



# Food Insecurity and Nutrition Focused Physical Exam

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# Objectives

1. Understand concept of food insecurity and it's prevalence
2. Recognize the impact of food insecurity on adolescence
3. Learn ways to support
4. Identify the basics of a nutrition focused physical exam



# Definitions

**Food Insecurity:** a household-level economic and social condition of limited or uncertain access to adequate food

**Food secure households** have access, at all times, to enough food for an active, healthy life for all household members

**Food-insecure households** are uncertain of having, or unable to acquire, at some time during the year, enough food to meet the needs of all their members because they had insufficient money or other resources for food

**Hunger** is an individual-level physiological condition that may result from food insecurity



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# Definitions

## Levels and Severity of Food Insecurity:

**Low food security** (old label = Food insecurity without hunger): reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake.

**Very low food security** (old label = Food insecurity with hunger): reports of multiple indications of disrupted eating patterns and reduced food intake



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# Examples

## Low Food Security

- Worried food would run out
- Food bought did not last
- Could not afford a balanced meal

## Very Low Food Security

- Cut the size of a meal
- Cut or skipped a meal in last 3 months
- Ate less than they felt they should
- Hungry but did not eat
- Lost weight
- Did not eat the whole day



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## FOOD INSECURITY MAY PRESENT IN A FAMILY AS:

Food Anxiety



Diet Monotony



Decreased Nutrition Quality



Inadequate Food Intake



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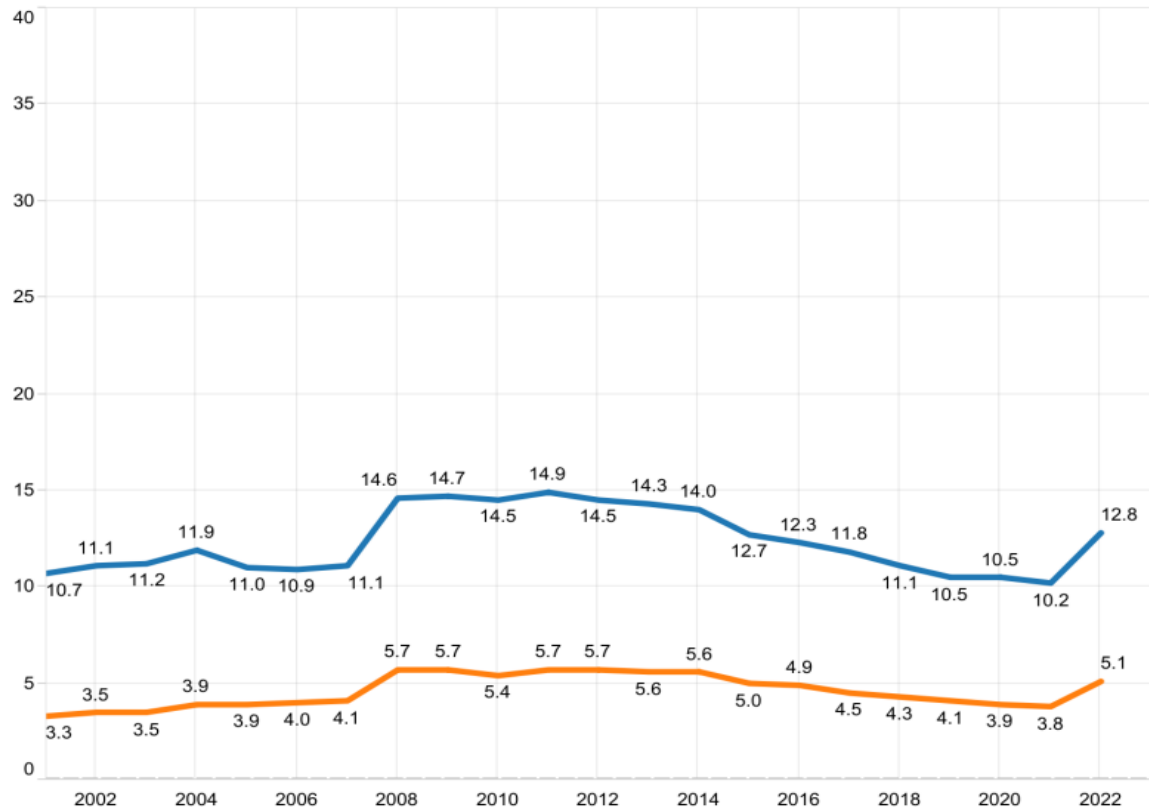
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## Trends in the prevalence of food insecurity and very low food security in U.S. households, 2001–22

