

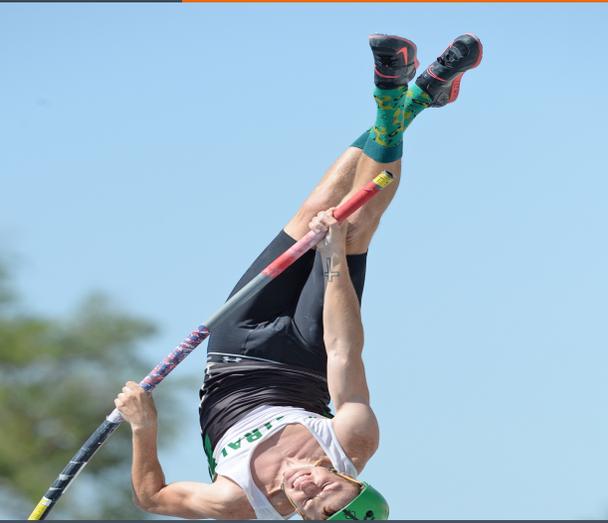


2019-20 Body Fat Testing

ILLINOIS HIGH SCHOOL
ASSOCIATION

The Future Plays Here!

2019-20 IHSA Rules Interpretation Presentation



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ISAK Certified Anthropometrist (Level 3)

IHSA Body Fat Instructor Since 2002

Owner of Goldstandard Systems Inc.



Purpose of Re-Certification

The purpose of the IHSA Body Assessor Re-Certification Home study course:

- Ensure continued competence as an IHSA Certified Body Fat Assessor
- Provide information needed to pass the Body Fat Assessor exam



Introduction





Purpose/Goals

Purpose:

- Prevent unhealthy weight management practices in student athletes that compete in the sport of wrestling through education and best practice

Goals:

- Elimination of all weight control practices that could potentially risk the health of wrestlers
- Focus on competition, not weight loss
- Recommendations should be practical, enforceable, and scientifically based



Regulations

To accomplish these goals, standards have been established that require each wrestler to undergo a comprehensive preseason evaluation to assess the following:

- Hydration Status
- Body Weight
- Percent Body Fat



Regulations

The data from these assessments are entered into a series of equations so that the following safeguards can be determined for each wrestler:

- Minimum Wrestling Weight (MWW)
- A safe weight loss descent plan (1.5% Rule)
- A weight class cycling limit



Regulation

Minimum Wrestling Weight (MWW) Defined: The lowest weight that a wrestler can maintain indefinitely without adverse effects on health and performance. (*American Academy of Pediatrics & American College of Sports Medicine*)

Regulation: MWW is based on **7%** body fat for males and **12%** body fat for females



The Regulation

- The initial body fat assessment will require all wrestlers to be assessed using the **3- site Skinfold Technique**.
- All wrestlers must have their minimum wrestling weight established **prior** to any interscholastic competition.
- **ONLY** Certified IHSA Body Fat Assessors can determine a wrestlers MWW.



Determining MWW: Scenario 1

Rule: If the predicted weight is exactly that of one of the weight classes, that weight class shall be the wrestler's minimum weight class.

Example: If a wrestler's MWW is calculated at **132.0 lbs.**

WEIGHT CLASSES

106.0 LBS	152.0 LBS
113.0 LBS	160.0 LBS
120.0 LBS	170.0 LBS
126.0 LBS	182.0 LBS
132.0 LBS	195.0 LBS
138.0 LBS	215.0 LBS
145.0 LBS	285.0 LBS



Determining MWW: Scenario 2

RULE: If the weight class falls between two weight classes, he/she must wrestle at the higher weight class.

Example: If a wrestler's MWW is calculated at **132.2 lbs.**

WEIGHT CLASSES

106.0 LBS	152.0 LBS
113.0 LBS	160.0 LBS
120.0 LBS	170.0 LBS
126.0 LBS	182.0 LBS
132.0 LBS	195.0 LBS
<u>138.0 LBS</u>	215.0 LBS
145.0 LBS	285.0 LBS



Determining MWW: Scenario 3

RULE: Any wrestlers whose % body fat is determined to be below the minimum threshold they will not be allowed to lose additional weight and their minimum weight class will be determined using the same criteria as scenario 2.

Example: If a wrestlers % body fat is 6.5% and MWW is calculated at **132.2 lbs.**

WEIGHT CLASSES

106.0 LBS	152.0 LBS
113.0 LBS	160.0 LBS
120.0 LBS	170.0 LBS
126.0 LBS	182.0 LBS
132.0 LBS	195.0 LBS
<u>138.0 LBS</u>	215.0 LBS
145.0 LBS	285.0 LBS



Maximum Allowable Weekly Weight Loss (1.5% Decent Rule)

RATIONALE: Rapid weight loss can be unhealthy & unsafe.

REGULATION: Maximum weekly wt. loss is set at **1.5%** of wrestlers body weight starting from the date of the initial body fat assessment.

A wrestler will NOT be allowed to wrestle at any weight class below their initial weight class until the date specified on the body fat results sheet provided by the IHSA.

Weight Cycling: Limiting the Ups and Downs

- **REGULATION:** If a wrestler weighs in **two** weight classes above the lowest certified weight they have competed at, then the wrestler will automatically be recertified at one weight class above that certified weight for the remainder of the season.
- **Example:** If a wrestler has competed at 132 wt. class they are eligible to compete at 138 wt. class (because its only one weight class up). If that wrestler weighs in at 145 (which is two weight classes above the 132 wt. class) that wrestler may not weigh in lower than 138 the remainder of the season.



Important Dates for Scheduling the Body Fat Assessment

- Measurements may begin on Monday, week 19 in the IHSA calendar (Nov. 11, 2019)
- Competition begins on Monday, week 21 in the IHSA Calendar (Nov. 20, 2019)
- Measurements must be complete by Friday of Week 30 of the IHSA calendar (Jan. 31, 2019)
- **REMEMBER** a wrestler's MWW must be established prior to competition



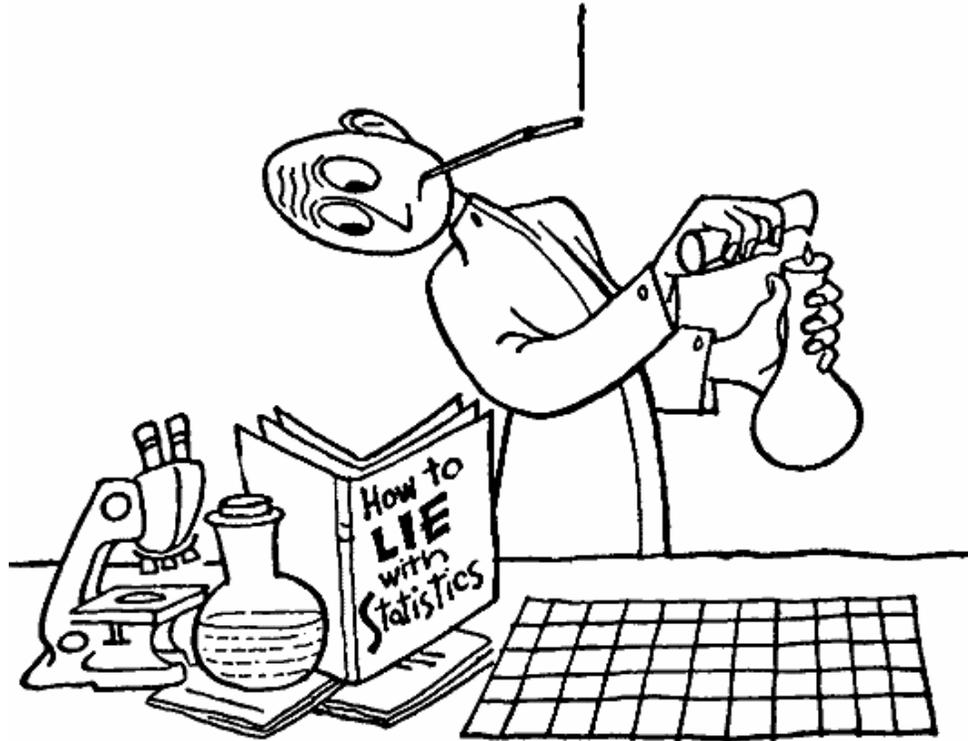
IHSA Certification Scheme

Certification Scheme & Fees

- Attend a 3-hour “live” training course every 4 years (Fee \$35) and;
- Complete an annual “Home Study” course and exam (Fee \$10) in the years between the “live” training courses.

Basic Statistics

- The best strength of a method is knowing its weakness.





