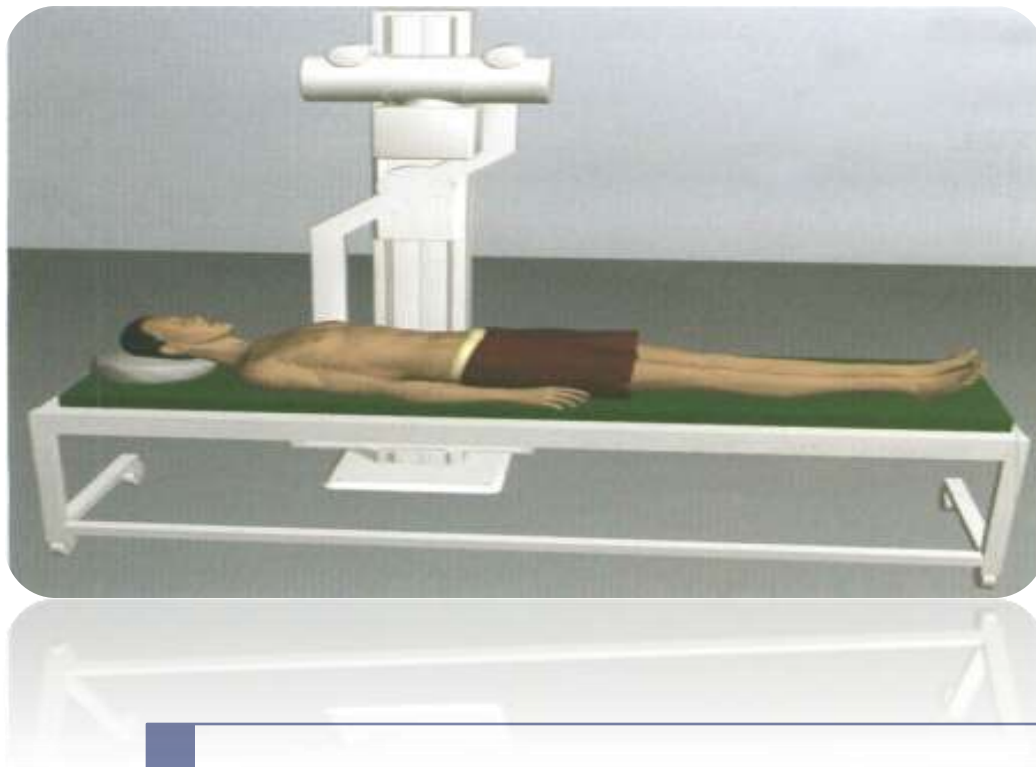


بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ





# **Radiography Positioning 3**

## **Abdomen Imaging Projections**

By

**Dr. Ahmad Mokhtar Abodahab**

# Review Of Previous Lecture (**10 min**)

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**& Home Work**

# Home Work

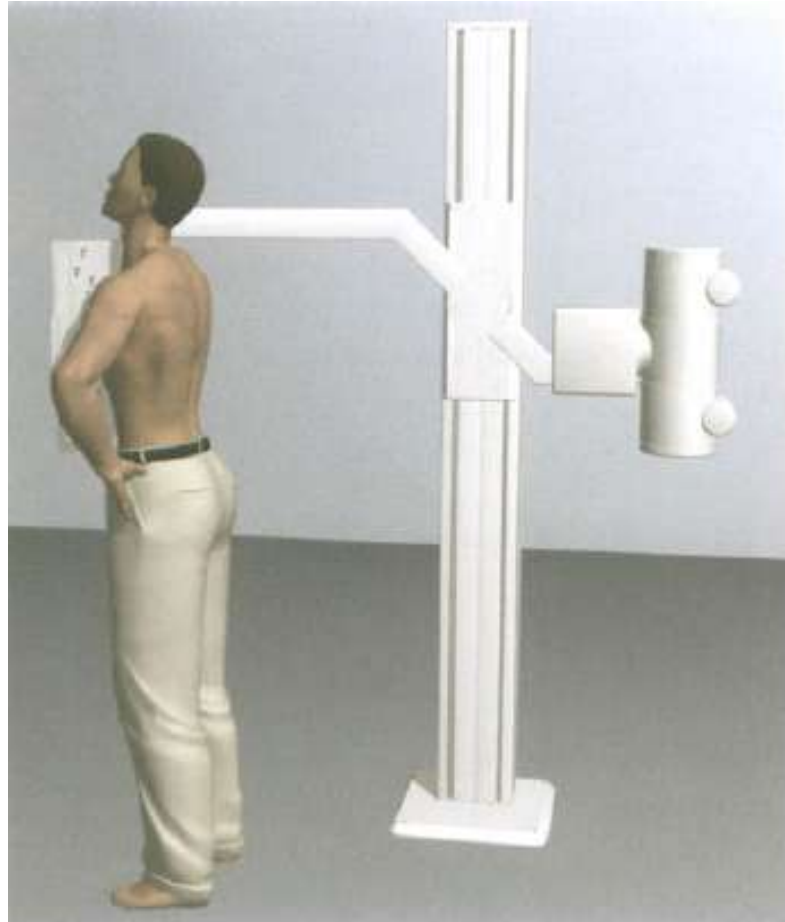
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- ▶ A patient suffering from an apical lung mass  
.....what is the 1<sup>st</sup> chest projection to Do ?



# A- 111111- CXR PA Erect

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**Q2 mention 11 position if CXR**

---



- 
- ▶ **CXR PA Erect** 1
  - ▶ **CXR Lateral Erect** 2
  - ▶ CXR Lateral Setting 3
  - ▶ CXR AP Setting 4 - Supine 5
  - ▶ CXR Lordotic (Apex) 6
  - ▶ CXR Decubitus 7
  - ▶ CXR Oblique Erect 8 - Supine 9
  - ▶ CXR **Child** AP Erect 10 - Supine 11



**"GREEN SYSTEM"****Recommended factors**

	<b>Cassette in- or out- side the holder</b>	<b>Film size</b>	<b>Nominal/ actual screen-film speed</b>	<b>FFD</b>	<b>kV</b>	<b>mAs</b>
<b>CHEST</b>						
<b>CHEST 1 PA standing</b>	in	35x43	200/250	1.4	120	2
<b>CHEST 2 lateral,standing</b>	in	35x43	200/250	1.4	120	4
<b>CHEST 3 AP sitting</b>	in	35x43	200/250	1.4	120	2.5
<b>CHEST 4 lateral sitting</b>	in	35x43	200/250	1.4	120	5
<b>CHEST 5 AP supine</b>	in	35x43	200/250	1.4	120	2.5
<b>CHEST 1/3/5 PA/AP child 30 kg</b>	in	24x30	200	1.4	90	2
<b>CHEST 2 lateral child 30 kg</b>	in	24x30	200	1.4	90	2.5
<b>Chest lying lateral view</b>	in	35x43	200/250	1.4	120	5
<b>CHEST 6 apical lordotic</b>	in	24x30	200/250	1.4	120	2.5
<b>CHEST 7 lateral decubitus</b>	in	24x30	200/250	1.4	120	2
<b>CHEST 8/9 ribs oblique</b>	in	35x43	200	1.4	70	20
<b>CHEST 10 AP infant hanging</b>	in	24x30	200/250	1.4	90	1.6
<b>CHEST 11 AP infant supine</b>	out	24x30	200	1.37	70	2
<b>Chest bedside AP</b>	Grid	35x43	200/250	1.4	120	2.5
<b>Chest bedside lateral</b>	Grid	35x43	200/250	1.4	120	5
<b>Chest bedside flank</b>	Grid	35x43	200/250	1.4	120	2.5
<b>Sternum AP</b>	in	24x30	400	1.4	70	25
<b>Sternum lateral</b>	in	24x30	400	1.4	90	32
<b>Ribs lower</b>	in	24x30	400	1.4	70	32