Percent of households



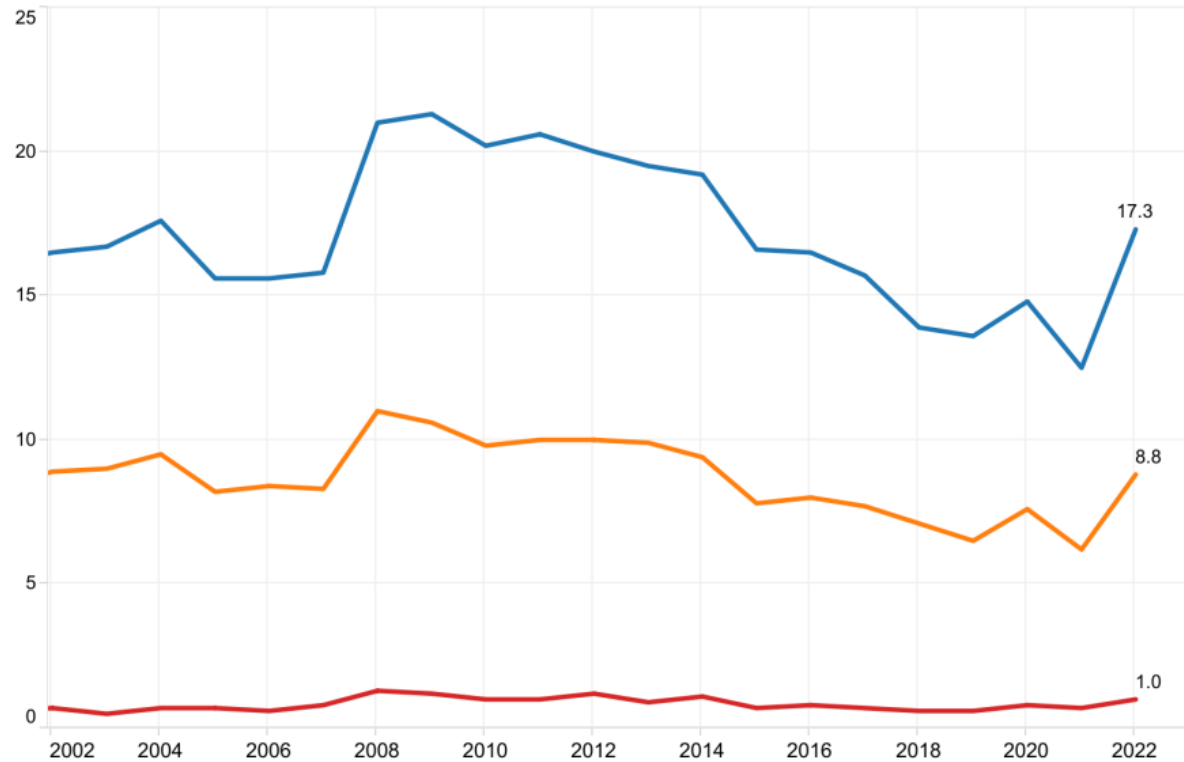
**12.8 % of all US households were food insecure in 2022 (up from 10.2% in 2021)**

■ Food insecurity  
■ Very low food security

Source: USDA, Economic Research Service calculations using Current Population Survey Food Security Supplement data.

