

# Four things that might surprise you

Dr Elizabeth McCarthy  
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“Transfusion medicine is part of women's health. ”



**Transcribed directly from MOGCAST Episode 17. Listen here:**

**<https://open.spotify.com/show/6dtXQ6jLjAli7lHtP71cYe?si=7671224caacc4f4a>**

Hello and welcome to Women's Health. My name is Dr. Elizabeth McCarthy. I often answer to Liz, and I'm the Academic Coordinator for the Women's Health rotation of PCP3A.

I'm pleased to add to your snack box podcast by presenting information on four things which might surprise you in women's health because they're a little bit different from other aspects of the MD course. Even if they aren't complete surprises to you, I hope you'll find them interesting. I will talk about one test, one medical treatment, one surgical technique and a short history behind the Cochrane Collaboration logo and how this reminds me about the importance of linking scientific evidence with medical practice.

So first, a test called blood group and antibodies. You will hear this phrase a lot in antenatal clinic and other settings where pregnant women attend for scheduled or urgent medical care. So what does it mean? It is a slightly colloquial phrase, but first the blood group part.

You probably aren't surprised. You probably understand that this relates to type of red cells. You might know your own blood group. It's abbreviated by the ABO system and the Rhesus system. Of the ABO, O is the most common followed by A, then B, then AB. Of the Rhesus system, there are C, D and E antigens and antigens meaning markers on the red cell membrane. D is the most common and also most biologically active. So, if you, like me, have a O positive blood group, it means my red cells don't have any A or B markers and they do have a capital D marker.

Second, the blood group and antibodies, as a single phrase, is actually an abbreviated way of saying blood group and red cell antibodies. By that I mean we aren't asking the poor lab technician to test for any of thousands of antibodies or do immunoglobulin subclasses. We are specifically asking the lab to assess if there are antibodies floating around in the patient's serum which react with red cells. We're looking for anti-A, anti-B, anti-D and many, many others. And you don't have to write down the whole list. The technician in the blood bank has a protocol and will look for several dozen antibodies.

So, most women get a negative result. That's good news. It means the patient doesn't have antibodies against red cells. Some women will get a weak positive anti-D result. In that case, ask the patient if she's had an injection of anti-D in the last month, and this will usually explain where the anti-D came from. But any positive antibody screen should be discussed with an obstetric registrar or consultant. The other names used for the red cell antibody test can be group and screen or indirect Coombs test. I don't know who Dr. Coombs was, sorry. The indirect means that the technician is looking for antibodies which are freely floating in the plasma, not attached to red cells.

So why is a blood group and antibody test important in pregnancy and birth care? First, it is an important step for safe transfusion practice. If we need to give a patient red cells, they need to be matched as closely as possible between donor and recipient. It is dangerous and counterproductive to infuse donated red cells into a patient who has pre-formed antibodies against that type of red cells. The cells will dissolve, that is haemolyse and much worse.

Transfusion medicine is part of women's health in various situations including postpartum haemorrhage, in complex surgery for gynaecological cancers and even in extreme iron deficiency related to heavy menstrual bleeding.

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“In placement you will be involved in preventing anti-D Rhesus isoimmunization in pregnant and postpartum women. ”

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The second reason why it is important to assess for the presence of red cell antibodies in pregnancy is that the fetus can have a different red blood cell type from their mother and antibodies cross the placenta in pregnancy. If these antibodies help fight COVID or pertussis or other infection, the fetus benefits. If antibodies haemolyse red cells, that's a problem called haemolytic disease of the fetus and newborn. There's a lecture about this and in placement you will be involved in preventing anti-D Rhesus isoimmunization in pregnant and postpartum women. So that's a bit about a test you might not have seen ordered much before you get to women's health rotation.

Now consider a treatment, magnesium sulfate. It's a naturally occurring mineral. You might have put magnesium sulfate into steaming bath water as Epsom salts after you've run a marathon. The WHO classifies magnesium sulfate as an essential medicine to maternity care because it saves women's life when given intravenously or intramuscularly to stop or prevent seizures of the type called eclampsia. So, look out for where magnesium sulfate is used in high dependency care in obstetrics. It's used for women with severe preeclampsia, that is high blood pressure and multi-organ disease characterized by widespread endothelial dysfunction.

I don't know how magnesium sulfate works but I do know that compared with placebo it prevents repeated eclamptic seizures and saves women's lives. It has a range of effects including vasodilatation, stabilizing platelets, promoting quieter and dampening excitatory neurotransmitters, regulating the blood-brain barrier. Maybe the neuroscientists among you can explain it more effectively. I know it's not used for other seizure disorders, just for eclampsia. So, you'll learn more about preeclampsia in a webinar and during your placement.

