MA-10 Pregnancy care without ultrasound: anaemia, malaria, position, danger signs and nutrition

HEALING after the FALL, research library, MA-10

Researched 10 October 2026 by Claude Opus agent for THRIVING after the FALL, Book Four. Library document, unverified.

How to read this report

This report asks what care during pregnancy actually changes, and which parts of it survive without a clinic, a laboratory or a scanner. It builds on the library and does not repeat it. Pre-eclampsia, blood pressure, urine protein, aspirin and calcium are in MA-04. Normal birth, the fetal heart in labour and the referral thresholds are in MA-01. Breech, turning, twins in labour and obstruction are in MA-03. Iron, folate, iodine and vitamin A in general are in HY-08, malaria and its drugs in IN-09, syphilis and urinary infection in IN-14 (THRIVING library, MA-01, MA-03, MA-04, HY-08, IN-09, IN-14). Surgical obstetrics belongs to OR-04 and OR-05.

Method. PubMed, PMC, WHO IRIS and several journals blocked direct reading, so most sources were read as abstracts through Europe PMC, as each reference says. The WHO 2016 antenatal guideline could not be opened and is quoted from secondary sources. Hesperian's A Book for Midwives was read online. Figures resting on a search summary or on my own arithmetic are marked [VERIFY], village choices [OWNER]. Tradition, record and scientific inference are kept apart.

Findings by section

1. What antenatal care changes

Where it came from. Routine care before birth is young. In Edinburgh in 1901, after an appeal by John William Ballantyne, a bed was endowed at the Royal Maternity Hospital for the complications of pregnancy, and the first outpatient antenatal clinic in Britain opened there in 1915 (Royal Society of Edinburgh obituary and Lothian Health Services Archive, search summaries). Clinics spread across Britain in the 1920s and 1930s, yet maternal mortality did not fall until the late 1930s, with the sulphonamides and better obstetric care (Loudon 1992, search summary) [VERIFY: Loudon read only in summary]. A visit is not an intervention. Only what is done at it can save anyone.

The WHO trial. Villar and colleagues randomised 53 clinics in Argentina, Cuba, Saudi Arabia and Thailand to standard care or to a new model that kept only the components known to work. New-model women (12,568) had a median of five visits against eight (11,958 women). Low birthweight was 7.68 against 7.14 per cent, pre-eclampsia 1.69 against 1.38 per cent, severe anaemia after birth 7.59 against 8.67 per cent and treated urinary infection 5.95 against 7.41 per cent, none significantly different. More new-model women were referred onwards (13.4 against 7.3 per cent), and costs did not rise (Villar 2001, abstract).

Second thoughts. The Cochrane review of seven trials and over 60,000 women found that fewer visits did not change preterm birth, small babies or maternal deaths. But in low- and middle-income countries perinatal deaths

rose (risk ratio 1.15, 95% CI 1.01 to 1.32, three trials), and women everywhere were less satisfied (Dowswell 2015, plain-language summary). WHO therefore moved in 2016 to a minimum of eight "contacts": the first before 12 weeks, then at 20, 26, 30, 34, 36, 38 and 40 weeks. A contact can be a home visit or a community session, and women should hold their own notes (de Masi 2017). WHO's release claimed up to 8 fewer perinatal deaths per 1,000 births against four visits (WHO 2016 release, search summary) [VERIFY]. Where malaria is common, programmes add a contact at 13 to 16 weeks to start preventive treatment early (WHO 2016 release, search summary).

Risk scoring fails. In Kakamega County, Kenya, 19,653 women were classed at their first visit, and 64.5 per cent of the maternal deaths and 54.8 per cent of all deaths happened in pregnancies classed as low risk (Cooper 2025). In Matlab, Bangladesh, most women who later had obstructed labour or haemorrhage showed no warning sign in pregnancy, though blood pressure and fundal height did pick out many with hypertension and twins, and women with an antenatal visit were four times as likely to give birth with a midwife (Vanneste 2000, abstract and search summary). Antenatal care therefore saves lives in three ways: specific preventive acts (iron, folate, toxoid, malaria prevention, syphilis treatment), catching the few conditions that show early (high blood pressure, anaemia, twins, a baby lying across), and tying the woman to the person who will attend her birth.

2. Anaemia: finding it without a laboratory

Why it matters. WHO defines anaemia in pregnancy as haemoglobin below 110 g/L, or below 105 g/L in the second trimester (WHO, via BIGG-REC, search summary). In 312,281 women in 29 countries, severe anaemia (below 70 g/L) more than doubled the odds of maternal death (adjusted odds ratio 2.36, 1.60 to 3.48) (Daru 2018, abstract). A woman with little blood has nothing to lose when she bleeds at birth (THRIVING library, MA-02).

Pallor. The tradition everywhere is to look at the inner eyelid, the palm, the nail beds and the tongue. In 480 pregnant women in rural Benin, conjunctival pallor caught 87.5 per cent of severe and 74 per cent of moderate anaemia but almost none of the mild, and two observers agreed only fairly (kappa 0.34) (Fourn and Salami 2004, abstract). Across studies its sensitivity runs from 19 to 97 per cent (Duke-indexed review, search summary). The eye finds the woman in danger and misses the woman drifting towards it.

The haemoglobin colour scale. WHO's card has six printed reds matched to 40, 60, 80, 100, 120 and 140 g/L, compared against a drop of blood on a special absorbent strip. Pooling 14 studies, the scale's sensitivity for anaemia was 80 per cent against 52 per cent for clinical assessment, with specificity about 80 per cent for both, and for severe anaemia it caught 57 per cent with 99.6 per cent specificity (Marn and Critchley 2016, search summary). Paddle found only 46 per cent of 408 readings within 10 g/L of the laboratory and 23 per cent more than 20 g/L away (Paddle 2002, abstract). Tallqvist's paper scale of 1900 was already judged "far from accurate" by 1946 (Tallqvist history, search summary). The scale beats the eye, lasts only as long as its strips, and whether ordinary paper would serve was not found [VERIFY].

