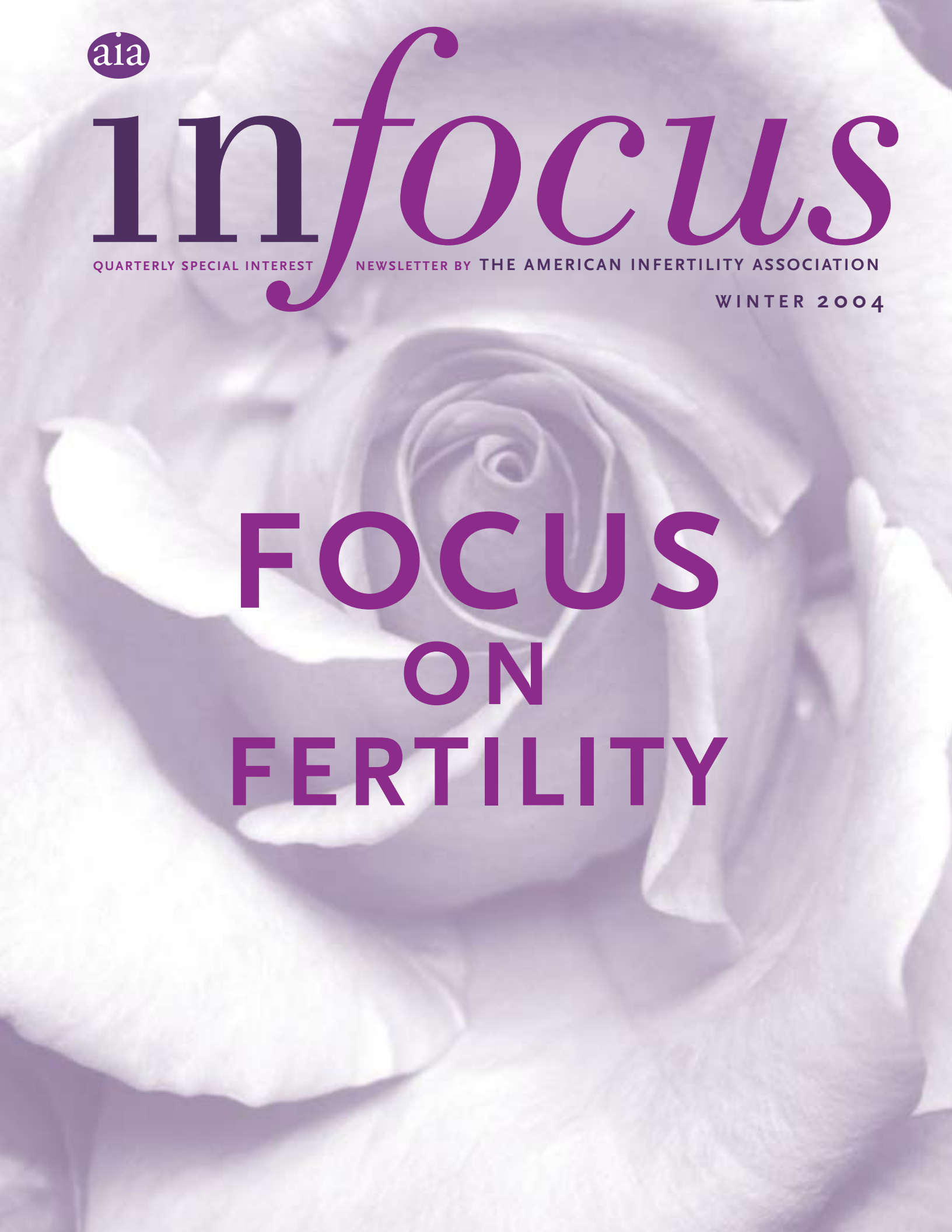
aia

infocus

QUARTERLY SPECIAL INTEREST NEWSLETTER BY THE AMERICAN INFERTILITY ASSOCIATION

WINTER 2004



FOCUS ON FERTILITY

Having a baby. It's the most important decision a couple can make. And helping fulfill the dream of parenthood is what we at Organon are all about. Having been at the forefront of fertility research for nearly 70 years, Organon brings more than just breakthrough products to couples.

We understand that there's more to having a child than just science. That's why Organon assists couples with comprehensive educational support as well as a full line of products. After all, with nearly 70 years' experience to share, we want to help you give birth to your dreams.

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INSIDE *this* ISSUE

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INFERTILITY • REPRODUCTIVE DISORDERS • ADOPTION • SUPPORT • REFERRAL • SERVICES
Monthly Newsletter, Weekly On-Line Education Meetings, Support Groups, Telephone Support, Peer Support Network, Information on Adoption, Seminars and Symposia, Physician Referral Services. **Lisa Rosenthal, Editor**

MESSAGE *from* THE EXECUTIVE DIRECTOR

Pamela **MADSEN**

FAST *forward* ON *fertility*

FUNNY HOW ONE THING OFTEN EMBODIES OR DEFINES ITS OPPOSITE. TAKE INFERTILITY. WITH ALL THE EXPERTISE WE'RE DEVELOPING ABOUT THE DISEASE (THIS IS THE AMERICAN INFERTILITY ASSOCIATION, AFTER ALL), WE'VE COME TO APPRECIATE THAT FERTILITY—UNDERSTANDING AND PRESERVING IT—IS ABSOLUTELY CRITICAL.

The reason is simple. Some infertility is preventable. The AIA wants to help make sure that no one suffers the often-unbearable emotional, social and economic strains unnecessarily. To that end, we've been reaching out to women and men, to the young and not-so-young, in a pedal-to-the-metal effort to tell the truth about fertility. We started with a survey about fertility and out of 12,000 respondents only one, that's right one, person answered all the 15 questions correctly. Pretty bleak for such a sex-savvy society.

FOCUS ON FERTILITY

That knowledge gap hot-wired The AIA's fertility initiative, a drive to get information into the hands of people who need it. Turns out, that's pretty much everyone, the fertile and infertile alike. In conjunction with Organon, Inc., The AIA launched "Focus On Fertility," a multi-pronged public education campaign. There are fact sheets (more of them are on the way) explaining the whys, wherefores and the when of fertility; the how-tos for holding on to it; ovulation and the timing of intercourse. We tackle fertility-enhancing lifestyles, and low-tech treatments, therapies and aids that will benefit all fertile and infertile folk. We're rolling out in-depth brochures and stepping up our program of Public Service Announcements.

As you can tell by now, this special edition of inFocus isn't for the fertile only. Rest assured, there's a lot on these pages that men and women grappling with the disease can use. Some will find that if they heed the advice offered they may actually increase their fertility. At The AIA core is our dedication to support, educate and advocate for the infertile.

Check out the Focus on Fertility website (www.focusonfertility.org) and you'll see that our free interactive tools, on-line educational seminars and downloadable fact sheets are for everyone dealing with reproduction—whether medically assisted or not.

In short, Focus on Fertility is all about getting intimate with the nuts-and-bolts of successful conception and pregnancy. (see "Focus On Fertility", pp.17)

We've had success. But believe me, there's a long way to go. Despite our efforts (and those of other organizations such as The American Society For Reproductive Medicine), far too many folks still rely on dumb luck when it comes to procreation. People are often more knowledgeable about building a retirement fund than building biogenetic families.

What we've learned is it takes a long and sustained campaign for information to sink in, to become integrated baseline knowledge that facilitates enlightened individual and public decision-making. The joint goal of the AIA and Organon is to bring the facts of reproductive life to as many people as possible. Because the truth is, what we don't know about fertility and preserving

it can rob us of a choice most of us take for granted. What we don't know about fertility can actually inhibit success with assisted reproductive treatments.

So, we're out there every day promoting fertility wellness, giving people the tools to pursue the families they deserve, if and when they're ready.

These thoughtful analyses and recommendations will enable all to take better care of themselves and improve the quality of their lives whether or not they ultimately succeed in having genetically linked kids.

BETWEEN THE COVERS

Randine Lewis' piece on "Reproductive Enhancement With Traditional Chinese Medicine" (pp. 5) illuminates the issues and benefits that bridge the fertile and the infertile. Lewis, a Ph.D. and licensed acupuncturist, discusses how ancient and thoroughly refined treatment modalities can augment the likelihood of a positive IVF outcome. For those who aren't infertile, techniques that address physical and emotional "disharmonies" may boost their chances of conception. We tend to forget that alternative and complementary medicine offers another path toward improving our underlying health and well-being, so essential in optimizing fertility.

Prominent psychologist and infertility specialist Alice Domar not only explains the negative correlation between stress and fertility, but she delivers strategies for smoothing the rough emotional and psychological terrain of reproduction (see "Stress and IVF" pp.18). While Domar, an infertility expert, focuses on the IVF experience, her analysis and recommendations will benefit everyone.

In "Lifestyles of the Fit and Fertile" (pp. 7) you'll find basic information about what your body needs to procreate. It's a primer that'll lead you through the gamut from weight (yes, you can be too thin), diet and exercise to the benefits of clean living. It'll also give you some helpful guidelines and suggestions for becoming the optimal reproductive you.

The complementary piece, "Fueling Your Fertility" by Dr. Ronald Feinberg and

WE ARE HERE TO SUPPORT EVERY PERSON TRYING TO CONCEIVE, WITH OR WITHOUT MEDICAL ASSISTANCE, AND THOSE WHO CHOOSE TO ADOPT. WE'RE HERE FOR THOSE WHO'VE ELECTED TO REMAIN CHILD-FREE AFTER INFERTILITY— BECAUSE THE AMERICAN INFERTILITY ASSOCIATION HAS ALWAYS BEEN AND WILL ALWAYS BE ABOUT FAMILIES.

Lesa Childs, M.S.W. (pp. 26 for fresh insights and a more detailed at the connection between insulin over-production, "overnourishment" as distinct from overweight) and ovulation disruption and infertility. You'll also get a glimpse into the significant roles of foods, exercise and the mind-body connection that can heighten or diminish your body's ability to reproduce.

On the prevention front, Dr. Ted Schettler of the Collaborative for Health and The Environment, explains the dangers of exposure to environmental hazards, some of the obvious and others not (see pp. 12, "Infertility and the Environment: Preventable Causes.") His piece is particularly noteworthy because, as he reports, the largest increase in infertility is among women under 25, not in the older women as might be expected. He makes a compelling case that environmental factors are, at least in part, to blame.

