

Table 2. Cervical Spine Virtual Physical Examination

Examination Component	Documentation	Verbal Instructions
Cervical Spine Examination		"We are going to start by examining your neck."
Pain Location	<input type="checkbox"/> Midline <input type="checkbox"/> Paracervical <input type="checkbox"/> Trapezius <input type="checkbox"/> Periscapular <input type="checkbox"/> Other:	"Do you have any neck pain? If so, please point to the location."
Range of Motion		"If you experience pain during any of the following motions, please describe the location of these symptoms."
Flexion	<input type="checkbox"/> WNL <input type="checkbox"/> Limited <input type="checkbox"/> Severely limited <input type="checkbox"/> Painful	"Bend your neck forward as far as you can trying to touch your chin to your chest."
Extension	<input type="checkbox"/> WNL <input type="checkbox"/> Limited <input type="checkbox"/> Severely limited <input type="checkbox"/> Painful	"Now, tip your head backward as far as you can trying to look up at the ceiling."
Rotation Right	<input type="checkbox"/> WNL <input type="checkbox"/> Limited <input type="checkbox"/> Severely limited <input type="checkbox"/> Painful	"Look back at the camera. Without moving your shoulders, rotate your head to the right as far as you can."
Rotation Left	<input type="checkbox"/> WNL <input type="checkbox"/> Limited <input type="checkbox"/> Severely limited <input type="checkbox"/> Painful	"Now rotate your head to the left as far as you can."
Spurling	<input type="checkbox"/> Negative <input type="checkbox"/> Shoulder pain <input type="checkbox"/> Elbow pain <input type="checkbox"/> Radicular pain	"With your head still in this position, tilt your head back and to the right side as far as it will go. Does this cause pain? If so, where is the pain located?" "Now tip your head back and to the left side as far as it can go. Does this cause pain, if so where is the pain located?"

* The left column contains the physical examination maneuver. The middle column contains recommended medical record documentation options. The right column contains verbal instructions that the clinician may use to guide the patient through each of the physical examination maneuvers.

WNL within normal limits.

Table 3. Core Elbow Virtual Physical Examination

Examination Component	Documentation	Verbal Instructions
Core Elbow Examination		"We are now going to examine your elbow."
Inspection (General)	<input type="checkbox"/> Normal <input type="checkbox"/> Abrasion <input type="checkbox"/> Swelling <input type="checkbox"/> Rash <input type="checkbox"/> Ecchymosis <input type="checkbox"/> Erythema <input type="checkbox"/> Scar(s) <input type="checkbox"/> Healed incision(s) <input type="checkbox"/> Healing incision(s) <input type="checkbox"/> Other:	<p>"Please stand facing the camera with your palms towards the camera so that I can see the front of your elbows."</p> <p>"Now, turn sideways so that I can see the outside of your injured elbow."</p> <p>"Now, face the opposite direction and raise you arm straight out in front of you so I can see the inside of your injured elbow."</p> <p>"Now, turn so I can see the back of your elbows."</p>
Inspection (Deformity)	<input type="checkbox"/> None <input type="checkbox"/> Resting elbow position <input type="checkbox"/> Carrying angle <input type="checkbox"/> Popeye <input type="checkbox"/> Reverse Popeye <input type="checkbox"/> Other:	"Turn back and face the camera. Have you noticed any deformities? If so, point to the location."
Palpation	<input type="checkbox"/> None <input type="checkbox"/> Bony Prominences <input type="checkbox"/> Olecranon <input type="checkbox"/> Medial epicondyle <input type="checkbox"/> Lateral epicondyle <input type="checkbox"/> Radial head <input type="checkbox"/> Muscles and soft tissue <input type="checkbox"/> Flexor-pronator mass <input type="checkbox"/> Extensor mass <input type="checkbox"/> Olecranon bursa <input type="checkbox"/> MCL origin/insertion <input type="checkbox"/> LCL origin/insertion <input type="checkbox"/> Other:	"Does your elbow hurt anywhere specifically? If so, please point to the location using one finger."
Range of Motion		"Move away from the camera approximately 10 feet."
Flexion	<input type="checkbox"/> Degrees of flexion	<p>"Turn to the side so that you are standing sideways to the camera, with your affected elbow closest to the camera. Raise your arms straight out in front of you with your palms facing the ceiling. Flex both of your elbows up as much as you can."</p> <p>"If the injured elbow does not flex as much as the other side, use your hand to push against your wrist on your injured arm to help flex the elbow as much as you can."</p>
Extension	<input type="checkbox"/> Degrees of extension	"Now in this same position, extend both elbows as much as

