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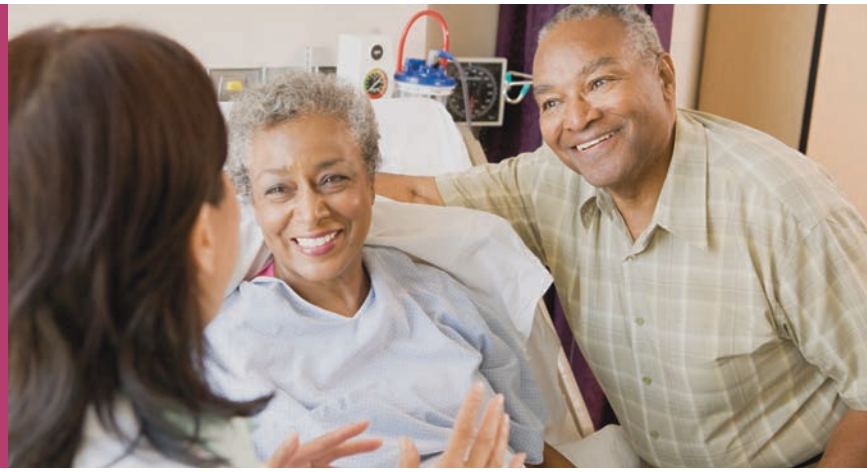
Women's Health



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Women's Health
Looking Forward

By Genevieve L. Fairbrother, M.D., M.P.H., FACOG

When I set to work on the Women's Health edition of Atlanta Medicine, the question was not what topics to address but what topics to cull. There are so many women's health issues across multiple medical disciplines that are on the forefront of the national consciousness; it was difficult to know where to begin.

With this issue of Atlanta Medicine, I have for you a group of authors who will address a sampling of the pressing issues in women's healthcare.

In specialties such as cardiology, the sex differences are enough to render the classical studies less useful. In the United States, deaths due to cardiovascular disease are declining, but cardiovascular mortality in women now exceeds that of men. Basic differences in the normal physiology and pathophysiology between the sexes are still not well understood. Dr. Kim Champney, cardiologist, has chosen to address cardiology care particular to the female patient. In her article, she focuses on a women's cardiovascular risk, emphasizing an assessment of their reproductive history as well as their hormone exposure. Dr. Champney reminds us that women with a history of pre-eclampsia or Polycystic ovary syndrome (PCOS) are at a heightened risk for coronary artery disease from endothelial dysfunction.

Breast cancer is the leading cause of cancer death in women and has wormed its way into every race, age and social strata in this country. There is no one who has not been affected by this disease. A near herculean push from the research community has produced a 50 percent decline in mortality over the last 10 years. Drs. Lynn Baxter and Colleen Austin, director of the breast center at Northside Hospital and oncologist respectively provide us with updated information on the scope of the disease, best breast cancer detection methods and treatment protocols.

Drs. Franklin, Korotkin and Matsumoto address issues that obstetricians continue to wrestle with. Dr. Franklin reviews the history of cesarean sections and why we continue to see the rates climb. A century ago cesarean section was slowly becoming a safer alternative for the women who could not deliver vaginally. As the century rode on the fetus could be evaluated, and cesarean section for maternal reasons lost prominence to fetal indications. Today many factors drive the cesarean rates, some more legitimately than others, but clearly it is not a linear algorithm. This segues nicely into Dr. Korotkin's timely article on the obesity epidemic and its effect on pregnancy and delivery. Finally, Dr. Matsumoto discusses the birth and evolution of maternal-fetal medicine and what the future holds for a specialty devoted to the care of women and fetuses in high-risk pregnancies. Genetic modification and interventions prior to fetal viability appear to be this specialty's next frontier.

Moving away from obstetrics but still intimately connected, Dr. Joye Lowman discusses the advances in the evaluation of a patient with pelvic organ prolapse, its etiology and repair, describing the benefits and cautioning against the risks. Her discussion includes the firestorm surrounding mesh technologies.

Dr. E.J. Aspuru bravely tackled the common problem of low libido in women, describing the etiologies, evaluating the effectiveness of various remedies and finally offering proven solutions for our patients and their partners for this troublesome situation.

Dr. Kottke raises awareness of intimate partner violence (IPV) in her article and covers the impact it has on a victim's health. She explores the demographics and prevalence of IPV and offers concrete advice along with resources for our patients. Like Dr Kottke, Dr Engel addresses women's health issues that have a broad impact on our society's health. In his article he advocates for more accessible, effective, and reliable birthcontrol in a country where the unintended pregnancy rate is 60%.

There is something here for everyone. Please enjoy! ■

Genevieve L. Fairbrother, M.D., M.P.H., FACOG

Dr. Fairbrother is a board-certified obstetrician-gynecologist and a fellow of the American College of Obstetricians and Gynecologists. She received her undergraduate degree from Wellesley College before pursuing a dual M.D./M.P.H. from Tufts University School of Medicine in Boston. She completed her residency at Emory University School of Medicine. Dr. Fairbrother is past Chair of the Ob-Gyn Department at Northside Hospital and is current Chief of the Medical and Dental Staff of Northside Hospital.

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Cesarean Section:
A Look Back…and Forward

By Kirsten Franklin, M.D., FACOG

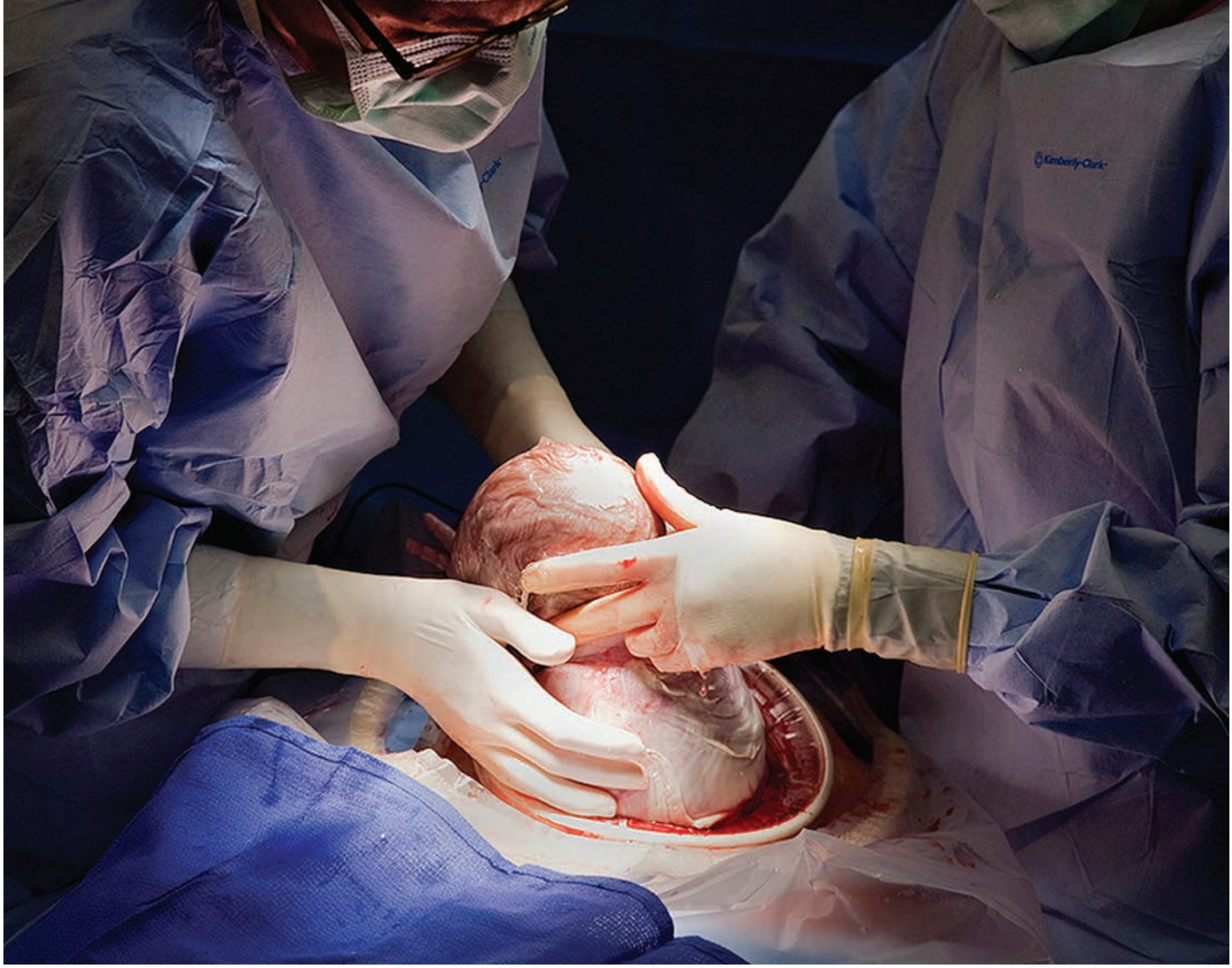
Cesarean section has been around for hundreds of years but not without serious consequences for the mother. Originally the procedure was used postmortem to satisfy religious and cultural requirements that the dead infant be buried separately from the mother. There are early reports of its use as a last resort to attempt to save the woman's life, but historical record of success in this arena is absent. The first written record of a live birth and living mother after cesarean delivery originates from Switzerland in 1500. There is some question regarding the accuracy of the story, but it has been reported that a sow gelder, Jacob Nufer, was granted permission by local authorities to attempt the procedure after his wife spent several days in labor and was unable to deliver despite help from 13 midwives. The child lived to the age of 77 and his mother subsequently delivered five more children, including a set of twins, via vaginal birth.

Although the sixteenth and seventeenth centuries brought numerous works of art illustrating human anatomy in detail, it was not until the mid to late 1800s that human cadavers were available to medical students and practical experience allowed physicians to gain a true understanding of anatomy. Thereafter, cesarean sections were attempted in greater numbers. Until then, unsuccessful deliveries had been treated via craniotomy and a mutilating extraction of the fetus through the vagina in an effort to save the mother's life. When ether was used for the first time in 1846 at Massachusetts General Hospital by dentist William T.G. Morton during surgery to remove a facial tumor, the future of cesarean section (and surgery as a whole), changed dramatically. There was initial reluctance to use anesthesia in obstetrics based upon the concept that women should suffer during childbirth to atone for Eve's sin. However, once Queen Victoria was administered chloroform for the births of two of her children in 1853 and 1857, widespread acceptance of anesthesia for childbirth took hold.

Initial mortality rates for cesarean section were high. Germ theory was introduced in the mid 1860s but was not widely accepted. Physicians and hospital staff did not wash hands between patients and wore street clothes to operate. Additionally, surgeons did not suture the uterine incision for fear that the sutures would cause infection and promote uterine rupture in future pregnancies. Adherence to this theory resulted in high maternal death rates from hemorrhage and infection. For a brief time, hysterectomy in conjunction with cesarean was used to decrease those rates. Once Max Sanger's monograph advocating silver sutures to close internal wounds was widely circulated in 1882, confidence in the procedure increased and hysterectomy was abandoned.

The more modern low cervical uterine incision was popularized by British obstetrician Munro Kerr in the early 20th century, and the surgical details were further refined after the widespread availability of penicillin in the 1940s. Population growth in the cities and the trend toward medical management of pregnancy in the 1940s led to a boom in growth of women's hospitals. In 1938, about half of births in the United States were taking place in hospitals, rising to 99 percent by 1955. In 1965, the cesarean section rate was 4.5 percent.

