

Using the exposure factor chart

1. Measure the **thickness** of the part to be radiographed
2. Find the nearest thickness in the appropriate column of the Patient Points table

Use the first column for *all* AP and PA views and *all* cervical views

Use the second column for lateral lumbar and pelvic views

Use the third column for lateral thoracic views

3. **Read** off the corresponding "**Points**" value. Add 1 - 2 points for muscular patients. Subtract 1 - 2 points for adiposity or osteopaenia.

4. **Add the System Correction** (see "Calibration" below)

5. **Choose** an appropriate **kV** and find the corresponding Points value, then finally

6. **Select mAs** so that

$$\text{Patient Points} + \text{System Correction} = \text{kV Points} + \text{mAs Points}$$

Example

AP lumbar, 25 cm thick	>>>>>	34 points	
System Correction	>>>>>	-1 points	
very muscular	>>>>>	2 points	
Total	>>>>>	35 points	
Choose 81 kV	>>>>>	16 points	
so we need another		19 points	>>>>> 80 mAs

Calibration - establishing the System Correction

In an established practice, it is sufficient to work the calculation backwards from a "known good" image of an average-build patient to derive the System Correction.

The initial calibration of a new installation can be made using about 20 cm thickness of 80 gsm photocopier paper to represent soft tissue, and 2p copper coins as "vertebrae". Radiograph the combination as for a PA lumbar spine at 80 - 81 kV and adjust the mAs value until detail can just be discerned in the coins, then calculate the initial System Correction.

Nominal correction values

Focus-film distance	100 cm	- 3	150 cm	0	180 cm	+ 2
Screen speed	200	+3	400	0	800	- 3
Grid	no grid - 4	10:1	0	16:1	+ 2	

Generator 1-phase +4 6-pulse 0 HF/12pulse -2

Review and adjust the System Correction in the light of clinical experience, and after any changes e.g. to processor temperature or screen speeds

Patient points + System points = kV points + mAs points

Patient thickness (cm)

all AP/PA and all cervical	lateral lumbo- pelvic	lateral thoracic (axilla)	Points	kV	mAs
			0	40	1
			1	41	1.25
			2	42	1.6
			3	44	2
			4	46	2.5
			5	48	3.2
			6	50	4
			7	52	5
			8	55	6.3
			9	57	8
			10	<i>knee....</i> 60	10
			11	63	12.5
			12	66	16
			13	<i>neck....</i> 70	20
			14	73	25
			15	77	32
			16	<i>PALx...</i> 81	40
			17	85	50
			18	<i>LatLx...</i> 90	63
			19	96	80
4			20	102	100
5.5			21	109	125
7			22	117	160
8.5		16.5	23	125	200
10		18	24	133	250
11.5		19.5	25	141	320
13		21	26	150	400
14.5		22.5	27		500
16		24	28		630
17.5		25.5	29		800

Annex C
to UCA X-Ray Guidelines

19	15	27	30	1000
20.5	17	28.5	31	
22	19	30	32	
23.5	21	31.5	33	
25	23	33	34	
26.5	25	34.5	35	
28	27	36	36	
29.5	29	37.5	37	
31	31		38	
32.5	33		39	
34	34.5		40	
	36		41	
	37.5		42	
	39		43	
	40.5		44	
	42		45	
System correction =			points	