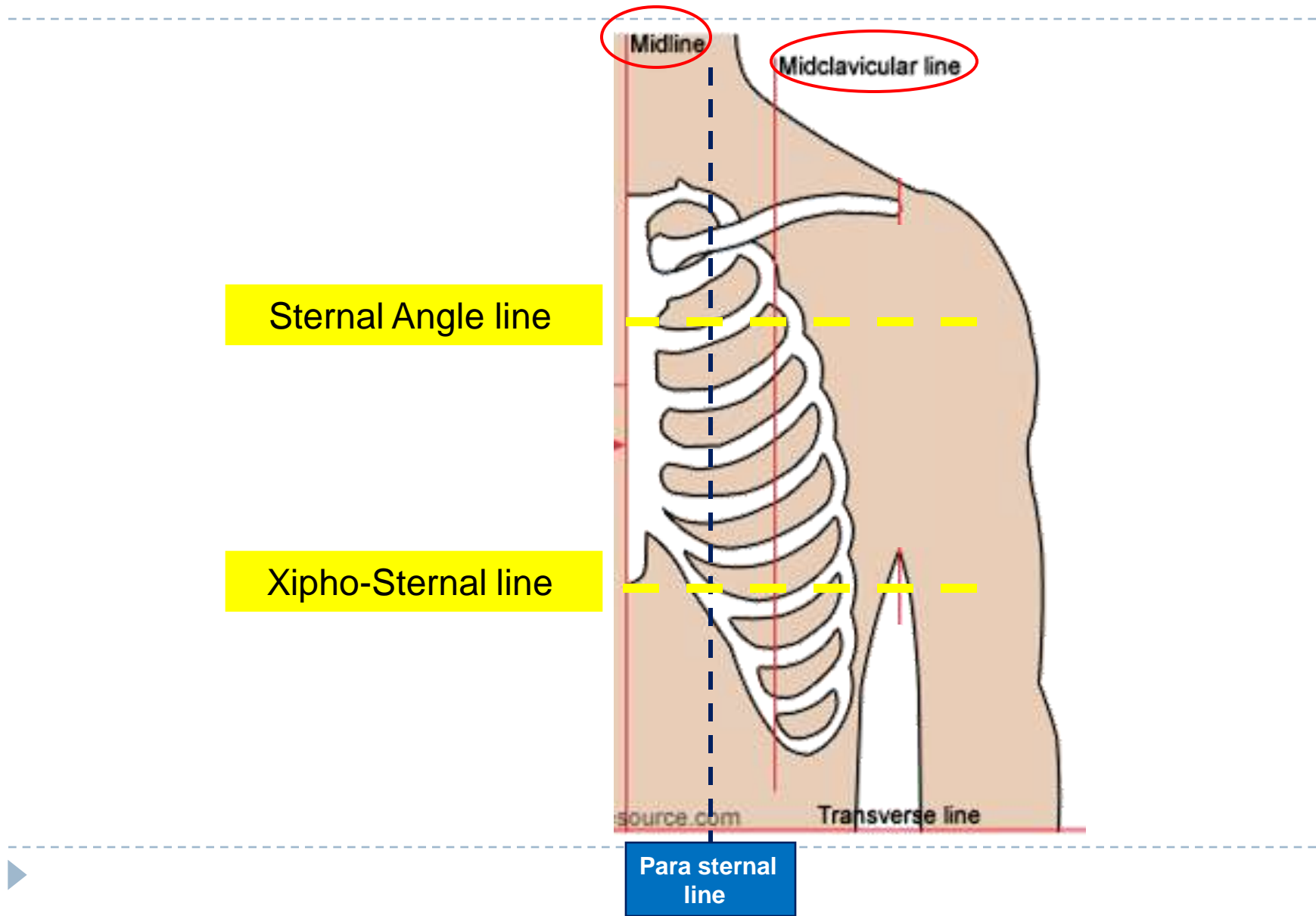


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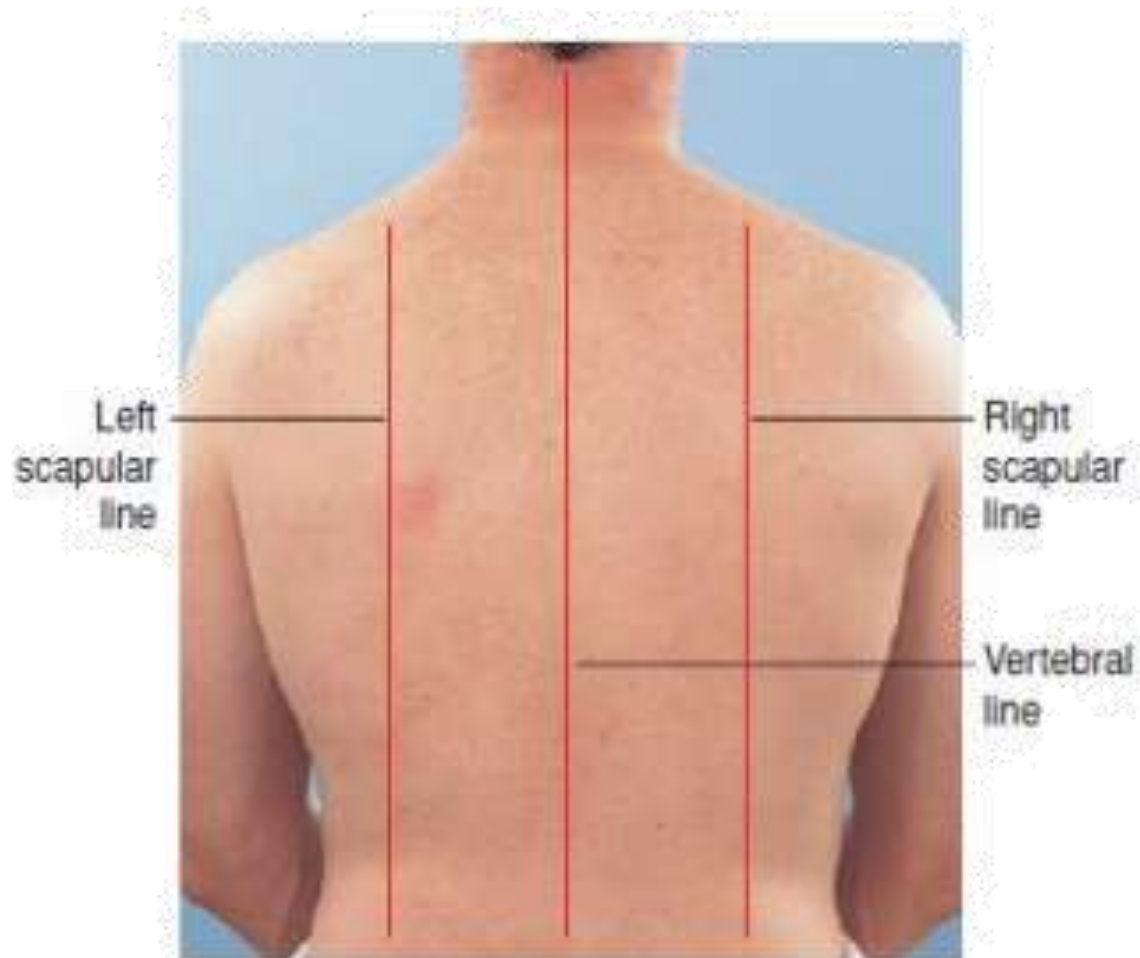
**Q2 mention Anatomical Lines**

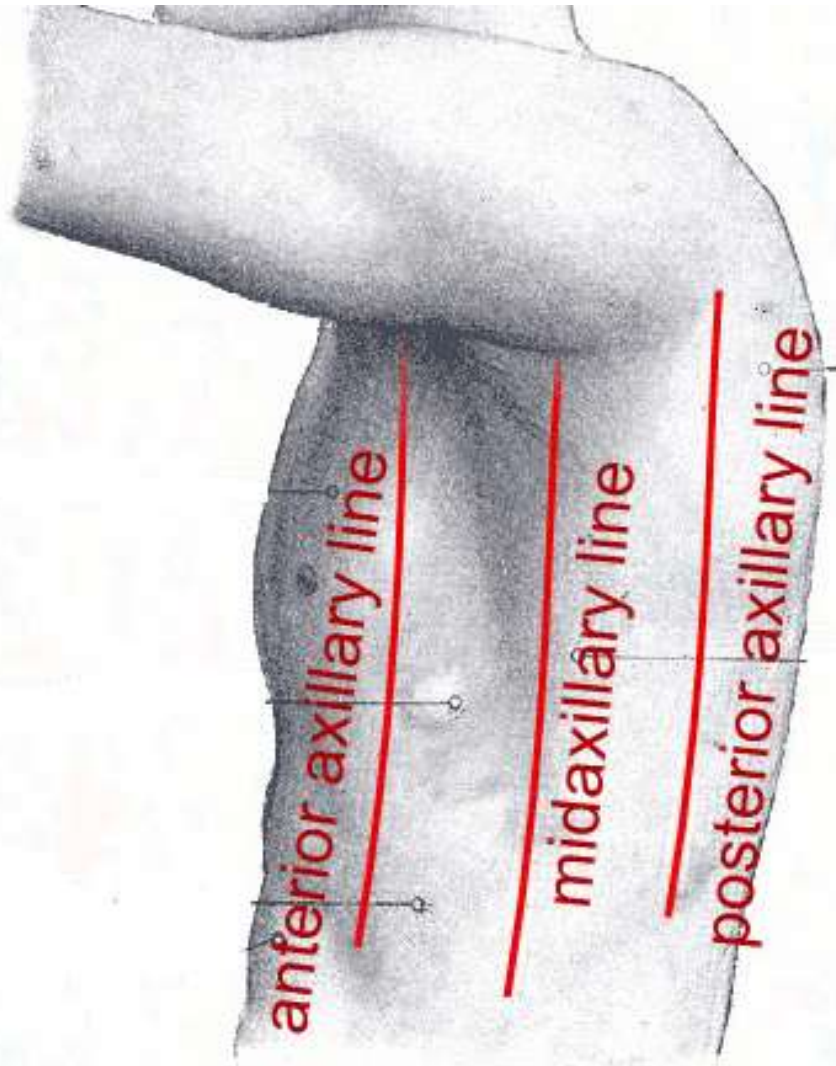
---





## Posterior vertical lines





anterior axillary line

midaxillary line

posterior axillary line

## Q Chest Imaging Factors

	<i>Kv</i>	<i>MAs</i>
<i>(P-A)</i>	<b>* CXR *</b>	
<1Y	42	10
child	45	10
Adult THin	60	10
" " Fat	70:80	10
<b><i>Lateral</i></b>		
Thin	60 : 65	10
Fat	75 : 80	10