Over the past 40 years, cultural shifts have changed the focus of obstetrics. Paternal involvement in the delivery process, the advent of fetal monitoring in the early 1970s, and the assessment of fetal development with ultrasound have led to a major shift in perspective. The delivery process is no longer centered on the mother; it is now an infant-focused condition. When comparing cesarean section to



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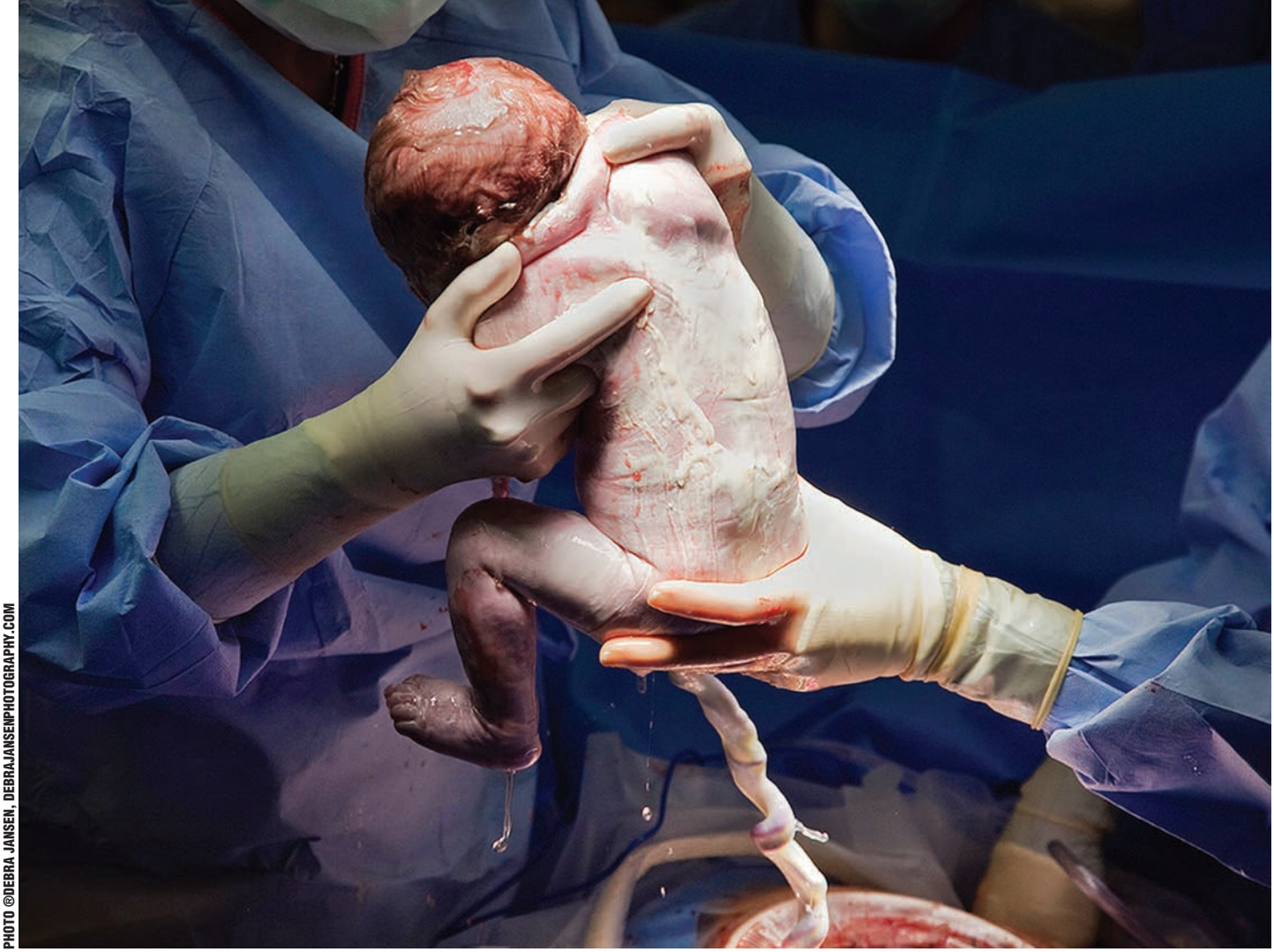
vaginal delivery, there is a small increase in risk for the mother but a decrease in risk for the fetus. As parents became increasingly involved in decision making surrounding the pregnancy, the impartiality of the physician's clinical judgment was muted by the parents' inherent bias in favor of their child. Parents began expecting perfect babies and healthy moms, and the cesarean section rate rose rapidly to 24.7 percent in 1988. A push for vaginal birth after cesarean (VBAC) began in the mid 1980s and eventually did lead to a decline in cesarean section rates in the 1990s to a new low of 21 percent in 1996.

In 1999 the American College of Obstetricians and Gynecologists released new guidelines requiring the presence of an obstetrician and anesthesiologist, as well as staff capable of performing an emergency cesarean section, for any patient undergoing a trial of labor after previous cesarean section. Many smaller hospitals were unable to meet these in-house requirements, and many physicians cover more than one hospital and are unable to be in the hospital during labor. The immediate impact of these guidelines was apparent. The cesarean delivery rate increased to 29.2 percent by 2004, and the VBAC rate decreased from 28 percent in 1996 to 8 percent in 2004.

The cesarean section rate has continued to climb yearly to a high of 32.9 percent in 2009. Finally, in 2010, the rate fell very slightly to 32.8 percent. Only time will tell whether this downward trend will continue. 2010 ACOG guidelines relaxed the earlier requirements for VBAC somewhat, indicating that trial of labor after cesarean (TOLAC) should be undertaken at a facility capable of emergency delivery and stated that most women with prior low transverse incision are candidates for TOLAC.

Prominent causes of the high current cesarean rates include the epidemic of maternal obesity in the United States, excess weight gain in pregnancy, macrosomic infants resulting from increased weight gain during pregnancy, and the increase in gestational diabetes. There is also an increase in twin/triplet/multiple pregnancies and a significant increase in pregnancy rates in women over 40 years of age. Despite a decrease of 3% in total number of births between 2009 and 2010, there was a 2% increase in births in women over 40. Women over 40 have a cesarean



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section rate 21 percent higher than women in their early 20s. The desire of women to have control over their delivery schedule has led to a rise in the induction rate of labor. Induction is clearly associated with increased cesarean section rates, particularly in patients with an unfavorable cervix. In a retrospective study done by Zhang, et. al., the cesarean section rate for women who were induced was twice that of women who went into labor spontaneously. Finally, the current legal climate and parental expectations for perfect neonatal outcomes promote quicker decision for cesarean section. There is some thought that maternal demand for elective cesarean section in the United States has had an impact on surgical rates, but a survey by Declor, et. al. in 2006, revealed only 1 of 1,600 patients requested an elective primary cesarean section.

Worldwide, the cesarean rate is increasing. In Asian and South American countries, women have been requesting elective cesarean sections in high numbers for social convenience and from a cultural desire to deliver on certain days. In a sampling done by the World Health Organization, 46 percent of births in certain areas of China were by cesarean, and half of those were patient-requested elective procedures. Vietnam has a 36 percent cesarean rate and Thailand's is 34 percent. The cesarean rate in Latin America is 35 percent, but certain areas like Paraguay (42 percent) and Ecuador (40 percent) are even higher. Some of the lowest rates worldwide are found in India, 18 percent, and Cambodia, at 15 percent.

Although overall cesarean delivery rates have significant impact on the health care system in the United States as a whole, the practicing clinician must make decisions based on the individual patient, her needs, her desires and her risk factors. It remains to be seen what the future holds for cesarean delivery and how the newest ACOG guidelines will impact the latest statistics. ■

Kirsten Franklin, M.D., FACOG is a board-certified Obstetrician Gynecologist in a busy comprehensive Ob-Gyn practice. A native of Georgia, she received her undergraduate degree from the University of Georgia where she was a Foundation Fellow. After obtaining her Doctorate of Medicine at Emory University, she completed a residency at East Carolina University in Obstetrics and Gynecology. She has been in private practice at Northside Hospital for the past 16 years and is a current member of the Medical Executive Committee.

Pelvic Organ Prolapse and Urinary Incontinence

By Joye Lowman, M.D., M.P.H., FACOG

Pelvic organ prolapse and urinary incontinence are common in parous women. Although these disorders are not life threatening, they can steal quality of life. The only disease that affects quality of life more is depression.

Surgical treatment of prolapse alone will cost our health care system more than $1 billion this year (1). As women become more aware of treatment options, the numbers seeking intervention will continue to rise. Physicians who care for women must be prepared to offer comprehensive evaluation and effective treatment, including subspecialty referral when indicated.

Pelvic Organ Prolapse

Pelvic organ prolapse (POP) is the protrusion of pelvic organs into or out of the vaginal canal … a vaginal hernia of sorts. There are several risk factors for developing POP, but the major risk is childbirth. Vaginal delivery damages the pudendal nerve and levator complex that maintain normal female pelvic support. This damage is cumulative, such that the risk of developing prolapse increases with each vaginal delivery. Women who avoid vaginal delivery have almost zero risk of developing significant prolapse, with few exceptions (morbid obesity, collagen/elastin disorders, spinal cord disorders). Additional risk factors include age, chronic heavy lifting or straining, smoking and pelvic surgery (hysterectomy).

POP may be described quantitatively using either the Baden and Walker Halfway system or the International Continence Society's POPQ (Pelvic Organ Prolapse Quantification) system (Table 1). Mild POP is often not bothersome and does not require treatment. However, advanced prolapse may cause significant symptoms, including pelvic pressure, voiding or defecatory dysfunction or the sensation of a bulge. Pelvic organ prolapse rarely causes pain, and women with this chief complaint should be evaluated for other pathology.

The least invasive treatment option for pelvic organ prolapse is a pessary, and most women (75%) are able to use one successfully (2). Many physicians and patients mistakenly presume that pessaries are reserved for patients who are not surgical candidates, but they are an excellent first-line treatment option. Pessaries are most effective if the patient is able to insert and remove it regularly. Postmenopausal women with vaginal atrophy should be prescribed local hormone therapy to prevent ulceration and irritation. Women using a pessary should have periodic evaluations to assure that the pessary is well tolerated.

Patients that opt for surgery should be referred to a physician with expertise in female pelvic reconstruction, as there are many options for surgical treatment and therapy should be individualized. There is little debate about the best surgery for an elderly non-sexually active patient (colpocleisis), or for a patient with recurrent vault prolapse (abdominal sacral colpopexy). However, there is much debate about the best surgical option for a young healthy patient with symptomatic primary prolapse.

Approximately 300,000 surgeries are performed annually in the United States to correct pelvic organ prolapse, and these numbers are expected to rise (1). Native tissue repairs for pelvic organ prolapse are plagued by high failure rates. Several randomized controlled trials have shown that mesh augmentation decreases this risk (3,4). Vaginal mesh augmentation is performed to achieve longevity through a minimally invasive approach. The development of vaginal mesh "kits" was an attempt to standardize vaginal mesh augmentation and make it easier to perform. Unfortunately, science lagged innovation, and several companies rolled out versions of vaginal mesh kits with little evidence to support safety and efficacy. The recent FDA warning about vaginal mesh has made the debate about how primary prolapse repair should be approached more complex. Transvaginal mesh augmentation can lead to excellent results when the appropriate mesh is used in the appropriate patient by a skilled and experienced surgeon. But it can lead to disability and suffering when misused, thus it should be reserved for specific circumstances by surgeons experienced with the nuances of mesh augmentation.

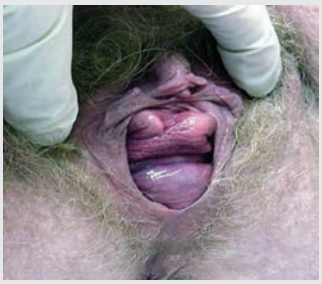
For most young, healthy, sexually active patients with symptomatic prolapse, I recommend hysterectomy and abdominal sacral colpopexy (ASC). ASC offers longevity, normal anatomy and good sexual function. It is associated with a lower risk of dyspareunia than vaginal reconstructive options, with or without mesh augmentation. (5) Although there is a risk of mesh erosion, the risk is low (3.4%) and most do not require surgical intervention. (6) ASC can be done laparoscopically with the same efficacy as open ASC, making it a minimally invasive option as well. Bowel obstruction is often quoted as a risk that discourages some from offering or recommending this procedure, but this is a rare occurrence (<1%) when the mesh is retroperitonealized. The goal is to restore normal anatomy and function with durability and minimal risk, and the ASC achieves this better than any other reconstructive surgical option.

