

## Cascade of interventions: the short and long-term impact on women and babies

There is no doubt that many women's and babies' lives have been saved by the timely intervention of obstetricians and medical technology. Obstetricians are experts in abnormality but, unfortunately, over the last sixty years they have gradually taken over control of maternity care so that the vast majority of women are subjected to unnecessary and avoidable interventions.

A happy, safe, and successful birth is much more likely when women are confident in their ability to birth; have peace and quiet and are attended by people they know; and the midwives need to be confident in their ability to support a woman to birth normally and understand when to encourage her and when to intervene. Sadly, these skills are being lost in the onslaught of medicalised deliveries, often in large, centralised, understaffed, dysfunctional, obstetric units.

The first intervention in childbirth is stepping outside the front door. For the majority of women throughout human history birth has taken place at home, but by 1962 63.3% of women in the UK gave birth in hospital. No evidence was ever produced to support the assertion that hospital was the safest place to birth, and Marjorie Tew's analysis of birth outcomes refuting this was published in 1980 and largely ignored (Tew, 1980). Attitudes changed when The BirthPlace Study was published in 2011, comparing outcomes for 64, 538 low risk women and babies who planned to give birth at home, in a Free-standing Midwifery Unit, an Alongside Midwifery Unit or a Consultant unit in England between April 2008 and April 2010. <http://www.bmj.com/content/343/bmj.d7400>

*The BirthPlace statistics show that the safest place for a fit and healthy woman to give birth is at home or in a free-standing midwifery unit, and their babies were just as safe.*

So, what are the effects of these interventions?

This table shows how those giving birth in an obstetric unit have many more interventions.

### Interventions per 100 Births

Intervention	Obs Unit	Home	FMU	AMU
Spontaneous vertex [normal]	73.8	92.8	90.7	85.9
Augmentation (Induction or acceleration)	23.5	5.4	7.1	10.3
Forceps	6.8	2.1	2.9	4.7
Caesarean	11.1	2.8	3.5	4.4
Ventouse	8.1	2.0	2.7	4.8
3 or 4 deg tears	3.2	1.9	2.3	3.3
Episiotomy	19.3	5.4	8.6	13.1

Source:

[http://www.bmj.com/highwire/markup/595269/expansion?width=1000&height=500&iframe=true&postprocessors=highwire\\_figures%2Chighwire\\_math](http://www.bmj.com/highwire/markup/595269/expansion?width=1000&height=500&iframe=true&postprocessors=highwire_figures%2Chighwire_math)

Those women who gave birth in the obstetric unit had more caesarean sections, more instrumental deliveries, more inductions (augmentation) and fewer normal births.

Following this study, the media focused on the very small number of adverse outcomes (250 out of 64,538 births) rather than the very much worse outcomes for fit and healthy women who gave birth in an obstetric unit. That message has still not been conveyed to women.

### **Induction and augmentation of labour**

- **Induction of labour has an impact on birth experience and the health of women and their babies, and so needs to be clinically justified. It may be less efficient and is usually more painful than spontaneous labour. Epidural analgesia and assisted delivery are more likely to be needed if labour has been induced.'**
- **NICE Quality Standard QS60 – April 2014 <https://www.nice.org.uk/Guidance/QS60>**

Induction or acceleration of labour was introduced in order to help women who truly had prolonged labours. In 1963 Keiron O'Driscoll, Master of the National Maternity Hospital, Dublin developed Active Management of Labour. This was a method introduced to process women through the labour ward as fast as possible. It was the start of the industrialisation of birth. It was developed because obstetricians in Ireland had successfully closed the majority of small community midwifery units resulting in the majority of women having to travel some distances to large centralised obstetric units. At one time Ireland had the dubious reputation for having the largest obstetric unit in Europe (9,000 births a year), sadly England is doing its very best to exceed that (St Mary's Manchester, now has over 10,000 births a year) despite the evidence of worse outcomes for fit and healthy woman and babies in these large obstetric units.

The need to ensure that women spent as little time on the labour ward as possible was sold to them on the grounds that a normal labour would not last more than 36 hours. As the number of admissions increased so the length of time decreased.

### **Length of a normal labour:**

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<b>Year</b>	<b>Length of labour</b>	<b>Number of deliveries</b>
<b>1963</b>	<b>36 hours</b>	
<b>1965</b>		<b>5,063</b>
<b>1968</b>	<b>24 hours</b>	
<b>1972</b>	<b>12 hours</b>	
<b>1981</b>		<b>8,964 (O'Regan M, 1998)</b>
<b>Currently</b>	<b>8 hours</b>	<b>Over 9,000</b>

As time passed, Active Management of Labour was enthusiastically adopted in the majority of high income countries but the propaganda changed from assuring women that they could have a quick labour, (with no mention of how very painful this would be), to stressing the alleged 'risks' of going over the due date.