Basic Statistics

- Components of measurement quality
- Sources of Measurement error
- Quantifying the level of uncertainty



5 Components of Measurement Quality

- Objectivity
- Precision
- Reliability
- Accuracy
- Validity

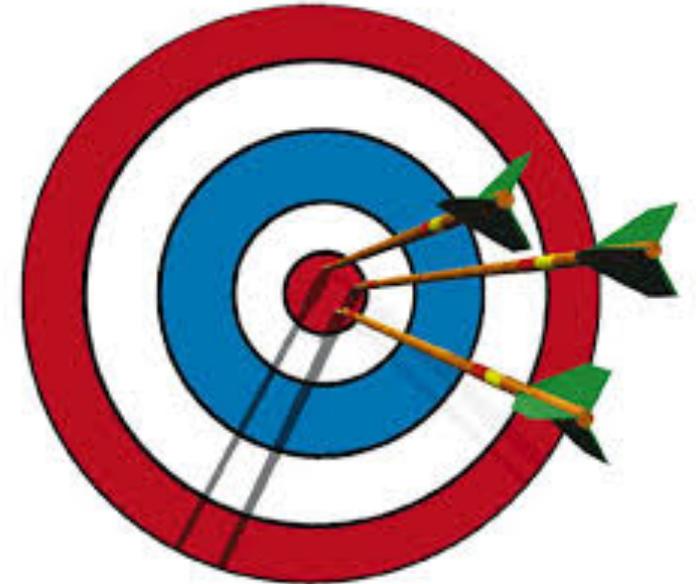
Measurement Quality: OBJECTIVITY

- Measurements that lacks bias, judgment or prejudice
- Example: Following Standardized Procedures vs. Eye balling/guessing



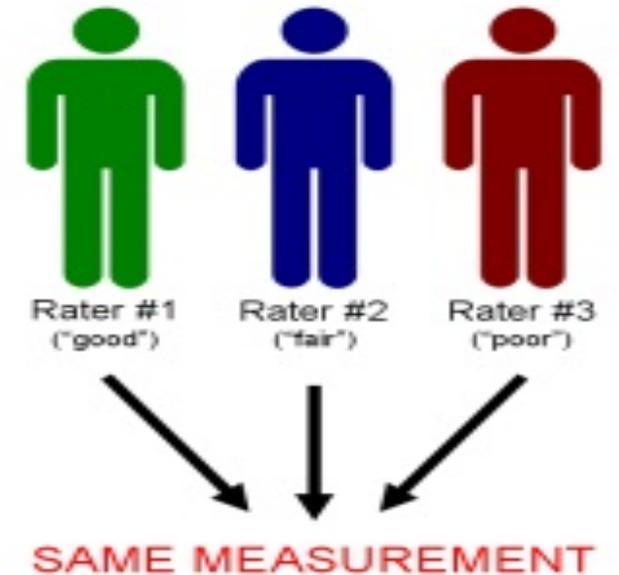
Measurement Quality: PRECISION

- The closeness of two or more measurements
- Intra-test Variability
- High precision = Low variability (visa versa)



Measurement Quality: RELIABILITY

- The degree to which the result of a measurement can be depended on to be consistent
- Inter-tester Variability
- Results are reliable when measurements can be repeated by you as well as by others independently



Measurement Quality: ACCURACY

- The extent to which a measured value corresponds to the real value
- BUT...what is the real value in Anthropometry?





Measurement Quality

PRECISION VS ACCURACY



✓ Precision
✗ Accuracy



✗ Precision
✓ Accuracy



✗ Precision
✗ Accuracy



✓ Precision
✓ Accuracy

Measurement Quality: **VALIDITY**

- The extent to which a measurement actually measures the variable under study





Measurement Goals

The measurement goals of an IHSA Certified Body Fat Assessor:

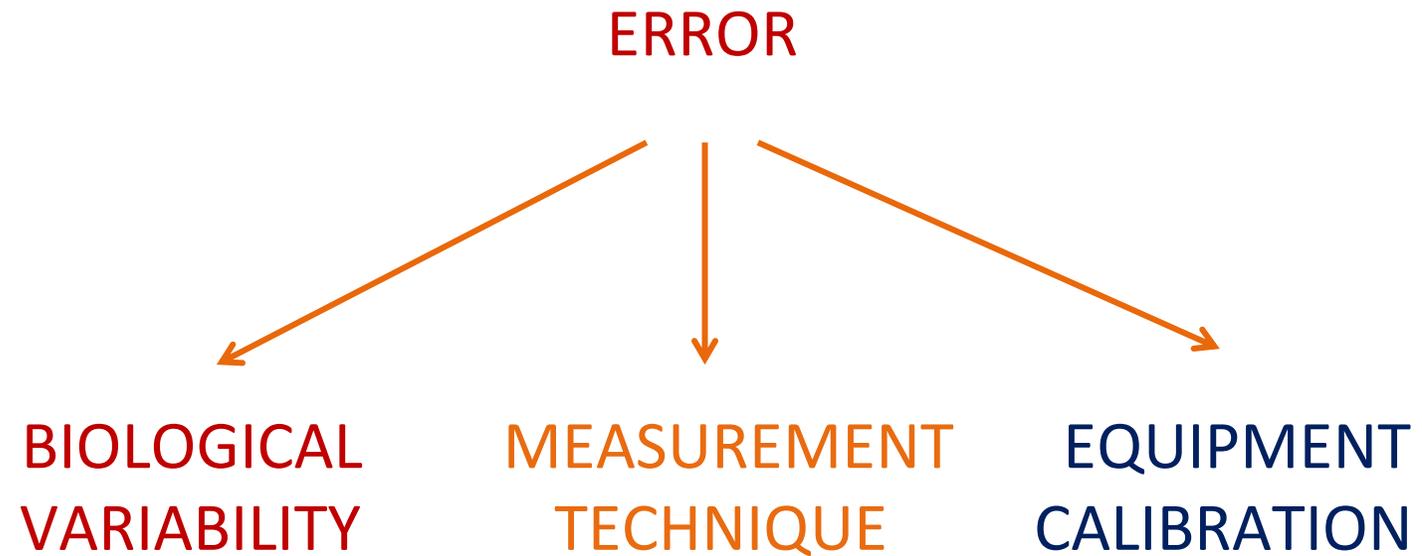
**TO ACHIEVE HIGH LEVELS OF PRECISION, RELIABILITY AND ACCURACY,
USING A VALID MEASURING TECHNIQUE**

All Measurements Are Subject To Error





Sources of Measurement Error





Biological Variability

Sources of Error We Cannot Control

- Skin Thickness is negligible or a constant fraction of skinfold
- Adipose tissue compressibility is constant
- Fixed adipose tissue patterning
- Percentage of lipid stored in adipose tissue
- Menstrual Cycle



Sources of Error You Can Control

Measurement Techniques

- Meticulous land marking
- Following standardized techniques (ISAK)
- Comparing measurements to certified Anthropometrist (level 3 or 4)
- Practice on all shapes and sizes (min. of 20 athletes within acceptable error margin)

Measurement Procedures

- Time of day/ between measurements
- Environmental conditions
- Athlete presentation
- Writing data correctly (1/7's & 4/9's & 0/6's)
- Clear pronunciation



Sources of Error You Can Control

ISSUES WITH ASSESSING LARGE TEAMS

- Assessor fatigue & reduced motivation over time
- Do not underestimate time required for each assessment
- Set aside at least 10-15 minutes per assessment
- Recruit other potential assessors from your school to get certified and/or recruit other IHSA Certified Body Fat Assessors to help



Sources of Error You Can Control

Equipment Quality Calibration & Maintenance

- Quality Equipment/Instrument
- Proper maintenance of Equipment/Instrument
- Calibration of Equipment/Instrument



Quantifying Uncertainty & Acceptable Error Margin

- IHSA Certified Body Fat Assessors must demonstrate they can measure skinfolds within an acceptable error margin
- Provides an objective method to evaluate competency
- IHSA has chosen a standard error of 1mm as the acceptable error margin in repeated skinfold measures
- IHSA is considering other options

Ethics & Professional Responsibility

Moral principles that govern a person's behavior or “code of conduct”





Professional Responsibility Statement

- All IHSA Certified Body Fat Assessors will respect the athletes “right to privacy” and the confidentiality of all the data collected during the assessment.
- Assessors are expected to provide the highest professional and ethical conduct relative to performing assessments on the student athletes.
- Independent circumstances may require assessors to make professional judgments to further validate the assessment process; therefore, mastering assessment skills and understanding the nature of the Wrestling Weight Certification Program is essential for the success of the program.



Ethics/Professional Responsibility

- Protect the athletes right to privacy
- Confidentiality of data
- Personal space
- Cultural, gender and para-sport issues
- Eliminate unnecessary comments or gestures
- Adherence to personal hygiene practices
- Room Temperature should be set at comfortable temp

Step One in the Assessment Process

Assessing Hydration Status

- Rationale
- SG Terms
- Equipment & Supplies
- Calibration
- SG Procedures
- Trouble Shooting





Assessing Hydration Status Rationale

Hydration is an important component of the Wrestling Weight Control Program for two primary reasons:

1. A well-hydrated state is essential for both health and performance of any student athlete.
2. Hypohydration compromises the accuracy of the body composition assessment.



Hydration Status Terms

- [Euhydration](#) refers to normal state/range of body water content
- [Hypohydration](#) refers to state that occurs when your body fluid levels are below the normal range of euhydration
- [Hyperhydration](#) The state that occurs when your body fluid levels are above the normal range of euhydration
- [Dehydration](#) refers to the PROCESS of losing body water.

- Athletes need to take a proactive effort to ensure adequate replenishment occurs.



How is Hydration Status Assessed

Laboratory Methods

- Isotope dilution
- Neutron activation analysis
- Plasma Osmolarity
- Bioelectrical impedance spectrometry (BIS)
- URINE SPECIFIC GRAVITY

Field Methods

- Urine color
- Body weight changes
- Urine frequency
- Rating of thirst



Urine Specific Gravity

What is Urine Specific Gravity?

