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X-ray Skin Injury Management

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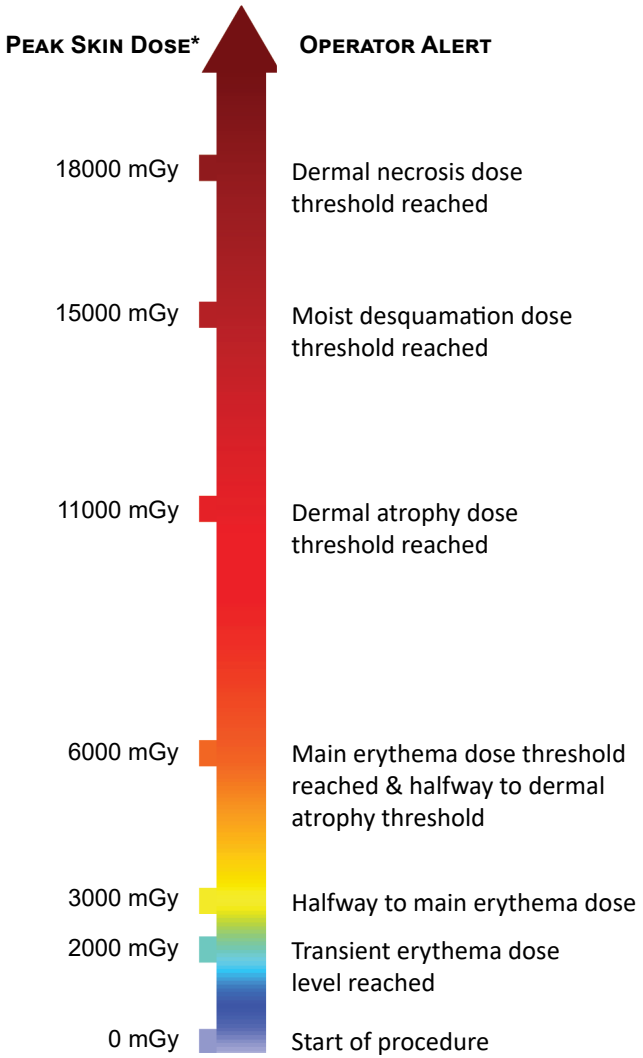
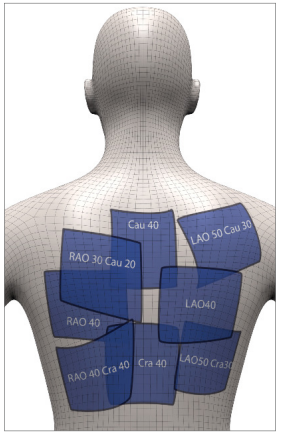
Alerts During the Procedure



*Peak Skin Dose is the dose to the most exposed patch of skin and may be significantly different from the cummulative air kerma reported on many x-ray systems.

Before the procedure

- Identify whether the patient has had a high x-ray dose (~ 3000 mGy or greater) procedure in recent months. If they have then advise the operator that patient may be at risk of injury at a lower x-ray dose threshold than normal.
- Optimise x-ray equipment: Adjust default settings to produce diagnostic images at lowest dose rate. A connection to MyXrayDose will help identify any problem protocols.



During the procedure

- Optimise technique: patient at isocenter, image detector close to patient, efficient use of x-ray beam, use low dose rate modes, collimate
- Alert operator when key peak skin dose thresholds reached (see Alerts During Procedure graphic on left)

After the Procedure

Skin Dose	Recommended Patient Follow-up Action	Possible Effects: 0-2 weeks	2-8 Weeks	6-52 Weeks	> 40 Weeks
0–2000 mGy	No symtoms expected. No action required				
2000–5000 mGy	Advise patient of possible transient erythema within 24/48 hours, and likely skin location. No further action required unless symtoms indicate. Include *High Skin Dose* alert with skin dose value in patient's record.	a	c		
5000–10000 mGy	Advise patient to perform self examination at 2-10 weeks at possible skin injury location. Medical follow-up with radiation history if needed. Include *High Skin Dose* alert with skin dose value in patient's record.	a	b c g	b	
10000–15000 mGy	Advise patient to perform self examination at 2-10 weeks at possible skin injury location. Medical follow-up with radiation history if needed. Advise that injury may be prolonged. Prophylactic treatment of infection. Pain may become an issue. Include *High Skin Dose* alert with skin dose value in patient's record.	a	b d e g	b	k
> 15000 mGy	Medical follow-up with radiation history is required. Skin lesion likely to progress to ulceration or necrosis. Include *High Skin Dose* alert with skin dose value in patient's record.	a	b d e g	h i	h j k
Repeat exposures after high dose event	For procedures following a high skin dose event the skin may look normal but may react abnormally if the same area of skin is irradiated. The effects of previous irradiation should be included in the evaluation of tissue reaction.				

a = Early transient erythema within 24-48 hours
b = Main erythema
c = Transient epilation
d = Possible dry or moist desquamation
e = Moist desquamation
f = Prolonged erythema
g = Permanent epilation
h = Dermal atrophy
i = Secondary ulceration. Dermal necrosis
j = Late skin break down/persistent wound possibly progressing to deeper lesion
k= Telangiectasia

References: Balter S, Hopewell JW, Miller D, et al. Fluoroscopically guided interventional procedures: a review of radiation effects on patients' skin and hair. Radiology 2010; 254:326-341
Wagner LK. Radiation injury is a potential serious complication to fluoroscopically-guided complex interventions. Biomed Imaging Interv J. 2007 Apr-Jun; 3(2): e22.