## Trends in food insecurity in U.S. households with children, 2001–22

Percent of households with children



**8.8% of children were food insecure at times during 2022 in households with children (up from 6.2 percent in 2021 and 7.6 percent in 2020).**

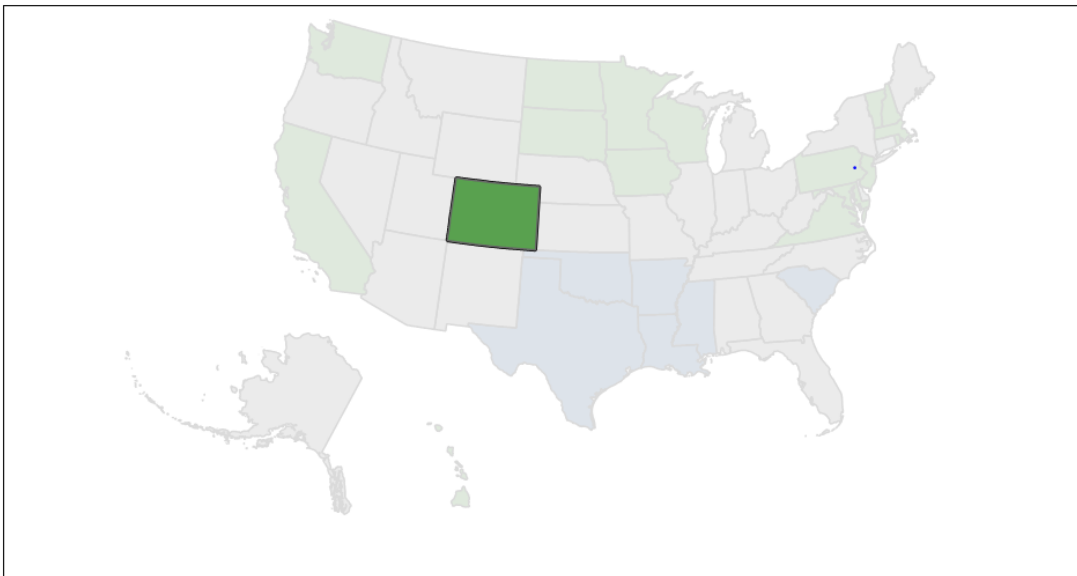
Source: USDA, Economic Research Service calculations using Current Population Survey Food Security Supplement data.

- Food insecurity in households with children
- Food insecurity among children
- Very low food security among children



# How do States compare to the U.S. average?

Food insecurity • 2020–2022



U.S. average  
Food insecurity  
2020–2022

11.2%

Colorado  
Food insecurity  
2020–2022

8.9%

- Below U.S. average
- Near U.S. average\*
- Above U.S. average

Select a level of severity.

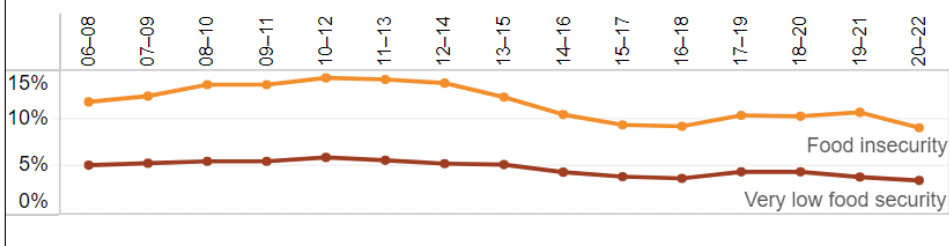
- Food insecurity
- Very low food security

Select a year.

2020–2022

Click on a State in the map to see State-level estimates & trends in food insecurity from 2006–08 to present.