Alison Carson,"Environmental Contaminants and Fertility: What Is This Silence?" (pp. 22), delivers a powerful punch with her own story about compromised fertility and environmental contaminants. It's a cautionary tale as well, prodding us to be aware, active and vocal in order to protect our reproductive health and that of our progeny.

WHY FOCUS ON FERTILITY?

With this issue, The AIA is covering a lot of territory and targeting a lot of constituencies. After all our years in the field, The AIA firmly believes it's our responsibility to arm all hopeful parents with the best, most credible and current information about reproductive health and family building options. It means our mission must embrace, among other areas, fertility preservation, infertility diagnosis and treatment, high-risk pregnancies and the health and welfare of children born through IVF and third party reproduction. (We just published a fact sheet for potential egg donors to assist them as they generously consider assisting the infertile.) We are here to support every person trying to conceive, with or without medical assistance, and those who choose to adopt. We're here for those who've elected to remain child-free after infertility—because The American Infertility Association has always been and will always be about families.

reproductive enhancement WITH TRADITIONAL *chinese medicine*

BY RANDINE LEWIS, LIC.AC., PH.D.

INFERTILITY IS A MULTI-FACETED PROBLEM AFFECTING UP TO ONE OUT OF SIX COUPLES AROUND THE WORLD. TRADITIONAL CHINESE MEDICINE IS A NATURAL, SAFE AND EFFECTIVE FORM OF HEALING, WHICH HAS BEEN PRACTICED BY ALMOST ONE-QUARTER OF THE WORLD'S POPULATION FOR FIVE THOUSAND YEARS. EVIDENCE OF TREATING INFERTILITY WITH TRADITIONAL CHINESE MEDICINE (TCM) DATES BACK TO 11 AD. WESTERN MEDICINE HAS BEEN ATTEMPTING TO TREAT INFERTILITY—WITH SOMETIMES DISCOURAGING RESULTS—FOR LESS THAN 100 YEARS. THE TWO SYSTEMS TOGETHER, HOWEVER, CAN GREATLY INCREASE THE LIKELIHOOD OF ENSURING A SUCCESSFUL PREGNANCY.

Oriental medicine not only focuses on the specific causes of infertility, be they hormonal imbalances, PCOS, mechanical (uterine, cervical or tubal) obstruction, sperm factors, endometriosis, autoimmune or implantation issues, but treats the whole man or woman—body, mind, and spirit. In this way, we address the underlying cause of the disharmony, rather than attempting to override the imbalance. These treatments are safe, natural and case-effective, and can improve overall health as well.

HOW CAN TCM HELP?

Traditional Chinese Medicine can help enhance your reproductive potential by harmonizing your endocrine system with herbal medicine, nutritional supplementation or dietary modification, and by removing obstructions to conception with exercises and acupuncture. The first visit to the acupuncture clinic consists of a thorough diagnostic evaluation, analysis of present symptoms and medical history. We then design a treatment plan for each individual, typically consisting of weekly acupuncture treatments and herbal preparations which are usually taken daily, in addition to practices employed on your own. The treatment plan is based upon the pattern ascertained from the results of each individual evaluation, and may change as your body responds to the treatments. TCM can help you balance the disharmonies which have been preventing conception.

It is very common for couples today to feel that "it is getting too late; we must employ severe measures." While its true that many couples wait until later in life to conceive, TCM may help "turn back the reproductive clock." Please be patient with yourself. It takes at least three cycles to normalize a woman's cycle, and longer if she has taken fertility drugs, has a history of sexually transmitted disease, endometriosis, pelvic inflammatory disease, or polycystic ovaries. Likewise, it takes 70 days to generate new sperm in a man.

Traditional Chinese Medicine can help enhance your reproductive potential by harmonizing your endocrine system with herbal medicine, nutritional supplementation or dietary modification, and by removing obstructions to conception with exercises and acupuncture.

You are not alone. Approximately one in six to seven couples experiences problems with fertility. Innumerable women grieve the loss of a potential child once a month, and lose a little more hope with each period. We believe that we can give you reason for optimism, no matter what approach you take.

TCM also increases the likelihood of conception if you opt for the fertility drugs or medically assisted fertilization techniques. Studies have proven that certain acupuncture techniques improve the blood flow (and therefore hormonal delivery) to the ovaries and uterus (better blood flow correlates with better implantation rates), which greatly increases the likelihood of a successful cycle. Other treatments may be aimed at making the uterus "non-reactive" before catheter insertion, making cramping and rejection less likely. The most common reason, however, that women seek acupuncture treatments during IVF cycles is the stress reduction and relaxation it provides. One study reported women categorized with a high level of stress were 93% less likely to conceive in any given cycle.

Acupuncture and herbal medicine function to restore balance to the energies of nature contained within us. Traditional Chinese Medicine suggests that we look at the processes in nature and make parallels with the internal processes of change occurring within us. The oriental medical diagnosis differentiates all pathological conditions first as being of either excess or deficient nature. The etiology is then broken down into constitutional weaknesses, stress factors, cold or heat processes, damp or dry reactions, the presentation of the symptoms, and the effect of diet. The process is then defined by how the individual body, mind, and spirit respond to the factors of imbalance. All of these elements influence fertility, and therefore effect how the practitioner of Chinese Medicine treats infertility.

Many hormonal problems are due to slight imbalances in the delicate endocrine system, which may alter a pathway by which the body produces hormones. A slight aberration can throw off the entire system so it no longer functions smoothly. Modern diagnostic techniques may not detect any laboratory abnormality or functional causes at all. This does not necessarily mean that fertility drugs or surgical procedures are the only solution.

Research has shown that acupuncture influences these hormonal pathways, and assists our own internal energies to restore endocrine harmony. Certain meridians influence the internal organs. Some control the reproductive organs themselves. Others affect the hypothalamic-pituitary-gonadal axis, which is responsible for ovulation and sperm production. Deeper meridians rule the endocrine and immunologic systems. They all need to be in balance to function correctly. Fertility is the natural expression of optimal reproductive health.

Certain herbs contain natural energetic substances whose essence gently corrects underlying deficiencies or removes obstructions. By way of a thorough analysis, a TCM diagnosis of your body's individual disharmonies is derived and a prescription designed precisely to correct your imbalances. These herbal formulas will be created based upon your medical past from an Eastern and Western perspective, your present symptoms, and menstrual patterns. A proper herbal prescription will contain no hormones, but will urge your body to produce its own—naturally and in the right amount. Over-the-counter herbal remedies are not as effective because they are aimed at a "general population." The whole key to effective treatment is that each individual's particular needs be addressed. Each herbal remedy is tailored to meet your body's reproductive requirements. The herbal formula is multi-faceted, containing herbs to:

- strengthen your entire system and improve general health;
- correct your particular imbalances;
- directly improve your reproductive function, depending on your individual diagnosis.

Acupuncture and herbal therapies are gentle, yet effective. Conventional Western medicine offers a bigger bang, but we liken this to putting a thumbtack in the wall with a sledgehammer. Many women do not need fertility drugs and medically assisted reproductive techniques, yet they go through months of physical and emotional agony, not to mention the financial burden. TCM will put the tack in the wall with a thumb. It is safe, natural, cost effective, and has no side effects. In fact, TCM can only make you stronger, while helping create a healthier environment for a harmonious pregnancy.

Randine Lewis, MSOM, L.Ac., Ph.D., author of The Infertility Cure: The Ancient Chinese Wellness Program for Getting Pregnant and Having Healthy Babies, has blended Western science and Eastern medicine to develop a program which helped herself and many hundreds of women conceive naturally. She presently offers fertility enhancing retreats at luxury health spas http://www.fertilityretreats.com. Dr. Lewis can be reached at (828) 687-8334.

lifestyles of the fit and fertile

HOW TO REACH - AND HANG ON TO - YOUR REPRODUCTIVE PRIME

BY MICHAEL STEINKAMPF, M.D. AND KAREN HAMMOND, M.S.N., C.R.N.P.

SOME PEOPLE WILL INSTRUCT YOU, "JUST RELAX." OTHERS WILL GIVE YOU TIPS ON COITAL POSITION, RECIPES FOR ANCIENT HERBAL POTIONS OR SLIP YOU THE FENG SHUI GUIDE TO INTERIOR DESIGN FOR FERTILITY. ONCE THEY GET WIND OF YOUR EFFORTS TO CONCEIVE, FAMILY, FRIENDS, MERE ACQUAINTANCES AND NEAR-STRANGERS WILL FREELY DISPENSE THEIR (USUALLY) UNSOLICITED ADVICE ON THE "SURE-FIRE" WAY TO GET PREGNANT.

And you may be tempted to try one or two of these well-intentioned but off-the-wall suggestions, especially when pregnancy isn't happening as fast as you think it should and you'd swear that every other couple at the mall is expecting.

Resist that temptation. There's no evidence that hanging from gravity boots for an hour after intercourse or chomping saw palmetto (alleged to promote male potency) increase the odds of pregnancy. There is evidence, though, that something less exotic, maybe even mundane, does work—a sensible, healthy lifestyle.

It is a fact of reproductive life that what you eat, how much you weigh, the exercise you do, the colas and coffee you slug, and the cigarettes you light up—just to name a few things—can profoundly affect your ability to make a baby.

While lip service about the high road to health comes easy, getting there typically isn't. You need discipline, support and, above all, the desire. Moreover, the steps to that good-for-your-fertility lifestyle aren't always obvious. Most of us could use a good road map that keeps us on the path. So here's one to help you figure out where you are and how to get where you need to go.

LIVING LA VIDA HEALTHY: MAX OUT YOUR PREGNANCY POTENTIAL

To a greater degree than most people imagine, you can manage your reproductive destiny. Start with a candid assessment of the way you live day-to-day, your physical and psychological self. Unless you're flawless (and who can make that claim and be called sane?), there's a good chance you'll have to make at least a few changes. Some are simple adjustments. Others are a test of will even for the strongest. Be prepared.

