Experiment # 4:

ORTHOPEDIC CAST AND DENSITY

Objective: To demonstrate the effect of cast material on radiographic density, and to prove that density can be maintained through the use of proper formula.

Procedure:

We will use 24X30 cm cassette, foot phantom and a cast.

Film one:

Place the foot phantom in lateral position, center on the ankle and collimate the X-ray beam to the area of interest.

Kv= 45 mAs = 4 FFD=100cm

Film two:

Place the foot phantom in lateral position, apply an orthopedic cast ,center on the ankle and collimate the X-ray beam to the area of interest.

Kv= 45 mAs = 4 FFD=100cm

Film three:

Place the foot phantom in lateral position, apply an orthopedic cast ,center on the ankle and collimate the X-ray beam to the area of interest.

Double the mAs

Kv= 45 mAs = **8** FFD=100cm

Film four:

Place the foot phantom in lateral position, apply an orthopedic cast ,center on the ankle and collimate the X-ray beam to the area of interest.

increase the Kv by 10%

Kv= **49.5** mAs = 4 FFD=100cm

Film five:

Place the foot phantom in lateral position, apply an orthopedic cast ,center on the ankle and collimate the X-ray beam to the area of interest.

Double the mAs and increase the Kv by 10%
Kv= **49.5** mAs = **8** FFD=100cm

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Compare film 1 and 2:

1: optimum density and optimum contrast (good quality).

2:low density and high contrast (bad quality)

Compare film 2 and 3:

2:low density and high contrast (bad quality)

3: optimum density and optimum contrast similar to film 1 (good quality).

Compare film 2 and 4:

2:low density and high contrast (bad quality)

4 : optimum density and optimum contrast similar to film 1 (good quality)

Compare film 2 and 5:

2:low density and high contrast (bad quality)

5: high density and low contrast (bad quality)

So we have 2 options when there is an orthopedic cast :

Doubling the mAs if the cast is dry OR increase the Kv by 10% if the cast is wet. to maintain the radiographic density.

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