



Orthopaedic Division
CANADIAN PHYSIOTHERAPY ASSOCIATION



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Intermediate Practical Exam (IPE) Examiners' Corner Summary Document

2010 ongoing

CONTENT:

The following document contains a summary of comments regarding the Intermediate Practical Examination (IPE) from the past several years i.e. *IPE Summary 2010-onward*.

Each year following the IPE, the document will be reviewed and revised based on the feedback from the Examiners and Chief Examiners.

PURPOSE:

The purpose of the document is to provide guidance for IPE examination preparation and instruction for candidates, mentors and instructors.

ASSUMPTIONS:

Candidates are strongly advised to read through the *Examiners' Corner: Advanced Practical Examination (APE)* as this document contains content related to the IPE examination, especially the sections relating to:

- a) Mobilizations/Manipulations (spinal regions) covered in the Level II and Level III curriculum
- b) Locking (spinal regions) covered in the Level II and Level III curriculum

GENERAL COMMENTS:

Candidates are reminded that the examination will include relevant theoretical and practical material inclusive from the Level 1 to Level 3 curriculum courses. The exam includes medical screening questions, particularly as they pertain to safety, indications/contraindications for manipulation, differential diagnosis questions and relevant pathology questions. Candidates should therefore not think of this exam as technique-based only.

Throughout the exam candidates are reminded to treat the models as if they are patients, using appropriate communication i.e. body language, dialogue and instructions as they perform their techniques.

Throughout the exam candidates are reminded to use optimal body mechanics during their demonstration of assessment and treatment. Candidates can utilize their own body, the mobilization bed and any additional props i.e. towels, theraband, etc. as needed to achieve effective and efficient body mechanics.

Thank you to the mentors and instructors and best wishes to all candidates.

ASSESSMENT:

Clinical Reasoning and Clinical Presentations:

Assessment Components Rationale:

- It is important to have a thorough understanding and rationale for application of all the curriculum's assessment testing procedures including their clinical implications, contraindications, related anatomical / physiological rationale, positive findings, clustering of testing procedures for differential diagnosis purposes, etc.

End Feel (Cyriax):

- It is important to be able to define different types of end feel (Cyriax) and the clinical implications.
- *Empty end-feel (E/F)*: The term empty end feel does not apply to the soft end feel of a grade 3 ligament tear; empty E/F denotes sinister or psychiatric issues. Also, there is always an E/F, either hard capsular, late, soft, spasm...
- It is important to understand the presentation of an articular fixation and how it differs from a capsular pattern of restriction.
- It is important to understand the presentation and be able to describe the difference between hypertonic, true shortness - contracture versus an articular cause of restricted motion.

Differentiation of causes of pain:

- The Candidate should be able to discuss the non-MSK causes of a typical pain presentation.

Differentiation of regional dysfunction:

- The candidate should be able to demonstrate specific tests to differentiate between SIJ & L5-S1 dysfunction.
- The candidate should be able to discuss and demonstrate how to differentiate myofascial versus neural mobility limitations in the presence of an abnormal neurodynamic test.

Differentiation of causes of dizziness:

- As part of dizziness differentiation, candidates should be able to indicate how they would either rule in or out the cervical spine. In other words, the candidates should be well prepared to discuss a sequential and organized approach to the assessment of dizziness, including tests for all possible reasons including cervicogenic causes.
- Candidates should be able to demonstrate their knowledge of neurovascular anatomy, anatomical variations as well as the effects of arterial dysfunction in a neural region i.e. vascular supply of the brain, spinal cord, nerve roots and peripheral nerves.
- Candidates should have a full understanding of the S&S of cervical arterial dysfunction (CAD) as well as appropriate testing for cervical arterial dysfunction as per the IFOMPT framework.
- Please note that provocative positional testing (also called vertebral artery positional testing) i.e. using DeKleyn's position, has been removed from the NOD curriculum.