WEIGHTY ISSUES

You can be too thin. Or too fat. It is one of nature's crueler quirks that weight will affect a woman's reproductive capacity more than a man's. The female body is at its baby-making best when it is within 15% the ideal weight. Ideal, in this context, is not about Hollywood aesthetics. It is about the weight at which your body and its hormonal systems run as smoothly as a well-oiled Mercedes. Although it's a highly individualized matter, many women begin experiencing problems when they're less than 95% or more than 125% of that weight.

- **BMI and the Ideal.** What you're looking for is a body mass index (BMI), the standardized measure of the ratio of height to weight, of between 24 and 30. To calculate your BMI, multiply your weight by 703 and divide that by the square of your height in inches. Not the complicated calculus it first appears. Really.

Say you're 66 inches tall and weigh 155 pounds. The equation looks like this:

155 x 703 = 108,965
66 x 66 = 4,356
108,965/4,356 = 25.01

That won't get you the cover of *Vogue*, but it's smack in the middle of the "ideal" weight range.

- **The Thin Risk.** This is a hard one for men as well as women because we've lost all perspective. And, okay, it's not the most common problem. But five minutes watching an episode of "Friends" and we're all checking ourselves for excess flesh. Skinny comes with a high cost. Underweight women can stop ovulating, having regular periods or any periods at all. Men with a BMI below 18 often can't find their libidos, their sperm are less active and have shorter lives than men in normal BMI range.

- **Overweight and Overwhelmed.** This is the biggie, the problem that afflicts most people. Indeed, between 4 to 5% of women of reproductive age have Polycystic Ovarian Syndrome, a common cause of female infertility, which is exacerbated by obesity. It's not known exactly how excess poundage interferes with conception, but it is associated with long gaps between menstrual periods and an overabundance of certain hormones that inhibit ovulation. Too much body fat contributes to insulin resistance and may also indicate underlying problems such as Polycystic Ovarian Syndrome.

Should you find yourself at either weight extreme, consult your doctor and a nutritionist. Not to belabor the obvious, but avoid crash or fad diets to gain or lose girth. It's not only about achieving a pregnancy, but sustaining a healthy one as well.

FEEDING YOUR DESIRES: FEAST FOR FERTILITY

It's simple. Eat all the things you know you should but probably don't. That's right. Lots of fruits, vegetables and low-fat protein. Make sure to have at least three nutrient-laden meals daily and treat yourself to snacks. Not a bowl of ice cream. Something more along the lines of cottage cheese with a few crackers or fruit. If you're trying to shed a few pounds, don't skip meals; limit portion size and take time to savor the tastes.

IT'S SIMPLE. EAT ALL THE THINGS YOU KNOW YOU SHOULD BUT PROBABLY DON'T. THAT'S RIGHT. LOTS OF FRUITS, VEGETABLES AND LOW-FAT PROTEIN. MAKE SURE TO HAVE AT LEAST THREE NUTRIENT-LADEN MEALS DAILY AND TREAT YOURSELF TO SNACKS. NOT A BOWL OF ICE CREAM.

Vegetarians need to take extra care to get sufficient protein when trying to boost fertility. Without it, estrogen metabolizes into inactive products more rapidly and menstrual cycles become longer.

Despite your best intentions, it's sometimes impossible to get all the vitamins and minerals from food alone. Both partners should take a good multivitamin and mineral supplement. A women's supplement should contain 400 units micrograms of folic acid, which helps prevent birth defects of the brain and spinal cord that occur within 30 days of fertilization. Zinc may be especially important for men to produce healthy sperm and for normal testicular function.

Whatever you do, avoid vitamin megadoses, especially A and D. The body doesn't quickly excrete these fat-soluble vitamins, allowing them to build to toxic levels.

And no herbs. These are unregulated substances, mostly untested and unregulated. And there is evidence some can cause problems. St. John's Wort, a commonly used remedy for depression, for example, has an adverse affect on male fertility. The solution: stay away.

Limit caffeine and alcohol intake. One cup of coffee a day should suffice. A glass of wine might not hurt, but moderate to heavy drinking takes its toll on male (sperm shape and motility) and female (ovulatory dysfunction) fertility and has a deleterious effect on embryos and fetuses.

EXERCISING YOUR RIGHTS

All right. You've got the good-eating thing knocked. The next part of your reproductive plan is to bend, stretch, run, lift weights, take yoga and maybe a bit of Pilates for good measure. You can overdo it.

Exercise devotees and serious athletes who train hard may find their fertility plummeting. Among women who log more than 30 or 40 miles a week

running, the risks are high for amenorrhea (no periods). Even when periods seem normal (not too light or far apart), heavy exercise can diminish progesterone levels so that an embryo might not be able to implant.

Men are less vulnerable to the side effects of uber-workouts but not immune. Those who do endurance training may find a drop in sex drive, testosterone levels and sperm health. Dedicated cyclists without a bike saddle that's got a cutout in the middle risk flattening the artery that brings blood to the penis. Give up bicycle shorts, or any snug pants, for that matter. Heat is bad for sperm and testosterone production. That also means limiting hot showers, Jacuzzis, saunas, steam rooms.

UP IN SMOKE

There is no wiggle room on this. Smoking will stunt your procreative

capabilities. Stop it. Now. It poisons gonads and increases susceptibility to sexually transmitted diseases in both men and women. Smoking ups the likelihood of a tubal pregnancies, cervical cancer and pelvic infections. Some studies show that in vitro fertilization, the leading assisted reproductive technology, has a lower success rate among smokers than non-smokers.

ENVIRONMENTAL HAZARDS

Let your lawn go weedy. If you're rebuilding your deck, give it a rest. Pesticides, weedkillers, paint thinners and the like can have a deleterious effect on male sexual function and sperm production. Women working with chemical solvents, nitrous oxide, or vinyl chloride, for instance, may be at risk for early miscarriage. Wear protective gear when working with these substances, particularly if there's regular exposure at your workplace.

THE DRUG BAZAAR: A STONE DRAG ON YOUR FERTILITY

At first blush, this appears to be a no-brainer. Yes, of course, marijuana and

cocaine are trouble. And those body-bulking anabolic steroids interfere with sperm production. But there's a subtler, more difficult drug use to confront. These drugs are legal and are found in some of the best-known treatments for a variety of diseases or conditions.

- Sulfasalazine, a component of some medications for irritable bowel syndrome, colitis or Crohn's disease, has a negative impact on sperm development.

- Cimetidine, the key ingredient in some ulcer drugs, is linked to impotence and semen abnormalities.

- Spironolactone, found in many hypertension prescriptions, may interfere with testosterone and sperm production.

- Non-prescription anti-inflammatory drugs taken at the time of ovulation can stymie embryo implantation.

- Prescription psychotropics can interfere with ovulation.

In many instances there are prescription alternatives, so check your meds and consult with your doctor as soon as you're thinking of having a baby.

STRESS AND, UM, MORE STRESS: THE STUFF THAT MAKES YOU NUTS

There's no doubt that attempting to create a new life adds a hefty amount of anxiety to yours. It's ironic how many people who've spent their entire adulthood trying to avoid pregnancy are suddenly reading how-to manuals. If conception doesn't happen in the first month or two, they worry that they're inept, or their bodies or brains have failed them.

Achieving a pregnancy typically takes some time. Unless there's a known medical condition that may compromise fertility, or you've been having unprotected intercourse for a year without conceiving (six months if you're 35 or older) there's no real reason for concern.

Sure, you'll be regaled with stories about how sex in the back seat of a '57 Chevy is the ultimate fertility enhancer. Or that instant conception is a mystical byproduct of giving up and going the adoption route. Don't believe any of it. The only proven result of these shopworn tales is a dose of "what's wrong with us" angst, which you don't need. There are enough social pressures.

If you're in the prime childbearing years, there's a good chance people in your circle are either pregnant or dealing with babies and toddlers of their own. Tell your friends and family that you're in family-building mode, and brace yourself for the onslaught of suggestions, including the proposal that you take their kids for a weekend if you think parenthood is so great—unintentionally hurtful and utterly bone-headed.

Also be prepared for their palpable discomfort if conception takes longer than you—or they—think it should. Aspiring parents-to-be report that baby shower and infant birthday party invitations come less frequently—a double-edged knife—and that family gatherings become touchy and difficult affairs.

continues ON PAGE 32

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infertility and the environment:
PREVENTABLE CAUSES

BY TED SCHETTLER M.D., M.P.H.

HAVING CHILDREN IS SUCH A FUNDAMENTALLY NORMAL THING TO DO THAT MANY PEOPLE TAKE FOR GRANTED THE BIOLOGICAL CAPACITY TO REPRODUCE. FERTILITY IS COMMONLY PRESUMED UNTIL EXPERIENCE CALLS THIS PRESUMPTION INTO QUESTION. ACCUMULATING EVIDENCE SUGGESTS, HOWEVER, THAT INFERTILITY IS AN INCREASINGLY COMMON PROBLEM, THOUGH TRENDS ARE DIFFICULT TO DETERMINE WITH CERTAINTY. SOME PEOPLE HAVE ASSUMED THAT ANY REPORTED INCREASES IN INFERTILITY ARE DUE TO DELAYED CHILD BEARING OR MORE REPORTING BECAUSE OF THE AVAILABILITY OF ASSISTED REPRODUCTIVE TECHNIQUES, BUT ON CLOSER INSPECTION, THOSE REASONS FAIL TO EXPLAIN THE PICTURE FULLY. A 1998 REPORT OF NATIONAL DATA SHOWED INFERTILITY INCREASING IN ALL AGE GROUPS BETWEEN 1982 AND 1995, BUT THE LARGEST increase of 42% was in women less than 25 years old—not in older women as might have been expected. The increase was 12% in women aged 25-34 and only 6% in those aged 35-44. Some of the increase in younger women could still be due to earlier reporting, but that is unlikely to be fully explanatory. More likely, infertility in younger women actually is increasing, raising questions about its cause and potential environmental factors. On closer examination, these factors are potentially important not only to people who may be having difficulty conceiving and completing a successful pregnancy, but also to the health of all fetuses and developing children. In other words, a look at environmental factors that may impair fertility is part of a look at reproductive health more generally.

Infertility may be caused by female-, male-, or couple-dependent factors. Identifying trends for each of these potentially explanatory factors, however, is very difficult without historical records. Sperm count studies provide perhaps the best record, though even these are quite limited.

