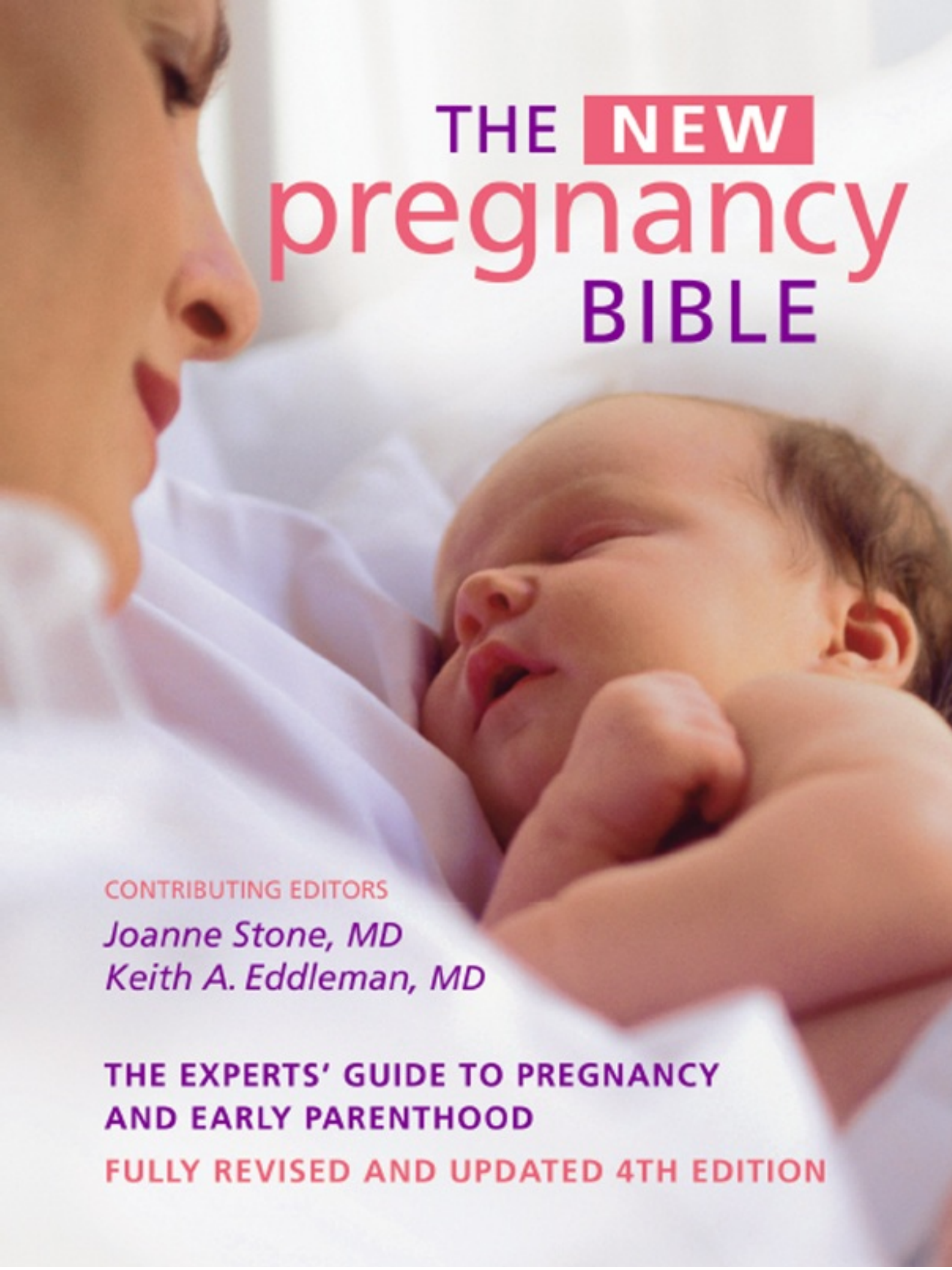


THE NEW pregnancy BIBLE

CONTRIBUTING EDITORS
Joanne Stone, MD
Keith A. Eddleman, MD

THE EXPERTS' GUIDE TO PREGNANCY AND EARLY PARENTHOOD

FULLY REVISED AND UPDATED 4TH EDITION

THE NEW pregnancy BIBLE

CONTRIBUTING EDITORS
Joanne Stone, MD
Keith A. Eddleman, MD

CARROLL & BROWN LIMITED

This fully revised and redesigned edition first published in Spring 2013 by

Carroll & Brown Limited
20 Lonsdale Road
London, NW6 6RD

First published 2003 by Firefly Books Ltd.

Library of Congress Cataloging-in-Publication Data

The pregnancy bible: your complete guide to pregnancy and early parenthood / consulting editors, Joanne Stone, MD Keith Eddleman, MD. -- [Fourth edition].
pages cm
Includes index.
ISBN 978-1-909066-08-3 (hardcover : alk. paper)
1. Pregnancy--Popular works. 2. Childbirth--Popular works. 3. Infants--Care--Popular works. I. Stone, Joanne. II. Eddleman, Keith
RG551.P74 2013
618.2--dc23
2012042824

ISBN 978 1 909066 15 1

Publisher's note: the information contained in this book should be used as a general reference guide and does not constitute, and is not intended to substitute for, an expert's medical advice or legal advice. Consult your doctor or healthcare professional prior to following any treatment or exercises contained in this book.

Contents

Part V Postpartum reference

CONSULTANTS AND CONTRIBUTORS

Chief consultants and contributors

Joanne Stone, MD
Professor of Obstetrics, Gynecology, and Reproductive Science at Mt. Sinai Medical Center, New York, is also Director of the Division of Maternal-Fetal Medicine and Perinatal Ultrasound. She also has a clinical and consultative practice and is active in cllinical research and education.

Keith A. Eddleman, MD
Professor of Obstetrics, Gynecology, and Reproductive Science at Mt. Sinai Medical Center, New York is also Director of Obstetrics and Professor of Genetics and Genomic Sciences. He is an expert and educator in maternal-fetal medicine and clinical genetics, specializing in reproductive genetics, ultrasound, and diagnostic procedures.

