

# WHAT ARE THE FUNCTIONS OF THE KNEE LIGAMENTS?

## Instructions

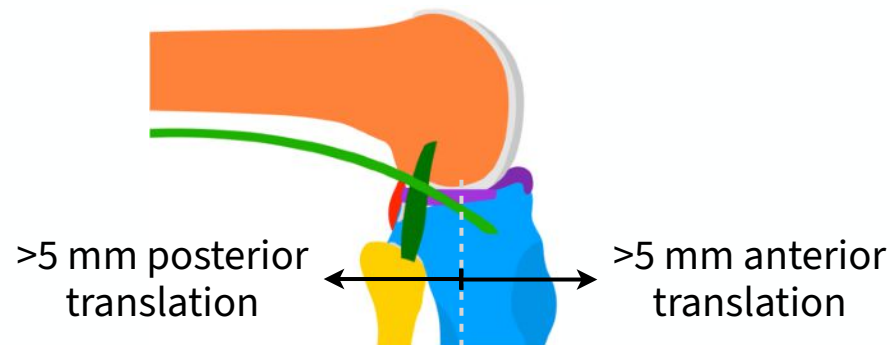
In this activity, you'll do a knockout experiment with your knee kit to determine the functions of each of the major knee ligaments. You'll then use what you learn about the ligaments' functions to explain common knee injuries and the strategies recommended to avoid them. To infer each ligament's function, you'll use a motion test: moving the knee in a particular way to test if the motion is normal or abnormal.

## Quick reference to determining abnormal/excess motions

For this activity, abnormal/excess motion is defined as motion outside the normal range of motion. The criteria for how to determine this for each motion is given below:

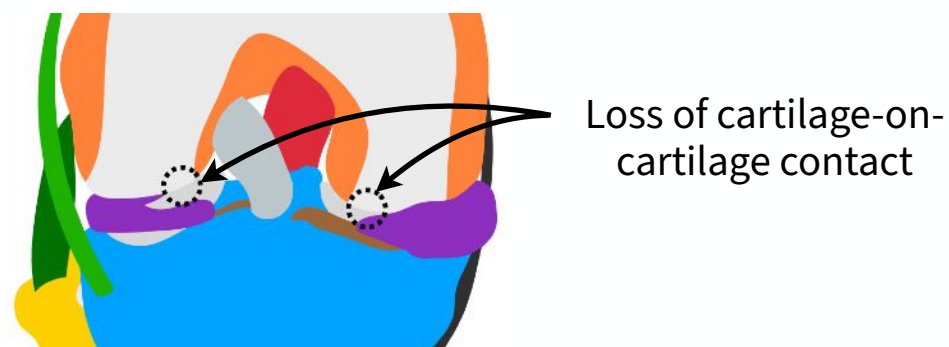
- **Anterior-posterior (AP) translation:** AP translation of the tibia (relative to the femur) outside the normal range of motion is greater than 5 mm anteriorly or posteriorly from its neutral position (i.e., the normal *total* range of motion for AP translation of the tibia should be 10 mm).

Abnormal motion is...



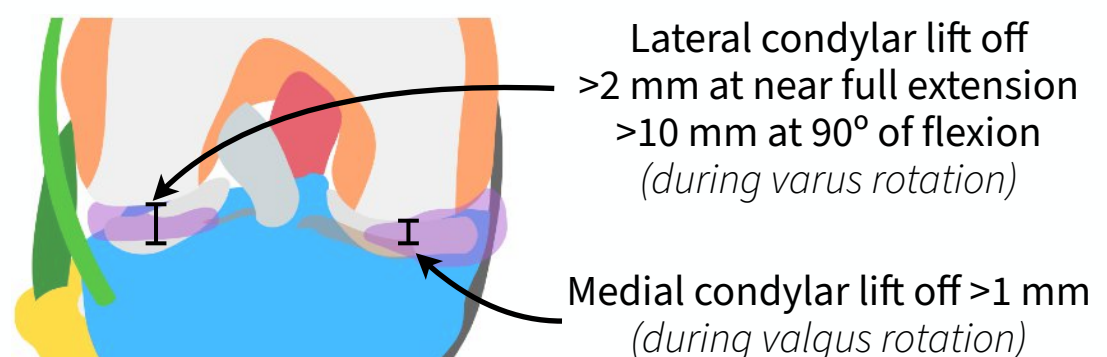
- **Longitudinal rotation:** Longitudinal rotation outside the normal range of motion is detected as a loss of "cartilage-on-cartilage" contact at the joint (i.e., if opposing surfaces of the joint are pressed together, there is not articular cartilage on both surfaces at the point of contact).

