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Paul Reuwer, Hein Bruinse and Arie Franx
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Chapter 1

General introduction

The natural process of birth increasingly involves medical intervention, but the benefits of this trend are questionable at best. The inexorable growth in cesarean delivery rates is not validated by tangible improvements in perinatal outcomes. Rather, short- and long-term maternal morbidity has risen significantly.

Apart from the physical impact, giving birth is one of the most profound emotional experiences in a woman's life, but women's satisfaction with childbirth remains a cause for common concern. Despite all good intentions, modern maternity care is often perceived as professional but impersonal, and labor is not infrequently described as a traumatic or even "dehumanizing" life-event. This must be changed.

1.1 Purpose

The aim of this book is to present a simple, cohesive, and evidence-based plan for the care of the normal, healthy woman in labor, designed to restore the balance between natural birth and medical intervention. The main target is to improve professional labor and delivery skills in order to promote spontaneous delivery and enhance women's satisfaction with childbirth. *Proactive support of labor* is a carefully orchestrated and audited expert team approach involving the laboring woman, nurse, midwife, and obstetrician, committed to a safe and good birth experience for both mother and baby. Emphasis is placed as much on the physical challenge as on the emotional impact of childbirth. The principles and practices are universally applicable.

The objective is to enhance women's childbirth experience by improving professional labor and delivery skills and the overall quality of routine intrapartum care.

1.2 Target readership

This book is directed to:

- All professionals who are primarily responsible for the quality of childbirth: obstetricians, midwives, and labor room nurses. Obstetricians are in the prime position to enhance all standards of care by creating the conditions for nurses and midwives to execute their labor support tasks properly;
- Medical students and student-midwives engaging in their first practical contacts with childbirth;
- All other healthcare providers involved in birth care such as family practitioners, childbirth educators, doulas, physiotherapists, sonographers, anesthesiologists, and home health nurses;
- Hospital administrators, healthcare policymakers and health insurers, since high-quality care in labor requires a sound organization, which should coincide with sound economics;
- Last but not least pregnant women and other interested laypersons. No experience with childbirth is needed to understand the relevance and significance of this book. Mothers-to-be have the most to gain from supportive care during their labor and delivery effectively preventing everyday labor disorders and promoting a safe and rewarding delivery. Although professional language is used, the text should be readily understandable to an educated lay audience.

1.3 Presentation

This book is divided into three sections. The first section is a mirror for reflection, unveiling the mechanisms in everyday childbirth that explain excessive operative delivery rates and avoidable discontent of many women with their labor experience. The second section goes back to the basics and reviews the physiological prerequisites for a rewarding and safe birth that are all too often neglected in common

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childbirth practice. The third section proposes structural measures to solve most problems by introducing the simple principles and safe practice of *proactive support of labor*. Special attention should be paid to the subsection and paragraph headings as many address topics of critical relevance that are seldom, if ever, discussed in standard textbooks.

Section 1 A wake-up call

To solve a problem, one must first admit that the problem exists and identify its causes. Inconsistencies in care, controversial midwifery and medical services, and unfounded concepts and dogmas on both sides of the aisle will be identified and discussed in detail, as well as the self-sustaining mechanisms and stubborn nuisance values hampering structural improvements. Deeply researched analysis of "evidence-based" guidelines will identify many pitfalls and flaws, and will debunk detrimental misguidance from several poorly designed randomized controlled trials and uncritical meta-analyses.

Many elements of care during pregnancy and childbirth can facilitate or jeopardize the successful accomplishment of this natural process.

The preventable or overtly iatrogenic (provider-caused) nature of many birth disorders in mainstream practices will be exposed, and the numerous examples of avoidable harm to women and babies will confront childbirth professionals, and may even shock lay readers. The defiant and provocative tone we adopt is by no means intended to question the integrity and devotion of birth care providers, or to belittle their efforts, but to promote debate and to guide structural and real evidence-based reforms. We wrote this section to serve as a mirror and an eye-opener, laying bare the fundamental problems plaguing current childbirth practices all over the world.

Section 2 Back to basics

Leading ideas about labor and delivery have been relayed from teacher to student and from textbook to textbook without any serious attempt at verification until they have become the main impediments to improvements in everyday care. Recognition of the latent phase of labor is one of the prime examples. The critical reappraisals in this section will show that many accepted and guiding concepts in the world of childbirth are scientifically unfounded, mutually in conflict, and sometimes even plain fallacies.

