

Summary of “Guidance on using shielding for diagnostic radiology applications” by the British Institute of Radiology 5/3/2020

Executive summary

- Patient contact shielding provides minimal or no benefit
- Professionals should concentrate on other areas of radiation protection
- Cessation of this widespread practice will require a major cultural change. The adoption of these guidelines will also require a suitable education programme.
- The full document can be found at https://www.bir.org.uk/media/416143/final_patient_shielding_guidance.r1.pdf

1. Scope

- The guidance covers patient contact shielding.

2. General requirements for patient contact shielding

- **“The overall conclusion from the available evidence is that patient contact shielding is not generally required in diagnostic and interventional radiology.”**
- Patient contact shielding can lead to an *increase* in patient dose due to the need to repeat an examination or interference with automatic exposure control (AEC) systems.
- Exceptions may occasionally occur a particular patient care pathway requires a number of repeat examinations where patient contact shielding may be applied, particularly in the case of paediatric patients.

3. Radiation dose and risk

- “Genetic risk estimations in human populations have concluded that there is no direct evidence of a radiation associated excess of heritable disease.” The weighting factor for the gonads has gone from 0.2 to 0.08 over time.
- If the dose has been reduced to “negligible” risk level, no further action need be taken to satisfy ALARP.

4. Sources of radiation exposure

- The primary beam contributes a large majority of the dose rate. Optimisation techniques that limit the primary beam size and position will therefore have a far greater impact on patient dose.

- If additional shielding is deemed necessary to reduce secondary radiation, then it will be most effective close to the beam edge.

5. Operator responsibilities

- The patient may expect patient contact shielding to be used. Operators may need to take time to explain the rationale for not using it.
- Patients must receive adequate information, time and opportunity to discuss and consent to the examination, including the decision to include or omit patient contact shielding, prior to the exposure.
- If the patient insists on the use of the patient contact shielding against local procedure, the operator must weigh up the risks and benefits of using patient contact shielding vs not performing the examination or delaying the scan until the patient can be convinced. The psychological benefit to the patient should be considered.

6. Clinical service requirements for patient contact shielding

- Operators must be trained to know how and when to use patient contact shielding
- It is expected there may be a few specific situations and exceptions where patient contact shielding is justified. In these cases, it should be a local multidisciplinary decision with these exceptions listed in the local procedure.
- There should be clearly documented and communicated local inclusion criteria that detail the type of examination and patient demographic where the use of patient contact shielding may be used.

7. Shielding in General radiography

- Patient contact shielding **not recommended** for general radiography for the majority of imaging situations.
- PA positioning should be used for spinal and chest examinations where possible. If using an AP projection, then a scoliosis shawl may be considered to protect the breasts..
- Gonad shielding may be considered for male patients (adult and paediatric) where the gonads are less than 5cm from the primary beam. Not recommended for female patients. Further details can be found in the “Gonad Shielding in Radiology” RPC leaflet available at <http://www.sghrpc.co.uk/Advice.htm>
- Thyroid shielding recommended where thyroid is less than 5 cm from the primary beam, projection is AP and will not obscure anatomy of interest or interfere with AEC device.
- Shielding for pregnant patients not required for examinations outside of pelvic region. For examinations within pelvic region, consider non-ionising alternatives. If ionising radiation must be used carry out a thorough justification and risk assessment process.

8. Shielding in diagnostic and interventional fluoroscopy

- The use of patient contact shielding is **not recommended** for fluoroscopy for the majority of imaging situations.

- Shielding for pregnant patients not required for examinations outside of pelvic region. For examinations within pelvic region, consider non-ionising alternatives. If ionising radiation must be used carry out a thorough justification and risk assessment process. If the procedure is justified, consideration should be given to the techniques used to ensure dose to the foetus is kept as low as reasonably practicable e.g. pulsed fluoroscopy, minimizing the number of views taken, strict collimation and angulation of the beam away from the foetus.

9. Shielding in CT

- The use of patient contact shielding is **not recommended** for CT for the majority of imaging situations.
- If the IR(ME)R practitioner believes there is a strong argument to justify the use of physical patient shielding in CT (in-beam or otherwise), the protocol should be carefully optimised in collaboration with the operator, the medical physics expert and applications specialist. It is highly likely that similar or even larger dose savings can be achieved by carefully considering alternative optimisation strategies that will not introduce significant artefact into the image.
- More information can be found in the RPC leaflet "Patient Shielding in CT" available at <http://www.sghrpc.co.uk/Advice.htm>

10. Shielding in mammography

- The use of patient contact shielding is **not recommended** for mammography.
- Thyroid shielding should **never** be used since it may interfere with imaging or cause artefacts that necessitate repeat imaging of the breast. Dose to the thyroid is extremely low during mammography.
- Although the dose to the uterus is unmeasurable, shields covering the abdomen can be provided to pregnant patients on request, since they do not interfere with imaging.

11. Shielding in dental radiography

- The use of patient contact shielding is **not recommended** for dental radiography for the majority of imaging situations.
- The MPE should be consulted regarding the use of a thyroid collar for dental CBCT with a large field of view (FOV).

Further information

We hope you find this information useful. If you would like any additional information, please contact the Radiological Protection Centre (details below).

Radiological Protection Centre

Unit 5, Tramlink Park, 24 Deer Park Road, London SW19 3UA

Telephone: +44 (0)20 8725 1050/1

E-mail: info@sghrpc.co.uk Web: sghrpc.co.uk