It is more common now for women to be told that the baby could die if the pregnancy exceeded 40 weeks and now, the latest research, from the United States of America, reports a trend of 'offering' first-time mothers induction at 39 weeks (Grobman W, 2018). Women who are over 35, or who are overweight, are also often pressed into agreeing to an induction at 40 weeks or earlier.

While women are told there is an increased risk they are not told precisely what that risk is.

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- **The Cotzia study (1999) revealed that the risks of an unexplained stillbirth in a singleton pregnancy are:**
  - **At 35 weeks 1 in 500**
  - **36 1 in 556**
  - **37 1 in 645**
  - **38 1 in 730**
  - **39 1 in 840**
  - **40 1 in 926**
  - **41 1 in 826**
  - **41 1 in 769**
  - **43 1 in 633**

A recent a recent randomised trial of elective induction of labour of 6,000 low risk primips at 39 weeks (the Arrive Trial) compared to expectant management to 42 weeks +2 days has encouraged clinicians to consider offering induction at 39 weeks.

Henci Goer (2017) in her excellent critique of this research noted that '*observational studies consistently find that inducing labour in healthy 1<sup>st</sup> time mothers roughly doubles their odds of caesarean.*' Her critique should be read by everyone

<https://www.scienceandsensibility.org/blog/new-henci>

in her critique she highlights the risks of induction, some of which are:

- Uterine rupture in women with an unscarred uterus**
- Severe haemorrhage and idiopathic disseminated intravascular coagulation (blood clots)**
- Amniotic fluid embolism**
- Cord prolapse (because induction frequently involves rupturing membranes).**

A study of 45,000 women who gave birth in Brisbane revealed that they had a lower chance of a normal birth and were more likely to have a caesarean section if they were induced. The outcomes in both groups (induced or not induced) were similar so one can conclude that an emergency caesarean was of no benefit for the women and babies who underwent induction. (Zhao Y et al, 2017)

Another recent study looked at 2851 women having their first baby in Pennsylvania, USA. Those women expecting their first baby, who underwent induction of labour, were found to



and said that they could not possibly return to their countries with such a recommendation. They proposed that it should be amended to 10-15%. I objected on the grounds that if they did that everyone would focus on 15% and not on 10%. I was voted down, and the following statement was agreed: **‘There is no justification in any specific geographic region to have more than 10-15% caesarean section births.’** Since then, 15% figure is commonly quoted. Fortunately, in 2015 WHO amended its statement to reflect the evidence:

- *‘... when the rate [of caesareans] goes above 10%, there is no evidence that mortality rates improve.’ (WHO, 2015).*

WHO has also pointed out that *‘Although it can save lives, caesarean section is often performed without medical need, putting women and their babies at-risk of short and long-term health problems.’* (WHO, 2015).

#### Caesarean section rates, per 100 live births, 2015

<b>Turkey</b>	<b>53.1</b>	
<b>Hungary</b>	<b>37.2</b>	
<b>Poland</b>	<b>36.2</b>	
<b>Italy</b>	<b>35.3</b>	
<b>Portugal</b>	<b>32.3</b>	
<b>Germany</b>	<b>30.2</b>	
<b>Ireland</b>	<b>30.1</b>	
<b>UK</b>	<b>26.2</b>	
<b>Netherlands</b>	<b>15.9</b>	
<b>Finland</b>	<b>15.5</b>	<b>(OECD Indicators, 2017)</b>

The wide range of caesareans is an example of medical abuse. If at least two thirds of men (and in some countries three quarters) were subjected to unnecessary major abdominal surgery (which is what a caesarean operation is) there would be a national outcry about the abuse, the risks, and the waste of money. It is really an international disgrace that these caesarean operation rates are simply accepted and hardly questioned.

Between 1990 and 2013 the maternal mortality ratio for the USA more than doubled from an estimated 12 to 28 maternal deaths per 100,000 births, and about half were preventable (Agrawal P, 2015). In Europe the maternal mortality rate has decreased by almost half between 2000 to 2015, from 33 to 16 deaths per 100 000 live births respectively but in some countries the deaths are not well reported. <http://www.euro.who.int/en/health-topics/Life-stages/maternal-and-newborn-health/data-and-statistics>

A Dutch prospective cohort study found that the incidence of severe acute maternal morbidity was 23 out of 1,000 in the planned caesarean group compared with 6 out of 1,000 of those who had a vaginal delivery. The maternal mortality outcomes were also increased in the caesarean group (9.7 v 6.4). (van Dillen J, et al 2010).

A systematic review of 21 studies across the world, including over 2 million births (Marshall et al, 2011), showed that repeat routine CS causes:

An increase in rates of blood transfusions;

Hysterectomy; surgical injury; and adhesions as the number of caesarean births increase.

*“Women who have a caesarean section have a higher chance of not becoming pregnant again, and a greater chance of future pregnancy complications,”* Sarah Stock, of the University of Edinburgh’s MRC Centre for Reproductive Health.