Management and Referral for Further Investigation:

- Candidates must be able to recognize and be able to demonstrate appropriate management for ‘red flags’ as well as non-musculoskeletal disorders with the given patient scenarios.
- Candidates must have the knowledge of, as well as, a management rationale for potential pathologies and or injuries / dysfunctions that may be associated with the given patient scenarios including further testing for differential diagnoses, relevant associated signs and symptoms, physiotherapy as well as other medical management i.e. further desired medical investigations.
- Candidates must have the knowledge and a rationale for the appropriate, timely management of the given patient scenarios including further desired investigations i.e. what imaging is desired, rationale for a referral for an orthopaedic surgeon consultation, etc.
- With all patient scenarios, the candidates must be clear as to when and how to send patients back to the physician for further investigation including being able to explain the goal and intent of this referral.
- Candidates need to be clear on procedures for emergency protocols for serious adverse events, especially monitoring of patients and taking charge of the situation.
- Candidates need to be clear on procedures regarding medical urgency protocols especially monitoring of patients and taking charge of the situation i.e. prioritizing patient monitoring and assessment by assessing and monitoring the patient’s vitals to see if symptoms dissipate before any attempt is made to assess patient articular stability and mobility.
- Candidates need to understand and discuss the implications of patient medications with regards to the total patient presentation.
- Candidates need to consider the given patient scenario and be able to discuss appropriate and realistic patient management.

Passive Intervertebral Movement testing (PIVM) all spinal regions: (please also refer to the Treatment section)

- The candidate should be clear about the difference between *Passive Physiological Intervertebral Movement (PPIVMs) testing* and *Passive Accessory Intervertebral Movement (PAIVMs) testing* when performing passive movement of the spine.
- When demonstrating PIVM assessment in the spine, be prepared to demonstrate uniplanar and combined movements and articulate your understanding of the differences.
- When testing PPIVMs:
- When testing PPIVMs & PAIVMs it is important to assess movement to the barrier at each level of the spine, staying localized to each segment.
- Candidate needs to demonstrate how they would assess the full extent of the motion (e.g. combined PPIVMs must include rotation and side-bend components as well as flexion/extension, and assess into the end of range).
- When demonstrating PIVMs of the spine, there is no need for locking proximal and distal spinal regions unless you are having difficulty focusing the PIVM into the targeted motion segment i.e. no need to lock the lumbar spine when doing combined movement PPIVMs.
- When assessing PAIVMs:
- Candidates need to demonstrate more than just a linear movement and also include the rock and roll motion within the joint.
- Candidates need to demonstrate that they are evaluating the full ROM of the segment in question i.e. PAIVMs in the neutral zone to understand the joint shape and quantity of movement as well as at barrier (EROM).
- Candidates should localize the intended movement to the target segment. This can be done:
- Where possible in the Csp (supine or sitting) with stabilization of the non-moving bone i.e. stabilize C2 when performing posterior glides of the right C1 on C2.
- Optional stabilization of the non-moving bone in the Tsp and Lsp as it is recognized that it can be hard to stabilize in these regions like one can in the Csp
- Prone PAs in all regions with no stabilization

Spinal Regions:

- **Craniovertebral region:**
 - It is recommended that PAIVMs be used to determine which side is causing the restriction.
 - When performing PAIVMs of the A/A joint, glides should be performed both in neutral as well as into the restriction (towards R2) but not necessarily at the end of the restricted range.
 - When performing PPIVMs and PAIVMs, candidates are encouraged to relax their hands to ensure model comfort.
 - Although the addition of *slight* flexion or extension at the AA joint could bias the rotation motion to the joint on one side or the other, the combination of end range extension and rotation should be avoided during AA joint manual therapy treatment.