Night blindness as a sign. In Nepal, women night-blind in pregnancy had three times the odds of severe anaemia (Christian 1998). In NNIPS-2, 877 of 10,422 pregnant women were night-blind (about 8 per cent, my arithmetic [VERIFY]), and those on placebo died at 3,601 per 100,000 pregnancies, about four times the rate of other women (Christian 2000). "Can you see at dusk?" is a free test for a woman who needs food, iron and vitamin A.

3. Iron, folate, food and worms

Iron and folic acid by tablet. WHO recommends daily iron of 30 to 60 mg elemental with 400 μg folic acid for every pregnant woman. Sixty milligrams of iron is 300 mg ferrous sulfate heptahydrate, 180 mg ferrous fumarate or 500 mg ferrous gluconate (WHO eLENA). The Cochrane review of 61 trials found iron cut anaemia at term by 70 per cent (risk ratio 0.30, 0.19 to 0.46) and iron-deficiency anaemia by two-thirds (0.33). Low birthweight was 8.4 against 10.3 per cent, a borderline result (0.84, 0.69 to 1.03), with no clear effect on preterm birth (0.93), neonatal death (0.91) or maternal death (0.33, 0.01 to 8.19, very low certainty). Women on iron more often had haemoglobin

above 130 g/L, itself linked to poor outcomes (Peña-Rosas 2015, abstract). Iron reliably fixes the blood and probably helps the baby a little. That it saves mothers has not been shown by trial.

Treatment. A woman found anaemic takes 120 mg elemental iron with 400 μg folic acid daily until her haemoglobin is above 110 g/L, then returns to the preventive dose (WHO 2012 and 2016, via BIGG-REC and the WHO SMART guide, search summary). Hesperian gives ferrous sulfate 300 to 325 mg twice a day, about 120 to 130 mg elemental iron [VERIFY: my arithmetic at 20 per cent elemental], rechecking after about four weeks and planning birth at a medical centre if she is still severely anaemic in the ninth month (Hesperian, Check the mother's body). The two sources agree. Black stools, nausea and constipation are common and harmless.

Iron and malaria. The fear that iron feeds malaria was tested in 470 Kenyan women. Sixty milligrams daily did not change infection at birth (50.9 against 52.1 per cent) and raised birthweight by 150 g (95% CI 56 to 244) (Mwangi 2015, abstract). Iron is safe where malaria is common, alongside the prevention in section 4.

Folate before conception. Folic acid prevents most neural tube defects, but the tube closes about four weeks after conception, before most women know they are pregnant (THRIVING library, HY-08). Folate must come from food or tablets in every woman who could conceive, as HY-08 sets out. In malarious areas keep folic acid at 0.4 mg, because 5 mg or more counteracts sulfadoxine-pyrimethamine (WHO IPTp policy brief 2014, search summary).

Iron from food and pots. The absorption rules (vitamin C at the meal, tea away from it, soaking and fermenting) are in HY-08. The iron pot evidence comes from Ethiopian children, whose haemoglobin rose more on food cooked in iron than in aluminium pots (Adish 1999, via secondary summaries and HY-08). I found no published trial in pregnant women: one registered trial shows no results (NCT02341300 registry, search summary), and a Cambodian iron ingot did not help women who were mostly not iron deficient (THRIVING library, HY-08). Iron pots are a sensible household measure but will not by themselves correct an established anaemia in pregnancy [VERIFY: inference].

Hookworm. Between a quarter and a third of pregnant women in sub-Saharan Africa carry hookworm, about 6.9 million in 2005, and heavy infection lowers haemoglobin clearly more than light (standardised mean difference minus 0.57) (Brooker 2008, abstract). Treatment is less impressive than the cause. A single dose in the second trimester may cut maternal anaemia by about 15 per cent (risk ratio 0.85, 0.72 to 1.00, low certainty) and probably makes no difference to low birthweight or perinatal death (1.01) (Salam 2021, search summary). In Peru, mebendazole did not change mean birthweight in 1,042 women taking iron (Larocque 2006, search summary). WHO advises single-dose albendazole 400 mg or mebendazole 500 mg after the first trimester where hookworm or whipworm infects 20 per cent or more and anaemia affects 40 per cent or more of pregnant women (WHO 2017, cited in a Campbell protocol, search summary) [VERIFY: dose from one source only]. Shoes and latrines prevent reinfection, which no tablet does (THRIVING library, HY-04).

Earth-eating. Geophagy is a living practice: up to 84 per cent of pregnant women in some African countries eat clay or earth, and pica affects about 28 per cent of pregnant and postpartum women in a pooled analysis (Njiru review and related reviews, search summary). Women describe the craving as a sign of pregnancy and value certain clays for nausea. The record links it to anaemia, to lead (blood lead 2.1 against 1.4 μg/dL in Johannesburg) and to roundworm (search summary). The craving may itself signal iron deficiency [VERIFY], so a woman who eats earth should be checked for pallor and given iron, without shame.

4. Malaria in pregnancy

What it does. About 25 million pregnant women a year are at risk of falciparum malaria in sub-Saharan Africa, and at birth one in four has parasites in the placenta. Where transmission is stable the infection is often silent, so it goes untreated, and low birthweight from it was estimated to cause about 100,000 infant deaths a year (Desai 2007, search summary). First and second pregnancies carry most of the risk, because immunity to the placental parasite builds

pregnancy by pregnancy (Desai 2007, Gamble 2006). Where transmission is low, malaria in pregnancy is less often silent and more often severe (THRIVING library, IN-09).

Preventive treatment. The Cochrane review of 17 trials and 14,481 women found that drug prevention in first and second pregnancies cut moderate to severe anaemia by 40 per cent (risk ratio 0.60, 0.47 to 0.75), antenatal parasitaemia by 61 per cent (0.39), placental parasitaemia by 46 per cent (0.54) and low birthweight by 27 per cent (0.73), and raised birthweight by 93 g. The trials were too small to show an effect on deaths (Radeva-Petrova 2014, abstract). The current drug is sulfadoxine-pyrimethamine: three tablets of 500 mg and 25 mg as one dose, swallowed in front of the midwife, at each contact from the second trimester, at least a month apart, at least three doses, never in the first trimester (WHO IPTp policy brief 2014, search summary) [VERIFY: dose from one source only].

