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Upper limb peripheral neurological examination

To begin:

WIPE

- Wash hands
- Introduce self, stating your name and role
- Identify patient (check name, DOB and what they would like to be called)
- Permission – gain consent for the exam including a brief outline of what it will entail and how long it will take.
- Position – patient seated
- Pain – ask if the patient is in any pain
- Privacy – ensure curtains/doors are closed
- Exposure – both upper limbs exposed from shoulders to fingers

General inspection and active observation

Look for	Example of why
Conscious level	ACVPU – alert, confused, responds to voice, responds to pain or unresponsive Glasgow coma scale 3-15 gives greater range of level of response
General appearance	Is patient alert, orientated, in pain, generally appearing well or unwell?
Gait/Posture	Use of mobility aids. Does gait appear normal? Abnormal posture e.g. leaning to one side. Limb posture e.g. contractures.
Body habitus	Cachectic, well-nourished or large body habitus
Face	Facial droop or asymmetry, reduced facial expression, ptosis, pupil asymmetry
Speech	Is speech normal for the patient? Does patient understand instructions? Dysarthria, receptive or expressive dysphasia

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Specific inspection UL:

Look for	**Example of why**
Skin and musculature	Scars, wasting
UL movements	Involuntary movements, fasciculations, tremors

Around the bed:

Look for	**Example of why**
Treatments	Medications, oxygen, NG tube, IV infusions, urinary catheter
Observation chart	Note the patient's current status and NEWS score. If there are no up-to-date observations consider taking a full set of observations.

Screening

What to examine	**Examination notes**	**Assessing for:**
Pronator drift	Ask patient to hold arms out with palms upwards, and close their eyes. Hold for 30s	Pronator drift – occurs in UMN lesions, the arms start to pronate so they face palm downwards

Tone

What to examine	**Assessing for:**
Ask the patient to relax their arm and allow you to take its weight. Passively move the arm joints through the following movements:	
Rotate, abduct and adduct shoulder	Flaccidity or increased tone • Hypertonia can be upper motor neuron lesion(s)

Flex and extend elbow	• Hypotonia can be lower motor neuron lesion(s) or cerebellar disease • Cogwheeling at the wrist (sign of parkinsonism) • Clasp knife – the resistance felt on flexing the arm suddenly gives way (UMN lesion) • Spasticity "velocity dependent hypertonia", where the tone increases if you move the joint more rapidly (suggests UMN lesion) • Lead pipe rigidity (increased tone throughout the whole movement of the muscle, velocity independent)
Supinate and pronate forearm	
Flex/extend & rotate wrist	

Power

What to examine:	**Muscle group, root and peripheral nerve tested**
Test power of each muscle group: • Start with the biggest muscle groups (and work distally) • Compare right with left as you move down • Test power with the same muscle group if possible, e.g. if testing wrist flexion, provide resistance with your wrist; finger movements with your finger etc. Nb. These are typically tested by nerve root rather than peripheral nerve	Use the MRC scale to assess power, where: 5 – normal power 4 – some movement against resistance 3 – movement against gravity only 2 – movement with gravity eliminated 1 – flicker of movement 0 – no movement
Shoulder Abduction: Ask the patient to put their arms out like a chicken, ask the patient not to let you push their arms down	Muscle: Deltoid/supraspinatus muscle. Nerve root: C5, 6 Peripheral nerve: axillary and suprascapular
Elbow flexion: Ask the patient to put their arms out "like a boxer" in front of them. Isolate the joint by holding just proximal to the elbow. One at a time, place resistance against each forearm and ask them to pull you towards them	Muscle: Biceps muscles (biceps brachiii/brachioradialis) Nerve root: C5, 6 Peripheral nerve: musculocutaneous
Elbow extension: Repeat with each forearm, asking them to push you away	Muscle: Triceps muscles Nerve root: C6, 7