		<p>you can.”</p> <p>“If the injured elbow does not extend as much as the other side, use your hand to push against your wrist on your injured arm to help extend the elbow as much as you can.”</p>
Pronation	<input type="checkbox"/> Degrees of pronation	<p>“Face the camera with your arms resting at your side. Now flex your elbows to 90 degrees with your hand open and thumb pointing to the ceiling. Turn both of your thumbs outward attempting to maximally face your palms toward the ceiling.”</p> <p>“Use your uninjured hand to rotate your wrist further if possible.”</p>
Supination	<input type="checkbox"/> Degrees of supination	<p>“Now turn both of your thumbs inward attempting to maximally face your palms toward the floor.”</p> <p>“Use your uninjured hand to rotate your wrist further if possible.”</p>
Neurovascular Examination		
Sensation (General)	<input type="checkbox"/> Axillary <input type="checkbox"/> LABCN <input type="checkbox"/> MABCN <input type="checkbox"/> Radial <input type="checkbox"/> Median <input type="checkbox"/> Ulnar	<p>“Please turn back to face the camera. Do you have any areas of numbness, burning, or tingling? If so, please point to these areas.”</p>
Sensation (Specific)		<p>“We are going to test sensation in some specific locations. Please use your other hand to touch...”</p>
Axillary	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	<p>“...the outside part of your shoulder.”</p>
LABCN	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	<p>“...the outside part of your forearm.”</p>
MABCN	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	<p>“...the inside part of your forearm.”</p>
Radial	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	<p>“...the back of your thumb below your nail.”</p>
Median	<input type="checkbox"/> Normal <input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	<p>“...the palm side of your index finger.”</p>
Ulnar	<input type="checkbox"/> Normal	<p>“...the palm side of your small finger.”</p>

	<input type="checkbox"/> Numbness <input type="checkbox"/> Painful touch	
Motor (General)	<input type="checkbox"/> Deltoid <input type="checkbox"/> Biceps <input type="checkbox"/> Triceps <input type="checkbox"/> Wrist flexors <input type="checkbox"/> Wrist extensors <input type="checkbox"/> Intact distally	<p>“Do you feel weak with any particular movements? If so, what feels weak?”</p> <p>“With your elbows bent and your knuckles touching one another, raise your arms to shoulder height. Bring your arms down to your sides with your elbows straight. Turn your palms facing up and bend your elbows. Now, bend your wrist down. Bend your wrist up. Hold your thumbs up. Spread your fingers. Make an ok sign.”</p>
Motor (Specific)		<p>“The following strength tests can be performed using a doubled plastic grocery bag and eight 16-ounce soup cans or other canned goods.”</p> <p>“For each of the following exercises, I ask that you place the maximum number of soup cans that you can lift in the bag.”</p> <p>“You will perform the movements that follow while lifting the bag of soup cans. If you are unable to perform the movement with the number of cans in the bag, remove some and repeat. If you are able to perform the movement, then increase the number of cans in the bag to a maximum of 8.”</p>
Deltoid	<input type="checkbox"/> Unable <input type="checkbox"/> Gravity only <input type="checkbox"/> Number of cans	“Raise your arm out to the side to shoulder height.”
Elbow flexion	<input type="checkbox"/> Unable <input type="checkbox"/> Gravity only <input type="checkbox"/> Number of cans	“With your arms by your side, bend your elbow.”
Elbow extension	<input type="checkbox"/> Unable <input type="checkbox"/> Gravity only <input type="checkbox"/> Number of cans	“Bring your injured arm overhead with the elbow bent such that the bag is touching your back. Now straighten your elbow to lift the bag overhead.”
Wrist extension	<input type="checkbox"/> Unable <input type="checkbox"/> Gravity only <input type="checkbox"/> Number of cans	“With your forearm turned down bend your wrist back.”
Wrist flexion	<input type="checkbox"/> Unable <input type="checkbox"/> Gravity only <input type="checkbox"/> Number of cans	“Turn your forearm facing up. Bend your wrist up.”
Extensor pollicis longus	<input type="checkbox"/> Unable <input type="checkbox"/> Able	“Give a thumbs up.”
Flexor pollicis longus	<input type="checkbox"/> Unable <input type="checkbox"/> Able	“Make an ok sign.”