A study of women who had elective repeat caesarean sections compared with those who had a vaginal birth after a previous caesarean found that elective caesarean sections cost approximately €3,400 (£3,003) more than a vaginal births (Fawcitt CG et al. 2013).

### **The risks of lying on your back for birth:**

It is common, despite the evidence of the problems and damage a prone position causes, that women are still giving birth on their backs. A study of birth position and obstetric anal sphincter damage of 113,279 spontaneous births found that the greatest damage was caused to women who were on their backs. (Elvander C et al, 2015). This position:

- **Reduces the available space for the baby (Gupta JK et al, 2012).**
- **Causes more fetal heart rate abnormalities**
- **Increases the length of labour**
- **Increases the length of the pushing stage (Lavender T et al, 2006).**
- **Increases the use of forceps or ventouse**
- **Increases the use of episiotomies (Gupta JK et al, 2012)**

Those women who adopt an upright position for birth are:

- **Less likely to have a caesarean section**
- **Less likely to have an epidural (Lawrence A et al, 2013)**

### **Postnatal depression**

**The Royal College of Psychiatrists estimates that between 10-15 women per 100 suffer postnatal depression.**

<https://www.rcpsych.ac.uk/healthadvice/problemsdisorders/postnataldepression.aspx>

This estimate is on the low side as it has been suggested that half the women with postnatal depression suffer in silence and do not report it, some because they are fearful that to do so will result in their children being removed by Social Services.

While it has been recognised that many women suffer postnatal depression after childbirth it was not until the late 1970s during the enthusiasm for Active Management of Labour that we began to see women who were severely traumatised by their birth experiences. The women suffered flashbacks, nightmares, out of body experiences, and were deeply traumatised. We were accustomed to helping women with post-natal depression, but these women’s experiences were far beyond that. We did not have a name for it but, over time, following the recognition of post-traumatic stress that returning soldiers suffered, this label was then applied to women following childbirth.

Very little research has been done into post-traumatic stress, women were often told to be 'grateful that you have a lovely baby', or that they had imagined it, and when the staff examined the records they often could not see anything different from a standard hospital delivery. The long-term impact of these traumas can only be surmised because there is little or no research about it, but we do know that: marriages have broken up; women have decided never to have another baby; and as the data on maternal suicide is not collected beyond one year we can only surmise how many more women have taken their lives because they could not live with the trauma any longer, they held out as long as they could for the sake of their children.

## **Maternal Death**

The death of a woman in childbirth or in the years following the birth is a terrible tragedy.

Many countries do not collect data on maternal deaths well, and many do not have a rigorous system for investigation. In the UK, between 2002 and 2005, there were ten maternal deaths of ethnic minority women at Northwick Park Hospital. The UK has an effective monitoring system, so the cases of the women who died were eventually investigated and the hospital put under special measures to ensure that such tragedies are avoided in the future.

The same could not be said for Ireland where, between 2011 and 2013, there have been twenty-seven maternal deaths that have been reported. Such deaths are investigated locally by the hospital involved and as a result most of those deaths were not properly investigated as only three of the 27 women had inquests. Despite this appalling statistic the Irish Taoiseach and senior obstetricians were able falsely to claim that '*Ireland is one of the safest places on the planet [to have a baby]*' (Kenny E, 2014).

Because of the flawed nature of local hospitals' internal investigations of maternal deaths, with no proper oversight to prevent cover-up, the Irish Department of Health has now moved to require that there is an independent medical review of all maternal deaths. There is also a government bill before the Irish parliament to make all maternal deaths subject to mandatory inquests, a bill which has been championed by a grass roots movement.

## **Suicide**

In the UK in the Confidential Enquiry into Maternal Deaths (2004) reported that '*suicide was in fact the leading cause of Indirect or Late Indirect maternal death over the whole year following delivery*' (Lewis, 2004). Jean Robinson (Past President of AIMS) and myself lobbied the Confidential Enquiry members for some years to investigate maternal death after childbirth, and to do so up to five years. (Until that time suicides were recorded by method, i.e. hanging, drowning, etc.). It was only after a meeting with Dr Gwyneth Lewis, who was then the Director of the Confidential Enquiry, who really listened to what we were telling her, that the Enquiry examined suicide after childbirth and extended its investigations up to a year after the birth. In fact, we lobbied, and are still lobbying, for the investigations to extend to five years because we know that many women live with the trauma of their births for very much longer than just one year. We understand that there is insufficient funding to take up our request.

***"Maternal suicides have now been reclassified by the World Health Organisation as a direct cause of maternal death. The rate of maternal death by suicide remains unchanged since 2003 and maternal suicides are now the leading cause of direct***

*maternal deaths occurring within a year after the end of pregnancy*" (Knight, M et al, 2016) <https://www.npeu.ox.ac.uk/downloads/files/mbrance-uk/reports/MBRRACE-UK%20Maternal%20Report%202016%20-%20website.pdf>

Maternal death can be a reflection of our dysfunctional maternity services and every country should collect data on maternal deaths for up to at least one year after the birth and, preferably, up to five years after a maternal death.

