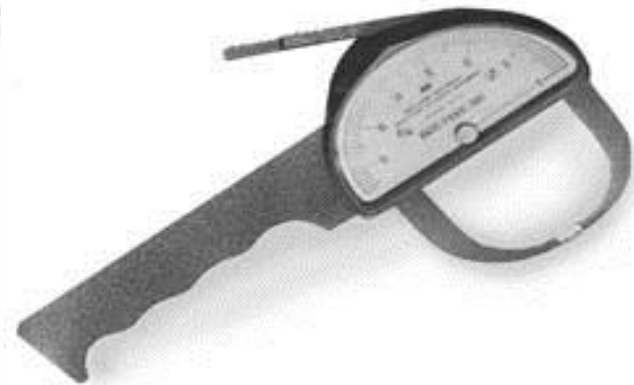


Minnesota Skinfold Assessor Workshop

Presented by:

Minnesota Athletic Trainers' Association
Secondary Schools Committee



HISTORY

- AMA – 1972
 - Position on weight loss in wrestling
 - Advising against dehydration to “make weight”
 - Warning against food restriction
- ACSM - 1976
 - Position paper on making weight in wrestling
 - Advising against the use of dehydration, sauna, and heat to lose weight



HISTORY

- MSHSL held a workshop in October of 1999 to begin certifying individuals in the state of Minnesota. Program required skinfold analysis and required signatures from the skinfold assessor, a physician, and the student-athlete's parent
- In 2006 The MSHSL required hydration testing for all wrestlers who are determined to be under 7% body fat



REGULATION OF BODY FAT LIMITS

- 7% body fat - males
- 12% body fat - females
- MSHSL has an available spreadsheet online to do calculations



Male Wrestling Weight Permit

NOTE TO SCHOOL OFFICIALS

Each student participating in wrestling must have a current completed physical form and must submit the annual Wrestling Weight Permit properly signed by the skin fold technician, a physician and the student's parent before engaging in any interschool wrestling match. **SKIN MEASUREMENTS AND WEIGHT MUST BE DONE AT THE SAME TIME.** This permit must be kept on file in the school office and be available on request.

NOTE TO PHYSICIAN AND PARENT

The purpose of this report is to prevent undue and unsafe weight reduction for competitive purposes—weight reduction which might jeopardize the physical, scholastic and psychological well-being of the student. During the wrestling season, which can extend to early March, the student-athlete should eat and drink normally while in training and participating in wrestling activities.

This weight permit form cannot be changed by modification or by a second examination. There are no exceptions to this rule.

Student: _____ School: _____

Date of Birth: _____ Age: _____ Years in Wrestling: _____

The MSHSL requires that the minimum wrestling weight be established based on body fat. Following is the required protocol.

Skin fold measurement sites (Thickness in mm)

Tricep _____
 Infrascapular (below medial lower angle of scapula) _____
 Abdominal (to right of umbilicus) _____
 Sum Skin Folds (SSF) [_____]

Weight (on date of examination) _____

Equations

$$\text{Body Density (BD)} = \{1.0973 - (\text{SSF} \times .000815)\} + \{(\text{SSF})^2 \times .00000084\}$$

$$\text{BD} = \{1.0973 - (\text{SSF} \times .000815)\} + \{(\text{SSF})^2 \times .00000084\} = \underline{\hspace{2cm}}$$

$$\% \text{ Body Fat (\% BF)} = \{(4.57 / \text{BD}) - 4.142\} \times 100$$

$$\% \text{ BF} = \{(4.57 / \text{BD}) - 4.142\} \times 100 = \underline{\hspace{2cm}}$$

$$\text{Weight at 7\% BF} = \{[1 - (\% \text{ BF} / 100)] \times \text{Weight}\} / .93$$

$$\text{Weight at 7\% BF} = \{[1 - (\% \text{ BF} / 100)] \times \text{Weight}\} / .93 = \underline{\hspace{2cm}}$$

Standard error allowance = 3%

Minimum Wrestling Weight = Weight at 7% BF x .97

Minimum Wrestling Weight = _____ x .97 =

Signature of Skin Fold Technician _____

Skin Fold Measurement Date _____

Any wrestler who is determined to be below 7% body fat at the time of certification will be required to verify proper hydration. The wrestler will submit a urine sample to the skin fold technician who is certifying the wrestler's weight. The technician will determine the hydration of the wrestler via refractometer or dip stick analysis. The specific gravity of the urine must be less than 1.025.