Abnormal motion is...



- **Varus-valgus rotation:** Varus-valgus rotation outside the normal range of motion is detected by greater than normal condylar lift off (gap between the condyles), as detailed below.

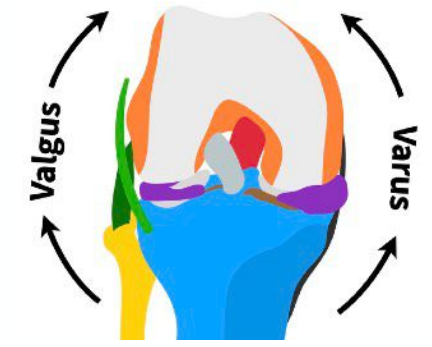
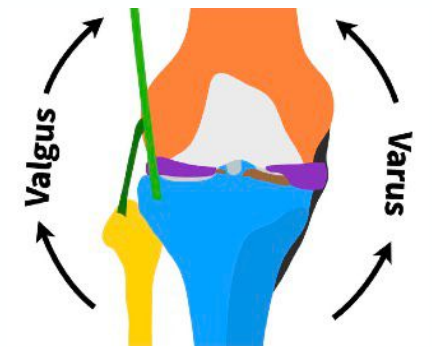
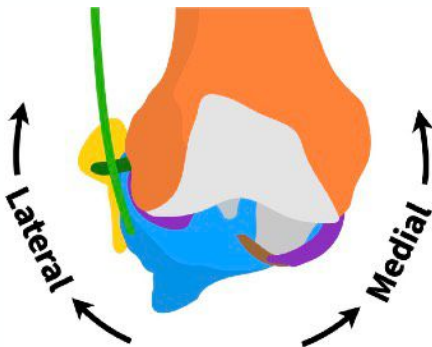
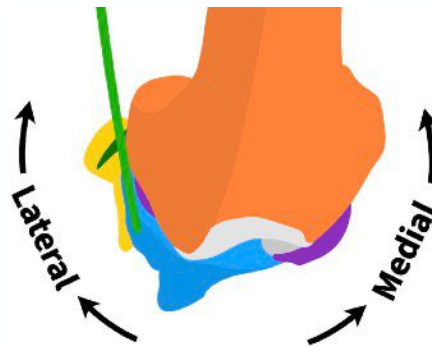
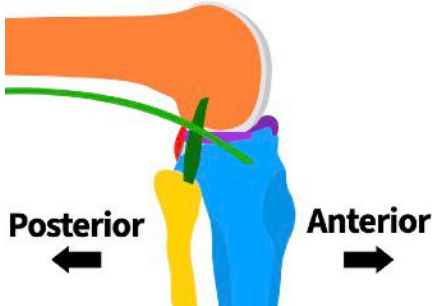
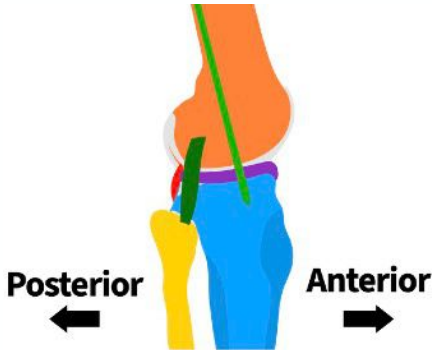
Abnormal motion is...



You can find the guide for this activity at [3das.us/guides/HSKN3](https://3das.us/guides/HSKN3)

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Motion test		Outcome after knockout is excess motion toward... Ligament functions to limit excess motion toward... The motion that can injure ligament is... Injury can cause pain/instability when moving...					
		MCL	PCL	ACL	LCL	IT Tract	MCL +ACL
Ant.-Pos. translation of tibia	Near full extension						
	At 90° flexion						
Longitudinal rotation of tibia	Near full extension						
	At 90° flexion						
Varus-Valgus rotation	Near full extension						
	At 90° flexion						



1. Are there ligaments that have the same function(s) as other ligaments? If yes, why do you think this is? If no, why not?

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2. Would you expect most knee injuries to affect a single ligament or more than one ligament? Why or why not?

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3. Which ligament or ligaments would be injured by a blow to the lateral side of the knee? Why?

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4. Why do you think the MCL is one of the most commonly injured ligaments in the knee?

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5. Why do you think the MCL and ACL are often injured together?

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6. Why does an injury of the MCL and the ACL often also injure the medial meniscus?

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7. Why do you think the IT tract is often injured with the ACL? What would be the nature of the injury to cause this?

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8. Why does landing with your knees bent and aligned over your toes decrease your chances of an ACL injury?

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