Suspected pulmonary embolism (PE) in pregnant women

What is a pulmonary embolus?
A deep vein thrombosis (DVT) is a blood clot that forms in one of the deep veins of the leg. If the clot moves to the lung, it is called a pulmonary embolus or embolism (PE).

What symptoms might I have with a DVT or a PE?
A DVT causes swelling, pain and skin reddening in the leg, most commonly below the knee in the calf.

A PE can cause:
• sudden unexplained difficulty in breathing
• tightness in the chest or chest pain
• coughing up blood
• an increased heart rate or palpitations.

How common is a PE and why is it important to diagnose?
Women have a five times increased risk of developing a PE both during pregnancy and for up to six weeks after delivery. Although rare, it can be life-threatening and is one of the commonest causes of maternal death in pregnancy.

If your doctor is concerned that you might have a PE, it is very important that you have tests to confirm this diagnosis. It is important to know about a PE before you go into labour, for future contraceptive choices and in planning further pregnancies.

Just because you have some or all of the symptoms listed above does not mean you have a PE. A normal pregnancy or other problems such as a chest infection or a collapsed lung can also cause similar symptoms.

What tests will I need to make the diagnosis?
If there is concern you might have a PE, the doctors looking after you will take advice from a consultant radiologist about which tests you should have and in which order. They could include:
• chest x-ray
• Doppler ultrasound scan of the legs
• lung perfusion scan (Q scan)
• CT pulmonary angiogram (CTPA).
It is usual to have more than one test to reach a diagnosis. Some of these tests will expose you and your baby to radiation.

**What is radiation?**  
Radiation is a form of energy which we are exposed to on a daily basis from the world around us. This energy is called background radiation. For example, when we go on an aeroplane we are exposed to a higher amount of radiation than when we walk around on the ground. It can be helpful to understand how much radiation we are exposed to during some of tests listed below by calculating the equivalent background radiation dose, eg, chest x-ray is the equivalent of three days background radiation or a four-hour flight.

The radiation doses you will be exposed to will be kept as low as possible. You will be asked to wear a lead apron for the chest x-ray and the CT pulmonary angiogram. This will reduce the amount of radiation that reaches your baby.

**What happens when I have these tests?**

- **Chest x-ray**  
  This is a low dose test for you and your baby to check that your symptoms are not due to a collapsed lung, broken rib or chest infection.

- **Doppler scan of legs**  
  This is the same type of scan used to monitor your baby during pregnancy. It looks for blood clots in the leg (a DVT). If this scan detects a DVT, no further tests are usually necessary. There is no radiation involved.

- **Lung perfusion scan**  
  You will have injection of a radioactive substance into a vein in your arm and be asked to lie on a table for approximately 30 minutes. This test checks for clots in the blood vessels in the lungs, but cannot assess for any other causes of your symptoms. It is normally not suitable for you if you have an abnormal chest x-ray, asthma or any other lung disease.

- **CT pulmonary angiogram**  
  This is a specialised x-ray of the chest. You will be asked to lie on the scanner table and will have an injection of dye into a vein in your arm at the same time as a CT scan of your chest is being performed. It normally takes about 10 minutes. The dye contains a substance called iodine, which helps to show up blood clots in the arteries in the lungs. This test can diagnose other abnormalities, not just pulmonary emboli. It cannot be done if you have an iodine allergy or have had an allergic reaction to a previous x-ray contrast injection.
If you are currently pregnant:
Perfusion scan
The radioactive substance in the injection is removed from the body in the urine. For 24 hours after this test it is important to drink extra fluids and pass urine frequently. As your bladder, which contains the radioactive urine, is next to the baby in the pelvis, the radiation exposure to the baby will reduce by drinking more fluids and passing urine more frequently.

CT pulmonary angiogram
All new babies routinely have a blood test called a Newborn Bloodspot Screening Test 5-8 days after birth, which checks the baby’s thyroid function. If the result is abnormal, a copy of the blood test report will be forwarded to your GP and a consultant paediatrician. There is a very small risk that the iodine in the x-ray contrast injection could temporarily affect the baby’s thyroid function.