It is all too frequent in medicine to find ignorance about the most common events.

The chapters in this section offer a fundamental reinterpretation of the basic biophysics dominating the natural process of birth. The basic biology is organized in a coherent manner, giving structure and direction to a scientifically based policy for the supervision of labor. We will emphasize the differences between nulliparous and multiparous labors and challenge the classic understanding of the onset of labor and the course of normal cervical dilatation. It is not the mechanics of delivery, but primarily the dynamics of first-stage labor that provide the optimal chance for a successful, safe, and rewarding birth. Furthermore, a basic knowledge of the biophysical changes in the uterus prior to labor is essential for an accurate understanding of the initiation of the birth process and the negative impact of labor induction. Equally important is knowledge of the physics of uterine contractions, dilatation, and expulsion. Crucial to expert care of labor is recognition of the parasympathetic condition controlling birth and the negative impact that anxiety and stress have on the effectiveness and safety of labor. These fundamental, universally valid aspects of childbirth are of such importance that each must be examined in considerable detail before genuine progress in labor supervision can be made.

Section 3 Proactive support of labor

The emphasis of this book is to organize basic scientific understanding of parturition and hard clinical evidence into an integrated, all-embracing birth-plan. This section provides a step-by-step exposition of the policy framework designed to prevent common labor disorders and to detect and treat problems at an early stage before they are compounded. Safety is crucial, and simplicity is the key. This science- and evidence-based policy offers providers a foothold in negotiating the complexity of daily practice and guards them against clinical stalemates, inconsistent (non-) policies of care, and mismanagement of labor with self-created birth complications. If caregivers follow the strategy promoted in this book, all elements of high-quality birth care will fall into place

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including honoring women's needs and desires, fetal and maternal monitoring, pain relief, and the prevention and timely correction of everyday labor complications.

Proactive support of labor

A simple and evidence-based approach specifically designed to promote safe and rewarding labor and delivery. It should appeal to both obstetricians and midwives.

The key points include a clear diagnosis of the onset of labor, early recognition and correction of dysfunctional labor, consistent conduct, personal attention and commitment, and continuous supportive care on a one-on-one basis extended to all women in labor.

Proactive support of labor encourages an active interest in the supervision of first-stage labor by all members of the delivery team and facilitates constant support and good communication in labor. The central birth-plan promotes the development of team spirit between doctors, midwives and nurses, and dictates good labor ward organization that will improve labor care immensely. This well-defined policy at last makes possible a meaningful daily audit of all procedures in the supervision of childbirth, promoting and ensuring safe, high-quality care. This approach effectively restricts operative delivery rates without any detrimental effects to the infants. Most importantly, this integrated women-centered care system invariably improves mothers' satisfaction with their childbirth experience.

1.4 Advice for readers

Although childbirth is the same physiological process worldwide, childbirth services – even if confined to western countries – have proved to be strongly influenced by cultural differences, medico-legal issues, social pressures, and politics. Therefore, transcultural diversities in birth philosophies, childbirth practices, and care organizations should not be ignored and will be addressed throughout this book. Time and again, *proactive support of labor* will be contrasted with ubiquitous but controversial approaches – ranging from "all natural" midwifery care to high-tech, fully medicalized childbirth – in order to illustrate the need for structural reforms in each type of care. Typical American or European issues should not distract from the universally valid observations, statements, and evidence-based policy proposals on the supervision of labor made here.

This book describes a cohesive and consistent concept of birth care universally applicable to all societal contexts. All aspects of childbirth will be discussed, but the emphasis is placed on redefining basic birth parameters, reinterpretation of physiological data, hard clinical evidence, emotional support, and strict adherence to logic. For this reason, we recommend reading the chapters in the order in which they are presented. The numbers in brackets represent cross-references within the text.

The authors recommend reading the chapters in the order in which they are presented.

1.4.1 Classification of birth professionals

Terminology with regard to childbirth professionals may be quite confusing as many doctors of unequal educational status are involved, ranging from junior residents to senior consultants. Likewise, the titles "nurse," "nurse-midwife," and "midwife" may cover dissimilar and often overlapping content, substance, and responsibilities. Sensitivity to status and emotion are involved here, and a few terms as used in this book may therefore benefit from definition:

Obstetricians hold a specialist qualification in obstetrics and gynecology. They bear the ultimate responsibility for the medical well-being of their patients. They may also be called "consultants."

