COC failure rate is 0.1 pregnancies per 100 women during the first 12 months of use. When typically used, failure rates for women of all ages range between 6–8 pregnancies per 100 women in the first 12 months of use. Depending on the population of adolescents, failure rates as high as 15 pregnancies per 100 adolescents have been reported. These high rates are attributed to errors in pill taking (Kaunitz, 1992). Appropriate general and method-specific counselling on the correct use of COCs (see below) is therefore essential for adolescents choosing to use this method.

Mechanism of action

[See chapter 5, page 5-3, **ECT**]

Although there are no studies that have specifically looked at COC mechanisms in adolescents, there is no biological evidence that such mechanisms differ from those operational in adults. The main mechanism of action of COCs is the inhibition of ovulation. Thickening of the cervical mucus is also believed to be an important mechanism. Although tubal motility is altered and the atrophic endometrium that develops during COC use is unsuitable for implantation, there is no confirmation that these effects are the primary mechanisms for preventing pregnancy (Elstein et al., 1976). Moreover, COCs have no effect on the continuation of an implanted pregnancy.

The processes that lead to ovulation begin within 24 hours of stopping COC use; this accounts for the high rates of accidental pregnancies that may be seen when consecutive or multiple pills are missed, particularly at the end or at the beginning of the pill cycle (Huggins & Cullins, 1990).

Return of fertility

[See *Executive summary and Overview*, page 6, **IAQCFP**; and chapter 5, page 5-4, **ECT**]

For adolescents and adult women, return of fertility after discontinuing COC use is rapid. Rarely, a COC user will experience a delay of up to three months in the return of ovulation. On the other hand, pregnancy may occur during the first menstrual cycle following discontinuation. The majority of adolescent and adult women who discontinue the pill to become pregnant will achieve pregnancy within a year (Huggins & Cullins, 1990; ACOG Technical Bulletin, 1994).

Side-effects and their management

[For specific side-effect management see chapter 5, pages 5-14 to 5-18, **ECT**]

Nausea, dizziness, mild headache, breast tenderness, mood changes and breakthrough bleeding may occur in some cases. As with adults, adolescents must be counselled about possible side-effects before initiating use. They should be reassured that these side-effects will usually subside within the first three months of use. If other pill formulations are available, reassurance should also be given that the pill formulation will be changed if side-effects continue after approximately three months of continuous use.

Although population-based studies indicate no statistically significant increase in weight gain among a population of women (Coney et al., 2000), some adolescents (and some adults) may be particularly sensitive to weight gain. If weight gain is more than 1–2 pounds per year (which is unlikely to be due to the use of COCs) dietary habits should be discussed with the adolescent. When any side-effect becomes an important concern for the adolescent, a change to a different pill formulation or contraceptive method should be considered.

Long-term safety

The long-term safety of COCs has been very reassuring. Safety studies have been performed in women aged 18 or over and the subsequent results have been extrapolated to young adolescents. Cardiovascular events are rare among young women aged 15–24 (Consensus conference on combination oral contraceptives and cardiovascular disease, 1999). Mortality from myocardial infarction and all forms of stroke are estimated as essentially unchanged from the incidence among non-COC users aged 15–24. For low-dose pills containing the newer progestogens (desogestrel or gestodene) the mortality rate per

100 000 women per year is slightly higher at 0.2–0.7 compared to 0.1 for 15–24 year olds not using COCs (Consensus conference on combination oral contraceptives and cardiovascular disease, 1999). Additionally, a WHO scientific group has concluded that the incidence and mortality rates of all cardiovascular diseases (stroke, acute myocardial infarction, and venous thromboembolism) in women of reproductive age are low in both developed and developing countries and that any additional incidence of mortality attributable to COCs is very small if the users do not smoke *and* do not have other risk factors (WHO, 1998b). Globally and for all causes of mortality, the risk of death from COC use is substantially lower than the risk of death from pregnancy (WHO, 2002; Physicians' Desk Reference, 2002a).

While the absolute risk of breast cancer among young women is very low, the risk of a breast-cancer diagnosis among women who are current or recent-past users of COCs is slightly increased (Relative Risk of 1.24; 99% CL 1.15–1.33) (Collaborative Group on Hormonal Factors in Breast Cancer, 1996). This increased risk of breast-cancer diagnosis is believed to be a consequence of detection bias. Promotion of breast cancer by oral contraceptives is a less likely explanation because:

- duration of pill use has no effect on risk
- the excess risk seen in current users is restricted to breast cancers that are localized
- ten years after discontinuing pills, women are at no increased risk for having breast cancer diagnosed (Collaborative Group on Hormonal Factors in Breast Cancer, 1996)
- women with a family history of breast cancer do not further increase their risk for breast cancer by taking COCs (Collaborative Group on Hormonal Factors in Breast Cancer, 1996; Lipnick et al., 1986; Colditz et al., 1996; Murray et al., 1989; The Centers for Disease Control Cancer and Steroid Hormone Study, 1983).

Data regarding the relationship between oral contraceptive use and cervical cancer are contradictory, and detection bias and inappropriate comparison groups confounded earlier cervical-cancer studies. Recent studies show there may be a modest increase in risk among women with persistent HPV infection who use COCs for longer than five years (American College of Obstetricians and Gynecologists (ACOG), 1994; Schlesselmann, 1989; The New Zealand Contraception and Health Study Group, 1994). If the risk for cervical cancer is increased, the absolute increase in risk is small for an individual adolescent (American College of Obstetricians and Gynecologists (ACOG), 1994).

Presence or history of cervical dysplasia is not a contraindication to oral contraceptive use.

COCs containing drospirenone may cause elevations in potassium among individuals with chronic diseases (for example, adrenal or renal insufficiency) or who take potassium-sparing medications (Physicians' Desk Reference, 2002c). Very few adolescents fit this profile.

Claims that COCs may affect the normal physical growth of adolescents do not have any scientific support (ACOG Committee Opinion, 1992). COCs may be safely used for many years without interruption; there is no scientific rationale for a "pill holiday".

Benefits

[See chapter 5, page 5-4, **ECT**]

Some non-contraceptive benefits of COC use may be of particular interest to adolescents, such as regularity of the menstrual cycle, relief from heavy periods and painful menstruation, relief from mittelschmerz, possible improvement of acne, and prevention or improvement of anaemia. These non-contraceptive health benefits form the basis of a therapeutic use of oral contraceptives in instances of dysfunctional uterine bleeding, iron-deficiency anaemia associated with menorrhagia, hypothalamic amenorrhoea with associated osteoporosis, dysmenorrhoea, mittelschmerz, polycystic ovarian syndrome, acne, and family history of ovarian cancer (Hatcher et al., 1998; Speroff & Darney, 1996; Andrews & Jones, 1991; Jones et al., 1985). Another advantage of the COC is that it is not a coitally related method. Additionally, COCs can be used to delay menses, and COCs and levonorgestrel-containing pills can be used as emergency contraception (see section on emergency contraception above). Even though

endometrial and ovarian cancers are extremely rare in adolescents, they may be interested in the long-term protection against these types of cancer provided by COCs.

Disadvantages

[See chapter 5, pages 5-4 to 5-5, **ECT**]

The disadvantages of COC use for the adolescent (as for all users) include the need to take the pill every day (preferably at the same time each day); and the lack of protection against STIs. Additionally, if not provided free, the cost of the pills can be prohibitive, particularly to adolescents. Although there is evidence that the pill provides some protection against upper-genital-tract disease (pelvic inflammatory disease) (Mishell, 1982), this does not remove the need to use condoms to prevent STIs.

Medical eligibility criteria

[See *Low-dose combined oral contraceptives*, pages 1–10, **IAQCFP**]

Current criteria indicate that there are no restrictions on COC use related to young age and nulliparity. The conditions in which COCs should not be used or are not usually recommended are the same for adolescents and adults. In adults, caution is recommended for women with certain cardiovascular diseases. However, with the exception of rheumatic heart disease in some developing countries, cardiovascular diseases that limit COC use are exceedingly rare in adolescents, and this bodes well for the safe use of COCs in this population.

Procedures required for initiation

[See chapter 4, page 4-21, **ECT**]

Counselling (see below for specific content) is the only procedure considered mandatory for the initiation of COCs in adolescents. In particular, pelvic examination and vaginal cytology should not be a requirement for initiation. Recent studies indicate greater likelihood of COC initiation if pelvic examination is deferred (Andrews & Jones, 1991; Jones et al., 1985; Mishell, 1982; Technical Guidance Working Group, 1994; Planned Parenthood Federation of America, 1996). In fact this practice of deferring the pelvic exam for adolescents is no different conceptually from the practice of field-based distribution of oral contraceptives. In these instances, the user is counselled to return within a specified time period to undergo preventive examination.

In addition, given the low prevalence of breast tumours in adolescents, breast examination is not essential prior to COC initiation (Technical Guidance Working Group, 1994; Harper et al., 2001; Planned Parenthood Federation of America, 1996; Planned Parenthood Federation of America, 1999; Hannaford & Webb, 1996; Armstrong & Stover, 1994; Zavala et al., 1987). It is however desirable to have blood-pressure measurements taken before initiation of COC use. However, in some settings blood-pressure measurements are unavailable. In many of these settings, pregnancy morbidity and mortality risks are high, and COCs are one of the few methods widely available. In such settings, women should not be denied the use of COCs simply because their blood pressure cannot be measured.

Initiation

[See *Low-dose combined oral contraceptives*, pages 1–2, **IAQCFP**; and chapter 5, pages 5-9 to 5-10, **ECT**]

COCs may be initiated at any time as long as the provider is reasonably sure the adolescent is not pregnant. Initiation at any time during the cycle becomes an important factor for those adolescents who may be experiencing amenorrhoea as a result of using another hormonal method. Preferably, COC use should be initiated during the first five days of the cycle in order to ensure that a possible existing but undetected pregnancy is unlikely, and that subsequent ovulation is successfully inhibited.

WHO recommends the use of a back-up method for one week when oral contraceptives are initiated after day 5 of the cycle. Such a back-up is recommended to guard against possible pregnancy resulting from ovulation during the first pill pack. If the pill is accidentally begun during the first trimester of pregnancy, the adolescent can be reassured that first-trimester pill use does not increase teratogenic risk (Huggins & Cullins, 1990; American College of Obstetricians and Gynecologists (ACOG), 1994; Linn et al., 1983).

The recommendations for COC initiation in postpartum, post-abortion and breastfeeding adolescents are the same as for adult women.

Correct use

[See chapter 5, pages 5-10 to 5-15, **ECT**]

Daily intake of the pill is essential to achieve full contraceptive effectiveness and poor compliance is often a major problem among adolescents (Balassone, 1989). The importance of daily intake (and of the cues that may act as a reminder to the adolescent; for example, after brushing the teeth in the morning) is a key method-specific counselling point. The use of the 28-day pill pack containing seven placebo pills may facilitate its use by adolescents.

Counselling

[See chapter 5, pages 5-10 to 5-15, **ECT**]

Method-specific counselling points should include:

- correct use
- instructions for missed pills
- need for STI protection (including dual method use) when and as appropriate
- side-effects
- re-supply options
- cost.

Follow-up

[See chapter 5, page 5-10, and pages 5-16 to 5-18, **ECT**]

Because discontinuations during the first year of use are common among adolescents, many providers recommend a 3-month follow-up visit to the health worker after pills are initiated. Other providers recommend giving at least a one-year supply of pills, if available, and to allow the client to return at her convenience, but before the pills run out. A 3-month follow-up visit may help to identify troublesome side-effects, and pill-taking problems, and to confirm correct method use. Given the safety of COCs a rigid, clinic-based follow-up may not be necessary; depending on circumstances a phone call or a visit from the worker involved in community-based distribution may serve this purpose. Adolescents with specific medical conditions may need more frequent follow-up than those without such conditions. Since an estimated 50% of pill discontinuations occur because of side-effects (Hatcher et al., 1998; Speroff & Darney, 1996; Khan, 2001; Rosoff, 1988; Rosenberg et al., 1998) it is important to enquire about these at follow-up, and to consider carefully their impact on user satisfaction. As a safeguard, adolescents (including oral contraceptive users) should be informed about emergency contraception (see above) and providers should consider giving oral-contraception users an extra pack of pills and explicit instructions on how to prepare emergency contraception from it. Services should also provide options for the easy and inexpensive re-supply of COCs to adolescents. Additionally, as a result of counselling, adolescents should be helped to acquire the confidence to return to the provider any time they have questions or believe it is necessary.

Provider options

Adolescents should be provided with a variety of options to initiate and continue the use of COCs. Appropriately trained pharmacists and workers involved in community-based distribution may safely and effectively provide COCs (Stang et al., 2000).

3.2(e) Combined injectable contraceptives (CICs)

[See *Combined injectable contraceptives*, pages 1–11, **IAQCFP**; note: CICs are not covered in **ECT**]

Types available

CICs are similar to COCs since they contain both a progestogen and an estrogen. However in addition to their different modes of administration, CICs also differ from COCs because the active estrogenic compound is estradiol as opposed to ethinyl estradiol. Ethinyl estradiol binds to estrogen receptors with its active ethinyl group attached, thereby potentially inducing an increase in the production of hepatic

globulins. Increase in hepatic globulins is the mechanism through which rare thromboembolic phenomena have been associated with COCs. Although theoretically beneficial, the clinical relevance of the formulation differences between COCs and CICs (that is between ethinyl estradiol and estradiol) has not been documented. Moreover, clinical experience with CICs in adolescents is limited, and current recommendations for the use of CICs and COCs are the same. Three types of monthly administered CICs are commonly available:

- one contains 25 mg of depot-medroxyprogesterone acetate (DMPA) and 5 mg of estradiol cypionate (Cyclofem®, Cycloprovera®, and Lunelle®)
- one contains 50 mg of norethisterone enanthate and 5 mg of estradiol valerate (Mesigyna®)
- one contains 150 mg of dihydroxyprogesterone acetophenide and 10 mg of estradiol enanthate – mostly available in Latin America under different commercial names (Deladroxate®, Perlutal®, Topasel®, and Perlutan®).