Other US Consultants and Contributors

Lenore Abramsky
Genetic Associate, North Thames Perinatal Public Health Unit, Northwick Park Hospital, London.

Patricia M Barnes, PNNP, MS, CNM
Certified Nurse-Midwife at Nativiti Women's Health and Birth Center, Houston, Texas.

Jane Butler, RN, CNM, BS, MPH
Certified Nurse-Midwife at Maggee Women's Hospital, Pittsburgh, Pennsylvania.

Kathleen Capitulo, DNSc, RN, FACCE
Director of Maternal-Child Health Care Center and Associate Hospital Director, The Mount Sinai Hospital, New York.

Eve R Colson, MD
Assistant Professor of Pediatrics, Yale University School of Medicine, Director, Well Newborn Nursery, Yale-New Haven Hospital, Connecticut.

Marilyn Graham, PhD, MD
Associate Professor of Clinical OB/Gyn, Indiana University, Indianapolis, Indiana.

Christine Obremski, CNM, MS, RN
Director of Midwifery at The Mount Sinai Hospital, New York.

Gayla Vanden Bosche, MA
Writer and Assistant Director, Magee Women's Hospital National Center of Excellence in Women's Health, Pittsburgh, Pennsylvania.

Other Consultants and Contributors

Stuart Campbell, DSc, FRCP, FRCOG
Professor and Associate of Create Health Clinic, Center for Reproduction and Advanced Technology, London.

Anne Deans, DCH, MFFP, MRCGP, FRCOG
Specialist in Obstetrics and Gynecology, Frimley Park Hospital, Surrey.

Wendy Doyle, SRD, PhD
Dietitian, London Metropolitan University, London.

Gavin Evans
Journalist, writing with Duncan Fisher, The National Childbirth Trust, and with the support group Fathers Direct.

Kate Harding, MRCOG
Specialist Obtetrician, Guys and St Thomas' Hospital, London.

Peter Hepper, PhD, FBPsS, CPsychol
Professor of Psychology, Head of School of Psychology and Director of Fetal Behavior Research Center, Queen's University, Belfast.

David K James, MA, MD, FRCOG, DCH
Professor, Division of Feto-Maternal Medicine, Academic Division of Obstetrics & Gynecology, The University of Nottingham, Nottingham.

Michelle F Mottola, PhD
Associate Professor and Director, R Samuel McLaughlin Foundation – Exercise and Pregnancy Lab., School of Kinesiology, University of Western Ontario, Canada.

Penny Preston, MB ChB
General practitioner and writer on pregnancy and child care.

June Thompson, RGN, RM, RHV
UK Health Visitor and freelance health writer.

James J Walker, MD, FRCP, FRCOG
Professor, Department of Obstetrics & Gynecology, St James University, Beckett St, Leeds.

Richard Woolfson,
PhD, FBPS
Writer, journalist and psychologist who works with children and families.

Introduction

Since it was first published in 2003, *The Pregnancy Bible* has proved to be invaluable to the expectan mothers and fathers who acquired a copy. Pregnancy is a unique experience and one that you will wa to enjoy while doing what's best for your baby. Today a great deal more is known about the risks to a baby's normal development, and also what a woman needs to do to successfully meet the challenges of pregnancy, labor, and delivery than was possible in the past. However, all the information that is now available, particularly relating to situations that may be, evenly remotely, out of the ordinary, is rarely known in total to a single doctor, no matter how well trained and experienced he or she is. Tha is why, to produce a thoroughly researched book, *The Pregnancy Bible* was created with a team of experts in every related field including genetics, gynecology and obstetrics, midwifery, pregnancy nutrition and exercise, psychology, fetology, and pediatrics. Additionally, teachers in natural childbirth techniques, breastfeeding, and baby care were consulted. Ten years on from its initial publication, we've gone back to the experts and revisited the material to bring out a comprehensively revised edition.

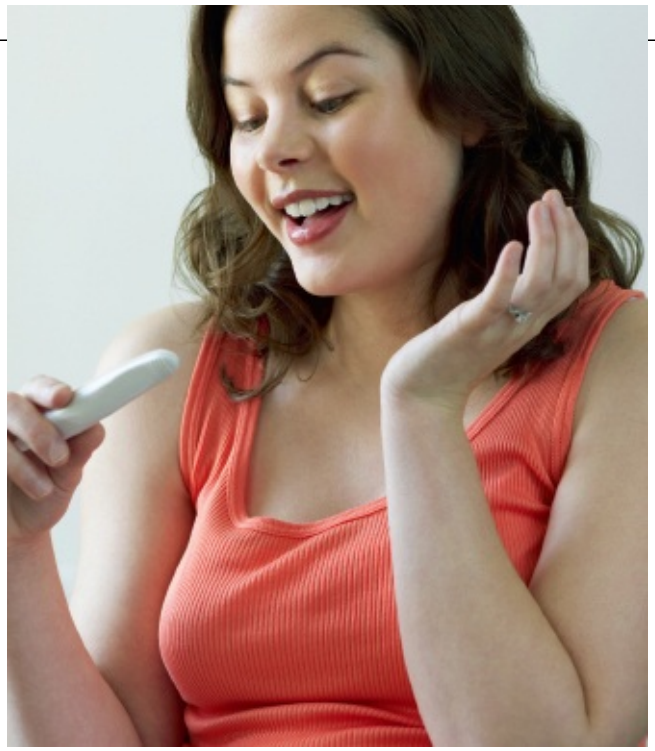
This new edition of *The Pregnancy Bible* continues to cover every aspect of pregnancy, birth, and new parenthood but has been brought up-to-date with all currrent practices, particularly in regard to Cesarean deliveries, which about one-third of new mothers will experience. Although it cannot repla the care and attention that you'll receive from your healthcare providers, who will know you as an individual, it can supplement that advice, explain procedures, give handy hints, and answer any questions you may have.

Past readers have come to appreciate its special features such as the helpful illustrations and colo photographs, including those that enable you to see how a baby develops week by week and the gatefold pages, which show at a glance what can be expected in each of the three trimesters. And this new edition is augmented by a comprehensive and useful glossary of pregnancy and neo-natal terminology.