Nets. In first to fourth pregnancies in Africa, treated nets cut low birthweight (risk ratio 0.77, 0.61 to 0.98) and fetal loss (0.67, 0.47 to 0.97), with no effect after four births (Gamble 2006, Cochrane summary). An intact untreated net still gives about half the protection, and mending is the work (THRIVING library, IN-09).

A village without the drug. I found no trial of any plant or food as a substitute for preventive treatment in pregnancy. What the village can do is what works without it. Every pregnant woman sleeps under an intact net from the first missed period, first and second pregnancies first when nets are short. The eaves of her house are closed (THRIVING library, IN-09). Every fever in pregnancy in malaria season goes to the healer the same day [VERIFY: inference from IN-09 red flags]. Iron and folate at 0.4 mg continue. A district holding a drug should give it to first and second pregnancies before others (Radeva-Petrova 2014). Where vivax is the parasite, one Thai trial of weekly chloroquine prevented almost all vivax infection in pregnancy (risk ratio 0.01) (Radeva-Petrova 2014, abstract) [OWNER: whether to spend chloroquine this way]. Treatment of malaria in pregnancy, quinine hypoglycaemia and the first-trimester use of artemether-lumefantrine are in IN-09. Artemisia tea is not a preventive (THRIVING library, IN-09).

5. Syphilis, tetanus, urine and blood pressure

Syphilis. One injection of 2.4 million units of benzathine penicillin prevents about 97 per cent of congenital syphilis, and the Herxheimer reaction in pregnancy must not stop treatment (Blencowe 2011, via THRIVING library, IN-14). After the Fall the obstacle is the test. Without one, a previous stillbirth, a genital sore or a rash on palms and soles are the clues left. Whether a district with penicillin treats every pregnant woman untested, or only those with a clue, is a decision about stock and allergy risk [OWNER].

Tetanus toxoid. Two or more doses given to the mother cut deaths from newborn tetanus by an estimated 94 per cent (95% CI 80 to 98), from one trial and one cohort study (Blencowe 2010, abstract). Untreated newborn tetanus is close to always fatal (THRIVING library, IN-01). For a woman with no record, WHO gives a first dose at first contact, a second at least four weeks later and at least two weeks before birth, a third at least six months after that, then a fourth and fifth a year apart (WHO schedule in an AJOG 2021 table and a WHO-derived training module, search summaries). Toxoid cannot be made in a village or a district. It must be stocked cold, and once it is gone the clean cord is the whole defence (THRIVING library, HY-01).

Urine. Treating silent bacteriuria cuts kidney infection about fourfold (THRIVING library, IN-14), but without dipsticks it cannot be found. Protein can still be found with heat and vinegar (THRIVING library, MA-04). Burning, fever and flank pain are the signs left.

Blood pressure. Thresholds, aspirin and calcium are in MA-04. In Matlab, a blood pressure reading was one of the few antenatal checks that picked out women who later needed help (Vanneste 2000, search summary). A cuff is the most valuable instrument a village midwife can hold.

6. The hands and the ear: dating, growth, position, heartbeat and twins

Dating. Without a scan, the due date comes from the first day of the last period plus 280 days, Naegele's rule [VERIFY: standard rule, not checked against a source]. In 42,803 women in six low- and middle-income countries, dating by last period differed from early ultrasound by under a week on average, but classed about four more births in every hundred as preterm (Patel 2023, abstract). The last period fails in women who are breastfeeding, bleed irregularly or cannot recall, which after the Fall is many. Quickening came at a mean of 18 to 19 weeks in first pregnancies and 16 to 18 in later ones, varying with the site of the placenta (Gillieson 1984, abstract). The spread was not reported, so quickening dates a pregnancy to within about a month at best [VERIFY: inference]. Hesperian gives the landmarks: the womb just above the pubic bone at three months, at the navel at about five, almost to the ribs at eight and a half to nine, growing about two finger widths a month, with births two to three weeks either side of the due date (Hesperian, Check the baby). Combining the period, quickening and the first measurement, then rechecking after two to four weeks, is the best a village can do.

Fundal height by tape. From the navel onwards, the distance from the top of the pubic bone to the top of the womb in centimetres is close to the weeks of pregnancy. Hesperian expects 22 to 26 cm at 24 weeks and growth of about 1 cm a week (Hesperian, Check the baby). The INTERGROWTH-21st standards, from 4,239 well-dated women in eight countries, put the median at 20 cm at 20 weeks, 24 at 24, 27.5 at 28, 31.5 at 32, 35 at 36 and 38 at 40, with the 3rd and 97th centiles about 3 to 4 cm either side. Even in ideal conditions one observer's repeat measurements varied by about 1.5 cm, and sensitivity for a small baby ranges from 17 to 93 per cent across studies (Papageorghiou 2016). The only randomised trial, 1,639 Danish women, found no difference in small babies or perinatal deaths between tape and hand palpation (Robert Peter 2015, search summary of Lindhard 1990), and WHO advises settings that use palpation not to switch (WHO 2016 recommendation B.2.2, search summary). For a village the tape's value is the trend. Too large suggests twins, too much fluid or wrong dates. Too small, or no growth between visits, suggests poor growth, high blood pressure, too little fluid or a dead baby (Hesperian, Check the baby).

Leopold's manoeuvres. Christian Gerhard Leopold of Dresden described four grips to find the lie and presentation in 1894 (Leopold biography, search summary) [VERIFY: original paper not read]. Their accuracy depends on the hands. Thorp and colleagues found 28 per cent sensitivity for a baby not lying head-down, with a kappa of 0.13 (Thorp 1991, abstract). Experienced nurse-midwives examining 150 women reached 88 per cent sensitivity and 94 per cent specificity (Lydon-Rochelle 1993, abstract). In an Australian audit of 1,070 term breeches, a fifth were first found in labour, and of these 64 per cent ended in emergency caesarean and 1.4 per cent in cord prolapse (Nassar 2006, abstract). Breech is common at 32 weeks (about 15 per cent) and uncommon at term (about 4 per cent) (Lydon-Rochelle 1993), so the check that matters is at 36 weeks, when there is still time for turning and for planning the birth (THRIVING library, MA-03). Hesperian adds a free check: ask where she feels the strong kicks, usually the legs (Hesperian, Check the baby).