Comparative data are lacking on potential differences between the three types of products.

Effectiveness

When used correctly and consistently CICs are very effective contraceptives, with a failure rate of approximately 0.3 per 100 women in the first 12 months of use (Coutinho et al., 2000; Hall, 1998).

Mechanism of action

The mechanism of action of CICs is the same as for COCs.

Return of fertility

Return of fertility in adult women who discontinue CIC use is prompt (Hall, 1998; Bahamondes et al., 1997). Based on experience with COCs, there is no reason to believe it should be any different in adolescents.

Side-effects and their management

Possible side-effects include those mentioned above for COCs.

Long-term safety

[See, *Combined injectable contraceptives*, page 10, **IAQCFP**]

The long-term experience of CIC use is still limited, both in adults and adolescents. Considering the biological similarities between CICs and COCs the long-term safety profile of both methods should be similar with the following exception (which may only rarely apply to adolescents). In women with symptomatic biliary tract disease, COCs should generally not be used but CICs can generally be used because they have no first-pass effect on the liver and have minimal effect on liver function.

Benefits and disadvantages

Although the non-contraceptive benefits seen with COCs have not yet been confirmed with CICs, it is reasonable to assume they will be the same. Few studies directly compare the bleeding patterns seen with CICs and those seen with COCs. One recent study that did compare the bleeding patterns of a triphasic COC with those of a medroxyprogesterone acetate/estradiol cypionate CIC reported regular bleeding episodes among most women in both groups after the first three cycles of use (65% regular, CIC; 71% regular, COC). For those CIC users who experienced regular bleeding, the typical pattern was a single episode of bleeding/spotting lasting 5–6 days and a bleeding/spotting-free interval of 21–22 days after injection. The comparison also showed that more medroxyprogesterone acetate/estradiol cypionate users experienced irregularity compared to COC users (Kaunitz et al., 1999). Initial irregularity in bleeding pattern may dissuade some adolescents from CIC use. The primary clinical advantage of CICs compared to progestogen-only injectables is more predictable and regular bleeding episodes when injections are given at regularly spaced intervals (Hall, 1998).

Medical eligibility criteria

[See *Combined injectable contraceptives*, pages 1–11, **IAQCFP**]

As with COCs there are no restrictions for CIC use related to young age and nulliparity. Because CICs eliminate the first-pass effect on the liver, and therefore have minimal effect on liver function, they can be more readily considered in those rare adolescents exhibiting symptomatic liver disease.

Procedures required for initiation

Counselling and proper infection prevention are the only two mandatory procedures for the initiation and use of CICs. The considerations given above for COC use regarding pelvic exam, vaginal cytology, breast examination and blood pressure also apply for CICs (Technical Guidance Working Group, 1994).

Initiation

CICs may be initiated any time if the provider is reasonably sure the adolescent is not pregnant. Current guidelines recommend initiation within the first seven days of the menstrual cycle for the medroxyprogesterone acetate/estradiol cypionate and norethisterone enanthate/estradiol valerate formulations. When the first injection is given after day 7, the use of a back-up method for seven days is necessary. For all formulations, the recommendations for initiation in postpartum, post-abortion and breastfeeding women are the same as for COCs (Hall, 1998; Kaunitz, 2000).

Correct use

CIC injections are repeated every four weeks. When the re-injection interval cannot be adhered to, the repeat injection can be given up to seven days early or up to seven days late without requiring additional contraceptive protection; such early or late injections may cause irregular bleeding without compromising contraceptive efficacy. If the adolescent is more than seven days late for an injection, she can have the injection if it is reasonably certain that she is not pregnant. She will need to abstain from sex or use additional contraceptive protection for the next seven days.

Counselling

Method-specific counselling points include:

- correct use (timing of monthly injections)
- side-effects
- menstrual cycle changes
- need for STI protection, including dual method use, when and as appropriate
- re-supply options
- cost.

Follow-up

Upon initiation of CIC use, a three-month visit to the health worker may be helpful to identify any possible problems and confirm the correct use of the method. As a result of counselling, adolescents should be helped to acquire the confidence to return to the delivery site or provider any time they have questions or believe it is necessary.

Provider options

Adolescents should be provided with a variety of service options to initiate and continue the use of CICs. Appropriately trained health-care providers using checklists may safely and effectively provide CICs, as long as proper infection-prevention procedures are in place (Stang et al., 2000).

3.2(f) New hormonal delivery systems

NuvaRing® and Evra® are new hormonal delivery systems that have recently come on to the market. Neither has been studied in adolescents.

- NuvaRing® is a non-biodegradable, flexible and transparent vaginal ring used for monthly hormonal contraception. This ring, which is made of ethylene vinyl acetate copolymers and magnesium stearate, contains ethinyl estradiol and etonogestrel (the active metabolite of

desogestrel, and also known as 3-keto-desogestrel). The ring's outer diameter is 54 mm and its cross-sectional diameter is 4 mm. A new ring is worn intra-vaginally for three out of four weeks. Each day 120 μg of etonogestrel and 15 μg of ethinyl estradiol are released into the bloodstream (Organon, 2001; Roumen et al., 2001; Mulders & Dieben, 2000; Timmer & Mulders, 2000).

- Evra® is a transdermal contraceptive patch containing 6 mg norelgestromin (the active metabolite of norgestimate) and 0.75 mg of ethinyl estradiol. The patch has a contact surface area of 20 cm^2. Recommended placement of the patch is on the abdomen, buttock, upper outer arm or upper torso (excluding the breast). Rotation of the patch placement site is recommended to avoid a skin reaction. A new patch is placed once a week for three weeks. Each weekly patch releases 150 μg of norelgestromin and 20 μg of ethinyl estradiol into the bloodstream daily (Burkman et al., 2001).

For both the vaginal ring and transdermal contraceptive patch, withdrawal bleeding occurs during the week when the device is not used. Because both methods deliver estrogen and a progestogen in doses comparable to those seen in low-dose COCs, the physiological impact for adults and adolescents should be similar. This assumption is borne out by data that show bleeding rates, bleeding patterns, and metabolic profiles similar to those for COCs (Organon, 2001; Roumen et al., 2001; Mulders & Dieben, 2000; Timmer & Mulders, 2000; Audet et al., 2001; Dittrich et al., 2002).

No research exists, however, as to the suitability of these methods for most adolescents or on whether adolescents will choose and correctly use them. Additionally, research has not been conducted to determine whether there are special service-delivery and counselling requirements for adolescents compared to older women. Theoretically these two options hold promise regarding consistent contraceptive use. From a client standpoint, these intermediate-acting hormonal methods allow ease of use and greater client control (client-controlled discontinuation) compared to hormonal implants and IUDs.

3.2(g) Progestogen-only pills (POPs)

[See chapter 6, pages 6-2 to 6-18, **ECT**]

Types available

These pills contain only a progestogen, and two general formulations are available:

- one formulation contains levonorgestrel (30 μg) or norgestrel (75 μg)
- the other contains norethisterone or norethindrone (350 μg).

There is no evidence that one formulation or product has any advantages over another. The progestogen-only pill is generally reserved for lactating adolescents, or for the very few adolescents who are medically unable to take estrogen. In addition to decreased effectiveness, progestogen-only pills have the disadvantage of more frequent and persistent irregular bleeding episodes. Accidental pregnancies due to incorrect use are thought to be more frequent with POPs than with COCs. Because of the high incidence of irregular bleeding and higher pregnancy rates, POPs are generally less well suited for adolescents than COCs. However in breastfeeding adolescents, who are six weeks to six months postpartum, POPs are a more appropriate choice.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 4, page 4-19, and chapter 6, page 6-4, **ECT**]

There are no reports on the effectiveness of POP use by adolescents, however in adults POPs are very effective contraceptives when used correctly and consistently. In breastfeeding women, typical failure rates as low as 1 per 100 women during the first year of use are seen. However, accidental pregnancies due to incorrect use are seen more frequently in POP users than in those using COCs (Burkman et al., 2001; Audet et al., 2001). Although the one-year failure rate of POPs is 0.5 with perfect use, this rises to 1–13% with typical use. Maximal contraceptive efficacy is achieved by consistently taking the pill at the

same time of the day, timed so that intercourse occurs when the progestational effect on cervical mucus is maximal (e.g., 3 to 22 hours after administration) (Burkman et al., 2001; Audet et al., 2001).

For these reasons under non-breastfeeding conditions, failure rates for adolescents using POPs may be even higher than the 15 pregnancies observed in the first year of use reported for adolescents using COCs. This possibility is an important limiting factor in the use of POPs by most non-breastfeeding adolescents.

Mechanism of action

[See chapter 6, page 6-4, **ECT**]

The main mechanisms of the contraceptive action of POPs are inhibition of ovulation and thickening of the cervical mucus. Since ovulation is not inhibited in all cases, the cervical mucus effect is considered to play a more important role than it does in the case of COCs. Because the cervical mucus effect disappears within 24 hours of last intake, accidental pregnancies are more likely to occur with variable timing of pill intake (Audet et al., 2001).

Return of fertility

[See chapter 6, page 6-18, **ECT**]

As with adults, the return of fertility upon discontinuation of POP use in adolescents is immediate.

Side-effects and their management

[See chapter 6, pages 6-13 to 6-15, **ECT**]

Breast tenderness, mild headaches and oiliness of the skin/acne may occur in some situations, and are important points in counselling. The most important side-effects of POP use are changes in the menstrual cycle, mainly irregular bleeding or spotting. These effects must be carefully discussed with adolescents considering or initiating this method. Medical management of any of these side-effects is not usually necessary or recommended.

Long-term safety

[See *Progestogen-only contraceptives*, page 4, **IAQCFP**; and chapter 6, page 6-5, **ECT**]

No important health risks (including adverse cardiovascular effects) have been confirmed with POP use.

Benefits

Possible relief from heavy periods and painful menstruation may be of interest to some adolescents. However, the benefit of regular, predictable menstrual cycles seen with COCs is not seen with POPs.

Medical eligibility criteria

[See *Progestogen-only contraceptives*, pages 1–11, **IAQCFP**]

As with adults, current breast cancer is the only condition that represents an unacceptable health risk. There are, however, a number of conditions for which caution should be exercised, and these conditions are the same for adolescents and adults. Some of these (such as ischaemic heart disease and stroke) are rare in adolescents. There are no restrictions for POP use related to young age and nulliparity.

Procedures required for initiation

[See chapter 4, page 4-21, and chapter 6, page 6-10, **ECT**]

Counselling is the only procedure considered mandatory for the initiation of POP use. Pelvic and breast examination, vaginal cytology and blood-pressure determination are not mandatory for the initiation of POP use by adolescents (Technical Guidance Working Group,1994 & 1997).

Initiation

[See chapter 4, page 4-21, and chapter 6, pages 6-9 to 6-10, **ECT**]

POPs may be initiated at any time if the provider is reasonably sure the adolescent is not pregnant. When the method is initiated after day 5 of the menstrual cycle, abstaining from sex or use of a back-up method for the next two days is commonly recommended. The recommendations for initiation in postpartum, post-abortion and breastfeeding women are the same as for adult women.

Correct use

[See chapter 6, pages 6-11 to 6-12, **ECP**]

Daily, uninterrupted intake of POPs is essential to achieve full contraceptive effectiveness. Adolescents should be counselled to take the pill at the same time of day, every day. It helps to link pill intake to a daily routine event such as preparing for bed or brushing one's teeth. Even hours of delay may result in the risk of pregnancy. The pill must be taken without interruption for as long as contraception is needed. This stringent requirement for consistent timing of use must be carefully addressed when the use of this method is being considered.

Counselling

[See chapter 6, pages 6-11 to 6-18, **ECP**]

Method-specific counselling points include:

- careful instructions in the requirements for correct use
- instructions for missed pills
- side-effects
- menstrual cycle changes
- need for STI protection, including dual method use, when and as appropriate
- re-supply options
- cost.

Follow-up

[See chapter 6, pages 6-13 to 6-15, **ECP**]

The same guidance for the follow-up of adolescents using COCs is applicable to adolescents using POPs. Briefly, for non-breastfeeding adolescents no annual follow-up visit is necessary, but a follow-up contact after initiation is recommended at about three months.

Provider options

Adolescents should be provided with a variety of options to initiate and continue the use of POPs. Appropriately trained pharmacists and workers involved in community-based distribution may safely and effectively provide POPs.

3.2(h) Progestogen-only injectables

[See *Progestogen-only contraceptives*, pages 1–11, **IAQCFP**; and chapter 7, pages 7-2 to 7-21, **ECT**]

Types available

[See chapter 7, page 7-3, and page 7-18, **ECT**]

This category refers to injectable contraceptives that contain only a progestogen. Two formulations are currently available:

- one contains 150 mg of depot-medroxyprogesterone acetate (DMPA) given every three months
- the other contains 200 mg of norethisterone enanthate (NET-EN) given every two months.

No differences in safety or efficacy between the two products have been documented. The longer duration of the contraceptive action of DMPA may however be considered an advantage in some circumstances. DMPA has also been better studied than NET-EN, including its use in adolescents.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 4, page 4-19, and chapter 7, page 7-18, **ECT**]

With a failure rate of 0.3 per 100 women in the first 12 months of use for DMPA and NET-EN, progestogen-only injectables are one of the most effective reversible hormonal contraceptives now available. Because of their longer duration of efficacy both products have the distinct advantage of easier compliance requirements than COCs, CICs and POPs. Therefore the risk of accidental pregnancy due to incorrect use is substantially reduced. High contraceptive effectiveness and easy compliance are important advantages for use in adolescents.