### **Babies birthed at home**

- *The safest place for a fit and healthy woman to give birth is at home or in a free-standing midwifery unit*

The BirthPlace study revealed that fit and healthy women were safer birthing at home or in a Free-standing Midwifery Unit. There was, however, a slight increased risk to the first baby, the second and subsequent babies were also safe birthing at home.

### **Adverse outcomes for the babies by Place of Birth per 1,000**

	OU	AMU	FMU	Home
• First baby	5	5	5	9
• Second, 3 <sup>rd</sup> or 4 <sup>th</sup>	3	2	3	2

*(Brocklehurst P et al (2011)).*

Taken individually the figures were not large enough to make any meaningful comparison because the numbers of adverse outcomes in each category are too small. The researchers, therefore, had to group together a list of 'adverse outcomes' in order to achieve statistically relevant numbers.

- Intrapartum stillbirth and neonatal death
- neonatal encephalopathy
- meconium aspiration syndrome
- brachial plexus injury
- fractured humerus or clavicle

The risk of an adverse outcome for the first baby was 9.3 per 1,000 for those who planned a home birth and 5.3 per 1,000 for those planning to birth in an obstetric unit.

In total there were 250 such incidents among 64,538 births between April 2008 and 2010.

Unfortunately, the study was not able to follow up the surviving children, who were in the majority, to determine whether or not there were any long-term health issues.

### **Babies born by caesarean section**

#### **Risks to babies born by caesarean:**

- **26% more likely to suffer childhood asthma**
- **36% increase in obesity in their first 5 years**
- **Slower to develop literacy and numeracy skills**
- **20% increase risk of childhood onset type 1 diabetes**

- **After 1 caesarean there is an increased risk of spontaneous preterm birth for the next baby**

Babies born by caesarean sections also experience health problems, for example, they are more likely to suffer childhood asthma than those born vaginally. The odds of obesity in their first five years are increased. (Blustein J and Liu J (2015).

A University of Melbourne study found that children born by caesarean section were slower to develop literacy and numeracy skills than those born by vaginal delivery. (Polidano C et al 2017)

A meta-analysis by Cardwell et al (2008) demonstrated a 20% increase in the risk of childhood-onset type 1 diabetes after Caesarean section delivery that cannot be explained by known confounders.

Women with caesareans have an increased risk of spontaneous preterm birth for their next baby. (Levine LD et al, 2015).

***“Women who have a caesarean section have a higher chance of not becoming pregnant again, and a greater chance of future pregnancy complications,” Sarah Stock, of the University of Edinburgh’s MRC Centre for Reproductive Health.***

Sarah Wickham (2014) commented in her excellent blog:

***"We might consider that [the research] teaches us that awaiting spontaneous labour while in the care of an obstetrician may increase the risk of being advised to have a caesarean section, which may or may not have been genuinely warranted."***

**<http://www.sarawickham.com/articles-2/does-induction-really-reduce-the-likelihood-of-caesarean-section/>**

## **Ultrasound**

The most insidious intervention of all is ultrasound. It has enabled doctors to find out more and more about the baby in the womb, bypassing the need to ask the woman for her own observations and experiences. Modern ultrasound scanners have become so complex that it is almost impossible for anyone other than a specialised laboratory or the original manufacturer to determine the actual output of the equipment.

In a review of the safety of ultrasound Bello and Ekele (2012) pointed out that it took 65 years to identify the risks of X-rays. We are still waiting for the research to investigate properly the potential risks of ultrasound.

### **Slide:**

***‘there are, for example, no epidemiological studies concerned with the use of pulsed Doppler techniques. .... the FDA decided to pass the responsibility for safe management to the user. Manufacturers are now able to use higher exposures than before, provided that the equipment displays “safety indices”.’***

Ter Haar G, Ed. (2012).

And, as Ter Haar has said, they do not know how to measure the ‘dose’ the baby actually receives.

### **‘Keepsake’ ultrasound scans**

It was only when women started to hire their own ultrasound scanner that the medical profession issued a warning suggesting that ultrasound may not be safe, but couched it in terms suggesting that it is safe in ‘professional’ hands. The doctors were concerned when women were paying to have 3D picture of their babies in the womb – but they were hampered in their criticism because they had assured women that ultrasound was safe.

