

The BCCI AVP TW3 Radiological Protocol (U-16 Boys and U-15 Girls)

1. **Nomination of the BCCI Radiological Centre in each State Association (SA):**
 - a. The radiological centre should have a digital x-ray unit capable of jpeg and dicom images.
 - b. The Radiological centre should be able to download the jpeg and dicom images onto a computer.
 - c. The radiological centre should have a broadband Internet facility, to email the x-ray images directly to the BCCI AVP department.
 - d. **All the above points are mandatory and non – negotiable.**

2. **Identification and Registration of the players at the BCCI radiological centre in each SCA.**

The BCCI AVP Coordinators will accompany the players to the radiological centre for their TW3 X-rays and the following procedures will be followed.

- a. The BCCI AVP Coordinator will examine each player's photo I.D. (Aadhar Card Only). No X-ray will be allowed by BCCI Coordinator if player isn't carrying a physical Aadhar card. **E- Aadhar, photocopy of Aadhar or any other identity proof will not be accepted, and player will not be allowed for x-ray and consequently s/he won't be eligible for U15/U16 tournament.**
- b. The State Association AVP Coordinator will click the photograph of player, carrying Aadhar card in his / her mobile with name in Aadhar card clearly visible. Later, these photographs should be mailed to BCCI AVP department by the association with each filed named as per name of players entered in the registration sheet.
- c. The radiographer identifies the players from the same Aadhar Card. The players are then sent for their x-rays. A copy of registration list should also be given to radiology centre in advance so that they know the sequence of players for the x-rays.
- d. The x-ray ID: The player's name, sex (M/F), DOB, Radiology centre, date of x-ray will be embedded on the x-ray images (jpeg).

3. Radiographic Technique: X-ray with standardized Demographics

- a. The x-ray film will be 10 X 8 inches with portrait view.
- b. The correct positioning of the wrist and hand is shown in Figure 1. It is of great importance since faulty positioning causes some bones to have appearances different from those described in the TW3 rating. The radiographer must be taught to look on this technique as an attempt to be qualitative and the anode film distance should be exact.
- c. The player's left hand is used. The palm faces downwards, in contact with the cassette, with the axis of the middle finger in direct line with the axis of the forearm; the upper arm and forearm should be in the same horizontal plane. The fingers are just not touching and the thumb is placed in the comfortable, natural degree of rotation with its axis making an angle of about 30 degrees with the first finger. The player presses the palm lightly downwards on the film cassette.
- d. The tube is centered above the head of the third metacarpal, with the focus film distance (FFD) of 76 cm or 30 inches. High definition screens should be used since high quality definition is essential.
- e. The X-ray table is topped with lead sheeting and a lead material apron is attached to its edge and is pulled well up into the players lap to shield the gonads from radiation.
- f. The Exposure factors will be in the range of 45-52 Kvp and 4-8 mAS.
- g. The development of the film should preferably be rather light.



Figure 1: The correct positioning of the hand and wrist for skeletal maturity radiograph.

4. The Demographics of the players Hand and Wrist Radiographs:

- a. The following details to be embedded in a strip at the bottom of the x-ray jpeg images.
 - **Top Row:** Name of player, Sex (M/F), Date of Birth (DD-MM-YYYY).
 - **Bottom Row:** Hospital name, Hospital x-ray code/ID, Date of x-ray (DD-MM-YYYY), Description (Left Hand & Wrist).
- b. The radiographs should be stored as jpeg and dicom images on the computer.
- c. The radiological centre should email the jpeg and dicom images to the BCCI AVP department immediately after the completion of all x-rays and in the presence of BCCI AVP Coordinator.

5. Additional guidelines for X-rays

- a. The image must be a posterior-anterior radiograph including at least 3 cm of radius measured from the distal end of its epiphysis.
- b. The distance between the detector and the X-ray tube (the so-called film-focus distance) should preferably be 1 meter.
- c. The distance between the palm surface and the detector should be no larger than 2 cm to limit the magnification.
- d. The hand should be pressed firmly towards the plane surface, and the fingers should be stretched. The fingers should not touch each other, and the angle of the thumb relative to the index finger should be at least 15 degrees.
- e. Metacarpals 2-5 should be totally contained in the image and not occluded by any material.
- f. The image must have a resolution of 100-720 dpi (dots per inch).
- g. The image must not be subjected to too much postprocessing (edge enhancement, sharpening), because it can lead to skewed bone age values. A minor degree of edge enhancement is acceptable.
- h. All players should use Gonad Protectors while undergoing X-rays.