Mechanism of action

[See chapter 7, page 7-3, **ECT**]

Both injectables are highly effective ovulation inhibitors. Although both preparations thicken cervical mucus, the main mechanism for contraceptive efficacy is ovulation inhibition. The duration of contraceptive effect normally extends for a short time beyond the 2-monthly and 3-monthly periods currently recommended for NET-EN and DMPA use respectively. This allows a window of opportunity for re-injection even when an adolescent is unable to comply with the precise timing. Current guidelines indicate that giving subsequent injections early or up to two weeks late is acceptable (Kaunitz, 2001a). In spite of this period of grace, counselling should emphasize compliance with the respective 2-month and 3-month re-injection intervals as this will maximize effectiveness.

Return of fertility

[See chapter 7, page 7-5, and page 7-18, **ECT**]

Return of fertility upon discontinuation of either injectable is delayed. The delay is better documented and probably longer for DMPA. Regardless of duration of use, those who discontinue DMPA experience a 4–6 month longer wait before pregnancy is achieved, compared to women who discontinue condoms or a vaginal method. While 50% of women who discontinue DMPA in order to conceive will have become pregnant within 10 months of the last injection, in a small proportion of users fertility is not re-established until 18 months after the last injection. Existing information does not indicate that the return of fertility is delayed for longer in adolescents, and nor has any permanent damage to fertility been associated with the use of either injectable (Technical Guidance Working Group, 1994 & 1997). The delay in the return of fertility must be clearly explained to, and understood by, adolescents considering the use of these methods. Adolescents who want an immediate return of fertility upon discontinuation of contraceptive use are not good candidates for these methods.

Side-effects and their management

[See chapter 7, pages 7-15 to 7-17, **ECT**]

Side-effects that may be seen with progestogen-only injectables are similar to those that may be seen with any progestogen-only contraceptive, namely: irregular, unpredictable, prolonged or heavy bleeding or spotting; breast tenderness; headaches; dizziness; hirsutism; hair loss; nervousness; and acne. Changes in the menstrual bleeding patterns, acne, and weight gain are the side-effects of progestogen-only injectables that are commonly of particular concern to adolescents.

While the following comments are based upon publications for DMPA, they also apply in theory to NET-EN. Although recent controlled trials in American and Thai women do not indicate that the long-term use of DMPA causes unexpected weight gain, there may be subgroups of DMPA users that may be predisposed to weight gain on DMPA. In a recent study of Caucasian adolescents, mean weight gain after adjustment for expected weight changes over a year was 2.1 kg in DMPA users and 0.6 kg in COC users. This difference, although not statistically significant, may cause concern for some adolescents. Additionally, a study of mostly African American adolescents showed that most who used DMPA tended to gain more weight than demographically similar adolescents not using hormonal methods. Nearly all users will experience a change in menstrual pattern. Irregular bleeding, the most common reason for discontinuation, may progress to amenorrhoea. With Depo-Provera® (DMPA) more than 50% of consistent users are amenorrhoeic at the end of the first year of use. As with other forms of hormonal contraception, most non-menstrual and non-weight-gain side-effects are short-lived. In the management

of these side-effects counselling prior to initiation and during use is essential. Studies indicate that appropriate counselling on menstrual-cycle changes diminishes the likelihood of discontinuation of the method (Lei et al., 1996).

In cases of very heavy or very prolonged bleeding, discontinuation of the method may be necessary. The use of estrogens, COCs and non-steroidal anti-inflammatory drugs are likely to be of short-term or no benefit. If any side-effect persists, discontinuation and change to another method should be considered. No medical management for amenorrhoea is recommended or necessary.

Long-term safety

[See *Progestogen-only contraceptives*, page1, and page 8, **IAQCFP**; and chapter 7, page 7-21, **ECT**]
Existing information on the long-term safety of injectables relates mostly to DMPA. The main concern about DMPA use in adolescents is increased risk of osteoporosis. It is proposed that hypoestrogenism linked to DMPA use in post-menarchal adolescents may affect bone-mass formation, lead to osteopenia and resultant osteoporosis (Cromer et al., 1996). Two studies have specifically examined the effects of DMPA upon bone density in adolescents. A small, prospective-cohort study showed decreased lumbar vertebral bone density after one year of use, compared to users of COCs, implants or no hormones (Harel et al., 1995). The other study, a cross-sectional comparison, showed lower age-adjusted bone-mineral density at all bone locations surveyed (Scholes et al., 1999). No studies have shown increased incidence of fractures. Because of these findings, however, the use of DMPA from menarche to 18 years of age may require special follow-up and management as yet undefined.

Available evidence confirms that adolescents who use hormonal contraception, including DMPA, have no increased risk of breast cancer 10 years or more after discontinuation of use. Studies reveal a small increase in breast-cancer risk among women of all ages who are currently using (or have recently used) hormonal contraception. The most probable explanation for this finding is that users may simply be more likely to have an earlier diagnosis of existing cancer rather than a new cancer caused by use (WHO Collaborative Study of Neoplasia and Steroid Contraceptives, 1991). Because breast cancer is so rare in adolescents, any small effect on breast-cancer risk related to current or recent use would affect very few individuals.

Benefits

[See chapter 7, page 7-4, **ECT**]
The prevention of anaemia and improvement in painful menstruation observed with DMPA and NET-EN use may be of interest to some adolescents. The long-term protection from benign breast disease and endometrial cancer, and the reduction in frequency and severity of epileptic seizures, and sickle cell disease crisis may also be relevant for some adolescents.

Medical eligibility criteria

[See *Progestogen-only contraceptives*, pages 1–11, **IAQCFP**]
The conditions under which progestogen-only injectables should not be used or are not usually recommended are few, and are the same for adolescents and adults. Because of bone-mineral density changes, the use of these injectables may require special, as yet undefined, follow-up or management in adolescents from menarche to 18 years. There is no restriction due to nulliparity.

Procedures required for initiation

[See chapter 4, page 4-21, **ECT**]
Counselling and adherence to proper infection-prevention techniques when giving the injection are the only procedures considered mandatory for the initiation of injectables. Pelvic and breast examination, vaginal cytology and blood-pressure determination should not be required for the initiation of these methods by adolescents.

Initiation

[See chapter 7, pages 7-7 to 7-9, **ECT**]

These injectables may be initiated at any time if the provider is reasonably sure the adolescent is not pregnant. Current guidelines recommend that the first injection be given during the first seven days of the menstrual cycle. When it is initiated after day 7, the use of a back-up method for seven days is recommended (Technical Guidance Working Group, 1994 & 1997). The recommendations for initiation in postpartum, post-abortion and breastfeeding women are the same as for adult women.

Correct use

[See chapter 7, page 7-10, **ECT**]

The mechanism of action, the medical eligibility criteria and the side-effects of DMPA and NET-EN are similar. Therefore it is safe to stop using one method and start using the other. Using DMPA and NET-EN injections interchangeably is however not recommended. If it becomes necessary to switch from one method to the other, the switch should be made at the time the repeat injection would have been given. If the previous injectable type and/or timing of injection is unknown, the adolescent can still have the injection if it is reasonably certain that she is not pregnant. She will need to abstain from sex or use additional contraceptive protection for the next seven days.

Counselling

Method-specific counselling points include:

- careful information on the anticipated changes in the menstrual cycle
- possibility of weight gain
- need for an injection every 2 or 3 months
- need for STI protection, including dual method use, when and as appropriate
- re-supply options
- cost.

Follow-up

[See chapter 7, page 7-14, **ECT**]

In most situations, re-injection will require contact with a health-care worker. The worker should use this encounter as an opportunity to enquire about method-specific concerns or problems. Considering the safety of the use of injectables in adolescents, a rigid, clinic-based follow-up may not be necessary in all cases or circumstances. Services should also provide options for the easy, safe and inexpensive re-injection of injectables, outside of a clinic setting, if possible.

Provider options

So far, the use of injectables in adolescents has been limited primarily to clinical settings. However, DMPA has been safely and widely used in non-clinical settings in the adult population of some countries. The primary issue for consideration is safety of the injection procedure. The provision of injectables requires an aseptic injection technique, use of sterile needles and syringes (preferably disposable) and their safe disposal. Appropriately trained providers may safely provide injectables to adolescents (Rai et al., 1999; Stang et al., 2000).

3.2(i) Progestogen-only implants

[See *Progestogen-only contraceptives*, pages 1–11, **IAQCFP**; and chapter 8, pages 8-1 to 8-24, **ECT**]

Types available

Two main types of progestogen-only implants are available:

- Levonorgestrel implants (Norplant® and Jadelle®)
- Etonogestrel implant (Implanon®).

Of these, Norplant® is the only implant that is widely available and for which global, clinical and programmatic experience has accumulated. It consists of six small silastic capsules that are inserted under

the skin of the upper inner arm. Each capsule contains 36 mg of levonorgestrel, which is released into the circulation at a low, constant rate. Norplant® provides extremely effective contraceptive protection for at least five years. Jadelle® consists of two levonorgestrel silastic rods that protect against pregnancy for five years, and Implanon® consists of etonogestrel-containing silastic capsules that protect for three years.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 4, page 4-19, and chapter 8, page 8-4, **ECT**]

Norplant®, with a failure rate of 0.1 pregnancies per 100 women in the first 12 months of use, is one of the most effective, reversible hormonal contraceptives available. Preliminary studies suggest that Jadelle® and Implanon® are as effective as Norplant® for five and three years respectively, although comparative studies between Norplant® or Jadelle® and Implanon® are lacking (Sivin et al., 1998; Croxatto, 2000).

The high contraceptive effectiveness, its duration, and easy compliance are important advantages for adolescents who desire long-term contraception. For all three formulations the risk of accidental pregnancies due to incorrect use is extremely low.

Mechanism of action

[See chapter 8, page 8-4, **ECT**]

Same as for POPs.

Return of fertility

[See chapter 8, page 8-1, ECT]

The return of fertility upon removal is immediate.

Side-effects and their management

[See chapter 8, pages 8-17 to 8-21, **ECT**]

Possible side-effects are those that can occur in users of other progestogen-containing contraceptives and can include nausea, dizziness, change in appetite with subsequent weight gain or loss, hair growth or loss, oiliness of the skin, acne, headaches and menstrual irregularities. As with oral contraceptives, many of the side-effects associated with these methods are short-lived, and generally the only side-effect that lasts a year or more is irregular, unpredictable bleeding episodes (Physicians' Desk Reference, 2002b; Population Reports, 1987; Population Council, 1990; Sivin, 1988). Norplant® data indicate that irregular and prolonged bleeding can be lessened by treatment with estrogen or non-steroidal anti-inflammatory drugs (Diaz et al., 1990); recommended regimens are the same as for adult women. Side-effects that a given patient will experience with Norplant® cannot be predicted based on user experience with other progestogen-only contraceptive methods such as the progestogen-only pill or Depo-Provera, nor with a "trial" of an oral course of medroxyprogesterone. Despite the side-effects, many adolescent and adult users are satisfied with Norplant® (Darney et al., 1990; Cullins et al., 1990). Similar studies among adolescents are needed for Implanon® and Jadelle®. Users who were properly counselled regarding potential side-effects prior to Norplant® insertion are more likely to continue with the method (Population Council, 1990; Berenson & Wiemann, 1993; Haugen et al., 1996). It should be emphasized, however, that when a woman prefers Norplant® removal instead of the symptomatic treatment of side-effects, her decision must be respected.

Long-term safety, benefits, and medical eligibility criteria

[See *Progestogen-only contraceptives*, pages 1–11, **IAQCFP**; and chapter 8, pages 8-1 to 8-9, and pages 8-22 to 8-24, **ECT**]

Because it contains no estrogen and releases small daily amounts of levonorgestrel, the safety profile of Norplant® is better than that of combined oral contraceptives, which, as detailed above, have an excellent safety profile(Stang et al., 2000; Croxatto, 2000). Jadelle® is expected to have a safety profile similar to Norplant® (Sivin et al., 1998; Physicians' Desk Reference, 2002b; Sivin, 1988). Long-term studies of the safety of Implanon® have not been completed. Serum levels of hormone are lower than those associated with combined oral contraceptives or combined injectable methods (Croxatto, 2000).

The long-term safety, benefits and medical eligibility criteria are all similar to those for POPs.

Procedures required for initiation

[See chapter 4, page 4-21, **ECT**]

An important issue for consideration regarding implant use in adolescents is ensuring the appropriate training of health workers in insertion and removal techniques, including basic infection-prevention measures during the procedure. Counselling is also an essential procedure. Pelvic and breast examination, vaginal cytology and blood-pressure determinations are not considered mandatory for the initiation of Norplant® use by adolescents.

Initiation

[See chapter 8, pages 8-10 to 8-13, **ECT**]

The same principles outlined above for progestogen-only injectables apply to Norplant®.

Correct use

[See chapter 8, pages 8-14 to 8-15, **ECT**]

Once the implant is inserted there are no contraceptive-compliance requirements. The user has only to remember the date when the implant should be removed. Current recommendations are to remove Norplant® and Jadelle® at five years and Implanon® at three years.

Counselling

[See pages 8-4 to 8-6, and 8-22 to 8-24, **ECT**]

Method-specific counselling points include:

- care of the insertion site the first few days after insertion
- remembering the 5-year (or 3-year) date of removal
- side-effects
- menstrual-cycle changes
- access to removal upon request, whether for personal or medical reasons
- need for STI protection, including dual method use, when and as appropriate
- cost.

Follow-up

[See chapter 8, pages 8-16 to 8-20, **ECT**]

While no routine schedule of follow-up is required, some providers recommend a first visit shortly after the insertion to check the insertion site and any possible problems related to insertion. Additionally some providers recommend a visit after three months to identify possible problems and confirm satisfaction with the method. As a result of counselling, adolescents should have the confidence to return any time they have questions or believe it is necessary. Very importantly, services must be prepared to provide for the removal of the implant when the need arises, or when requested by the client.

Provider options

Because of the procedural requirements for correct and safe insertion and removal, the provision of Norplant® must be considered as a clinic-based method, with relatively limited provider and delivery-site options.