Its definitive chapters on nutrition, exercise, maintaining good health, the essentials of prenatal care and managing emotions, will help you to achieve a healthy pregnancy, while those on childbirth choices, getting ready for birth, and the labor and birth experience, should prepare you for the birth that you want. Once your baby is born, further chapters will explain how to take care of yourself and your newborn. Two reference sections provide comprehensive coverage of all the prenatal tests and procedures that may be used as well as the medical complaints and problems that can affect you or your newborn.

Most importantly, *The Pregnancy Bible* has been designed to help you to achieve a positive attitude, which has been shown to be one of the most significant factors in a rewarding birth experience. With knowledge and understanding, you and your partner can take on pregnancy and parenthood with confidence.

Joanne Stone, MD and Keith A. Eddleman, M



PART I

MIRACULOUS BEGINNINGS

1

CHAPTER

The story of pregnancy

When a woman conceives, it's just the beginning of an amazing process. This chapter tells the story of how the fertilized egg reaches the uterus, how your baby inherits your characteristics, and how he or she develops week by week. It also outlines the major external changes to your body and the important milestones of the following nine months.

Sperm meets egg

An amazing process begins when an egg, no larger than a speck, unites with a single sperm, the sole winner of a race with several million competitors.

To meet, the egg and sperm undergo an arduous journey, which is unlikely to work out. However, if they succeed, their meeting leads to the creation of a single cell containing genetic information from each partner. It's this unique blueprint that forms the basis of a new life.

Conception takes place in three basic stages: ovulation, fertilization, and the division of the fertilized egg, which then implants in the uterus—it's not until this is successful that pregnancy begins.

The egg comes first

A woman is born with approximately two million eggs (ova) but from the moment of birth, they begi to die off, so by the time she reaches puberty, only an estimated 40,000 eggs remain. Of these, some 400 to 500 will mature over her lifetime and be released during ovulation. By her menopause, however, less than 1,000 eggs are left and a natural pregnancy will not longer be possible. Most women ovulate every month in response to luteinizing hormone (LH), which is released by the pituitary gland. Each month about 5 to 15 ova begin to ripen inside protective, fluid-filled sacs called follicles. Usually only one of these reaches maturity, and as this happens, the hormone estrogen is released into the bloodstream, stopping the ripening of other eggs. This hormone also triggers the lining of the uterus to thicken, forming a blood-rich cushion in preparation for the development of an embryo.

How ovulation happens

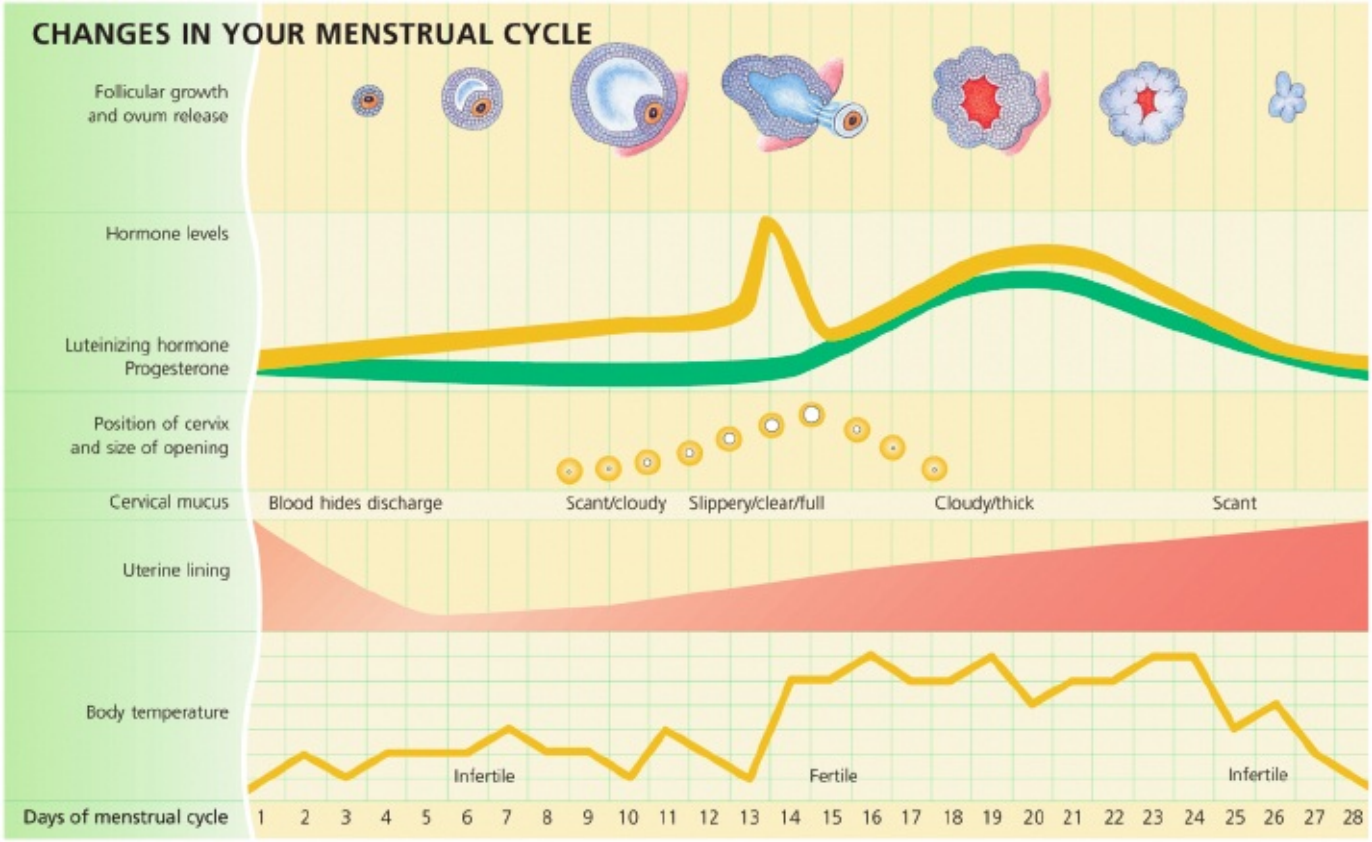
At ovulation, which occurs about midway through the menstrual cycle, the follicle that has outgrown the others finally ruptures, and the egg bursts out. The ruptured follicle goes on to form the corpus luteum ("yellow body"), which produces a hormone, progesterone, which sustains the growing baby until the placenta takes over the role. At this stage, the egg is barely visible to the naked eye.