Interossei	<input type="checkbox"/> Unable <input type="checkbox"/> Able	"Open your fingers out wide like a fan and keep them there."
Circulation Examination		"We are going to test the circulation of your extremities."
Well perfused	<input type="checkbox"/> Symmetric <input type="checkbox"/> Cooler <input type="checkbox"/> Hotter	"Does your hand feel the same temperature on both sides."
Capillary refill	<input type="checkbox"/> <2 seconds <input type="checkbox"/> >2 seconds	"Using your other hand, press the fingernail of your thumb until it turns white. Then, release your thumb and allow it to pink back up. How long did it take to pink back up?"

* The left column contains the physical examination maneuver. The middle column contains recommended medical record documentation options. The right column contains verbal instructions that the clinician may use to guide the patient through each of the physical examination maneuvers.

Table 4. Special Testing Elbow Virtual Physical Examination

Examination Component		Documentation	Verbal Instructions				
Instability							
Ulnar Collateral Ligament		<input type="checkbox"/>					
Milking Maneuver <table><tr><td>Sensitivity</td><td>65%</td></tr><tr><td>Specificity</td><td>50%</td></tr></table>		Sensitivity	65%	Specificity	50%	<input type="checkbox"/> Positive <input type="checkbox"/> Negative	<p>“The following test can be performed using a doubled plastic grocery bag and two 16-ounce soup cans or other canned goods.”</p> <p>“Sit in a chair facing the camera. Raise your arm to your side parallel to the floor with your elbow flexed to 90 degrees and your palm facing your head and your thumb pointed to the ceiling. Grip the bag in your fingers with the bag behind your arm. Now try to point your thumb towards the floor.”</p> <p>“Does this cause discomfort or pain? If so, where is the pain located?”</p>
Sensitivity	65%						
Specificity	50%						
Moving Valgus Stress Test <table><tr><td>Sensitivity</td><td>100%</td></tr><tr><td>Specificity</td><td>75%</td></tr></table>		Sensitivity	100%	Specificity	75%	<input type="checkbox"/> Positive <input type="checkbox"/> Negative	<p>“While in this position, maximally flex and extend your elbow.”</p> <p>“Does this cause discomfort or pain? If so, where is the pain located?”</p>
Sensitivity	100%						
Specificity	75%						
Posterolateral Rotatory		<input type="checkbox"/>					
Chair Push-Up Test <table><tr><td>Sensitivity</td><td>87.5%</td></tr></table>		Sensitivity	87.5%	<input type="checkbox"/> Positive <input type="checkbox"/> Negative	<p>“Sit in a chair facing the camera. Grip the armrests such that your hands are on the outside of the armrest with your thumbs facing forward and your elbows pointing away from</p>		
Sensitivity	87.5%						