لاحظ ان عوامل التصوير قد تختلف (و لكن تبعا لمدي متقارب ) ، تبعا لـ :

-نوع و قوة الجهاز

- نوع الافلام

- حالة الاحماض



"GREEN SYSTEM"	Recommended factors						Local factors	
	Cassette in- or out-side the holder	Film size	Nominal/ actual screen-film speed	FFD	kV	mAs	mAs	Notes
<b>ABDOMEN</b>								
<b>ABDOMEN 1</b> AP supine	in	35x43	400	1.4	70	40		
<b>ABDOMEN 2</b> PA/AP standing erect	in	35x43	400/450	1.4	80	25		
<b>ABDOMEN 3</b> lateral decubitus	in	35x43	400/450	1.4	80	20		
<b>ABDOMEN 1</b> AP supine child 30 kg	in	24x30	400	1.4	70	20		
<b>ABDOMEN 2</b> AP standing erect child 30kg	in	24x30	400/450	1.4	80	12.5		
<b>ABDOMEN 4</b> AP erect child 10 kg	in	24x30	400	1.4	70	10		
<b>ABDOMEN 5</b> supine urography	in	35x43	400/450	1.4	80	32		
<b>ABDOMEN 6</b> urinary bladder	in	24x30	400	1.4	70	100		
<b>ABDOMEN 6</b> bladder+contrast Urography 15 kg	in	24x30	400/450	1.4	80	50		
	in	24x30	400	1.4	70	16		
<b>ABDOMEN 8</b> pregnancy lateral standing	in	35x43	400/500	1.4	90	63		
<b>ABDOMEN 9</b> pregnancy PA/AP	in	35x43	400/500	1.4	90	63		

# Abdomen

## ABDOMEN GENERAL

X-rays of the abdomen are usually taken with the patient lying down; erect views are taken only when the clinical diagnosis is “acute abdomen”, e.g., intestinal obstruction or perforation of the gut.

### Patient diagnosed as “acute abdomen”, able to stand

1. Acute abdomen AP supine, page 18.
2. Acute abdomen AP standing erect, page 19.

### Patient diagnosed as “acute abdomen”, unable to stand

Acute abdomen AP supine (see ABDOMEN 1).

3. Acute abdomen lateral decubitus, page 20.  
Two views have to be taken.

### Non acute abdomen

Use ABDOMEN 1 (page 18) or ABDOMEN 5 (page 22).

## INFANTS AND SMALL CHILDREN WEIGHING UP TO 15 kg

Acute abdomen AP supine (see ABDOMEN 1, page 18).

4. Abdomen AP (hanging), page 21.

## URINARY TRACT

X-rays of the urinary tract are taken with the patient lying down.

5. Urinary tract survey AP, page 22.
6. Urinary bladder and inner pelvis, page 23.
7. Intravenous urography, pages 24–29.  
Follow the stepwise instructions (ABDOMEN 7.1–7.4, pages 26–29).

## PREGNANCY

### When obstructed labour (disproportion) is suspected

NOT TO BE TAKEN BEFORE THE 37<sup>th</sup> WEEK OF PREGNANCY

8. Pregnancy lateral erect, page 30.

### To view the position of the fetus

NOT TO BE TAKEN BEFORE THE 37<sup>th</sup> WEEK OF PREGNANCY

9. Pregnancy PA, page 31.





# Abdomen & Pelvis Imaging Factors

	<i>*PUT*</i>	KV	mA
Child	55		40
Thin	60		50
Fat	75		60
⇒ <i>HSG, Pelvis</i> as PUT			
⇒ <i>LSS</i> as PUT Kv/MAs + 10			
<i>*DLS*</i>			
AP	80:85		50
Lat	85		60



# Abdomen & Pelvis Films Size

	Adult	Child
<b>Abdomen</b>	<b>14 X 17</b> 35 X 43	10 X 12 <b>24 X 30</b>
<b>Pelvis</b>	10 X 12 <b>24 X 30</b>	Same or less According to body size





# ABDOMEN 1

---

**ABDOMEN AP**

**Supine**

**BASIC**

**ABDOMEN AP**

**Supine**

**BASIC**

## **Cassette speed**

Cassette with screen-film combination,  
nominal speed 200/400 in the cassette holder

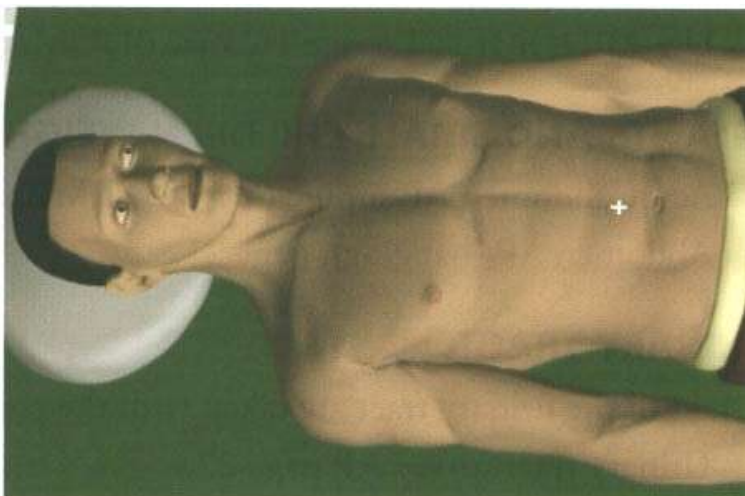
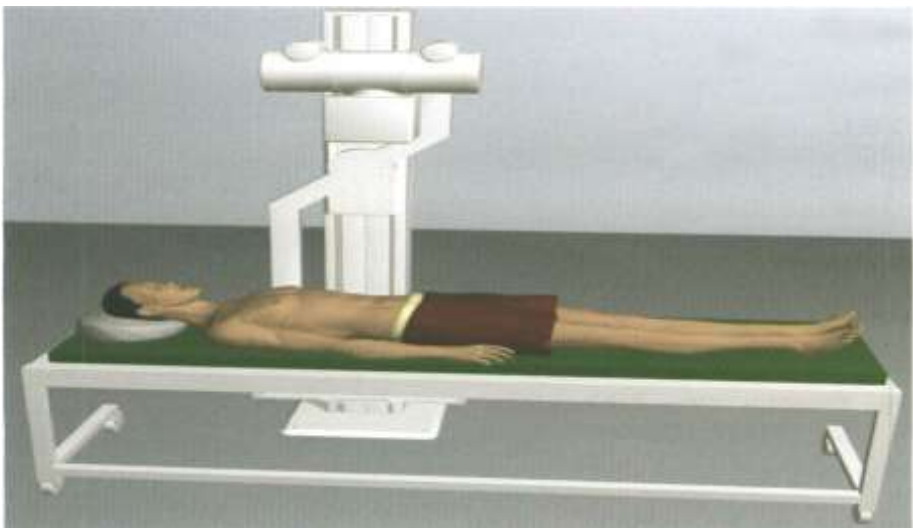
## **Cassette size**

35×43 cm (14×17 inches)

24×30 cm (10×12 inches) for a child

Use a **R**ight or **L**eft marker

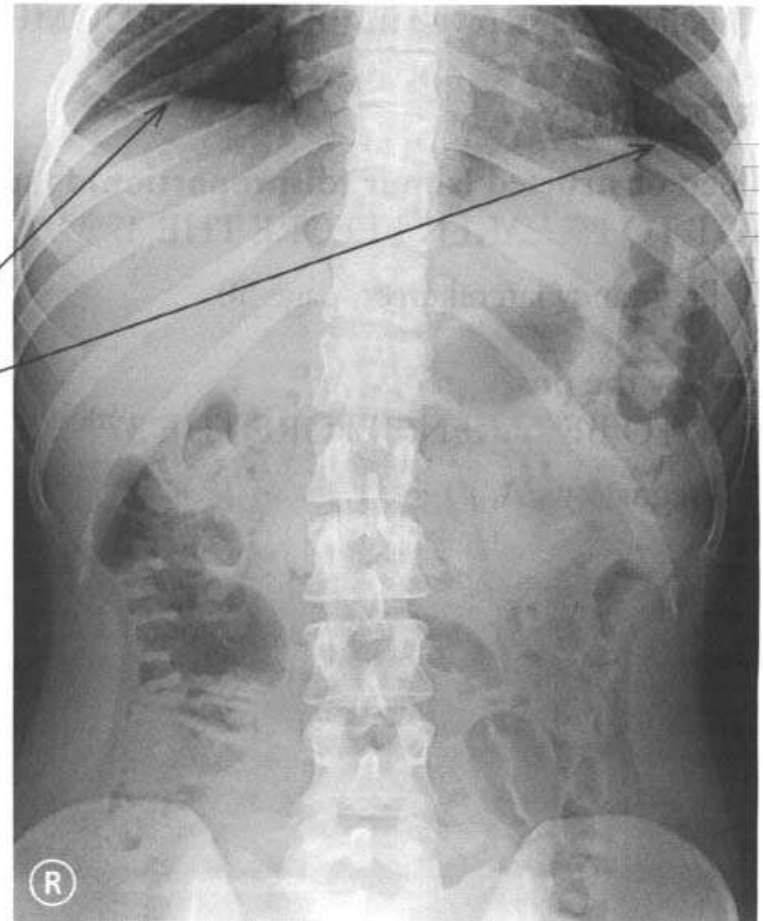




**Comments**

The diaphragm must be visible; if it is not, change the centre and take a new film.