## Colorado



## Food Insecurity can lead to

- Food insecurity among adolescents is adversely associated with waist circumference, triglycerides, HDL-C
- Iron deficiency anemia or other nutrient deficiencies
- Decrease in nutritional quality of food to shelf-stable, cost effective and calorie dense foods to decrease spending
- Early childhood malnutrition can be linked to adult diseases such as diabetes, hyperlipidemia, cardiovascular disease
- Stunted growth

## Food Insecurity and Mental Health

A 2020 CDC survey during the COVID pandemic found that food insecurity is associated with 257% higher risk of anxiety and 253% higher risk of depression

- Reduced learning and productivity
- Mental health - depression, anxiety, suicidal ideation
- Dysregulated behavior
- Emotional distress

[bmcpublichealth.biomedcentral.com](https://bmcpublichealth.biomedcentral.com) - The association between food insecurity and mental health during the COVID-19 pandemic

[ncbi.nlm.nih.gov](https://ncbi.nlm.nih.gov) - Food insecurity and hunger: A review of the effects on children's health and behavior

# Food Insecurity and Eating Behaviors

- Fluctuations in food availability are a potential ED risk factor
  - "Feast or Famine" cycle can be exacerbated by potentially helpful programs (SNAP)
  - Bulimia and binge eating are more common with food insecurity

[Food Insecurity and Eating Disorders: a Review of Emerging Evidence - PMC \(nih.gov\)](#)



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# Federal Policy Initiatives



- WIC - According to the USDA WIC supported 39% of all infants in the US in 2022. Support stops once a child is over 5.
- SNAP - Is helpful but, many families do not qualify
- The Healthy School Meals for All Program - 2023-2024: Provides free breakfast and lunch to all students.

# What Can Providers Do?

## 2015 AAP Policy Statement

### THREE STEPS FOR SUCCESS

#### PREPARE

- ▶ **Educate and train** staff on food insecurity, federal nutrition programs, and local food and income resources
- ▶ **Follow AAP's recommendation** of universal screening at scheduled check-ups or sooner, if indicated
- ▶ **Incorporate efforts** to address food insecurity into the institutional workflow
- ▶ **Practice** having empathetic and sensitive conversations when addressing food insecurity

#### SCREEN

Use the AAP-recommended Hunger Vital Sign™:

1. "Within the past 12 months, we worried whether our food would run out before we got money to buy more."

OFTEN TRUE    SOMETIMES TRUE    NEVER TRUE    DON'T KNOW/REFUSED

2. "Within the past 12 months, the food we bought just didn't last and we didn't have money to get more."

OFTEN TRUE    SOMETIMES TRUE    NEVER TRUE    DON'T KNOW/REFUSED

*Patients screen positive for food insecurity if the response is "often true" or "sometimes true" for either or both statements.*

*Document and code the administration and results of screening in medical records.*

#### INTERVENE

- ▶ **Administer** appropriate medical interventions per your protocols
- ▶ **Connect patients** and their families to the federal nutrition programs and other food resources
- ▶ **Document and track** interventions in medical records
- ▶ **Advocate and educate** to address food insecurity and its root causes, e.g., poverty, inadequate wages, housing insecurity, and structural racism



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For more information, visit [www.frac.org/aaptoolkit](http://www.frac.org/aaptoolkit)





## Local Resources

1. Hunger Free Colorado
2. Feeding Colorado: Member food banks include Care and Share Food Bank for Southern Colorado, Community Food Share, Food Bank for Larimer County, Food Bank of the Rockies, and Weld Food Bank.
3. Colorado Food Cluster (Meal deliveries)
4. Project Angel Heart (Medically Tailored Meals, those with severe illness)
5. We don't waste (Denver mobile markets)
6. Feeding Denver's Hungry
7. Metro Caring
8. Denver Community Food Access Coalition

# Nutrition Focused Physical Exam





## Malnutrition – Non-illness Related

- Caused by behavioral or environmental factors:
  - decreased intake
- Acute or Chronic
- Inflammation likely not present
- Mechanism - Starvation
  - Eating Disorder
  - Socioeconomic
  - Feeding interruptions
  - Food intolerance or allergy
  - Inability or lack of desire to manage self-care



## Malnutrition – illness related

- Caused by nutrient imbalance related to disease / trauma / illness
- Acute or Chronic
- Inflammation likely present
- Mechanisms
  - Starvation
  - Malabsorption
  - Nutrition loss
  - Hypermetabolism
- Examples: infection, trauma, burns, lung disease, cancer

# Preparing For Exam

1

First determine  
if the Pt is a  
candidate for a  
NFPE

2

Explain what  
you will be  
doing and  
how long it  
will take

3

Ask for  
permission to  
touch them



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## Physical Exam Considerations