3.2(j) Intrauterine devices (IUDs)

[See Intrauterine devices, pages 1–11, **IAQCFP**; and chapter 12, pages 12-1 to 12-27, **ECT**]

Types available

Worldwide, many types of IUDs exist, and the most efficacious include the T-Cu 380A, the Multiload Cu-375, and the levonorgestrel intrauterine contraceptive system. The most commonly used IUD outside of China is the T-Cu 380A which has a T-shaped frame with 380 mm^2 of copper, and provides extremely effective contraception for up to 10 years. There is no reported experience of progestogen-only IUD use in adolescents. While there are no restrictions based on age or parity for IUDs, many adolescents still

will not qualify as candidates because of the risk of exposure to STIs. Ideal candidates for IUDs are in long-term mutually monogamous relationships, are parous, and do not have unexplained vaginal bleeding.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 4, page 4-21, and chapter 12, page 12-4, **ECT**]

The first-year pregnancy rate for the T-Cu 380A IUD is 0.6–0.8 pregnancies per 100 women in the first year of use, and is comparable to first-year female sterilization failure rates. At 10 years, the cumulative failure rate is 1.8 per 100 (WHO, 1997). The levonorgestrel IUD has non-contraceptive benefits, is effective for five years, and has one-year and five-year failure rates comparable to the T-Cu 380A (Sivin et al., 1991; Sivin et al., 1990; Sivin & Stern, 1994).

Mechanism of action

[See page 12-4, **ECT**]

Although the mechanism of action of intrauterine contraception is not entirely understood, the available evidence indicates that IUDs work primarily by preventing fertilization (Ott et al., 2002; Santelli et al., 1998; Sivin, 1989; Rivera et al., 1999b). It is thought that the chronic sterile foreign body reaction in the endometrial cavity elicited by these devices affects sperm survival, capacitation or motility, and as a consequence fertilization does not take place. In addition, copper is known to be sperm-toxic. The LNG IUD has the additional action of thickening the cervical mucus, making sperm penetration more difficult.

Return of fertility

[See chapter 12, page 12-5, **ECT**]

With either type of IUD there is no delay in the return of fertility following removal. Increased risk of pelvic, inflamatory disease (PID), which may be seen in some groups of adolescents, is an important concern in determining IUD eligibility. If PID develops during IUD use, fertility may be impaired after IUD removal. The use of IUDs is appropriate only in carefully selected adolescents; IUDs are generally not appropriate for adolescents at increased risk of STIs.

Side-effects and their management

[See chapter 12, pages 12-18 to 12-24, **ECT**]

The most important side-effects experienced with copper-bearing IUD use are increased menstrual bleeding and pain. These side-effects are usually the main reasons for requesting removal. Evidence suggests that younger women are less tolerant of these side-effects and that nulliparous women may have a higher risk of IUD expulsion (Rivera et al., 1999a). For copper-bearing IUDs, bleeding may be prolonged and excessive in some cases, especially in the first month after insertion. In some cases prolonged and/or excessive bleeding may require medical management with non-steroidal anti-inflammatory drugs, removal of the IUD, or a switch to the LNG-IUD.

Long-term safety

[See chapter 12, pages 12-5 to 12-6, and page 12-26, and page 12-27, **ECT**]

The main concern with IUD use is development of PID which can lead to sequelae such as infertility and chronic pain. It has been shown however that the medical literature is replete with inappropriately designed studies that have exaggerated the risk of PID (Grimes, 2000). Nevertheless, the risk of PID is greatest within the first 20 days following insertion. PID in IUD users results from the contamination of the uterine cavity at the time of insertion or from a newly acquired STI, when infection develops separately from insertion. The risk of PID among women who are appropriate candidates for IUD use is about 1 case per 1000 users. Prophylactic antibiotics prior to IUD insertion among women at low risk for STIs does not appear to reduce the risk of PID following IUD insertion. Removing the IUD is thought to provide no additional benefit once PID is being treated with appropriate antibiotics.

While the absolute risk of ectopic pregnancy is lower in LNG and T-Cu 380A users than it is among women not using contraception, when an accidental pregnancy does occur it is more likely to be ectopic. The use of IUDs in adolescent women requires careful evaluation of each individual case.

Benefits

After several months of use, the therapeutic non-contraceptive benefits that may be seen with the LNG IUD include reduced dysmenorrhoea, reduction in menorrhagia and associated iron-deficiency anaemia, and development of amenorrhoea (WHO, 1997; Sivin et al., 1990).

Medical eligibility criteria

[See *Intrauterine devices*, pages 1–11, **IAQCFP**; and chapter 12, pages 12-7 to 12-8, **ECT**]

The conditions under which IUDs should not be used or are not recommended are the same for adolescent and adult women.

Procedures required for initiation

[See chapter 4, page 4-21, and chapter 12, pages 12-10 to 12-12, **ECT**]

The following procedures are mandatory before initiating the use of IUDs in adolescents:

- Counselling – the adolescent should comprehend the potential risks associated with IUD use. The relationships between sexual behaviour, STIs, PID and infertility should be understood.
- Assessment of *STI risk* by personal history and physical examination is essential and mandatory in all circumstances for the safe and effective use of the method.
- Pelvic examination to identify the presence of a genital infection or any abnormality that might make the insertion of the IUD inappropriate. Providers of IUDs must be trained in the performance and interpretation of the pelvic exam.
- Infection-prevention procedures necessary for the aseptic insertion of the IUD.
- The assessment of *STI presence* may be performed by personal history and physical examination including pelvic examination. In settings with a high STI prevalence, the use of laboratory tests to rule out STIs might be considered, where feasible.

Breast examination, vaginal cytology and determination of blood pressure are not mandatory for IUD use initiation in adolescents (Technical Guidance Working Group, 1994 & 1997).

Initiation

[See chapter 12, pages 12-10 to 12-11, **ECT**]

IUDs may be inserted in adolescent women at any time within the first 12 days after the start of menstrual bleeding. It can also be inserted at any other time during the menstrual cycle as long as the provider is reasonably sure that the adolescent is not pregnant. Some providers prefer to insert during menstruation when the cervical os may be slightly dilated, but this is not a requirement. IUDs may also be inserted postpartum, post-caesarean section and post-abortion under the same conditions as for adult women.

Correct use

An important requirement for the correct use of IUDs is compliance with safer sexual behaviours, prior to and after insertion.

Counselling

Method-specific counselling points include:

- comprehension, personal acknowledgement of, and commitment to, the safer sexual behaviours required for the safe use of IUDs
- side-effects
- information on how to access removal.

Follow-up

[See chapter 12, pages 12-17 to 12-24, **ECT**]

A follow-up visit is recommended after the first menses or 3–6 weeks following insertion. As a result of counselling, young women should be helped to gain the confidence to return to the provider any time they have questions or believe it is necessary. Clients should be specifically instructed to return if there is any change in STI risk.

Provider options

Because of stringent requirements for counselling, safe insertion, removal and follow-up, the IUD is a clinic-based method. As such there are relatively limited delivery-site options. Studies have shown that nurses, nurse practitioners, certified nurse midwives and physicians can be trained to insert IUDs competently (Wright et al., 1977; Zeighami et al., 1976; Aziz & Osman, 1999; Andrews et al., 1999).

3.2(k) Natural family planning/fertility awareness based methods

[See *Fertility awareness-based methods*, pages 1–4, **IAQCFP**; and chapter 14, pages 14-1 to 14-18, **ECT**]

These methods of fertility control rely on the avoidance of intercourse during times of peak fertility. They require identification of the fertile days of the cycle by observing fertility signs such as cervical secretions and/or basal body temperature (Ott et al., 2002; Santelli et al., 1998) or by adhering to a set number of abstinent days ("Standard Days Method" or "Fixed Formula Method") (Arevalo et al., 2000) during each menstrual cycle. Fertility awareness-based methods can be used in combination with barrier methods during fertile time periods.

The greatest risk for pregnancy is during the six-day time period that ends on the day of ovulation (Wilcox et al., 1995). Specifically, the probability of pregnancy increases from approximately 4% five days before ovulation to almost 30% just before ovulation, then decreases to 8% on the day of ovulation. The day after ovulation, the probability of pregnancy drops to almost zero until five days before the next ovulatory cycle (Wilcox et al., 1998). For traditional fertility awareness-based methods, ovulation may be estimated by monitoring the changes in body temperature and cervical mucus associated with the pre-ovulatory surge in progesterone (Ryder & Campbell, 1995). More recent fertility awareness-based methods have utilized mnemonic devices, such as colour-coded, beaded necklaces which enable the user to identify easily those times when intercourse should not occur (Institute for Reproductive Health, 2001). In order to achieve high pregnancy-prevention rates, fertility awareness-based methods usually require a motivated client and partner, and an experienced clinician or counsellor.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 14, page 14-4, **ECT**]

When fertility awareness-based methods are used correctly and consistently they are effective contraceptive approaches, and failure rates at one year of use as low as 1–9 pregnancies per 100 women may be achieved. For typical use, the rate is 20. Although there are no reports on the effectiveness of fertility awareness-based methods in adolescents, it is recognized that adolescents are very frequently unable to comply with the stringent requirements for the correct and consistent use of natural family planning methods. These methods are therefore not usually recommended for adolescents.

Mechanism of action

[See *Fertility awareness-based methods*, page 1, **IAQCFP**; and chapter 14, page 14-4, **ECT**]

Fertility awareness-based methods require user recognition of the fertile days of the menstrual cycle, and intercourse must be avoided or barrier contraception used during this time. These methods allow for a 24-hour survival of the ovum and 5-day survival for sperm. The main problem with successful implementation of these methods is the variability of the duration of the menstrual cycle and of the day of ovulation. Menstrual-cycle variability tends to be more common during the beginning and end of reproductive life (adolescents and peri-menopausal women) (Bravender & Emans, 1999; Kaunitz, 2001b). This variability, along with the degree of personal motivation required to practise these methods correctly, make fertility awareness-based methods a challenge for many adolescents. Research is needed into the use of the Standard Days Method (utilizing the mnemonic bead necklace) by adolescents.

There are no side-effects, long-term safety concerns or non-contraceptive benefits associated with the use of fertility awareness-based methods.

Medical eligibility criteria

[See *Fertility awareness-based methods*, pages 1–4, **IAQCFP**; and chapter 14, pages 14-7 to 14-9, **ECT**]

There are no medical conditions in which the use of these methods is restricted. However, there are some conditions that may affect ovarian function or the fertility signs and symptoms, and which make the use of fertility awareness-based methods very difficult or impossible.

Procedures required for initiation

[See chapter 4, page 4-21, and chapter 14, page 14-10, **ECT**]

Counselling is the only procedure considered mandatory for the initiation of fertility awareness-based methods. The presence of vaginal discharge may affect the interpretation of cervical mucus changes. This situation may be identified by a personal history, but in some cases a pelvic examination may be required.

Counselling/follow-up and managing problems

[See chapter 14, pages 14-10 to 14-18, **ECT**]

Counselling is essential in the provision of fertility awareness-based methods to adolescents. In most counselling situations, the adolescent should be referred to a provider specifically trained in the provision of fertility awareness-based methods. The involvement and active participation of both partners is essential for appropriate use of these methods. As with other contraceptive methods, the need for STI protection and emergency contraception should be addressed. Method-specific counselling points are based upon the fertility-awareness method chosen (Ryder & Campbell, 1995).

3.2(l) Lactational amenorrhoea method (LAM)

[See Table 1, *Executive summary and Overview*, page 5, and *Lactational amenorrhoea method*, page 1, **IAQCFP**; and chapter 15, pages 15-1 to 15-15, **ECT**]

LAM may be considered an appropriate contraceptive choice for postpartum adolescents planning to breastfeed. The main physiological variable governing method success is whether the adolescent is exclusively or nearly exclusively breastfeeding the infant (Hight-Laukaran et al., 1997; Ramos et al., 1996). There are no special considerations for the use of LAM in adolescents, and the same guidelines for use of LAM in adults apply.

Effectiveness

[See Table 1, *Executive summary and Overview*, page 5, **IAQCFP**; and chapter 15, page 15-4, **ECT**]

LAM is an extremely reliable form of contraception during the first six months postpartum as long as the woman is amenorrhoeic. Typically the failure rate is 2 pregnancies per 100 women in the first 12 months of use. With perfect use 0.5 failures per 100 women in the first 12 months is observed.

Mechanism of action

[See chapter 15, page 15-4, **ECT**]

Inhibition of ovulation is the mechanism of action.

Medical eligibility criteria

[See *Lactational amenorrhoea*, page 1, **IAQCFP**; and chapter 15, pages 15-6 to 15-7, **ECT**]

Eligibility is the same for adults and adolescents.

Procedures required for initiation

[See chapter 4, page 4-21, and chapter 15, pages 15-7 to 15-10, **ECT**]

Unchanged from adult procedures.

Counselling/follow-up and managing problems

[See chapter 15, pages 15-9 to 15-15, **ECT**]

Unchanged from adults.

3.2(m) Withdrawal

[See Table 1, *Executive summary and Overview*, page 5, and *Coitus interruptus*, page 1, **IAQCFP**]

Withdrawal requires a high degree of motivation and discipline, which may be quite difficult for a young adolescent couple. While withdrawal is generally acknowledged as a frequently-used method by adolescent couples, no precise data on the use of this practice exist. The few data that exist regarding its effectiveness show typical 12-month pregnancy rates of 19 per 100 women and perfect-use rates of 4 per 100 women. This method provides no protection against STIs including HIV infection.

3.2(n): Male and female sterilization

[See Table 1, *Executive summary and Overview*, page 5, and *Surgical Sterilization Procedures*, pages 1–14, **IAQCFP**; and chapter 9, pages 9-1 to 9-23, and pages 9/10-1 to 9/10-2, and chapter 10, pages 10-1 to 10-19, **ECT**]

There are few adolescents who would be candidates for sterilization, since both male and female sterilization are permanent forms of contraception. Young age has been found to be the most important factor associated with sterilization regret (Howard, 1982; Pati & Cullins, 2000; Schmidt et al., 2000; Hillis et al., 1999). Other factors correlated with regret, such as change in marital status or partners, and child deaths are also more likely to occur over the lifetimes of younger people (Howard, 1982; Wilcox et al., 1991). For all these reasons, sterilization is not generally considered to be an appropriate contraceptive option for adolescents. It may be performed only in exceptional circumstances. In such cases, appropriately obtained and verifiable informed choice and consent is mandatory.

