

**ALL INDIA FOOTBALL FEDERATION (AIFF)
SKELETAL MATURITY DETERMINATION PROGRAM GUIDELINES 2019-20**

TW3 Skeletal Maturity Qualification Rules for specific AIFF Youth Tournaments
[Eligibility determined on the basis of the TW3 method of skeletal maturity only]

1. **Introduction to the Skeletal Maturity Determination Program:**
 - 1.1 The All India Football Federation (“AIFF”), as the governing body for football in India, is responsible for ensuring that appropriate protocols are put in place to ensure a level playing field for competitive participation of players in AIFF tournaments for youth players, which aims to ensure that such competitions only take place between players of similar skeletal maturity.
 - 1.2 While the process of determining skeletal maturity of players is detailed subsequently herein, players, guardians, coaches, clubs and academies are advised through these AIFF Skeletal Maturity Determination Program Guidelines (“**AIFF SMDP Guidelines**”), that henceforth, for the Hero Junior League and the Hero Sub-Junior League tournaments as conducted by AIFF, which together constitute the AIFF (TW3) Youth Tournaments (“**AIFF Youth Tournaments**”), the AIFF shall only permit and recognise the participation of those players who satisfy the prescribed criteria as per the AIFF adopted scientific method of assessment of skeletal maturity introduced in 2001, known as the TW3 (Tanner, Healy *et al*) method of skeletal or bone maturity, in view of the change of the nature and eligibility criteria of the AIFF Youth Tournaments, wherein the focus is on skeletal maturity of players and not their chronological age. Accordingly, the earlier used process of assessing the eligibility of the players based on chronological age i.e. through reliance placed on chronological age determination documents including, but not limited to, birth certificates and passports has been discarded. Accordingly, in these AIFF SMDP Guidelines, the expression “(**TW3 Youth Players**)”, in relation to the players for the 2019-20 season shall mean those players whose skeletal maturity has been tested and found to be up to the rating of ‘16.2’ & ‘14.2’ years for Hero Junior and Hero Sub Junior Leagues respectively, pursuant to the TW3 method of testing.
2. **The Determining Factor:**
 - 2.1 The AIFF shall follow the TW3 method of assessment of skeletal maturity (Tanner, Healy *et al*) which is an internationally recognized testing method of assessing skeletal maturity and which will be the sole determining factor for eligibility to participate in the AIFF Youth Tournaments as specified above. No other process or methodology shall be acceptable or be applicable.
 - 2.2 AIFF has decided that henceforth, the skeletal maturity assessment tests (as per AIFF SMDP guidelines) will be conducted only once in a player’s career.

- 2.3 In this eligibility process, x-ray images of a player's left wrist and hand bones would be examined by Skeletal Maturity Determination Program ("SMDP") radiological consultants consulted by AIFF who would assess the skeletal maturity of a player and assign a rating that is up to 16.5 years, where only players rated up to 16.2 and 14.2 years respectively, are eligible to participate in the Hero Junior League and the Hero Sub-Junior League tournaments for the 2019-20 season, respectively.
- 2.4 Players will however, first be required to be registered on the Central Registration System ("CRS") of the AIFF, if not already registered in such manner, by submitting basic information and documents as required therein pertaining to such players including, but not limited to, scanned copies of passports or any other government issued identification card (other than Aadhaar card).
- 2.5 In order to compute and equate the eligibility for participation in AIFF Youth Tournaments, for the upcoming season(s), following the date on which the player gets tested, AIFF has decided to calculate the time period (years, months, days) passed between the date of the test and 1st of September of each year and add that resultant figure to the skeletal maturity rating received under the AIFF SMDP Guidelines, to get the skeletal maturity rating for that season. This is explained below:

Example: If in the 2018-19 season a player got tested on 1st February 2019 and got a skeletal maturity rating of 12.1, the rating for 2019-20 will be calculated as follows:

- Date of Test – "1st February 2019"
- Skeletal Maturity Rating – "12.1 years"
- Eligibility for 2019-20 season to be counted till – "1st September 2019"

Difference between Date of eligibility for 2019-20 season and Date of Test -- "1st September 2019" (minus) "1st February 2019" = 212 days --> "0.58 years" (when converted into years in decimal system)

Skeletal Maturity Rating for season 2019-20 = 12.1 yrs + 0.58 yrs => 12.68 yrs

- 2.6 It is clarified that for the purpose of assessing eligibility to participate in the AIFF Youth Tournaments, chronological age shall not be the determining factor and the player shall be either allowed or disallowed to participate in the tournament depending solely on the result of his TW3 test results or calculation of the projected rating for subsequent season(s).
- 2.7 The parameters of the TW3 Protocols are;
- (i) Full skeletal maturity at the wrist and hand takes place at 17 years.
 - (ii) The TW3 skeletal maturity rating system evaluates skeletal maturity up to 16.5 years.