And you probably already know about other seizure disorders such as epilepsy. 1% of the adult population live with epilepsy. Maybe you do, maybe you know people. About half of people with epilepsy are women and many of these women wish to have a family. Now they aren't at any excess risk of eclampsia, it's different. And people living with epilepsy can have healthy pregnancies. And there is more in the webinar and tutorials about how to make pregnancy, birth and parenting a safe and satisfying experience for women who live with epilepsy. These women sometimes change medications as part of pregnancy preparation, but I'm absolutely sure magnesium sulfate does not work for routine epilepsy management.

So, I've discussed a test which might be new to you and a medical treatment which might be new to you. My third snack box reflection relates to surgical techniques to close the uterine incision at caesarean section after the baby's been born, remember that's second stage, and after the placenta has been born, remember that's third stage.

So, I remember seeing this as a medical student. Once the baby and placenta were delivered, I remember thinking, there's blood everywhere, I can't see anything. The obstetrician behaved as if this was normal. They asked the scrub nurse for the uterine suture, please, and was handed what I thought looked like rope with a giant half-circle needle and they cobbled up the uterus while the assistant used a sucker and some packs to mop up the bloody mess. Within a minute or so, I could see again with the uterus stitched back together. This seems so different from laparoscopy or cataract surgery or other operations I'd seen. In these, the surgeons handled delicate tissues, dabbed at spots of blood, and asked for sutures such as a 10-0.

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I understood that the higher the number, the finer the thread, and at the caesarean, the obstetrician used 1-0, quite different. So how can rope and speed work to stop uterine incision bleeding at caesarean?

Firstly, myometrium, like other tissues, responds to pressure, so quickly bringing the incision edges together under pressure does a lot on the haemostatic front. Sometimes the obstetrician will place mattress sutures or figure of eight sutures on particularly forthcoming venous sinuses or arterial branches. But normal physiology also helps. The myometrium is a living ligature. By this, I mean that the muscle fibers are arranged net-like around vessels. Once the baby and the placenta are born, the uterus contracts down on the newly empty cavity. This tends to compress vessels within the myometrium and staunch the bleeding. And this process happens at caesarean section just as it does after vaginal birth. The anaesthetist will also give a medicine colloquially called ‘third stage.’ This is an oxytocic which supplements the woman's natural oxytocin and gives a more reliable third stage uterine contraction.

So, when you are there as a student and you see a lot of blood at caesarean section, please pay attention and follow instructions. You might be asked to direct a sucker or retract the abdominal wall so the obstetrician can keep up their suturing momentum. Now if you feel faint, you won't be the first. Please say how you're feeling and step away from the operation and put your head lower than your heart. But if you don't feel faint, pause and reflect on the awesome vascularity of the pregnant woman. That hemochorial placenta is an amazing thing.

Right, I've talked about a test, medical treatment, surgical techniques. Now I'd finally like to reflect on the Cochrane logo and what this means for evidence-based medicine and improving health for women and babies. Look, I acknowledge a podcast isn't usually used to discuss visual communication, but I like a challenge. If you haven't done this before, find a Cochrane logo that you can look at. But don't do this while driving. Defer it till you've stopped the car.

Okay, on the logo you'll see two C's. The one on the left is in the normal orientation and its mirror image is on the right as you look at it. CC means Cochrane Collaboration. The two C's make up a globe-shaped circle and it reminds us that research is global. It particularly reminds me that childbirth is universal and that we're striving to make childbirth safe for all women and all babies.

Within the C's is a forest plot. Its trunk is a vertical line like that of a conifer. Statistically this is the line of null effect. The branches are horizontal lines of various lengths centred, sometimes to the left or to the right or the middle of the trunk. The lowermost line is shortest and has the largest central tendency blob. Some people call a forest plot a blobbogram. So, it's this bottom branch that is the summary effect from multiple individual studies and it's a shorter length because it has a narrow confidence interval because it has more sample points contributing by the method of meta-analysis.

So, the forest plot in the Cochrane logo is a famous one. It shows an intervention which reduces perinatal death. That is, it saves babies' lives. It's really core to what we're doing in women's health. It's actually figure 1.1 of the meta-analysis titled antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth. So, women in the intervention arm receive steroids, mainly intramuscular, short course, high dose, mainly betamethasone and women in the control arm either received a placebo or usual care.

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And the women didn't directly benefit. You know, they complained about the injection sometimes. But the steroids were of a dose and a type which meant the medication could and did cross the placenta and turn on fetal genes for surfactant production. Surfactant is the phospholipid which meant that these babies' alveoli, their lung sacs, would be better placed to expand and be ready for air breathing even though birth was anticipated to occur at less than 34 weeks gestation.

So perinatal research historically has been at the forefront of research collaboration, of choosing methods at low risk of bias such as RCTs and applying treatments in thoughtful patient-centered approaches. Look out for lots more examples in women's health of how evidence supports practice. Find links between your Monday MDR research subject learning and your clinical placements Tuesday to Friday or even on weekends.

So that's the end of my podcast on four things that might or might not surprise you in women's health. A test, a medical treatment, a surgical treatment and a reflection on history and evidence-based medicine.

I hope you enjoy this rotation and look forward to seeing you in clinics and on the wards.