- **Cervical & Cervico-thoracic region:**
 - PPIVMs & PAIVMs testing should be reviewed especially bilateral cervico-thoracic extension and the related glides.
 - When assessing mobility of the cervical spine, candidates need to be able to assess all the various ranges of, as well as planes of movement available i.e. candidates should be able to consider, for analysis, all the vectors and their various contributions to movement: inferior, medial, posterior as well as superior, lateral, anterior.
 - Note: removed from the NOD curriculum is the U-joint assessment as a specific structure as this has been changed to the investigation of the assessment of motion limitations in side-flexion / medial-lateral i.e. a movement based assessment and treatment versus a structure based assessment and treatment of the U joint.
- **Thoracic region:**
 - When testing PPIVMs & PAIVMs of the thoracic spine it is important to assess movement to the barrier at each level of the spine, staying localized to each segment.
- **Thoracolumbar junction region:**
 - The region of the thoraco-lumbar transitional joints may be located using rotation PPIVMs from the thoracic region downwards as there will be less movement at that region than the levels above.
 - The thoracolumbar junction segments have the movement of combined sideflexion and rotation. When performing assessment of the combined movements of the thoracolumbar junction, *emphasize* the sideflexion with the combined movements rather than only doing the sideflexion or only doing the rotational component.
- **Lumbar/Pelvis region:**
 - PPIVM assessment of the lumbar motion segments should include triplanar movements incorporating flexion and extension with ipsilateral/contralateral side flexion and rotation, considering motion of the entire joint complex and not just focusing on the Z joint on the top side. Maintain end range flexion or extension with sideflexion and rotation.
 - PPIVM assessment of the L5/S1 complex, the triplanar movements should include ipsilateral side flexion and rotation incorporating flexion and extension.
 - Unilateral SIJ PPMs/PAMs, sacrum on the innominate, should include directing a vector of force on the opposite sacral ILA in order to create movement of the sacrum around the oblique axis thereby allowing for the PPM/PAM of counternutation i.e. right sacral counternutation requires a left ILA anterior vector.
 - Note: removed from the NOD curriculum are the specific unidirectional SIJ arthrokinematics glides i.e. removal of specific glides along the long and the short arm. Assessment of the SIJ will still include exploring passive articular mobility in the various available vectors of motion and quantitatively assess the same as too much or too little. Also retained in the NOD curriculum will be stability testing in the anterior and-posterior plane as well as the superior and inferior plane.

Passive Physiological Movement testing (PPMs) and Passive Accessory Movement testing (PAMs) peripheral regions:

- When assessing PAMs:
 - Candidates need to demonstrate more than just a linear movement but also include rock and roll within the joint.
 - Include the conjunct rotation where it is applicable.
 - PAM testing of a given joint should include all of the directions – for example at the hip, distraction should be included as an accessory glide.
 - Candidates need to demonstrate evaluation of the full joint complex ROM i.e. PAMs in the neutral position to understand the joint shape and quantity of movement as well as at barrier of motion (end ROM).

Peripheral Regions:

- **TMJ region:**
 - Candidates should review PAMs of the TMJ ensuring proper handling and stabilization.
- **Shoulder Region:**
 - When assessing PPMs at the glenohumeral (GH) joint, it is important to stabilize or at least monitor motion at the scapula to be able to localize the motion to the GH joint.
 - When assessing passive glenohumeral movement (PPMs /PAMs), a short lever is more efficient than moving distal from the elbow.
 - Candidates should understand and be able to demonstrate assessment of the sternoclavicular joint arthrokinematics (PAMs) and the associated scapular physiological movements (PPMs) that occur.
 - When assessing the PAMs at the sternoclavicular (SC) joint, be sure to find the oblique plane of the joint. The manubrium is relatively fixed, and so the focus can be on the clavicular glide.
- **Hand/Wrist Region:**
 - When asked to assess the radiocarpal joint as a unit, it is expected that the motion will be focused on moving the whole proximal row on the radius/ulna, rather than individual carpals
 - Biomechanics of the 1st CMC, as well as all joints of the thumb, will be adopted to reflect the current international language and align with the biomechanical model in the new manuals (2020)
- **Knee Region:**
 - Tibio-femoral: Keep in mind that rocking techniques are very useful to regain end-range motion and are often more effective than doing just glides to regain the last few degrees of movement.
- **Foot/Ankle Region:**
 - Subtalar: When performing subtalar joint techniques, watch hand positioning, being attentive to the stabilization of the talus, location of joint planes (anterior and posterior joint) and axis of movement (anterior and posterior joint).
 - Candidates must ensure that they are not blocking the posterior joint when they are assessing the anterior joint i.e. the calcaneus must be allowed to swing to allow anterior joint movement. Visa versus for the posterior joint assessment.

Quadrant Testing:

- End range combined movements / quadrants are examinable at any joint (particularly shoulder, hip, elbow, knee) as either assessment or treatment techniques.
- When demonstrating quadrant assessment of a particular joint, it is important to incorporate the scouring component to explore the “arc” of movement and the joint surfaces as per Maitland’s description of the technique.
- When testing the hip quadrant (combined movement of flexion/adduction), it is important to assess the joint at various angles either by scouring or by maintaining the flexion and assessing various angles of adduction. The joint motion must be appreciated through a range, not as a static position.