As the egg is released from the ovary it's moved along the Fallopian tube toward the uterus by tiny, hair-like projections called cilia. Conception (fertilization) occurs when a sperm fuses with the egg, usually toward the outer end of the tube, near the ovary. The optimum time for conception is when a man and woman make love during the woman's fertile period—that is, when ovulation has ju happened or is imminent.

If the egg isn't fertilized within 12 hours of being released, the egg dies, the follicle dries up, and menstrual period occurs when the lining of the uterus is shed. This is all due to a drop in the level of the hormone progesterone. However, if the egg is fertilized, the levels of progesterone will increase and the uterine lining will continue to thicken.

Signs of ovulation

Although most women are completely unaware of ovulation, around 25 percent experience lower abdominal pain, usually on the side near the ovary that's ovulating. The pain is called *mittelschmerz* (literally, "middle pain") and is thought to be caused by irritation from fluid or blood from the follic when it ruptures. However, this pain is not always a reliable predictor of ovulation because it doesn't occur with every cycle.



A more consistent sign of ovulation is a change in the cervical mucus. Just after menstruation thi is scanty, thick, and sticky, making it impenetrable to sperm. As ovulation approaches, it becomes thinner and more liquid, allowing healthy sperm to travel through it at speed. After ovulation, the mucus reverts to its usual, more inhospitable consistency.

Another sign of ovulation is body temperature. Progesterone causes a small but measurable rise i body temperature from 36.4 to 36.7ºC.

“Ferning” of your saliva, which occurs during the few days leading up to ovulation, can be checke for with special pocket-sized portable microscopes sold in salivary ferning kits—a type of ovulation predictor kit (see also page 12). As your estrogen levels rise, the salt content of your saliva increases and when dried, crystallizes into a fern-like pattern.

The great sperm race

When the man ejaculates into a vagina he releases hundreds of millions of sperm at a speed of aroun 10 miles an hour. (Sperm are made from puberty onward, although their quantity and quality begin t decrease from about the age of 40. The average healthy young man produces 2 to 6 ml of semen per ejaculation, with each millilitre containing 50 to 150 million sperm.) The sperm are mixed with a sugar-containing fluid that gives them energy for the testing journey ahead. The fastest will reach the egg in 45 minutes, the slowest take about 12 hours. However, most don’t even make the journey—the either trickle out of the vagina or are lost or destroyed along the way. Only a few hundred of the strongest swimmers will eventually arrive at the Fallopian tubes where fertilization can take place. Sperm have to traverse the vagina, cervix, and uterus, and swim out into the Fallopian tubes before they reach the egg. It’s a distance of only some 6 to 7 inches, but it is the equivalent of a human bein swimming over 100 lengths of an Olympic-sized pool. Millions get lost in the numerous crevices of the vagina or arrive at the wrong Fallopian tube. Others, mainly weak or damaged sperm, are destroyed by the lethal acidic environment in the vagina. Interestingly, it seems that female sperm, which contain an X chromosome (see page 18), are more comfortable with the acidic conditions in th vagina than male sperm, which contain a Y chromosome. Millions more sperm are pushed back by

microscopic hairs inside the uterus.

However, other factors give the sperm a helping hand. If a woman orgasms during intercourse, it' thought that wavelike contractions in her vagina draw the sperm in towards the cervix—although you don't have to have an orgasm to become pregnant. During a woman's fertile period (see diagram, pag 11), the mucus that usually forms a barrier to the cervix becomes slippery and thin, so helping the sperm's progression into the uterus. The opening of the cervix also becomes wider in readiness for receiving sperm, and it's estimated that some 40 million healthy sperm make this journey through th cervix and across the uterus, a journey that takes around 45 minutes. The Fallopian tubes release an alkaline mucus, which nourishes the sperm as it waits for the egg to be released.

MORE **ABOUT** ovulation predictor kits (opk)

OPKs help identify your fertile "window." Urine-based ones are sensitive to any increase (surge) in luteinizing hormone (LH) in your urine, which normally occurs one day or two days before ovulation, and is around the most fertile part of your cycle—the best time to maximize love-making. Depending on the brand, you'll either collect your urine in a cup and insert a test strip into it or hold a strip under you as you urinate. Colored bands or symbols on the strip will indicate whether or not the LH surge is occurring. The instructions will tell you when is the best time to test your urine (not first thing in the morning). Generally, each kit contains five to nine days' worth of tests. Urine-based LH tests are about 99% accurate.

A matter of timing

The moment of conception is wholly dependent on timing. A woman must have a ripe egg ready as a healthy sperm arrives in the Fallopian tube. Sperm can survive for up to four days in the female body but any longer than this and they'll die before the egg arrives. This means that if a woman has intercourse two to three days before ovulation, she can still conceive. If sperm arrive after ovulation, they never have the chance to meet the egg in the Fallopian tube.

And the winner is…

Only around 200 sperm make it to the site of fertilization, but the race isn't yet over. The egg is surrounded by thousands of cells that nourish it. The sperm fight their way through these cells, flipping them out of the way with their tails. When they reach the wall of the egg, a sticky substance on the surface helps them attach. The objective now is to burrow through the outer layer of the egg, called the corona radiata, and through a further layer, the zona pellucida. Several sperm may break through the outer layer, but usually only one reaches the nucleus. When this happens, the head of the sperm fuses with the nucleus of the egg, and the egg immediately throws up a chemical barrier aroun it to stop other sperm from penetrating.

The beginning of life

As the egg and sperm fuse together, the sperm loses its tail and its head enlarges. The egg and sperm form a single cell containing 46 chromosomes of genetic information—23 from each parent. The inside of the cell swirls around, forcing the chromosomes to mingle. In a matter of hours this single cell will duplicate material known as deoxyribonucleic acid (DNA) and split into two. The building blocks of life are now forming.