- Urinary specific gravity (SG) is a measure of the concentration of solutes in the urine. SG refers to the density (mass per volume) of a sample in comparison with distilled water.



Urine Specific Gravity: Measurement Ranges

- SG of water is 1.000g/ml.
- SG is always greater than 1.000g/ml. The more concentrated the **urine**, the higher the **urine specific gravity**.
- The reference range of SG in humans is 1.002-1.030g/ml (although it can go higher)



Urine Specific Gravity: Regulation

- SG is simply a pass/fail assessment based on the specific gravity level equal to or less than 1.020g/ml.
- If an athlete fails the SG test, the assessment process is ended and the athlete will not be eligible for reassessment for 24 hours.
- Hydration testing **MUST** be done immediately prior to and at the same site where the body composition testing occurs.

Refractometer is Used to Assess Urine Specific Gravity

Optical/Analog



Digital





USG Supplies List

- Urine Collection Cups
- Latex-Free Gloves
- Pipettes/Straws
- Bio-hazard Waste Bags & Waste Basket
- Copies of “Clean Catch” procedures for males & females
- Hand Sanitizer
- Towelettes
- Mild soap and water solution, Isopropyl Alcohol to clean
- Distilled Water
- Soft Lint & Residue-free cloth (Kimwipes)
- Markers/pens
- Clipboard
- Tape
- Color dye

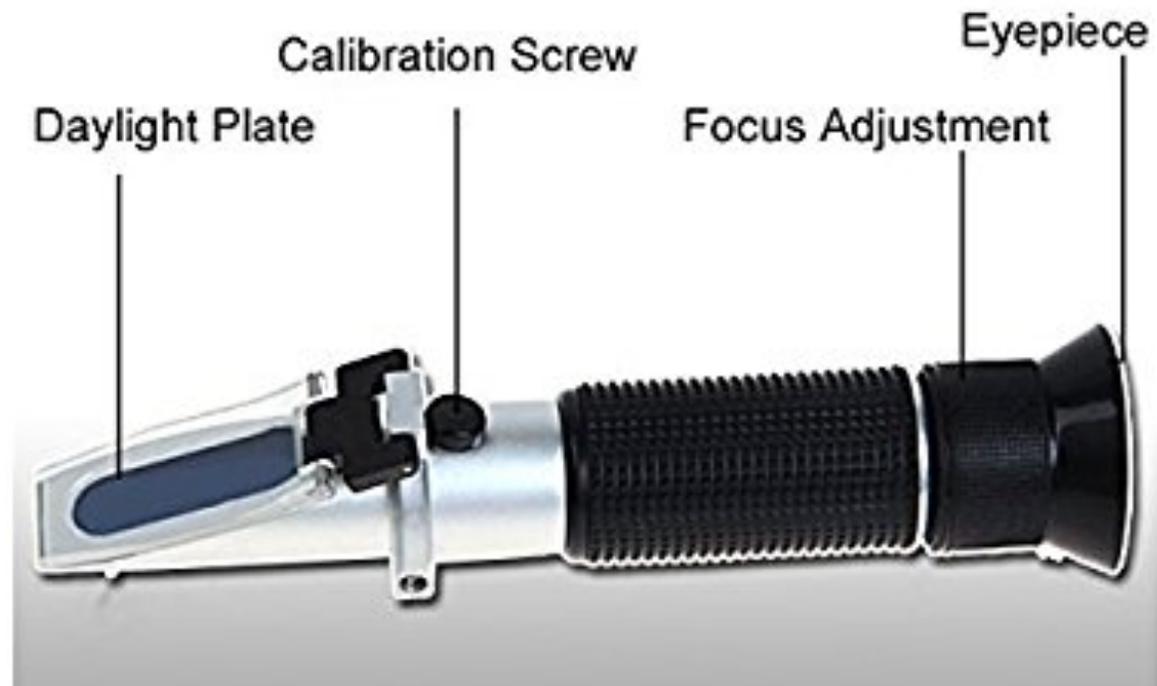


Refractometer Calibration

- Refer to your refractometer operation manual for your model's specific calibration instructions. If you do not have the manual, here are basic calibration instructions. (Note that while distilled water works for most models, a few models require calibration fluid. The procedure is the same whether you use distilled water or calibration fluid.)

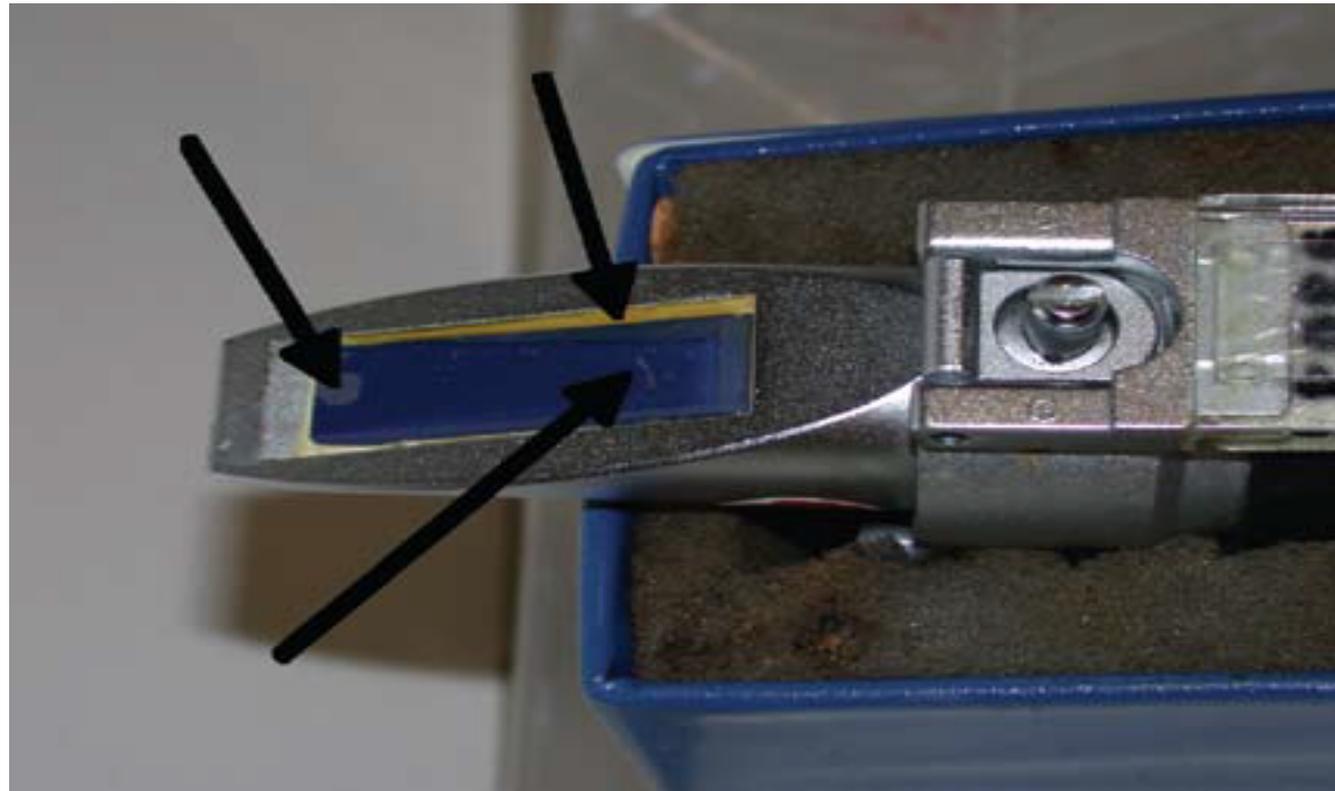
OPTICAL Refractometer Calibration

Parts



OPTICAL Refractometer Calibration

- Check for damages (scratches, separations, detached prism)



OPTICAL Refractometer Calibration

- Open the daylight plate and place 2-3 drops of distilled water on the main prism. Close the daylight plate so the water spreads across the entire surface of the prism without air bubbles or dry spots.
- Hold the daylight plate in the direction of a light source and look into the eyepiece. You will see a circular field with graduations down the center (you may have to focus the eyepiece by turning it to see the graduations clearly). The upper portion of the field should be blue, while the lower portion should be white. Read the specific gravity level off the scale - the point where the contrast line (difference between light and dark areas) crosses the scale.