Urinary Incontinence

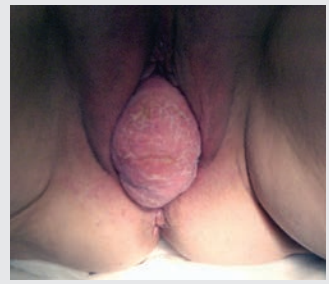
Incontinence affects more than 60 percent of reproductive-age women and costs our health care system $32 billion annually. (7,8) Most women suffer from either overactive bladder or stress incontinence. Women with overactive bladder complain of urinary urgency and frequency with or without incontinence. They may report nocturia or "triggers" that incite urgency or urge incontinence (hearing running water, putting the key in the door at home). Initial evaluation should include urinalysis and urine culture to rule out infection, and screening for irritant exposure (caffeine, alcohol, tobacco). Many can achieve excellent urinary control by eliminating bladder irritants and bladder training. Others may require anticholinergic medications. Most anticholinergics are effective, although side effects may affect compliance. If a patient fails or cannot tolerate anticholinergic therapy, she should be referred to a urogynecologist or a urologist for further evaluation and treatment.

Patients that fail anticholinergic therapy in the absence of bladder pathology may be offered sacral neuromodulation or detrusor injection of Botulinum toxin. Sacral neuromodulation involves the use of electrical stimulation of the sacral nerves to modulate bladder function. It is 70 percent effective at treating urinary urgency and frequency but requires minor surgery. Botulinum toxin can be injected directly into the detrusor muscle cystoscopically and is more than 90 percent effective at treating urinary urgency and frequency. Unfortunately, it is associated with a high rate of urinary retention, limiting its use primarily to patients who require catheterization for other reasons (multiple sclerosus, spinal cord injury).

Stress incontinence is leakage of urine of small amounts associated with increases in abdominal pressure (coughing, sneezing, laughing, exercising). Risk factors mirror those of pelvic organ prolapse and include childbirth, obesity,



Stage 2 (ICS) or grade 2 (Baden and Waker) prolapse, (mild)



Stage 4 (ICS) or grade 4 (Baden and Walker), (advanced)

Baden and Walker Halfway system

Grade 0: normal position for each respective site

Grade 1: descent halfway to the hymen

Grade 2: descent to the hymen

Grade 3: descent halfway past the hymen

Grade 4: maximum possible descent for each site

International continence society pelvic organ prolapse ordinal staging system

Stage 0: All vaginal points are at least 3 cm inside the hymen, and point C (cervix) or D (vaginal cuff) is no more than 2 cm less than the full vaginal length above the hymen

Stage 1: The criteria for stage 0 are not met but the leading edge of prolapse is more than 1 cm inside the hymen

Stage 2: Leading edge of prolapse is at least at 1 cm inside the hymen, but not more than 1cm past the hymen

Stage 3: Leading edge of prolapse is more than 1cm past hymen, but less than the length of the vagina minus 2cm beyond the hymen

Stage 4: Leading edge of prolapse is at least the length of the vagina minus 2 cm beyond the hymen

surgery and aging. Women who suffer with mild stress incontinence may benefit from kegel exercises but this is most effective if the patient is able to perform a kegel squeeze at the time of a cough or sneeze (difficult to do).

Surgical treatment should be offered as first-line therapy for moderate or severe stress incontinence as most women will require surgery to achieve cure. Therapy for stress incontinence was revolutionized in 1976 with the advent of the first transvaginal tension-free mid-urethral sling. Previous anti-incontinence procedures suspended the bladder neck and often caused urinary retention requiring prolonged catheterization. Today stress incontinence can be cured in a 10-minute outpatient procedure under monitored anesthesia with minimal risk of retention or major complication. Physical therapy and urethral bulking agents are less effective and should be reserved for patients who want to avoid surgery, have failed surgery or are not surgical candidates.

Conclusion

Pelvic organ prolapse and urinary incontinence affect millions of women worldwide. Excellent therapies exist for both, and women deserve comprehensive evaluation and treatment to promote and restore quality of life. ■

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Joye Lowman, M.D., M.P.H., FACOG

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Low Libido

Something To Talk About

By E.J. Aspuru, M.D., FACOG

Introduction

For many physicians, discussions with patients regarding decreased libido are uneasy, mostly because decreased libido is a multifaceted problem. The perception exists that there is no quick way to evaluate all of the contributing factors to the problem, and there is no simple medical solution. As a result, a number of physicians may fail to ever bring up the topic, even with patients they've known for years. Similarly, many patients may fear that their physicians will be uncomfortable if they bring up questions about their sexual function or that the physician may dismiss their concern. However, with roughly 40 - 50% of women in various surveys having some form of sexual dysfunction, decreased libido is an issue physicians should proactively address during a comprehensive women's health visit.

Libido is the desire or the drive to have sexual activity and is believed to be triggered in the hypothalamus by activation of the dopamine system. It is one phase of the female sexual response cycle, which includes desire, arousal, orgasm and resolution. Worldwide, the lack of libido is one of the most commonly reported types of female sexual dysfunction. In women, the desire for sex is rarely spontaneous and is more frequently precipitated by emotion, physical closeness or by arousing imagery. In fact, desire does not always precede arousal. It is important to identify which phase is the primary source of sexual dysfunction and if the dysfunction is leading to distress in the patient. For the majority of women, lack of desire is the principal cause of decreased libido.

Percentage of Women Reporting Frequency of Vaginal Sex, N=2393

Age Group	18-24	25-29	30-39	40-49	50-59	60-69	70+
Single							
Not in past year	50.8	43.0	72.3	71.1	85.4	84.5	100.0
A few times per year to monthly	16.4	21.5	10.7	16.9	5.4	6.5	0.0
A few times per month to weekly	19.7	24.1	12.5	9.9	7.0	6.5	0.0
2-3 times per week	8.2	1.3	4.5	2.1	2.2	2.6	0.0
4 or more times per week	4.9	10.1	0.0	0.0	0.0	0.0	0.0
Partnered							
Not in past year	12.9	10.6	14.8	20.6	21.1	14.8	30.8
A few times per year to monthly	16.1	11.7	13.6	13.7	18.3	11.1	15.4
A few times per month to weekly	31.2	36.2	43.2	24.5	36.6	48.1	23.1
2-3 times per week	32.3	28.7	18.2	31.4	18.3	18.5	7.7
4 or more times per week	7.5	12.8	10.2	9.8	5.6	7.4	23.1
Married							
Not in past year	11.8	3.5	6.5	8.1	22.0	37.9	53.5
A few times per year to monthly	14.7	11.6	16.3	21.7	23.7	20.0	25.4
A few times per month to weekly	14.7	47.7	50.2	46.6	36.2	35.9	18.3
2-3 times per week	35.3	35.2	21.9	20.8	16.9	6.2	1.4
4 or more times per week	23.5	2.0	5.1	2.7	1.1	0.0	1.4

National Survey of Sexual Health and Behavior (NSSHB). Findings from the National Survey of Sexual Health and Behavior, Centre for Sexual Health Promotion, Indiana University. Journal of Sexual Medicine, Vol. 7, Supplement 5.

Risk Factors

Risk factors for decreased libido may include, but are not limited to, the following:

- Age (complaints of decreased libido peak in women between 45-64 years of age)
- Menopause (particularly surgical menopause) and associated symptoms of hot flashes and vaginal atrophy

- Poor body image of self (particularly true of women treated for breast or pelvic cancer) or poor body image of partner
- Relationship dissatisfaction and distrust
- Depression, anxiety and stress
- Fatigue
- Medications including Selective Serotonin Receptor Inhibitors (SSRIs), Benzodiazepines, antipsychotic medications, oral contraceptives, antiepileptic medications, aromatase inhibitors, etc.
- Substance abuse
- Physical discomfort, including vaginal atrophy, vaginal shortening after hysterectomy, or pain following radiation for endometrial or cervical cancer
- History of physical and/or sexual abuse
- Endocrine problems, including adrenal insufficiency
- Cultural and religious issues

Screening and Diagnosis

The diagnosis of decreased libido requires an open, proactive conversation with the patient consisting of a thorough medical and sexual history, in addition to a physical exam. The history should include a review of medications, an evaluation of mental health and potential psychological contributors, and a review of physical health and limitations that may lead to decreased sexual desire. Such a comprehensive history and physical may need to be scheduled at a separate, future visit. Because androgen levels do not appear to be directly correlated with sexual desire in women, ordering testosterone or other labs has limited value in investigating decreased libido. Asking open-ended questions is the easiest way to elicit a patient's concern regarding low libido. Giving permission to speak about sex by asking questions such as, "Do you have any concerns about your sex life or about your sex drive?" is the most basic way to convey openness and comfort with the topic.

Non-Pharmacologic Management

Management of decreased libido could include giving patients a more realistic idea of how often other patients in their age range or social situation might desire sex. Quite frequently, females will compare their sex drives to when they were teenagers and had no financial, family or home responsibilities. Many women may not even consider that they have a problem with their sex drive until their partners complain of perceived decreased desire in these women. Resetting realistic expectations may address the problem. Moreover, encouraging spouses to help with childcare and household responsibilities can be surprisingly effective in boosting libido. Patients with hectic schedules frequently still enjoy sex, while their lack of desire may be a reflection of their overscheduled lives. Scheduling periodic "date nights" in which neither parent has these all-too-common responsibilities can also go a long way to improving the desire for sex. Similarly, setting cell phone alarms to remind themselves to consider sexual activity on a particular night can be helpful for patients whose demanding lives may distract them from regular thoughts about intimacy.

Because decreased sex drive can also result from relationship dissatisfaction, depression, substance abuse or from a history of sexual abuse, addressing these issues by providing resources can be very helpful. Referrals to

couples' counselors, psychotherapists, support groups, rehab facilities or sex therapists can lead to an eventual increase in libido. Stress reduction, through regular exercise, yoga or other relaxation techniques, may also be beneficial. While poor body image or physical discomfort may be at the root of some patients' low sex drive, referral to a nutritionist, personal trainer or to a pelvic physical therapist may increase sexual interest as these conditions improve. Additionally, vibrators, dilators, lubricants and other novelty items might not only help bring newness to a long-term sexual relationship, but these devices may also help in patients with reduced elasticity, such as menopausal women or those patients completing pelvic radiation therapy.

Medical Management

When a number of physicians contemplate medical therapy for low libido, many would consider exogenous androgens, such as testosterone. Although levels of endogenous androgens are not believed to have a direct correlation with sex drive, boosting serum concentrations of androgens with exogenous testosterone is thought to be effective in treating postmenopausal women for decreased sex drive, as well as for problems with arousal and orgasm. To be clear, the FDA has not approved any androgen therapies for female sexual dysfunction. In fact, Estratest (estrogen combined with methyltestosterone) was taken off the market in 2009. Nevertheless, various forms of testosterone are in use today in postmenopausal patients: oral, compounded, micronized testosterone which requires a prescription, topical, compounded 1% or 2% creams and ointments, intramuscular testosterone injections and testosterone implants. Because levels of testosterone in men are 10 times higher than those in women, practitioners should not use transdermal products formulated for men, such as gels or skin patches, in their female patients. Although not yet approved by the FDA and currently unavailable in the U.S., transdermal testosterone in the form of a matrix pouch that delivers 300 micrograms of testosterone per day has been shown to be effective for short-term treatment (< 6 months) of decreased libido. Dehydroepiandrosterone (DHEA), which is available over-the-counter, has also been shown to improve sex drive in premenopausal women with adrenal insufficiency. Nevertheless, patients should be warned that there can be various inconsistencies in both compounded and over the counter products and that data on safety and efficacy may be limited.

Females should be appropriately counseled that androgen therapy can have the following side effects:

- Androgenic: hirsutism, acne, clitoromegaly, deepening of voice, increase muscle mass and temporal balding
- Metabolic (the majority of androgens are aromatized to estrogens): endometrial hyperplasia, endometrial cancer, breast cancer, cardiovascular disease and hepatic disease
- Endocrine: decreased serum HDL (in oral testosterone users)

In fact, women who are on androgen therapy should have monitoring of serum lipids and liver function tests. When considering the above side effects, it should also be noted androgen therapy is never recommended in premenopausal women with low libido because of the additional risk for accidental exposure of an unborn fetus, as well as scant data on efficacy.