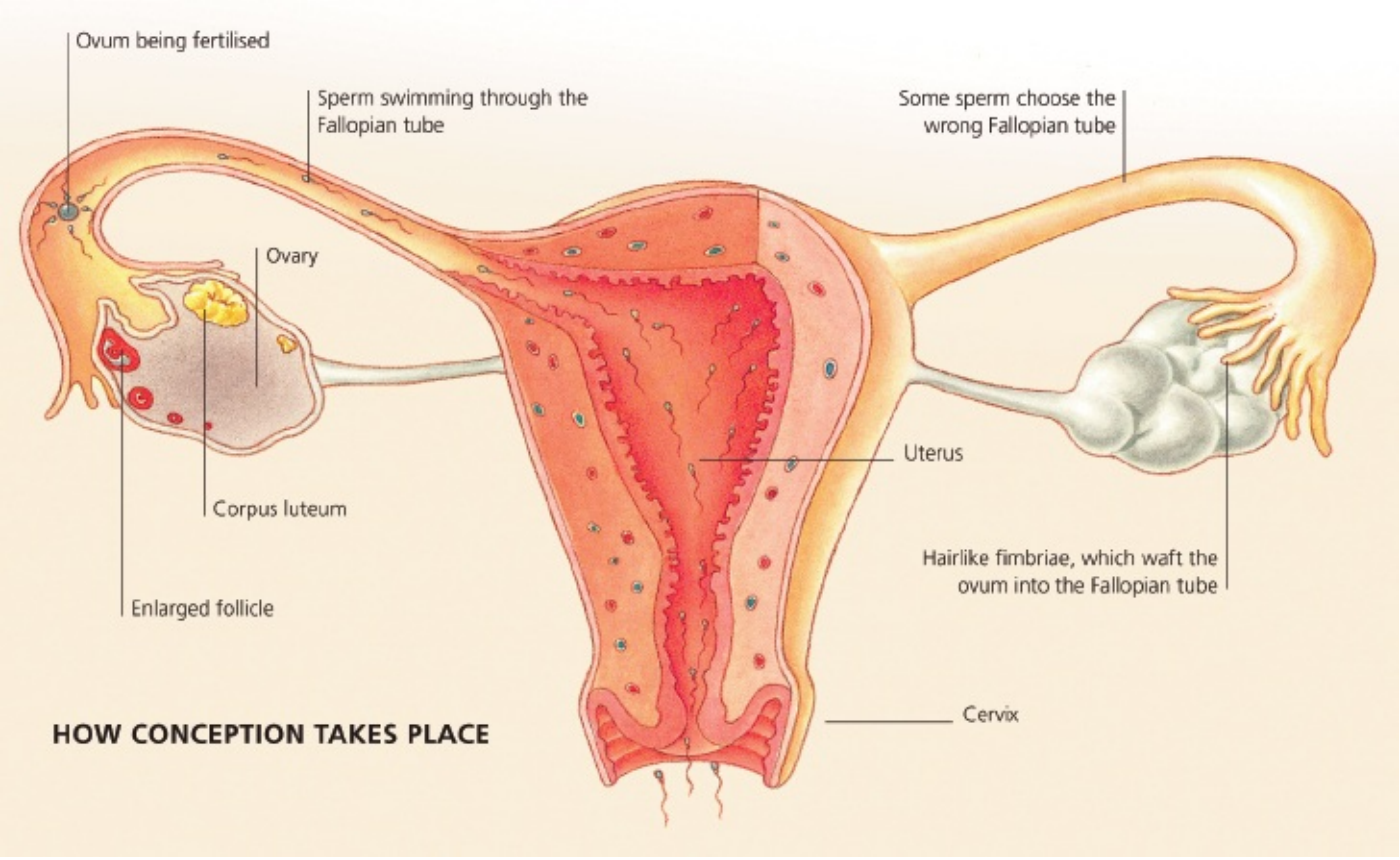
Your chances of conceiving

Fertility varies widely, so it can take longer for some couples to conceive than others. On average, among couples having regular intercourse, 25 percent of women will conceive within one month, 60

percent within six months, 80 percent within a year, and 90 percent within 18 months.

However, certain factors on both the male and female side can mean that it may take longer to conceive. For example, smoking, drinking alcohol, certain medications, obesity, and exposure to heat and chemicals can all affect sperm quantity and quality. Insufficient and poor quality sperm won't survive the journey to the egg. Even if they meet, damaged sperm or eggs may not be able to fuse successfully or they may produce a fertilized egg that can't survive the early stages of growth. The quality of a woman's eggs deteriorates with age, and, after the age of 35, she may not ovulate every month, even though she still has regular periods. Some women may have a blocked or scarred Fallopian tube, which can hinder the movement of a ripe egg down the tube. If you're trying to conceive, you can improve your chances with the following:

- *Avoid smoking* Smoking has a damaging effect on many aspects of health including female fertility.
- *Keep your weight healthy* Women with a BMI>30 (see page 64) can have problems with ovulation A healthy diet containing plenty of iron, calcium, and folic acid will be sensible, and the folic aci will benefit the baby by reducing the risk of neural tube defects.
- *Check with your doctor* Determine whether you are immune to rubella, and if you feel you may be at risk, have a STD check-up.
- *Timing of sex* Make love at least every other day to improve the chance of conception.
- *Don't drink too much alcohol* A high alcohol intake is bad for a man's reproductive function as well as his general health. There is less convincing evidence linking alcohol with female fertility problems, but more than two units a week (1 small glass of wine) can harm a developing fetus.



The journey to the uterus

Between 12 and 20 hours after the egg is fertilized, the cell that is formed begins to divide in two replicating its DNA as it does so. This division continues rapidly, and all the while this bundle of cells is heading toward the uterus, where the fetus will eventually grow.

It takes the fertilized egg around five to seven days to reach the uterus after leaving the ovary. This journey along the Fallopian tube is helped along by the cilia (hair-like feelers) that line the tube. The Fallopian tube also nourishes the developing cells and removes waste products produced by the cells as they divide. During this time the fertilized egg goes through several stages of development.