PART 4
Counselling for choice and utilization of contraceptive methods

4.1 Counselling in providing adolescent services

With respect to clinical encounters, counselling is a very important factor in influencing whether an adolescent will adopt positive health behaviours. Effective counselling requires the establishment of trust, respect, privacy and confidentiality between the health-care provider and the adolescent. Successful counselling requires attentive listening, the ability to see things from the client's perspective and a willingness to provide adequate uninterrupted time. Asking questions that will provide clues about the adolescent's knowledge, thinking capacity and attitudes to sexuality, contraception and STI prevention can help to optimize the usefulness of the time available in clinical settings. An example of the type of question that would yield such information would be: "What advice would you give to a friend who is thinking about having sex with his/her boy/girlfriend?"

Counselling requires the provider to explore their own assumptions about adolescents so that they will be able to offer services without judgement or bias. For some providers it will mean coming to terms with their own feelings regarding adolescent sexuality so that they can help adolescents to make informed choices, rather than giving negative-consequence advice to deter sexual expression or experimentation. For other providers, it may mean considering their own feelings regarding adolescent sexual behaviour that may include homosexual or bisexual activities, or specific sexual practices such as oral sex.

The goals of counselling adolescents for positive health practices involve helping them to:

- access accurate and complete information that is understandable to them
- explore who they are, how they see themselves, and what they want to accomplish immediately and in the near/distant future
- explore their ability to make decisions
- explore their ability to carry out decisions
- explore behaviours which may put the individual at risk, and that need to change.

Addressing the adolescent's self-worth, their belief in what they can do, their ability to decide and act upon decisions, and their sense of their own power to change existing risky behaviours are critical prerequisites for successful abstinence, contraceptive use and STI prevention. Counselling will need to include communication-skills practice for adolescents of both sexes. Female adolescents must be able to talk with their partners about abstaining from sex or about specific sexual behaviours that could put them at risk for untimely pregnancy and/or infection.

For younger adolescents, counselling should focus on putting them at ease with sharing their concerns regarding the normality of physical development and sexual sensations, or their curiosity and development of positive feelings about sexuality. Encounters with young adolescents offer rich opportunities to provide information on how their bodies and emotions are changing; to practise communication skills (for explaining, refusal and negotiation); to address the issue of abstinence; and to help negotiate peer norms. Where adolescents are at risk of pregnancy, contraceptive-method information designed to help in decision-making should be presented using approaches that are likely to be understood and retained (for example by dealing with questions and answers in written or cartoon-formatted educational materials).

Sexual force or coercion, or their possibility, is a part of the sexual experience of some adolescents, and they should be encouraged to develop strategies to avoid all unwanted sexual encounters (Blythe et al., 2000).

For older adolescents, counselling should focus on promoting safer sex practices. Counselling should involve helping the adolescent to develop skills in the negotiation of abstinence or protected sex, comfort with use of condoms, and, if not monogamous, in reducing the number of sexual partners. Contraceptive-method information should be concise and formatted in pamphlets. For adolescents who are not sexually active, counselling should help them to maintain abstinence. In one assessment of a sexual-abstinence programme within the school health-education system in Uganda, increased human-to-human interaction had more potential for effecting behaviour change than simply disseminating information (Shuey et al., 1999). It is important to remember that most adolescents want to discuss sexual matters with a knowledgeable person such as a health-care provider, and that each encounter should be seen as a valuable "teachable moment".

Again for the older adolescent, the content of the dialogue should include the reasons for preventing pregnancy and STIs, the methods that are available and method-specific issues. Initially, the adolescent must be presented with the opportunity to decide whether or not he/she wants to prevent pregnancy or regulate fertility. Once this decision is made the counselling process should move on to provide enough information to allow the adolescent to choose the method of his/her choice. If the adolescent is at risk for STIs, he/she should be counselled about ways to reduce that risk, including the consistent and correct use of condoms. Counselling should then cover more specific information on the method chosen to ensure its correct and satisfactory use. Finally, the counselling process should include information on the entire spectrum of services or assistance that may be provided to the adolescent, particularly on the complementary non-fertility-regulation programmes that may be available.

Adolescents may find it difficult to give fully accurate personal sexual histories due to embarrassment or fear of censure. They may also appear "difficult" or sullen when being called upon to discuss intimate personal details. Health-care providers should raise questions about the client's personal sexual history only after rapport has been established and it is clear that no judgements are being made about the adolescent's lifestyle.

Adolescents (whether married or unmarried) are less tolerant of side-effects than adults, and counselling on the management of contraceptive-method side-effects in females requires patience and creativity in drawing the client into the problem-solving process. In this way the adolescent is helped to develop confidence in her own ability to take responsibility for herself and her care. Adolescents should also be helped to determine specifically what they can do to cope with and improve their situation, and reassurance should be given on issues such as breakthrough bleeding (e.g., when to expect improvement, what the options might be if the side-effect persists, and how to explore what other conditions might cause it). Through contraceptive counselling the adolescent should be made to feel that she can contact the health service at any time to talk about any issue that is worrying her. In some cases an adolescent may want to become pregnant. In this situation, the health-care provider will need to explore the realities of being an adolescent parent with his/her client.

It is important for providers to remember that some adolescents who may not have had sexual intercourse may still be involved in sexual activities (such as fellatio, cunnilingus and anal intercourse) which might put them at risk of infections (Remez, 2000). Counselling should explore with adolescents whether or not they are involved in such sexual activities and how they can protect themselves and their partners from infection. A sample question to access this information might be: "Some of my clients have told me that they worry about infections and germs they might have caught from heavy petting, oral or anal sex. Have you been worried or do you have questions about problems like that?" (Remez, 2000). In providing services to adolescents, the use of creative approaches to encourage them to practise protective behaviours consistently is essential. Examples of such approaches might include engaging in role-play related to partner communication; enhancing refusal and negotiating skills; and practising the placement and removal of male and female condoms on models.

Addressing the needs of male adolescents helps to protect the health and well-being of female adolescents. As with adolescent females, adolescent males have an important need for a basic knowledge of reproductive health – covering issues such as sexual function, physiology of reproduction, contraception and STI prevention. Male adolescents are more likely to discuss sexual matters where confidentiality is assured and when male counsellors who speak to them in an engaging manner are available.

Finally, consistent and repeated follow-up counselling sessions are crucial in helping adolescents become sexually responsible adults. Such follow-up should aim to help the adolescent adjust to and maintain positive behaviours, to problem-solve, and to support the successes made by adolescents in communicating their needs, and in preventing pregnancy and infection.

4.2 Personal and social issues affecting the adolescent's choice and utilization of contraceptive methods

A number of very personal and individual factors affect the use, non-use, and the correct and consistent use of contraceptive methods by adolescents. In addition, personal, social and cultural factors in the environment of the adolescent will influence patterns of contraceptive use, and such factors will include:

a: sexual experiences
b: psychosocial development
c: gender issues
d: previous health-care experience
e: access to services, and their cost
f: access to information
g: health and education structures
h: social and cultural norms.

Knowledge of these personal, social and cultural factors is essential in the planning of *how* contraceptive services are going to be provided to adolescents. This information has to be locally obtained through formal and informal mechanisms. It also needs to be regularly updated and evaluated. Services must be provided in such a way that any special requirements associated with the factors listed above are met. Sometimes these factors pose challenges that cannot be addressed immediately, and developing mid- to long-term strategies may be necessary. Since the scope of this document precludes comprehensive discussion, each of the above factors will be briefly outlined, focusing upon aspects that may influence the organization of clinical services or adolescent-provider interaction during a clinical encounter. Mention will also be made of areas where research is lacking.

4.2(a) sexual experiences

The frequency, circumstances and types of sexual behaviours of the adolescent influences the type of methods preferred and their use. Adolescents who are unmarried and not sexually active, or unmarried and sexually active, or married and wanting to postpone, space or limit pregnancy, or adolescents wanting to prevent STIs only are all at different stages of their reproductive lives and have different contraceptive needs. Similarly whether the sexual behaviour is consensual or coerced, along with the specifics of the behaviours (oral, anal or vaginal sex; frequency, and number of partners) will also influence the type of method(s) needed. There are however practically no studies which have attempted to correlate the specifics of sexual behaviour types and their sequencing with contraceptive decision-making and continuation in adolescents.

4.2(b) Psychosocial development

[Please see PART 2: Personal and social issues affecting adolescents for more details]
In the process of becoming adults, adolescents constantly analyse the world around them, testing the boundaries of what is possible. This can result in risk-taking behaviour. Adolescents may for example perceive the risk of pregnancy as low, and may therefore use an ineffective contraception method (or none at all), or use a method incorrectly. Studies have shown that adolescents usually engage in unplanned,

sporadic sexual activity (Harper, 1988; Alan Guttmacher Institute, 2002a). As a result, it is not uncommon for no contraception to be used, particularly at the time of first intercourse. If adolescents do not think that they are at risk of pregnancy (or STIs) or have the attitude "it won't happen to me", then they are less likely to make any decision at all regarding contraception, or are less likely to use an effective form of contraception (Durant & Jay, 1987). Many adolescents seek information on contraception only after a pregnancy scare (Centre for Population Options, 1990). Adolescents may also be less likely to possess the motivation and skill to use a contraceptive method correctly. Even when adolescents have correct information about contraceptives, this will not guarantee that responsible sexual behaviour will follow. For example, an adolescent may know about condoms but may be unable (or find it very difficult) to obtain them or may be forced to have sexual intercourse without them.

As adolescents are still developing into adults, they may lack certain skills that adults take for granted. The processes of planning and thinking about life may be less formed and more spontaneous in adolescents than among those who are older. These factors impact on their choice and utilization of methods and must be taken into consideration in the provision of services.

Adolescents may also experience difficulties in communicating with their parents on sexuality-related issues. This may be due to the adolescent having a different set of values in such issues, as well as the perceived notion that parents do not want (or find it inappropriate) to discuss such issues (International Planned Parenthood Federation, 1995). Similarly, adolescents may not visit a health service if there is a perceived fear of rejection, or if it will create difficulties with their partner. Furthermore, some adolescents may think that talking about contraception may ruin the romantic moment or make sexual activity less fun. Health-care providers should encourage discussion of all these issues.

Essential elements to consider in this area include the educational goals, and more generally, the life goals, life expectations and future plans of adolescents. Limited or non-existent educational or life expectations have a negative effect on the use of contraceptive methods by adolescents, who otherwise may seem to be in obvious need of such methods. In some circumstances the development of linkages between contraceptive services and youth-development services needs to be considered.

4.2(c) Gender issues

Societal assumptions concerning gender affect the access that adolescents have to contraception. This may be due to the assumption that contraception is a "female" issue, thus excluding men from responsibility or participation. Consequently, while some women may have little power and choice regarding contraceptives, they end up bearing most of the responsibility for their use (Alan Guttmacher Institute, 1998). (See also section 2.2 above).

4.2(d) Previous health-care experiences

Previous experiences with health-care workers or with the health-care delivery sites available to adolescent are likely to influence the use of contraceptive services when the need arises. In some cases a negative perception of health services needs to be overcome. Furthermore, it is important to know the attitudes and expectations of adolescents towards reproductive-health services in general, and to plan the provision of services accordingly. Positive or negative experiences with a previous contraceptive method (such as frequency or severity of side-effects, follow-up and re-supply requirements) will also affect future contraceptive choices. Particular attention needs to be given to how adolescents perceived the demands required for the correct use of a previous method, and the conditions that they had to meet for re-supply.

4.2(e) Access to services, and their cost

Adolescents in need of contraception may not be economically independent due to their educational status, employment skills, age or gender role. Some young women may be economically dependent on their partners for money; if problems in the relationship occur or if the partner is economically insecure, this may limit her access to a service. Economic dependence and financial insecurity will impact on an adolescent's contraceptive use in different ways. It may for example be impossible for adolescents to meet the financial costs of transport to health-care services. In one study, it was found that contraceptive

use decreased as the travel time to services increased (WHO & International Youth Foundation, 1993). Similarly, clinic fees and the cost of contraceptives themselves may not be affordable by adolescents, or they may have to take time off work or school to attend services.

4.2(f) Access to information

The level of, and access to, information are key determinants of contraceptive use and choice. Adolescents frequently lack essential information on the characteristics of contraceptive methods, and the information they do have is often incorrect (Mehta & Malhotra, 2000). The myths around reproductive issues can have a large bearing on whether and how adolescents seek reproductive-health care (Otoide et al., 2001). Focus groups conducted among young people in Nigeria revealed that the myth that contraception was a cause of infertility motivated the seeking of abortion services rather than contraceptive services (Grimes, 2000). Sometimes, information on contraception is not tailored to the needs or expectations of adolescents, and in some circumstances it may be intentionally denied.

4.2(g) Health and education structures

The extent to which health and education structures recognize adolescent health-care needs (and reproductive health-care needs in particular) has a significant effect on a number of factors which in turn determine the use made of contraceptive methods by adolescents.

A lack of comprehensive education in school, home or youth centres may mean that adolescents do not acquire the necessary information (or have incorrect information) about their own bodies, contraception and services (UNFPA/WHO/UNICEF, 1989; Sivin, 1989). According to a review of research studies conducted in 1993 by WHO, 10 studies found that school sex education leads to an increase in the adoption of safer sexual practices by sexually active young people (UNAIDS, 1997). Six studies showed that adolescents delayed starting sexual activity or decreased their overall sexual activity. Two studies reported that access to counselling and contraception had no effect on the timing and level of sexual activity. It was also found that sex education was most effective if it was given before adolescents became sexually active.