Midwives. The general term "midwife," as used in this book, is a state-registered caregiver who has completed four years of vocational education at one of the official midwifery schools, including practice training programs in accredited hospitals and home birth practices. They are regarded as specialists in the supervision of normal pregnancy and delivery. Midwives provide antenatal and postnatal care and supervise normal deliveries independently in primary birth centers or at the woman's home. They are trained in risk assessment and the detection of disease, at which point they will or should seek consultation and transfer the patient. A "clinical midwife" is a postgraduate with two years' additional education and medical training, often to the academic level of a master degree in "advanced midwifery" working exclusively in the hospital.

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Labor room nurses are general nurses with two years' additional training in maternity care. They support women in labor and assist midwives and doctors. Labor room nurses do not perform vaginal examinations or deliveries. Whenever the term "nurse" is used in this book, labor room nurses are meant unless indicated otherwise.

Residents are doctors in training to become a medical specialist. Senior residents are in their final years of training and largely function at a level equal to obstetricians after formal authorization.

Interns are undergraduate medical students performing their clinical rotations.

"Laborist" or "OB-hospitalist" is a new breed of caregiver still in its infancy but spreading fast. The titles refer to medical officers who work exclusively in the hospital, keeping watch over women in labor and performing deliveries. Their role should be compared with that of other and more familiar hospital-based doctors such as emergency room physicians. Confusingly, education and responsibilities vary widely ranging from the level of junior residents to fully certified obstetricians. The titles are, therefore, avoided except in Chapter 25 on professional working relations and organization. It is for laborists/OB-hospitalists to decide how to recognize themselves in this book: either as residents or fully qualified obstetricians.

Family practitioners. Some primary care physicians (general practitioners) still attend births, mainly in the woman's home. Their childbirth services resemble those of community-based midwives. Although they are not specifically mentioned throughout this book for reasons of readability, this group of primary care providers is not forgotten: whenever independent midwives are mentioned, readers may include family practitioners as well.

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Section 1 A wake-up call

Chapter 2 Medical excess in normal childbirth

"Not everything that is faced can be changed, but nothing can be changed until it is faced."
–James Arthur Baldwin

The purpose of professional care during labor and delivery is to ensure that every child is born as healthy as possible while causing the least possible damage to the mother. For the most part, this dual goal was realized during the twentieth century as demonstrated by the sharp reduction of maternal and perinatal mortality. In the past three decades, however, obstetrics has failed to maintain its objectives. The once-declining rate of maternal morbidity and mortality is now on the increase, primarily because of the ever-increasing cesarean birth rate in low-risk pregnancies.[1–5] This is a trend that must be changed.

2.1 The cesarean pandemic

The ideal overall cesarean rate is not known, but on the basis of available databases no noticeable improvement in fetal outcome is observed once cesarean rates rise above 10–15%.[6] By now, however, the cesarean birth rate in all developed countries far exceeds these target figures.[7] In the USA, for instance, one in three babies is currently delivered by cesarean section, but the US rates of cerebral palsy and perinatal mortality have remained steady over the past decades.[8–10] The "cesarean problem" that first seemed to be an American affliction is now international. In the last two decades, there has been a 100% increase in cesarean births in England, and the cesarean birth rate continues to climb.[11] The cesarean rates in urban Brazil and China even rocketed to 47% and 60%.[7]

The increase in cesarean delivery-related maternal morbidity and mortality rates, without any evidence of improvement in overall fetal outcomes, is indicative of the failure of current childbirth methods.