Specific Gravity: _____

Physician's Recommendation

As the attending physician, I have personally examined this student and certify that the student-athlete designated above should not be allowed to wrestle in any weight classification less than the listed weight class circled below:

106 113 120 126 132 138 145 152 160 170 182 195 220 285
 (Hwt.)

Signature of Physician: _____ Date Examined: _____

Parent's Recommendation

As a parent, I am responsible for the health and welfare of my child. I have read the recommendation of the examining physician and I request that the student-athlete designated above should not be allowed to wrestle in any weight classification less than the listed weight class circled below:

106 113 120 126 132 138 145 152 160 170 182 195 220 285
 (Hwt.)

The higher of the two weight class designations recommended by the Parent or the Physician shall be the minimum weight class for competition.

Signature of Parent: _____ Date: _____

Note to physician and parent: The purpose of this report is to prevent undue and unsafe weight reduction for competitive purposes—weight reduction which might jeopardize the physical, scholastic and psychological well being of the student. During the wrestling season the student-athlete should eat and drink normally while in training and participating in wrestling activities. The physician is encouraged to review the MSHSL's guidelines for the weight certification process found on the MSHSL Website prior to completing the weight certifications.

Female Wrestling Weight Permit

NOTE TO SCHOOL OFFICIALS

Each student participating in wrestling must have a current completed physical form and must submit the annual Wrestling Weight Permit properly signed by the skin fold technician, a physician and the student's parent before engaging in any interschool wrestling match. **SKIN MEASUREMENTS AND WEIGHT MUST BE DONE AT THE SAME TIME.** This permit must be kept on file in the school office and be available on request.

NOTE TO PHYSICIAN AND PARENT

The purpose of this report is to prevent undue and unsafe weight reduction for competitive purposes—weight reduction which might jeopardize the physical, scholastic and psychological well-being of the student. During the wrestling season, which can extend to early March, the student-athlete should eat and drink normally while in training and participating in wrestling activities.

This weight permit form cannot be changed by modification or by a second examination. There are no exceptions to this rule.

Student: _____ School: _____

Date of Birth: _____ Age: _____ Years in Wrestling: _____

The MSHSL requires that the minimum wrestling weight be established based on body fat. Following is the required protocol.

Skin fold measurement sites (Thickness in mm)

Tricep _____
 Infrascapular (below medial lower angle of scapula) _____
 Sum Skin Folds (SSF) [_____]
 Weight (on date of examination) _____

Equations

Triceps SF _____
 Subscapular SF _____
 Sum = _____

(Sum x 1.33) - (Sum)² x .013 - 2.5 = _____ %BF

When the SF Sum >35mm, then substitute the following equation: .546(Sum) + 8.3= _____ %BF

Weight at 12% BF = {[1 - (% BF / 100)] x Weight} / .88

Weight at 12% BF = {[1 - (_____ / 100)] x Weight} / .88 = _____

Standard error allowance = 3%

Minimum Wrestling Weight = Weight at 12% BF x .97

Minimum Wrestling Weight = _____ x .97 =

Any wrestler who is determined to be below 12% body fat at the time of certification will be required to verify proper hydration. The wrestler will submit a urine sample to the skin fold technician who is certifying the wrestler's weight. The technician will determine the hydration of the wrestler via refractometer or dip stick analysis. The specific gravity of the urine must be less than 1.025.

Specific Gravity: _____

 Signature of Skin Fold Technician

 Skin Fold Measurement Date

Physician's Recommendation

As the attending physician, I have personally examined this student and certify that the student-athlete designated above should not be allowed to wrestle in any weight classification less than the listed weight class circled below:

106 113 120 126 132 138 145 152 160 170 182 195 220 285
(Hwt.)

Signature of Physician: _____ Date Examined: _____

Parent's Recommendation

As a parent, I am responsible for the health and welfare of my child. I have read the recommendation of the examining physician and I request that the student-athlete designated above should not be allowed to wrestle in any weight classification less than the listed weight class circled below:

106 113 120 126 132 138 145 152 160 170 182 195 220 285
(Hwt.)