1

Consider size, color and shape

2

Look for atrophy, asymmetry or deformity

3

Compare unilaterally and bilaterally

4

Note texture (dry, scaly), temperature and tenderness

5

Use anatomical landmarks to determine fat or muscle loss

# Assessment of Fat Loss



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## Assessment of Subcutaneous Fat Loss

Exam Area	Subcutaneous Fat Area
Orbital region	Orbital fat pads
Zygomatic arch region	Buccal fat pads
Upper arm region	Triceps
Thoracic and lumbar region	Ribs, mid-axillary line, iliac crest, lower back

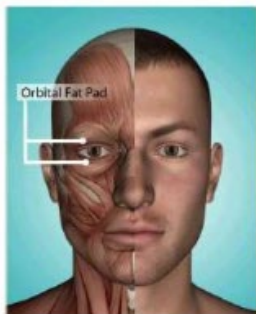
# Orbital Fat Pad Assessment

Exam - Stand directly in front and touch below the eye and above the cheekbone

- Severe - hollow look, dark circles, loose skin
- Moderate - slight hollowness, slightly dark circles
- Normal / Well-nourished - slightly bulged fat pads

# Orbital Fat Pad Example

## Orbital Fat Pads



NOTE: Water retention can mask subcutaneous fat loss in orbital fat pads

TIP: Look at patient straight on, observe area under eyes



Slightly bulged fat pads

Somewhat hollow look, slightly dark circles

Hollow look, eyes sunken, dark circles, loose skin



# Buccal Fat Pad Assessment

Exam: loss of fat under the cheek bones visually and touch below the cheek bones and above the jaw to as

- Severe loss - sunken, hollow cheeks
- Mild / Moderate loss - flat cheeks with minimal "bounce" when palpated
- Normal / well nourished - well rounded and full

# Buccal Fat Pad Example



Image from Microsoft PowerPoint



CDC Public Health Image Library. Retrieved from <https://phl.cdc.gov/details.aspx?pid=6901>



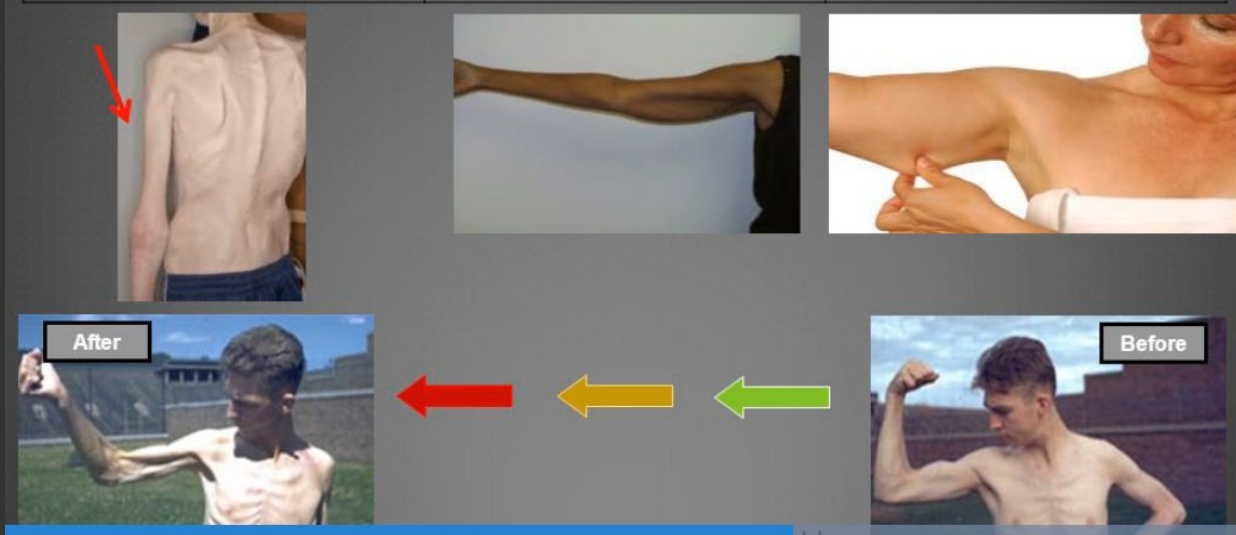
CDC Public Health Image Library. Retrieved from <https://phl.cdc.gov/Details.aspx?pid=3995>

# Tricep Assessment

Exam: Bend arm to 90 degrees. Roll skin between fingers until free of muscle and only pinching fat.