Sperm count trends have been of particular interest since a widely publicized study in 1992 reported falling sperm counts in several countries. That report analyzed 61 studies published between 1938 and 1990 and concluded that over this period, the average sperm count in the general population had declined from about 113 million/ml to 66 million/ml. Limits of data and methods used in the report sparked animated debates about the findings, though a reanalysis of the data concluded that the average sperm count in the US and Europe, but not in non-Western countries, has declined. Since then several other studies have also documented a decline in sperm counts while others have failed to find similar evidence.

Following the lead suggesting geographical differences, Shanna Swan and colleagues from the University of Missouri reported that men from rural mid-Missouri had markedly reduced sperm concentration and motility compared to men from more urban environments. They suggested that exposure to agricultural pesticides may be responsible.

CAUSES

In women or men, genetic or environmental factors or endocrine or immune system disorders may play a role in infertility. For example, failure to ovulate normally can be caused by genetics, diet, thyroid or other endocrine problems, or toxic chemical exposures. Based on the results of animal testing, considerable attention is now also focused on the role of fetal exposure to endocrine-disrupting chemicals in ovulatory abnormalities.

Reduced sperm counts can be caused by genetics, infections (e.g., mumps), anatomic abnormalities, heat, or exposure to toxic chemicals during fetal development or adulthood. In addition to directly damaging sperm, some toxic chemicals can also reduce the number of testicular Sertoli cells after fetal exposure, resulting in a corresponding reduction in sperm count in the adult, since there is a direct relationship between Sertoli cell numbers and sperm count. Damage to testicular Leydig cells can result in changes in testosterone levels with indirect impairment of fertility.

TOXIC EXPOSURES AND INFERTILITY:

Though the extent to which toxic environmental exposures contribute to the total societal burden of infertility is unclear, there is little doubt that as preventable causes, they deserve close attention. Table 1 lists some of the chemical substances that can impair fertility in men or in women. No animal data are cited in Table 1, though numerous animal studies show reproductive impacts of many commonly encountered chemicals. In all of the studies cited in Table 1, the reproductive impacts were caused by adult exposures. In many cases, the exposures occurred in the workplace where they are often, but not always, higher than exposures in the general population. Exposures to solvents, for example, can be excessive in hobbies or during home renovation projects without proper ventilation.

NEW CONCERNS ABOUT EARLY LIFE ENVIRONMENTAL EXPOSURES AND FERTILITY:

Many studies of wildlife and laboratory animals show reproductive impacts of

TABLE 1: Environmental factors reported associated with adverse outcomes related to infertility/decreased fecundity

AGENT (EXPOSURE)	IMPACT FROM EXPOSURE IN WOMEN	IMPACT FROM EXPOSURE IN MEN
Alcohol (ethanol)	Menstrual irregularities	
Perchloroethylene (dry cleaning fluid)	Prolonged time to pregnancy; miscarriage (conflicting data)	
Toluene (inks, coatings, gasoline, cosmetics, glues)	Reduced fecundity Miscarriage	Miscarriage in female partner Hormonal changes decreased sperm count
Styrene (plastics, resins, rubber)	Menstrual irregularities, reduced fertility, hormone changes (conflicting data)	Decreased sperm count (conflicting data)
Formaldehyde (resins for particle board, plywood, insulation, cosmetics, labs, rubber production, dyes)	Menstrual irregularities, miscarriages; reduced fecundity	
Glycol ethers (primarily short-chain) (electronics, deicing, inks, dyes, varnish, paint, printing, photography, some pesticides, cosmetics)	Miscarriage, infertility	Decreased sperm count
Solvent mixtures	Infertility; Reduced fecundity; miscarriage/menstrual disorders	Abnormal sperm; Miscarriage in female partner/infertility (conflicting data)
Ethylene oxide (sterilant used in medicine/ dentistry)	Miscarriage	Miscarriage in female partner
Nitrous oxide (dentistry)	Reduced fecundity	Miscarriage in female partner
Lead (paint, batteries, electronics, ceramics, jewelry, printing, ammunition, PVC plastic)	Miscarriage	Low sperm count, reduced fertility
Chlorinated hydrocarbons (some pesticides, wood preservatives)	Spontaneous abortion, infertility	
Dioxin	Endometriosis	
Pesticides	Spontaneous abortion	Low sperm count (DBCP*; EDB**; 2,4D); delayed time to pregnancy in partner
Cigarette smoke	Infertility, reduced fecundity	Conflicting data

* Dibromochloropropane—a soil fumigant no longer used in the US. DBCP was responsible for causing sterility of many chemical and farm workers in the US and other countries
** Ethylene dibromide—a pesticide and jet fuel additive. Contaminates groundwater in some areas of the country

exposure to environmental contaminants during windows of vulnerability in very early development. Abnormalities include reduced sperm counts, reproductive failure, birth defects of the reproductive tract, behavioral abnormalities, and pre-cancerous changes in reproductive organs. Particular recent interest has focused on the impacts of fetal exposure to estrogenic or anti-androgenic substances, where there is also a human historical record. Between 1947 and 1971 millions of pregnant women in the US were given a synthetic estrogen, diethylstilbestrol (DES), with the hope that it might reduce the risk of miscarriage, though it never did. A 1971 study concluded, however, that use of DES during pregnancy caused a rare cancer of the vagina and cervix in daughters who had been exposed in the womb. (Herbst 1971). Subsequently other health consequences of fetal DES exposure became clear, including infertility, birth defects of the reproductive tract, and abnormalities of the immune system. In boys, fetal exposure to DES seems to increase the risk of two birth defects of the reproductive tract (hypospadias and undescended testis) and decreases sperm counts, although sons have been much less widely studied than daughters.

IT IS BECOMING INCREASINGLY PLAUSIBLE THAT FETAL OR INFANT EXPOSURES TO ENDOCRINE DISRUPTORS MAY AT LEAST PARTIALLY EXPLAIN OBSERVED CHANGES IN FERTILITY, CERTAIN BIRTH DEFECTS AND CANCERS OF THE REPRODUCTIVE TRACT, AND OTHER HEALTH IMPACTS THAT MAY ONLY BECOME APPARENT LATER IN LIFE HAS BECOME INCREASINGLY PLAUSIBLE, THOUGH MANY UNCERTAINTIES REMAIN.

As a result of these observations in wildlife, laboratory animals, and people, the developmental impacts of hormonally active agents or "endocrine disruptors" are of rapidly growing interest. Endocrine-disruptors include some pesticides, ingredients in commonly encountered plastics (e.g.,

bisphenol A, alkylphenols, phthalates, flame retardants), glues and resins, detergents, hormones used in humans and farm animals, byproducts of waste incineration (e.g., dioxin), and are in many other consumer products. Human exposures are widespread in the general population, and most of these substances readily cross the placenta. It is becoming increasingly plausible that fetal or infant exposures to endocrine disruptors may at least partially explain observed changes in fertility, certain birth defects and cancers of the reproductive tract, and other health impacts that may only become apparent later in life has become increasingly plausible, though many uncertainties remain. We can easily see why we must be as concerned about the fetal environment as well as the environment after birth when considering some of the trends in human reproductive health.

While the susceptibility of the fetus and infant to chemicals that can impair reproductive tract development and function is the subject of considerable research, available data already show an increased risk of infertility after adult exposures to some commonly encountered chemicals and environmental contaminants. The good news in these cases is that, with some notable exceptions, eliminating the exposure may be all that is necessary to return fertility to normal, justifying a search for potential environmental causes in virtually all cases of infertility. Men and women who are considering having children should carefully consider what they might be exposed to at home, in the community, or in the workplace that may impair their fertility. Clinicians should also routinely consider environmental factors when providing routine medical care or when counseling patients about having children.

Ted Schettler has a medical degree from Case-Western Reserve University and a masters degree in public health from the Harvard School of Public Health. Dr. Schettler is co-author of Generations at Risk: Reproductive Health and the Environment and In Harm's Way: Toxic Threats to Child Development, which discusses the impact of environmental exposures on neurological development in children.
Dr. Schettler is on the medical staff of Boston Medical Center and has a clinical practice at the E. Boston Neighborhood Health Center.

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The Focus on Fertility Web site (www.focusonfertility.org) empowers couples to make informed family planning decisions, educates couples about infertility and treatment should they encounter difficulty, and raises awareness of basic fertility facts.

In 2000, The AIA and Organon conducted an infertility awareness survey, in which only one out of 12,000 respondents had answered all of the questions correctly! With such startling results, it became apparent that individuals and couples needed to educate themselves to make informed family planning decisions.

FocusonFertility.org is the centerpiece of a successful, nation-wide educational campaign. Since its inception two years ago, the site has hosted 23,550 visitor sessions, and an average of approximately 2,000 visitors per month.

About six million American couples are affected by infertility, roughly 10% of the reproductive age population. Being aware of some of the risks for infertility may help you avoid a struggle when it comes time to get pregnant. Focus on Fertility provides an interactive fertility risk assessment tool. This tool provides some of the risk factors of infertility and what you can do to preserve your ability to conceive a child.

If you're a woman trying to balance the pressures of a career and a family, or a couple with questions about insurance coverage for infertility treatment, you'll find the answers and support you need at the Focus on Fertility Web site.

Some topics currently featured on FocusonFertility.org include:

- Family Planning Isn't Just About Contraception
- Planning for a Baby: Things Couples Should Know About Natural Conception
- Diagnosis: Stress—Alleviating Anxiety While Undergoing Infertility Treatment

The time to start thinking about your fertility is now. Don't wait any longer. We invite you to visit FocusonFertility.org.

IF YOU'RE A WOMAN TRYING TO BALANCE THE PRESSURES OF A CAREER AND A FAMILY, OR A COUPLE WITH QUESTIONS ABOUT INSURANCE COVERAGE FOR INFERTILITY TREATMENT, YOU'LL FIND THE ANSWERS AND SUPPORT YOU NEED AT THE FOCUS ON FERTILITY WEB SITE.

THE TIME TO START THINKING ABOUT YOUR FERTILITY IS NOW. DON'T WAIT ANY LONGER. WE INVITE YOU TO VISIT FOCUSONFERTILITY.ORG.