The pubic symphysis must also be visible; if is not, take an ABDOMEN 6 (urinary bladder view).



## ABDOMEN 2

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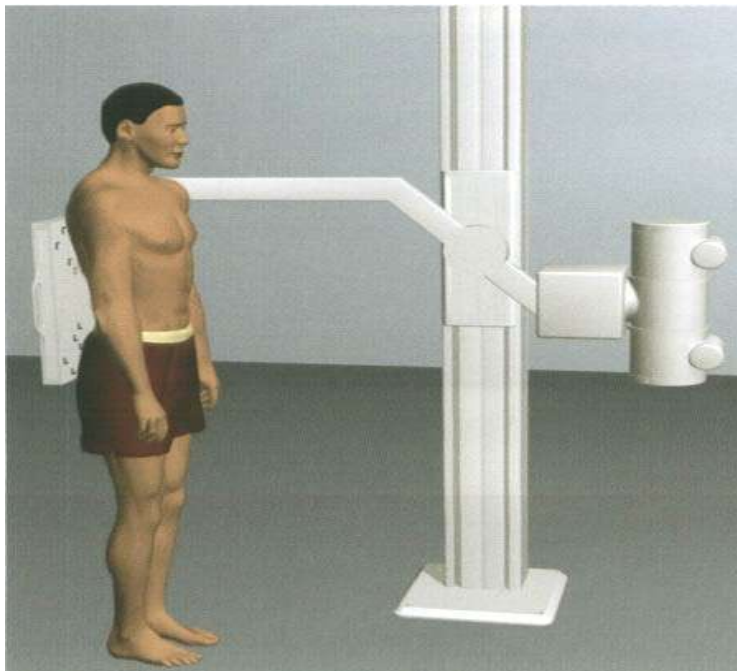
**ABDOMEN AP: "ACUTE ABDOMEN"**    Standing erect    BASIC



## ABDOMEN 2

### Standing erect BASIC

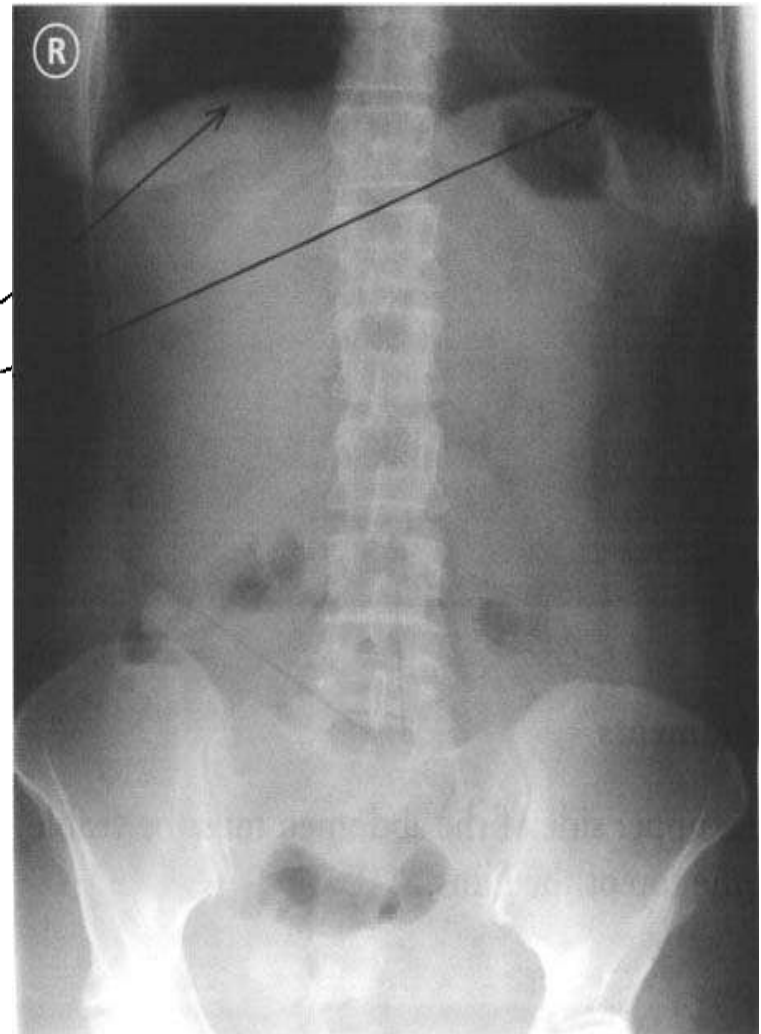
1. Bring in the patient, decide the cassette format and put the cassette in the cassette holder. Collimate to that format.
  2. Position the patient. Press the patient's abdomen against the cassette holder. Centre. Collimate further, if possible.
  3. Tell the patient to stop breathing. Expose.
  4. Tell the patient to breathe normally.
- For INFANTS and SMALL CHILDREN weighing up to 15 kg, see ABDOMEN 4.





### Comments

The diaphragm must be visible; if it is not, change the centre and take a new film.



## ABDOMEN 3

---

**ABDOMEN LATERAL DECUBITUS** Lying first on the left side, then on the right

Both views to be taken

ROU AIGM2 IO DS ISK6U



# ABDOMEN 3

---

## **ABDOMEN LATERAL DECUBITUS**    Lying first on the left side, then on the right

Both views to be taken

### **Cassette speed**

Cassette with screen-film combination,  
nominal speed 200/400 in the cassette holder

### **Cassette size**

35×43 cm (14×17 inches)

Use a **R**ight or **L**eft marker

1. Bring in the patient, put the cassette in the cassette holder. Collimate to the format.
2. Position the patient. **THE PATIENT MUST LIE AGAINST THE CASSETTE HOLDER.** Centre.  
Collimate further, if possible.
3. Tell the patient to breathe **OUT** and hold the breath **OUT**. Expose.
4. Tell the patient to breathe normally.
5. Turn the patient over and repeat.





### Comments

The upper side of the abdomen must be visible at the top of the films.

The upper part of diaphragm must be visible on the films.

## ABDOMEN 3

### ABDOMEN LATERAL DECUBITUS    Lying first on the left side, then on the right Both views to be taken

#### Cassette speed

Cassette with screen-film combination,  
nominal speed 200/400 in the cassette holder

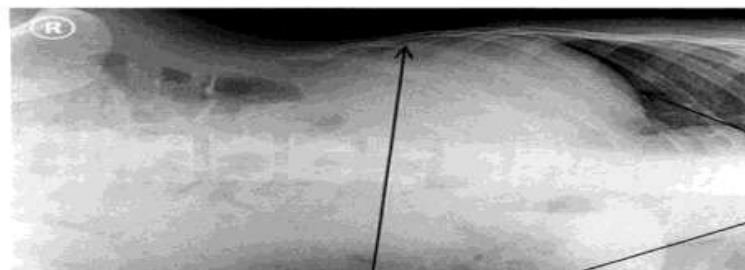
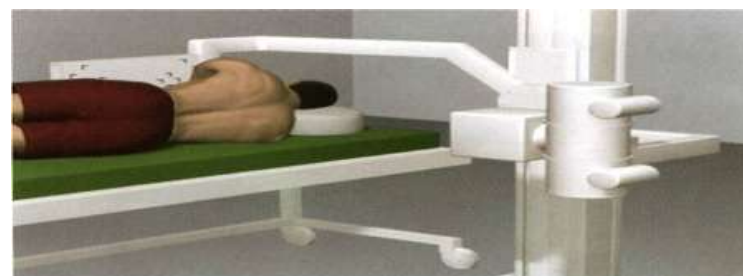
#### Cassette size

35×43 cm (14×17 inches)

Use a **R**ight or **L**eft marker

Exposure values	mAs	
	"blue" system 200	"green" system 400/450
80 kV		
Average	50	20
Range	40–100	16–40

1. Bring in the patient, put the cassette in the cassette holder. Collimate to the format.
2. Position the patient. **THE PATIENT MUST LIE AGAINST THE CASSETTE HOLDER.** Centre. Collimate further, if possible.
3. Tell the patient to breathe **OUT** and hold the breath **OUT**. Expose.
4. Tell the patient to breathe normally.
5. Turn the patient over and repeat.