OPTICAL Refractometer Calibration

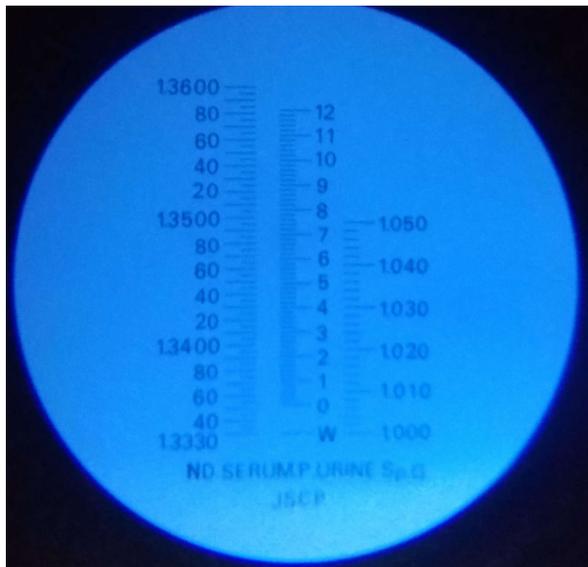
- While looking into the eyepiece, adjust the Calibration Screw (on the top of the refractometer) until the boundary between the upper blue field and the lower white field meet exactly on the 0.0° line if it is not already perfectly lined up.
- CAUTION: Be careful turning the scale adjustment screw. If it is excessively turned, it may cause breakdown of the refractometer!
- Once Calibration is complete dry the prism and daylight plate with soft non-abrasive cloth



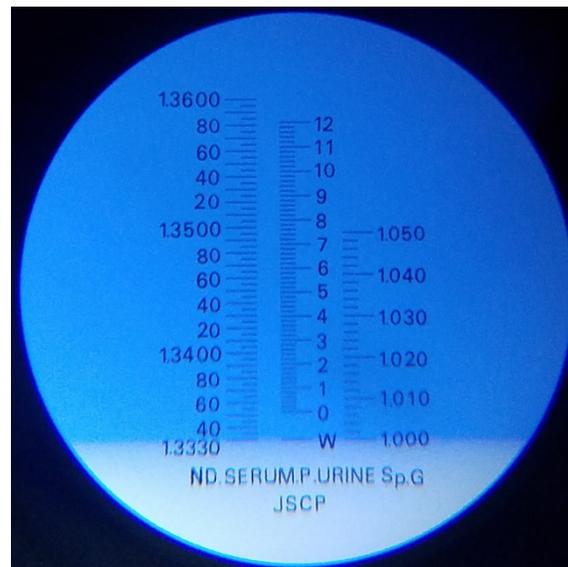


OPTICAL Refractometer Examples

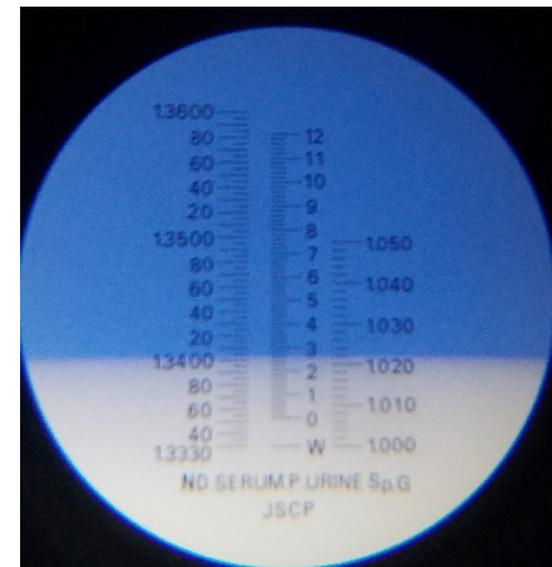
NO FLUIDS



WATER
1.000g/ml



URINE
1.022g/ml



DIGITAL Refractometer Calibration

- Clean the prism surface
- Place distilled water onto the prism surface
- Press the START key. The measured value will be displayed
- If the display indicates "1.000", the refractometer is calibrated and ready for use
- Wipe the water off of the prism with a lint free tissue



DIGITAL Refractometer Calibration

- If the indicated value is not “1.000” press the ZERO key and wait a couple seconds for calibration.
- When “1.000” is displayed, the refractometer is calibrated and ready for use.
- Dry the prism surface by wiping with a tissue.
- If an error code is displayed look up the code in your user manual and follow the troubleshooting instructions.





Caring for Your Precision Instrument

- Always store your calipers in a protective case.
- When not in use, be sure to return the caliper to its storage case.
- Do not use solutions that the refractometer is not made for.
- Do not exceed the measurement range of the refractometer.
- Store your refractometer in a location that has a relatively constant temperature. Extreme temperatures can compromise the functioning of the refractometer.
- Be sure to check the caliper's calibration periodically and follow the manufacturer's instruction for recalibrating if necessary.
- Protect your dial calipers from dust which can get inside the dial and cause inaccurate readings.
- Never drop or throw your caliper.
- Don't lay the caliper in any kind of debris (metal chips or grinding grit).



Prior to Scheduling Body Fat Assessment

- To ensure privacy and confidentiality of data reserve a washroom dedicated only to wrestlers to provide a urine sample
- Reserve a second private area nearby where the body fat test can take place
- Distribute “How to Prepare & Pass the Hydration Assessment”
- Check inventory to ensure all equipment & supplies are readily available and in working order
- Coordinate dates and times to perform the assessments with assistants and wrestling coach based on your availability



How to Pass USG Test

- Eat normal diet of foods high in H₂O content.
- Drink Plenty of fluids (at least 8-16 eight oz cups of water) for several days prior to assessment.
- Discontinue any supplements that promote dehydration 24-48 hours prior (i.e. Creatine).
- Avoid foods or beverages w/ caffeine 24-48 hours prior (i.e. soda, chocolate, coffee).
- Avoid vigorous activity involving sweating 24 hours prior.
- Avoid early morning tests.
- Distribute these hydration tips to the athlete and their parents in advance of the testing.



Prior to Scheduling Body Fat Assessment

- **RECRUIT ASSISTANTS**
- Assistants will help supervise the process of urine sample collection, NOT with taking any measurements
- Assistants can record measurements communicated by the Body Fat Assessor
- Ensure that conditions do not exist that could compromise the integrity of the urine sample collection (bulky clothes, backpacks, horseplay, etc).
- Ensure personnel is in all traffic areas between the collection area and the testing area if they are in different places.



Urine Specific Gravity Procedures

- Inform the athlete on how to collect a “clean-catch midstream urine sample”
- Print out copies of the Clean-Catch Midstream Urine Sample” instructions and tape them inside the bathroom stalls for wrestlers to review
- The goal of the clean-catch midstream urine sample is to avoid contamination. A contaminated specimen can produce an inaccurate result



Male: Clean-Catch Midstream Urine Sample

Step 1: Wash hands with soap and water, rinse and dry

Step 2: Expose penis, retract foreskin (if not circumcised) and wash the head of the penis with one anti-bacterial towelette

Step 3: Rinse penis with one sterile towelette

Step 4: Pick up collection cup container at sides. Do not touch the lid or inside the cup

Step 5: Begin by urinating a small amount into the toilet to clear urethral commensals (bacteria)

Step 6: Next, pass a portion of urine (approximately $\frac{1}{4}$ cup) into the collection container.

Step 7: When voiding is complete, athlete will give container to appropriate personnel



D



E



F



Female: Clean-Catch Midstream Urine Sample

Step 1: Wash hands with soap and water, rinse and dry

Step 2: Remove undergarments. Sit on toilet seat and swing one leg to the side as far as possible.

Step 3: With one hand, spread the labia folds and keep spread until specimen is collected. Clean around the entire urinary opening using 3 anti-bacterial towelettes (clean sides and center) using a front to back motion. Discard used towelettes in toilet.

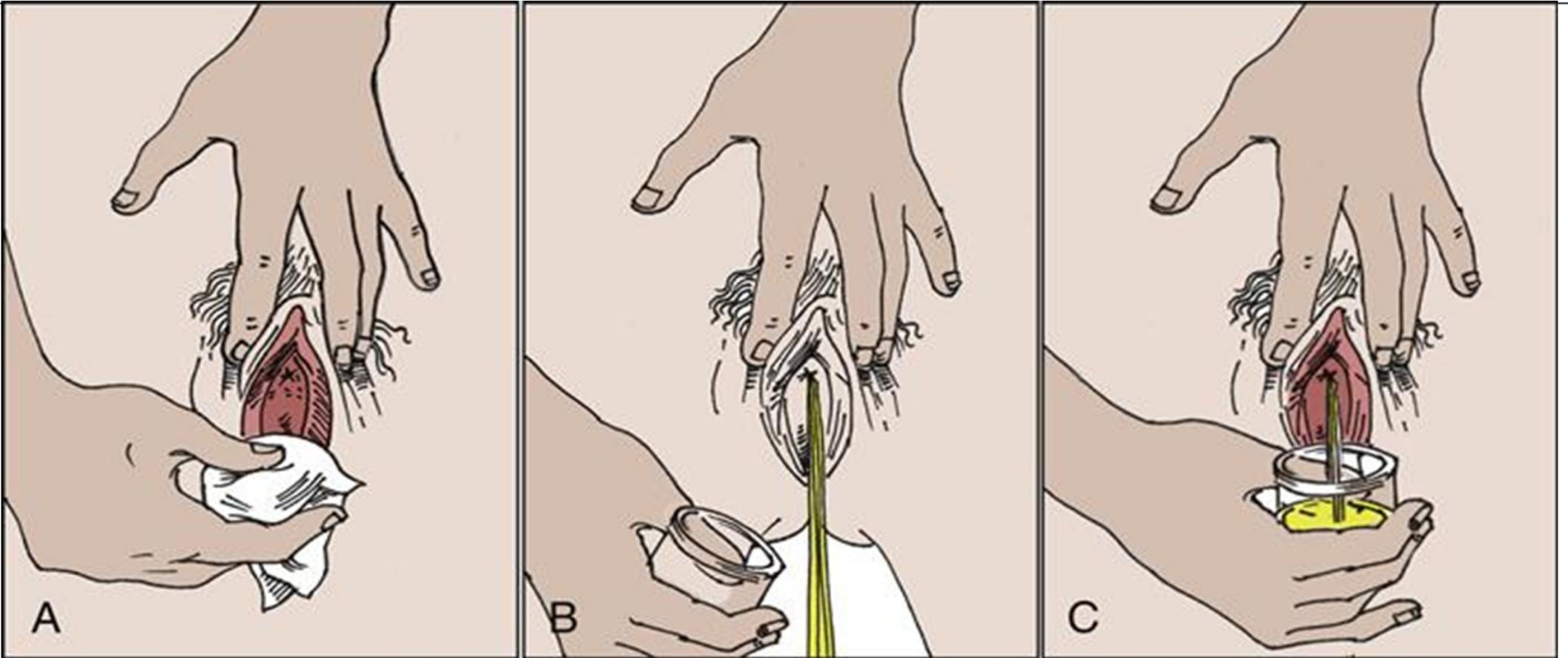
Step 4: Rinse area with one sterile towelette.