Other physicians may consider estrogen with or without progesterone therapy for treatment of decreased libido in menopausal patients. While the Women's Health Initiative (WHI) Study found that systemic estrogen with or without progesterone did not improve sexual function, many menopausal female patients may suffer from hot flashes leading to sleep disruption and fatigue or from vaginal atrophy leading to sexual discomfort, which may all impact sexual desire. Although postmenopausal hormone therapy carries with it risks that will not be addressed in this article, improvement in hot flashes and vaginal atrophy through the use of various oral, transdermal or vaginal hormone preparations can indirectly lead to an improvement in libido.

For patients of childbearing age with decreased libido while on oral contraceptive pills, switching their contraception to a non-oral form may produce less of an increase in sex hormone binding globulin (SHBG), which in turn may lead to additional free testosterone available to promote sex drive.

Herbal supplements, such as Avlimil, may have estrogenic components, but similar to compounded products, their safety and efficacy is unproven.

For patients with sexual dysfunction as a result of SSRI treatment for depression or anxiety, switching to Bupropion may lead to an increase in sex drive in comparison with their sex drive on the SSRI.

Summary

With nearly 40 - 50 percent of women having elements of sexual dysfunction across different age ranges, physicians

owe it to their patients to broach the topic of low libido, the most common component. When decreased sex drive is undermining a patient's relationship or causing distress, intervention of some kind, either non-medical or medical, is required. Physicians need to better communicate to patients that while there are many possible causes of low libido, they are almost all treatable. Although the physician may prefer the team approach to treatment by referring to and consulting other providers, the physician still needs to recognize the need to make patients feel at ease while proactively initiating the evaluation of their sexual function. Following appropriate screening, diagnosis and treatment of low libido, the resulting rewarding sex life can be very important to an adult woman's overall well-being at every stage of life. ■

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Obesity in Pregnancy
A National Dilemma

By Jeffrey H. Korotkin, M.D., MBA, FACOG

The problem of obesity in the United States is rampant. Obesity is defined as a body mass index (BMI)>30. A BMI>25 is considered overweight, and a value of greater than 40 defines morbid obesity. Overall, 34% of women of child-bearing age are considered obese while 59% are classified as overweight or obese. African-American women have the highest rates of being overweight or obese compared to other groups in the U.S. About four out of five African-American women are overweight or obese. Over the last 14 years, there has been an alarming increase in obesity (BMI>30) in America. Amongst non-Hispanic white women the rate of obesity has increased from 23% to 33%; in non-Hispanic black women has increased from 38% to 50%; and amongst Mexican-American women obesity rates have increased from 35% to 45%.

Obesity is a risk factor for many medical conditions, including type 2 diabetes mellitus, hypertension, coronary artery disease and stroke. Pregnancy adds an additional stressor to the already compromised endocrine and cardiovascular system of the obese patient. Obese gravidas are at higher personal risk for antepartum complications as well as difficulties during delivery and post partum. In addition, an obese pregnant woman places her unborn child at increased risk for both long- and short-term complications. The overweight and obese gravida are more likely to encounter gestational diabetes, hypertensive disorders, thromboembolic disorders (in certain situations), increased risk of cesarean delivery and wound infection. Their newborn has an increased risk for macrosomia (birth weight greater than the 90th percentile for gestational age), birth trauma, electrolyte imbalances and perinatal death. The fetus of an obese mother is also at increased risk of congenital malformations.

Maternal Complications
Gestational Diabetes (GDM)

Gestational diabetes occurs in approximately 5% of all pregnancies. It develops in non-diabetic mothers who are unable to handle the increased glucose load associated with pregnancy. Human placental lactogen (HPL), a hormone secreted by the placenta, is an insulin antagonist that modifies maternal metabolism. It keeps the maternal blood glucose high enough to provide a normal amount of glucose to the baby. Patients with gestational diabetes are unable to produce a sufficient amount of insulin to overcome this glucose load and subsequently become diabetic during their pregnancy.

Women who have a BMI of >30 are 2.6 times more likely to develop GDM while women with a BMI > 35 are 4 times more likely to have GDM. Untreated this often leads to fetal macrosomia (classified as a baby weighing more than the 90% for its gestational age, or greater than 9 pounds), the need for cesarean section, newborn hypoglycemia and hypokalemia. Their newborns often require NICU admission for close monitoring and intravenous correction of electrolytes and hypoglycemia.

Hypertensive Disorders

Obesity and a higher pre-pregnancy BMI have been shown to increase the risk of a mother developing gestational hypertension and preeclampsia. The risk of pregnancy-induced hypertension roughly doubles for each 5-7kg/m2 increase in maternal BMI. Gestational hypertension is defined as elevated blood pressure identified for the first time during pregnancy. A patient with gestational hypertension does not have proteinuria. Hypertension along with proteinuria defines preeclampsia. Preeclampsia can be temporized but typically only for a short period of time allowing the obstetrician to maximize fetal outcome without endangering the mother's health. Delivery and sometimes premature delivery is the only cure. Preeclampsia is one of the leading causes of obstetric death in this country with the other leading causes being thromboembolic disorders and hemorrhage.

Thromboembolic Risks

Thromboembolic events or blood clots occur more frequently in overweight pregnant. If confined to bed during the pregnancy for any reason, a woman's risk becomes elevated. The use of sequential compression devices and sub-q heparin can mitigate but not eliminate those risks. Blood clots occur more frequently in women who have a surgical delivery, and women who are obese have an increased risk of cesarean section.

Growth Disorders Of The Newborn

A women's pre-pregnancy weight and the birth weight of her infant are highly correlated. Maternal obesity and a large for dates child or macrosomic infant are correlated even if the patient does not develop gestational diabetes. Infants of obese mothers have been found to have a higher percentage of body fat than normal-weight mothers. This can lead to long-term health problems for the child. In addition, obese women carrying a macrosomic infant are more likely to have protracted non-progressive labors increasing their risk for infection and cesarean section. Vaginal deliveries of macrosomic infants over 10 pounds can result in an obstetric emergency called shoulder dystocia. Shoulder dystocia is a complication where the infant's head is delivered vaginally, and then the shoulders become entrapped coming through the pelvis. This can lead to fractures or nerve damage in order to deliver the baby without causing other potential complications.

Intrauterine growth restriction (IUGR), or a small for dates fetus is usually associated with underweight women who conceive rather than overweight or obese patient. Evidence does exist that being overweight protects against IUGR, however the morbidly obese patient (BMI>40) may be at risk of developing IUGR. The reasons for this are not well understood. What is understood is that maternal obesity does increase the risk of hypertension and type 2 diabetes, which may lead to vascular compromise in the mother followed by poor weight gain in the fetus resulting in growth failure. A small for dates baby is more likely to suffer with neurologic complications such as cognitive delay, attention deficit disorders and possible cerebral palsy.

Preterm Delivery:

Epidemiologically preterm birth is associated with underweight pregnant women. Approximately 75% of preterm births occur spontaneously, while 25% are medically induced. This is where obesity has a significant negative impact. Studies have shown that medically induced preterm births occur more frequently in the patient experiencing complications directly linked to her obesity. Again, this includes preeclampsia and hypertension.

Intrauterine Fetal Demise:

Being overweight or obese has been shown to increase the risk of stillbirths. The reason that this occurs remains uncertain, however, it is speculated that subclinical hypertension or abnormal glucose control may be at the center of this dilemma. In addition, monitoring the obese patient for fetal well-being is more difficult. Obesity decreases the maternal perception of fetal movement, and this can lead to fewer patients reporting self-perceived fetal compromise. Women who are overweight with associated hypertension or diabetes will need intensive monitoring late in pregnancy to avoid sudden fetal loss.

Congenital Malformations

Recent studies have indicated that pre-pregnancy obesity is associated with a range of fetal structural malformations. According to a meta-analysis conducted by Stothard et. al., obesity was associated with an increased risk of the following malformations: neural tube defects, heart defects, cleft lip or palate, anorectal malformations and limb abnormalities. The authors speculated that the reasons for these findings may be due to undiagnosed diabetes in the obese patient. In addition, the obese patient is often nutritionally deficient and lacking in an adequate dietary source of folic acid, which increases the risk of abnormal fetal development.

Bariatric Surgery

In 1991, the National Institutes of Health Consensus Developmental Conference concluded that bariatric surgery is the most effective treatment for the morbidly obese patient, a BMI>40. This type of surgery along with behavioral modifications does produce a significant impact on weight loss, lowering BMI and improving medical conditions. Women who have undergone bariatric surgery generally have good pregnancy outcome, but they require more extensive monitoring and dietary supplementation. Morbidly obese women who have tried to reduce their weight unsuccessfully may wish to consider this surgery not only to improve their overall health, but also to improve their chances for conception and a healthy pregnancy outcome.

In the last few decades the U.S. has experienced alarming increases in the rates of obesity and the medical complications that are it's legacy. Adding pregnancy to obesity places the gravid women at significant risk for both maternal and fetal complications. Intensive medical care is needed to help these women achieve the best possible outcome. ■

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Heart Disease In Women

Is Fifty Really The New Forty?

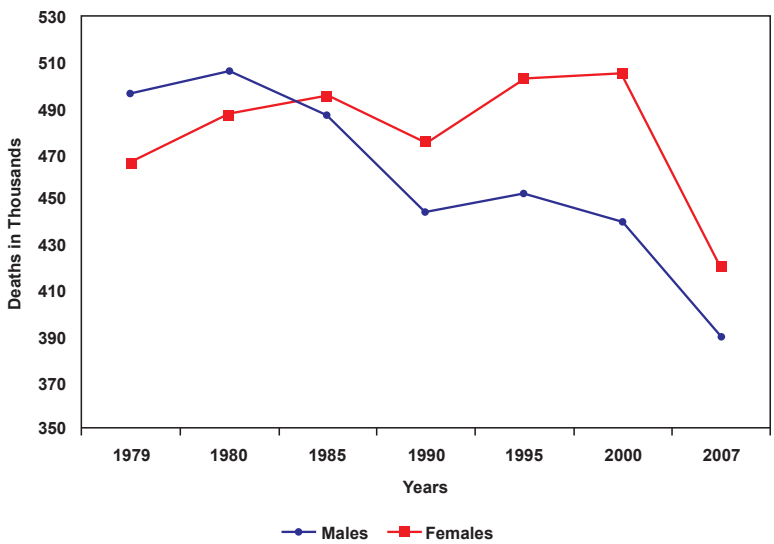
By Kimberly P. Champney, M.D., MSCR

National public awareness campaigns for heart disease in women from the American Heart Association and other organizations have seen initial success. Between 1997 and 2006, the number of women recognizing that the leading cause of death among women is heart disease increased from 30 percent to 55 percent (1). Along with this increased knowledge, women have seen a decline in deaths secondary to cardiovascular disease (Figure 1).2 However, areas of concern still remain. For example, women know that cholesterol is an important risk factor for cardiovascular disease, but few women know their own personal cholesterol levels and other risk factors (1).

"Fifty is the new forty" is a common phrase heard today, especially as many famous women such as Oprah Winfrey, Christie Brinkley, Madonna and Sharon Stone approach or have turned 50. However, in terms of vascular age, 50 may really be the new 60 for women. For example, a 51-year-old teacher with a family history of heart disease reports good health. She feels well, is currently enrolled in Weight Watchers at work, and has joined an exercise class that meets twice a week. Her blood pressure is 140/82, total cholesterol 220mg/dL, HDL 34 mg/dL, LDL 145 mg/dL, and triglycerides are 198 mg/dL. She would like to know if she needs to take a statin, as prescribed by her primary care physician. She is 5'1", weighs 147 lbs, body mass index (BMI) 27 and has a waist circumference of 37 inches. This 51-year-old lady is clearly not the "new forty" and in fact has a coronary artery calcium score of 25 estimated vascular age of 63. Vascular age can be calculated using data from the Multi-Ethnic Study of Atherosclerosis (MESA) knowing age, gender, cholesterol values, blood pressure and use of tobacco (3).

While this particular patient is not the "new forty," epidemiologic data suggest that she is a more representative 50-year-old female today. Two out of every three women in the U.S. are overweight or obese, one out of three women will have high blood pressure, almost one in two will have elevated cholesterol, and less than one third of women report regular physical activity. By the age of 50, 40 percent of women will have one cardiovascular risk factor and 17 percent of women will have two or more traditional risk factors (2).