- (iii) For the purposes of determining eligibility to play in a tournament, the rating determined for a player as per these AIFF SMDP Guidelines shall be deemed to be final and shall not be subject to any further moderation/alteration on account of the standard deviation mentioned above.
- (iv) For new aspiring players, a current TW3 skeletal maturity rating of 16.2 years or below is mandatory in order for the player to be eligible to participate in the Hero Junior League tournament and a current TW3 skeletal maturity rating of 14.2 years or below is mandatory in order for the player to be eligible to participate in the Hero Sub-Junior League tournament.

2.8 Once a player undergoes testing under AIFF TW3 protocols, his rating shall be recorded with the AIFF.

2.9 Since the TW3 test can reliably produce a rating of up to 16.5 years, in case a player enters the AIFF system for the first time by looking to participate directly in the AIFF Elite Youth League, without ever having undergone the TW3 test in the past, then such player's eligibility for such tournament shall be determined as per the requirements specified by the regulations issued by AIFF for the AIFF Elite Youth League.

3. **Skeletal Maturity Determination Program Task Force**

3.1 The AIFF Skeletal Maturity Determination Program Task Force (SMDF) shall consist of:

- AIFF Sports Medical Committee members and
- AIFF officials

3.2 **Responsibilities of the Skeletal Maturity Determination Program Task Force**

3.2.1 The SMDF, with the assistance of designated representatives (appointed by AIFF), is required to:

- (i) Coordinate and facilitate the activities and functions of the AIFF SMDF, collate results and data, communicate the information as required to the remaining AIFF SMDF members and football clubs/academies.
- (ii) Maintain the AIFF SMDF archives and data banks.

3.3 All the affiliated Football Club(s)/Academies ("FCAs") will appoint a 'Skeletal Maturity Determination Program Officer' ("**BDP Officer**") who will be the one-point contact for the FCA for communication/interaction with the SMDF. Such BDP Officer is required to report to the senior most executive officer or official of the FCA ("**CEO**") with the authority to sign documents on behalf of the FCA and liaise with the AIFF SMDF on behalf of the FCA.

4. **AIFF Skeletal Maturity Determination Program Protocols**

The AIFF Skeletal Maturity Determination Program Protocols are as follows:

4.1 **Protocol 1: Registration & Screening of players by the participating Football Clubs/ Academies (FCAs)**

- a) The AIFF SMDF will send each affiliated FCA the AIFF SMDP Guidelines for Hero Junior League tournament and the Hero Sub-Junior League tournament
- b) The CEO or equivalent of the FCA with the authority to sign documents on behalf of the FCA, will study these AIFF SMDP Guidelines for Hero Junior League tournament and the Hero Sub-Junior League tournament and thereafter sign, scan and upload the document in AIFF Competitions Management System (“CMS”), as proof of acceptance of the terms and conditions, within the time limit provided by AIFF.
- c) The FCA is required to select and register a minimum of 20 (twenty) players and a maximum of 40 (forty) players (“**FCA Squad**”) (unless otherwise specified by the AIFF) in CMS. The list of players selected by FCA for testing shall be registered with the AIFF in the prescribed manner and within such time limit as may be specified by the AIFF. It is mandatory for each player in the registered squad to undergo/have undergone the tests prescribed below in the manner as specified below from Protocol 2 onwards at least once.
- d) However, for competition purposes, teams can only register a maximum of 30 (thirty) players, out of the maximum 40 (forty) tested players, who are fully compliant with the respective competition’s participation eligibility criteria, in the competition.

4.2 **Protocol 2: Inspection of FCA Squad documentation requirements by the SMDF**

4.2.1 AIFF SMDF will verify if the players named in the FCA Squad, satisfy the documentation specifications and requirements or not by inspecting the information provided in the submitted documents for CRS registration of each player.

4.2.2 If all the specified documentation and information provided in the same is compliant with the documentation specifications and requirements detailed by AIFF for the concerned AIFF Youth League, the player shall be sent to the nominated radiological centre for the x-ray.