Step 5: Pick up collection cup container at sides. Do not touch the lid or inside the cup

Step 6: Begin by urinating a small amount into the toilet to clear urethral commensals (bacteria)

Step 7: Next, pass a portion of urine (approximately $\frac{1}{4}$ cup) into the collection container.

Step 8: When voiding is complete, athlete will give container to appropriate personnel





Urine Specific Gravity: Procedures

- Mark each urine collection cup to identify the athlete being tested.
- Instruct each wrestler to enter the toilet or urinal one at a time with nothing but the urine collection cup.
- It is recommended that no more than THREE wrestlers be supervised at one time during the urine collection.
- Allow reasonable time for the athlete to provide a sample of urine.
- Wrestlers should not have access to sinks where water can be added to their samples, therefore, it is recommended that faucets are taped shut (except for one to wash hands).

Urine Specific Gravity: Procedures

- Colored dye, tide-bowl, fruit punch packets or other agents to color the toilet water may be added so that wrestlers are not tempted to dip their cup into the toilet water.
- Personnel must ensure that the wrestler has provided a sample of their own urine. Reasonable supervision is required, however, **under no circumstances will personnel witness the sample going from the body into the collection container.**
- After collection of the urine by the athlete, appropriate personnel should ensure that the urine is warm by feel on the outside of the collection cup. If the urine is cold or suspect, reject that sample and require the athlete to provide another sample under closer supervision.



Determining SG: Refractometer

- Use Refractometer (Optical or Digital)
- Tester will use latex free gloves
- Administer test ASAP after sample is collected
- Use clean pipette/straw to obtain sample
- Place 2-3 drops on refractometer prism
- Record results....remember passing has to be between 1.002 g/ml - 1.020g/ml
- Discard urine, pipette, container, cleaning supplies
- Clean and dry refractometer
- Re-calibrate after every 10 samples

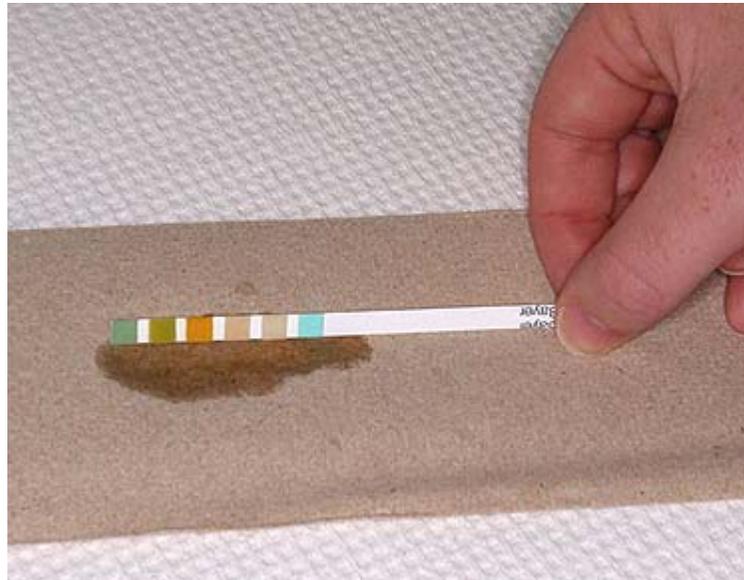


Determining SG: Test Strips

- Use Bayer Multi-Stix 10 SG
- Use latex free gloves
- Administer test ASAP after sample is collected
- Remove one strip and then replace cap
- Immerse strip completely in urine and then remove to prevent dissolving the reagents
- Hold strip in horizontal position for 45 seconds
- Compare color blocks to the specific gravity chart on the side of the bottle (order extra color charts)
- Record results....remember passing has to be between 1.002 g/ml - 1.020g/ml
- Discard urine, test strip, and container



Reading Test Strips





Troubleshooting

- Infrequent Calibration
- Sample Contamination
- Not cleaning the daylight plate or prism surface completely between samples
- Misreading the metered scale displayed in the viewfinder



Step Two in the Assessment Process: Body Weight

- Body weight scale options & requirements
- Scale care & maintenance
- Scale calibration locations
- Proper attire

Body Weight Scale Options & Requirements

Digital



Balance Beam



Spring



Scale Capacity: 250+ LBS

Accuracy Requirements: 0.2 LBS



Scale Care & Maintenance

- To clean the scale, wipe surfaces with damp cloth. Never submerge the scale in water
- Do not store the scale in direct sunlight or other hot places
- Do not try to adjust digital/electronic scales. If adjustment is necessary, contact the manufacturer



Scale Calibration

Local bureau of weights and measure can calibrate equipment against criterion standards.

- Illinois Dept. of Agriculture- Weights & Measures: 801 E Sangamon Ave, Springfield, IL 62702
- Department of Business Affairs and Consumer Protection (BACP): 2350 W. Ogden Ave., 2nd Floor Chicago, IL 60608

Obtaining Body Weight: Attire

- Males must wear shorts w/ t-shirt removed
- Females must wear shorts and a top that exposes the scapula
- Underwear is not acceptable attire.
- Under NO circumstances may a wrestler be weighed-in, in the nude





Step 3 in the Assessment Process: 3-site Skinfold

- Facility & Assistance Recommendations
- Equipment & Supplies
- Skinfold Caliper Calibration
- Land marking
- Skinfold Technique



Skin Fold Assessment: Facility Recommendations

- Choose a location close to where the Hydration assessment was taken for convenience.
- Assessments must be taken in a separate room or screened-off area to allow for privacy and confidentiality of data.
- Ensure adequate space to easily move around the subject and manipulate the equipment.
- Area should be set at a comfortable temperature.

➔ Skin Fold Assessment: Assistant Needs

- Assistant should be used to help record data.
- Body Fat Assessor must use clear pronunciation and the recorder must write clearly.
- After Body Fat Assessor takes measurement and verbally announces skinfold value the assistant should repeat the value to ensure agreement.



Skinfold Assessment: Equipment & Supplies

- Lange & Slim Guide Skinfold Calipers only
- Calibration Block/Dowel/Rod/Vernier Caliper
- Anthropometric Tape Measure (preferably metal)
- Segmometer (optional)
- Fine tipped felt or Dermographic pen (white & black)
- Record Sheet
- Assessment Procedures Manual



Skinfold Assessment: Maintenance Check

Caliper Springs- Not be distorted
(slim guide)

Pivot Joint- Smooth operation
Indicator mechanism- clearly
visible/not bent

Indicator Mechanism- Clearly
visible/not bent

Jaw Alignment- Should be square
to ensure full surface are can be
applied



Skinfold Caliper Calibration: Jaw Gap

Caliper Jaw Gap

- Calibration Block/Dowel/Rod/
- Vernier caliper
- Be sure indicator is on zero
- If caliper jaw gap is off send caliper to manufacturer for repair or purchase new caliper





Skinfold Caliper Calibration: Spring Tension

- Caliper spring tension should remain constant throughout the range of measurement; if not replace springs or send caliper to manufacturer or replace old springs
- Calipers spring tension should be calibrated every 2 years!
- Currently working on developing standard foam “open cell” blocks

Prior to Skinfold Assessment

- Wrestlers must not exercise, take a shower, or sit in a sauna/steam or equivalent between their Hydration status assessment and the skinfold assessment. All of above mentioned will increased blood flow to the skin which will compromise the accuracy of the assessment.
- Ensure the athlete's skin is dry and lotion-free.
- If the wrestlers skin is not dry for any reason use a dry cloth or towel to dry the areas of the body that will be skinfold tested.
- **It is recommended that Body Fat Assessors review their ethical and professional responsibilities prior to the skinfold assessment.**

Preparing Wrestler Prior to Skinfold Assessment

- Explain the skinfold assessment process to the wrestler and answer any questions/concerns.
- Verbal consent should be obtained prior to beginning the skin fold assessment.
- Athletes should be offered the option of having a friend or parent as chaperone especially if the Body Fat Assessor is not the same gender.