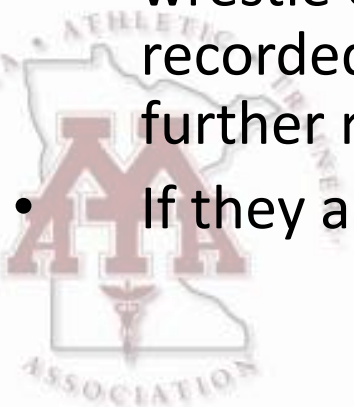
The higher of the two weight class designations recommended by the Parent or the Physician shall be the minimum weight class for competition.

Signature of Parent: _____ Date: _____

Note to physician and parent: The purpose of this report is to prevent undue and unsafe weight reduction for competitive purposes—weight reduction which might jeopardize the physical, scholastic and psychological well being of the student. During the wrestling season the student-athlete should eat and drink normally while in training and participating in wrestling activities. The physician is encouraged to review the MSHSL's guidelines for the weight certification process found on the MSHSL Website prior to completing the weight certifications.

HYDRATION TESTING PROCESS

- Student-athlete's weight is certified by a trained and certified skinfold technician.
- If the male student-athlete is below 7% body fat (12% female) then the hydration test must be conducted.
- The certified skinfold technician determines the specific gravity through the use of a refractometer or dip stick.
- The specific gravity must be less than 1.025.
- Penalty if the wrestler is not hydrated is that they must wrestle one weight class higher than minimum weight recorded on form. This decision is final and there are no further retries for hydration.
- If they are hydrated they can stay at that same weight.





LEUKOCYTES 2 min.							
	NEGATIVE 0	TRACE 15	SMALL (+) 70	MODERATE (+ +) 125	LARGE (+ + +) 500 ca CELLS/μL		
NITRITE 60 sec.		POSITIVE (ANY DEGREE OF PINK COLOR)					
	NEGATIVE						
URO-BILINOGEN 60 sec.							
	0.2 NORMAL 3.2	1 16	2 32	4 64	8 128	EHRLICH UNITS/μL URINE	
PROTEIN 60 sec.							
	NEGATIVE	TRACE	30 (+) 0.3	100 (++) 1.0	300 (+++) 3.0	>2000 (++++) >20	
PH 60 sec.							
	5.0	6.0	6.5	7.0	7.5	8.0	
BLOOD 60 sec.							
	NEGATIVE 0	NON-HEMOLYZED NO TRACE	HEMOLYZED TRACE	SMALL (+) 25	MODERATE (+ +) 80	LARGE (+ + +) 200 ca CELLS/μL	
SPECIFIC GRAVITY 45 sec.							
	1.000	1.005	1.010	1.015	1.020	1.025	
KETONE 40 sec.							
	NEGATIVE	TRACE (0) 0.5	SMALL (15) 1.5	MODERATE (40) 4.0	LARGE (90) 9.0	LARGE (180) 18	
BILIRUBIN 30 sec.							
	NEGATIVE	SMALL +	MODERATE +	LARGE ++			
GLUCOSE 30 sec.							
	NEGATIVE	100 5	250 (+) 15	500 (++) 30	1000 (+++) 60	>2000 (++++) 120	



SKINFOLD ASSESSMENT STANDARDS

- Site Selection and Identification
 - Anatomical Position
 - Right Side Assessment
 - Site Identification
 - **Triceps (Male and Female)**
 - **Subscapular (Male and Female)**
 - **Abdominal (Male only)**
 - Site Rotation across sites



SKINFOLD ASSESSMENT STANDARDS

- Sites
 - Identify & mark sites
 - Palpate site gently
 - Elevate skinfold & fat under it
 - Use thumb and index finger of left hand

