STUDY OF OSTEOPOROTIC FRACTURES (V5)

Protocol for Follow-up Hip/Pelvis X-rays

I. Introduction

Purpose of the study: AP pelvis films were taken at the baseline examination, about 8 years prior to this visit. A repeat AP pelvis film will be obtained during the current clinic visit. The baseline and follow-up pelvis films will be assessed for radiographic evidence of osteoarthritis of the hip in order to determine incidence and progression of disease. Since this represents the principal outcome variable for this study, quality control is extremely important.

Quality control: The purpose of this manual is to standardize the examination procedures among the centers obtaining pelvis films in SOF. It is intended to support both technologists and radiologists in their respective responsibilities by spelling out technical details and radiologic aspects that may otherwise be left vague or inconsistent.

It is expected that all technologists participating in this study already have an in-depth knowledge and extensive experience in their field. This manual can by no means be regarded as a training course in taking pelvis x-rays. This manual simply points out details pertaining to this specific study that otherwise are likely to differ between centers. There is no claim that the proposed techniques are the only ones to yield acceptable results. Rather, this manual provides guidelines to make the results of all participating centers consistent and comparable.

The primary aim for the follow-up hip/pelvis film will be to reproduce the original measurement technique as closely as possible. The imaging technique and examination procedures described below are the same as those used at baseline. These procedures should be carefully reviewed by the technologists at each x-ray facility assigned to the SOF study.

Centers that cannot meet the requirements detailed in the imaging technique sections will need to contact Michael Nevitt at the SOF coordinating center to discuss whether alterations to the specified parameters are acceptable.

The SOF coordinating center will review the quality of the radiographs during the study, and will notify the centers if problems with image quality are found. Possible sources of error, and possible solutions, will be suggested, but responsibility for the resolution of technical problems rests with the radiology facility and the clinical center.

During the study, questions regarding x-ray procedures should be directed to the SOF coordinating center.

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II. Hip/Pelvis Film Imaging Technique and Examination Procedures

AP projection

1. Imaging technique

a.	Imaging system	- Bucky screen technique
b.	Focus size	- Large focal spot
c.	Total filtering	- ≥ 2.5 mm AL-equivalent value (half-value layer)
d.	Scattering grid	- r = 12 to 1 at 40 inches
e.	Film/screen speed	- Medium film/screen speed: 200 speed preferred; 400 acceptable
f.	Imaging voltage	- 70-80 kVp
g.	Film focus distance	- 40" focal film distance
h.	Exposure time	- < 0.1 s for 200 film, < 0.5 s for 400 film, or can be phototimed; mAs dependent on film screen system.

2. Film size

a. 14" x 17" film is required.

b. Place the cassette crosswise in the bucky tray.

c. The top of the cassette should be about 1 inch above the level of the iliac crest.

3. Patient position for AP view

a. Position patient supine, centered along the longitudinal axis of the table,

b. hands on chest to keep them out of the field of view.

4. Part position

Feet are taped at 15°-30° internal rotation to minimize joint space and visualize the neck of the femur. Obese individuals will generally require a greater degree of internal rotation at the feet to achieve the same degree of internal rotation at the hip, compared to slender individuals.

5. Central ray

a. Center on the symphysis pubis (at the the level of the greater trochanters).

b. The beam is perpindicular to floor/long axis of body

6. Collimation

a. Lateral: cone to lateral dimension of film.

b. Longitudinal: cone down 2-3 inches from top and bottom edge of film.

7. Special remarks

Be sure that central ray is properly centered and all of the anatomy is on the cassette by crosschecking anatomical landmarks. The entire pelvis should be imaged to include the hip

joints, the soft tissue lateral to the greater trochanters, the ilium up to a level about 3 inches above the superior edge of the femoral head, and the proximal femur to about 3 inches below the greater trochanters.

III. X-ray labeling

The x-ray films should include the following information typed and imaged directly on the film:

- patient's name
- Clinic name (Portland, etc.)
- SOF ID and 4 letter namecode
- date of x-ray
- x-ray tech ID (may be on a stick-on label)

To ensure legibility, all label information should be typed.

IMPORTANT: It is the respsonsibility of the clinical center to verify the legibility, completeness and accuracy of all identifying information on the x-ray label before the x-ray is shipped to the coordinating center. Missing or illegible information should be typed on a separate stick-on label, and placed next to (NOT OVER) the imaged plate. The x-ray tech ID may also be recorded on a stick on label.

In general, additional stick-on labels with redundant information (e.g. film date) are unnecessary and are discouraged. Any stick-on labels used should be placed next to (but not over) the imaged ID plate.

IV. Shipping

Films will be inventoried, boxed and shipped by staff at the SOF clinical center.

a) Multiple films may be packaged in a single paper jacket. It is not necessary to include any identifying information on the jacket.