Passive and Dynamic Stability Testing:

- When performing stability tests, end feel should be achieved.
- All stability tests include a sustained loading (for an adequate amount of time) at the end of range in order to achieve and fully assess the inert structure end feel.
- When performing directional stability tests, candidates should be prepared to discuss/demonstrate both neutral zone assessment and end of range stress tests.
- *Dynamic stability testing:* Candidates must be prepared to demonstrate a test of dynamic stability in all regions of the spine. This may start with observing and palpating the recruitment of stability muscles but must go further to determine if these muscles can actually control the motion in question. This could be achieved by retesting either the passive directional stability test or a limb load test under active control – observing and palpating the segment to be tested.
 - **Cervical Spine region:**
 - During upper cervical stability testing, ensure adequate fixation of the stabilizing hand, for example – C2 stabilization during a rotary (alar ligament) stress test.
 - Alar ligament testing: a positive test is an absence of stability in all three positions of flexion/extension and neutral. If stability is found in one position, then all three positions do not have to be tested.
 - Candidates are expected to demonstrate their understanding of the Sharp Purser test as well as demonstrate the practical components of the test on a model.
 - A good reference for upper cervical stability testing is available within the Orthopaedic Division Review (ODR) 2011 (accessed online) and includes an article, clinical reasoning algorithm flow sheet, and video.
Article reference: Fahlman A, Levesque L, Kennedy C. The Craniovertebral Ligaments A directional guide for testing. Orthopaedic Division Review (ODR) 2011

- **Thoracic spine region:**
 - With lateral stability testing of the thoracic ring, the entire inferior ring should be stabilized through the ribs and not with contact on the inferior vertebrae transverse processes only i.e. be sure to include the rib in the stabilizing hand so that the rib and the inferior vertebrae are fixed as the intent is to move the superior vertebrae laterally on the fixated rib and vertebra.
 - Note: removed from the NOD curriculum is the structure specific ligament testing in the thoracic spine i.e. the superior and lateral costotransverse ligaments.
- **Lumbar torsion test:**
 - When testing torsional/rotational stability, be sure to have both hands local to the spinous processes of the involved vertebrae above and below the segment.
 - When testing for torsional/rotational stability in the lumbar spine in side-lying it is inadequate to just apply a transverse pressure to the spinous process in the coronal plane. There must be rotation occurring about a vertical axis, with overpressure at the end of that range.
- **Sacroiliac joints region:**
 - Candidates should be prepared to demonstrate and discuss both pain provocation testing and directional stability testing of the sacroiliac joints.
 - Directional stability tests of the SIJ are different from pain provocation or mobility tests, and the former would include sustained end range glides directed anterior, posterior, superior and inferior. Note assessing directional stability can be done as a passive shear testing end range restraints, or as an evaluation of the neutral zone.
 - Joint play tests may also give information about the size of the neutral zone and therefore give some indication of the stability of the joint but do not fully stress the passive restraints.
- **Hip:**
 - Note: removed from the NOD curriculum is the structure specific ligament testing in the hip. All hip stability testing will now only include torque testing.

- **Shoulder:**

- Note: removed from the NOD curriculum is the structure specific testing for the shoulder i.e. removal of the conoid and trapezoid ligament specific testing
- When practicing the technique of testing anterior stability of the gleno-humeral joint, candidates are advised to protect the model by creating a protective “artificial” barrier for motion.

- **Hand and Wrist region:**

- When testing wrist / hand ligaments, gapping must be incorporated (i.e. not just a simple glide).

Neurodynamic testing:

- Candidates are advised to review neurodynamic testing handling and clinical reasoning for sensitization procedures.
 - When performing neurodynamic testing, each component should be added sequentially with careful monitoring as each component is added.
 - For neurodynamic testing, it is important for candidates to understand how altering the sequence of the test may aid in focusing the effects of the test on a specific part of the nerve. Candidates must have a good working knowledge of the anatomy of each of the peripheral nerves that is assessed with neurodynamic tests.
 - When doing neurodynamic testing: if the targeted tissue/mechanical interface is proximal, i.e. the IVF of the cervical spine, then the proximal components of the test should be done first. If the targeted tissue is distal, i.e. carpal tunnel, then the distal components of the test should be done first.
 - In the presence of dural irritability, the candidates should be able to make various modifications of both the assessment and/or the treatment techniques i.e. scapular elevation, flexion of knees, support of arm with a pillow, etc.
 - The candidate should be able to discuss and demonstrate how to differentiate myofascial versus neural mobility limitations in the presence of an abnormal neurodynamic test.