#### Comments

The upper side of the abdomen must be visible at the top of the films.

The upper part of diaphragm must be visible on the films.

## **ABDOMEN AP** Erect BASIC

Infants and small children weighing up to 15 kg, hanging by the upper arms



**ABDOMEN AP Erect BASIC**

Infants and small children weighing up to 15 kg, hanging by the upper arms

**Cassette speed**

Cassette with screen-film combination, nominal speed 200/400 in the cassette holder

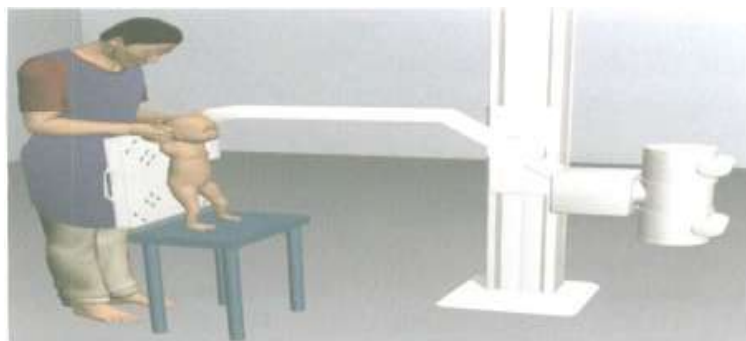
**Cassette size**

24×30 cm (10×12 inches)

Use a **R**ight or **L**eft marker

Exposure values	mAs	
	"blue" system 200	"green" system 400
70 kV		
Average	20	10
Range	8–32	4–16

1. Bring in the patient, put the cassette in the cassette holder. Collimate to the format.
2. Position the patient. The child is held hanging by the upper arms (if possible, its feet can be supported by a stool or the floor or by another person holding the thighs) with its back resting against the front of the cassette holder.
3. **THE PERSON(S) HOLDING THE CHILD, preferably one of the parents, MUST WEAR A LEAD APRON and, whenever possible, LEAD GLOVES.**
4. Centre to the navel. Collimate further.
5. Expose when the child is not moving.



**Comments**

The person holding the child must wear a lead apron and lead gloves, whenever possible.

The whole abdomen (from diafragm to symfysis) must be included on the film.





**ABDOMEN AP Erect BASIC**

Infants and small children weighing up to 15 kg, hanging by the upper arms

**Cassette speed**

Cassette with screen-film combination, nominal speed 200/400 in the cassette holder

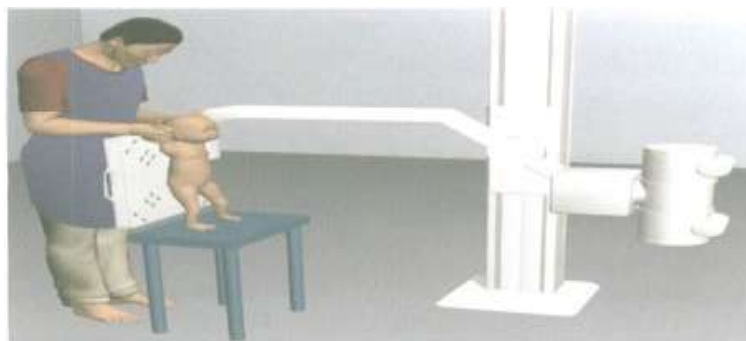
**Cassette size**

24×30 cm (10×12 inches)

Use a **R**ight or **L**eft marker

Exposure values	mAs	
	"blue" system 200	"green" system 400
70 kV		
Average	20	10
Range	8–32	4–16

1. Bring in the patient, put the cassette in the cassette holder. Collimate to the format.
2. Position the patient. The child is held hanging by the upper arms (if possible, its feet can be supported by a stool or the floor or by another person holding the thighs) with its back resting against the front of the cassette holder.
3. **THE PERSON(S) HOLDING THE CHILD, preferably one of the parents, MUST WEAR A LEAD APRON and, whenever possible, LEAD GLOVES.**
4. Centre to the navel. Collimate further.
5. Expose when the child is not moving.



**Comments**

The person holding the child must wear a lead apron and lead gloves, whenever possible.

The whole abdomen (from diafragm to symfysis) must be included on the film.

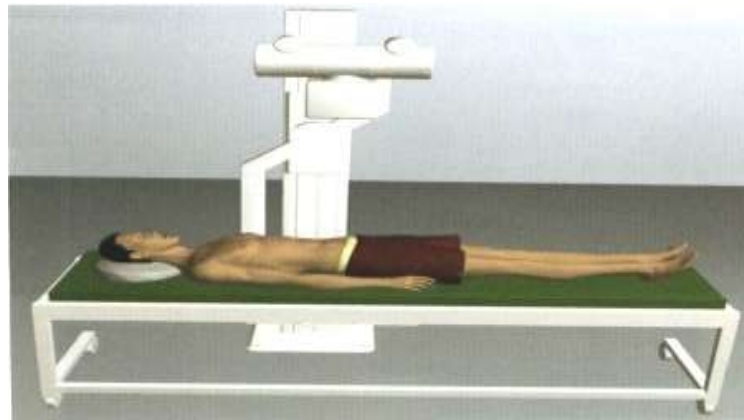




## ABDOMEN 5

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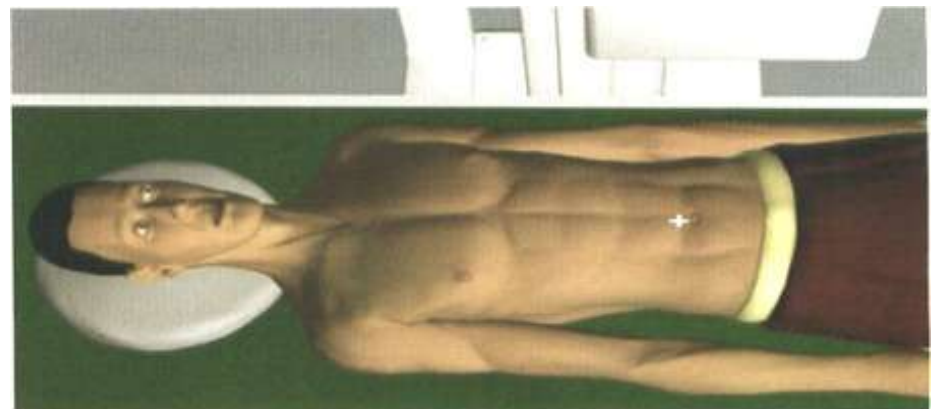
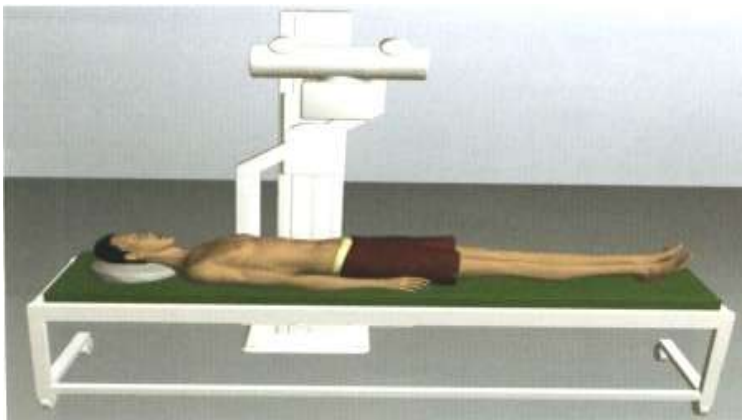
**URINARY TRACT SURVEY, also NON ACUTE ABDOMEN    Supine    BASIC**

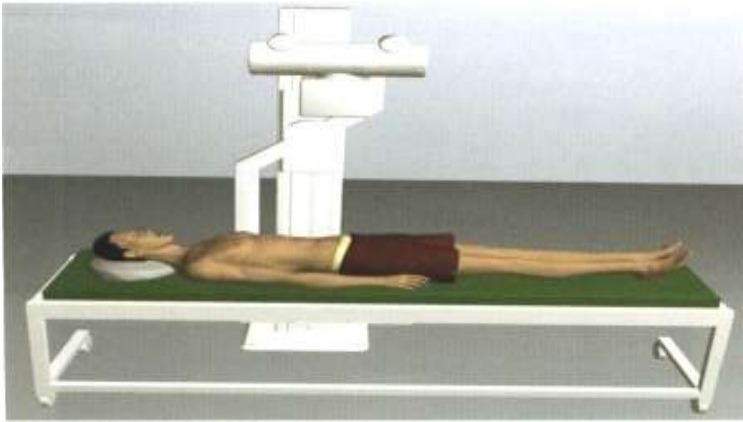


---

**ABDOMEN      Supine      BASIC**

1. Bring in the patient, decide the cassette format and put the cassette in the cassette holder. Collimate to that format.
2. Position the patient. Put a small pillow under the head. Centre. Collimate further, if possible.
3. Tell the patient to breathe **OUT** and hold the breath **OUT**.
4. Expose.
5. Tell the patient to breathe normally.