In 2006 the State of California passed a Bill prohibiting the sale of diagnostic ultrasound equipment to anyone other than licensed clinicians. *‘This bill is an important first step in protecting parents, perhaps unaware of potentially harmful effects of misuse of ultrasound technology, from placing their unborn children at risk.’* (James Borsted Am College of Radiology, 2006)

The implication that ultrasound is safe in professional hands is called into doubt by a paper published by Houston et al., (2011) who found that

**‘only 10.9% of residents and 22.7% of fellows use output display standards during ultrasound examinations and up to 39% freely use Doppler ultrasound at all stages of pregnancy.’**

There are hundreds and thousands of research papers on ultrasound, but only a handful have looked at the possible long-term implications of its widespread use. As time has passed the machines have become more powerful and more commonly used. As a result,

**one cannot tell whether any potential long-term effects have been caused by:**

**the output of the machine;  
the type of machine being used;  
the length of time the baby was exposed;  
the type of ultrasound being used;  
a particular time in the pregnancy;  
the number of exposures;  
or the effects of heating on the developing cells.**

When transvaginal ultrasound is used and not through the abdominal wall, the baby gets a bigger dose, but women are not told this.

While there are research papers that do raise questions about safety, the current machines are much more powerful so it cannot be assumed that the research results using one particular type of machine is necessarily applicable to the machine being used by obstetricians and midwives currently. Had ultrasound been properly researched right from the beginning there would now be answers to the question ‘What are the long-term effects of ultrasound?’ As it is, we do not know, but we do know that it is unethical to claim that ultrasound is safe. One of the problems is that even the first study showing abnormality (increase in non-right handedness) the researchers could not find a totally unexposed population for comparison. A prospective randomised trial is now being done in India on a population that has not had

access before. In many instances, the information obtained through using ultrasound will make no difference anyway, but in other instances it can have serious consequences. For example:

**Mis-diagnosis.** Women being told a due date which they know to be wrong and having to argue throughout their pregnancy; babies that have been aborted for abnormality when there were none; women have had unnecessary caesarean operations because they had been told that their babies were too large, or too small, to be born safely, when in fact their babies were an average weight. Ultrasound scans, especially in late pregnancy should not be relied upon in terms of babies' sizes. A retrospective observational study by Bajracharya J, et al (2012) found that *'significant error was seen while estimating fetal weight by ultrasound. Depending only on the fetal ultrasound for the estimation of fetal weight can lead to unnecessary obstetrical intervention.'*

Ultrasound may be reassuring to many but to others it can be a source of real anxiety.

In a study in Finland (Saari-Kemppainen et al, 1990) of 4,000 women who were scanned at 16-20 weeks, about 250 were diagnosed as having "placenta praevia". When it came to birth there were only 4 placenta praevias – and one of those had not been diagnosed. So, 246 women had presumably been worried unnecessarily and thought they might need a caesarean section. Women are still told they have placenta praevia far too early, and then spend their pregnancies worrying only to find out at 38 weeks that their placenta had moved. This study also revealed 20 miscarriages after 16-20 weeks in the screened group and none in the controls, a fact that was not mentioned in the summary.

I may be alone, but I worry about those women who have had a miscarriage and who are so worried about their next baby that they have frequent ultrasound scans. If the woman miscarries again was it the ultrasound, or was it some other cause?

*'It appears that some caution should be exercised in the first trimester, particularly with the use of Doppler sonography, for which, in any case, clinical indications are not well defined.'* (Abramowicz, 2002)

In 1992 a randomized study of 2,475 women Davies et al reported a fourfold increase in perinatal deaths in babies exposed to routine Doppler ultrasound examination of umbilical and uterine arteries at 19-22 weeks and 32 weeks. (16 vs 4 perinatal deaths of normally formed infants).

A study in 1990 by Taskinen et al found that physiotherapists who used ultrasound for at least 20 hours a week increased significantly their risk of having a spontaneous abortion.

Doppler ultrasound is the most worrying form of ultrasound because it is so powerful, and in a paper drawing attention to current safety standards Barnett and colleagues (2000) commented that:

**'...the FDA allows a relaxation of some intensity limits, specifically approving the use of medical ultrasound devices that can expose the fetus or embryo to nearly eight times the intensity that was previously allowed.'**

This allows over 700% increase in allowable fetal exposure.

Records of ultrasound exposure are incomplete and fragmented, if there is a record it is cursory. AIMS devised an ultrasound consent form.

### **My Baby's Ultrasound Record**

Every mother should keep a record of all drugs and procedures she has had during pregnancy, labour and postnatally. This information could be valuable to your child in the future. Any women having an ultrasound examination should present this form and ask the operator to complete it and put it in the notes, and keep a copy for herself.

### **Animal Studies**

Numerous animal studies have shown adverse effects of ultrasound, for example:

#### **Effects of ultrasound on animals:**

##### **Behavioural differences in Macaque monkeys**

##### **Baby chicks with memory impairment**

##### **Mice and rats with altered brain development.**

In a study of prenatal ultrasound exposure in Macaque monkeys Tarantal et al (1993) found that the babies exposed to ultrasound in the womb sat or lay around the bottom of the cage, whereas the little control monkeys were climbing up the bars and were up to the usual monkey tricks.