STRESS *and* IVF

BY ALICE D. DOMAR, PH.D,

STRESS IS ONE OF THE TOP CONCERNS OF MOST INFERTILITY PATIENTS AND LEADS TO A NUMBER OF QUESTIONS. IS YOUR STRESS LEVEL CONTRIBUTING TO OR CAUSING YOUR INFERTILITY? ARE YOU TOO STRESSED TO BE ABLE TO HANDLE COMPLEX TREATMENT CYCLES? WILL YOUR OLD "PRE-INFERTILITY" PERSONALITY EVER RETURN? MANY CONSIDER IVF TO BE THE ULTIMATE IN TERMS OF COST, BOTH FINANCIALLY AND EMOTIONALLY. SO, WHAT IS THE RELATIONSHIP BETWEEN STRESS AND IVF? IS IVF MORE STRESSFUL THAN OTHER INFERTILITY TREATMENTS? DOES STRESS HAVE ANY IMPACT ON THE OUTCOME? ARE THERE WAYS TO REDUCE IVF-INDUCED STRESS? THE ANSWERS ARE PROBABLY, PROBABLY, AND YES.

How stressful is IVF? The answer actually depends on the path you took to IVF. For couples who basically start with IVF, either because of blocked tubes or a severe male factor, IVF can seem pretty overwhelming. The thought of daily injections, frequent visits for blood tests and ultrasounds, and a surgical procedure to extract eggs may feel extreme for a couple who just finished their infertility work-up. However, there may be some excitement about proceeding with a treatment which can compensate for the diagnosed problem. Conversely, for a couple who has not conceived despite numerous medicated cycles, with and/or without IUIs, IVF may seem scary. Often it is perceived as the treatment of last resort with the accompanying thought that if IVF doesn't work, you may have to say goodbye to the dream of producing a genetic child. However, these couples may also approach IVF with renewed hope and optimism since it has the highest success rates per cycle of any infertility treatment.

The research on the psychological impact of IVF indicates that prior to beginning treatment, many patients report increased levels of stress but a significant portion also report excitement and hope. In addition, couples report that the stressful part of IVF is not the physical aspect, but rather the emotional. I have had many patients tell me that proceeding to IVF feels completely overwhelming. However, if you have undergone a cycle of gonadotropin therapy (the shots) with IUI, you actually may find that IVF doesn't feel all that different. The shots, the blood work, and the ultrasounds will feel familiar. You may be on additional medication, such as Lupron, and the egg retrieval is new (but hopefully you will be asleep for it), but the embryo transfer feels a lot like an IUI. Unfortunately, the horrible two weeks of waiting will feel too familiar.

Another stressor associated with IVF is the financial cost. Many patients can find the money needed for preliminary treatment but IVF brings with it a much bigger price-tag. Although some people have insurance or the financial means to effortlessly pay for treatment, they are the exception. When considering the various contributors to the stress of treatment, paying for it usually ranks up in the top one or two. There are several things to do, including making sure (as in not necessarily believing your HR rep) than your insurance policy covers none of IVF before assuming you are responsible for the cost yourself. If you are indeed on your own financially, make some noise. Tell your doctor that

this will be difficult for you since some programs have sliding scale fees, many patients donate medications they no longer need, and some of the pharmaceutical companies offer medication support. Consider asking family members to contribute to the cause but be aware that if, for example, your parents do contribute but the partner's parents don't, your parents may feel that they are entitled to more time with any resultant baby.

So, to answer the question about the stress of IVF, yes, it is stressful but most of that stress comes from the intense desire to have a baby and the fear that it may not work, rather from the stress of the medical aspects of the cycle itself. Recent research on why insurance-covered patients drop out of treatment prior to completing all of their covered cycles has shown that it is the stress of the treatment, not the physical demands.

Does stress have any impact on the outcome? This is a controversial question because the research has been somewhat contradictory. I just did a literature review on the subject and found 20 research studies from around the world. All looked at whether or not psychological distress had an impact on IVF success rates. Fifteen of these found that increased levels of psychological distress before or during the IVF cycle were associated with decreased pregnancy rates; three found no relationship, and two were inconclusive. Several of the studies found strong relationships between distress and outcome; in one study, depressed women were only half as likely to conceive as non-depressed women. One of the problems in interpreting these studies is that a patient's distress may be related to her prognosis. Thus, if a patient is told by her doctor before she starts an IVF cycle that he is pessimistic about her chances (due to age, FSH level, past response to treatment, etc.), she would likely be more anxious before and during her cycle than a patient told that her chances were exceptionally good. If the "poor prognosis" patient reports significant amounts of distress during her cycle and then finds out she is not pregnant, how can one be certain that the distress caused the cycle to fail? In addition, even if a patient does not receive any sort of prognosis from her physician beforehand but hears from the technicians and nurses during her cycle that the cycle is not going well, she is understandably going to experience a lot of distress. So, if she doesn't get pregnant, how can one blame the distress caused by the IVF cycle? It could well be that the distress was the result and not the cause of the cycle not going well.

THE RESEARCH ON THE PSYCHOLOGICAL IMPACT OF IVF INDICATES THAT PRIOR TO BEGINNING TREATMENT, MANY PATIENTS REPORT INCREASED LEVELS OF STRESS BUT A SIGNIFICANT PORTION ALSO REPORT EXCITEMENT AND HOPE.

Recent research from the University of California, San Diego, controlled for the factors which are related to poor prognosis, such as age and FSH level. They surveyed women prior to starting an ART cycle and found a very strong relationship between pre-cycle psychological state and birth rates. In fact, the women who expressed the most negative emotions prior to starting their cycle were 93% less likely to have a baby than the women who were the most positive.

There are basically two approaches to answer the question on the relationship between stress and IVF outcome. One would be to design a study to assess the relationship between distress and IVF outcome in women who are not told anything about their condition. Their physician doesn't venture an opinion about chances of success beforehand and the patients would be kept in the dark about their cycle progress—no feedback on estradiol level, no peeking at ultrasound screens to count follicles, no knowledge on how many eggs were retrieved and fertilized, etc. In all honesty, I don't think we could get many women (or physicians!) to agree to be in this study.

The second approach would be to make the assumption that distress does indeed decrease the chances for success in IVF and determine the best way to decrease distress and ultimately increase pregnancy rates. For a lot of reasons, I think this is the best option and in fact, I am currently seeking funds to pursue such a project. In the meantime, if you are feeling sad much of the time and suspect that you may be depressed, you may want to talk to your doctor about having a consultation with a mental health professional prior to beginning your next treatment cycle.

At the current time, there is no data about the impact of antidepressant medication on IVF outcome. We do not

know if it has no effect, a positive effect, or a negative impact. I advise my depressed patients that unless they had a history of clinical depression and were on antidepressant medication prior to trying to conceive, it may be advisable to go on antidepressant medication to decrease the infertility-induced depressive symptoms and go off them as soon as they do conceive. However, women who were on antidepressant medication prior to infertility may need to be on medications throughout their pregnancy.

An issue which is related to the stress/IVF relationship is the impact of stress-induced lifestyle behaviors on IVF outcome. Detail on the research between lifestyle behaviors and fertility is beyond the scope of this article but note that cigarette smoking, caffeine, alcohol, and vigorous exercise have been associated with decreased fertility and/or lower IVF success rates. Thus, in order to maximize one's chances of IVF success, look carefully at your health habits and consider making some changes prior to undergoing treatment.

THINK SERIOUSLY ABOUT OBTAINING SOME MORE FORMAL, STRUCTURED STRESS-REDUCTION TRAINING. THERE ARE NOW MIND/BODY INFERTILITY PROGRAMS IN MANY STATES. IN ADDITION, A NUMBER OF THESE PROGRAMS (INCLUDING MINE IN BOSTON) OFFER WEEKEND RETREATS FOR INDIVIDUALS AND COUPLES WHO LIVE TOO FAR AWAY T O BE ABLE TO PARTICIPATE IN A WEEKLY PROGRAM.

Are there ways to reduce IVF-induced stress? The answer is yes, lots! One of the first things you can do when planning your upcoming IVF cycle is to look carefully at your work schedule. If you have some massive work deadline May 1, don't do an April cycle. Conversely, if you are committed to doing an April cycle and your boss asks if you would be willing to do a new project which is due May 1, take a pass. Also, think carefully about who you tell about your plans to do an IVF cycle. If you tell 20 people that you are cycling, expect 20 calls per day to inquire about your progress. And if you get a negative pregnancy test on Day 28, receiving those 20 hopeful calls may be very difficult. You need to think about achieving a balance between receiving support from loved ones, and communicating to your best advantage. Perhaps you should appoint

a spokesperson (sister, best friend, etc.) who you will keep posted and anyone who wants to know how you are doing will call her. You are then free to call any one you want. If you decide not to tell anyone, don't expect to get effortless support if the cycle doesn't work because you will be catching them off guard.

Consider adding some relaxation techniques to your routine to do on a daily basis to keep your baseline level of stress down and learn some "mini" relaxation techniques to use during blood tests, ultrasounds, etc. Think about all the ways you can nurture yourself during your treatment. Since alcohol is out, indulge in hot chocolate, old family muffin recipes, or other comfort foods. Since you are saving time from your routine by not exercising, buy some juicy novels and revel in the indulgence of reading. And you can now consider yourself under doctor's orders to skip all baby showers because of the stress they can cause (and don't, as one of my patients just did and regretted it enormously, make the huge mistake of actually giving a baby shower). Plan some couple time for the day of your pregnancy test so you ensure time to talk—to either mourn privately together or to celebrate. And always go into each cycle with a "Plan B" which may be time off, another cycle, obtaining a second opinion, getting information about donor eggs, etc. You don't have to stick to Plan B when the time comes, but it makes it easier to go into a cycle knowing there is another plan.

Think seriously about obtaining some more formal, structured stress-reduction training. There are now mind/body infertility programs in many states. In addition, a number of these programs (including mine in Boston) offer weekend retreats for individuals and couples who live too far away to be able to participate in a weekly program. Mind/body programs for groups or individuals provide you with the skills to reduce stress at every stage of the cycle. You will learn numerous relaxation strategies, stress management skills, and get the support from others who "get it." The data shows that participants experience significant decreases in infertility distress as well as decreases in stress-related physical symptoms (insomnia, abdominal pain, shortness of breath, back/neck pain, etc) and preliminary research shows increased pregnancy rates as well.