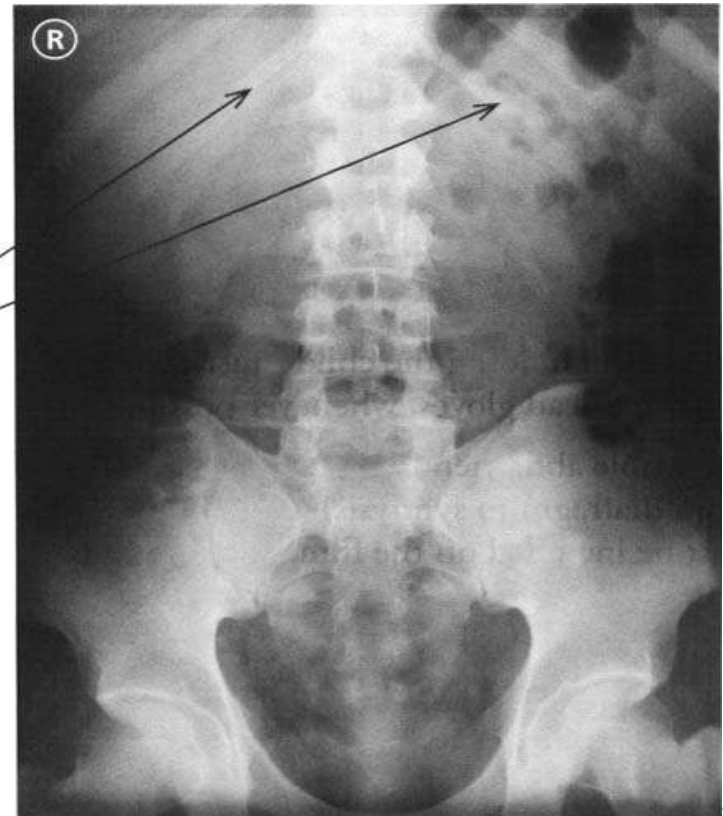




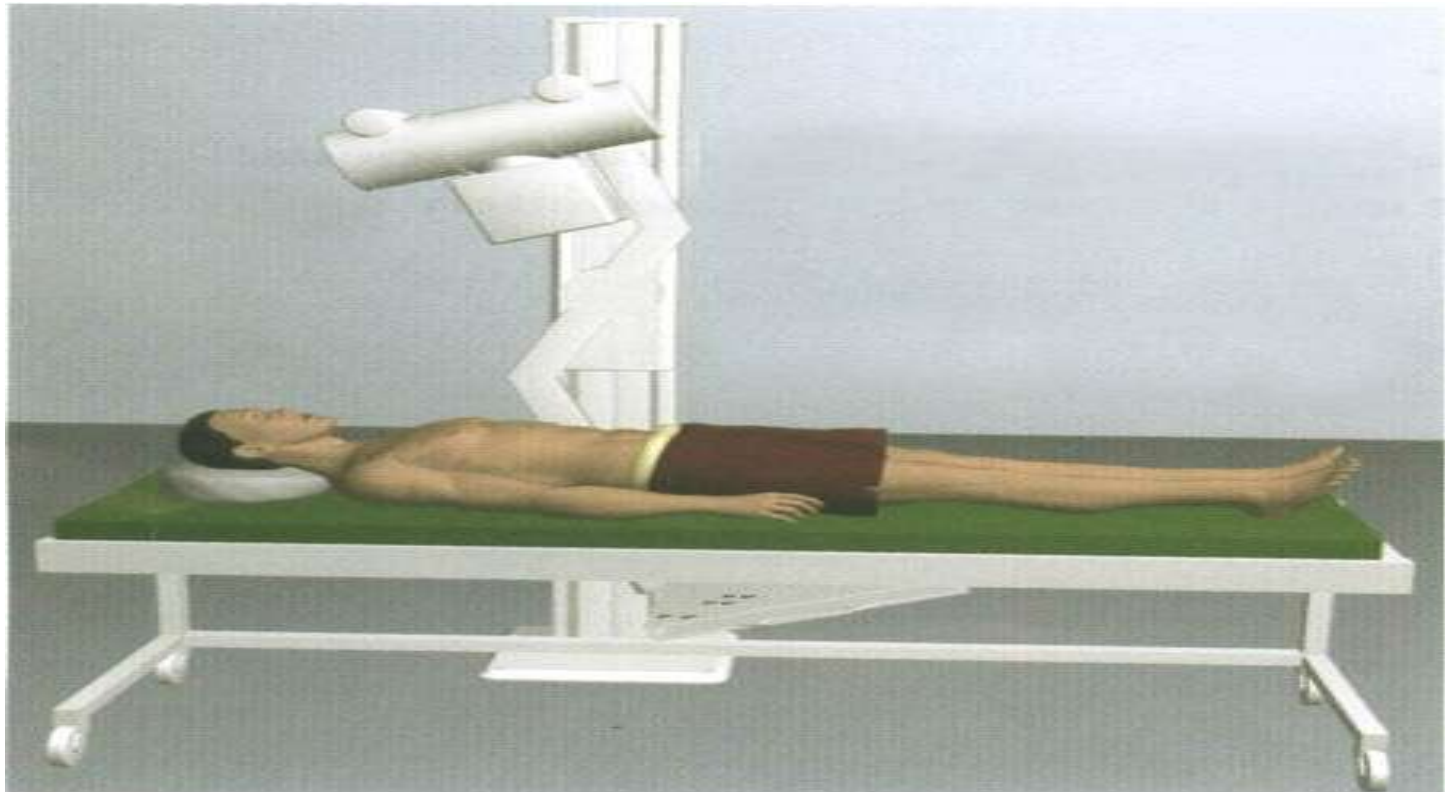
### Comments

The lower ribs (the top of the kidneys) must be visible; if it is not, change the centre and take a new film.

The pubic symphysis must be visible; if it is not, take an ABDOMEN 6 (urinary bladder view).



**URINARY BLADDER and INNER PELVIS**    Supine – vertical beam angled 20° as shown  
BASIC



# URINARY BLADDER and INNER PELVIS BASIC

## Cassette speed

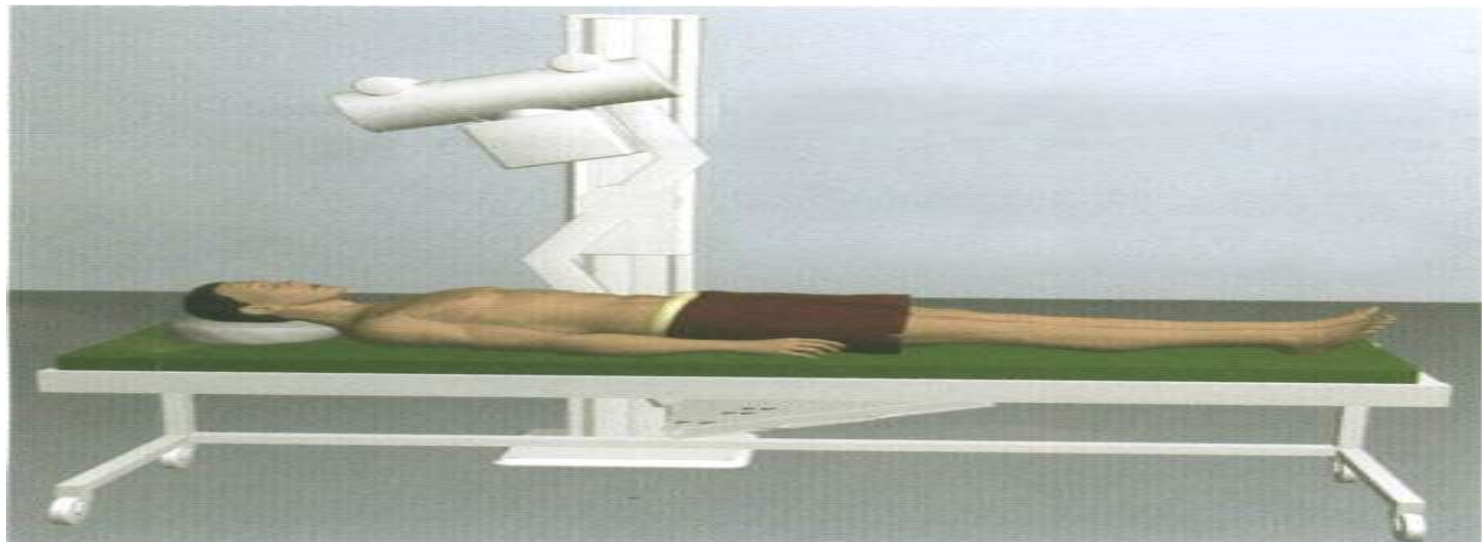
Cassette with screen-film combination, nominal speed 200/400 in the cassette holder