A study (Schneider-Kolsky ME et al, 2009) of ultrasound exposure of chicken eggs found that after hatching the exposed chickens had memory impairment. The chicks had an inability to learn in the short-term, intermediate and long-term. The authors conclude that *'extended exposure to pulsed Doppler ultrasound can adversely affect cognitive function in the chick when exposure occurs close to the time of hatch.'*

It is often suggested that research on animals cannot be relevant to humans, in which case, why do the animal studies? Furthermore, a well-designed randomized controlled trial by Newnham JP (1993) revealed a strong association of low birth weight in human babies with ultrasound exposure, and suggested that animal findings may indeed be extrapolated to humans.

Another claim is that the outputs are far higher in the animal studies, but where is the evidence that similar outputs are not being used on human babies, particularly when one considers the increased ultrasound exposure used by 3D and 4D ultrasound imaging and the failure of clinicians to abide by the output display standards?

Furthermore, a study by Salvesen (1993) on children aged 8-9 who had been exposed to ultrasound in the womb found an increase in children who were not right handed. This suggests that ultrasound has an effect on the development of the brain, a finding that has also been found in studies on mice and rats.

### **Subtle effects of ultrasound**

It has been acknowledged that there has been a significant increase in dyslexia, ADHD and such related conditions, although it is recognised that these conditions can occur naturally it

begs the question whether the increase is due to better detection or as a result of ultrasound usage, environmental factors, prescribed medicines, or pollution.

The Health Protection Agency in a report (2010) on the use of ultrasound stated: ‘...very little scientific information is available with which to assess the impact of exposure to ultrasound on the unborn child. Subtle effects have been reported in studies of brain development in small animals, and some studies in humans indicate changes in neurological functions following in utero exposures. While these data are not considered to provide clear evidence of a specific hazard, **the possibility of subtle long-term effects cannot be ruled out. In addition, the evidence on the effects of fetal ultrasound mainly date from some time ago, and used different techniques and lower exposures than are used today: there is little evidence on the safety of modern techniques.**’

It is not known with any certainty what the long-term risks of ultrasound are, and while we continue to use it extensively without any kind of careful monitoring we are unlikely to find out.

Furthermore, one of the problems is that prospective parents, as well as obstetricians, like ultrasound, whereas with induction the effects were unpleasant so women challenged it earlier and tried to avoid it.

## **Conclusions**

Over the last sixty years women have been subjected to a barrage of misinformation reinforcing the claim that hospital is the safest place to give birth and that a medical approach to birth is best. Hundreds and thousands of research papers have been produced, exploring more and more interventions, but very few studies asked the women for their views, instead there are comments, such as: ‘*the intervention was well tolerated.*’ One is left to imagine precisely what ‘*well tolerated*’ means. Importantly, very few studies follow up the outcomes more than a few months.

The interests of obstetric control, and the commercial interests around the promotion of medical equipment, drug and baby milk formula company sales take precedence over the long-term health and well-being of women and babies when health professionals have limited time. The adverse outcomes of avoidable and unnecessary obstetric interventions such as instrumental delivery, caesarean sections, episiotomies, postnatal depression or post-traumatic stress have an effect on the women and their families for the rest of their lives, and each of these interventions can affect a woman’s ability to become pregnant again, to have another baby, to breastfeed successfully; and the worst adverse effect of all - maternal suicide. All of this is trivialised or simply ignored.

It is unacceptable that women are inveigled into birthing in the very place where they are more likely to have a whole range of avoidable damaging interventions. Women need to be able to make informed decisions about whether or not they are prepared to accept these additional risks of birthing in an obstetric unit, risks that may impact the risk of their lives, their future fertility, and the health of any further children yet they are denied information to enable them to do so.

Midwives too are traumatised by over-medicalised birth. They are voting with their feet and, as a result, the majority of large centralised obstetric units are understaffed and dysfunctional. There is a solution which is staring us in the face.

We know from the research that the most successful way to improve the health of mothers and babies, and reduce the interventions and adverse outcomes, is to provide continuity of midwifery care in the community, so that a woman has a midwife she knows and trusts and will have that midwife attend her during the birth. The long-term health of women and babies depend upon it and we ignore this at our peril.

### **Beverley Ann Lawrence Beech**

Childbirth activist, author, and formerly Fellow of the Royal Society of Medicine and past Hon Chair, Association for Improvements in the Maternity Services

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#### References:

Abramowicz JS (2002). Is this hot technology too hot? *Journal of Ultrasound in Medicine*, 21 (12), p1327-1333.

Agrawal P (2015) Maternal mortality and morbidity in the United States of America, Editorial, *Bulletin of the WHO*. 93:135. doi: <http://dx.doi.org/10.2471/BLT.14.148627>

Bajracharya J, Shrestha NS, Karki C (2012). Accuracy of prediction of birth weight by fetal ultrasound, *Kathmandu Univ Med J (KUMJ)*, Apr-Jun;10(38):74-6. PMID:23132481

Barnett SB, Ter Harr GR, Ziskin MC, Rott HD, Duck FA and Maeda K (2000). International recommendaitons and guidelines for the safe use of diagnostic ultrasound in medicine. *Ultrasound Med Biol*, Mar 2000, 26(3), p355-366.