4.2.3 The player should carry his original photo ID card for his identification.

4.2.4 The player should carry his original copy of Parent/Guardian consent form (format as shared by AIFF with FCA) to undergo the skeletal maturity assessment tests. The scanned copy of the same needs to be submitted in AIFF CMS.

4.3 **Protocol 3: Identification and Testing of Players at Radiological Centres.**

- 4.3.1 The AIFF SMDF will send each affiliated FCA the details of the nominated radiological centre, date and time, where the FCA squad have to be present to undergo the X-ray scan as per the prescribed radiological protocols
- 4.3.2 Each player (as registered by/with FCA) will report to the nominated radiological centre along with the BDP Officer of that FCA and a designated representative, “**AIFF SMDF Observer**”, nominated by the AIFF SMDF.
- 4.3.3 The AIFF SMDF Observer will identify the player against his original photo ID (this process of identification is vital to the SMDP).
- 4.3.4 Such players will then undergo the X-ray scan as per the prescribed radiological protocols.
- 4.3.5 The x-ray identification (“**X-Ray ID**”): The player’s name, player code (as per the concerned player’s CRS registration details), sex (M/F), date of birth, photograph, radiology centre, date of X-ray test and code number will be immediately embedded on the x-ray images (jpeg & dicom) after the procedure. The radiographer/radiology centre shall put a covering note with every X-ray identifying each player with their respective X-rays and declaring that such player has been examined personally by the said radiographer in the centre therein and undersigned by the specific centre/radiographer.
- 4.3.6 The radiological centre would then be required to forward the digital x-rays of each tested player as per the protocol, to the AIFF SMDF.

4.4 **Radiographic Technique: X-ray with standardized demographics**

- 4.4.1 The x-ray film is required to be 10 x 8 inches with portrait view
- 4.4.2 The correct positioning of the wrist and hand is shown in **Figure 1**. It is of great importance to follow the positioning shown in Figure 1, since faulty positioning causes some bones to have appearances different from those described in the TW3 rating. The radiographer must be directed to maintain the exact anode film distance for most accurate possible results.
- 4.4.3 The player’s left hand is used for conducting x-ray. 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 almost touching but do not actually touch 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.

4.4.4 The tube is centred 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.

4.4.5 The x-ray table is required to be 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.

4.4.6 The Exposure factors will be in the range of 45-52 Kvp and 4-8 mAS.

4.4.7 The development of the film should preferably be rather light.

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



4.5 **The Demographics of the players Hand and Wrist Radiographs:**

4.5.1 The following details shall be embedded in a strip at the bottom of the x-ray jpeg and dicom images. The font type is Arial Bold and font size is 32. All details are required to be recorded in CAPITALS.

- **Top Row:** Name of player, Sex (M/F), Date of Birth (DD-MM-YYYY),

Player code (as per the concerned player's AIFF CRS registration number)

- **Bottom Row:** Hospital name, Hospital x-ray code/ID, date of x-ray (DD-MM-YYYY), description (Left Hand & Wrist), Radiographer's name and/or code.
- **Right Lower Corner:** Player photograph (2 cm X 3 cm) in colour.

4.5.2 The radiographs should be developed and stored on film, jpeg and dicom images on CD/DVDs or other secure storage media.

4.5.3 The radiological centre should email the jpeg images to the designated representative of the AIFF SMDF and the AIFF SMDP radiological consultants (on instruction from the AIFF SMDF).

4.5.4 Besides, the x-ray films (if not digital) and the CD/ DVD copy of the jpeg and dicom images should be emailed and/or couriered to the AIFF SMDF, as applicable.

4.6 **Protocol 4: Payment for TW3 Skeletal Maturity Test**

4.6.1 The cost of conducting TW3 test for each individual player has been calculated to be Rs. 1500/- (Rupees One Thousand Five Hundred) payable by the FCA to the AIFF in advance. This cost has been calculated after factoring in the costs for X-Rays, skeletal maturity determination software, highly experienced radiological consultants' consulting fees and a small administrative cost. The AIFF shall at the time of registration of the players of the FCA Squad for TW3 testing, collect the fee in advance i.e. Rs. 1500/- (Rupees One Thousand Five Hundred) per player from the concerned FCA through the AIFF CMS only.

4.7 **Protocol 5: Result Management of TW3 Skeletal Maturity**

4.7.1 Result management of TW3 Skeletal Maturity shall be done as per System-I detailed below, and then, if required, as per System-II.

