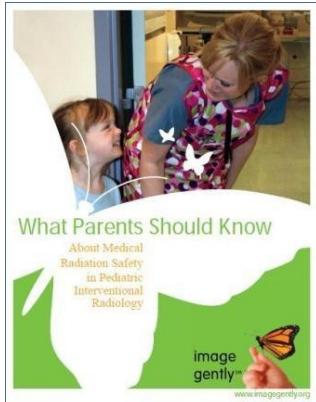


# 10 Mutiara: Proteksi Radiasi Bagi Anak-Anak Pada Prosedur Intervensional

**1. Ingat: Beberapa jaringan pada anak yang tengah berkembang lebih peka terhadap radiasi dibanding pada orang dewasa**

Anak-anak memiliki jangka hidup yang lebih panjang untuk timbulnya efek radiasi



**2. Bahas dengan orang tua sebelum prosedur dimulai**

Tanya pemeriksaan sebelumnya

Jawab kekhawatiran tentang keselamatan radiasi

Patient's Name \_\_\_\_\_ MR# \_\_\_\_\_ Date of exam \_\_\_\_\_

**Step Lightly Checklist**

Review steps below before starting the procedure.

Safety is a team effort: don't be afraid to ask the necessary questions to ensure you are working as a team to keep radiation dose to patients and staff as low as possible.

Reducing radiation dose must be balanced with safe, accurate and effective completion of the procedure. Not all the steps below may be possible in each case, depending on patient size, technical challenge and critical nature of the procedure. The following steps are the most important. The goal is to minimize the dose to the patient while providing important and necessary medical care.

Ask patient or family about previous radiation ([reduced card downloadable at this link](#)) Answer: [questions about radiation safety general patient brochure downloadable here](#)

Use ultrasound when possible

Position hanging table shields and overhead lead shields prior to procedure with reminders during the case as needed

Operators and personnel wear well fitted lead aprons, thyroid shield and leaded eye wear

Use pulse rather than continuous fluoroscopy when possible, and with as low a pulse as possible

Position and collimate with fluoroscopy off, tipping on the pedal to check position

Collimate tightly. Exclude eyes, thyroid, breast, gonads when possible

Operator and personnel hands out of beam

Step lightly: tip on pedal and review anatomy on last image hold rather than live fluoroscopy when possible; minimize live fluoroscopy time

Minimize use of electronic magnification; use digital zoom whenever possible

Acknowledge fluoroscopy timing alerts during procedure

Use last image hold whenever possible instead of exposure

Adjust acquisition parameters to achieve lowest dose necessary to accomplish procedure: use lowest dose possible for patient size, lower frame rate, minimize magnification, reduce length of run

Plan and communicate number and timing of acquisitions, contrast parameters, patient positioning and suspension of respiration with radiology and sedation team in advance to minimize improper or unnecessary runs

Move table away from X-ray tube in both planes. Move patient as close to detector in both planes

Use a power injector, or extension tubing if injected by hand

Move personnel away from table or behind protective shields during acquisitions

Minimize overlap of fields on subsequent acquisitions

After procedure: record and review dose

<http://www.pedrad.org/associations/5364/files/>

[ImGen StpLight Chklist.pdf](#)

**3. Tingkatkan kesadaran di antara anggota tim  
Anda melalui penggunaan daftar periksa keselamatan pra-prosedur dilakukan**

**4. Rencanakan prosedur dengan rinci dan sebelumnya untuk menghindari pelaksanaan yang tidak tepat, dibatalkan, atau pengulangan**