Undergoing an IVF cycle can be a very stressful experience but planning ahead can give you a much greater sense of control. Going into a cycle feeling calm and prepared not only makes the treatment more bearable, but may well increase the chance of success.

I wish you the very best of luck.

Alice D. Domar, Ph.D, is the Director of the Mind/Body Center for Women's Health at Boston IVF and Assistant Professor of Obstetrics, Gynecology, and Reproductive Biology at Harvard Medical School. She is the founder and director of the world-renowned Mind/Body Program for Infertility. She has written four books, including the award-winning *Conquering Infertility: Dr. Alice Domar's Mind/Body Guide to Enhancing Fertility and Coping With Infertility* with Alice Lesch Kelly (hardcover: Viking 2002, paperback: Penguin 2004). For information on her infertility programs: look at www.bostonivf.com or email liz.milovanovic@bostonivf.com or call 781-434-6578.

[your voice]

ENVIRONMENTAL CONTAMINANTS AND FERTILITY: WHAT IS THIS SILENCE?

BY ALISON CARLSON

I KNOW THE PAIN OF "UNEXPLAINED" PRIMARY INFERTILITY. GRANTED, I ONLY STARTED TRYING TO GET PREGNANT IN MY VINTAGE YEARS FERTILITY-WISE, JUST AFTER FORTY. BUT I'D BEEN A VIGILANTLY HEALTHY ATHLETE ALL MY LIFE, AND MY SISTERS HAD BOTH CONCEIVED FIRST CHILDREN IN THEIR LATE THIRTIES AND SECOND ONES AFTER FORTY. MY FSH NEVER TESTED ABOVE A 7.8, AND ALL OUR OTHER DIAGNOSTIC SCREENS TURNED UP NOTHING BUT GOOD NEWS. WHEN MY HUSBAND AND I DID IN VITRO FERTILIZATION CYCLES, I WAS THE FORTUNATE PRODUCER OF BETWEEN 16 AND 29 EGGS PER RETRIEVAL. WITH EXCELLENT FERTILIZATION RATES, WE WERE BLESSED WITH AN ENVIABLE NUMBER OF BEAUTIFUL EMBRYOS TO CHOOSE FROM FOR EVERY TRANSFER...

I know the pain of "unexplained" primary infertility. Granted, I only started trying to get pregnant in my vintage years fertility-wise, just after forty. But I'd been a vigilantly healthy athlete all my life, and my sisters had both conceived first children in their late thirties and second ones after forty. My FSH never tested above a 7.8, and all our other diagnostic screens turned up nothing but good news. When my husband and I did in vitro fertilization cycles, I was the fortunate producer of between 16 and 29 eggs per retrieval. With excellent fertilization rates, we were blessed with an enviable number of beautiful embryos to choose from for every transfer...

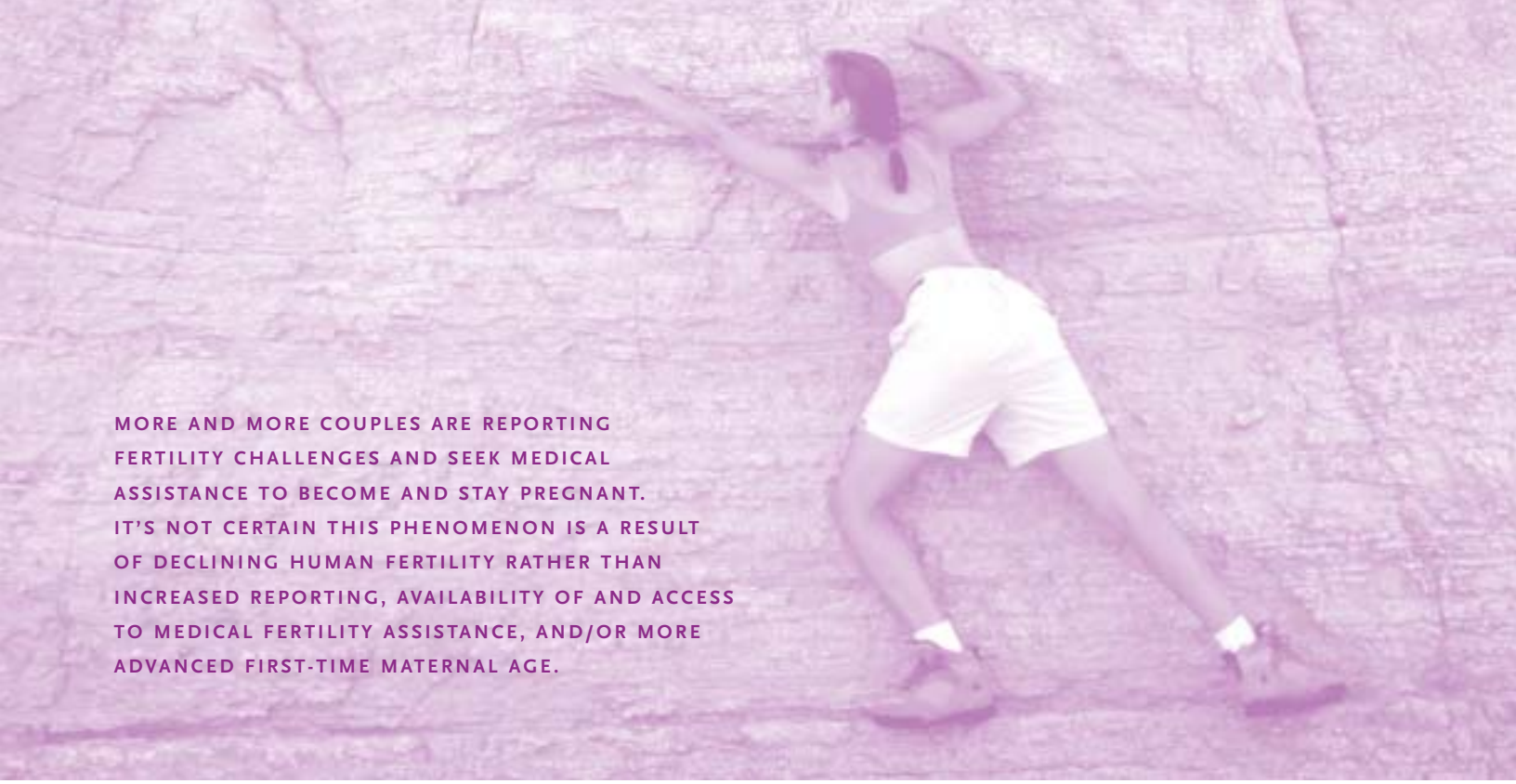
Who could blame us for hoping? But over four years trying fertility diets, antioxidants, yoga, clomid; IUIs; IVFs; FETs; and gestational surrogacy—along with acupuncture and some immunological therapies—we achieved three pregnancies, all lost by nine weeks gestation. Only one loss was proved to have been caused by abnormal cytogenetics.

My undergraduate degree in and work experience in human biology were both a blessing and curse during these experiences. I knew all the questions to ask and where to look for answers about the best practitioners, diagnosis, treatment, cycle failures, and losses. I was a proactive partner with our clinicians, and joined Internet fertility listservers. I sought second, third, fourth opinions. Ultimately though, it seemed like it was mostly just a crapshoot. For every question answered, there were so many more for which we couldn't know the answers. A lot about A.R.T. is just that: art (astonishing as it can be), and not science. Ignorance might have been...certainly not blissful, but it might have been easier.

We haven't found the answer to our infertility, but some time a while ago I was able to cast off the draining "what if" thinking of the typical A.R.T. patient: Should one lay still during "the two week wait," or exercise mildly? Could the transferred embryos have dislodged from my uterus when I lifted that box? Would I have had a positive beta if I'd done acupuncture...?

But one concern about infertility still looms in my mind. As a part of my career crisscrossing journalism, biomedical policy and later a nonprofit management program at Stanford business school, I maintained a particular interest in the environment. So I was aware of the growing body of research showing environmental chemical influences on reproductive health. And I've been surprised by the dearth of discussion about this disturbing topic among fertility patients and professionals. I wondered if my own fertility could have been affected by the PCBs left on and in the Atlantic Richfield Company land next to the tennis club I helped build and where I taught for so many years.

By the time I learned in 2003 that researchers had discovered that a



MORE AND MORE COUPLES ARE REPORTING FERTILITY CHALLENGES AND SEEK MEDICAL ASSISTANCE TO BECOME AND STAY PREGNANT. IT'S NOT CERTAIN THIS PHENOMENON IS A RESULT OF DECLINING HUMAN FERTILITY RATHER THAN INCREASED REPORTING, AVAILABILITY OF AND ACCESS TO MEDICAL FERTILITY ASSISTANCE, AND/OR MORE ADVANCED FIRST-TIME MATERNAL AGE.

ubiquitous chemical called bisphenol-A causes very high rates of aneuploidy in mouse eggs, I'd decided this dearth of discussion is not smart. Mice and humans share the same cellular mechanisms, and bis-A is what hard polycarbonate plastics are made of—in things like CD covers, baby bottles, food can liners, dental sealants, and milk cartons. It can leach from these products. It's a potent estrogen mimic.

Increasing numbers of studies in animals and humans suggest causal links between environmental contaminants and, collectively, both male and female reproductive system development errors and dysfunction; decreased sperm quality, number and DNA integrity; egg quality and cytogenetic damage; time to pregnancy; spontaneous abortion/miscarriage and other reproductive health issues.

Biomonitoring of blood, urine, tissue, and breast milk show that the average American has a "body burden" of persistent man-made chemicals, including a significant number of known reproductive toxicants, at levels that concern scientists and physicians. (Mind you, this kind of current-time evaluation does not reflect an individual's earlier exposures to non-persistent chemicals—including exposures in utero to compounds known to alter fetal reproductive development and function later in life.)

More and more couples are reporting fertility challenges and seek medical assistance to become and stay pregnant. It's not certain this phenomenon is a result of declining human fertility rather than increased reporting, availability of and access to medical fertility assistance, and/or more advanced first-time maternal age. But the weight of the evidence tells us that the former assumption is a real possibility as part of a combination of factors, and also that a number of health conditions undermining fertility—endometriosis and decreased sperm counts for example—have been increasing in incidence in recent years.