Neuroconductivity testing:

- Candidates should be prepared to demonstrate their understanding of cranial nerves as well as be able to demonstrate the practical testing of the cranial nerves on a model.
- Candidates are expected to be clear in the signs and symptoms that differentiate upper motor neuron and lower motor neuron pathologies in various parts of the spine, particularly as it relates to differentiating spinal cord vs. cauda equina lesions.
- **Sensory:**
 - With regards to testing the conductivity of nerve roots, candidates should review and be able to map out the full sensory distribution of both the upper and lower quadrant dermatomes (proximal and distal portions).
 - Candidates should demonstrate proper sensory testing procedures on the model including ensuring that the model’s eyes are closed during testing; proper usage of cotton ball/tissue for light touch.

- **Key muscles:**

- Watch body position of both patient and therapist when doing strength testing i.e. ensure specificity when testing key muscles with proper stabilization.
- Candidates should be prepared to demonstrate testing key muscles including various alternatives for specific nerve roots.
- Candidates should be prepared to determine key muscle fatigable weakness by either sustained or repetitive contractions.

Muscle: Length, Strength as well as Recruitment testing:

- When demonstrating muscle length/strength testing, candidates should be prepared to demonstrate differentiation and what movements can be added to selectively test various muscles to ensure specificity.
- Candidates should consider the difference in testing when assessing muscle recruitment/activation versus manual muscle testing for strength.
- When a scenario calls for the need to demonstrate a muscle lengthening / stretching technique, it is important that the candidate demonstrate their knowledge of the involved muscle and relevant anatomy, including its attachment sites, by the proper patient handling of the tissue and imparting appropriate ROM vectors to lengthen the target tissue.
 - **Scapular muscles:**
 - Candidates should be knowledgeable of the actions of all stabilizing muscles around the scapula, particularly the various portions of the trapezius muscle.
 - **Foot/Ankle:**
 - With muscle testing extensor hallucis longus (EHL), ensure there is stabilization of the proximal phalange when resisting the DIP extension.

Anatomy:

- Candidates should be able to demonstrate their knowledge of neural anatomy in the regions of the brain, spinal cord, cauda equina, nerve roots and peripheral nerves as discussed in the Theory 1, Theory 2 and all course specific level manuals. In particular, the candidate should understand neural anatomy, its anatomical variations, associated pathologies/conditions as well as its potential relevance to a clinical scenario.
- Candidates should be able to demonstrate their knowledge of neurovascular anatomy, anatomical variations as well as the effects of arterial dysfunction in a neural region i.e. vascular supply of the brain, spinal cord, nerve roots and peripheral nerves.
- It is important that candidates are able to demonstrate their knowledge of surface anatomy to accurately identify and if requested palpate the location, attachment sites and course/orientation of multiple structures (tendons, ligaments, joint lines, etc.) and then apply this knowledge when assessing and treating.
- Candidates should be able to correctly palpate and localize spinal and peripheral bony and joint structures in various regions.
 - **Thoracic spine region:**
 - Candidates need to understand the anatomy and be able to correctly landmark such areas of the Tsp as T1 and T2 SP/TP's, 1st and 2nd rib, costo-chondral junctions, region of the costovertebral joint, the region of the thoraco-lumbar transitional joints.
 - Land-marking levels in the thoracic spine requires specific knowledge of the location of the TVP's in relation to the spinous processes, and how that changes dependant on the region.
 - When locating thoracic levels, it is appropriate to count down vertebral levels and the candidate may cross reference to anatomical landmarks to see if they correspond.

TREATMENT:

Treatment Rationale:

- It is important to have a thorough understanding and rationale for application of all the curriculum's treatment procedures including their clinical implications, contraindications, related anatomical / physiological rationale, adjunct treatment, etc.