Bello SO and Ekele BA (2012). On the safety of diagnostic ultrasound in pregnancy: Have we handled the available data correctly? *Annals of African Medicine*, Vol 11, No 1, p1-4.

Blustein J and Liu J (2015). Time to consider the risks of caesarean delivery for long term child health, *BMJ*, 350.h2410 : <https://doi.org/10.1136/bmj.h2410>

Brocklehurst P, Hardy P, Hollowell J, Linsell L, Macfarlane, A, McCourt C, Marlow N, Miller A, Newburn M, Petro S, Puddicombe D, Redshaw M, Rowe R, Sandall J, Silverton L and Stewart M. (2011). Perinatal and maternal outcomes by planned place of birth for healthy women with low risk pregnancies: the Birthplace in England national prospective

cohort study. *BMJ*, Vol.343 (No.7840). d7400. ISSN 0959-535X

Cardwell CR, Stene LC, Joner G, Cinek O et al. (2008). Caesarean section is associated with an increase risk of childhood-onset type 1 diabetes mellitus: a meta-analysis of observational studies, *Diabetologia*, 51(5), p726-735.

Cotzias C S et al (1999). Prospective risk of unexplained stillbirth in singleton pregnancies at term: population based analysis, *British Medical Journal*, Vol 319, p287-8.

Davies JA, Gullivan S. Spencer JAD (1992). Randomised controlled Doppler ultrasound screening of placental perfusion during pregnancy, *The Lancet*; ii: p1299-1303

Elvander C, Ahlberg M, Thies-Lagergren L, Cnattingius S and Stephansson O (2015). Birth position and obstetric anal sphincter injury: a population-based study of 113,000 spontaneous births, *BMC Pregnancy Childbirth*, 15: 252. Published online 2015 Oct 9.  
doi: [10.1186/s12884-015-0689-7](https://doi.org/10.1186/s12884-015-0689-7)

Fawsitt CG, Bourke J, Green RA, Everard CM, Murphy A and Lutomski JE (2013). At what price? A cost-effectiveness analysis comparing trial of labour after previous caesarean versus elective repeat caesarean delivery, *Public Library of Science*, ; 8(3): e58577.  
doi: [10.1371/journal.pone.0058577](https://doi.org/10.1371/journal.pone.0058577)

Goer H (2017). Preventive induction of labor: Does Mother Nature Know best? *Science and Sensibility* <https://www.scienceandsensibility.org/blog/new-henci>

Grobman W (2018). Presentation of the research findings of the ARRIVE trial at the SMFM 38th Annual Pregnancy Meeting in Dallas, Texas, on February 1, 2018.  
<https://clinicaltrials.gov/ct2/show/NCT01990612>

Gupta JK, Hofmeyr GJ, Shehmar M (2012). Position in the second stage of labour for women without epidural anaesthesia, *Cochrane Database of Systematic Review*, Issue 5. Art. No.: CD002006. DOI: 10.1002/14651858.CD002006.pub3.

Health Protection Agency, HPA response to the AGNIR report on health effects to ultrasound and infrasound, the Advisory Group on Non-Ionising Radiation (AGNIR), 2 February 2010  
[http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb\\_C/1265028749590](http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1265028749590)

Houston LE, Allsworth J, Macones GA (2011). Ultrasound Is Safe . . . Right?: Resident and maternal-fetal medicine fellow knowledge regarding obstetric ultrasound safety. *J Ultrasound Med*, 30:21-7.

Jiang H, Qian Xu, Carroli G and Garner P (2017). Selective versus routine use of episiotomy for vaginal birth. [Systematic Review] *Cochrane Pregnancy and Childbirth Group*. *Cochrane Database Syst Rev*.2017; doi: 10.1002/14651858.CD000081.pub3.

Kenny E (2014) Taoiseach says Ireland is 'one of the safest places on the planet' to have a baby, quoted in *The Journal* ie. <http://www.thejournal.ie/maternity-services-enda-kenny-1535382-jun2014/> accessed 6 April 2018.

Kjerulff K, Attanasio LB, Edmonds JK et al (2017). Labor induction and cesarean delivery: A prospective cohort study of first births in Pennsylvania, USA. *Birth: Issues in Perinatal Care*. DOI:10.1111/birt.12286

<https://onlinelibrary.wiley.com/doi/abs/10.1111/birt.12286>

Knight M, Nair M, Tuffnell, D, Kenyon S, Shakespeare J, Brocklehurst P and Kurinxyzuk JJ (Eds) (2016). *Saving Lives Improving Mothers' Care*, MBRRACE-UK. December.