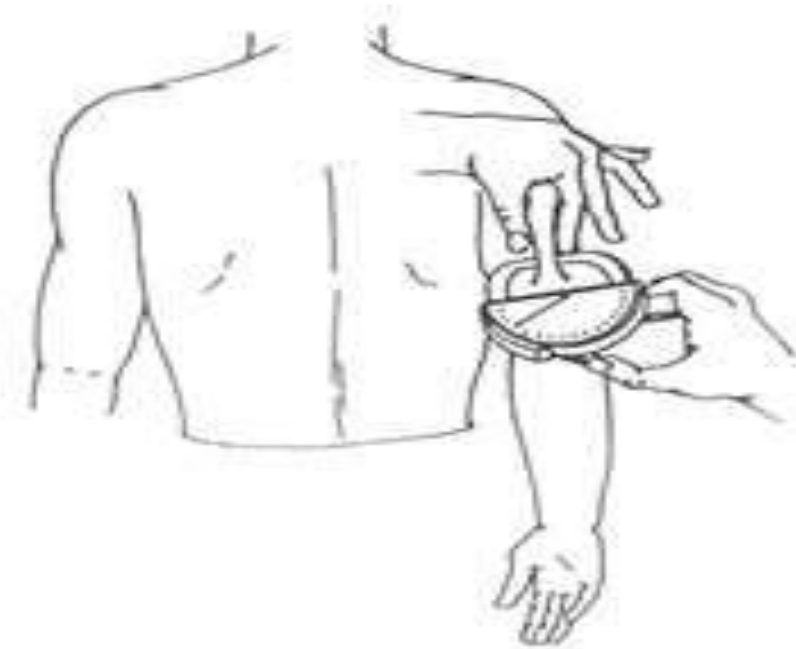


SKINFOLD ASSESSMENT STANDARDS

- Skinfold Sites (right side – rotate across)
 - Triceps = vertical, posterior mid-way between the AC joint and elbow olecranon process and mid-way between the medial and lateral tissue of the triceps (|)
 - Subscapular = diagonal axis one cm below inferior angle of scapula (\)
 - Abdominal = vertical, anterior 3 cm lateral & 1 cm below the umbilicus (|)



SKINFOLD ASSESSMENT STANDARDS



TRICEPS

- Vertical
- Posterior mid-way between AC joint and elbow olecranon process
- Mid-way between medial and lateral tissue of triceps

Perpendicular Caliper

Orientation to site (+)

Parallel skinfolds

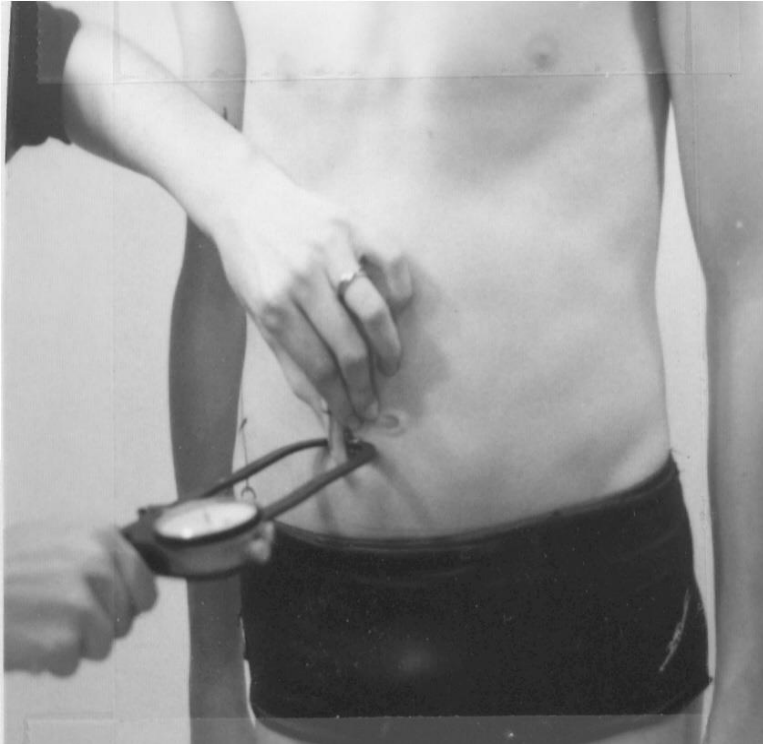
Calipers in right hand

SKINFOLD ASSESSMENT STANDARDS



- SUBSCAPULAR
 - Diagonal fold taken 1cm below the inferior angle of the scapula
- Caliper jaws placed midway between body and crest of skinfold
- Caliper perpendicular to skinfold
- Read caliper between 2-4 seconds after releasing thumb pressure from caliper *while maintaining skin fold grasp*