Transverse Frictions:

- It is important to understand and be able to describe the anatomy and function of the ligaments in the body as well as when given a patient scenario be able to demonstrate appropriate transverse friction of these ligaments.
- It is important to review proper body positioning for deep transverse friction massage and to understand the principles and how to apply them to the technique.
- With regards to deep transverse friction massage, it is important to know which tissues should be treated while on stretch vs. slack.
- The candidate must demonstrate localization as well as the appropriate amount of target tissue sweep force, amplitude, and pressure when demonstrating transverse frictions i.e. coronary ligaments at the knee should have the friction applied on the top of the tibial plateau.

Mobilizations/Manipulations: (please also refer to the Assessment section)

- **Consent:**
 - Obtaining treatment consent i.e. for manipulation this includes discussing how the set-up feels as well as permission to thrust.
- **Pre-manipulation:**
 - It is important to achieve an end feel with the pre-manipulation hold and be in communication with the patient during the procedure to further assess the appropriateness of the manipulation.
 - Please note that pre-manipulation hold is not a 10 second hold. The thrust should be applied at the end of the pre-manip hold, not releasing too much as then the barriers have been lost and localization can be compromised, and the amplitude can then look too large.
- **Grades:**
 - Read the document on the grades available through the <https://www.orthodiv.org/> website.
 - Candidates are encouraged to review Maitland grading of mobilization techniques, their position in range and the inclusion of + and – components, especially grades III, III+, IV, IV+. Please be prepared to discuss the differences between the grades and rationale for use of each grade including the + and –.
 - When choosing to use a grade I or II mobilization, ensure that there is no stretch taking place at the joint as these grades are located before R1 and so no resistance to motion should be felt. In acute situations, distraction techniques can sometimes be graded or progressed beyond grade II as this technique may relieve the joint pain. The response of the joint will dictate the grade of distraction that is best applied for a specific case.
 - It is important to achieve the appropriate force and speed associated with the desired grade of motion i.e. sufficient force and speed for a grade V technique
- **Theory:** Candidates should be able to discuss the theoretical basis for the effects of mobilization /manipulation.

Spinal Regions:

- Regarding anticoagulants (e.g. Warfarin, Heparin, Coumadin), note that this is considered a contraindication to manipulation in all areas of the spine.
- Keep in mind that post-manipulation care should include mobility and stability testing (passive & dynamic).
- **Craniovertebral Region:**
 - When demonstrating mobilization techniques at the AA joint, it is important to take up the available range using combined movements and to perform the technique in a non-irritable stiff joint at the end of the available range, not in the neutral position
 - Although the addition of *slight* flexion or extension at the AA joint could bias the rotation motion to the joint on one side or the other, the combination of end range extension and rotation should be avoided during AA joint manual therapy treatment.
- **Cervical region:**
 - Note: removed from the NOD curriculum is the U-joint treatment as a specific structure as this has been changed to the treatment of the assessed motion limitations (sideflexion / medial-lateral) i.e. a movement based treatment versus a structure based assessment and treatment of the U joint.
 - Joint mobilization of a non- irritable joint in the mid-cervical spine should be at end range of triplanar movements. In order to achieve a strong capsular stretch, grade should be 3+ or 4+.
- **Cervico-thoracic region:**
 - First rib mobilization for inspiration requires an understanding and appreciation of the joint curvature as well as the fact that the inferior glide also has an anterior component, ensuring sufficient stabilization of T1.
- **Thoracic region:**
 - Watch that the head/neck are supported when doing supine roll down manipulation techniques for the thoracic spine.
 - When doing supine roll down thoracic manipulations, be sure not to hold too long and create undue irritability for the models.
 - For supine roll-down techniques, be sure to return the model's hips/ legs to neutral after set up, rather than leaving the lower extremity and low back twisted during the manipulation.
 - When performing supine roll down thoracic manipulations, be sure not to over compress the thorax.
 - When performing thoracic traction in sitting (mobilization or manipulation), consider therapist/model positioning and have the model close to the edge of the bed.

▪ **Lumbar/Pelvis region:**

- For the indirect technique, SF alone does not fully extend the joint on the concave side so make sure to include extension and the appropriate SF with this technique.
- For flexion and extension techniques in the lumbar spine, candidates are reminded to emphasize the side-bending component inducing the superior or inferior glide during mobilization/manipulation as opposed to rotational components.
- When using a body drop to manipulate the lumbar spine, ensure that your vertical force is along the plane of that joint i.e. the patient must be rolled towards the therapist.
- As with all mobilizations / manipulations, ensure the appropriate vector is applied for the Lsp manipulations i.e. the oblique gap of the Lsp facets in not pure rotation.
- As with all manipulations, ensure adequate and appropriate force and amplitude is applied for the Lsp manipulations.
- For the SI supine gap manipulation technique, keep in mind that some internal rotation of the hip will help to stabilize the hip joint to enable the force to be directed to the SI joint.