Lawrence A, Lewis L, Hofmeyr GJ and Styles C (2013). Maternal positions and mobility during first stage labour, *Cochrane Database Syst Rev*. Aug 20;(8):CD003934. doi:10.1002/14651858.CD003934.pub3

Lavender T, Hofmeyr GI, Neilson JP et al (2006). Caesarean section for non-medical reasons at term., *The Cochrane Database of Systematic Reviews*, issue 3.

Levine LD , Sammel MD, Hirshberg A, Michal A, Elovitz MA and Srinivas SK (2015). Does stage of labor at time of caesarean affect risk of subsequent preterm birth? *Am J Obstet Gynecol*, March, 212(3), 360 .e1-360.e7 Published online 2014 Sep 30 doi: [10.1016/j.ajog.2014.09.035](https://doi.org/10.1016/j.ajog.2014.09.035)

Lewis G (Ed) 2004). *Why Mothers Die 2000-2002, Why Mothers Die 2000-2002, the Sixth report of the Confidential Enquiries into Maternal Deaths in the United Kingdom, Confidential Enquiry into Maternity and Child Health, RCOG.*

Marshall NE, Fu R, Guise J-M (2011). Impact of multiple cesarean deliveries on maternal morbidity: a systematic review, *Am Journal of Obstetrics and Gynecology*, Vol 205, Issue 3, p262.e1-262.e8.

Newnham JP, Evans SF, Michael CA, Stanley FJ, Landau LI (1993). Effects of frequent ultrasound during pregnancy: A randomized controlled trial. *The Lancet*.342:887-91.

OECD (2017), "Caesarean sections", in *Health at a Glance 2017: OECD Indicators*, OECD Publishing, Paris, p183 [http://dx.doi.org/10.1787/health\\_glance-2017-en](http://dx.doi.org/10.1787/health_glance-2017-en)]

O'Regan M (1998). Active Management of Labour – The Irish way of birth, *AIMS Journal*, Vol 10, No2, Summer 1998, p1-8.

Polidano C, Zhu A and Bornstein JC, (2017). The relation between cesarean birth and child cognitive development, *Scientific reports* 78, Article number: 11483. doi:10.1038/s41598-017-10831-y

Saari-Kemppainen A, Karjalainen O, Ylostalo P, Heinonen OP (1990). Ultrasound screening and prenatal mortality; controlled trial of systematic one-stage screening in pregnancy. *The Lancet*, Vol 336, Issue 8712; p387-391. DOI:10.1016/0140-6736(90)91941-3

Salvesen K et al (1993). Routine ultrasonography in utero and subsequent handedness and neurological development. *BMJ* 1993, Vol 307, pp159-164.

Schneider-Kolsky ME, Avobi Z, Lombardo P, Brown D, Kedang B and Gibbs ME et al (2009). Ultrasound exposure of the foetal chick brain: effects on learning and memory. *International Journal of Developmental Neuroscience*, Vol 27, Issue 7, Nov, p677-683.

Sleep J, Grant AM, Garcia J, Elbourne DR, Spencer JAD, Chalmers I (1984). West Berkshire perineal management trial. *BMJ*. 289:587-90.

Sleep J, Grant AM (1987). West Berkshire perineal management trial: Three year follow up. *BMJ*. 295:749-51

Tarantal AF et al. Evaluation of the bioeffects of prenatal ultrasound exposure in the *Cynomolgus Macaque (Macaca fascicularis)*: III Developmental and Mematologic Studies, *Teratology*, 1993, 47: p159-170

Taskinen H et al (1990). Effects of ultrasound, short waves and physical exertion on pregnancy outcome in physiotherapists, *Journal of Epidemiology and Community Health*, 1990, Vol 44, p196-201.

Ter Haar G, Ed. (2012). The safe use of ultrasound in medical diagnosis, British Institute of Radiology, 3<sup>rd</sup> Edition.

Tew M (1980). Is home a safer place? *Health and Social Service Journal*, 89, p702-705.

van Dillen J, Zwart JJ, Schutte J et al. (2010) Severe acute maternal mortality and mode of delivery in the Netherlands. *Acta Obstetrica et Gynecologica Scandinavica* 89: 1460–5

WHO (2015). Caesarean sections should only be performed when medical necessary, Geneva, 10 April 2015. <http://www.who.int/mediacentre/news/releases/2015/caesarean-sections/en/>

Wickham S (2014). Who is most at risk of caesarean? <http://www.sarawickham.com/articles-2/does-induction-really-reduce-the-likelihood-of-caesarean-section/>

Zhao Y, Flatley C and Kumar S (2017). Intrapartum intervention rates and perinatal outcomes following induction of labour compared to expectant management at term from an Australian perinatal centre, *ANZJOG*, Vol 57, Issue 1, p40-48  
<https://doi.org/10.1111/ajo.12576>