In addition, a sturdy shipping container or other packaging should be used (i.e. x-rays should be double wrapped).

b) Complete a shipping inventory of the films contained in a shipment. The inventory consists of a numbered list of the IDs and namecodes of films contained in the shipment.

Package the inventory form with the shipment. The inventory list will be checked against the films contained in the shipment at the coordinating center. Keep a copy of the inventory at the clinical center.

c) IMPORTANT: Separately group x-rays obtained using a portable device, at home, in a nursing home, or at an x-ray facility other than the primary one designated by the clinical center. Indicate these with a 'P' on the shipping inventory list.

d) Send all films to:

SOF Pelvis X-Rays
SOF Coordinating Center/UCSF

74 New Montgomery, Suite 600
San Francisco, CA 94105

For security and speed of delivery, use of second day courier service (e.g. UPS second day air) is recommended.

Accumulated films should be shipped **every two weeks**.

V. Certification and Quality Control

a) Each x-ray facility and subcontractor for portable x-rays should have a primary contact/supervisor for this study. This person should generally be a chief technologist, technologist supervisor, or supervising radiologist at the facility, with responsibility for seeing that the SOF x-ray procedures are carried out correctly.

b) The primary contact should have a detailed knowledge of the SOF x-ray protocol. This person is responsible for assuring that:

- all x-ray technicians involved in the study are familiar with the SOF x-ray protocol,
- all SOF pelvis x-rays are taken according to the SOF protocol,
- copies of the x-ray protocol are available to SOF x-ray technologists at all times.

b) The primary contact should complete the SOF X-ray Facility Certification Form. The clinial center should send a copy of this form to the SOF Coordinating Center.

c) The primary contact should assign specific technologists to this study. Each technologist is given a SOF staff ID number, preceded by a capital X.

- 2-3, but no more than 5, technologists are recommended at small and medium size x-ray facilities, and 5-7, but no more than 10 technologists at large hospital radiology departments.
- 2-3 technologists maximum, are recommended for portable x-ray subcontractors.
- Technologists assigned to SOF should be experienced in taking pelvis x-rays.

d) All assigned SOF technologists should read and have a thorough knowledge of the procedures outlined in the SOF protocol and review any questions with the primary contact.

e) The primary contact at each facility should review all pelvis films for protocol adherence and quality before they are shipped.

For x-rays taken at an x-ray facility, films should ideally be reviewed while the participant is still at the facility so that if necessary a repeat film may be obtained without additional burden on the participant..

In addition, "problem cases" where the technologist or chief technician is unsure of the quality of the image should be identified for review at the coordinating center.

VI. Central Review by SOF Coordinating Center

The SOF coordinating center will review the quality of all films during the study, and will assess the performance of each technologist.

Clinic project directors and chief x-ray technologists will be notified in writing of persistant departures from optimal imaging and examination technique.

Repeat films will be requested for films that do not provide valid information on hip OA.

SOF X-ray Facility Certification Form

	Yes	No	If no, specify
A. Imaging Technique - Facility			
The *focus size* of our x-ray device(s) are ≤1.3 mm.	o	o	_____
Total *filtering* of at least 2.5 mm Al-equivalent half value layer.	o	o	_____
Our *scattering grid* has a ratio of 12 to 1 at 40 inches.	o	o	_____
We will use films of 400 *speed.*	o	o	_____
B. Imaging Technique - Technologists			
The *film/focus distance* will be 40 inches. It is critical to maintain this distance carefully.	o		
Exposure level:			
pelvis films will be taken at 70-80 kVp	o		
with < 1 s exposure (200 film), < 0.5 s (400 film) or may be phototimed	o		
C. Positioning			
The patient will be positioned supine with feet taped to 15-30° of internal rotation.	o		
Careful *positioning* will ensure that the entire pelvis is imaged, including the hip joints, the soft tissue lateral to the greater trochanters, the ilium up to at least the level of the anterior superior iliac spines, and the proximal femur to at least 2 inches below the lesser trochanter.	o		
The beam is centered on the symphisis pubis.	o		

Technologist Supervisors statement: Only identified technologists will be involved in this study. If personnel need to be added, they should be identified to the clinic and coordinating center.

_____ Clinical center

_____ X-ray facility location

_____ Last name, first name

_____ Position

_____ Phone number

_____ Address

_____ Date

_____ Signature

SOF X-ray Technologist Identification Form

I have carefully read the FIT x-ray manuals. I will adhere to the protocol as stated in the manual as closely as possible.

	Last name	First name	FIT staff ID #	Date	Signature of

Technologist Supervisors statement:

The above-listed individuals are qualified to perform the required x-ray examinations.

Clinical center _____ X-ray facility location _____

Last name, first name _____ Position _____ Phone number _____

Address _____ Date _____ Signature _____