- Severe loss - very little space between fingers, fingers touching
- Mild / Moderate loss - Some fat tissue but not ample
- Normal / well nourished - obvious fat tissue between skin

# Tricep Example

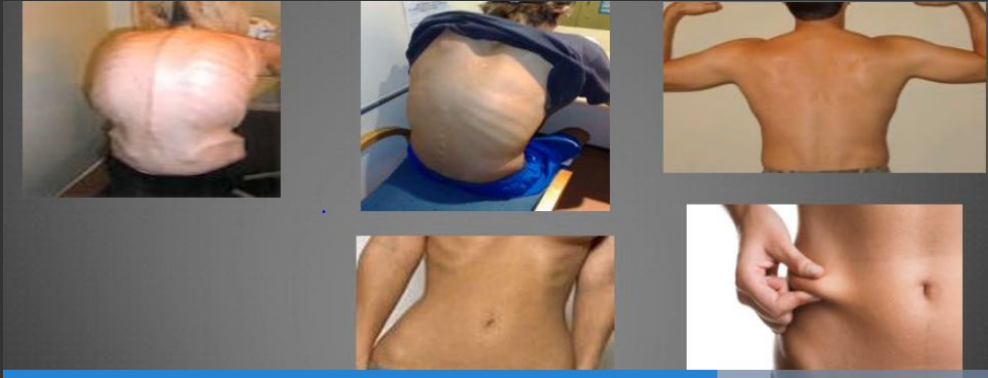


# Ribs and Mid-Axillary Line Assessment

Exam: Have patient push against a solid object

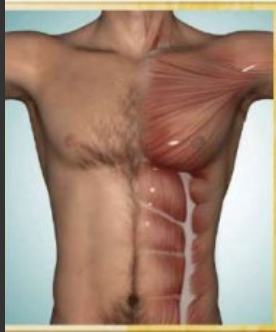
- Severe loss - ribs visible with prominent depression, iliac crest prominent
- Mild / Moderate loss - ribs visible with mild depressions, iliac crest somewhat prominent
- Normal / well nourished - chest is full, ribs not visible and iliac crest little to no protrusion

# Ribs and Mid-Axillary Line Example



## Anterior Ribs

**TIP:** Examine the lower rib region for loss of fullness or loose skin



Ample fat tissue around ribs, fullness, taut skin



General loss of fullness, loose skin, ribs somewhat visible



Prominent, well-defined ribs; skin over ribs appears stretched

# Assessment of Muscle Loss



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# Assessment of Muscle Loss

Exam Area – Upper Body	Muscle(s)
Temporal Region	Temporalis
Clavicle Bone Region	Pectoralis Major
Clavicle and Acromion Bone Region (shoulder)	Deltoid
Scapula Bone Region	Trapezius, Supraspinatus, Infraspinatus
Dorsal Hand Region	Interosseous
Exam Area – Lower Body	Muscle(s)
Patellar/Anterior Thigh Region	Quadriceps
Posterior Calf Region	Gastrocnemius



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# Temporalis Muscle Assessment

Exam - Observe from front and side, touch temple and have patient simulate a chewing motion.