The heart by ear. Kergaradec described the fetal heart heard through Laennec's stethoscope in 1821 or 1822, and Pinard's horn of 1895 became the midwife's instrument (histories of fetal auscultation, search summaries). Hesperian listens at every visit from five months for a full minute, gives 120 to 160 as normal, below 100 or above 180 as needing help, and warns that a rate equal to the mother's pulse is her own heart (Hesperian, Check the baby). WHO uses 110 to 160 in labour (THRIVING library, MA-01). Teaching texts say the horn first hears the heart at about 18 to 20 weeks, against 10 to 12 for a Doppler, but these are not studies [VERIFY]. Before labour the ear confirms the baby is alive and supports the hands: loudest below the navel suggests head-down, above it breech (Hesperian, Check the baby). In labour a Doppler finds abnormal rates more reliably than a Pinard (Mahomed 1994, search summary).

Twins. Twins are more than three times as likely to die as single babies (THRIVING library, MA-03). At Korle Bu hospital in Accra, 181 of 806 twin births (22 per cent) were not known before delivery, mostly in women with little antenatal care, and these had more complications (Obed 2000, abstract). In a British series of 1975 to 1978 about one set in ten was unknown when labour began, and some series reported up to 29 per cent undiagnosed (BMJ 1979, search summary). The signs are a womb larger than the dates, two heads or two bottoms, many small parts, and two

heartbeats counted at the same time by two listeners with different rates (Hesperian, Check the baby). At the birth, feel for another baby before any drug to contract the womb (THRIVING library, MA-03).

7. The danger signs the woman must know

The midwife sees a woman for an hour a month. The woman sees herself all the time, so the danger signs are her part of antenatal care. From Hesperian, MA-01 and MA-04 they are: bleeding from the vagina, a severe headache or blurred or flashing vision, fits, a swollen face or hands, pain high in the belly, fever, waters leaking before labour, the baby moving less or not at all, and severe belly pain or fainting (Hesperian, Check the mother's body and Check the baby, THRIVING library, MA-01 and MA-04). I could not read WHO's own list in its essential-practice guide [VERIFY].

Knowledge is low even with clinics. In rural Uganda only 52 per cent of 764 recently delivered women could name one key danger sign of pregnancy. Almost half knew of severe bleeding, 8.7 per cent of swollen hands or face and 1.6 per cent of blurred vision, and 19 per cent knew three signs across pregnancy, birth and after (Kabakyenga 2011).

Reduced movements need honesty. Formal kick-counting has not been shown to prevent stillbirth in a review of 71,458 women (Mangesi 2015, abstract). The AFFIRM trial, a package of care for reduced movements across 409,175 British pregnancies, did not reduce stillbirth (4.40 against 4.06 per 1,000, adjusted odds ratio 0.90, 0.75 to 1.07) and raised induction and caesarean (Norman 2018, abstract) [VERIFY: the rise in interventions not confirmed from the full text]. WHO allows daily counting only in research (WHO 2016, search summary). Yet a baby still for a day may be dying or dead, and the midwife who knows can listen for the heart and prepare the woman. The honest advice: know your baby's usual pattern, and come the same day if it changes.

8. Nutrition

Energy and protein. Ceesay and colleagues gave undernourished women in 28 Gambian villages groundnut biscuits of 4.3 MJ a day, about 1,000 kcal [VERIFY: my conversion], for about 20 weeks before birth, against the same after birth in controls. Birthweight rose by 136 g over the year, 201 g in the hungry season (June to October) and 94 g at harvest. Low birthweight fell (odds ratio 0.61), stillbirth halved (0.47, 0.23 to 0.99) and first-week deaths fell (0.54), with no change after a week (Ceesay 1997, abstract). The Cochrane review agrees: balanced energy and protein supplements cut stillbirth (risk ratio 0.60, 0.39 to 0.94) and small-for-dates babies (0.79) and raised birthweight by 41 g, while high-protein supplements increased small-for-dates babies (1.58, 1.03 to 2.41) (Ota 2015, abstract). Feeding a hungry pregnant woman more ordinary food saves babies, most of all in the hungry season. Protein concentrates do not, and may harm.

Calcium and iodine. Calcium of at least 500 mg a day, from milk, bony fish, greens or prepared eggshell, is in MA-04. Iodine failure in pregnancy cannot be undone. In Papua New Guinea's Jimi valley, mothers given saline bore 26 cretins in 534 births against 7 in 498 after iodised oil (Pharoah 1971, via THRIVING library, HY-08). Pregnancy needs 220 to 250 μg a day, and iodised salt or measured seaweed must reach girls before they conceive (THRIVING library, HY-08).

Vitamin A: Nepal against Ghana and Bangladesh. In NNIPS-2 in Nepal, 44,646 women took weekly vitamin A (7,000 μg retinol equivalents), beta-carotene or placebo. Among 22,189 pregnancies, pregnancy-related deaths were 704 per 100,000 on placebo, 426 on vitamin A and 361 on beta-carotene, a combined fall of 44 per cent (relative risk 0.56) (West 1999, abstract). It did not replicate. In Ghana, ObaapaVitA's weekly 25,000 IU gave 348 against 377 deaths per 100,000 (adjusted odds ratio 0.92, 0.73 to 1.17) (Kirkwood 2010, abstract). In Bangladesh, JiVitA-1 repeated the Nepal design in 125,257 women: 206 deaths per 100,000 on placebo against 237 on vitamin A (relative risk 1.15) (West 2011, abstract). One positive trial and two larger null ones. WHO now recommends vitamin A in pregnancy only where deficiency is severe, to prevent night blindness, not to save lives (WHO 2016, via BIGG-REC,

search summary). Nepal's result may reflect unusually severe deficiency (Christian 2000). The village answer is food, with night blindness as the sign of need.