Skinfold Technique: Landmarking

- All landmarks are identified and marked using a fine-tipped felt or dermatographic marker before any measurements are made.
- Landmarks are identifiable skeletal points which generally lie close to the body's surface and are the “markers” which identify the exact location of the measurement site.
- Landmarks are identified with the thumb OR index finger.
- For accuracy of measuring and comfort of the athlete, the body fat assessor's fingernails should be kept trim.

The Anthropometric Position

- Body, neck and head should be erect and facing forward, with the arms extended down on each side of the body,
- Palms parallel to the body and thumbs pointing towards the front.
- The legs are extended with the feet comfortably apart, but no more than hip width.



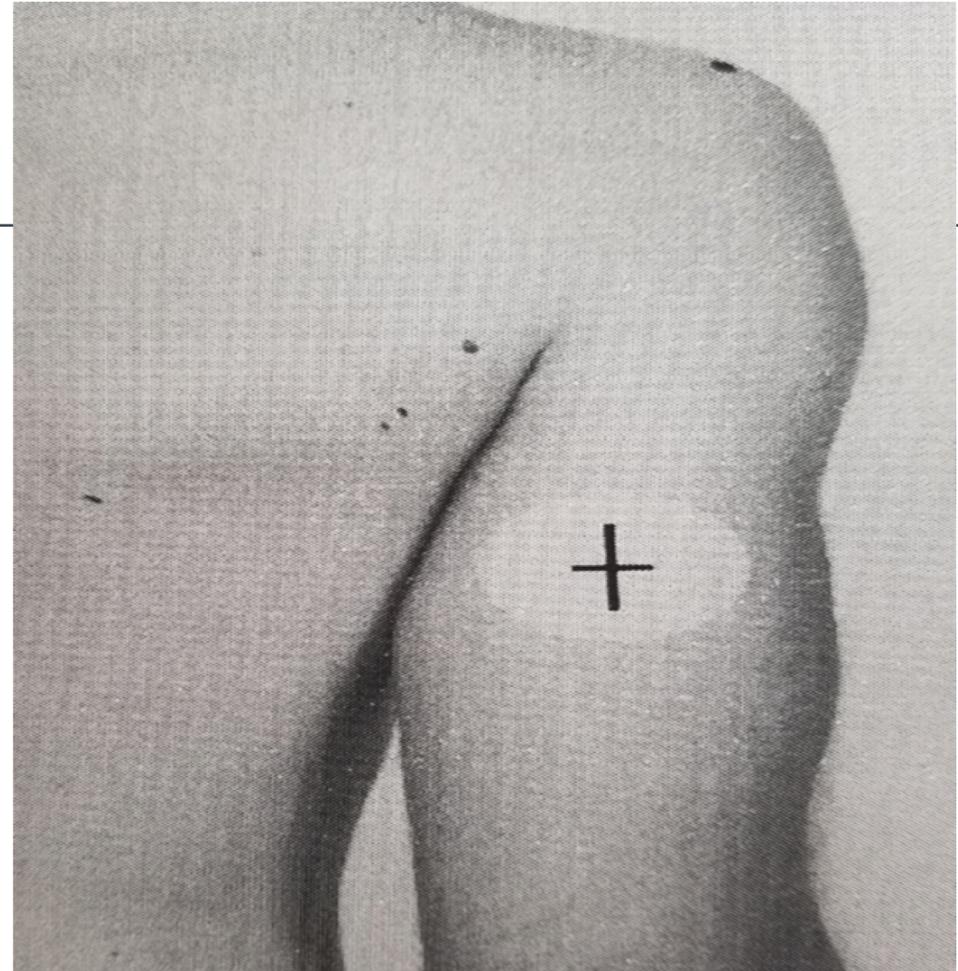


Skinfold Technique: Landmarking

- Particular attention should be made to preserving a 90* angle between the assessor's finger and the athlete's skin surface to detect bony surfaces. without the skin being pulled out of its normal position.
- Once a landmark is identified with your finger release to remove any distortion of the skin, then relocated and make your mark.
- The mark is then re-checked to ensure that there has been no displacement of the skin relative to the underlying bone.

Marking- Landmarks & Measurement Sites

- ❑ Marking landmarks: small identification marks (-- *)
- ❑ Marking measurement sites: Draw straight lines crossing at landmarked sites
- ❑ Long axis identifies the direction to grasp skinfold AND a guide for aligning fingers
- ❑ Short axis is used as a guide for aligning fingers





Landmarking Sites

Males: 5 Landmark Sites

- ACROMIALE
- RADIALE
- MID-ACROMIALE-RADIALE
- SUBSCAPULARE
- ABDOMINAL

Females: 4 Landmark Sites

- ACROMIALE
- RADIALE
- MID-ACROMIALE-RADIALE
- SUBSCAPULARE

Acromiale landmark

- ❑ **Definition:** The point at the superior and lateral border of the acromion process, midway between the anterior and posterior borders of the deltoid muscle when viewed from the side.
- ❑ **Subject Position:** Anthropometric Position
- ❑ **Location:** Standing behind and on the right side of the athlete palpate along the spine of the scapula to the corner of the acromion. The landmark is a point on the most lateral and superior part of the border which is adjudged to be the mid-deltoid position when viewed from the side.



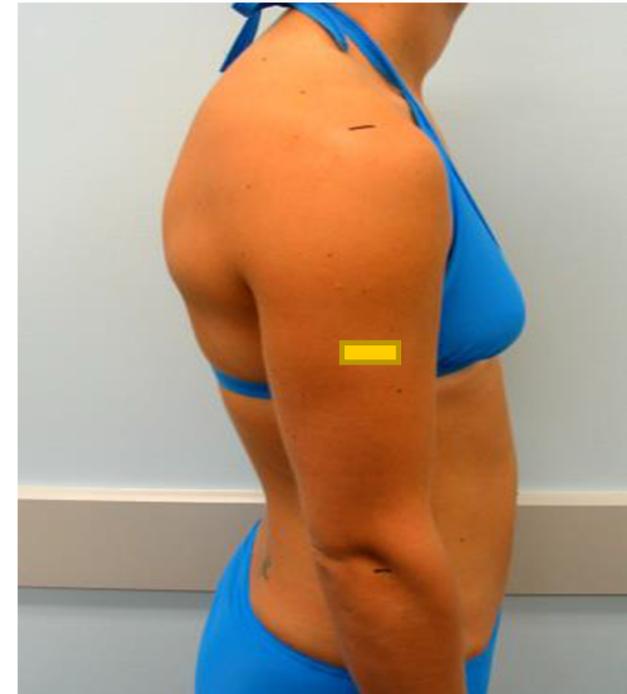
Radiale landmark

- ▣ **Definition:** The point at the proximal and lateral border of the head of the radius
- ▣ **Subject Position:** Anthropometric Position
- ▣ **Location:** Palpate downward into the lateral dimple of the right elbow. It should be possible to feel the space between the capitulum of the humerus and the head of the radius. Move your thumb distally onto the most lateral part of the proximal radial head. Mark with short line perpendicular to the long axis of the forearm.



Mid-acromiale-radiale landmark

- ❑ **Definition:** The mid-point of the straight line joining the Acromiale and the Radiale
- ❑ **Subject Position:** Anthropometric Position
- ❑ **Location:** Measure the linear distance between the acromiale and radiale landmarks. If a tape measure is used, be sure to hold it so that the perpendicular distance between the two landmarks is measured, rather than following the curvature of the skin. Place a small mark at the level of the mid-point between those two landmarks. Using a tape measure project this mark around to the posterior surface of the arm. Next, intersect the projected line with a vertical line in the middle of the arm when viewed from behind



Subscapulare landmark

- ❑ **Definition:** The undermost tip of the inferior angle of the scapula.
- ❑ **Subject Position:** Anthropometric Position
- ❑ **Location:** Palpate the inferior angle of the scapula using your left thumb. Mark the undermost point as a dot when located. Next, draw a line 2 cm from the mark laterally downward at an angle of 45 degrees. Draw a second line, perpendicular to the first, to indicate the alignment of the finger and thumb when picking up the fold. If there is difficulty locating the inferior angle of the scapula, have the athlete slowly reach behind the back using the right arm. The inferior angle of the scapula should then be felt continuously as the hand is again placed by the side of the body



Subscapulare landmark

- ❑ **Definition:** The undermost tip of the inferior angle of the scapula.
- ❑ **Subject Position:** Anthropometric Position
- ❑ **Location:** Palpate the inferior angle of the scapula using your left thumb. Mark the undermost point as a dot when located. Next, draw a line 2 cm from the mark laterally downward at an angle of 45 degrees. Draw a second line, perpendicular to the first, to indicate the alignment of the finger and thumb when picking up the fold. If there is difficulty locating the inferior angle of the scapula, have the athlete slowly reach behind the back using the right arm. The inferior angle of the scapula should then be felt continuously as the hand is again placed by the side of the body



Abdominal landmark

- ▣ **Definition:** The point 5 cm horizontally to the right hand side of the omphalion (midpoint of the navel).
- ▣ **Subject Position:**
Anthropometric Position
- ▣ **Location:** The site is identified by a horizontal measure of 5 cm, to the athlete's right, from the omphalion.





Skinfold Technique

- Begin by having athlete standing in anthropometric position
- Take all measurements on right side of body (exceptions include; injury, deformity, etc.).
- Hold the skinfold caliper in the right hand while raising the skinfold with the thumb and index finger of the left hand using the prone grip (the back of the hand should be facing the measurer).