From egg to blastocyst

The fertilized egg is called a zygote, and this divides and subdivides until it forms a solid ball the size of a pinhead. Consisting of 16 to 32 cells, this is now called a morula. The morula continues dividing at 15-hour intervals so that by the time it reaches the uterus, some 90 or so hours later, it has approximately 64 cells. Of these, only a few cells will actually develop into the embryo; the rest will go to form the placenta and the membranes that surround the baby in the uterus.

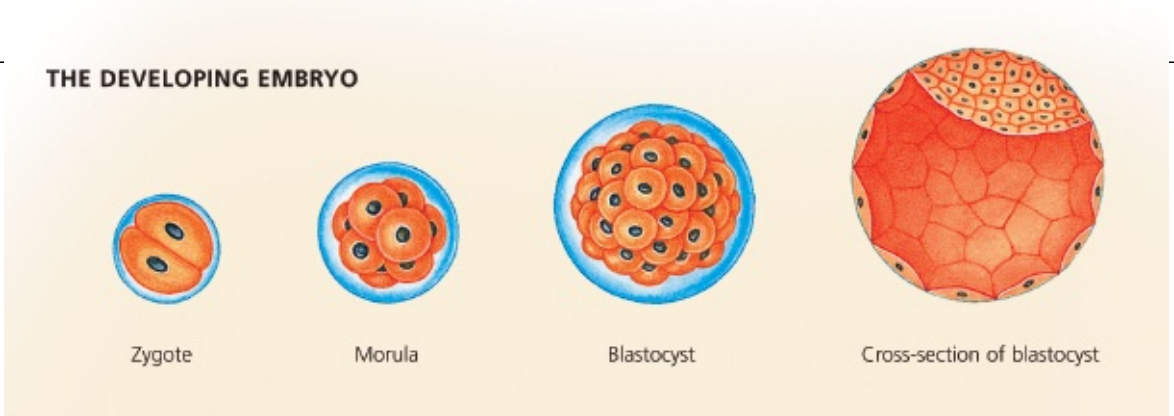
The morula gradually goes from being solid to being a fluid-filled ball of cells, and at this stage it is called a blastocyst. The surface of the blastocyst consists of a single layer of large, flat cells called trophoblast cells. These later develop into the placenta. Inside the ball is a small cluster of inner cells that will become the embryo.

In the early stages of development, when the zygote is no bigger than a few cells, each one of these has the potential to become a human being. If the zygote splits, identical twins are formed.

Implantation takes place

About five to seven days after ovulation occurs, progesterone production is at its height, stimulating the growth of the rich blood vessels that supply the endometrium (the lining of the uterus). This coincides with the arrival of the blastocyst in the uterus ready for implantation. At this stage, the blastocyst is less than one hundredth of an inch (0.23 mm) across. It floats freely in the uterus for a few days as it continues to develop and grow. Approximately nine days after fertilization, the blastocyst attaches itself to the uterine wall by means of spongelike projections of trophoblast cells, which burrow into the endometrium. These cells grow into the chorionic villi (see page 140), which will later develop into the placenta. Occasionally, implantation causes a small amount of bleeding, known as spotting.

If the blastocyst doesn’t implant, it will be swept out with the next menstrual period, and the woman won’t even be aware that she had conceived.



DID YOU KNOW…

IMPLANTATION CAN OFTEN FAIL Attaching to the endometrium is a risky business. It's estimated that around 40 percent of blastocysts entering the uterus never implant. Instead they die and are swept out with the next period. It appears that timin plays a part, with an early or late arrival impacting negatively on the blastocyst's success in implanting.

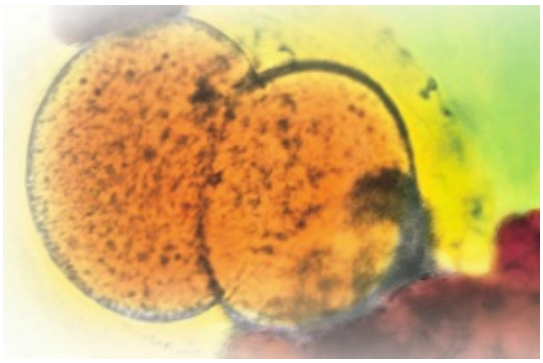
Finding nourishment

By the time it implants, the blastocyst is made up of hundreds of cells. It releases enzymes that penetrate the lining of the uterus and cause tissue to break down. This provides a nourishing mix of blood and cells on which it can feed. Occasionally, the lining of the uterus doesn't supply a rich enough source of food for the blastocyst. In this case, a miscarriage occurs, rather like a late, heavy period.

It's also after implantation that the placenta begins to develop and the embryo begins to produce the pregnancy hormone human chorionic gonadotrophin (HCG). It's this hormone that can be detecte by pregnancy testing kits.

What happens next

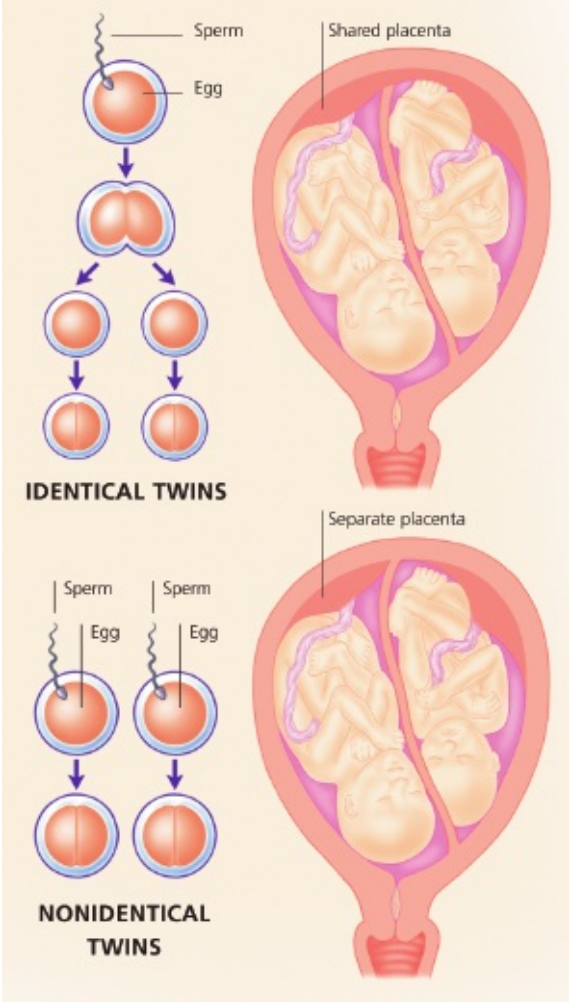
It takes about 13 days for the embryo to implant firmly. Miscarriage is still a possibility but is less likely now. The embryo begins to produce progesterone of its own, encouraging the endometrium to develop. It's also at this stage that the embryo's first organs start to form, beginning with the nervous system and, later, the heart. Thirteen days is the latest date that an embryo can split into two to become twins. If the split occurs later, conjoined (Siamese) twins are formed.