- Severe - Hollowing, scooping depression
- Mild / Moderate - slight depression
- Normal - Can see / feel the muscle, may be slightly bulged



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# Temporalis Muscle Example



# Pectoralis Major Muscle

Exam - Have patient sit upright and exam bone and surrounding muscle

- Severe - Protruding prominent bone
- Moderate - Some protrusion, bone visible
- Normal / Well-nourished - not prominent, bone not visible



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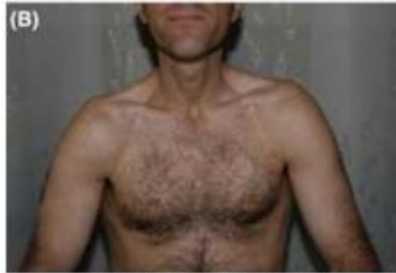
# Pectoralis Major Muscle



Hedén P. Chapter 24. In Hall-Findlay E, Evans G. *Aesthetic and Reconstructive Surgery of the Breast*. Saunders Ltd; 2010:357-386.



Pepersack T. *Lancet Oncol*. 2011;12(5):423-424.



Stubblefield MD. *PM R*. 2011;3(11):1041-1054.

# Deltoid Muscle Assessment

Exam- patient may be standing or sitting. Observe shape and gently cup hand over the shoulder to feel roundness. Gently abduct arm to engage muscle

- Severe - squared shoulder, bones and acromion process protruding
- Mild / Moderate - acromion may slightly protruded, some shoulder angling
- Normal / Well nourished - rounded shoulder, curves at shoulder and neck



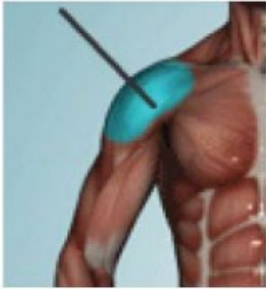
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# Deltoid Muscle Example

## Shoulder



**TIP:** Inspect patient with arms at their sides, look for prominent bones, observe shape of shoulder



Normal

Nice curvature, roundness from neck to shoulder and down to arm

Mild- Moderate

Acromion process may protrude slightly, shoulder may appear slightly squared-off

Severe

Bones prominent, significant squaring of shoulders, acromion process clearly visible



# Scapular Region Assessment

Exam - May be sitting or standing but have them press against a solid object and touch muscles all around the scapula bone

- Severe - bone prominent, depressions easily visible between ribs, spine and shoulders
- Moderate loss- moderate depressions, bones may be slightly visible
- Normal / Well Nourished - bones not prominent, no visible depressions



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# Scapular Region Example

## Scapula



**TIP:** Have patient push hands against a solid object (such as a wall), look for prominent bones or depression between bones



Normal

Bone not prominent, no significant depressions

Mild- Moderate

Mild depression or bone may show slightly

Severe

Prominent, visible bone; depressions between ribs, scapula & shoulder, or spine



# Interosseous Muscle Assessment

Exam - Observe hand looking for depressions on the back of the hand. Have patient make an "OK" sign and feel for musculature

- Severe - prominent depression
- Moderate - slight depression
- Normal / Well nourished - muscle bulges or could be flat

# Interosseous Muscle Example

## Interosseous

**TIP:** Observe back of patient's hand, have them move thumb & forefinger back and forth



Normal

Mild- Moderate

Severe

Muscle protrudes, could be flat in well-nourished females

Slightly depressed or flat

Flat or depressed area between thumb and forefinger

# Patellar Region Assessment

Exam - Ask patient to bend their knee

- Severe - bones prominent, little sign of muscle around knee
- Moderate - knee cap less prominent, more rounded
- Normal / Well nourished - muscle protrude around patella, difficult to see bone