Figure1. Cardiovasucalar mortality trends for males and females (United States: 1979 -2006)



Source: National Center for Health Statistics

Heart Disease in Young Women

Despite the overall improvement in heart disease awareness and mortality among women, there is a slight increase in heart disease death rates seen in young women, ages 35-54 years. This trend "may represent the leading edge of a brewing storm (3)." We also know that it is younger, not older women, who have higher risk of death after myocardial infarction relative to men (4). This increase in cardiovascular mortality among young women is likely linked to obesity and the cardiovascular risk factors associated with obesity. Particular attention to cardiovascular risk should be given to women in this younger age group.

Cardiovascular Disease Among Minority Women

Racial disparities in healthcare are evident among many diseases, and this is of particular importance in Atlanta given the diverse population. Black women, particularly in southern states, have the highest incidence of uncontrolled hypertension, obesity, sedentary lifestyle and dyslipidemia. This combination of uncontrolled risk factors leads to increased mortality among minority women, particularly black women. Among young women, ages 45-64, with a first myocardial infarction, 18 percent of non-Hispanic white women will die within five years. More alarming is that among that same younger age group, 28 percent of black women will die within five years after a first myocardial infarction. This racial disparity among women is not as great among older women. This is a cause for concern because it is the younger age minority women at greatest mortality risk (2).

Identifying Cardiovascular Risk in Women

All women should have their cardiovascular risk classified by their provider as high risk, at risk, or ideal cardiovascular health. Classification criteria have been established by the American Heart Association and are listed in Table 1.5. Along with appropriate risk stratification, providers must make it a priority to educate each woman regarding their personal cardiovascular risk factors and overall risk for future cardiovascular disease.

Pregnancy: A Unique Opportunity To Estimate A Women's Future Risk

The short-term risk to both mother and baby of preeclampsia and gestational diabetes is well understood. However, we are now learning that these pregnancy complications have long-term risk as well. Pregnancy is an early metabolic and cardiovascular "stress test" for many women. Women with a history of preeclampsia have a twofold increased risk of ischemic heart disease, stroke or thromboembolic event in the five to 15 years following pregnancy (6). Pregnancy can unmask endothelial and metabolic dysfunction early in life, and obstetricians should not miss this opportunity to intervene early on these at-risk women. Postpartum, women with preeclampsia and gestational diabetes should be referred to a primary care provider or cardiologist for risk factor modification (5).

Early Intervention on Future Cardiovascular Risk

While cardiovascular disease typically does not manifest until the fifth or sixth decade in life, it is well known that atherosclerotic process begins in the second and third decades. Despite this knowledge of the atherosclerotic process, risk factor modification is typically not emphasized early enough. Clinical trials have shown a 30 percent reduction in cardiovascular events when statins are

HIGH RISK (>1 high-risk status)

- Clinically manifest coronary heart disease
- Clinically manifest cerebrovascular disease
- Clinically manifest peripheral arterial disease
- Abdominal aortic aneurysm
- End-stage or chronic kidney disease
- Diabetes Mellitus
- 10-y Predicted CVD risk >10%

AT RISK (>1 major risk factor(s))

- Cigarette smoking
- SBP <120 mm Hg, DBP <80 mm Hg, or treated hypertension
- Total cholesterol <200 mg/dL, HDL-C <50 mg/dL, or treated for dyslipidemia
- Obesity, particularly central adiposity
- Poor diet
- Physical inactivity
- Family history of premature CVD occurring in first degree relatives in men <55 y of age or in women <65 y of age
- Metabolic syndrome
- Evidence of advanced subclinical atherosclerosis (e.g., coronary calcification carotid plaque or thickened IMT)
- Poor exercise capacity on treadmill test and/or abnormal heart rate recovery after stopping exercise
- Systemic autoimmune collagen-vascular disease (e.g., lupus or rheumatoid arthritis)

IDEAL CARDIOVASCULAR HEALTH (all of these)

- Total cholesterol <200 mg/dL (untreated) BP <120/<80 mm Hg (untreated)
- Fasting blood glucose <100 mg/dL (untreated)
- Body mass index <25 kg/m2
- Abstinence from smoking
- Physical activity at goal for adults <20 y of age: <150 min/wk moderate intensity, <75 min/wk vigorous intensity, or combination
- Healthy (DASH-like) diet
- History of preeclampsia, gestational diabetes, or pregnancy-induced hypertension

Adapted from Guidelines for the Prevention of CVD in Women-2011 Update. Mosca et al. J Am Coll Cardiol. 2011:1404-23

started in patients age 50 to 60. Initiating statin therapy at age 30 may prevent 60 percent of cardiovascular events when initiated early in the disease process and outcomes measured over a lifetime rather than the standard five years in most clinical trials. Primordial prevention (prevention of risk factors) and early risk factor modification need to be a primary focus for medical providers.

In summary, significant improvements in the awareness and treatment or heart disease in women have been made. However, heart disease remains the leading cause of death for women. The increasing rates of obesity and heart disease in young women raise concern about the future of women's health. Health care providers need to identify and intervene on women with cardiovascular risk factors early, making special note of high-risk subgroups like black women. Pregnancy complications such as preeclampsia and gestational diabetes should be viewed as a "failed metabolic stress test" and serve as an early warning sign of potential risk both to patients and their obstetric provider. ■

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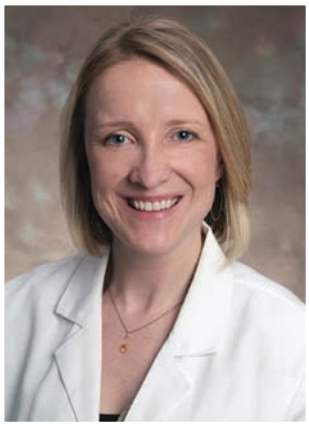

Intimate Partner Violence

Impacting Women's Health

By Melissa Kottke, M.D., MPH, FACOG

The images of intimate partner violence are graphic, visceral, harrowing, and sadly, ubiquitous. Media portrayals of intimate partner violence (IPV) are everywhere, from top-grossing box office movies and reality television shows to popular music videos. Images also surface far too often in our news and our lives. Unfortunately, these images have not translated into a meaningful discourse about IPV and its impact on women's health. Indeed, IPV is far too common, and its impact on women's well-being is far-reaching. As clinicians who provide care to women, we have an obligation to understand the link between IPV and health and a unique opportunity to connect patients to needed services.

While physical violence between those in a relationship is readily undeniable, it is not the only type of mistreatment in intimate relationships. IPV includes a range of abusive behaviors including sexual violence, emotional and/or psychological abuse. Recent data highlight reproductive coercion (preventing contraceptive use, contraceptive or condom sabotage, etc.) and technology-based (inappropriate online activity, incessant texting, "cyber" stalking, etc.) abuse to be additional areas of concern that intersect with IPV. IPV does not discriminate and is present in all races, all education and socio-economic levels and across the lifespan. Recent data highlight this growing issue amongst young people. The most recent Youth Risk Behavior Survey found that one in 10 high school students had experienced physical abuse from their dating partner in the past year; in Georgia that number is one in 6. Further, one in three adolescent girls report physical, emotional or verbal abuse from a dating partner.

While IPV victims are not exclusively women, women do experience much higher rates of IPV than do men. In December 2011, the Centers for Disease Control and Prevention (CDC) released its findings from the first National Intimate Partner and Sexual Violence Survey (NISVS). This survey of more than 16,000 men and women sought to provide details on the magnitude and characteristics of sexual and intimate partner violence. Many will find the results alarming. Before reading the following, consider performing a mental tally of the number of women you see clinically in a typical week and extrapolate to determine the magnitude of IPV in your population.

- Nearly 1 in 5 women in the U.S. report being raped at some point in their lives. Of those who reported rape, more than 50% were raped by an intimate partner.
- About 1 in 4 women experience severe physical violence by an intimate partner.
- One in 6 have experience stalking. Two thirds of these women reported that the stalking was by a current or previous intimate partner.
- More than 1 in 3 women have experienced rape, physical violence and/or stalking by an intimate partner in their lifetime. Approximately 6% reported that they experienced this within the past 12 months.
- Of those who report IPV, more than one third experienced multiple forms of abuse.
- Nearly half (48.4%) of all women have experienced psychosocial aggression by an intimate partner in their lifetime.

"But I am a doctor, not a social worker, not a counselor."

Clinicians may avoid the subject of IPV with their patients for a variety of reasons. Some cite the logistic barriers of lack of time and formal training. Clinicians may not want to open "Pandora's box" for fear of not knowing what to do if a patient discloses violence. Further, screening for IPV may seem unrelated to the presenting complaint, or some may feel uncomfortable broaching the subject with patients who are well-known to them. Regardless, doctors (as well as social workers and counselors) need to know that the connection between IPV and physical wellness cannot be denied. Women exposed to IPV seek emergency, dental, mental health,

physical therapy, radiology, primary care and specialty care services. According to health-system wide data, those who are currently experiencing physical IPV have medical costs 42% higher than women who are not being abused. Further, those who are experiencing non-physical abuse by a partner had medical costs that were 33% higher than those not in abusive relationships. In 2003, the cost of intimate partner rape, physical assault and stalking was more than $8 billion per year for direct medical and mental health care services and lost productivity.

Beyond acute health issues, the NISVS found that women who experienced IPV in their lifetime were more likely to report headache, chronic pain, poor physical and mental health, asthma, irritable bowel syndrome and diabetes than women who did not experience IPV. Previous studies of data from the Behavioral Risk Surveillance Survey found that a wide range of health conditions including arthritis, asthma, stroke, high cholesterol, heart attack and heart disease were significantly higher among women with a lifetime history of IPV. More than 300,000 women in the U.S. experience IPV during pregnancy each year, which surpasses both pre-eclampsia and gestational diabetes.

A woman may not present with IPV as her chief complaint, but it may be impacting her condition nonetheless. Cancelled and missed appointments, interrupted care and noncompliance with treatment and follow-up may be related to victimization. The NISVS found that 17% reported that a partner prevented her from seeking health care, compared to 2% of those who were not experiencing violence.

Intimate partner violence is tightly linked to an individual's health, but also plays an important role in the health of the community. Healthy People 2010, and now Healthy People 2020, sets goals for the health of the nation. Healthy People 2020 identifies 12 Leading Health Indicators to gauge progress on health-related issues (Nutrition, Physical Activity And Obesity; Tobacco Use; Substance Use; Reproductive And Sexual Health; Injury And violence; Maternal, Infant And Child Health; Mental Health, Environmental Quality; Access To Health Care; Oral Health; Social Determinants And Clinical Preventive Services). Intimate partner violence is negatively associated with nine of these 12 Leading Health Indicators.

