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

Patient diagnosed as "acute abdomen", unable to stand
Acute abdomen AP supine (see ABDOMEN 1).
   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).

URINARY TRACT
X-rays of the urinary tract are taken with the patient lying down.
   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 37th WEEK OF PREGNANCY

To view the position of the fetus
NOT TO BE TAKEN BEFORE THE 37th WEEK OF PREGNANCY
ABDOMEN 1

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 Right or Left marker

<table>
<thead>
<tr>
<th>Exposure values</th>
<th>mAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 kV</td>
<td></td>
</tr>
<tr>
<td>&quot;blue&quot; system</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
</tr>
<tr>
<td>&quot;green&quot; system</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Average</td>
<td>80</td>
</tr>
<tr>
<td>Range</td>
<td>50–100</td>
</tr>
<tr>
<td>Child 30 kg</td>
<td>40</td>
</tr>
</tbody>
</table>

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 breathe OUT. 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.
The pubic symphysis must also be visible; if it is not, take an ABDOMEN 6 (urinary bladder view).
ABDOMEN AP: "ACUTE ABDOMEN"  Standing erect  BASIC

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

Cassette size
35x43 cm (14x17 inches)
24x30 cm (10x12 inches) for a child
Use a Right or Left marker

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</tr>
<tr>
<td>&quot;green&quot; system</td>
<td>400</td>
</tr>
<tr>
<td>Average</td>
<td>80</td>
</tr>
<tr>
<td>Range</td>
<td>50-160</td>
</tr>
<tr>
<td>Child 30 kg</td>
<td>32</td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Exposure values</th>
<th>mAs</th>
</tr>
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<tbody>
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<tr>
<td>Average</td>
<td>50</td>
</tr>
<tr>
<td>Range</td>
<td>40–100</td>
</tr>
</tbody>
</table>

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

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 Right or Left marker

<table>
<thead>
<tr>
<th>Exposure values</th>
<th>mAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>70 kV &quot;blue&quot; system</td>
<td>200</td>
</tr>
<tr>
<td>&quot;green&quot; system</td>
<td>400</td>
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<tr>
<td>Average</td>
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<tr>
<td>Range</td>
<td>8–32</td>
</tr>
<tr>
<td></td>
<td>4–16</td>
</tr>
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</table>

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 diaphragm to symphysis)
must be included on the film.
URINARY TRACT SURVEY, also NON ACUTE ABDOMEN  Supine  BASIC

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

**Cassette size**
35x43 cm (14x17 inches)
24x30 cm (10x12 inches) for a child
Use a Right or Left marker

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<td>mAs (average)</td>
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<tr>
<td>KV</td>
<td></td>
</tr>
<tr>
<td>&quot;blue&quot; system</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>125</td>
</tr>
<tr>
<td>&quot;green&quot; system</td>
<td></td>
</tr>
<tr>
<td>400/450</td>
<td></td>
</tr>
<tr>
<td>80 with contrast</td>
<td></td>
</tr>
<tr>
<td>63</td>
<td>32</td>
</tr>
</tbody>
</table>

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

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 Right or Left marker

<table>
<thead>
<tr>
<th>Exposure values</th>
<th>mAs (average)</th>
</tr>
</thead>
<tbody>
<tr>
<td>kv</td>
<td></td>
</tr>
<tr>
<td>&quot;blue&quot; system 200</td>
<td>&quot;green&quot; system 400/450</td>
</tr>
<tr>
<td>70</td>
<td>200</td>
</tr>
<tr>
<td>80 with contrast</td>
<td>100</td>
</tr>
</tbody>
</table>

Supine – vertical beam angled 20° as shown

1. Bring in the patient, put the cassette in the cassette holder. Collimate to the format.
2. Position the patient. Put a small pillow under the head. Centre 4 cm above the symphysis. Collimate further, if possible.
3. Tell the patient to hold the breath.
4. Expose.
5. Tell the patient to breathe normally.
INTRA VE NOUS UROGRAPHY:

EXAMINATION OF THE KIDNEYS, URETERS AND BLADDER

OBSERVE: Read this before you go to the procedure (i.e. next page).

The patient will be given an intravenous injection of a contrast medium. Make sure syringe, needles, and contrast medium are ready.

Only media specifically made for intravenous urography should be used. Media for vascular investigations may be too strong and those which are used for filling of the bladder or urethra (cystography, urethrography) may be too weak.

Contrast media come in different concentrations. Ask the doctor which concentration and which volume to use.

The normal volume (dose) is between 40 ml and 100 ml for adults. For children weighing less than 10 kilogram, 2 ml per kilogram body weight is commonly used, and for children above 10 kilogram the normal dose is 1 ml per kilogram body weight.

Check the contrast medium with the doctor. A wrong drug may be harmful or even kill the patient.

WARNING: Injection of contrast media may lead to adverse reactions that can be serious. A medical doctor and appropriate drugs for treatment must therefore be immediately available whenever contrast media are given.

Now read the next page which describes the procedure for intravenous urography.
PROCEDURE FOR INTRAVENOUS UROGRAPHY

READ THE PREVIOUS PAGE BEFORE YOU START HERE.