85,000 synthetic chemicals have been registered for manufacture and use in the US. Every year 2000 more are added to the list. Unlike for pharmaceuticals, there is no safety testing required for agricultural and industrial chemicals prior to commercial introduction. So the vast majority of even the 3000 "high production volume" chemicals to which many people are regularly exposed have never been tested for safety; and few have been studied in reference to their human reproductive effects.

Some of the contaminants that are suspected contributors to infertility, miscarriage, pre-term birth, fetal damage, etc are persistent and bioaccumulative, which means they stay around a long time and concentrate up the food chain. Many are known endocrine disruptors and therefore strong candidates for disturbing the delicate hormone balances required for reproductive health—including fetal future fertility (i.e., intergenerational effects, much as in the case of DES). And now science shows that these

compounds can produce ill effects in minute doses, dependant upon timing and route of exposure. Furthermore and very worrisome, evaluations of our risk have thus far focused narrowly on single chemicals and exposures—neglecting to take into account the reality of multiple, cumulative and potentially synergistic exposures we all face.

The course of this imaginable human reproductive health disaster can be likened to that of a massive ship requiring many miles and much time to turn around. Some researchers say it is plausible we as a species could end up in reproductive intensive care if one extrapolates from some of the research currently coming to light. But most doctors I know, unless they are occupational or environmental medicine specialists, remain largely unapprised. I suspect this is ascribed to the fact that there are few proven causal links and so much more research has to be done. This doesn't mean we shouldn't be paying attention. Disease is multi-factorial and causation is often hard to prove. We may all be guinea pigs in what is often termed "a vast toxicological experiment with no informed consent."

THE ANGUISH OF PREVENTABLE FERTILITY AND PREGNANCY PROBLEMS (NOT TO MENTION BIRTH DEFECTS) HAS NO JUSTIFICATIONS—PARTICULARLY THOSE PROTECTING CHEMICAL AND AGRICULTURAL INDUSTRY PROFIT AND CORPORATE SHAREHOLDER VALUE INSTEAD OF OUR AND OUR BABIES' HEALTH AND WELL-BEING.

So, I became a Partner of the Collaborative for Health and the Environment (CHE, www.cheforhealth.org), a national partnership of scientists, health professional associations, patient organizations, environmentalists and concerned individuals who want to raise the level of public and scientific dialogue regarding links between health and the environment. I'm coordinating a discussion group on environment and fertility.

There are things you can do on the individual level to try to reduce your exposures to harmful chemicals. Consider eating organics if you can; filter water; reduce consumption of fish containing PCBs, dioxin and mercury; use nontoxic alternatives to herbicides, pesticides, household cleaning agents;

stay away from solvents like benzene (in gasoline), perchloroethylene (for dry cleaning); avoid toxic glues, furniture stripping, and so on.

But contaminants are mostly unavoidable because they are ambiently pervasive. They permeate our air, water, food, soil, bodies, homes and workplaces. So it's a larger issue—one that demands we advocate for more "right to know" laws about toxic chemical releases; shifting the burden of proof regarding safety from government regulators and citizen victims ex post facto to the manufacturers of chemicals before commercial introduction; and precautionary approaches to regulation of toxicants in the absence of certainty. We need increased, improved disease tracking, biomonitoring, research—and patient and physician education.

The anguish of preventable fertility and pregnancy problems (not to mention birth defects) has no justifications—particularly those protecting chemical and agricultural industry profit and corporate shareholder value instead of our and our babies' health and well-being. The costs of infertility and assisted reproduction in both monetary and psychic terms are already too high.

Alison Carlson lives in San Francisco. She is a special projects consultant to The Gorilla Foundation, and a Senior Research Fellow at Commonweal, an environmental health institute in Bolinas, California. She coordinates a discussion group on environmental contaminants and fertility compromise for the Collaborative on Health and the Environment. Please contact The AIA for information on how to reach Ms. Carlson.

TO LEARN MORE ABOUT ENVIRONMENTAL HEALTH AND FERTILITY, CONSULT WEB SITES FOR THE US CENTERS FOR DISEASE CONTROL, THE US ENVIRONMENTAL PROTECTION AGENCY, AND THE NATIONAL INSTITUTES OF HEALTH. SEE ALSO:

www.protectingourhealth.org/infertility

www.ewg.org/reports/bodyburden

www.ourstolenfuture.org

www.environmentalhealthnews.org

www.psr.org/home.cfm?id=toxics

www.nrdc.org/health

www.worldwildlife.org/toxics

www.panna.org

www.panna.org/resources/documents/nowhereToHideAvail.dv.html

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key strategic CONCEPTS *for* FUELING *your* FERTILITY

BY RONALD F. FEINBERG M.D., PH.D. & LESA CHILDERS, M.S.W.

FERTILITY DOCTORS HAVE BEEN INCREASINGLY SPEAKING OUT ABOUT MEDICAL TERMS LIKE "'INSULIN RESISTANCE," "METABOLIC SYNDROME," AND "POLYCYSTIC OVARIES" TO THEIR PATIENTS. FOR MANY WOMEN THIS HAS LED TO CONFUSION, FRUSTRATION, GUILT, POOR SELF-ESTEEM, AND EVEN DEPRESSION. NEVERTHELESS, THE PREVALENCE OF METABOLIC PROBLEMS CONTRIBUTING TO FEMALE (AND MALE) INFERTILITY, MISCARRIAGE, AND POOR PREGNANCY OUTCOME IS RAPIDLY INCREASING AROUND THE WORLD. EXPERTS BELIEVE THIS PHENOMENON IS MIRRORING THE OVERALL HEALTH CONSEQUENCES IN THE U.S. AND OTHER DEVELOPED COUNTRIES RELATED TO NUTRITION, SEDENTARY BEHAVIOR, AND RESULTANT OBESITY.

In 2001, 6% of all IVF cycles in the U.S. were carried out for the sole diagnosis of "ovulatory dysfunction." Countless others had IVF for combined reasons, including male factor infertility and unexplained causes. The reproductive system—whether in the female or male—does not exist in isolation. Organs such as the liver, adrenals, pancreas, and even the brain have a significant role in the glandular internet needed for successful reproduction. Do you suspect that your body's metabolic and emotional health may be contributing to your fertility challenges? Here are some key strategic concepts to consider if you are struggling with infertility, or are working towards getting pregnant soon.

Food Fuels Your Fertility. Every morsel of food you eat plays a vital role in your fertility. Macronutrients within food provide essential fatty acids, amino acids (the building blocks of protein), and carbohydrate molecules to every part of the body. Minerals and vitamins are more subtle, but equally important components. All organs require these fuels, and the reproductive system is no exception. Biologically, the reproductive system is probably last in line to capture essential nutrients since the brain, heart, liver, kidneys, intestines, and muscles must be fed first. During the low fat diet craze of the 1980s and 90s it is likely that many women were literally starving themselves of essential fats, amino acids, and even cholesterol. (Most people don't realize that the so-called "bad" LDL-cholesterol is an essential precursor for ovarian production of progesterone and estrogen.) In the current high protein diet craze, fat and cholesterol-laden foods have made a big comeback. Yet, this nutritional approach has unknown effects on essential enzymes and hormones that require carbohydrate molecules. As just one example, the well-known hormones FSH, LH, and hCG are all glycoproteins, which means they contain many different carbohydrate components. Common sense would dictate that a diet with severe carbohydrate restrictions might negatively impact the action of many different fertility hormones and enzymes. For most women trying to get pregnant, a moderate and balanced diet of protein, fat, and healthy carbohydrates works best, especially if spaced out sensibly throughout the day. Skipping meals, especially breakfast, is not a pro-fertility strategy. Avoiding foods containing high levels of simple sugars, trans fats (partially hydrogenated vegetable oils), salt, and nitrites is very important. Be sure to take a multi-vitamin containing folic acid. Organizing and optimizing your own pro-fertility approach to nutrition costs you very little. Food is the cheapest, safest, and most cost-effective fertility drug.

Fitness Fuels Your Fertility. It is no secret that obesity is a major epidemic, and life factors that contribute to obesity also have significant implications for the female reproductive system. This whole body impact of metabolism on female reproduction was first defined in 2001 as Syndrome O, with its hallmark triad of

Overnourishment, Ovarian Confusion, and Ovulation Disruption. Polycystic ovaries are a consequence of Syndrome O, as are millions of cases of infertility, miscarriage, high risk pregnancies, and life-threatening obstetrical outcomes. Overnourishment is a key concept, suggesting that the majority of people in the U.S. take in more food calories than their bodies burn on a day-to-day basis. For most people, overnourishment usually leads to being overweight, which now describes about 60% of all Americans. An example of the overnourishment formula is this: if you are overnourished by a mere 100 calories/day, your well-meaning fat-forming genes will typically "help" your body store away 12 extra pounds in one year. Even thinner people can be overnourished, yet their fat-storing hibernation genes may not be as active.

In general, the consequences of overnourishment are the overproduction of insulin and insulin-related hormones. The insulin family of hormones is profoundly important to reproduction, and are required by the ovaries, follicles, eggs, developing embryo, placenta, and uterus. However, excess insulin affects every key step of human reproduction, from egg development to embryo implantation to fetal development. Despite various diet opinions from the well-known gurus, everyone agrees that a dedicated commitment to physical activity and exercise reduces insulin overproduction and counteracts overnourishment. Even calories from healthy foods must be burned effectively, or insulin levels will spin out of control. We recommend that you create a personal commitment to devote 5% of your weekly hours to physical activity—walking, bicycling, hiking, or even treadmilling. Moderate weight training will also improve the way your muscles burn calories. Recent journal articles offer scientific proof that modest weight loss (i.e. 5-10%) and enhanced fitness improve reproductive function and outcome. Most monthly gym memberships cost less than a single vial of gonadotropins! A treadmill costs less than one cycle of ovulation induction monitoring.