Clinicians need not feel that they become experts in IPV prevention or services. Simply presenting the clinical space as a safe environment for women to discuss IPV or seek resources can be immensely helpful, especially considering that the clinical interaction may provide a singular opportunity to connect with support services. Simple strategies from Futures Without Violence include:

- Display posters pamphlets, and information on services for victims and perpetrators; have phone numbers for local resources available and offer to clients (Georgia Domestic Violence Resources has resource lists and contact information by county at http://www.aardvarc.org/dv/states/gadv.shtml)
- Have information on IPV in waiting rooms, other public areas, and in private areas including exam rooms and bathrooms
- Small safety cards with information about safety planning and local advocacy services that can be hidden by a victim are available from Futures Without Violence at www.futureswithoutviolence.org
- Create time during each clinic encounter when the patient has time to speak privately with the clinician; have a private, sound-proof area where your conversations take place

- Wear a "Is someone hurting you? You can talk to me." button on your lab coat. Examples of supportive messages include:
- "It's not your fault."
- "You are not alone."
- "You do not deserve to be treated this way."
- Implement a routine screening process and use it as an opportunity to educate clients about how abuse can affect their health, and that of their children

It is not the clinician's job, nor should be the expectation that one person will be able to provide an immediate fix to the IPV in another's life. However, incorporating screening and education into the clinical interaction may reduce isolation and introduce options for safety. Framing IPV as a health issue can serve to lessen stigma and open the door for future disclosures and linkage to care, if the need arises. ■

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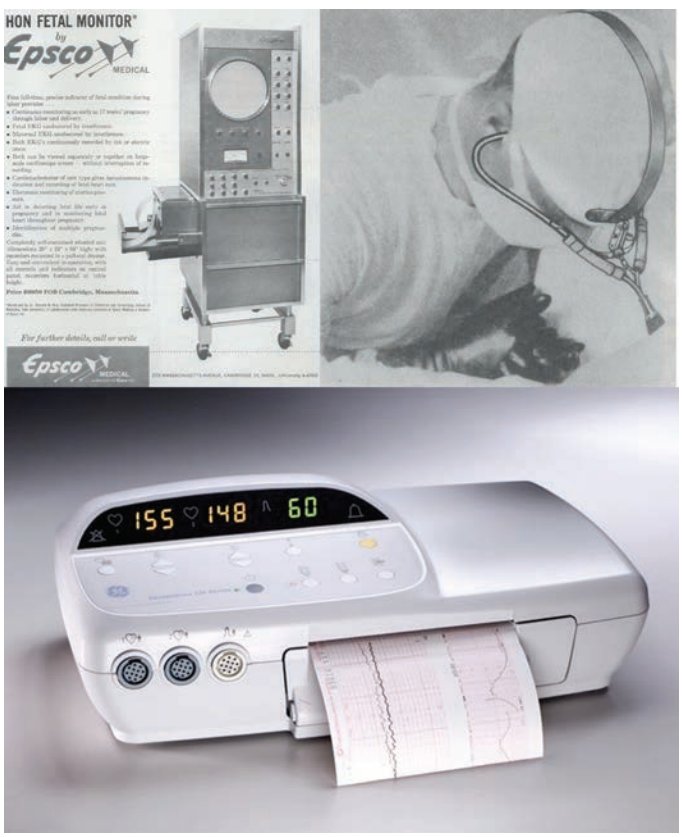
Maternal-Fetal Medicine
A Brief History

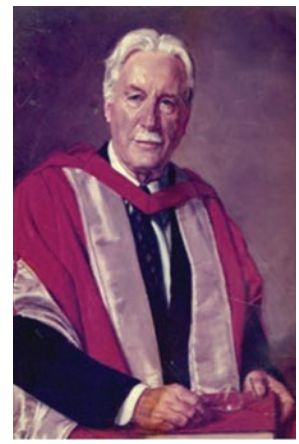
By Larry C. Matsumoto, M.D., FACOG
Board Certified in Obstetrics and Gynecology and Maternal-Fetal Medicine

We've witnessed great strides in obstetrical care over a relatively short period of time. A mere 40 years have passed since fetal heart rate monitoring emerged and replaced the once commonly used fetoscope. The newfound wherewithal to evaluate fetal well-being was a watershed moment for the field of obstetrics, and in retrospect, a terminus a quo for the field of Maternal-Fetal Medicine.



Fetal Stethoscope vs. Fetal Monitor. Clockwise from top left: Original FHR Monitor, Obstetrician using Fetoscope, Contemporary FHR Monitor.

As recently as 1952 the United States saw a maternal mortality rate of 83/100,000 and a stillbirth rate of 20/1,000 live births (LB's). In more contemporary data published by the World Health Organization, you'll find a maternal mortality rate of 15/100,000 and stillbirth rate of 6/1,000 LB's. This improvement was the result of a transition from opinion-based medicine to evidence-based medicine.



Dr. Donald Barron

The furtherance of obstetrical care came riding in on the coattails of fetal physiologists such as Dr. Donald Barron, a pioneer in the understanding of fetal adaptation to in utero hypoxia. Using the pregnant sheep model, fetal physiologists began understanding the process and result of this in utero acclimatization to a hostile environment. Through this research, the interconnection between the fetal cardiovascular system and fetal acid-base status was deciphered and used as a catalyst to set-up standards for fetal heart rate interpretation. Contributions from other fetal physiologists are too numerous to mention, but suffice it to say an explosion of studies in the 1950s and 1960s led to the necessity of training obstetrical specialists.

The American Board of Obstetrics and Gynecology had the first formal meeting to discuss the possibility of a subspecialty in 1969. This exploratory board consisted of Ted Quilligan (director), Frederick Zuspan, Joseph Seitchik, Donald Hutchinson, Edgar Makowski and Harry Prystowsky, all leaders in the field of obstetrics during the 1960s. The decision to name the subspecialty field "Maternal-Fetal Medicine," was partly political and partly practical. Not wanting to step on the toes of pediatricians the term "Fetal" was used. Since most of the medical complications were jointly managed with an internist, the terms "Maternal and Medicine" were utilized. The initial board had decided that all prospective Maternal-Fetal-Medicine specialists would be Obstetrician-Gynecologists

first. To become specialists they would then elect to pursue a two-year fellowship to gain expertise in areas listed in the table below then pass a written and oral examination.

- genetics
- biochemistry of genes and chromosomes
- gene transformation in man
- cytogenetics
- karyotyping
- population genetics and genetic counseling
- maternal physiology
- fetal physiology
- effect of maternal disease on the fetus
- effect of pregnancy of maternal disease
- newborns adjustments and adaptations to health and disease
- infection in mother and fetus
- diagnosis and therapy
- immunologic disorders
- intrapartum disorders
- contraceptive techniques
- knowledge of investigative techniques
- statistics
- teratology
- embryology
- drugs affects on fetus
- viral and bacterial effects on the fetus
- radiation effects on fetus

In 1977, obstetric anesthesia was added to the requirements. The following year the MFM board required that candidates complete two university-level courses in biostatistics, epidemiology and research design, as well as be published in a peer-reviewed journal. By 1979, they required training in an ultrasound unit, and in 1998 fellowship training was increased to three years.

More than 1,500 candidates have been certified from 62 training programs in the United States, with programs now functioning in many countries across the globe.

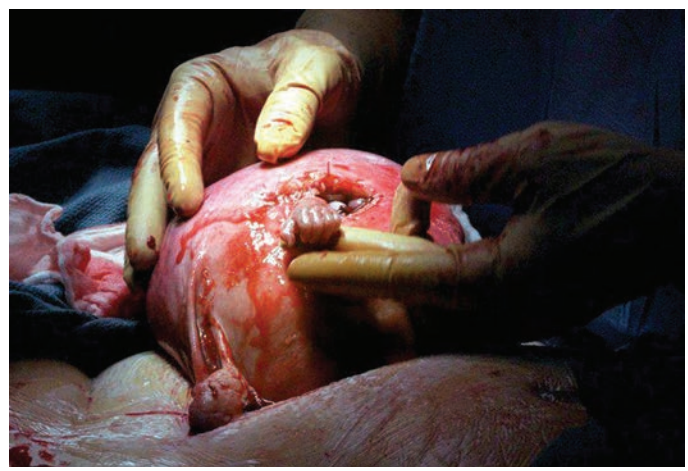
Since that inaugural meeting in 1969 and the organization of a new subspecialty field called Maternal-Fetal Medicine, the technological advances have not only ameliorated maternal outcome, but also fetal outcome, a relatively recent area of concentration made possible through high-resolution ultrasound. With the advent of digital ultrasound, management of high-risk pregnancies had to be redefined, with more of a focus turning to fetal well-being. Concurrent with technologic improvements in ultrasound came genetic advances such as the Genome Project in addition to more sophisticated techniques for genome analysis. The ability to analyze fetal DNA within maternal serum using "Next Generation DNA Sequencing" opens the opportunity for diagnosing all known genetic diseases without risking the pregnancy with an invasive procedure.

The question now arises, "Where do we go from here?" Is in utero treatment possible?

The quick answer is "Yes."

A short 15 years ago, the first successful in utero stem cell transplant was performed. Dr. Mark Evans, an obstetrician and geneticist, diagnosed and then treated a fetus with severe combined immunodeficiency syndrome, also known as SCIDS. This autosomal recessive disease was highlighted in the movie, "The Boy in the Plastic Bubble," a disease so serious intimate contact has to be avoided for fear of infection. Yet, this treatment was carried out during the pregnancy, a time when the immune system is most receptive to such a transplant. None of this would have been possible without the availability of digital ultrasound and genetic testing.

Maternal-Fetal Medicine has evolved from a purely maternal focus to a specialty that manages two patients, the fetus and mother. Using ultrasound Maternal-Fetal Medicine, specialists have performed fetal blood sampling and in utero blood and platelet transfusions, genetic testing through procedures such as chorionic villus sampling and amniocentesis, stent placement for bladder outlet obstructions or pleural effusions causing cardiac compression, tracheal occlusion for poor prognostic diaphragmatic hernia, laser surgery of abnormal placental vascular connections seen with monochorionic/diamniotic twins, and even angioplasty of valvular stenosis in a fetus with heart failure.



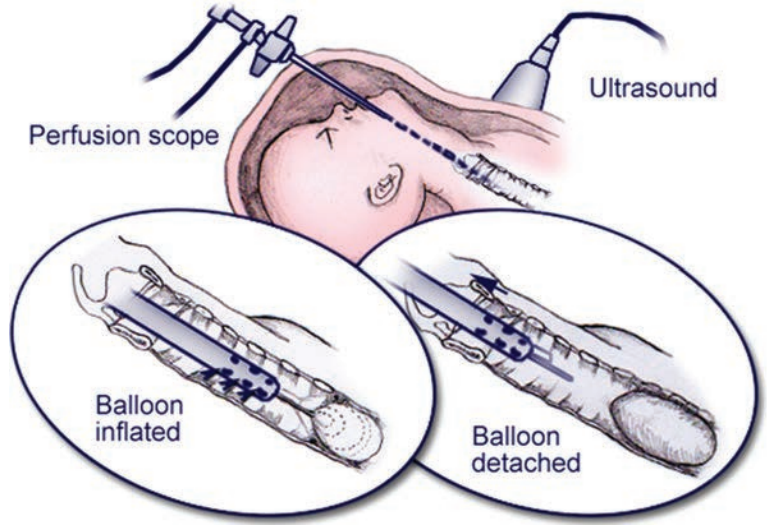
Fetal surgeon's finger held by fetus through open uterine wall prior to repair of spina bifida.

With the completion of the landmark "Management of Myelomeningocele Study (MOMS)," we now know in utero fetal surgery for spina bifida is associated with an improved outcome, thus, increasing the arsenal for fetal treatment centers. Undoubtedly, the field of Maternal-Fetal

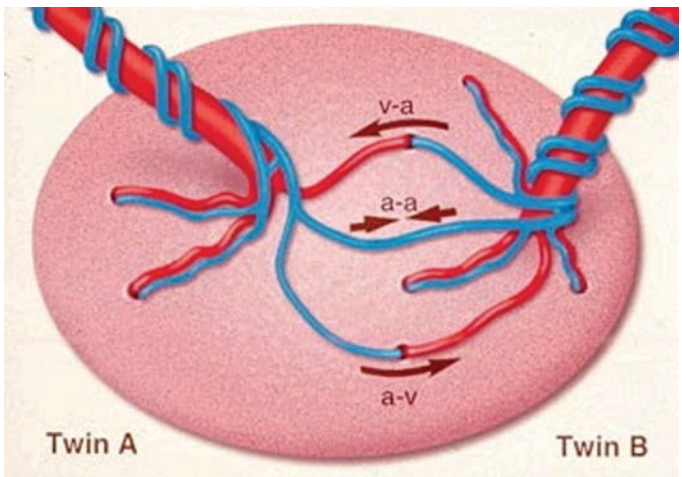
Medicine has moved into a new realm that has to include both fetal and placental anomalies amenable to diagnosis and treatment, not just the mother, as was once the case.