Too much vitamin A. In 22,748 American pregnancies, women taking more than 10,000 IU a day of supplemental vitamin A had 4.8 times the rate of defects derived from the cranial neural crest, about one affected baby in 57 such mothers (Rothman 1995, abstract). A 68 g slice of beef liver carries about 6,420 µg, roughly 21,000 IU (THRIVING library, HY-08, my conversion [VERIFY]). Once a week it is close to the Nepal weekly dose. Every day in early pregnancy it passes Rothman's threshold [VERIFY: my arithmetic, and food may act differently from supplements].

9. Nausea, herbs and food rules

Ginger. Ginger, the rhizome of *Zingiber officinale* Roscoe, is used for nausea from China and India to the Caribbean, as tea, fresh, candied or dried. In a Thai trial of 70 women, 1 g a day for four days improved nausea in 28 of 32 against 10 of 35 on placebo and reduced vomiting (Vutyavanich 2001, abstract). A review of 12 trials and 1,278 women found ginger improved nausea but not clearly vomiting, with doses below 1,500 mg favoured (Viljoen 2014, search summary). The two dose sources agree. In 68,522 Norwegian pregnancies, the 1,020 women who used ginger had no more malformations, stillbirths, preterm births or small babies (Heitmann 2013, abstract). WHO lists ginger, chamomile, vitamin B6 and acupuncture as acceptable for nausea (WHO 2016, via BIGG-REC). The cultivated rhizome has few lookalikes, but ornamental "ginger lilies" (*Alpinia* and *Hedychium*) are different plants and no substitute [VERIFY: not checked in a toxicology source].

Blue cohosh. *Caulophyllum thalictroides* (L.) Michx., root, is used in North American herbal midwifery to start labour. A newborn whose mother took it was born with a heart attack and severe heart failure (Jones and Lawson 1998, abstract). A perinatal stroke was later reported, and a Canadian review found three such cases and advised extreme caution (Finkel and Zarlengo 2004 and Canadian review, search summaries). Case reports do not prove cause, but with no proven benefit it has no place in the village. Its lookalike danger runs the other way: black cohosh (*Actaea racemosa*) is a different plant often confused with it in trade [VERIFY].

Raspberry leaf. *Rubus idaeus* L., leaf, is the traditional "womb tonic" of British and American midwifery. In 192 first-time mothers taking 2.4 g a day from 32 weeks, it did not shorten the first stage, shortened the second by about 10 minutes and went with fewer forceps births (19.3 against 30.4 per cent), with no harm seen (Simpson 2001, abstract). The abstract does not report these as significant [VERIFY]. Weak evidence of little effect, probably safe.

Food rules on their own terms. Almost every people has rules for what a pregnant woman eats. In Ethiopia women avoid milk, some fruits, green leaves, meat and honey, saying the food will make the baby too big to be born or will stick to it (Gebregziabher 2023). About a third of pregnant women in pooled Ethiopian studies kept a taboo, three to four times more often without antenatal care or in rural areas (Debela 2023, abstract). In rural Bangladesh three-quarters of women ate less in early pregnancy, a fifth citing the baby's size (Harding 2017, search summary). The logic is not foolish. Where obstructed labour kills, as MA-03 shows, a smaller baby is a real hope, and a cross-cultural analysis tied such taboos to the fear of a big baby (PeerJ 2022, search summary). But I found no study showing that eating down reduces obstructed labour, while extra food in the Gambia halved stillbirths (Ceesay 1997). The midwife should not mock the rule but explain that the baby gains less than the mother loses [VERIFY: inference]. Rules that remove meat, eggs, milk or greens are the ones to argue against. Rules against raw meat, unboiled milk and alcohol are on the side of the evidence.

Evidence grades

Practice	Tradition says	Record shows	Grade
Fewer visits (5 against 8)	n/a	Mothers unchanged, perinatal deaths up 15 per cent in poorer countries	A
Risk scoring	Finds the women at risk	Most deaths in women classed low risk	B (fails)
Pallor of eyelid and palm	Pale means thin blood	Finds severe, misses mild	B
Haemoglobin colour scale	n/a	80 per cent sensitive and specific, wide error	A (diagnostic)
Iron 30 to 60 mg with folic acid 0.4 mg	Liver, iron water	Anaemia at term down 70 per cent	A
Iron 120 mg for anaemia	n/a	WHO and Hesperian agree	B
Folate before conception	n/a	Neural tube defects down about 70 per cent	A
Iron pots in pregnancy	Old practice	Child trial positive, no pregnancy trial	B children, D pregnancy
Deworming after first trimester	n/a	Anaemia down about 15 per cent, no birth effect	A (small)
Preventive malaria drugs	n/a	Severe anaemia down 40, low birthweight down 27 per cent	A
Nets in pregnancy	n/a	Low birthweight down 23, fetal loss down 33 per cent	A
Penicillin for syphilis	n/a	Congenital syphilis down 97 per cent	B
Tetanus toxoid, two doses	n/a	Newborn tetanus deaths down 94 per cent	B
Fundal height by tape	Hand measure	No better than palpation	A (null)
Leopold's manoeuvres	Hands find the baby	28 to 88 per cent sensitive by skill	B
Formal kick-counting	n/a	No fall in stillbirth	A (null)
Balanced energy and protein	Eat for two, or eat less	Stillbirth down 40 per cent	A
High-protein supplement	n/a	More small babies	X
Vitamin A for maternal survival	Liver for the eyes	Nepal positive, Ghana and Bangladesh null	X survival, B night blindness
Vitamin A above 10,000 IU a day	n/a	Birth defects 4.8 times	X
Ginger for nausea	Pan-cultural	Nausea better, safe in cohort	A
Raspberry leaf	Womb tonic	First stage unchanged	D
Blue cohosh	Brings on labour	Newborn heart failure and stroke reports	X
Eating down	Small baby, easy birth	More food cuts stillbirth	X
Earth-eating	Craving of pregnancy	Linked to anaemia and lead	D, harm likely