ABDOMEN 7.1
1. Ask the patient to empty the bladder or, if there is a catheter in the bladder, open the catheter and drain the urine into a container.
2. Take a urinary tract survey with the patient lying supine (ABDOMEN 5)—FILM 1.
3. If the pelvis is not completely visible on the radiograph adjust the X-ray stand and take a urinary bladder and inner pelvis view (ABDOMEN 6)—FILM 1A.

ABDOMEN 7.2
4. When FILM 1 (and FILM 1A if taken) have been checked by the DOCTOR, and the X-ray stand has been adjusted if necessary after FILM 1A, the DOCTOR gives the contrast injection.
5. YOU MUST NOTE THE TIME the injection is given.
6. As soon as the injection is given, take a urinary tract survey with the patient lying supine (ABDOMEN 5)—FILM 2.
7. Ten minutes later take another urinary tract survey with the patient lying supine (ABDOMEN 5)—FILM 3.

ABDOMEN 7.3
8. If the doctor confirms that the radiographs are SATISFACTORY, proceed directly to point 11 below. If the kidneys, ureters, and bladder are not sufficiently visible, and the doctor confirms that the radiographs are NOT SATISFACTORY, proceed to point 9.
9. Turn the patient into a prone position (lying on the abdomen) and take a prone abdomen view (ABDOMEN 7.3) 15 minutes after FILM 3; that is 25 minutes after the contrast injection was given—FILM 3A.
10. Turn the patient back into supine position (lying on his back).

ABDOMEN 7.4
11. Take a urinary bladder and inner pelvis view (ABDOMEN 6) with the bladder full—FILM 4.
12. Ask the patient to empty the bladder (urinate), or re-attach the catheter, and take a second view—FILM 4A.
13. Show all the radiographs to the doctor; keep the patient on the X-ray table until they have been checked.

REMEMBER, when developing the films, to mark the time on each one so that the interval between the injection and the exposure is clear. Use Right and Left markers.
INTRAVENTOUS UROGRAPHY:
EXAMINATIONS OF THE KIDNEYS, URETERS, AND BLADDER

1. Ask the patient to empty the bladder before lying on the table. If there is a catheter in the bladder, open the catheter and drain the urine into a container.

2. Take FILM 1, abdomen and pelvis with the patient lying supine (ABDOMEN 5). Use a Right or Left marker.

3. If the pelvis is not completely visible on the radiograph adjust the X-ray stand and take FILM 1A, urinary bladder and inner pelvis view (ABDOMEN 6).

Position ABDOMEN 5

Position ABDOMEN 6

FILM 1

FILM 1A
Intravenous urography (continued)

4. When FILM 1 (and FILM 1A if it has been necessary to take it) have been checked by the doctor, the doctor gives the patient the contrast injection.
5. MAKE A NOTE OF THE TIME THE INJECTION IS GIVEN in the patients record.
6. As soon as the injection is given make sure the doctor moves behind the control screen or out of the X-ray room. Take FILM 2, a urinary tract survey with the patient lying supine (ABDOMEN 5).
7. AFTER 10 MINUTES take FILM 3, another urinary tract survey with the patient lying supine (ABDOMEN 5).
8a. SHOW FILM 2 AND FILM 3 TO THE DOCTOR. The kidneys, ureters and bladder should be visible. When the doctor has seen the films, turn to the next page.
Intravenous urography (continued)

8b. If the doctor confirms that the films (FILM 2 and FILM 3) are SATISFACTORY, turn to the next page and take FILM 4.

8c. If the doctor says that the films are NOT SATISFACTORY:

9a. Turn the patient into a prone position (lying on the abdomen as shown below) and make sure the tube is pointing on the centre of the lumbar spine. Use the same the position of the machine (stand) and exposure. Make sure that the L or R marker is correctly positioned when the patient is turned around to the prone position.

9b. 25 minutes after the contrast injection was given take FILM 3A (PRONE ABDOMEN).

10. Check that the film is satisfactory. Turn the patient back into supine position (lying on his back). Go to the next page and take FILM 4.
Intravenous urography (continued)  bladder film

11a. Take FILM 4 (ABDOMEN 6) with the bladder full.
11b. Check the quality of the film.
12a. A soon as a SATISFACTORY film is obtained, send the patient to empty the bladder (urinate), or release the catheter.
12b. Take FILM 4A (ABDOMEN 6).
13. Show all the films to the doctor; keep the patient on the X-ray table until they have been checked.
PREGNANCY LATERAL  Standing erect  BASIC
Take this view when obstructed labour (disproportion) is suspected, but NOT before the 37th week of pregnancy.
Do not use this examination if ultrasound is available.

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

Cassette size
35×43 cm (14×17 inches)

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<tbody>
<tr>
<td>90 kV</td>
<td></td>
</tr>
<tr>
<td>“blue” system</td>
<td>200</td>
</tr>
<tr>
<td>200</td>
<td>400/500</td>
</tr>
<tr>
<td>Average</td>
<td>160</td>
</tr>
<tr>
<td>Range</td>
<td>100–200</td>
</tr>
</tbody>
</table>

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. Tell the patient to stand with the left side against the cassette holder. Place a measuring-rod between the legs, as shown. Centre. Collimate further, if possible.
4. Tell the patient to STOP breathing. Expose.
5. Tell the patient to breathe normally.

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 37th 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

<table>
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<td>Average</td>
<td>160</td>
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<tr>
<td>Range</td>
<td>100–200</td>
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</table>

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.