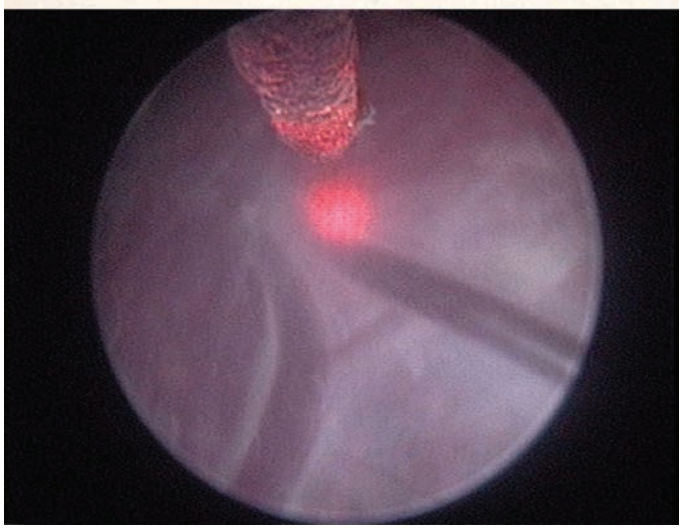
Open uterine surgery has been performed for open neural tube defects such as spina bifida, removal of anomalous lung lesions such as Congenital Cystic Adenomatous Malformations, and tracheal occlusion through plug placement to accelerate lung growth when poor prognostic diaphragmatic hernia exists.

The most common fetal procedure performed today is laser surgery for Twin-Twin Transfusion Syndrome, a potentially lethal process resulting from abnormal vascular connections across the placenta in monochorionic diamniotic twins (see image below). Using either the Yag or CO2 laser along with specialized fetal laparoscopic equipment, fetal surgeons have mapped out and destroyed abnormal vascular connections in thousands of pregnancies, yielding a 70-75% double fetal survival rate compared to a dismal outcome in higher staged lesions.



Fetoscopic Plug Placement into Trachea of Fetus with Diaphragmatic Hernia.





Laser surgery for Twin-Twin Transfusion Syndrome. Upper image cartoon of vascular abnormality and bottom image is actual laser of placental vessel.

The next big sphere of treatment options during pregnancy will probably result from genetic advances. In utero stem cell treatment is still uncharted territory, but the possibilities are quite exciting. Using the genetic sequencing model mentioned above and our continued improvements in transplant technology, in utero treatment will become an undeniable focus for the field of MFM, one that will move the field further ahead than any prior advancement. One just needs to understand the significance of the landmark study by Dr. Barker to appreciate the possibilities and to envision the future of MFM. With his data we now better understand the impact a hostile in utero environment can have on the future of the developing fetus. In his study, he showed that fetuses with intrauterine growth restriction were more likely to suffer with adult onset diseases such as obesity, hypertension, coronary artery disease and diabetes. He hypothesized that restricted growth in utero resulted in a reprogramming of both the fetal endocrine and vascular systems with subsequent disease states in adulthood. We now know through animal studies that epigenetic changes can occur when the in utero environment is less than optimal, and these alterations can be passed on to future generations. It is this epigenetic area that needs to be studied for the next big step in the field of MFM. ■

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Breast Cancer Update

By Colleen Austin, M.D. and Lynn Baxter, M.D.

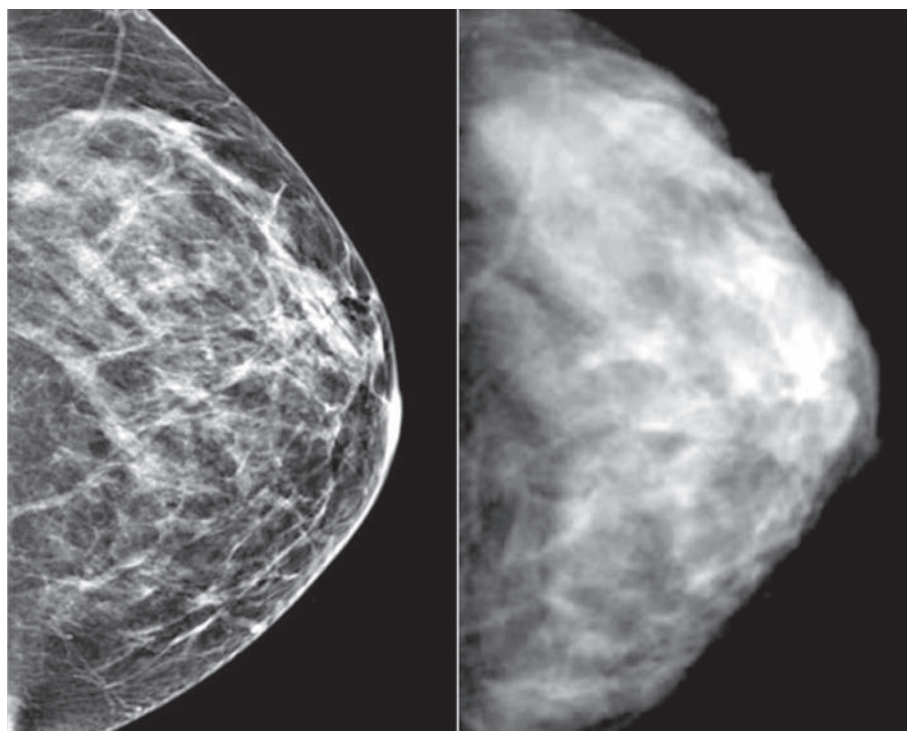
The diagnosis and management of breast cancer has evolved dramatically since the declaration of the War On Cancer 40 years ago and especially during the past decade. In addition to the developments in diagnosis and treatment, there has been a major paradigm shift in our understanding of the disease such that we increasingly focus on the intrinsic molecular subsets of breast cancer rather than viewing the disease as one entity.

There are over 200,000 cases of breast cancer per year in the United States with 40,000 deaths (1). After an increase in incidence during the 1990's attributed to the increased use of screening, there has subsequently been a decrease. This has been attributed to the decline in use of hormone replacement therapy in part driven by the results of the Women's Health Initiative (2). The decrease has largely been in estrogen receptor positive tumors with little decline in the incidence of ER negative malignancy.

During the past decade the mortality from breast cancer has also been declining. This decrease has been attributed to the benefits of screening and adjuvant therapy; thus far treatments for metastatic disease have had little impact on mortality. Unfortunately while having a lower incidence of breast cancer, African American women continue to experience higher mortality from the disease (3).)

Risk factors for which adequate evidence exists include age, gender, race, family history, reproductive history, diet and lifestyle, alcohol use, smoking and exposure to radiation. A recent report from the Institute of Medicine extensively reviewed evidence for environmental factors contributing to breast cancer risk. Inadequate data exists for many suspected risks, and a focus on exposures in early life might be important (4). In the meantime strategies for prevention should include a healthy diet limiting fat and alcohol, avoiding weight gain especially after menopause, avoiding exposure to cigarette smoke and radiation, and limiting use of hormone therapy.

Germline mutations account for less than 10% of all breast cancer cases. In addition to BRCA 1 and 2 mutations, Li-Fraumeni, Cowden and Chek 2 mutations are important. All are autosomal dominant and include the risk of other malignancies as well. Obviously family history is an important consideration in determining the appropriateness of genetic testing. However referral for genetic testing should be considered in patients 45 or younger regardless of family history, in patients less that 50 with a limited family history and in patients less that 60 with triple negative breast tumors (5).



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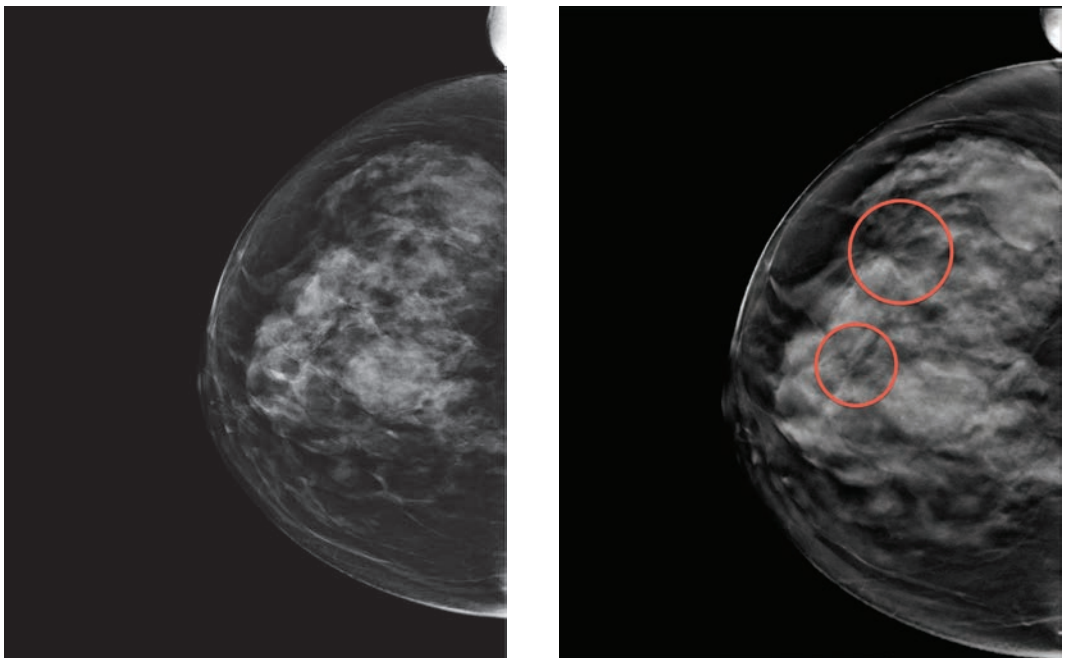
Digital (L) vs. Film (R) Mammography in a dense breast.



A tomosynthesis slice (R) reveals two cancers masked by dense tissue and cysts on the 2D digital mammogram.

While there are many types of imaging used to evaluate for breast cancer, mammography is the gold standard. As Dr. Dan Kopans of Harvard likes to point out, it is the only test of any kind ever proven to reduce mortality from breast cancer.

Eight large, randomized controlled trials beginning in the 1960s showed a 20-30% decrease in mortality for women offered mammography (6) - and this was using technology from the 1960s and 70s! Digital mammography is rapidly becoming the new standard. It allows computer manipulation of the images and can reveal fine details not seen on film. Digital imaging has been demonstrated to be superior to film for cancer detection in women with dense breasts and women under age 50 (7). However, digital mammography still has some of the same limitations as film mammography. Things such as dense tissue and implants can obscure underlying cancers, and approximately 10% of patients having screening mammograms are recalled for additional imaging. Most of these patients do not have cancer, and the false positive recalls can be stressful. These limitations have led some people to advise against routine mammography, despite its proven benefits.

Fortunately, new technology is beginning to address these issues. The latest advance in mammographic imaging is digital breast tomosynthesis (also known as 3D mammography). In tomosynthesis, multiple images are obtained in an arc around the breast and then reconstructed in 1 mm slices. This allows radiologists to view the internal structures of the breast unobscured by overlapping tissue. In traditional 2-D mammography, tissue in one part of the breast can be superimposed on tissues from another to mask cancers or create the illusion of a mass. Tomosynthesis can overcome this problem, allowing us to detect more cancers and reduce recall rate. In fact, in studies that have been published so far, the recall rate has decreased by up to 40 % (8).

However, tomosynthesis still has limitations. It cannot find all cancers. For example, lobular cancers that do not create a mass or calcify will not stand out on tomosynthesis. Cancers that are equally dense with surrounding tissue can also be missed. Also, tomosynthesis will not eliminate all recalls. Patients with cancer will still need to be recalled and patients with real but benign lesions such as fibroadenomas will still need additional evaluation to exclude malignancy.

Like 2D mammography, tomosynthesis requires breast compression and radiation. In fact, the standard combination exam of 2D and 3D mammography delivers two to three times the radiation dose of a 2D mammogram. The radiation dose is still extremely low and well within FDA guidelines. The FDA also points out that the marked decrease in recalls for the extra views should offset the additional radiation from the initial exam. The combination exam has been shown to find the most cancers, and calcifications are still best evaluated with 2D digital mammography (9). Therefore, only the combination exam is approved by the FDA.