Just 40 hours after fertilization, the ovum splits into two cells, producing a genetic copy of itself.

Conceiving twins and more

Largely because of better nutrition and increased fertility treatments, the chances of conceiving twins —and more—have increased. Canada and the U.S. have the highest rate of twin births from IVF in th world. In Canada, twins accounted for over 3 percent of all births in 2009. While in the United States the rate of twin births increased from 28.9 per 1000 live births in 1999 to 33.2 per cent in 2009. Although this was about 2 percent more than in 2008, and the twinning rate between 1980 and 2004 rose 70 percent, the pace of increase has slowed in recent years. This may be due to changes in infertility treatments. During the process of IVF, drugs are used to stimulate the release of more than one egg and create several embryos. The ASRM (American Society for Reproductive Medicine) and SART (Society for Assisted Reproductive Technology), which oversee fertility treatment in the US, have advised that for most younger and healthy women, only one or two embryos be transferred into the uterus in order to reduce multiple births. Many more twins are conceived than are actually born. Known as the "vanishing twin" syndrome, this is when one of the fetuses spontaneously miscarries, usually during the first trimester, and the fetal tissue is absorbed by the mother, making it seem that the twin has vanished. An early ultrasound may show an empty sac in these circumstances.



Identical or nonidentical twins

About a third of twins of naturally conceived twins are identical—technically monozygotic—and two thirds are nonidentical—technically dizygotic.

Identical twins develop when, as in a normal conception, an egg is fertilized by a single sperm. The fertilized egg then splits into two, causing two separate embryos to develop—if it splits into three, triplets result, and so on. Identical twins may or may not share a placenta and amniotic sac, but each twin has its own umbilical cord. These babies will have an identical genetic make-up and will b the same sex. They will also have the same hair, eye color, and blood type.

Nonidentical twins—also called fraternal twins—are produced when a woman releases more than

one egg when she ovulates. This could be two eggs from one ovary, or one from each. Each egg is fertilized by a different sperm and two genetically different babies are conceived. They can be the same sex or boy and girl, and will look as much alike or different as any other siblings.

In the case of triplets, quads, and more, there can be any combination of identical and nonidentica children. For example, three—or four or more—eggs can be fertilized, creating nonidentical triplets. Or, one fertilized egg can split into identical twins with another fertilized egg making it a triplet pregnancy with two identical babies and one non-identical. Or a single egg can divide into three, thereby creating identical triplets.

The hereditary factor

One factor influencing the conception of twins is the mother's age; after 35, the chances of conceivin identical twins rises. However, the chances of conceiving nonidentical twins rises until about the sam age and then drops off. This may be due to the fact that as a woman ages she naturally produces more ovulation-stimulating hormones, which could trigger her ovaries to release more eggs each month.

Your chances of having twins also increase with each subsequent pregnancy, and it seems that larger, taller women are 25 to 30 percent more likely to have them. Nonidentical twins also may run families, on the mother's side. Finally, there seems to be an ethnic predisposition: Twins are more common in women of African origin and occur least frequently in women of Asian origin.

Your baby’s inheritance

Your baby’s genetic endowment is determined at the moment of conception. Half of it will come from the egg and half from the sperm. So both you and your partner have contributed equally t her inherited make-up.

The process whereby you pass on characteristics to your children is amazingly intricate, but the natural rules that govern it can be easily understood. To understand more about how you and your partner influence your baby’s characteristics, you first have to be clear about some basic genetics.

Genes and chromosomes

Your body is made up of millions of cells, all of which are copies of the fertilized egg from which yo developed, and the nucleus (cente) of each of these cells contains a copy of all your genes. Genes are the blueprints that instructed your body how to form when you were an embryo and determine how it functions now. These blueprints are encoded in miniscule units of deoxyribonucleic acid (DNA).

Your child may resemble you more than your partner because of the way the genes you gave her have mixed.

DNA influences how your baby will look. The color and efficiency of her eyes, the texture of her hair, the shape of her nose, her blood type, her bone structure, and many more of her characteristics are determined by her genes, which she inherits from you—and you inherited from your parents. There are about 30,000 genes in each of the body’s millions of cells, so it takes little imagination to realise that they’re extremely small—too small to be seen even under a very powerful microscope. A these genes combine to make a person unique.

Genes don’t float around loose inside the body’s cells; they’re packaged systematically onto structures called chromosomes. Normally, in each cell, your baby has 46 chromosomes that exist in matching pairs. One chromosome in each pair came from you and the matching one from your partne Each chromosome carries thousands of genes and is large enough to be seen under a powerful microscope.

Your genetic make-up

You have one pair of genes for each characteristic: One from your mother and one from your father. For some characteristics, both your parents may have given you the same version of a gene, and for others, they different versions. Sometimes, one version of a gene dominates over another; in other cases, both influence the outcome equally. It's the total effect of the combination of all your genes that determines your hereditary make-up.

Variety is the spice of life

Many genes exist in a variety of different forms, just as there are many possible recipes for chocolate cake. If this weren't the case, people would all look exactly alike and the world would be a very borin place. Since there are many versions of the thousands of genes you inherit from your parents, you are genetically unique, unless, that is, you have an identical twin. Even your brothers and sisters will be genetically different, because their inheritance depends on the unique combination of genes in a particular egg and a particular sperm. This idea carries through for your baby and any children you have in the future.