Is Your Uterus A Good Home? There is a disturbing trend in modern fertility care of couples jumping to treatment and subsequently skipping over careful evaluation of the female reproductive system. Women with ovulation disruption and insulin overproduction are particularly prone to problems within the uterus, including polyps and abnormally thickened endometrium. Insulin overproduction has been strongly implicated in endometrial dysfunction. In many instances, failed cycles of ovulation induction and/or IVF could be due to unsolved problems within the uterus and pelvis. At Reproductive Associates of Delaware, sonohysterography and hysteroscopy are frequently utilized to diagnose and treat endometrial factors interfering with implantation. Likewise, laparoscopy still has a vital role for investigating other female infertility factors, such as endometriosis, adhesions, tubal disease, and more subtle abnormalities of the distal fallopian tubes. It is more justified to implicate metabolic factors as a primary infertility problem when all other potential roadblocks have been ruled out or treated. Ovulation induction cycles are more likely to be successful with this approach, and IVF is less likely to be necessary when a detailed evaluation is carried out first.

FOR MOST WOMEN TRYING TO GET PREGNANT, A MODERATE AND BALANCED DIET OF PROTEIN, FAT, AND HEALTHY CARBOHYDRATES WORKS BEST, ESPECIALLY IF SPACED OUT SENSIBLY THROUGHOUT THE DAY. SKIPPING MEALS, ESPECIALLY BREAKFAST, IS NOT A PRO-FERTILITY STRATEGY.

Your Mind Matters. With many helpful pharmaceutical and high tech options available, one key aspect of fertility care is often ignored by physicians and patients alike—the mind-body connection. Infertility, and the treatment processes to overcome it, can be very stressful. Couples communicate their reactions to infertility in different ways, and are often conflicted as they resolve difficult decisions and negative outcomes during treatments. Studies show that infertility can result in psychological symptoms similar to those who have serious medical conditions such as cancer, heart disease and HIV. Depression rates amongst infertile women are high—as much as twice that of fertile women. Chronic stress invokes hormonal reactions via cortisol that actually worsens insulin resistance and metabolic function. Women with Syndrome O may find their metabolic symptoms are exacerbated as their body reacts to ongoing stressors of daily life and infertility. This vicious cycle adds another challenge, yet we believe it can be overcome. The work of Dr. Alice Domar and others demonstrate that certain targeted counseling therapy and interventions have resulted in improved pregnancy rates for participants. More good news

is that many clinics already recognize the importance of optimizing mental health and emotional well-being as an adjunct to successful fertility care. Increasingly, onsite counseling, support groups and referral services are available to patients. Organizations such as the AIA and PCOStrategies (www.pcostrategies.org) offer specialized programs to address whole body aspects of achieving health and fertility. We have developed the Syndrome O Survival (SOS) Strategies™ as an important avenue to help countless women fuel their fertility, heal Syndrome O, and attain a more positive outlook on their lives.

We Can't Do It Alone. Excellence in fertility care requires teamwork. This is particularly true for women facing the health and fertility challenges of Syndrome O. Getting the body and mind ready for the exciting process of pregnancy works best when everyone is doing their part to create a pro-fertile environment. This requires a commitment by doctors, nurses, and clinic staff to support their patients in all aspects of lifestyle and stress management. Likewise, it requires you to be motivated and dedicated to a healthy living plan. Educating women about nutrition, exercise and emotional health can pose quite a challenge for fertility clinics. In the era of managed care, time available to help each patient continues to decrease. The need to address individualized life management strategies often requires more time than is feasible. Referrals and access to appropriate professionals could help you develop a personal life management plan that is practical and realistic. This could be your key to success. At PCOStrategies, the Syndrome O Coaching Services (SOCS) program was developed to help address this need, which has become very apparent both in the U.S. and around the world. The program involves a detailed lifestyle assessment, a prioritization of goals, and an individualized SOS Strategies action plan. SOCS also provides an opportunity to interact one-on-one with a personal and empathetic coach who understands the unique challenges of Syndrome O and polycystic ovaries as they relate to fertility and health.

In 2003, PCOStrategies sponsored an important study that was recently presented at the 59th meeting of the American Society for Reproductive Medicine in San Antonio, TX. An online survey of 635 people with Syndrome O indicated that 97% of respondents were concerned about

their long term health (including weight), with 80% expressing concerns about their fertility. Surprisingly, 79% of respondents also expressed significant concern about their mental health. Overall, a minority of survey respondents had been referred for counseling related to nutrition, exercise, and emotional state. Yet, there was a high level of interest in approaches such as the SOS Strategies and SOCS. We concluded from this study that most women who face fertility and health challenges of Syndrome O desired professional resources that would help them enhance their physical and emotional well-being. There is much work to be done! Consider joining us in this mission.

Ronald F. Feinberg MD, PhD is a Board-certified reproductive endocrinologist and is the IVF Medical Director for Reproductive Associates of Delaware, located on the main campus of Christiana Care Health System in Newark, DE. He is also an associate professor (adjunct) at Yale University School of Medicine. Dr. Feinberg's book *Healing Syndrome O: A Strategic Guide to Fertility, Polycystic Ovaries, and Insulin Imbalance* is in press by Avery Publishing (Penguin Group USA, Inc.) for release in May, 2004.

Lesa Childers, M.S.W. is the CEO of PCOStrategies, Inc. a 501(c)3 national non-profit organization devoted to educational and counseling strategies for women with Syndrome O, polycystic ovaries, infertility, and miscarriage. She has worked and volunteered extensively in the non-profit sector as an advocate for healthy women and children, and family-building options. Lesa currently resides and works in Western North Carolina.

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CONNECTIONS

ONLINE SESSIONS SCHEDULE

date February 4, 2004, Wednesday
speaker Benjamin Sandler, M.D.
Reproductive Medicine Associates of New York
topic **Blastocysts? Grading? How to Make Sense Out of the Language....**
time 8-9 PM, EST (DST)

date February 11, 2004, Wednesday
speaker Kaylen Silverberg, M.D.
Texas Fertility Center
topic **Surgical Procedures: What They Are and When They're Necessary**
time 8-9 PM, EST (DST)

date February 17, 2004, Tuesday
speaker David Hoffman, M.D.
IVF Florida Reproductive Associates
topic **IVF Explained**
time 8-9 PM, EST (DST)

date February 24, 2004, Tuesday
speaker Peter Schlegel, M.D.
Cornell Institute for Reproductive Medicine; Center for Male Reproductive Medicine and Microsurgery
topic **When Male Factor is Part of Your Diagnosis**
time 8-9 PM, EST (DST)

date March 3, 2004, Wednesday
speaker Michael Feinman, M.D.
Huntington Reproductive Center in California
topic **Surragacy and Third Party Reproduction Discussed**
time 8-9 PM, EST (DST)

date March 11, 2004, Thursday
speaker Lawrence Grunfeld, M.D.
Reproductive Medicine Associates of New York
topic **Why Use Ovulation Induction Instead of IVF**
time 8-9 PM, EST (DST)

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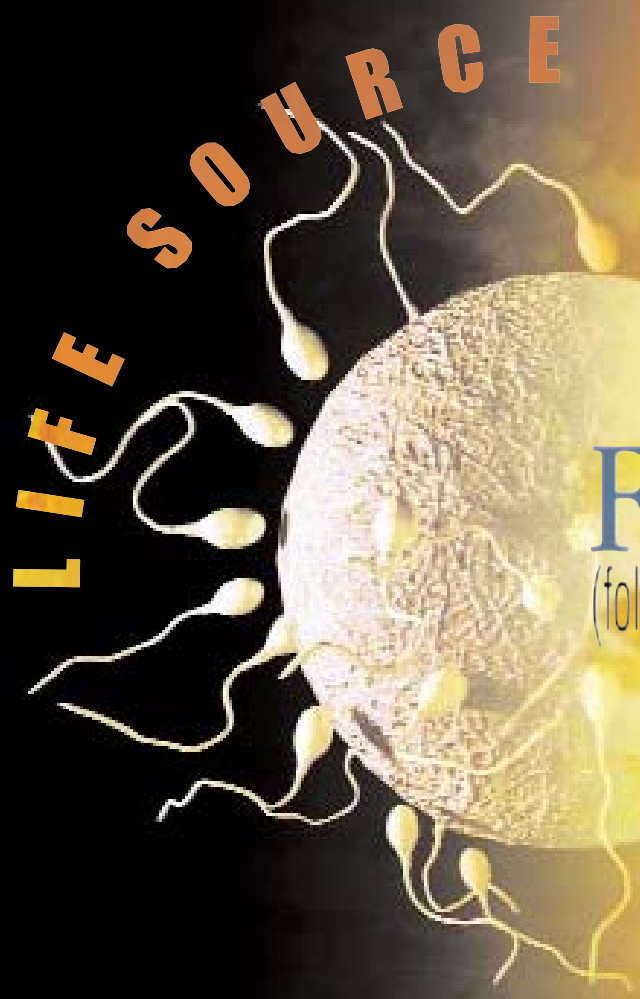
On the other hand, keeping your decision private is not always a simple proposition. It's surprising how uninhibited your own parents, siblings or associates can be about asking why there are no children or when you're planning to get on the stick.

Regardless of your choice, the most important stress buffer is your partner. Keep your shared goal, a biological child, in mind and approach this as an unwavering, mutually supportive collaboration. Seek reassurance from health care professionals or patient advocacy groups. Nothing soothes like the balm of clear-headed, objective information. That's why The American Infertility Association is here. Please call for support and information toll-free at (888) 917-3777. We've been there and we know.

Dr. Steinkampf is Professor and Director of the In Vitro Fertilization Program in the Division of Reproductive Endocrinology and Infertility at the University of Alabama at Birmingham (UAB). He is also the director of the Egg Donor IVF Program, the Reproductive Endocrinology Fellowship Program, and the Reproductive Endocrinology Sonography Laboratory at UAB. He is also on The American Infertility Association medical advisory board. Dr. Steinkampf can be reached at (205) 934-1030.

Karen Hammond is the Chairman of the Board of Directors of the American Infertility Association. An Ob/Gyn Nurse Practitioner, Ms. Hammond has worked in the field of reproductive endocrinology and infertility for more than 19 years. She is NCC certified as both an OB/Gyn Nurse Practitioner and a Reproductive Endocrinology/Infertility Nurse. Ms. Hammond can be reached at karenhammond@bellsouth.net



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