Skinfold Technique (cont.)

- The skinfold is picked up at the marked site. The near edge of the thumb and index finger are in line perpendicular to the skinfold orientation.
- The skinfold should be grasped and lifted (raised) so that a double fold of skin plus the underlying subcutaneous adipose tissue is held between the thumb and index finger of left hand.
- The size of the fold should be the MINIMUM necessary to ensure that the two skin surfaces of the fold are parallel.
- Hold the skinfold firmly but do not pinch to the point of pain.



Skinfold Technique Sequence

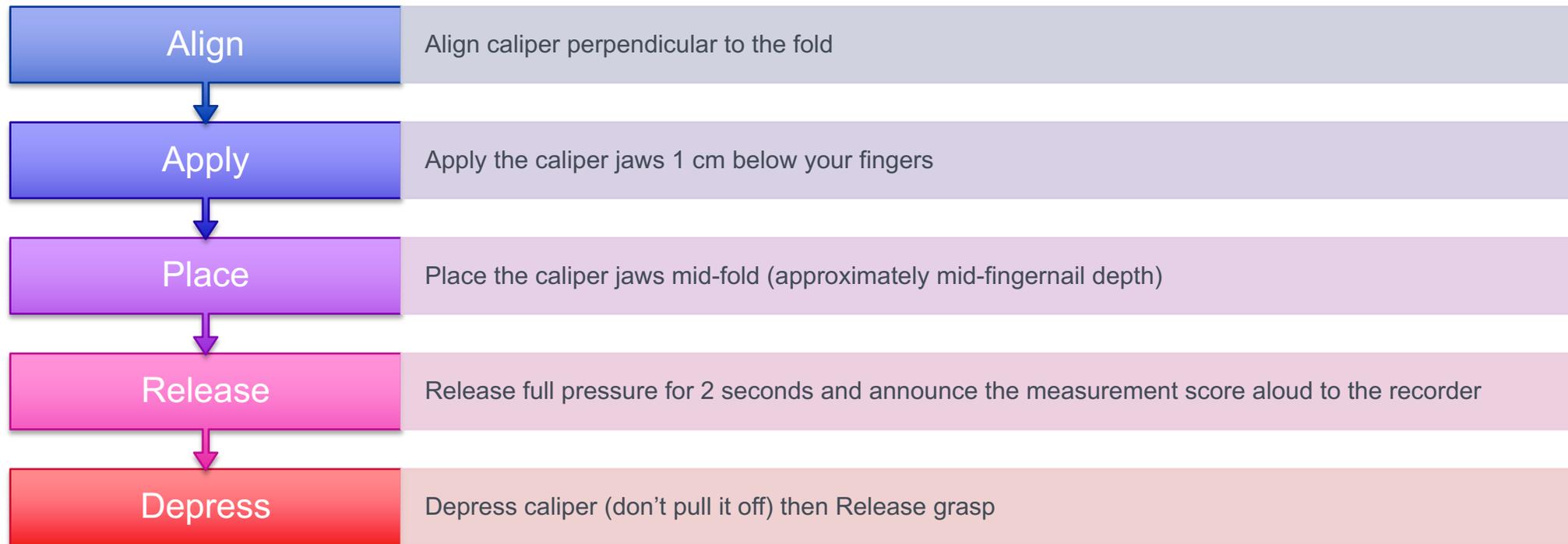
Positioning

Approaching landmark

Align fingers with landmark and gently palpating skinfold

Grasp minimum double fold of skin & adipose tissue

Skinfold caliper sequence



Skinfold Technique (cont.)

- Measurement is recorded TWO seconds after the full pressure of the caliper is applied
- Read the dial of the caliper to the nearest 0.5mm
- Record three measurements at each site in *rotation order*.
- Practice is necessary to ensure the same size of skinfold is grasped at the same location for repeated measures

Skinfold Technique (cont.)

- If the difference between the three values is more than 1mm for a single site, the subject will need to wait 20 minutes for additional skinfold reading (this allows the skin to return to normal condition).
- Example 1: If the triceps skinfold values are 10.0mm, next 10.5mm, and finally 11.0mm those 3 values are within 1.0 mm and would be acceptable.
- Example 2: If the triceps skinfold values are 10.0mm, next 10.5mm and finally 11.5mm those 3 values are NOT within 1.0mm and would not be acceptable.



Skin Fold Sights

Male

- Triceps
- Subscapular
- Abdominal

Female

- Subscapular
- Triceps

Triceps Skinfold

- Arm relaxed hanging by side in **mid-prone position**
- The Skinfold is measured vertically and parallel to the line of the upper arm, over the triceps muscle



Subscapular Skin Fold

- Athlete assumes a standing position with arms relaxed by the side
- Skinfold is raised along a line running laterally and obliquely downwards at an angle (approximately 45°) as determined by the natural fold of the skin



Abdominal Skin Fold

- Athlete assumes a standing position with arms relaxed by the side
- The skinfold is measured vertically. Make sure **initial grasp is firm and broad**. NOTE: Do Not place calipers in the navel





Special Circumstances

- There are some people for whom the skinfold technique cannot be accurately taken (injury, deformity, extremely tight skin, large subcutaneous adiposity). To avoid both large errors and/or embarrassment contact IHSA for another option.



Body Fat Appeal

Rationale: Allow wrestlers the opportunity to pursue a more accurate/comprehensive body fat assessment when the 3-site skinfold technique proves to be insufficient for a particular “high risk” wrestler and/or circumstance.



When is Appeal Option Recommended?

- Wrestler considering a wt. class that would put them below the minimum threshold
- Multiple “varsity” wrestlers competing for same weight class (who goes up or down?)
- Wrestler/coach isn’t satisfied with the results and another skinfold test isn’t likely going to change
- Cannot obtain valid skinfold assessment (anatomical or mechanical reasons)
- Wrestler/coach/parent request

Body Fat Appeal Options

1. Repeat Initial Skinfold Assessment
2. Hydrostatic “underwater” Weighing





Appeals Process Rules

- Appeal must be filed w/in 7 calendar days of info appearing on the schools body fat results sheet
- Can appeal **ONE** time
- Can use a different tester
- Use “Wrestling Weight Control Appeal Form”
- Fax to IHSA
- Results of appeal test will replace previous test, may not be appealed, and wrestler may not wrestle until results are posted
- If Wrestler weighs less than 1.5% of the initial test the appeal is void and the results of the previous test are taken
- IHSA reserves the right to re-test any wrestler



Final Appeal

- Final Appeal: The school may file a final appeal for weight certification after their first certification date and on or before Friday of week 24 (Dec. 15th) on the IHSA Standardized calendar with approval of the IHSA administrator. A final appeal can only occur if the athlete wishing to appeal has not exceeded 1.5% weight loss per week each week from the date of the athlete's first certification. This appeal would allow the wrestler to drop no more than one weight class from the original minimum result from the first test.



Website Data Entry

ILLINOIS HIGH SCHOOL
ASSOCIATION

The Future Plays Here!

Calculations/Results



IHSA Website

IHSA
ILLINOIS HIGH SCHOOL ASSOCIATION

Schools & Officials Center **LOGIN**

the future plays here!

Home Sports & Activities Schools Officials News & Media Resources About the IHSA **SEARCH**

Today with IHSA This Week

August 2011						
Sun	Mon	Tue	Wed	Thu	Fri	Sat
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

► 1st Contest - Girls GO; Boys GO | 8/15/2011

The IHSA governs the equitable participation in interscholastic athletics and activities that enrich the educational experience

IHSA around the WEB

Like 5,537 people like this.

IHSA Tweets

Massac County girls' golf team returns all of its golfers from last year's Class 1A runner-up squad... <http://t.co/PyGAAzm> about 6 hours ago

Thorwood prepares for athletics without Superfan Dave Brown for the first time in over 30 years... <http://t.co/GbRM0n11> 1 day ago

Schools taking a more personal approach to cutting players on sports team... <http://t.co/mfQvOPtTK> 3 days ago

[Follow IHSA on Twitter!](#)

>Welcome to IHSA.org 3.0!

Read all about the new features. Problems with the site? Let us know.

IHSA Headlines

[IHSA Board Approves Continuation of Performance-Enhancing Drug Testing Program](#)
Monday, August 08, 2011

The Illinois High School Association (IHSA) Board of Directors approved a recommendation to continue the Association's Performance-Enhancing Drug Testing Program at its regularly s... [Read More](#)

[Welcome to IHSA.org 3.0](#)
Thursday, August 04, 2011

Today the Illinois High School Association presents a redesigned version of the IHSA Web site. Opened to the public in January, 1996, IHSA.org is the association's primary mode of... [Read More](#)

Heat and Hydration

Heat Alert!
Please review the [Heat & Hydration Guide](#)

IHSA ScoreZone™

IHSA ScoreZone™ is back for its 16th year! The first results will appear on August 26 (Week 1 of boys football).

Porter's Corner

[The Origin of "March Madness"](#)

IHSA TV

Enter your ID # and Password



Enter user ID:

Enter password:

THE FUTURE PLAYS HERE! **IHSA**
ILLINOIS HIGH SCHOOL ASSOCIATION

Welcome to the IHSA Schools & Officials Center

To log in, please type your user ID in the upper box and your password in the lower box, then click the button.