If your baby has an abnormal thyroid function test result, it is important to tell the doctors looking after your baby that you have had this x-ray contrast injection when you were pregnant. After this scan your GP will receive a letter telling him/her that you have had this injection and a copy will also be sent to you to keep.

If you have delivered and are breastfeeding:
Perfusion scan
Breastfeeding:
• at least one feed should be expressed and stored before the scan and your baby should be breastfed immediately before the scan
• 3-4 hours after the scan you should express as much milk as possible and throw it away. You should continue to do this regularly for 12 hours after the scan. Your baby must not be breastfed during this period because your milk is radioactive. During this period you should feed your baby with milk stored prior to the scan or with formula.

Holding your baby:
During this 12 hour period after the scan you should avoid prolonged contact with your baby. If possible your partner, a relative or a midwife/nurse should feed your baby. This is relevant to breastfed and bottle-fed babies.

If these instructions are followed, the radiation dose to your baby will be less than half the annual background radiation dose.

CT Pulmonary Angiogram
Breastfeeding:
• the current advice from the manufacturers of the x-ray contrast is that you may continue to breastfeed as normal because only very small amounts of contrast are excreted into the breast milk and it is poorly absorbed by the baby’s gut

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• previously, the manufacturer’s advice was to express a feed before the scan and store it. Following the scan, express as much milk as possible and then discard it. The baby should then be fed the milk that has been previously expressed. Breastfeeding should then continue as normal. Some mothers prefer to do this even though it is no longer recommended by the manufacturer.

Holding your baby:
There are no restrictions on you holding your baby

**Are these tests safe for me and my baby?**
All the tests that you might undergo have radiation doses well within limits considered safe for your baby. If you had to undergo all of the previously mentioned investigations, the total radiation dose to your baby would still be less than the 9 months of background radiation.

A chest x-ray uses a very small dose of radiation and the baby will be shielded as much as possible.

The perfusion scan dose is halved in pregnant women to reduce the dose to the baby. The risk to your baby of developing a cancer in childhood after a perfusion scan is extremely rare (1 in 280,000).

A CT pulmonary angiogram (CTPA) gives the mother a bigger dose of radiation than a perfusion scan. This might slightly increase your lifetime risk of developing lung or breast cancer. No studies have confirmed this and therefore it is not possible to quantify this risk exactly. The risk to your baby of developing cancer in childhood after a CTPA is even rarer than a perfusion scan – less than 1 in 1,000,000.

The radiographic staff will ensure you are happy to proceed with the tests and will answer any further questions regarding the radiation dose to you and your baby. Please be assured staff will protect your baby as much as possible throughout the examination, by using lead shielding where appropriate.

**Other risks**
Rarely the contrast injection can cause an allergic reaction or affect the kidney function.

**Conclusion**
The small risks of these scans have to be weighed up against the risk to both mother and baby of an undiagnosed and untreated pulmonary embolus. This is a potentially life threatening condition – the risk of dying from an untreated PE is 15-30%.

If there is concern that you might have a PE, further tests are essential to confirm the diagnosis. Radiation doses are kept as low as possible for both you and the baby and are well below the level considered to be harmful for your baby.
If you have any other concerns, please do not hesitate to ask the doctors looking after you or the consultant radiologist who is overseeing your investigations.

**Concerns or complaints**
If you have any concerns or worries about your care please contact the department responsible. However, if you are unable to resolve your concerns or wish to make a formal complaint, please contact the Integrated PALS (Patient Advice and Liaison Service), Complaints and Litigation Service on 01206 745926 or ask any member of staff for a leaflet, which will describe how you may make a complaint.

**Your views**
If you or a family member has recently been in either Colchester General Hospital or Essex County Hospital for any reason, you can tell us about your experience by visiting the www.nhs.uk website and then click on the "Comments" section, or you can write to the address on the front of this leaflet or email your comments to info@colchesterhospital.nhs.uk

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