Liability concerns regarding uterine rupture have effectively sliced VBAC-rates (Vaginal Birth After Cesarean) worldwide, and the old adage "once a cesarean, always a cesarean" again prevails in many nations.[12] Relatively low overall cesarean rates in the Netherlands and the Scandinavian countries are largely explained by relatively high VBAC rates whereas, there too, about one in four first pregnancies ends with a cesarean delivery.[13]

2.1.1 Operative solutions for failed labors

The cesarean pandemic is not the result of standard elective surgery for indications such as breech presentations, multiple pregnancies, or severely compromised pregnancies, since they represent only a small minority of all births. Neither do emergency interventions, to rescue babies from neurological damage or death, explain the rising cesarean rates. The overall US cesarean rate for "fetal distress" has remained stable between 3.8% and 4.2%.[14,15] The alarming observation is that the vast majority of cesarean deliveries today are performed as the easy-exit strategy for disorders in the first (dilatation) stage of labors in healthy women with a single term fetus in the cephalic presentation – the precise group presumed to be low risk. Predictably, fetal outcome in this group has not improved at all during the past three decades despite this trend.[1–7]

There is a growing tendency to resolve the problems of first-stage labor by surgical intervention.

The American College of Obstetricians and Gynecologists (ACOG) identified dystocia or failure to progress as the primary impetus for the startling expansion of cesarean deliveries, in particular in first labors.[16] These failed labors and related repeat operations in next pregnancies account for two-thirds of all cesarean deliveries in the USA.[8,16] National statistics

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from all other countries with accurate obstetric records confirm similar trends worldwide. Faced with decreasing VBAC rates, a reduction in the primary cesarean section rate should have a significant effect on the need for subsequent surgical delivery and, therefore, a large impact on the overall cesarean delivery rate.[8] Clearly, when trying to reduce undue cesarean rates one should focus on the supervision of low-risk first labors. That is precisely the emphasis of this book (Sections 2 and 3).

Failure to progress accounts for the majority of cesarean deliveries in first labors and, by inference, for the largest proportion of repeat procedures.

A detailed discussion regarding the recent trend of elective (planned) cesareans for no reason other than the patient's request falls outside the scope of this book. Nonetheless, such requests must be considered in the overall context of current practice in which the woman – upon denial of her request – has a very high chance of a cesarean or an instrument-assisted vaginal delivery anyhow. In fact, most demands for elective cesarean relate to a previous traumatic labor experience or discouraging horror stories from others. Indeed, the overall cesarean rate is effectively determined – directly and indirectly – by the women-friendly conduct and care of first labors.

Cesarean delivery reduction programs, to be effective and safe, should primarily focus on the conduct and care of low-risk first labors.

2.2 Instrumental delivery rates

With rising cesarean rates, fewer women reach the second (expulsion) stage of labor, and the rates of instrumental vaginal deliveries should, therefore, decline. However, this has not always happened. Many hospitals with high cesarean rates also have high operative vaginal delivery rates.[17,18] The main indication is second-stage arrest. A forceps or vacuum delivery is not a trivial intervention either as it is particularly damaging to a woman's pelvic floor, potentially risky, and certainly painful for her child.[19] Instrumental vaginal delivery is worryingly associated with serious perinatal birth injuries.[19–21]

First-time mothers-to-be (nulliparas) face the highest risks of operative delivery. Even if a nullipara manages to escape the major surgery of a cesarean, she still has a 25% chance of an instrument-assisted vaginal delivery, in most cases for failure to progress.[19–21] Of course, these are average figures as the rates vary greatly among hospitals and even among practitioners in the same institution. Overall, however, less than half of all women in western countries deliver their first babies spontaneously by the normal route nowadays. There are only two possible explanations: either modern women are no longer capable of normal childbirth or modern childbirth services fail.

Currently, less than half of all first-time mothers in western countries give birth via the normal route without surgical or instrumental intervention.

2.3 Conceptual flaws

High intervention rates in childbirth are often attributed to the supposedly changing needs of childbearing women and their babies. Some authors suggest a causal association between increasing maternal age and weight and dysfunctional labor.[22–30] In reality, however, the predominant contributors to excessive operative delivery rates more likely relate directly to the caregivers and reflect birth philosophies, culture, organization, the degree to which doctors are paid on a "piecework" basis, their propensity for convenience and control, the extent to which malpractice litigation is feared, and so forth. It is impossible to express the relative impact of each of these factors in absolute numbers, but they all contribute to current obstetric performance. The literature addressing these topics is extensive but mostly vague, and it generally misses the point: the spiraling operative delivery rates actually reflect a progressive lack of understanding of the labor process and, consequently, declining labor and delivery skills of today's birth professionals.