**5. Lindungi thyroid, payudara, mata dan gonad pasien se bisa mungkin**



*Halaman poster RPOP:*

<https://rpop.iaea.org/RPOP/RPop/Content/AdditionalResources/Posters/index.htm>

<http://rpop.iaeа.org>

<http://www.pedrad.org/associations/5364/ig/>

# 10 Mutiara: Proteksi Radiasi Bagi Anak-Anak Pada Prosedur Intervensional

## 6. Gunakan teknik yang optimal:

Laju frame yang rendah. Turunkan dari 7.5 ke 3 pulsa per detik jika memungkinkan

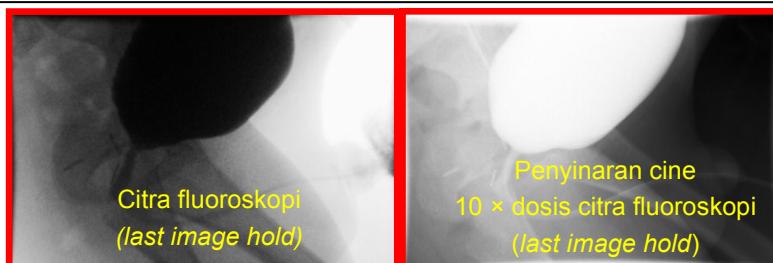
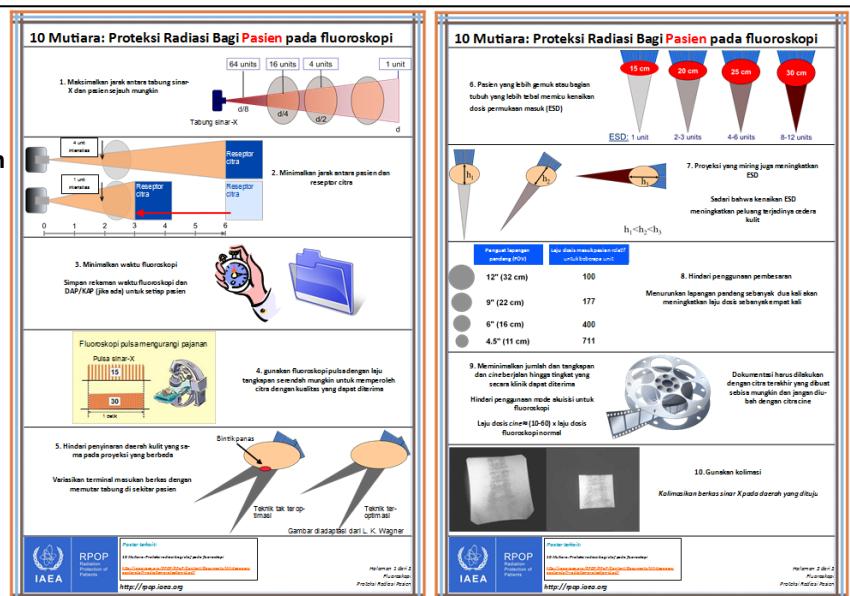
Singkirkan grid dari pesawat jika memungkinkan untuk bayi di bawah 20 kg. Sebagai gantinya gunakan teknik air-gap

Minimalkan waktu pencitraan

Minimalkan tumpang tindih lapangan pada akuisisi berulang

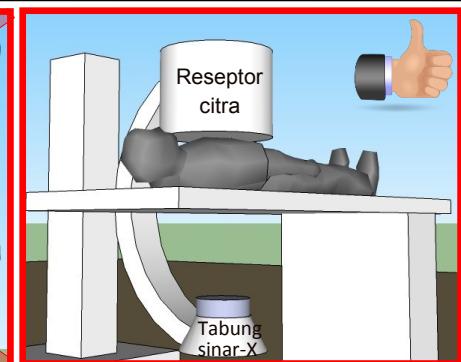
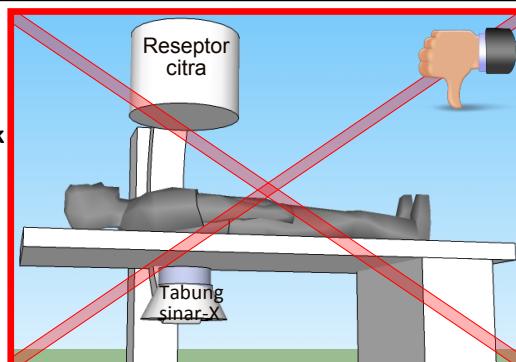
Gunakan kolimasi yang lebih ketat

Minimalkan penggunaan pembesaran

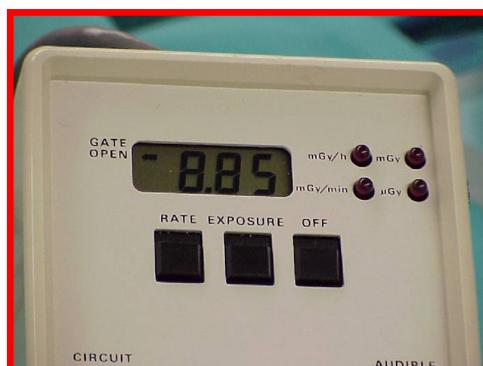


7. Gunkan *last image hold* daripada penyinaran tambahan, jika layak

8. Perbesar jarak antara pasien dan tabung sinar-X, dan perkecil jarak antara pasien dan reseptor citra



9. Gunakan teknologi rekaman dosis dan reduksi dosis pada peralatan



10. Tinjau dan rekam dosis radiasi setelah prosedur