Means ledger

Rung	Examination	Anaemia	Malaria	Infections and vaccines	Nutrition
Hands	Dates by period and quickening, height by fingers, Leopold grips, danger signs taught	Eyelids, palms, dusk vision, ask about earth-eating	Net every night, fever seen the same day	Clean birth taught	Eat more in the hungry season, argue against harmful taboos
Hearth	Wooden horn, a watch or sand-glass	Iron pot, vitamin C with meals, tea away from them	Mend nets, close eaves	Boiled water, clean cord	Pulses and greens daily, ginger tea, eggs
Garden and still	Cloth tape marked in cm, the card	Sprouting, fermenting, liver weekly	Screened sleeping room	Heat and vinegar for protein	Groundnuts and oil, eggshell calcium
Village dispensary of 300	Cuff, Pinard, register, a midwife at five to eight contacts	Iron and folic acid tablets, colour scale while strips last, albendazole	Treated nets while stock lasts	Penicillin, toxoid while stock lasts	Iodised salt or measured seaweed
District infirmary of 3,000	Microscope, second opinion, turning by the trained	Haemoglobin by any surviving meter, severe anaemia treated	Microscopy, preventive drug for first pregnancies, severe malaria treated	Syphilis test if reagents exist, cold store for toxoid	Food reserve for the hungry season
Hospital before the Fall	Ultrasound dates, growth, position, twins	Laboratory haemoglobin, intravenous iron, transfusion	Rapid tests, IPTp, artemisinins	Universal screening	Supplements on prescription

Most of the measurable benefit sits at the dispensary rung, because iron, folate, toxoid, penicillin, nets and the cuff are the components with trial evidence. Ultrasound adds accurate dates and certain twins, but its effect on deaths in low-risk women was not searched here [VERIFY].

Harm test

Iron tablets. Iron is a leading poison of small children. Toxicity begins at 20 to 60 mg per kg and death at 180 to 250 mg per kg (THRIVING library, HY-08). For a 10 kg toddler that is four to ten 60 mg tablets to poison and about 30 to 40 to kill [VERIFY: my arithmetic]. In the United States, after unit-dose packaging and warnings were required in 1997 for products of 30 mg or more, child iron deaths fell from 29 to 1 across comparable periods, though coatings changed at the same time (Tenenbein 2005, search summary). Keep iron in a closed tin out of reach and dispense a week at a time [OWNER]. Poisoning shows as vomiting, diarrhoea, black or bloody stools, then drowsiness. Haemoglobin above 130 g/L on iron is a reason to stop (Peña-Rosas 2015).

Folic acid. Keep to 0.4 mg in malarious areas, because 5 mg blunts sulfadoxine-pyrimethamine (WHO IPTp policy

brief 2014).

Vitamin A. Above 10,000 IU a day of supplement in early pregnancy causes birth defects (Rothman 1995). Daily liver in the first three months is unsafe, and the 200,000 IU child capsules are never for a pregnant woman [VERIFY: inference from the threshold].

Deworming and sulfadoxine-pyrimethamine. Neither in the first trimester. Sulfadoxine-pyrimethamine not with 5 mg folic acid and not with cotrimoxazole, and sulfa drugs can cause severe skin reactions [VERIFY: not read in this search].

Penicillin. Anaphylaxis is rare, and the Herxheimer reaction can bring contractions. Keep adrenaline at hand (THRIVING library, IN-14).

Examination. Never examine inside the vagina when there is bleeding in late pregnancy, because a low-lying placenta can bleed torrentially (THRIVING library, MA-01). Turning a breech carries serious complications in about 1 in 400 attempts (THRIVING library, MA-03).

False reassurance. The great harm of care without tests is the "all normal" card. A normal height and a heard heartbeat do not exclude a small baby, twins or malaria.

Herbs. Blue cohosh never. Raspberry leaf, if used, only from 32 weeks as in the trial. Ginger up to about 1 g dried a day, as in the trials.

Food rules. Withholding food from a hungry pregnant woman is the harm with the largest measured cost in this report (Ceesay 1997, Ota 2015).

Red flags

Send to the district at once when there is a district.

- Bleeding from the vagina after 20 weeks. Lie her down, do not examine inside, send her. If nothing more exists: rest, fluids, someone with her, and the warning that labour may follow.
- Fits, severe headache, blurred vision or pain under the right ribs: MA-04.
- Fever in pregnancy in malaria season, especially with drowsiness or confusion: IN-09.
- Severe anaemia: breathless at rest, pulse over 100, palms with no pink in the creases, or the darkest two shades of the colour scale [VERIFY: the creases sign is common teaching]. Iron at once and a birth where bleeding can be met. If nothing more exists, plan the birth with the most skilled attendant, prepare for bleeding as in MA-02, and tell the family the risk.
- Waters broken before labour, or before 37 weeks: MA-01.
- No movements for a day after 28 weeks, or a heartbeat heard before and not found now. If the baby has died, tell the truth gently, care for her through the birth and give her time with the baby.
- A baby lying across at 37 weeks that cannot be turned: MA-03. A transverse lie cannot be born by itself.
- Twins suspected: two attendants at the birth, at the district if possible [OWNER].
- Fever with flank pain: kidney infection, IN-14.

The case against

Against antenatal care as ritual. Ann Oakley's history argued that antenatal care grew as surveillance before it had evidence (cited in Fox 1991, search summary) [VERIFY: Oakley not read]. Loudon's record shows clinics spreading for two decades without a fall in maternal deaths (Loudon 1992). Risk scoring predicts badly (Cooper 2025). The fair conclusion is not that antenatal care is useless but that its weight sits on a few acts.

Against eight contacts in a village. WHO's eight contacts rest on low-certainty evidence from three cluster trials (Dowswell 2015), and Villar's trial itself showed no harm from five visits (Villar 2001). Eight may cost more midwife

time than the village has [OWNER].

Against the romance of the supplement. Nepal's 44 per cent fall in maternal deaths was widely quoted, and two larger trials found nothing (West 1999, Kirkwood 2010, West 2011). Iron cut anaemia by 70 per cent but has not been shown to save mothers (Peña-Rosas 2015). Deworming moves anaemia a little and birth outcomes not at all (Salam 2021).

Against the romance of the herbal. Blue cohosh is traditional and dangerous, clay-eating traditional and tied to lead, raspberry leaf traditional and nearly without effect. Ginger is the one plant here with trial support, and that support is modest.