The majority of problems surrounding childbirth can be attributed to the widespread lack of a consistent and cohesive policy framework for the supervision of normal labor.

2.3.1 Professional controversies

Professional birth care should be based on an astute comprehension of the fundamental processes of parturition such as the cervical and myometrial changes in late pregnancy, the onset of labor, the pattern of

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normal dilatation, and the length of normal labor. Although nature designed a biological blueprint for labor and delivery – fine-tuned over millions of years of evolution – knowledge and appreciation of the basic biophysical processes controlling birth vary significantly among care providers. As a result, professional views range from understanding childbirth as a natural process, best supervised with the least possible interference, to the emphasis being placed on risks – leading to highly medicalized "management" of labor. This diversity in birth philosophies and practices echoes differences in opinion or lack of scientific knowledge, and the inexorable rise in failed labors seriously calls into question whether midwives and obstetricians still operate from valid concepts of childbirth, if from any concept at all.

Professional conduct and care of labor and delivery should be based on solid, scientific knowledge of the physiology of parturition.

2.4 Counting the costs

The high failure rate of normal labor and delivery is more detrimental than meets the eye and includes severe psychological and physical harm to women, and adverse neonatal outcomes, as well as serious economic and social damage.

2.4.1 Psychological harm

Ideally, women experience childbirth as an empowering and ultimately gratifying event in which the care providers are allowed to partake. Unfortunately, practice shows that many women do not achieve this rewarding scenario, in particular not for their first labor. Apart from the physical burden of a stalled labor that ends in a forceps, vacuum, or cesarean delivery, the woman may sustain substantial emotional damage owing to a feeling of frustration and failure. An operative delivery denies her the unique experience of giving birth to her child by her own efforts as well as the sense of accomplishment from which she could gain further self-esteem and self-confidence. The harsh reality of daily practice is that current birth care turns many a birth into an ordeal.

In the worst-case scenario, the parturient ends up in a deplorable condition; after a whole day or more of exhausting labor, she undergoes abdominal surgery or a difficult instrumental extraction. The psychological damage from such a poorly managed labor can be worse than the emotional impact of an emergency cesarean for acute fetal distress: a lasting aversion to all things related to birth maintained by recurring nightmares and complicated by feelings of inadequacy and even conscious or subconscious feelings of hostility toward her child.

The emotional impact of women's labor experience remains a matter of common but underrated concern.

The prevalence and severity of these life-lasting effects are strongly underestimated as they mainly develop outside the field of vision of childbirth professionals. Too many women, estimated between 9 and 20%, experience labor and delivery as a genuinely traumatic event.[31–37] Approximately 3% of all women develop a full-blown chronic post-traumatic stress disorder (PTSD) following childbirth, and an additional 22 to 40% experience some post-traumatic stress symptoms.[31–37] About half the women with childbirth-related PTSD also suffer postpartum depression.[33,36,38,39] Importantly, the prevalence of PTSD (symptoms) is reportedly much higher after intrapartum cesarean section and instrumental delivery.[34,38] Usually, PTSD following childbirth is not self-limiting and impairs mother–child bonding, affects the intimate partner relationship, and gives rise to severe fear of childbirth in a subsequent pregnancy, all too often leading to a request for an elective cesarean section.[35,39–44]

Childbirth-related depression and PTSD are chronic conditions permeating throughout a woman's lifetime.

2.4.2 Direct physical harm

Although cesarean section is safer than ever before, it remains major abdominal surgery, and the direct risks are far from negligible. The short-term complications, such as excessive blood loss, infectious morbidity, thromboembolic complications, longer recovery time, extended hospital stay, and the chance of rehospitalization are all too well understood.[2,16,45–50] Moreover, the baseline morbidity associated with cesarean section rockets in obese women, and obesity is another epidemic disease of modern times.[51]

Less well known is that the overall maternal mortality rate for cesarean section is nearly five

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times greater than that for planned vaginal birth (relative risk [RR] = 4.9; 95% confidence interval [CI] = 3.0–8.0), and the maternal death rate has been slowly but steadily increasing in western countries since the 1980s.[47] The need for emergency hysterectomies has also increased: in about 1 per 200 cesarean deliveries as compared with 1 per 1000 vaginal deliveries.[48,49,52,53] More than 40% of postpartum hysterectomies for massive hemorrhaging follow cesarean delivery.