SKINFOLD ASSESSMENT STANDARDS



- Measure & Mark
- ABDOMINAL
 - 3 cm lateral to naval
 - 1cm inferior
 - Vertical fold

SKINFOLD ASSESSMENT STANDARDS

- Read measurement from caliper to the nearest 0.5 mm
- Have assistant record your measurements
- Rotate to next site
- Return to same site to obtain subsequent measures normally within 0.5 mm of previous one **BUT** less than and not equal to 3 mm variance
- Perform 3 skinfolds at each site and record the average of each individual site



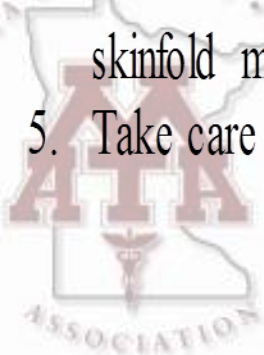
IMPROPER METHODS

- Insufficient tissue
- Improper angle of calipers
- Holding too long to read
- Left hand below calipers
- Performing skinfold in the wrong direction
 - Vertical, diagonal



COMMON ERRORS

1. Be careful to measure and mark each site. Raise the skinfold one-centimeter above that site so the caliper paddles will be directly over the marked location. The paddles then are placed one centimeter below the thumb and index finger that is grasping the skinfold.
2. Don't squeeze the skinfold too much. It is uncomfortable for the subject and may increase your measure.
3. Be cautious to take skinfolds when the skin is dry. Wet skin makes it harder to hold, thereby forcing the tester to raise a larger skinfold and inflating the measure.
4. Measurements should not be taken immediately after a workout when the subject is overheated. Fluid shifts to the skin tissue to cool the body may transiently increase the skinfold measure.
5. Take care to look directly at the caliper dial to avoid errors in viewing from an odd angle.



COMPLETING THE FORM

- Have the student-athlete fill out the top portion with their demographics
- Then fill in each respective skinfold measurement for each site
- Use those measurements and put them into the spreadsheet to get your % body fat and minimum weight
- Sign and date form



COMPLETING THE FORM

- The rest is up to the school and participant
 - Need physician signature – this can be done all at once, or the student-athlete can go on their own. Physician then circles minimum weight, signs, and dates form
 - Need parent signature – parent circles minimum weight, signs, and dates form
 - If the physician and parent sign 2 different weights the higher one will be the minimum weight for competition



TIPS AND POINTERS

- Locate a certified skinfold assessor in your area to perform the skinfold test
 - Skinfold assessor list is under the wrestling section of the MSHSL website
- Cost will vary
- Remember that a physician and the parent need to sign the form as well
- Ideally perform before practice so the student-athlete is in a more hydrated state
- School may need to provide:
 - Computer, certified scale, skinfold caliper, specific gravity urinalysis testing strips,



OTHER IMPORTANT WRESTLING INFORMATION

Eric	Poulin	M.D.	Mayo Clinic Health System at Zumbrota, Red Wing, Cannon Falls	1350 Jefferson Dr. Zumbrota, MN 55992	507-732-7314
Craig	Kuhlmann	M.D.	Innovis Health	1401 13th Ave. E West Fargo, ND 58078	701-364-5751
Joel	Baumgartner	M.D.	Rejuv Medical Center	2330 Troop Drive, Suite 105A Sartell, MN 56377	320-217-8480
Tony	Amon	M.D.	Family Practice Medical Center	501 2nd St. SW, Suite 1 Wilmar, MN 56201	320-231-8888
B.J.	Anderson	M.D.	Boynton Health Service University of MN	401 Church St SE Minneapolis, MN 55455	612-626-0421

Regional SMAC Skin Specialists



QUESTIONS??

- Please contact the Minnesota Athletic Trainers Association Secondary School Committee
 - ssatc@mnata.com



REFERENCES

- MSHSL Body Composition Clinic for Wrestlers, october, 1999
- Michigan High School Athletic Association skinfold assessor program
 - <http://www.mhsaa.com/Sports/Wrestling.aspx>