Illiteracy too can certainly affect the accessibility of information and contraceptive services. In some countries, even the ability to read a phone book or poster may make a difference to the health of an adolescent. Studies have shown that the more educated a young woman is, the more likely she is to obtain contraceptives and use them effectively (Alan Guttmacher Institute, 1998).

4.2(h): Social and cultural norms

Societal perceptions of contraception have a great influence on adolescents, for example, the perception of some people that contraception should only be used by married couples who want to space out pregnancies. Others erroneously believe that exposure to contraceptive information encourages women to promiscuity, and social attitudes may condemn women for seeking such information before marriage (Alan Guttmacher Institute, 1998).

Cultural attitudes towards sexuality differ widely and may hinder an adolescent's understanding of, and ability to obtain access to, contraception. In many countries, the gender and marital status of individuals can influence whether they are able to utilize a health service, and the comprehensiveness of the services that they will receive. The opportunity should exist for an adolescent to choose the sex of the health-care provider they see.

Cultural or social stigma may cause adolescents to feel embarrassed about being seen at a reproductive-health service, and there may be social objections to the use of certain methods, such as condoms or the pill. In general, moralistic community attitudes are common obstacles to effective youth services (In Focus, 1997), and imparting correct and reliable information to adolescents may often be difficult. In some cultures, adolescents may face disapproval if they seek contraceptives or become pregnant outside marriage (Bledsoe & Cohen, 1993).

Conclusion

Reproductive and sexual health care tailored to the needs of adolescents must be delivered in a context of confidential, personalized services that take into account the particular adolescent's psychosocial and sexual-development needs. Adolescence signals burgeoning sexual desire, and by the end of adolescence many individuals, married or not, will have experienced sex. The nature of these sexual encounters and the nature of reproductive health-care obtained during adolescence will influence a lifetime of sexual health or ill health. Often, health-care providers are uniquely positioned to guide an adolescent towards more responsible sexual behaviour. Guidelines for health-care providers need to be specific enough to guide the clinical care of any adolescent, yet they should also allow for clinician judgement, when circumstances require a more tailored approach for a specific adolescent. In terms of national or international guidelines development, guidelines must allow for adaptation to local programmatic considerations, opportunities, resources and constraints.

In the past, family-planning guidelines focused primarily on contraceptive-method attributes, namely: safety, efficacy, method suitability and the advantages and drawbacks of specific methods. In such guidelines and in service delivery sites, little attention was given to STI prevention and treatment, sexuality, and the influence of intimate, family and social relationships on a client's ability to use a method successfully or to initiate, maintain or adopt healthy reproductive behaviours successfully. Forty years of global experience with modern contraceptive methods, 20 years of active HIV/AIDS prevention programming, and 40 years of small- and large-scale family-planning initiatives have led to the recognition that reproductive health-care services cannot be delivered within a clinical vacuum. This applies to both adults and adolescents.

Review of clinical and programmatic literature has revealed that any method medically safe for an adult is also safe for adolescents. The only exception to this statement is Depo-Provera®; the prolonged use of which may negatively affect bone-mineral density in adolescents. In general, methods that are safe for healthy adults at low risk for STIs are also safe for healthy adolescents at low risk for STIs. Both the clinician and the adolescent client should assess the advantages and disadvantages of specific contraceptive methods together, based upon the adolescent's lifestyle and preferences. Variables that should influence this assessment include: the likelihood of its use, the risk of STIs, and the type and frequency of sexual encounters (including number of partners, their sex, and the sequencing of sexual behaviours within a sexual encounter or encounters). Additionally, the social, cultural, educational, and economic environment in which the adolescent interacts influences all the variables listed above. This information, unique in the way it influences each adolescent, can only be determined through dialogue with the adolescent, hence the importance of a quality, clinical encounter designed to elicit from the adolescent what his/her needs are.

Such quality clinical encounters occur within the context of a health-care system. For health-care providers to serve adolescents effectively, they must work with all members of the health-care team to design and deliver services that are "adolescent-friendly". This implies that health-care workers are cognizant of more than the clinical aspects of their work, and that they understand how their activities fit into the overall picture of adolescent health. Effective guidelines will encourage clinicians to this level of awareness and will facilitate the effective division of labour and service provision by a team of individuals who want to improve continuously their services.

The field of reproductive health for adolescents is evolving. Continued research into methods, novel pilot service-delivery projects, and demonstration projects will need to continue in order for adolescent reproductive and sexual health services to improve.

The current trend towards globalization of democracy and free-market economics has resulted in delays in marriage and childbearing without a corresponding delay in sexual maturation. This trend bodes well for social and health-care systems that assist adolescents in their development into sexually responsible adults. As part of national sociocultural and health-care systems, providers of reproductive health-care services are uniquely positioned to provide this assistance. To assist rather than hinder, providers should be cognizant of adolescent needs and should work within their respective health-care organizations to effect services that attract adolescents, enhance STI prevention, prevent early pregnancy and childbearing, enable healthy sexuality, and protect future fertility.

References

ACOG Committee Opinion (1992) Committee on Adolescent Health care, number 90, February 1991, Safety of Oral contraceptives for teenagers. *Int J Gynecol Obstet*, 37(4):309–312.

ACOG Practice Bulletin (2002) Emergency Oral Contraception. Number 25, March 2001, American College of Obstetricians and Gynecologists,Washington. DC. *Int J Gynecol Obstet*, August 2002; 78(2):191–198.

ACOG Technical Bulletin (1994) Hormonal contraception. American College of Obstetricians and Gynecologists. October 1994; 198.

Alan Guttmacher Institute (1998) *Into a New World – Young Women's Sexual and Reproductive Lives*. New York, 5–14, and 26–44.

Alan Guttmacher Institute (1999) *Sex and America's teenagers*. New York, 9–29, and 44–63.

Alan Guttmacher Institute (2002a) *Facts in Brief. Teen Sex and Pregnancy*, 1999. Accessed February 2002a. http://www.agi-usa.org/pubs/fb_teen_sex.html

Alan Guttmacher Institute (2002b) *Issues in Brief. Risks and Realities of Early Childbearing Worldwide*, 1997. Accessed February 2002b. http://www.guttmacher.org/pubs.ib10.html

American Medical Women's Association (1996) Position Statement on Emergency Contraception. November 1996.

American School Counsellors Association, www.familyeducation.com.

Anandalakshmy PM, Buckshee K (1993) Teenage pregnancy and its effect on maternal and child health – A hospital experience. *Indian J Medical Sciences*, 47(1):8–11.

Andrews GD, French K, Wilkinson CL (1999) Appropriately trained nurses are competent at inserting intrauterine devices: An audit of clinical practice. *Eur J Contracept Reprod Health Care*, Mar 1999; 4(1):41–44.

Andrews WC, Jones KP (1991) Therapeutic uses of oral contraceptives. *Dialogues in Contraception*, 3:1–8.

Arevalo M, Sinai I, Jennings V (2000) A fixed formula to define the fertile window of the menstrual cycle as the basis of a simple method of natural family planning. *Contraception*, 60:357–360.

Arkutu AA (1978–79) Pregnancy and labor in Tanzanian primigravidae aged 15 years and under. *Int J Gynaecol Obstet*, 16(2):128–131.

Armstrong KA, Stover MA (1994) Smart Start: An option for adolescents to delay the pelvic examination and blood work in family planning clinics. *J Adolesc Health*, 15(5):389–395.

Audet M, Moreau M, Koltun WD, Waldbaum AS, Shangold G, Fisher AC, Creasy GW (2001) (for the Ortho Evra®/Evra® 004 Study Group) Evaluation of contraceptive efficacy and cycle control of a transdermal contraceptive patch vs. an oral contraceptive: A randomized controlled trial. *JAMA*, 285(18):2347–2354.

Aziz FA, Osman AA (1999) Safety of intrauterine device insertion by trained nurse-midwives in the Sudan. *Adv Contracept*, 15(1):9–14.

Bahamondes L, Lavin P, Ojeda G, Petta C, Diaz J, Maradiegue E, Monteiro I (1997) Return of Fertility after Discontinuation of the Once-a-Month Injectable Contraceptive Cyclofem®. *Contraception*, 55(5):307–310.

Balassone ML (1989) Risk of contraceptive discontinuation among adolescents. *J Adolesc Health Care*, 10(6):527–533.

Barfai G (2000) Emergency contraception in clinical practice: Global perspectives. *Int J Obstet Gynecol*, 70:49–58.

Barlow D (1977) The condom and gonorrhoea. *Lancet*, Oct 15; 2(8042):811–813.

Berenson AB, Wiemann, CM (1993) Patient Satisfaction and Side Effects With Levonorgestrel Implant (Norplant) Use in Adolescents 18 years of Age or Younger. *Pediatrics*, 92(2):257–260.

Bledsoe C, Cohen B (1993) *Social Dynamics of Adolescent Fertility in Sub-Saharan Africa*. Washington, 203.

Bloemenkamp KW, Rosendaal FR, Helmerhorst FM, Buller HR, Vandenbrouke JP (1995) Enhancement by factor V Leiden mutation of risk of deep-vein thrombosis associated with oral contraceptives containing a third-generation progestogen. *Lancet*, 346(8990):1593–1596.

Blythe MD, Margaret J, Rosenthal PhD, Susan L (2000) Female Adolescent Sexuality. Obstetrics and Gynecology Clinics of North America, 2000 March; 27(1):134.

Bounds W (1997) Female Condoms. *Eur J Contracept Reprod Health Care*, 2:113–116.

Bravender T, Emans SJ (1999) Menstrual disorders. Dysfunctional uterine bleeding. *Pediatr Clin North Am*, June; 46(3):545–553, and viii.
Brucker C, Lipford GB (1995) The human sperm acrosome reaction: physiology and regulatory mechanisms. An update. *Hum Reprod Update*, 1(1):51–62.
Burkman RT, Mishell DR Jr, Shulman LP (2001) Transdermal Contraceptive System. *Dialogues in Contraception*, 7(2):1–4, and 8.
Center for Disease Control and Prevention (1998) Youth risk behavior surveillance – United States 1997. *Morbidity and Mortality Weekly Report*, 47(SS3), and 1–89.
Center for Reproductive Law and Policy (1999) *Adolescent Reproductive Rights: Law and Policies to Improve Their Health and Lives*, 18.
Centre for Population Options (1990). *Adolescents and Abortion: Choice in Crisis*. Washington.
Colditz GA, Rosner BA, Speizer FE (1996) Risk factors for breast cancer according to family history of breast cancer – For the Nurses' Health Study Research Group. *J Natl Cancer Inst*, 88(6):365–371.
Collaborative Group on Hormonal Factors in Breast Cancer (1996) Breast cancer and hormonal contraceptives: collaborative reanalysis of individual data on 53,297 women with breast cancer and 100,239 women without breast cancer from 54 epidemiological studies. *Lancet*, June; 347(9017):1713–1727.
Coney P, Washenik K, Langley RG, DiGiovanna JJ, Harrison DD (2000) Weight change and adverse event incidence with a low-dose oral contraceptive: two randomized, placebo-controlled trials. *Contraception*, 63(6):297–302.
Consensus conference on combination oral contraceptives and cardiovascular disease (1999) *Fertil Steril*, 71(6 Suppl 3):1S–6S.
Cook RL. Rosenberg MJ (1998) *Do Spermicides Containing Nonoxynol-9 Prevent Sexually Transmitted Infections? A Meta-Analysis*. Philadelphia: Lippincott, Williams and Wilkins, 144–150.
Coutinho EM, Spinola P, Tomaz G, Morais K, Nassar de Souza R, Sabino Pinho Neto J, de Barros Leal W, Bomfim Hippolito S, D'Aurea Abranches A (2000) Efficacy, acceptability and clinical effects of a low-dose injectable contraceptive combination of dihydroxyprogesterone acetophenide and estradiol enanthate. *Contraception*, 61(4):277–280.
Creinin MD (1997) A reassessment of the efficacy of the Yuzpe regimen of emergency contraception. *Hum Reprod*, 12(3):496–498.
Cromer BA, Blair JM, Mahan JD, Zibners L, Naumowski Z (1996) A Prospective Comparison of Bone Density in Adolescent Girls Receiving Depotmedroxyprogesterone Acetate (Depo-provera), Levonorgestrel (Norplant), or Oral Contraceptives. *J Pediatr*, 129(5):671–676.
Croxatto HB (2000) Clinical profile of Implanon: A single-rod etonogestrel contraceptive implant. *Eur J Contracept Reprod Health Care*, Sep; 5 Suppl 2:21–28.
Cullins VE, Huggins GR (2000) Adolescent Contraception and Abortion. In: Rock JA, Carpenter SEK, eds. *Pediatric and Adolescent Gynecology*, 2nd edition. Philadelphia, Lippincott, Williams and Wilkins.
Cullins VE, Remsburg RE, Blumenthal PD, Huggins GR (1990) Comparison of adolescent and adult experiences with Norplant levonorgestrel contraceptive implants. *Obstet Gynecol*, 83(6):1026–1032.
Darney, PD, AtkinsonE, Tanner S, MacPherson S, Hellerstein S, Alvarado (1990) Acceptance and perceptions of NORPLANT among users in San Francisco, USA. *Stud Fam Plann*, 21(3):152–160.
Davis AJ (1995) Contraceptive Choices: The Adolescent Years. *Dialogues in Contraception*, 4(6).
Davis KR, Weller SC (1999) The Effectiveness of Condoms in Reducing Heterosexual Transmission of HIV. *Fam Plann Perspect*, 31(6):272–279.
DeJonge CU (1998) An update on human fertilization. *Semin Reprod Endocrinol*, 16(3):209–217.
Diaz S, Croxatto HB, Panez M, Belhadj H, Stern J, Sivin I (1990) Clinical assessment of treatments for prolonged bleeding in users of Norplant® implants. *Contraception*, 42:97–109.
Dittrich R, Parker L, Rosen JB (2002) (for the Ortho Evra®/Evra® 001 Study Group) Transdermal contraception: evaluation of three transdermal norelgestromin/ethinyl estradiol doses in a randomized, multicenter, dose-response study. *Am J Obstet Gynecol*, Jan; 186(1):15–20.
Donovan B (1996) Condoms and the prevention of sexually transmissible disease. *Br J Hosp Med*, 13 Dec 1995–16 Jan 1996; 54(11):575–578.
Durant RH, Jay MS (1987) A Social Psychological Model of Female Adolescents' Compliance with Contraceptives. *Seminars in Adolescent Medicine*, (2):135–144.
Elstein M, Morris SE, Groom GV, Jener DA, Scarisbrick JJ, Cameron EH (1976) Studies on low-dose oral contraceptives: Cervical mucus and plasma hormone changes in relation to circulating D-norgestrel and 17_ ethinyl-estradiol concentrations. *Fertil Steril*, Aug; 27(8):892–899.
Family Health International Network (2000) *Adolescent Reproductive Health*, 20(3):1–36.
Farmer RD, Lawrenson RA, Thompson CR, Kennedy JG, Hambleton IR (1997) Population-based study of risk of venous thromboembolism associated with various oral contraceptives. *Lancet*, 349(9045):83–88.
Farmer RDT, Todd JC, MacRae KD, Williams TJ, Lewis MA (1998) Oral contraception was not associated with venous thromboembolic disease in recent study. *BMJ*, 316(7137):1090–1109.