Spiraling cesarean delivery rates hugely increase severe maternal morbidity.

2.4.3 Long-term medical harm

The negative implications of a cesarean section for future childbirth are the most alarming although generally underrated. Firstly, the risk of unexplained stillbirth in women with a cesarean scar is doubled,[54] and secondly, up to 90% of American pregnant women with a previous cesarean undergo a repeat operation for fear of uterine rupture.[10] Many US hospitals have banned VBACs. Inevitably, the more first cesarean deliveries performed today, the more repeat cesareans will be necessary tomorrow.

The most distressing are the uterine scar-related complications as a result of placental implantation in the lower uterine segment with placenta previa, accreta, or even percreta, leading to massive hemorrhaging. In effect, 2–3% of pregnant women with a cesarean scar – regardless of whether they are scheduled for elective cesarean or a vaginal birth – require massive blood transfusions, embolization therapy, or extensive surgery including emergency hysterectomies and post-treatment intensive care as a result of life-threatening uterine rupture or massive bleeding from the placental implantation site.[2,55–60] Too many women suffer severe harm or even die because of these catastrophic complications in pregnancies that follow an unnecessary primary (first-time) cesarean delivery. These secondary harms are, in fact, primarily iatrogenic.

The initial cesarean delivery is associated with increasing maternal morbidity and mortality, but the downstream effects are even greater because of the relatively higher risks from repeat cesareans in future pregnancies.

Other unforeseen harm includes lifelong discomfort and pain from adhesions, scar endometriosis, or nerve entrapment in the abdominal wall. The amount of attention given to these late complications is inversely proportional to the gravity of long-term patient burden. The same holds for adhesions related difficulties in abdominal surgery many years later. In survey-studies on cesarean-related morbidity, these late sequelae are usually underreported or undetected altogether.

2.4.4 Increased neonatal mortality

In the past, it was assumed that babies were delivered by cesarean because they were medically at risk, thereby explaining the higher infant and neonatal mortality rates typically associated with cesarean births. However, research of the US Centers for Disease Control and Prevention, analyzing over 5.7 million live births and nearly 12 000 infant deaths over a four-year period in the USA, suggested that the mechanism of cesarean birth itself poses a risk of neonatal mortality.[61] The study showed that for mothers at low risk, neonatal mortality rates are nearly three times higher among infants delivered by cesarean (1.77 per 1000 live births) than for those delivered vaginally (0.62 per 1000 live births). The increased risk for neonatal mortality related to cesarean delivery persisted even after adjustment for sociodemographic and medical risk factors. The authors concluded: “Timely cesareans in response to medical conditions have proved to be life-saving for countless babies. At present, we are witnessing a different phenomenon: a nearly threefold increased risk for neonatal mortality in low-risk infants following cesarean birth with no formal medical indication.” The overall rate of babies delivered by cesarean among women with no indication save women’s request more than doubled in the USA and UK in the last decade. Although neonatal mortality rate for this low-risk group remains low – regardless of delivery method – unnecessary cesarean births might inadvertently put more babies at risk for neonatal morbidity and mortality.

Unbridled expansion of cesarean births in low-risk infants inadvertently increases neonatal morbidity and mortality.

2.4.5 Neonatal and long-term morbidity

No single scientific report indicates that newborns profit from cesarean delivery after an uneventful

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pregnancy. On the contrary, planned cesarean in uncomplicated pregnancies is associated with a threefold increase of short-term neonatal respiratory morbidity – necessitating admission to advanced care nurseries – compared with a trial of labor (RR 3.58, 95% CI 3.35–3.58).[62] Levine *et al*. also found a fivefold greater risk of persistent pulmonary hypertension for elective cesarean than for vaginal deliveries.[63] Older literature suggested that neonatal pulmonary hypertension, respiratory distress, and transient tachypnea in elective cesarean deliveries are the exclusive result of iatrogenic prematurity.[64] However, the evidence from well-dated pregnancies shows otherwise.[62] Labor itself benefits the newborn owing to less respiratory morbidity and mortality. Labor induces the release of fetal catecholamines and prostaglandins that promote lung surfactant secretion. In addition, epinephrine (adrenaline) release during labor and the physical compression of the fetal thorax help to remove fetal lung fluid and facilitate postnatal lung adaptation.[65] Moreover, babies born spontaneously are spared the potentially harmful effects of maternal anesthetic medication, such as analgesics and vasopressors, and of standard prophylactic antibiotics.