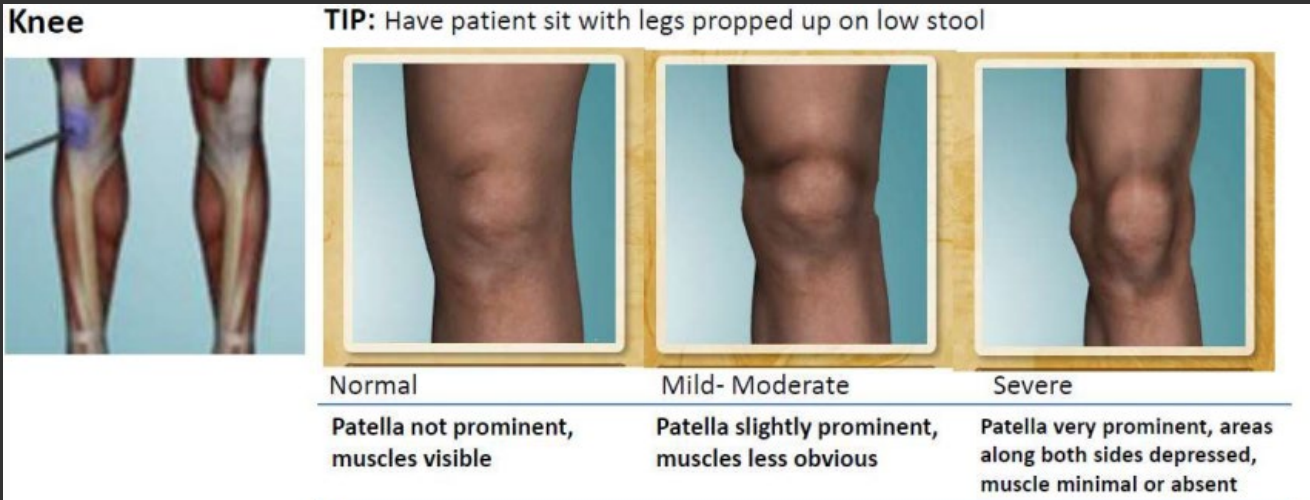
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# Patellar Region Example

**Knee** **TIP:** Have patient sit with legs propped up on low stool



The image displays a clinical assessment of the patellar region. On the left, an anatomical diagram shows the knee joint with a blue highlight on the patella and a black line indicating the patellar tendon. To the right, three photographs illustrate different levels of patellar prominence. The first photograph shows a normal knee with a flat patella and visible muscles. The second photograph shows a mild-to-moderate case with a slightly prominent patella and less visible muscles. The third photograph shows a severe case with a very prominent patella and depressed areas on both sides, with minimal or absent muscle.

Normal	Mild- Moderate	Severe
Patella not prominent, muscles visible	Patella slightly prominent, muscles less obvious	Patella very prominent, areas along both sides depressed, muscle minimal or absent

# Quadricep Muscle Assessment

Exam - Have patient sit with leg propped up and knee bent.  
Grasp quadriceps bilaterally

- Severe - Line / depression along thigh, thin
- Moderate - Mild depression of inner thigh
- Normal / Well Nourished - no loss - muscles protrude, well developed

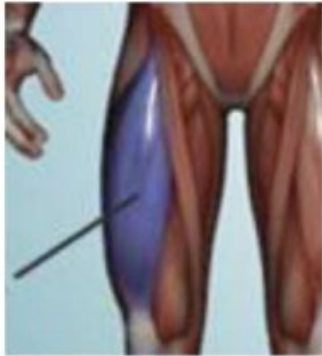


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# Quadricep Muscle



Normal

Quadriceps well-rounded,  
no depressions



Mild- Moderate

Mild depression along  
inner thigh, upper leg  
appears thin



Severe

Significant depression of  
inner thigh region, upper  
leg obviously thin

# Gastrocnemius Muscle Assessment

Exam - Grasp back of lower leg and observe bilaterally

- Severe - thin with little definition or firmness
- Moderate - Some roundness, slight firmness
- Normal / Well nourished - well rounded, firm, well developed muscle



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# Gastrocnemius Muscle Example

## Calf



**TIP:** Observe patient in supine position with knees bent



Normal

Mild- Moderate

Severe

Well-developed bulb of calf muscle

Calf muscle not well-defined/well-developed

Thin, no muscle definition



# Questions?

What you eat  
before a workout  
fuels TODAY.  
What you eat  
after fuels  
TOMORROW

Stephanie Wilson  
Sports Dietitian

Schedule a sports nutrition appointment at 720-777-5593

# References

- Abbott Nutrition Health Institute - Nutrition Focused Physical Exam Part 1
- USDA - Food and Nutrition
- CDC - Food and Food Systems Resources



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