4.7.2 System-I: TW3 Automated BoneXpert Analysis

- a) It is a stand-alone software which receives x-ray dicom files from Pacs over the dicom network.
- b) It also imports dicom files from CD-ROM or other sources. Produces a printed report or a pdf in 5 seconds. Reduces the time and human exhaustion.
- c) It completely eliminates the tedious and error-prone human judgement
- d) It delivers more accurate and precise results than manual rating.
- e) It automatically rejects abnormal bones or poor quality images.

- f) It requires 1 (one) AIFF SMDP TW3 radiological consultant.

4.7.3 System-II: TW3 Skeletal Maturity Manual Interpretation by SMDP Radiological Consultant

- a) If the computer rejects the dicom image of the TW3 x-ray due to an error, the same will be interpreted by the TW3 manual system protocol.
- b) Upon receipt and assessment of the X-Ray ID of a player, the AIFF SMDF will then refer it to 2 (two) AIFF SMDP radiological consultants for TW3 skeletal maturity rating, who will separately analyze/interpret the skeletal maturity.
- c) The AIFF reserves the right to request additional documentation including a fresh x-ray reports as may be deemed necessary.
- d) If the results of the two AIFF SMDP radiological consultants tally so as to be within the standard deviation of +/- 6 months of each other, then the lower TW3 Skeletal Maturity will be accepted. If the results do not tally within the standard deviation of +/- 6 months, the two AIFF SMDP radiological consultants will be called upon to jointly review the SMDP data of that player and attempt to reach a consensus, which may be done by meeting in person, or through communication/conversation over voice devices or electronic mail or any other electronic means of communication. If such a consensus cannot be reached between the two, a third AIFF SMDP radiological consultant will be appointed to analyze/interpret the SMDP data of the player and thereafter, the mean value of the readings taken by the 3 radiological consultants shall prevail if any two of the consultants' opinions do not match.
- e) The concerned AIFF SMDP radiological consultants will email to the AIFF SMDF the results of their interpretation on the AIFF SMDP radiological consultants skeletal maturity rating form.

4.8 **Protocol 6: The AIFF and FCAs communicate on the AIFF SMDP TW3 rating, for player's eligibility.**

4.8.1 The AIFF's SMDF will inform the participating FCAs of the results of the SMDP bone testing for each of the FCA's players.

4.8.2 The FCA is not allowed to replace ineligible player(s), if any, from those tested in the initial FCA Squad for any AIFF Youth Leagues. **If on account of ineligibility, the number of eligible players in an FCA Squad is found to be 17 (seventeen) or lesser at any stage, then the concerned team of the FCA shall not be allowed to take part or continue in that respective AIFF Youth League.** However, notwithstanding the above, ineligible players of Hero Sub Junior League shall be allowed to move to Hero

Junior or Hero Elite League if they are in conformity with the criteria of the concerned AIFF Youth Tournament and ineligible players of the Hero Junior League shall be allowed to move to Hero Elite League if they are in conformity with the concerned criteria of the Hero Elite League, subject to a maximum total squad strength of up to 30 players per FCA for each AIFF Youth Tournament.

4.8.3 The Skeletal Maturity Determination Database:

The AIFF SMDF will maintain a database of all the AIFF SMDP results.

4.8.4 Radiation Risk:

- (i) The WHO guidelines recommend that x-rays should be avoided for non-clinical use.
- (ii) The x-ray systems nowadays are clean, fast and with minimum radiation exposure. Besides the wrist and hand constitute a very small peripheral area and the x-ray radiation is minimal.
- (iii) The International Atomic Energy Agency (IAEA) had released the following figures on x-ray radiation exposure:
 - X-ray exposure in the TW3 process, to the wrist and hand, including skin and bones is 0.01 msv.
 - Natural radiation exposure from external cosmic outer space is 0.26 msv
 - Internal radiation in food and water radionuclides is 0.39 msv
 - Terrestrial external gamma radiation is 0.16-0.63 msv
 - Annual effective dose is 39 msv

One cannot ignore the issue of undue radiation. Subject to the provisions of these Guidelines, the AIFF is committed to keeping the exposure of a player to the process of x-ray of the wrist and hand as limited as possible to ascertain the eligibility of the player for participating in the AIFF Skeletal Maturity Determination Program.

Signature:

Name:

Designation:

Date:

Seal/Stamp of FCA