A beneficial effect of vaginal birth might also hold true for other aspects of later health, as birth by cesarean is associated with a higher incidence of allergic diseases, obesity, and diabetes, possibly or probably related to an altered neonatal bacterial colonization of the skin and gut influencing the immune system.[66–72] Even an association between cesarean birth and the chance of developing psychosis in later life has been suggested, possibly due to an altered perinatal adjustment of the dopamine metabolism.[73]

There is no evidence whatsoever to indicate that elective cesarean after an uncomplicated pregnancy is of any benefit for babies. Rather, the reverse is true.

2.4.6 Economic damage

Cesarean section has now achieved the dubious distinction of being the most frequently performed inpatient operation of any category. In the USA alone, more than 1.2 million cesareans are performed each year, relegating hysterectomy – not without a tinge of irony – into a lower place in the surgical league tables.[74,75] A systematic review of health economic studies demonstrated that cesarean delivery costs a health service at least 3 to 5 times more than vaginal delivery.[76] This accounts for the direct expenses only, not those resulting from related repeat procedures and complications in subsequent pregnancies. Nearly a quarter of all US hospital stays are related to pregnancy and childbirth, but most people do not realize what a big chunk of hospital care that is: it involves approximately 4 million women and their babies each year in the USA alone. Cesarean deliveries cost more than $16 billion in the USA alone each year. Consumer watchdog group Public Citizen estimated that at least half of these are unnecessary and result in 1.1 million extra hospital days. Soon the costs of the cesarean pandemic will become unsustainable. Clearly, uncritical use of cesarean deliveries is a huge waste of resources, both financial and professional, and to the detriment of those who really need medical attention.

The billions of dollars spent worldwide on "unnecesareans" are an inexcusable assault on increasingly limited healthcare budgets.

2.4.7 Prejudice of future reproduction

Cesarean section undermines fertility.[77] A Scottish study followed over 25 000 women who had their first single child – multiple births were excluded. Women who had delivered their firstborn by cesarean were 9% less likely to conceive again compared with those who had a spontaneous natural delivery (66.9% versus 73.9%).[78] It was concluded either that women were avoiding second pregnancy because of the negative experience of cesarean delivery or that the surgery itself directly affected fertility. The latter surely plays a role because women who have undergone cesarean section are more likely to suffer an ectopic pregnancy, with 9.5 occurring per 1000 pregnancies compared with women after spontaneous delivery, who suffer 5.7 per 1000 pregnancies.

2.4.8 Social damage

The social effects of obstetric excess are also disturbing. WHO consultant and male feminist Marsden Wagner, an influential and outspoken critic of medicalized childbirth, was intentionally provocative but essentially correct when he wrote: "[A] woman giving birth is a human being, not a machine and just a container for making babies. Showing women – half

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of all people – that they are inferior and inadequate by taking away their power to give birth is a tragedy for all society." He concluded: "Respecting the woman as an important and valuable human being and making certain that the woman's experience while giving birth is fulfilling and empowering is not just a nice extra, it is absolutely essential as it makes the woman strong and therefore makes society strong."[79]

2.4.9 Dangerous export

Perhaps the most tragic result of the trend toward surgery-oriented obstetrics is its widespread export to underdeveloped countries from which so many graduates are trained in American and European institutes. In the developing world, a uterine scar is a far more dangerous condition than in the western world, and extremely limited healthcare resources could be utilized far more wisely.

2.4.10 Declining overall quality of childbirth

Since most surgical interventions are performed to resolve problems of labor in low-risk pregnancies, spontaneous delivery rates are currently the most realistic objective measure of professional labor and delivery skills. By this criterion, the overall standard of maternity care has declined markedly over the last decades. Considering the impressive list of harms inflicted on mothers and the lack of evidence of any benefits for the newborns – rather the opposite is the case – the obstetrical establishment has some pertinent questions to answer about the explosive growth of operative deliveries in low-risk pregnancies and the dissatisfaction of women subjected to their care.

> *Spontaneous delivery rates in low-risk pregnancies are the most realistic measure of the standard of care afforded to mothers.*

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