Filn SD, Latham RH, Roberts P, Running K, Stamm WE (1985) Association between diaphragm use and urinary tract infection. *JAMA*, 254(2):240–245.
Fitzgerald AM, Stanton BF, Terreri N, Shipena H, Li X, Kahihuata J, Ricardo IB, Galbraith JS, De Jaeger AM (1999) Use of Western-based HIV risk-reduction interventions targeting adolescents in an African setting. *J Adolesc Health*, 25(1):52–56.
Foxman B, Frerichs RR (1985) Epidemiology of urinary tract infection: I. Diaphragm use and sexual intercourse. *Am J Public Health*, 75(11):1308–1313.
Gillespie I (1984) The diaphragm: an accomplice in recurrent urinary tract infections. *Urology*, 24:25.
Glasier A, Baird D (1998) The effects of self-administering emergency contraception. *N Engl J Med*, 339(1):1–4.
Glasier A (1997) Emergency Postcoital Contraception. *N Engl J Med*, 337(15):1058–1064.
Goldman JA, Dicker D, Feldberg D, Samuel N, Resnik R (1985) Barrier contraception in the teenager: a comparison of court methods in adolescent girls. *Pediatr Adolesc Gynecol*, 1985; 3(1):59–76.
Gosselink CA, Ekwo EE, Woolson RF, Moawad A, Long CR (1993) Adequacy of prenatal care and risk of pre-term rupture of amniotic sac membranes. *Acta Obstet Gynecol Scand*, 72(6):443–449.
Grimes DA (2000) Intrauterine device and upper-genital-tract infection. *Lancet*, Sept 16; 356(9234):1013–1019.
Hall PE (1998) New once-a-month injectable contraceptives, with particular reference to Cyclofem/ Cyclo-Provera. *Int J Gynecol Obstet*, Aug; 62(Suppl 1):S43–S56.
Hannaford PC, Webb AM (1996) International Planned Parenthood Federation (IPPF). International Medical Advisory Panel Statement on Steroidal Oral Contraception. London: IPPF, 1998; US Agency for International Development (USAID). Recommendations for Updating Selected Practices in Contraceptive Use, Volume I, Washington, DC. 1994; and World Health Organization, Eligibility Criteria for Initiating and Continuing Use of Contraceptive Methods. Geneva, World Health Organization, 1996.
Harel Z, Biro FM, Kollar LM (1995) Depo-Provera in adolescents: effects of early second injection or prior oral contraception. *J Adolesc Health*, 16(5):379–384.
Harper C, Balistreri E, Boggess J, Leon K, Darney P (2001) Provision of Hormonal Contraceptives Without a Mandatory Pelvic Examination: The First Stop Demonstration Project. *Fam Plann Perspect*, 33(1):13–18.
Harper C (1988) *Adolescent Pregnancy in Latin America and the Caribbean*. IPPF Western Hemisphere Region. New York.
Hatcher RA, Trussell J, Stewart F, Cates W, Stewart GK, Guest F, Kowal D (1998) *Contraceptive Technology*, Seventeenth revised edition. Montreal, Quebec: Ardent Media, Inc.
Haugen MM, Evans CB, Kim MH (1996) Patient satisfaction with a levonorgestrel-releasing contraceptive implant. Reasons for and patterns of removal. *J Reprod Med*, 41(11):849–854.
Hight-Laukaran V, Labbok MH, Peterson AE, Fletcher V, von Hertzen H, Van Look PA (1997) Multicenter Study of the Lactational Amenorrhea Method (LAM): II. Acceptability, utility, and policy implications. *Contraception*, 55:337–346.
Hillis SD, Marchbanks PA, Tylor LR, Peterson HB (1999) Poststerilization regret: findings from the United States Collaborative Review of Sterilization. *Obstet Gynecol*, 93(6):889–895.
Ho PC, Kwan MS (1993) A prospective randomized comparison of levonorgestrel with the Yuzpe regimen in postcoital contraception. *Hum Reprod*, Mar; 8(3):389–392.
Hooton TM, Hillier S, Johnson C, Roberts PL, Stamm WE (1991) Escherichia Coli Bacteriuria and Contraceptive Methods. *JAMA*, Jan; 265(1):64–69.
Howard G (1982) Who asks for vasectomy reversal and why? *BMJ*, 285(6340):490–492.
Huggins GR, Cullins VE (1990) Fertility after contraception or abortion. *Fertil Steril*, 54(4):559–573.
In Focus (1997) *Do Youth-Friendly Services Make a Difference?* December.
Institute for Reproductive Health (2001) The standard days method: a modern, effective method of Family Planning. Georgetown University Medical Center. Washington, DC, USA.
International Planned Parenthood Federation (1994) *Understanding Adolescents*. London.
International Planned Parenthood Federation (1995) *Working with Youth*. London, 4:9.
Jick H, Jick SS, Gurewich V, Myers MW, Vasilakis C (1995) Risk of idiopathic cardiovascular death and nonfatal venous thromboembolism in women using oral contraceptives with differing progestogen components. *Lancet*, 346(8990):1589–1593.
Jolly MC, Sebire N, Harris J, Robinson S, Regan L (2000) Obstetric Risks of Pregnancy in Women Less than 18 Years Old. *Obstet Gynecol*, 96(6):962–966.
Jones KP, Ravnikar VA, Tulchinsky D, Schiff I (1985) Comparison of bone density in amenorrheic women due to athletics, weight loss, and premature menopause. *Obstet Gynecol*, 66(1):5–8.
Kaunitz AM, Garceau RJ, Cromie MA (1999) Comparative safety, efficacy, and cycle control of Lunelle monthly contraceptive injection (medroxyprogesterone acetate and estradiol cypionate injectable suspension) and Ortho-Novum 7/7/7 oral contraceptive (northindrone/ethinyl estradiol triphasic), Lunelle Study Group. *Contraception*, Oct; 60(4):179–187.

Kaunitz AM (1992) Guiding Adolescents in Proper Contraceptive Use. *Cont OB/GYN*, 15–33.
Kaunitz AM (2000) Injectable contraception. New and existing options. *Obstet Gynecol Clin of North America*, 27(4):741–780.
Kaunitz AM (2001a) Injectable long-acting contraceptives. *Clin Obstet Gynecol*, 44(1):73–91.
Kaunitz AM (2001b) Oral contraceptive use in perimenopause. *Am J Obstet Gynecol*, 185(2 Suppl):S32–S37.
Khan MA (2001) Side effects and oral contraceptive discontinuation in rural Bangladesh. *Contraception*, 64(3):161–167.
Kilbourne-Brook M (1998) Adolescent Reproductive Health: Making a Difference. *Outlook*, 16(3):1–8.
Kirby D (1997) *No easy answers*. Washington, DC: The National Campaign to Prevent Teen Pregnancy, 3–9.
Kirby D (2001a) *Emerging Answers – Research findings on programs to reduce teen pregnancy*. Washington, DC: The National Campaign to Prevent Teen Pregnancy.
Kirby D (2001b) Understanding What Works and What Doesn't in Reducing Adolescent Sexual Risk-Taking. *Fam Plann Perspect*, 33(6):276–281.
Kost K, Forrest JD, Harlap S (1991) Comparing the health risks and benefits of contraceptive choices. *Fam Plann Perspet*, 23:54.
Kulig JW (1989) Adolescent contraception: Non-hormonal methods. *Adolesc Gynecol*, 36:717.
Lei ZW, Wu SC, Garceau RJ, Jiang S, Yang QZ, Wang WL, Vander Meulen TC (1996) Effect of pretreatment counseling on discontinuation rates in Chinese women given depot medroxyprogesterone acetate for contraception. *Contraception*, 53(6):357–361.
Linn S, Schoenbaum SC, Monson RR, Rosner B, Stubblefield PG, Ryan KJ (1983) Lack of association between contraceptive usage and congenital malformations in offspring. *Am J Obstet Gynecol*, 147(8):923–928.
Lipnick RJ, Buring JE, Hennekens CH, Rosner B, Willett W, Bain C, Stampfer MJ, Colditz GA, Peto R, Speizer FE (1986) Oral contraceptives and breast cancer: a prospective cohort study. *JAMA*, 255(1):58–61.
Lytle CD, Routson LB. Seaborn GB, Dixon LG, Bushar HF, Cyr WH (1997) An in vitro evaluation of condoms as barriers to a small virus. *Sex Transm Dis*, 24(3):161–164.
Lytle CD, Routson LB, Seaborn GB, Dixon LG, Bushar HF, Cyr WH (1999) Lack of Latex Porosity: A Review of Virus Barrier Tests. *J Rubber Research*, 2(1):29–39.
McBride D, Gienapp A (2000) Using Randomized Designs to Evaluate Client-Centered Programs to Prevent Adolescent Pregnancy. *Fam Plann Perspect*, 32(5):227–235.
Mehta M, Malhotra A (2000) *Adolescent reproductive health in Nepal using participatory methods to define and respond to needs*. Briefing paper No. 2 – findings from formative research. AVSC International (New York, USA) and ICRW (Washington, DC, USA), 1–4.
Mesleh RA, Al-Aql AS, Kurdi AM (2001) Teenage pregnancy. *Saudi Med J*, 22(10):864–867.
Mishell DR Jr (1982) Noncontraceptive health benefits of oral steroidal contraceptives. *Am J Obstet Gynecol*, 142:809.
Moore KA, Miller BC, Sugland BW, Morrison DR, Blumenthal C (1995) *Beginning too soon: adolescent sexual behavior, pregnancy, and parenthood*. Washington, DC: Child's Trends, Inc.
Mulders TMN, Dieben TOM (2000) Use of novel combined contraceptive vaginal ring NuvaRing for ovulation inhibition. *Fertil Steril*, 75(5):865–870.
Murray PP, Stadel BV, Schlesselmann JJ (1989) Oral contraceptive use in women with a family history of breast cancer. *Obstet Gynecol*, 73:977–983.
National Institute of Allergy and Infectious Diseases (2000) National Institute of Health, Department of Health and Human Services. Workshop Summary: *Scientific Evidence on Condom Effectiveness for Sexually Transmitted Diseases (STD) Prevention*. Hyatt Dulles Airport, Herndon, Virginia.
Olukoya AA, Kaya A, Ferguson BJ, Abou Zahr C (2001) Unsafe abortion in adolescents. *Int J Gynecol Obstet*, 75:137–147.
Organon (2001) NuvaRing Package Insert. West Orange, NJ:1–7.
Otoide VO, Oronsaye F, Okonofua FE (2001) Why Nigerian adolescents seek abortion rather than contraception: evidence from focus-group discussions. *Int Fam Plann Perspec*, 27(2):77–81.
Ott MA, Adler NE, Millstein SG, Tschan JM, Ellen JM (2002) The trade-off between hormonal contraceptives and condoms among adolescents. *Perspectives on Sexual and Reproductive Health*, 34(1):6–14.
Pati S, Cullins V (2000) Female sterilization. Evidence. *Obstet Gynecol Clin North Am*, 27(4):859–899.
Pemberton J, McCann JS, Mahony JD, MacKenzie G, Dougan H, Hay I (1972) Socio-medial characteristics of patients attending a VD clinic and the circumstances of infection. *Br J Vener Dis*, Oct; 48(5):391–396.
Phipps MC, Sowers M (2002) Defining early adolescent childbearing. *Am J Public Health*, 92(1):125–128.