Some genes do not form correctly. If one or both genes of the pair are abnormal, this can result in problems. Cystic fibrosis or sickle cell disease are disorders said to be inherited recessively (see below). Other abnormal genes, dominant ones, cause problems even if the other gene of a pair is normal, for example in Huntington's disease. Some abnormal genes that are carried on the X chromosome cause problems only for boys. These so-called X-linked disorders include Duchenne muscular dystrophy and hemophilia. For information about these diseases see page 240. More information on genetic counseling is given in the Prenatal Reference section.

DID YOU KNOW…

IVF CAN PRODUCE BABIES FREE FROM GENETIC DISORDERS Couples who are carriers of lethal or severely crippli conditions such as muscular dystrophy can benefit from preimplantation genetic diagnosis. Using IVF, eggs are collected an fertilized in the laboratory. One or two cells are removed from the resulting embryos and screened for abnormal genes or to check if the normal number of chromosomes are present. Healthy embryos are implanted (or frozen for later use).

Who will your baby look like?

If you and your partner both passed on your full complement of 46 chromosomes in the egg and sperm, your baby would have 92 chromosomes in her cells, and the numbers would continue to doubl with every generation. This system wouldn't work. Instead, in the formation of eggs and sperm, the cells go through a specialized division, in which they halve the number of chromosomes within each —so each egg and sperm contains only 23 chromosomes. Therefore, for any given chromosome you will give your baby either the one you received from your mother or the one your received from your father; your partner does the same.

Your baby will receive some chromosomes that you inherited from both your parents, so she coul have, for example, your father's build and hair color but your mother's eye color. If you plan to expand your family in the future, your next child will inherit a slightly different combination, so will be another unique addition to your family.

Silent genes

Your baby can inherit genes from you that you didn't know you had. This is because some genes are dominant and others are recessive and, in the pairs of chromosomes that are formed, the dominant genes override the information coded on the recessive genes. For example, you and your partner may

carry both the gene for black hair, which is dominant, and the gene for red hair, which is recessive. In each of you, the black hair gene dominates. However, if you both pass on your red hair gene, your baby will have red hair as there is no dominant gene to override the recessive one.

Gender determination

Your baby's sex is also decided at the moment of conception. Of the 23 pairs of chromosomes, only one pair determines whether your baby is a boy or a girl. This crucial pair are the sex chromosomes: and Y. Girls have two X chromosomes, boys have one X and one Y chromosome. Because of the way that eggs and sperm are produced, all eggs contain a either an X or Y chromosome. At fertilization, when the sperm and egg pool their chromosomes, if the sperm carries an X, the baby will be a girl an if it carries a Y, the baby will be a boy; in other words, the sex of the baby is determined entirely by the father.

The first signs of pregnancy

Some women just intuitively know when they're pregnant and are even able to pinpoint the exac moment that they conceived. For other women, it might not be so obvious.

You don't have to "feel" pregnant to actually be pregnant and while there are certain telltale symptoms of pregnancy, you might not necessarily experience them all.

Early indications

You may experience one or two, or all, of the following symptoms of pregnancy. Morning sickness is the classic giveaway sign, but you may be one of the lucky ones and hardly have it at all. Likewise, while missing a period is another classic symptom, if your periods have always been irregular, it can be difficult to tell if you're late because you're pregnant or late because of the irregularities in your cycle.

Missing a period

This is one of the clearest indications of pregnancy. However, there are other reasons why menstruation may be delayed. Stress, illness, extreme fluctuations in weight—excessive gain or anorexia—or coming off the oral contraceptive pill can all stop periods for a while. Irregular periods are a common symptom with polycystic ovary syndrome, a condition in which periods can occur several months apart.

Breast tenderness

Changes in the size and feel of your breasts are one of the earliest signs of pregnancy. As early as a few days after conception your breasts will begin to enlarge in readiness for breastfeeding, and you'll probably experience heaviness and soreness. Many women report that their breasts are very sensitive and experience a sharp, tingling sensation, too, although this often disappears a few weeks later. Thes breast changes may be less dramatic with subsequent pregnancies.

Nausea and vomiting

Feeling sick is the most common complaint in early pregnancy and is experienced by most women from around five to six weeks of pregnancy, but it can also begin as early as two weeks after conception. Although termed "morning sickness," the nausea can occur at any time of day and can vary from an occasional, faint sensation to an overwhelming feeling of nausea and vomiting (see pag 67). By and large, these symptoms disappear by around 14 to 16 weeks of pregnancy.

Tiredness

Many women report feelings of extreme tiredness during pregnancy, especially at the beginning. Typically, after getting in from work in the evening all you want to do is go to bed, or you may be desperate for a mid-afternoon nap. When you reach week 14 of your pregnancy, your energy levels should start to pick up.

Carried out correctly, home pregnancy testing kits are 98 to 99 percent accurate, so you can trust the results.

Frequent urination

As early as two to three weeks after conception you will find yourself wanting to urinate more frequently. This is due to the pressure of the enlarging uterus on the bladder, literally reducing the capacity of your bladder. At about 14 weeks, the uterus rises up into the abdomen, which often relieves this annoying symptom until the last few weeks of pregnancy when the baby's head engages (drops down in the uterus), again causing pressure on your bladder. Rising levels of the pregnancy hormone progesterone relax the bladder muscle so that you feel your bladder is full even when there' not much urine in there. In addition to this, your kidneys are working harder in response to being pregnant, and an extra 13 to 15 pints will be added to your circulation to increase the blood flow around your body.

Changes in taste and smell

Don't be surprised if certain foods suddenly make you feel queasy or if you start to crave particular foods (see page 99) or are bothered by certain smells. You also may have a strange metallic taste in your mouth.

Constipation

A common early symptom of pregnancy, this is caused by high levels of progesterone, which relaxes the bowel and slows your digestion (see page 72).

Mood swings

High levels of pregnancy hormones flood your body in early pregnancy, making you extra emotional and sometimes weepy (see page 151).

Confirming your pregnancy

Two weeks after conception your baby is just a ball of cells, not much bigger than a pinhead, starting to develop in the lining of the uterus. Already the placenta is forming and starting to produce a hormone called human chorionic gonadotrophin (hCG), which passes into your bloodstream and urin from the day of your first missed period.

Home pregnancy tests

These tests, which you can buy from most drug stores, confirm pregnancy by detecting hCG in the