Ask EuroSafe Imaging Tips & Tricks

What patients should know
Paediatric Working Group

I had an X-ray but didn’t know that I’m pregnant. And now?

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Real stories from the Web

- “I had an X-ray last week on my lower back (had to have injections in my back and they had to take 3 or 4 pictures). I did one of those pregnancy tests which tells you 6 days early just in case I was, I only did the test one day early, but it was negative so didn’t think there was anything to worry about. Then on Sat I found out I was pregnant! Now I am worried sick…”

- “….I am going through the worst scenario right now. I had 7 exposures in one day without knowing that I was pregnant. Three were done on my pelvis and 4 on my hip. I was just 9 days pregnant at the time. I’m worried sick that the amount of exposures will harm the baby… I’M DRIVING MYSELF CRAZY”
As a matter of fact

- Despite the usual precautions to rule out pregnancy before performing a X-ray study, thousands of women who are unaware of being pregnant have X-ray examinations every year.
- X-rays exposure during pregnancy always causes huge anxiety in pregnant women.
- Misinformation on the related risks of malformation of the foetus or cancer during childhood can lead some women to seek voluntary termination of pregnancy.
- Supplying pregnant women with accurate information is pivotal to avoiding unnecessary fear, anger, anxiety and unnecessary termination of pregnancy.
Getting the thing into perspective

- **ALL OF US** are exposed to natural background radiation, originating from soil, rocks, and outer space: this background radiation is always there and it is NOT caused by pollution.

- The unit of measure for radiation exposure can be given in **milliGray**.

- 1 milliGray is approximately the dose that everyone receives annually from natural background radiation.

- It has never been shown that this minimal amount of radiation from natural background can cause harm.

- The radiation exposure from X-ray studies is usually much less than 1 milliGray with conventional radiology and a few times more for computed tomography.
We know that:

- Radiation exposure during pregnancy may cause malformations in the unborn baby or cancer during childhood.
- The radiation risk to the unborn baby is related to the stage of pregnancy at the time of exposure and to the quantity of radiation adsorbed by the foetus.
- The risk for the unborn baby is highest during the first weeks of the 1st trimester, less during the 2nd trimester, and least in the 3rd trimester.

**but...**
But...

- The chance of malformation in the unborn baby or the chance of cancer during childhood caused by a radiation dose of < 50 milliGray is negligible

- **With a dose of at least 100 milliGray,** the chance of organ malformations in the unborn baby or development of cancer during childhood is about 1%

- Foetal doses of 100 milliGray are never reached even in pelvic computed tomography or with tens of conventional diagnostic X-ray studies
More in detail: approximate foetal doses from conventional X-ray examinations

<table>
<thead>
<tr>
<th>Examination</th>
<th>Mean dose (milliGray)</th>
<th>Maximum dose (milliGray)</th>
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<tbody>
<tr>
<td>Abdomen</td>
<td>1.4</td>
<td>4.2</td>
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<tr>
<td>Chest</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
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<tr>
<td>Lumbar spine, urography</td>
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<td>10</td>
</tr>
<tr>
<td>Pelvis</td>
<td>1.1</td>
<td>4</td>
</tr>
<tr>
<td>Skull</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
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<tr>
<td>Thoracic spine</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Barium meal</td>
<td>1.1</td>
<td>5.8</td>
</tr>
<tr>
<td>Barium enema</td>
<td>6.8</td>
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</table>
More in detail: approximate foetal doses from computed tomography (CT) studies

<table>
<thead>
<tr>
<th>Examination</th>
<th>Mean dose (milliGray)</th>
<th>Maximum dose (milliGray)</th>
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</thead>
<tbody>
<tr>
<td>Head CT</td>
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<tr>
<td>Chest CT</td>
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<td>Abdomen CT</td>
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<td>Pelvis CT</td>
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</table>
In conclusion

▪ A foetal dose of less than 100 milliGray carries a negligible risk of radiation-induced malformation and radiation induced cancer during childhood

▪ **None of the diagnostic X-ray studies commonly performed causes a 100 milliGray exposure to the foetus**

▪ **Termination of pregnancy at foetal doses of less the 100 milliGray is NOT justified**

▪ In case you were not aware of being pregnant and you had a X-ray study, always seek advice from the institution where the study was performed or from your practitioner
The information provided in this Tips & Tricks issue are based on the following documents:

- ACR American College of Radiology. ACR-SPR practice parameters for imaging pregnant or potentially pregnant adolescents and women with ionizing radiation