		<p>your body. Now push up from the chair using only your arms.”</p> <p>“Does this cause discomfort or pain? If so, where is the pain located?”</p>								
Valgus Extension Overload										
Valgus Extension Overload Test	<div><input type="checkbox"/> Positive</div> <div><input type="checkbox"/> Negative</div>	<p>“While standing facing parallel to a wall, place your palm against the wall with you fingers pointing to the floor. Maximally extend your elbow while you rotate away from the wall.”</p> <p>“Does this cause pain? If so, where is the pain located?”</p>								
Tendon										
Lateral Epicondylitis	<div><input type="checkbox"/></div>									
Maudsley Test	<div><input type="checkbox"/> Positive</div> <div><input type="checkbox"/> Negative</div> <div><input type="checkbox"/></div>	<p>“While sitting down in a chair, raise your arm parallel to the floor and completely straighten your elbow with your palm facing the floor. Extend only your middle finger. With your other hand apply some resistance.”</p> <p>“Does this cause pain? If so, where is the pain located?”</p>								
Chair Test	<div><input type="checkbox"/> Positive</div> <div><input type="checkbox"/> Negative</div> <div><input type="checkbox"/></div>	<p>“The following test can be done using a doubled plastic grocery bag and three 16-ounce soup cans or other canned goods.”</p> <p>“Stand facing the camera. Elevate your arm straight out in front of you with your palm facing the floor. With your uninjured arm, place the bag with canned goods in your hand and hold the bag up without letting your wrist drop.”</p> <p>“Does this cause pain? If so, where is the pain located?”</p>								
Biceps Tendon	<div><input type="checkbox"/></div>									
<div>Hook Test</div> <table><tr><td>Sensitivity</td><td>100%</td></tr><tr><td>Specificity</td><td>100%</td></tr><tr><td>PPV</td><td>100%</td></tr><tr><td>NPV</td><td>100%</td></tr></table>	Sensitivity	100%	Specificity	100%	PPV	100%	NPV	100%	<div><input type="checkbox"/> Positive</div> <div><input type="checkbox"/> Negative</div> <div><input type="checkbox"/></div>	<p>“For this test, we will start with a demonstration on your uninjured elbow. Face the camera with your arm at your side and elbow flexed to 90 degrees. Point your thumb away from your body. In this position, flex your biceps muscle. With your opposite Index finger make a hook and try to feel for the soft spot on the front of your elbow on the outside of the tendon you should feel running across the front of your elbow. Now hook the tendon with your finger. Do you feel this tendon?”</p> <p>“Now repeat this on your injured elbow. Are you able to feel the same tendon on this side?”</p>
Sensitivity	100%									
Specificity	100%									
PPV	100%									
NPV	100%									
<div>Passive Forearm Pronation Test</div> <table><tr><td>Sensitivity</td><td>9%</td></tr></table>	Sensitivity	9%	<div><input type="checkbox"/> Positive</div> <div><input type="checkbox"/> Negative</div> <div><input type="checkbox"/></div>	<p>“Stand facing the camera with your arms at your side and your palms facing forward. While keeping the front of your elbow facing the camera, rotate both thumbs outward as far as you can. Now rotate both thumbs inward as far as you</p>						
Sensitivity	9%									

Specificity	100%		can.”
Nerve			
Cubital Tunnel Syndrome	<input type="checkbox"/>		
Elbow Flexion Test	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/>	<p>“Stand facing the camera and touch your shoulders with your finger tips. Hold this position for 60 seconds.”</p> <p>“Does this reproduce your symptoms?”</p>	
Tinel Sign	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/>	<p>“Stand facing the camera and feel for the prominent bony spot on the inside of your elbow. Just behind this bony prominence you should feel a groove. Tap with 2 fingers in this area.”</p> <p>“Does this reproduce your symptoms?”</p>	
Radial Tunnel Syndrome	<input type="checkbox"/>		
Passive Pronation with Wrist Flexion Test	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/>	<p>“Stand facing the camera with your arm stretched out in front of you parallel to the floor and your palm facing down. With your other hand, flex your wrist down.”</p> <p>“Does this reproduce your symptoms?”</p>	
PIN Syndrome	<input type="checkbox"/>		
Resisted Supination Test	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/>	<p>“The following test can be done using a doubled plastic grocery bag and three 16-ounce soup cans or other canned goods.”</p> <p>“Sit in a chair facing the camera. Rest your forearm on the armrest with your wrist hanging off the tip of the armrest and your palm facing the floor. Grip the bag in this position. Without letting the bag slip, rotate your wrist so your palm is facing up.”</p> <p>“Does this reproduce your symptoms?”</p>	
Pronator Syndrome	<input type="checkbox"/>		
Tinel Sign	<input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/>	<p>“Stand facing the camera with your arm at your side and your forearm facing the camera. With your other hand, tap on the front of your forearm just past your elbow crease with one finger.”</p> <p>“Does this reproduce your symptoms?”</p>	
Beighton Criteria		“Each of the following tests should be done on the right and left side.”	
Thumb-to-Forearm	RIGHT <input type="checkbox"/> Positive	“Flex your wrist. Now, bend your thumb down and try to make it touch it to your forearm.”	

	<input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	
5 th metacarpophalangeal joint extension >90 degrees	RIGHT <input type="checkbox"/> Positive <input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	"Bend your pinky finger back as far as it will go"
Elbow recurvatum >10 degrees	RIGHT <input type="checkbox"/> Positive <input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	"Stand perpendicular to the camera, straighten your elbows as far as they go."
Knee recurvatum >10 degrees	RIGHT <input type="checkbox"/> Positive <input type="checkbox"/> Negative LEFT <input type="checkbox"/> Positive <input type="checkbox"/> Negative	"Step back from the camera and stand perpendicular to it, straighten your knees as far as they go."
Palms to Floor	<input type="checkbox"/> Positive <input type="checkbox"/> Negative	"Bend at the waist while keeping your knees straight, and attempt to place both palms on the floor."

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