Forgot your password? You can [reset your password](#) via email.

SCHOOL PERSONNEL: If you don't know your ID or password, please contact your athletic director or AD's assistant.

Have a question about clinics or rules meetings or other Officials Center items?
Contact the [IHSA Officials Department](#).

The Schools & Officials Center is closed every morning between 3 and 4 am Central Time.

Please report problems to the [IHSA Technology Department](#).



Check Personal Data

Log out

OFFICIALS CENTER **IHSA**
ILLINOIS HIGH SCHOOL ASSOCIATION

Admin Schools Officials

27639: Quint McGugh Enter new selection: Find

YOUR PHOTO



Delete this image
Upload a new image

PERSONAL DATA

- Personal information
- Membership card
- Association memberships
- Affiliated schools
- Daily availability calendar
- Licensing center
- License & promotion details
- Officials insurance (PDF)

FORMS AND REPORTS

- Top 15 lists
- Reports index
- Special Yellow Card Report (Soccer)
- Special Report (all except Soccer)
- SAWA Report
- Advisory committee survey
- Official Evaluation Form (PDF)
- Official Evaluation Recording Form (PDF)
- Submit body fat data
- Boys basketball tickets
- IESA Sportsmanship Rating
- IESA Special Report
- IESA Availability

MEETINGS, CLINICS & EDUCATION

- Clinic ratings & feedback
- 2017-18 Officials Handbook (PDF)

MESSAGES more >>

You are invited to view an archived version of the [webinar](#) on IHSA Basketball Officiating, recorded on Dec. 12.

9/21 Cross Country Regional and Sectional Officials Assignments Update

We have not posted Officials Assignments in the Officials Center yet. We are still missing 3 Regional hosts and will not release the Officials Assignments until we have all of our sites (to avoid reassignment of officials). Kraig is reaching out to schools who do not have a host.

Cross Country Officials

Cross Country official and received a probation/suspension email please disregard the

Sports Concussion Safety Act

The purpose of this message is to inform all licensed officials that, effective September 1, 2017, the Illinois General Assembly amended the Youth Sports Concussion Safety Act to include Advanced Practice Nurses (APN) and Physician's Assistants (PA) ... more >>

8/29 Severe Weather Policy reminder

As a reminder, the IHSA Severe Weather Policy provides member schools and officials with guidance on how to handle state series contests where severe weather may be present. Part of a Pre-Game Huddle should identify what, if any, local policy will be... more >>

STATE SERIES ASSIGNMENTS

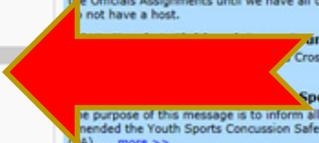
No recent assignments.

LICENSE STATUS & AVAILABILITY SUMMARY

You passed the Concussion Management Program examination on 2/7/2017 and are in compliance until 2/7/2019.

You have not yet passed the Concussion Management Program examination. You must pass the examination to be in compliance with Illinois State Law. Please review the [concussion education resources](#) and take the test.

Sport	Last Licensed	Level, Years & Promotion Status	License Status	Last Part 1 Exam & Score	Last Rules Meeting	Last Clinic	State Series Availability	Ratings
Baseball	7/19/17	C-Certified 10 years	probation	4/30/17 (36%)	4/12/17	clinic credit good thru 4/12/20	UNKNOWN	Power Rating & other ratings info



Log out

OFFICIALS CENTER **IHSA**
ILLINOIS HIGH SCHOOL ASSOCIATION

Admin Schools Officials

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Personal Information

Make sure to keep your personal information up to date. It's especially important to let the IHSA know about changes to your phone number(s) and email address.

ID number	27639	You cannot change your ID number.
Name	Quint McGugh	If you wish to change your name or date of birth, you must call the IHSA Officials Department at 309-663-6377. You cannot make these changes online or via email.
Gender	M	
Date of birth	1/1/1970	
Mailing Address (either PO Box or street address)	2715 McGraw Drive	Please double-check your address before saving. Make sure it has the proper capitalization, spacing, and punctuation.
City, state & ZIP	Bloomington IL 61704	
Email address	sjohnson@ihsa.org	Please list only one email address. Make sure it is typed correctly.
Cell phone	987-876-7653	If the IHSA needs to contact you by phone, we will call your cell phone number first, if listed. On rare occasions, we may try to alert you via text message (SMS) if you have provided your carrier information.
Text messaging	<input checked="" type="checkbox"/> Willing to receive text messages (SMS) on my cell phone	
Cell phone carrier	Alltel	
Home phone	223-456-7890	
Business phone	789-787-7777	

Save changes



Enter Data

Log out

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ILLINOIS HIGH SCHOOL ASSOCIATION

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9/13 Track & Field and Cross Country Officials
Track officials that do not want to be a Cross Country official and received a probation/suspension email please disregard the notification.

9/12 Amendment to the Youth Sports Concussion Safety Act
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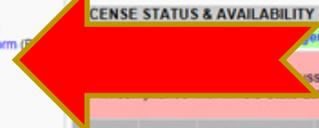
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STATE SERIES ASSIGNMENTS

No recent assignments.

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Log out

OFFICIALS CENTER **IHSA**
ILLINOIS HIGH SCHOOL ASSOCIATION

Admin Schools Officials

27639: Quint McGugh Enter new selection: Find

Select a School

Choose a school from the list below and click the button at the bottom of the page.

School

Select school



Adding a Wrestler

sjohnson



Admin
Schools
Officials

27639: Quint McGugh Enter new selection:

Team Roster -- Abingdon (A.-Avon)

To add a student to the roster, enter the information below and click the button.

First Name	Last Name	Year in School	Gender (M/F)
<input type="text"/>	<input type="text"/>	<input type="text" value="v"/>	<input type="text" value="M"/>

To delete a student from the roster, check the box next to the name and click the button.
You cannot delete a wrestler for whom data has already been entered.
To input body fat data, click on the wrestler's name.

Del?	Name	Year	Gender	Date Tested	Weight	% Body Fat	7 (or 12)% Weight	First Date at Target Class(es)	Tester	Appeal Tester
<input type="checkbox"/>	Dough, John	Sr.	M							





Input Data

[Log out](#)

Admin **Schools** **Officials**

27639: Quint McGugh Enter new selection: [Find](#)

Body Fat Data

Please enter the body fat data in the fields below, then click the button to store the data.

Name	Quint McGugh (M)		
Date tested	<input type="text"/>	<input type="text"/>	
Urine specific gravity	<input type="text"/>	<input type="text"/>	
Body weight	<input type="text"/>	<input type="text"/>	
Skinfold measurements			
Abdominal	<input type="text"/>	<input type="text"/>	<i>Complete these items ONLY if you are using the skinfold measurement method.</i>
Triceps	<input type="text"/>	<input type="text"/>	
Subscapular	<input type="text"/>	<input type="text"/>	
Hydrostatic or Bioimpedance method			
Percentage of body fat	<input type="text"/>	Method: <input type="text"/>	<i>Complete this item ONLY if you are using the hydrostatic or bioimpedance weighing method. Otherwise this figure will be calculated from the skinfold measurements.</i>

[Save changes](#)



Master Report

Log out

Admin Schools Officials

27639: Quint McGugh Enter new selection: Find

Team Roster -- Elgin (H.S.)

To add a student to the roster, enter the information below and click the button.

First Name	Last Name	Year in School	Gender (MF)
<input type="text"/>	<input type="text"/>	<input type="text" value="▼"/>	<input type="text" value="M ▼"/>

To delete a student from the roster, check the box next to the name and click the button.
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Def?	Name	Year	Gender	Date Tested	Weight	% Body Fat	7 (or 12)% Weight	First Date at Target Class(es)	Tester	Appeal Tester
	Avalos, Ivan	Sr.	M	11/17	165.8	13.58	154	170 ... 11/17 160 ... 12/03	71753	
	Berendt, David	So.	M	11/11	181.6	23.39	149	182 ... 11/11 170 ... 12/11 160 ... 1/08 152 ... 2/01	71753	
	Berr, Eric	So.	M	11/11	183.0	23.97	149	195 ... 11/11 182 ... 11/13 170 ... 12/15 160 ... 1/12 152 ... 2/04	71753	
	Cano, Jaron	Sr.	M	11/19	120.0	12.98	112	120 ... 11/19 113 ... 12/16	71753	
	Culotta, Spencer	Jr.	M	11/11	164.8	24.84	133	170 ... 11/11 160 ... 11/24 152 ... 12/18 145 ... 1/09 138 ... 2/01	71753	



IHSA Quality Assurance Standards

- Assessors are properly trained (i.e., ISAK Certified Instructor Level 3 or equivalent)
- Validated protocols are used (i.e., ISAK Protocol)
- Level of uncertainty is quantified (i.e., +/- 1mm)
- Assessment results are collected in a standardized format including all assessment details (IHSA data sheets & website entry)
- Assessment results are returned to athlete/coach in a timely manner and in a form that is readily understood and interpreted (Master Report)



Redeem Credit

[Click here to REDEEM CREDIT](#)

You will be redirected to the appropriate center once credit is redeemed