Physicians' Desk Reference (2002a) Table – *Annual number of birth-related or method-related deaths associated with control of fertility per 100,000 non-sterile women, by fertility-control method according to age*. 56th edition. Medical Economics, Thomson HealthCare. Montvale, NJ. 987.
Physicians' Desk Reference (2002b) Table 1 – *Annual and five-year cumulative pregnancy rates per 100 users by weight class*. 56th edition. Medical Economics, Thomson HealthCare. Montvale, NJ. 3544.
Physicians' Desk Reference (2002c) Yasmin" 28 Tablets. 56th edition. Medical Economics, Thomson HealthCare. Montvale, NJ. 980–988.
Piaget J (1969) The intellectual development of the adolescent. In: Caplan G, Lebovici E, eds. *Adolescence – Psychological Perspectives*. Basic Books, New York.
Planned Parenthood Federation of America (1996) National Medical Committee. *Manual of Medical Standards and Guidelines*. PPFA, New York.
Planned Parenthood Federation of America (1999) National Medical Committee. *Manual of Medical Standards and Guidelines*. PPFA, New York.
Population Council (1990) *Norplant® levonorgestrel implants: a summary of scientific data*. Population Council, New York, 1–30.
Population Reports (1987) *Injectables and Implants. Hormonal Contraception: New Long-Acting Methods*. March–April 1987; Series K:3.
Population Reports (1995) *Meeting the needs of young adults*. John Hopkins University, October 1995; Series J, No. 41:3–12, and 17.
Rai C, Thapa S, Day J, Bhattarai L, McMullen S, Jha R, Shrestha S, Bastola S (1999) Presence of Conditions in Rural Nepal for which DMPA Initiation is not Recommended: Implications for Community Based Service Delivery of DMPA. *Contraception*, July; 60(1):31–37.
Ramos R, Kennedy KI, Visness CM (1996) Effectiveness of lactational amenorrohea in prevention of pregnancy in Manila, the Philippines: a noncomparative prospective trial. *BMJ*, 313:909–912.
Raymond E, Dominik R (1999) The Spermicidal Trial Group. Contraceptive Effectiveness of Two Spermicides: A Randomized Trial. *Obstet Gynecol*, 6:896–903.
Remez L (2000) Oral Sex Among Adolescents: Is it Sex or is it Abstinence. *Fam Plann Perspect*, 32(6):295–298, and 304. http://hiv.medscape.com/reuters/prof/2001/01/01.
Rivera R, Chen-Mok M, McMullen S (1999a) Analysis of client characteristics that may affect early discontinuation of the TCU-380A IUD. *Contraception*, Sept; 60(3):155–160.
Rivera R, Yacobson I, Grimes D (1999b) The mechanism of action of hormonal contraceptives and intrauterine contraceptive devices. *Am J Obstet Gynecol*, Nov; 181(5 Pt 1):1263–1269.
Roddy RE, Cordero M, Cordero C, Fortney J (1993) A Dosing Study of Nonoxynol-9 and Genital Irritation. *Int J STIs and AIDS*, 4:165–170.
Roddy RE, Zekeng L, Ryan KA, Tamoufe U, Tweedy KC (2002) Effect of nonoxynol-9 gel on urogenital gonorrhea and chlamydial infection. *JAMA*, 287:1117–1122.
Roddy RE, Zekeng L, Ryan KA, Tamoufe U, Weir SS, Wong EL (1998) A Controlled Trial of Nonoxynol 9 Film to Reduce Male-to-Female Transmission of Sexually Transmitted Diseases. *N Engl J Med*, 339(8):504–510.
Rosenberg K, McEwan HP (1991) Teenage pregnancy in Scotland: trends and risks. *Scott Med J*, 36(6):172–174.
Rosenberg MJ, Waugh MS, Burnhill MS (1998) Compliance, counseling and satisfaction with oral contraceptives: a prospective evaluation. *Fam Plann Perspect*, 30:89–92, and 104.
Rosoff JI (1988) Not just teenagers. *Fam Plann Perspect*, 20:52.
Roumen FJME, Apter D, Mulders TMT, Dieben TOM (2001) Efficacy, tolerability and acceptability of a novel contraceptive vaginal ring releasing etonogestrel and ethinyl oestradiol. *Hum Reprod*, 16:469–475.
Rwenge M (2000) Sexual Risk Behaviors Among Young People in Bamenda, Cameroon. *Fam Plann Perspect*, 26(3):118–123, and 130.
Ryder B, Campbell H (1995) Natural family planning in the 1990s. *Lancet*, 346(8969):233–234.
Santelli JS, Warren CW, Lowry R, Sogolow E, Collins J, Kann L, Kaufmann RB, Celentano DD (1997) The use of condoms with other contraceptive methods among young men and women. *Fam Plann Perspec*, 29(6):261–267.
Santelli JS, Brener ND, Lowry R, Bhatt A, Zabin LS (1998) Multiple sexual partners among US adolescents and young adults. *Fam Plann Perspect*, 30(6):271–275.
Santow G, Bracher M (1999) Explaining Trends in Teenage Childbearing in Sweden. *Stud Fam Plann*, 30(3):169–182.
Scales PC (1991) *A Portrait of Young Adolescents in the 1990s: Implications for Promoting Health, Growth and Development*. Minneapolis, MN: Search Institute/Center for Early Adolescence.
Schlesselmann JJ (1989) Cancer of the breast and reproductive tract in relation to use of oral contraceptives. *Contraception*, 40(1):1–38.

Schmidt JE, Hillis SD, Marchbanks PA, Jeng G, Peterson HB (2000) Requesting information about and obtaining reversal after tubal sterilization: findings from the U.S. Collaborative Review of Sterilization. *Fertil Steril*, 74(5):892–898.
Scholes D, Lacroix AZ, Ott SM, Ichikawa LE, Barlow W (1999) Bone Mineral Density in Women Using Depot Medroxyprogesterone Acetate for Contraception. *Obstet Gynecol*, 93:233–238.
Schwartz MA, Lafferty WE, Hughes JP, Handsfield HH (1997) Risk factors for urethritis in heterosexual man. The role of fellatio and other sexual practices. *Sex Transm Dis*, Sept; 24(8):449–455.
Shuey DA., Babishangire BB, Omiat S, Bagarukayo H (1999) Increased sexual abstinence among in-school adolescents as a result of school health education in Soroti district, Uganda. *Health education research*, Jun; 14(3): 411–419.
Sivin I, Campodonico I, Kiriwat O, Holma P, Diaz S, Wan L, Biswas A, Viegas O, el din Abdalla K, Anant MP, Pavez M, Stern J (1998) The performance of levonorgestrel rod and Norplant contraceptive implants: a 5 year randomized study. *Hum Reprod*, Dec; 13(12):3371–3378.
Sivin I, el Mahgoub S, McCarthy T, Mishell DR Jr., Shoupe D, Alvarez F, Brache V, Jimenez E, Diaz S, Faundes A (1990) Long-term contraception with the levonorgestrel 20 mcg/day (LNg 20) and the copper T 380 Ag intrauterine devices: a five-year randomized study [erratum appears in *Contraception* 1991 Jan; 43(1):100]. *Contraception*, 42(4):361–378.
Sivin I, Stern J, Coutinho E, Mattos CS, el Mahgoub S, Diaz S, Pavez M, Alvarez F, Brache V, Thevenin F (1991) Prolonged intrauterine contraception: a seven-year randomized study of the levonorgestrel 20 mcg/day (LNg 20) and the copper T 380A IUDs. *Contraception*, 44(5): 473–480.
Sivin I, Stern J (1994) Health during prolonged use of levonorgestrel 20 microgrms/d and the copper T Cu 380 Ag intrauterine devices: a multicenter study. International Committee for Contraception Research (ICCR). *Fertil and Steril*, 61(1):70–77.
Sivin I (1988) International Experience with NORPLANT and NORPLANT-2 Contraceptives. *Stud Fam Plann*, Mar–Apr 1988; 19(2):81–94.
Sivin I (1989) IUDs are contraceptives, not abortifacients: A Comment on Research and Belief. *Stud Fam Plann*, 20(6):355–359.
Speroff L, Darney PD (1996) *A clinical guide for contraception*. 2nd ed. Williams and Wilkins, Baltimore:
Stang A, Schwingl P, Rivera R (2000) New contraceptive eligibility checklists for provision of Combined oral contraceptives and Depot-medroxyprogesterone acetate in Community-based Services Programmes. *Bull WHO*, 78(8):1015–1023.
Strasburger VC, Greydanus DE (200) At-risk Adolescents: An Update for the New Century. *Adolesc Med*, 11(1)19–33.
Swahn ML, Westlund P, Johannisson E, Bygdeman M (1996) Effect of postcoital contraceptive methods on the endometrium and the menstrual cycle. *Acta Obstet Gynecol Scan*, 75:738–744.
Taylor-Seehafer M, Rew L (2000) Risky Sexual Behavior among Adolescent Women. *JSPN*, 5(1):15–25.
Technical Guidance Working Group (1994 and 1997) *Recommendations for Updating Selected Practices in Contraceptive Use. Results of a Technical Meeting*. Volume I. November 1994 and Volume II, September 1997.
The Centers for Disease Control (1983) Cancer and Steroid Hormone Study. Long-term oral contraceptive use and the risk of breast cancer. *JAMA*, 249(12):1591–1595.
The New Zealand Contraception and Health Study Group (1994) Risk of cervical dysplasia in users of oral contraceptives, intrauterine devices or depot-medroxyprogesterone acetate. *Contraception*, 50:431–441.
Timmer CJ, Mulders TM (2000) Pharmokinetics of etonogestrel and ethinyl estradiol released from a combined contraceptive vaginal ring. *Clin Pharmacokinet*, 39(3):233–242.
Treffers PE, Olukoya AA, Ferguson BJ, Liljestrand J (2001) Care for adolescent pregnancy and childbirth. *Int J Gynaecol Obstet*, 75(2):111–121.
Trussell J, Ellertson C, Stewart F, Koenig J, Raymond EG, Shochet T (2001) Emergency Contraception: A Cost-Effective Approach to Preventing Unintended Pregnancy. *Semin Reprod Med*, Dec; 19(4):323–330.
Trussell J, Ellertson C, Stewart F (1996) The effectiveness of the Yuzpe regimen of emergency contraception. *Fam Plann Perspect*, Mar–Apr; 28(2):58–64, and 87.
Trussell J, Ellertson C (1995) Efficacy of emergency contraception – topical review. *Fertility Control Reviews*, 4(2):8–11.
Trussell J, Raymond EG (1999) Statistical Evidence about the Mechanism of the Yuzpe Regimen of Emergency Contraception. *Obstet Gynecol*, 93:872–876.
Trussell J, Sturgent SJ, Strickler J, Dominik R (1994) Comparative efficacy of the female condom and other barrier methods. *Fam Plann Perspect*, 26(2):66–72.
UNAIDS (1997) *Impact of HIV and sexual education in the sexual behavior of young people: A review update*. UNAIDS. Geneva.
UNFPA/WHO/UNICEF (1989) *The Reproductive Health of Adolescents: A Strategy of Action*. Geneva, 7.

Van Damme L, Masse B, Laga M (2000) Vaginal microbicides, an update. XIII World Conference on HIV/AIDS, Durban, South Africa, July 12, 2000.
Weiss E, Whelan D, Gupta GR (1996) *Vulnerability and Opportunity: Adolescents and HIV/AIDS in the Developing World*. International Center for Research on Women, 3–24.
Whitaker DJ, Miller KS, Clark LF (2000) Reconceptualizing Adolescent Sexual Behavior: Beyond Did They or Didn't They? *Fam Plann Perspect*, 32(3):111–117.
WHO (1995) *A Picture of Health? A review of health and annotated bibliography of the health of young people in developing countries*. Geneva, World Health Organization (WHO/FHE/ADH/95).
WHO (1997) *Intrauterine Devices*. Technical and Managerial Guidelines for Services. Geneva, World Health Organization.
WHO (1998a) Task Force on Postovulatory Methods of Fertility Regulation. Randomised trial of levonorgestrel versus the Yuzpe regimen of combined oral contraceptives for emergency contraception. *Lancet*, 353:429–433.
WHO (1998b) *Cardiovascular disease and steroid hormone contraception. Report of a WHO Scientific Group*. WHO Technical Report Series, No. 877, Geneva, World Health Organization.
WHO (2002) Global estimates of maternal mortality for 1995: Results of an in-depth review, analysis and estimation strategy. http://www.who.int/reproductive-health/publications/RHR_01_9_maternal_mortality_estimates/statement_on_maternal_mortality_estimates.en.html – Accessed March 10, 2002.
WHO and International Youth Foundation (1993) *Approaches to Adolescent Health and Development: A Compendium of Projects and Programmes*. Geneva.
WHO Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception (1995a) Effect of different progestagens in low oestrogen oral contraceptives on venous thromboembolic disease. *Lancet*, 346:1582–1588.
WHO Collaborative Study of Cardiovascular Disease and Steroid Hormone Contraception (1995b) Venous thromboembolic disease and combined oral contraceptives: results of international multicentre case-controlled study. *Lancet*, 346:1575–1582.
WHO Collaborative Study of Neoplasia and Steroid Contraceptives (1991) Breast cancer and depot medroxyprogesterone acetate: a multinational study. *Lancet*, 338:833–838.
Wilcox AJ, Weinberg CR, Baird DD (1998) Post-ovulatory aging of the human oocyte and embryo failure. *Hum Reprod*, 13(2):394–397.
Wilcox AJ, Weinberg CR, Baird DD (1995) Timing of sexual intercourse in relation to ovulation. Effects on the probability of conception, survival of the pregnancy, and sex of the baby. *N Eng J of Med*, 333(23):1517–1521.
Wilcox LS, Chu SY, Eaker ED, Zeger SL, Peterson HB (1991) Risk Factors for Regret after Tubal Sterilization: 5 Years of Follow-up in a Prospective Study. *Fertil Steril*, 5(5):927–933.
Wright NH, Sujpluem C, Rosenfield AG, Varakamin S (1997) Nurse-midwife insertion of the copper T in Thailand: performance, acceptance, and programmatic effects. *Stud Fam Plann*, Sept; 8(9):237–243.
www.gktged.sask.com/cni/instres/food/147.
www.nursingworld.org/mods/mod4/ceah5.htm.
Zabin LS (1994) *Addressing adolescent sexual behavior and childbearing: self-esteem or social change?* Women's Health Issues, Official Publication of the Jacobs Institute of Women's Health, 492.
Zabin LS (1990) Adolescent pregnancy: the clinician's role in intervention. *J Gen Intern Med*, 5(5 Suppl):S81–S88.
Zavala AS, Perez-Gonzales M, Miller P, Welsh M, Wilkens LR, Potts M (1987) Reproductive risks in a community-based distribution program of oral contraceptives. Matamoros, Mexico. *Stud Fam Plann*, 18(5):284–290.
Zeighami E, Zeighami B, Eftekhari AE, Khoshnevis P (1976) Effectiveness of the Iranian auxiliary midwife in IUD insertion. *Stud Fam Plann*, Sept; 7(9):261–263.