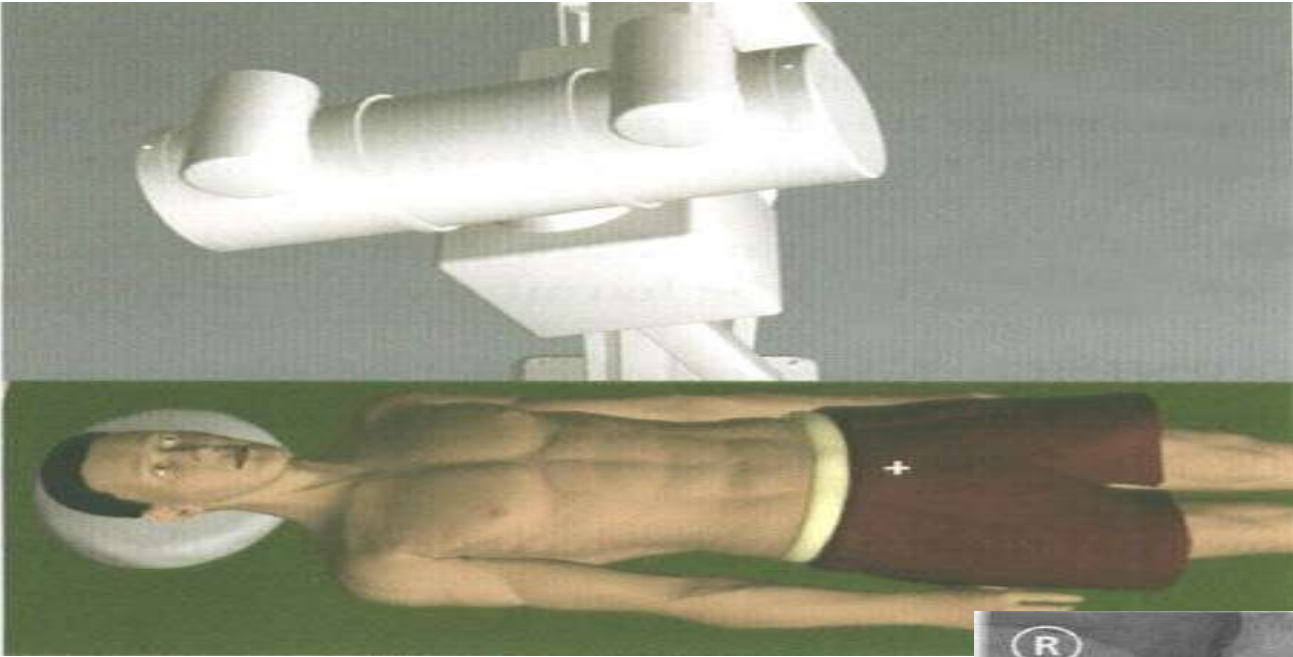
## Cassette size

24×30 cm (10×12 inches)

Use a **R**ight or **L**eft marker

Exposure values	mAs (average)	
	"blue" system	"green" system
kV	200	400/450
70	200	100
80 with contrast	100	50





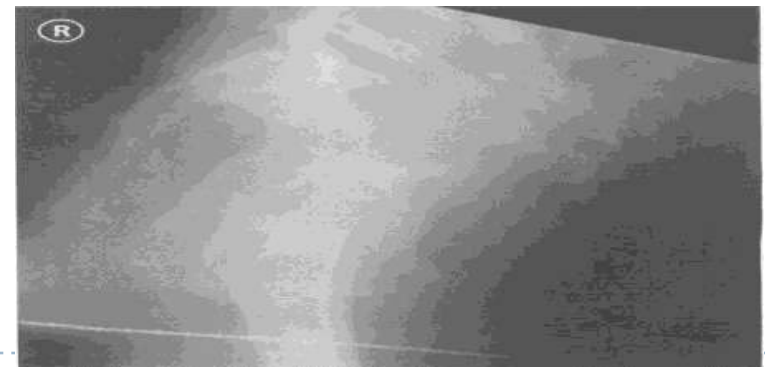
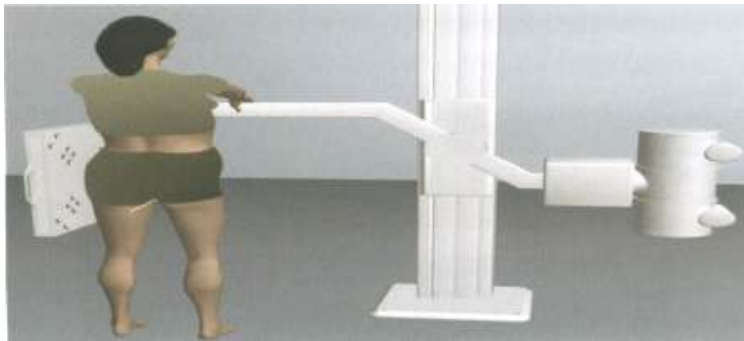


# ABDOMEN 8

## **PREGNANCY LATERAL**    *Standing erect*    **BASIC**

Take this view when obstructed labour (disproportion) is suspected, but NOT before the 37<sup>th</sup> week of pregnancy.

Do not use this examination if ultrasound is available.

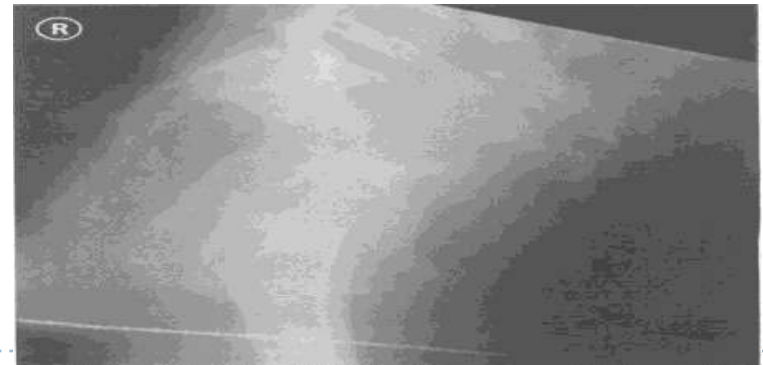
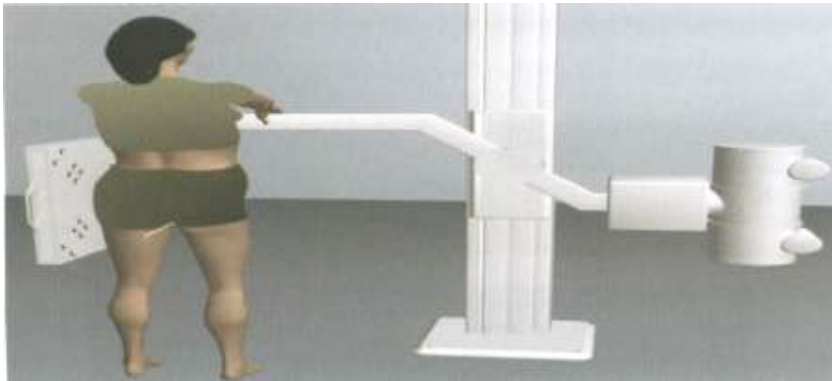


**Cassette speed**

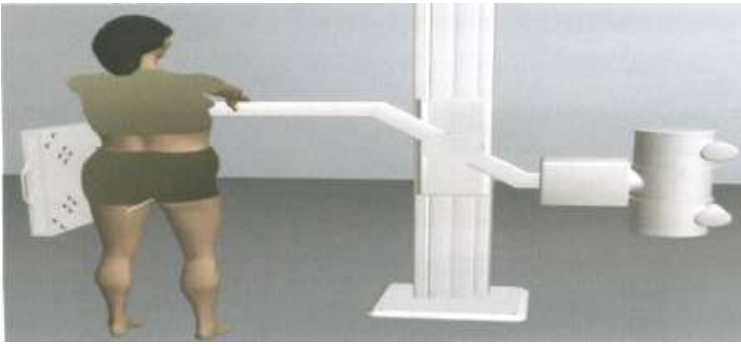
Cassette with screen-film combination,  
nominal speed 200/400 in the cassette holder

**Cassette size**

35×43 cm (14×17 inches)



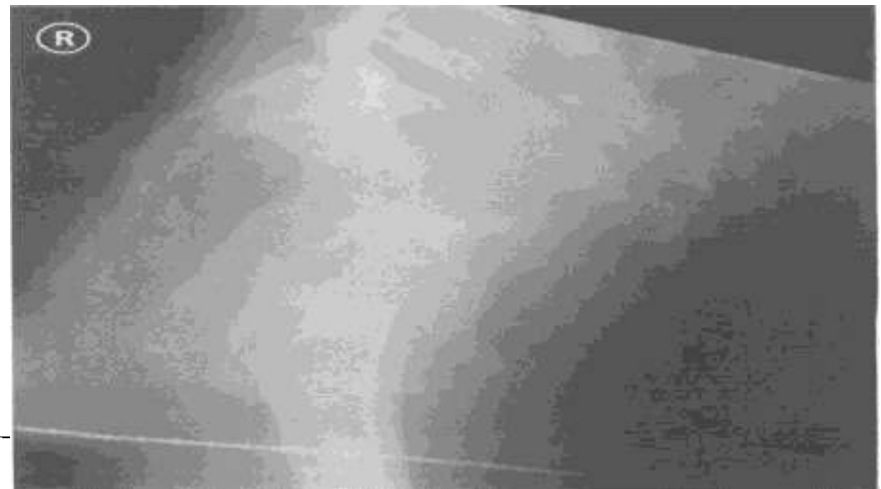




**Comment**

Make sure the symphysis is shown on the film.