Against the romance of the hospital. AFFIRM's hospital package for reduced movements prevented no stillbirths (Norman 2018). What a hospital adds most is the answer to the red flags: blood, theatre and drugs. The antenatal acts that work were mostly cheap and portable all along.

10-line summary

1. A visit saves no one. The specific acts done at it save some.
2. Five visits did as well as eight in the WHO trial, but fewer visits raised perinatal deaths 15 per cent in poorer countries (low certainty).
3. Most deaths happen in women classed as low risk, so every woman needs the danger signs and a birth attendant.
4. Iron 30 to 60 mg with folic acid 0.4 mg cuts anaemia at term by 70 per cent. Anaemia is treated with 120 mg.
5. Folate must start before conception, because the neural tube closes in the first four weeks.
6. Malaria prevention in first and second pregnancies cuts severe anaemia by 40 and low birthweight by 27 per cent. Nets work too.
7. One penicillin injection prevents 97 per cent of congenital syphilis. Two doses of toxoid prevent 94 per cent of newborn tetanus deaths.
8. Hands find a breech 28 to 88 per cent of the time depending on skill. The tape shows a trend, not a diagnosis.
9. Extra ordinary food for hungry women halved stillbirths in the Gambia. Protein concentrates harm.
10. Vitamin A did not save mothers in Ghana or Bangladesh, and above 10,000 IU a day it causes birth defects.

Open questions

- What is the fewest contacts, and at what weeks, that keeps the benefit of eight in a village with one midwife?
- Do iron pots raise haemoglobin in pregnant women? No trial has reported.
- Can a usable colour scale be made from local paper and dyes, and how accurate would it be?
- Should a district with penicillin but no test treat every pregnant woman?
- What replaces sulfadoxine-pyrimethamine for prevention when it is gone? No tested plant exists.
- Does eating down reduce obstructed labour in small women? I found no study.
- How early can a trained ear with a wooden horn reliably hear the fetal heart?

Sources to read in full

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At the bedside after the Fall

Household. The minimum is a woman who knows the danger signs and a family that will carry her when one appears. She eats more, not less, above all in the hungry season. Pulses and greens daily from before conception, something fresh or sour at the same meal, tea away from it, food cooked in an iron pot. She sleeps under a mended net, uses ginger for nausea and nothing to start labour. Needs: an iron pot, a net, a needle, a store of food for the lean months. First failure to expect: she eats less late in pregnancy for fear of a big baby, and nobody argues.

Village of 300. About 9 to 12 pregnancies a year (THRIVING library, MA-04). One trained midwife holds a register and gives every woman a card. She sees each woman at least five and ideally eight times [OWNER], checks blood pressure, pallor, fundal height, position at 36 weeks and the heart, and hands out iron with folic acid by the week. Needs: a cuff, a tape, a Pinard horn, a watch, iron and folic acid in a locked box, toxoid while it lasts, spare nets, and the cards. First failure to expect: visits drift to "she looks fine", the cuff stays in its bag, and the breech is found in labour.

District of 3,000. About 90 to 120 births a year (THRIVING library, MA-04). The district holds what a village sees too rarely to stock: penicillin, sulfadoxine-pyrimethamine or chloroquine as the parasite allows, albendazole, toxoid in a cold store, the colour scale and a microscope. It has one person skilled at turning a breech, and beds where a woman with twins, severe anaemia or a baby lying across can wait for labour. It keeps a hungry-season food reserve with pregnant women first [OWNER]. Needs: a cold box or cool cellar, a supply record, a messenger route to each village. First failure to expect: toxoid and colour-scale strips run out in the second year and nobody planned what replaces them.

Protocols

Protocol 1. The village midwife's schedule

- ☐ Contact 1, as soon as a period is missed, ideally before 12 weeks: history, dates, examination, card opened, iron and folic acid started, toxoid dose 1, net checked.
- ☐ Contact 2, 13 to 16 weeks in malarious areas: first preventive malaria dose if held, deworming if the district advises it.
- ☐ Contact 3, 20 weeks: womb at the navel? Quickening date written. Toxoid dose 2, at least 4 weeks after dose 1.
- ☐ Contact 4, 26 weeks: heart heard, fundal height charted from here.
- ☐ Contacts 5 and 6, 30 and 34 weeks: pallor, blood pressure, growth, twins?
- ☐ Contact 7, 36 weeks: position by hand. Breech or transverse: MA-03. Birth plan made.
- ☐ Contacts 8 and 9, 38 and 40 weeks: blood pressure, heart, movements.
- ☐ If the midwife cannot manage eight: before 16, at 24 to 28, at 32 and at 36 weeks [OWNER].
- ☐ Between contacts the woman comes the same day for any danger sign.

• (Schedule from de Masi 2017 and the WHO release, minimum adapted from Villar 2001.)

Protocol 2. The hand-written antenatal card

The woman keeps her own card (de Masi 2017), on stiff paper or cloth in a sealed pouch. The midwife copies each line into the register.

Front: - Name, village, age. Past pregnancies, births, living children. - Past problems: heavy bleeding, fits, stillbirth, caesarean, baby died in the first week, twins, breech, labour over a day. - First day of last period. Due date (period plus

280 days). Date of first movement. - Toxoid dates, earlier doses. Penicillin allergy. - Danger signs as pictures: blood, a head with lightning, a fit, a hot body, water, a baby with a cross.

Inside, one line per contact: - Date. Weeks. - Blood pressure. Swelling of face or hands. Urine protein if tested. - Pallor (none, some, severe), colour-scale number if held, pulse. - Fundal height in cm, or fingers from the navel. - Lie and presentation from 36 weeks. Heart rate per minute. Movements: yes, less, no. - Fever. - Given: iron (days), folic acid, malaria dose, deworming, toxoid. - Next date. Midwife's mark.

Back: - Birth plan: who attends, where, who carries her, goods set aside, a second attendant if twins. - Growth chart: weeks 20 to 40 along the bottom, cm up the side, a median line from 20 cm at 20 weeks to 38 cm at 40, shaded 3 cm either side (Papageorghiou 2016, simplified [VERIFY: band rounded]).