Another major advance in breast cancer imaging is the use of MRI. MRI has long been the gold standard for evaluating the integrity of silicone implants. It is now also increasingly being utilized to evaluate for breast cancer. MRI uses no compression or radiation, and it not only shows anatomy, but also uses intravenous contrast to evaluate physiologic changes in bloodflow patterns. Invasive cancers alter bloodflow patterns through angiogenesis and other mechanisms. MRI can identify these changes with great sensitivity. In fact, published studies show an almost 100% detection rate for invasive cancers (10). Unfortunately, MRI is not as sensitive for non-invasive cancers, since they do not reliably alter blood flow. In addition, benign lesions such as fibroadenomas, fibrocystic tissue, and papillomas can enhance with patterns that can mimic cancer. Bloodflow patterns can even change during different phases of the menstrual cycle. For these reasons, MRI cannot replace mammography, but is useful as a compliment in many situations.

MRI is now frequently used to evaluate patients with a new breast cancer diagnosis. It identifies additional unsuspected cancers in the ipsilateral breast in up to 1/3 of patients and finds unsuspected contralateral cancers in 4 to 6 percent of patients. It can find primary tumors in 90 percent to 100 percent of patients whose cancer is initially detected in an axillary lymph node (11). It is also useful for following patients on chemotherapy since its physiologic evaluation of blood flow can show a response earlier than anatomic studies such as mammography or ultrasound. In high risk screening patients, MRI finds unsuspected cancers in approximately 4 percent (12).

With all of the new tools available for breast imaging, what are the current recommendations for breast screening? The America Cancer Society recommends annual screening mammography for all women ages 40 and older. Annual MRI is recommended in addition to mammography for high- risk patients (those who are BRCA + or have a 20 percent greater lifetime risk of breast cancer). Screening for these high-risk patients should begin at age 30. Intermediate risk patients (15 to 20 pwecent lifetime risk) may wish to consider yearly MRI in addition to mammography. Research is ongoing in this population, which includes patients with a personal history of breast cancer. MRI screening is not recommended for average risk patients, since in a population with a low prevalence of cancer, the number of false positives would be unacceptably high.

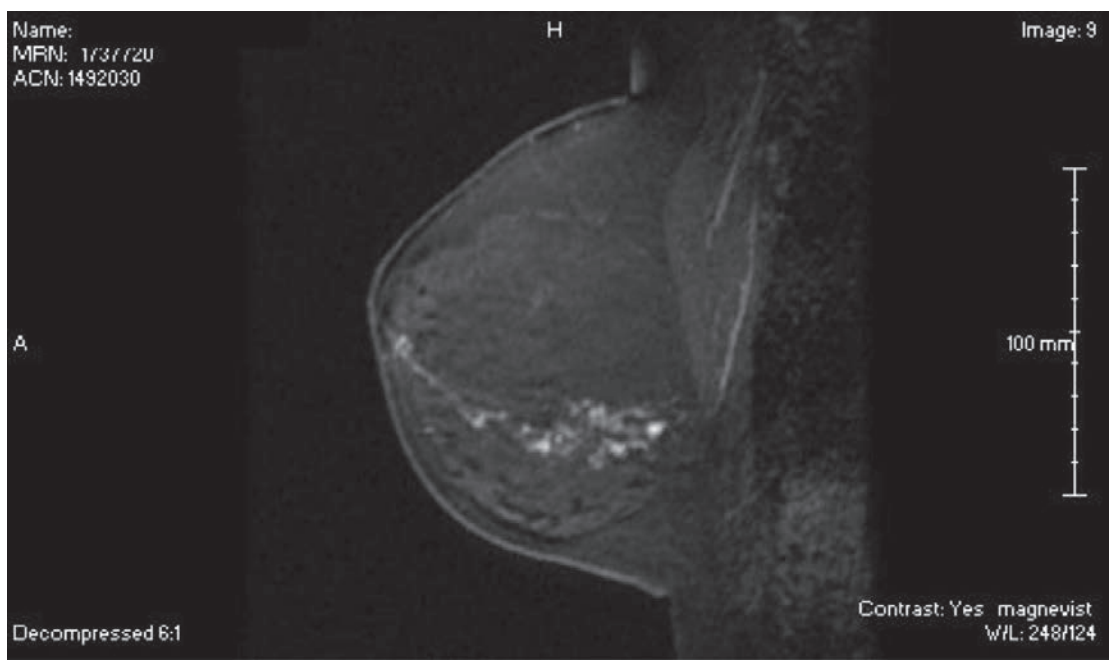
Ultrasound screening is not generally recommended except for high-risk patients who cannot tolerate MRI (such as those with pacemakers). While ultrasound is quite useful as a diagnostic tool to evaluate a mass seen on mammography or palpated on clinical exam, it is hampered in the screening setting by issues of both sensitivity and specificity. While screening ultrasound can find some additional unsuspected cancers, it only finds 0.4 % more than mammography (13), as opposed to 4 % more for MRI. Comparative studies have shown that ultrasound does not add any increased cancer detection to the combination of mammography and MRI. Moreover, ultrasound has a high rate of false positive recommendations for biopsy (14).

We've come a long way with breast imaging since those first mammography trials. Challenges still remain, and no current imaging test or combination of tests is perfect. However, with continued advances, we will hopefully be able to address current issues, decrease false positives, and find ways to identify more cancers at treatable stages.

With improved tools for screening, earlier diagnosis is possible with opportunities to modify the extent of treatment. Breast conserving surgery is now the standard of care for patients with early malignancy. Acceptable margin width has declined, and neoadjuvant systemic therapy can often be used to reduce larger tumors making them amenable to breast conservation. Radiation therapy is a critical adjunct to breast conserving surgery, reducing recurrences by 25% (15).

Node sampling has also evolved in the direction of "less is more." Sentinel node biopsy is now the standard of care, and two studies have demonstrated that complete axillary node dissection can be avoided when two or fewer nodes are involved in patients receiving subsequent radiation therapy (16, 17.)

The use of IMRT (Intensity Modulated Radiation Therapy) has improved the accuracy and uniform dosing of treatment. Although a five-week course of whole breast irradiation remains the standard, hypo fractionated regimens (Canadian Regimen) permit completion of treatment in half the time. Accelerated partial breast irradiation techniques (PBI) limit the treatment volume to the tumor bed and 1-2 cm surrounding margin. Treatment can be completed in five days. Although gaining in popularity, PBI is subject to con-



An unsuspected cancer found on MRI

tinuing evaluation in clinical trials and its use is limited to patients over 45 years old with small node negative tumors (18).

Finally there are patients who may avoid radiation after breast conserving surgery: women over 70 with small ER positive tumors who are receiving adjuvant hormonal therapy (19). The use of radiation after breast conserving surgery for non-invasive tumors (DCIS) is also being reconsidered, and molecular profiling of the tumor may help predict which patients can avoid therapy (20).

The evolving paradigm of the intrinsic tumor subtypes in breast cancer has had a major impact on the use of systemic treatment in this disease. Therapy is now individualized for hormone sensitive, HER 2 amplified, and "triple negative" tumors. The use of systemic treatment prior to surgery, so-called "neoadjuvant therapy" initially focused on patients with locally advanced disease. While no survival benefit has been associated with this approach, it is valuable in assessing response to systemic treatment and can be used to evaluate new therapies prior to large-scale trials.

Genomic studies of patient tumors have also helped individualize systemic therapy choices. Gene expression profiling provides a molecular signature of a patient's cancer, which can be used to classify the risk for relapse and the benefit of a variety of treatment strategies. Many patients have avoided the toxicity of treatments, which would likely have contributed little to reducing their risk of recurrence.

Central to the paradigm shift in the management of breast cancer has been the elucidation of the molecular pathways critical for cell growth. Targeting these pathways has led to some of the most important advances in treatment (e.g. Traztuzumab for HER 2 overexpressing tumors). Among the large number of agents in the pipeline, many if not most will target critical steps in these pathways and hopefully will lead to significant progress including for those patients with metastatic disease.

With the rapid evolution in technology for diagnosis and treatment of breast cancer, it is likely that our approach to this disease will increasingly reflect the unique aspects of each tumor rather than a global approach to the disease. The results of many prior studies are likely compromised by our lack of understanding of this complexity. Fortunately in many instances tissue banking of tumor specimens from older studies has allowed the reevaluation of some of these issues, often with very different conclusions.

Perhaps the most gratifying aspect of the progress we have made in this disease is the increasing focus on "Survivorship." Even patients with metastatic disease often live years, and programs directed at managing the aftermath of cancer treatments are receiving increased attention. ■

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Advances in Birth Control Options

By Joel S. Engel, M.D., FACOG

The National Center for Health Statistics defines intended pregnancies as those that occurred to women who either wanted a baby at the time they became pregnant or who were indifferent about conceiving. One of the most important reproductive health issues facing women in the USA is an unintended pregnancy rate close to 60%. Unplanned pregnancies are known contributors to poor maternal and child health.

Physicians should advocate for birth control methods with high compliance rates as well as prescribe for 6-12 months at a time to lower discontinuation rates. Quick start regimens with immediate start times are preferable to waiting for the first Sunday following the menses. We need to redouble our efforts and provide guidance on birth control choices for families that will enhance their compliance and fit with their life styles. It is unfortunate that family planning has become a political football, holding millions of women hostage to unfavorable medical policies.

1. Birth Control Pills/Patches/and Rings

Daily ingestion of oral contraceptives, although popular, has an inherent lack of compliance and a significant failure rate. The development of 10 microgram ultra-low dose estrogen pills has reduced the number one reason for discontinuance – nausea and vomiting. New guidelines from the World Health Organization allow prescribing pills in spite of medical co-morbidities.

Skin patches and vaginal rings free us from the compliance issue of daily regimens. Progesterone-only pills remain a viable option in the face of persistent concerns about obesity and deep vein thrombosis from exogenous estrogen components.

Some 50% of pill users continue to take advantage of the beneficial side-effects of the combination pills for relief of pelvic pain, regulation of cycles and reduction of both length and amount of flow.

2. Long Acting Reversible Contracetion

These three long acting methods can be delivered to even the youngest and nulliparous patients. With continuation rates approaching 100%, intrauterine contraceptive devices (IUCD) with and without hormones and lasting up to ten years need to become a more popular part of our armamentarium. An end to the stigma of the Dalkon Shield experience is long overdue.

The updated Nexplanon implantable progesterone rod is already available. Minimal training and experience makes this an attractive method for clinic and private use with few side effects and high retention rates. This modality can be utilized immediately following a pregnancy.

Depo-provera appeals to younger patients who are inconsistent with daily methods as well as provide birth-control without discernible evidence that the patient is preventing pregnancy. In some cultures, this is important. Look to the removal of the black box warning against bone loss in the near future. Weight gain represents its most serious downside in an already obese society.

3. Barrier Methods

These remain a satisfactory method when used consistently and correctly and remain a mainstay in prevention of sexually transmitted diseases. Proper instruction in their use is often lacking. The new female condom joins the armamentarium.

4. Permanent Methods

Sterilization still represents the #1 method of choice for permanent birth control while novel hysteroscopic methods such as the Essure and Adiana systems of tubal blockage gain ground. These hysteroscopic methods can be performed in office as well as at outpatient facilities under minimal analgesia and sedation. Vasectomy is safe and available to those males wishing to take responsibility for birth control.

5. Emergency Contraception (EC)

The development of hormones following unprotected intercourse is available over the counter for those 17 years and older. The Department of Health and Human Resources needs to consider lowering that age limit in light of the increasing number of early teenage pregnancies. For now, physicians can proactively provide prescriptions for EC to younger teens before it is needed. The newest drug Ulipristal (Ella) promises to be more effective and still work up to 5 days after unprotected intercourse.

In Summary

The costs for contraception continue to be a barrier to those who need it most. Societal costs of unintended pregnancy remain far higher than even the highest upfront costs for certain contraceptive methods. Remember, a pelvic exam is not a prerequisite for a contraception prescription. ■

Joel S. Engel, M.D., FACOG is a medical graduate of the University of Texas Medical Branch, two years in the USAF Dept Ob-Gyn Eglin AFB and Emory-Grady resident. He was the resident research chair winner in 1972 under Dr. John D. Thompson. Dr. Engel, after a preceptorship at the University of Colorado, established the first ultrasonography laboratory in the South at C.W. Long Hospital. An Ob-Gyn staff member at Northside Hospital since 1972 and a current member of the long-term planning committee, he looks forward to each Georgia legislative session where he is often seen testifying for women's rights issues..


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