Measuring-rod



**PREGNANCY PA (or AP) Prone with support under the pelvis BASIC**

Take this view when obstructed labour (disproportion) is suspected, but NOT before the 37<sup>th</sup> week of pregnancy

Do not use this examination if ultrasound is available.

**Cassette speed**

Cassette with screen-film combination, nominal speed 200/400 in the cassette holder

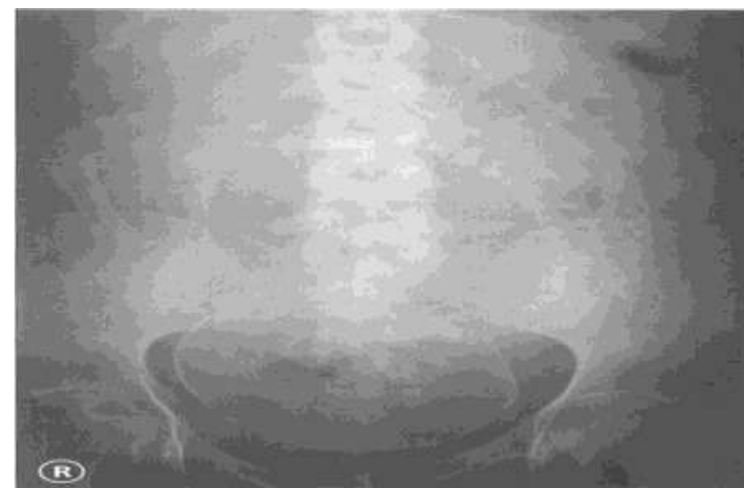
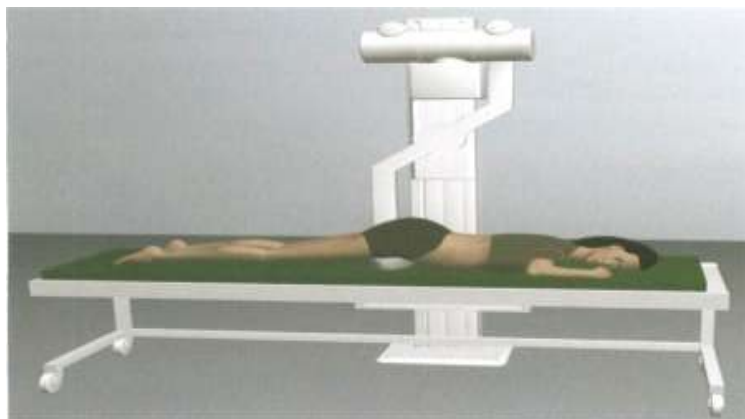
**Cassette size**

35×43 cm (14×17 inches)

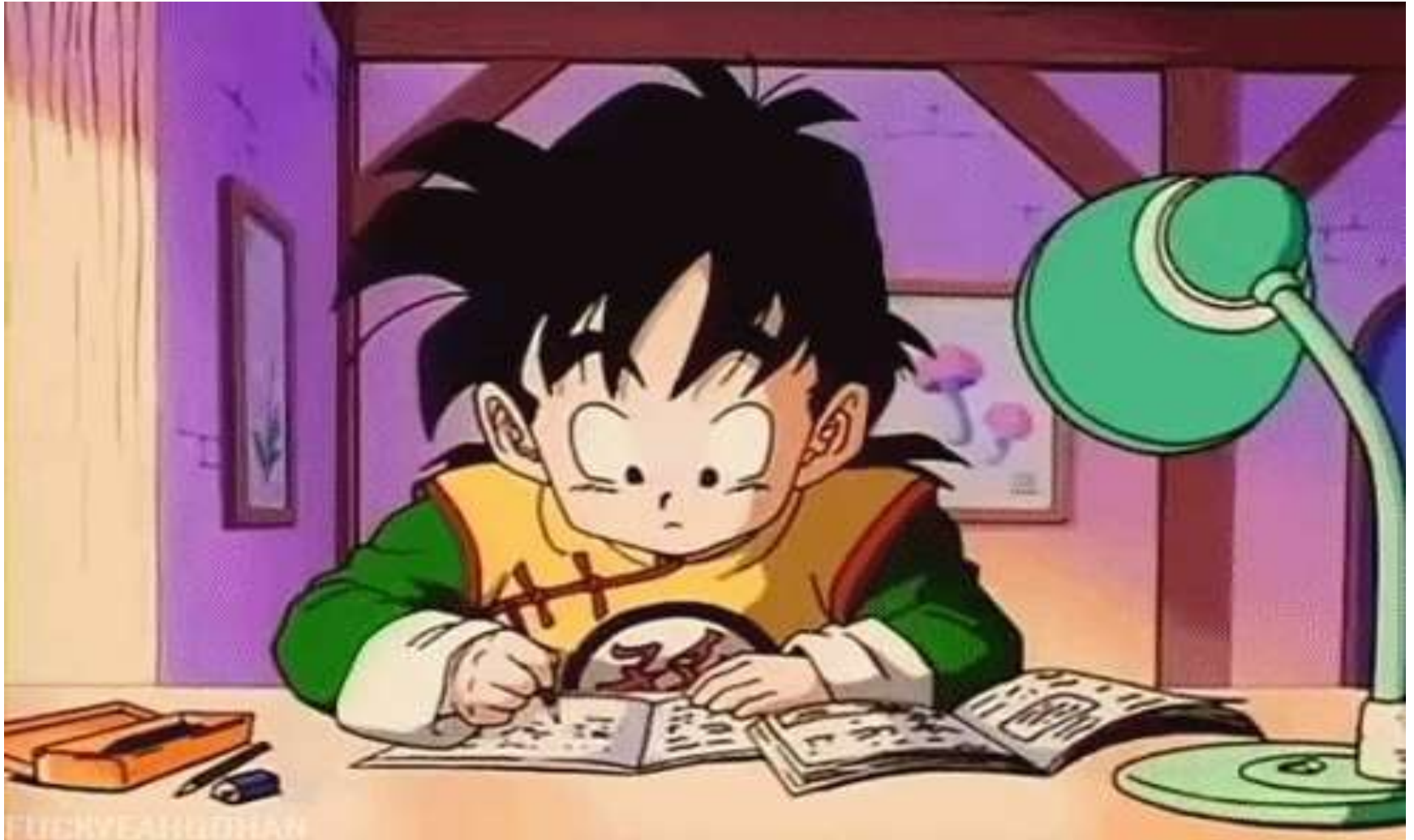
Use a **Right** or **Left** marker

Exposure values	mAs	
	"blue" system 200	"green" system 400/500
90 kV	200	400/500
Average	160	63
Range	100–200	40–80

1. The patient must **EMPTY HER BLADDER BEFORE THE X-RAY** is taken.
2. Bring in the patient, put the cassette in the cassette holder. Collimate to the format.
3. Position the patient as shown (if the patient finds it impossible to lie prone use the supine position). Centre. Collimate further, if possible. Make sure that the **R** or **L** marker is correctly positioned when the patient is in the prone position.
4. Tell the patient to **STOP** breathing. Expose.
5. Tell the patient to breathe normally.



# .....Home Work



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**Q. What are**

**Abdomen & Pelvis**

**Imaging Factors ?**

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# Sources

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- ▶ **\_WHO Manual** of Diagnostic Imaging

[https://www.who.int/diagnostic\\_imaging/publications/dim\\_radiotech/en/](https://www.who.int/diagnostic_imaging/publications/dim_radiotech/en/)

- ▶ **Pocket Handbook for Radiographers**

<https://archive.org/stream/Positions/59-Clark-s-Pocket-Handbook-For-Radiographers-pdf>

- ▶ **Clarks Positioning Radiography**

<https://www.pdfdrive.com/clarks-positioning-in-radiography-e43494907.html>

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# THANK YOU

A sunset over the ocean with silhouettes of people in the foreground. The sun is low on the horizon, creating a bright orange and yellow glow that reflects on the water. The sky is dark with some clouds. The foreground shows the dark silhouettes of several people's heads and shoulders, suggesting they are watching the sunset.

*A. M. Abdahab*

2020