Protocol 3. The examination at each contact

- ☐ Wash hands. Ask: bleeding, headache, vision, fits, fever, fluid, movements, burning urine, earth-eating, night blindness, foods avoided.
- ☐ Blood pressure seated after 5 minutes' rest. Thresholds and actions: MA-04 Protocol 1.
- ☐ Pallor in daylight: lower eyelid, palm creases, nail beds.
- ☐ Pulse for a full minute. Over 100 at rest: look for anaemia and fever. Temperature 38 °C or more is fever (Hesperian).
- ☐ Weight if a scale exists. More than 2 kg in a week: check for pre-eclampsia (Hesperian).
- ☐ Fundal height, bladder empty, knees bent: tape from the top of the pubic bone to the top of the womb, numbers face down, read once. From 20 to 36 weeks, cm within about 3 of the weeks. Two contacts without growth, or more than 4 cm off: district [VERIFY: simplified from INTERGROWTH centiles].
- ☐ From 36 weeks, four grips: hands at the top of the womb (round and hard, or soft and broad?), down each side (where is the back?), above the pubic bone (what is lowest, does it move?), pressing down to the pelvis (is it entering?). Ask where she feels kicks. Unsure: ask the most experienced person.
- ☐ Heart from 20 to 24 weeks, Pinard on the side of the back, a full minute while feeling the mother's pulse. Normal 110 or 120 to 160. Two different rates counted together: twins.
- ☐ Write it on the card and in the register. Give the next date. Repeat the danger signs.

Protocol 4. Anaemia

- ☐ Every contact: pallor and pulse. Colour scale at contacts 1 and 5 while strips last.
- ☐ Prevention: iron 60 mg elemental with folic acid 0.4 mg daily from first contact to 3 months after birth [VERIFY: the after-birth duration not checked]. 30 mg if stock is short and anaemia uncommon [OWNER].
- ☐ Some pallor, or colour scale 100 or below: iron 120 mg daily (two 60 mg tablets, or ferrous sulfate 300 to 325 mg twice a day) with folic acid 0.4 mg. Recheck in 4 weeks.
- ☐ Severe pallor, scale 60 or below, breathless or pulse over 100: district. Plan the birth with the most skilled attendant and prepare for bleeding (MA-02).
- ☐ Ask about earth-eating, night blindness and worms. Treat fever as Protocol 6.
- ☐ Deworming after the first trimester where the district advises: albendazole 400 mg once or mebendazole 500 mg once.
- ☐ Food: pulses, greens, eggs, meat or fish when there is any. Liver once a week, about 50 to 70 g, never daily in the first three months [VERIFY: my arithmetic].
- ☐ Cook in an iron pot. Fresh fruit, tomato or lemon with the meal. Tea an hour away from meals [VERIFY: interval].
- ☐ Iron tablets in a closed tin, high up, a week at a time.

Protocol 5. Folate before pregnancy

- ☐ Every girl and woman who could conceive eats pulses and greens daily (HY-08).
- ☐ Folic acid 0.4 mg daily if tablets exist, from before conception to 12 weeks.
- ☐ After a baby with a spine or skull defect: 4 mg daily from before the next conception, but not alongside sulfadoxine-pyrimethamine.

Protocol 6. Malaria in pregnancy

- ☐ An intact net every night from the first missed period. First and second pregnancies first when nets are short.
- ☐ Eaves closed. Net checked at every contact.
- ☐ Every fever in malaria season: to the healer the same day, treated as IN-09, with sugar alongside every quinine dose.
- ☐ If sulfadoxine-pyrimethamine is held: three tablets (500 mg and 25 mg each) swallowed in front of the midwife, from 13 to 16 weeks, at each contact at least a month apart, at least three doses. Never in the first trimester. Folic acid stays at 0.4 mg.
- ☐ Vivax areas with chloroquine at the district: weekly prevention is an option [OWNER, dose from IN-09 or a current source].
- ☐ Iron continues.

Protocol 7. Vaccines and infections

- ☐ Toxoid: dose 1 at first contact, dose 2 four weeks later and at least two weeks before birth. In later pregnancies one dose each, to five in a lifetime.
- ☐ Syphilis: test if any test exists. Previous stillbirth, genital sore, or rash on palms and soles: benzathine penicillin 2.4 million units deep into the buttock, adrenaline ready, watch 30 minutes, warn of fever and contractions (IN-14).
- ☐ Burning urine: IN-14. Fever with flank pain is an emergency.

Protocol 8. Food and herbs

- ☐ Each contact: what did you eat yesterday, what are you avoiding, and why?
- ☐ Hungry or thin: one extra meal a day, grain with groundnuts or beans and oil, for the last 20 weeks. In the hungry season she has first claim on the store [OWNER].
- ☐ No protein concentrates or powders.
- ☐ Iodised salt or measured seaweed (HY-08). Calcium as MA-04.
- ☐ Nausea: ginger, about 1 g dried a day as tea, in small doses through the day. Small dry meals.
- ☐ Never blue cohosh. Nothing to start labour. No vitamin A capsules.
- ☐ Argue gently against taboos on meat, eggs, milk and greens. Support taboos on raw meat, unboiled milk and alcohol.

Numbers to carry

- Five visits did as well as eight in the WHO trial. Fewer visits raised perinatal deaths 15 per cent in poorer countries.
- Anaemia below 110 g/L (105 mid-pregnancy). Severe below 70: odds of death 2.4 times.
- Iron 60 mg with folic acid 0.4 mg daily. Anaemia: 120 mg. Anaemia at term down 70 per cent.
- A toddler is poisoned by about four 60 mg tablets and killed by about thirty.
- Malaria prevention in first and second pregnancies: severe anaemia down 40, low birthweight down 27 per cent. Never in the first trimester.

- Toxoid, two doses four weeks apart: 94 per cent fewer newborn tetanus deaths. Penicillin: 97 per cent less congenital syphilis.
- Fundal height in cm about equals weeks: 20 at 20, 35 at 36, 38 at 40.
- Breech: 15 per cent at 32 weeks, 4 per cent at term. Check at 36 weeks.
- Fetal heart 110 to 160 a minute, counted for a full minute.
- Vitamin A never above 10,000 IU a day. Extra food in the hungry season halved stillbirths.

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