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	Peripheral nerve: radial
Wrist flexion: Ask the patient to hold their arms outstretched (like superman) and make a fist. Isolate the wrist by holding their forearm. Place your other hand underneath their fist and ask them to push down	Muscle: Flexor carpi groups Nerve root: C7, C8 Peripheral nerve: median
Wrist extension: Move your hand on top of their fist and ask them to push up	Muscle: Extensor carpi groups Nerve root: C5, 6 Peripheral nerve: radial
Finger extension: Ask the patient to extend their fingers and hold them there against resistance.	Muscle: Finger extensor muscles Nerve root: C7, 8 Peripheral nerve: radial (posterior interosseous branch)
Finger abduction: Ask the patient to put their hands out, palm down, and splay their fingers. Ask them to resist you pushing their little finger and index finger inwards	Muscle: Abductor digiti minimi and interossei Nerve root: T1 Peripheral nerve: ulnar
Thumb abduction: Ask the patient to turn their hands over (palms facing up) and point their thumbs up. Place downward pressure on their thumb and ask them to resist you.	Muscle: Abductor pollicis brevis C8, T1 Peripheral nerve: median

Reflexes

What to examine	**Assessing reflexes**
Use a tendon hammer in a "swinging arc" to test the deep tendon reflexes. Use gravity, rather than hitting. If reflexes absent or diminished ask the patient to grit their teeth or clench their hands to reinforce the reflex	
Biceps reflex – ask the patient to relax their arms, place across their body, place thumb on biceps tendon and tap hammer onto thumb	May be: absent, reduced, normal, brisk/increased • Brisk (or increased) reflexes suggest upper motor neurone
Triceps reflex – support arm so elbow is in 90 degree flexion, tap triceps tendon	

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Supinator reflex – place 2 fingers over brachioradialis tendon (posterior and lateral aspect of forearm), tap fingers with tendon hammer	• Reduced or absent reflexes suggest lower motor neurone Each reflex relates to a nerve root: Biceps: C5/6 Triceps: C7 Supinator: C5/6

Co-ordination

What to examine	Examination notes	Assessing for
Finger-nose test	Place your finger arm's length in front of the patient. Ask patient to touch their nose with their index finger, then touch your finger, then their nose and repeat. Repeat with other arm.	Normal movement is smooth and accurate Intention tremor – tremor that becomes more intense as they near the target (your finger) Past pointing – attempted reach overshoots the target (your finger) Both signs of upper limb ataxia
Rapid alternating movements	Ask the patient to perform rapid pronation/supination of one hand on the other. Ask patient to place hands on top of each other. Ask them to turn their top hand over, then back… Continue this as fast as they can. Repeat with the other hand on top.	Testing ability to make rapid, repetitive movements Dysdiadochokinesia – slow irregular movements – cerebellar dysfunction.

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Sensation

What to examine	Examination notes	Extra notes
Light touch and pain: Get patient to close their eyes. Use the sternum to demonstrate "normal"	Move down in a dermatomal distribution (C4/5-T1) compare side to side. Ask if the patient can feel the sensation and if it feels the same on both sides	Assess: • Light touch – cotton wool • Pain – neuro tip
	Check for peripheral neuropathy by grossly testing sensation distally to proximally	May elicit a 'glove and stocking' deficit
Vibration: Eyes closed – use the sternum to demonstrate "normal"	Tuning fork; start with most distal bony prominence (distal IP joint thumb) and if they can't feel it move to next proximal joint	128Hz tuning fork You are checking that they can feel vibration sense, not just the ability to feel the cold tuning fork Ask the patient to tell you when vibration stops
Proprioception: eyes closed	Using your thumb and forefinger stabilise the distal interphalangeal joint of the thumb & demonstrate moving the thumb up and down. Ask the patient to tell you if the thumb is up or down as you move it.	Hold the thumb on either side to prevent pressure on the nail

To finish

- Ensure the patient is dressed and comfortable
- Wash hands