List spinal manipulations potentially included on the IPE *(please refer to the APE document for further spinal manipulation information):*

○ **Cervical Region:**

- Mid-cervical traction manipulation

○ **Thoracic Region:**

- Tsp bilateral gap (bilateral flexion) in sitting/supine manipulation
- Tsp bilateral extension in supine manipulation

○ **Lumbar / Pelvic Region:**

- Lumbar unilateral oblique distraction (gap) manipulation
- Lumbar unilateral extension manipulation
- SIJ supine gap manipulation
- SIJ innominate inferior translation manipulation (prone or supine – Note: position of supine or prone based on both patient and physiotherapist comfort)

Locking:

- Always consider the patient scenario, patient's comfort, therapist's body mechanics, therapist's ability to control the patient and the technique to be used when setting the patient up for locking.
- **Cervical Spine Region:**
 - Ensure that all components of the lock are maintained as the next motion is added. Although the SF component is emphasized during locking, the contralateral rotation is also important in obtaining an effective lock.
 - Ensure that there has been a consideration of the need for cervical flexion from above and/ or below as a component of an effective lock.
 - Ensure that there has been a consideration of the need or not for cervical lateral translation from above and/ or below as a component of an effective lock.
- **Lumbar Spine Region:**
 - The choice of locking in the lumbar spine has many options and depends on several factors. You may or may not choose to incorporate the components to be restored in the lever through which you will apply the mobilization/thrust i.e. the caudal chain can be locked using flexion even if the restriction is into extension.
 - If the candidate is experiencing difficulty in maintaining control of the model during set up for locking of the lumbar spine, one should consider locking the upper lever first or if starting with the lower lever, leave the leg offset until after the upper lever has been dealt with.
 - When using a flexion lock on the caudal segments for a lumbar mobilization or manipulation technique, be careful not to lose the lock when the bottom leg is extended.
 - If using a flexion lock from below for a lumbar manipulation/mobilization, candidates are advised to recheck the segment to ensure that the caudal lever lock is not lost as the model extends his/her bottom leg.
 - For lumbar spine manipulation techniques ensure there is not excessive rotation in the lock of the cranial chain.

Peripheral Regions:

▪ Shoulder Region:

- When mobilizing the accessory movements at the sternoclavicular (SC) joint, be sure to find the oblique plane of the joint. The manubrium is relatively fixed, and so the focus can be on the clavicular glide.

▪ Elbow Region:

- For ulnohumeral joint restrictions (abduction / adduction), candidates may choose either an arthrokinematic medial/lateral glide through the ulna or humerus or an osteokinematic motion of abduction/adduction motion through ulna, as long as the appropriate amplitude, force and vector is adequately controlled for the given scenario. Note: the manipulation for the adducted ulna has been removed from the curriculum.
- Mill's manipulation technique is examinable, and candidates should be prepared to demonstrate this technique including being able to discuss its indications for usage as well as demonstrating use of sufficient force with the manipulation.
- Mill's manipulation does not have to be a large dynamic motion. The limb can be positioned near the barrier and then the thrust should be short, controlled and delivered at the joint not through the long lever. As for any other manipulation, it is important to understand post manipulation reassessment and care.
- For a Mill's manipulation the candidate should consider the neural tissue load on shoulder and neck and position appropriately.

▪ Hand/Wrist Region:

- When performing dynamic manipulations at the wrist, ensure that there is an adequate traction component. The physiological motion is used to produce the force, ensuring that the glide is at its barrier and included in the final thrust. It is important to be aware of the model's neck and arm position during the set-up and application of the manipulation.
- When demonstrating carpal manipulations on a very mobile patient, ensure the humerus is stabilized i.e. patient can passively stabilize the humerus into their thorax.
- As with all manipulations, ensure adequate and appropriate force and amplitude is applied i.e. for the osteokinematic carpal manipulations.

▪ Hip Region:

- When demonstrating mobilizations at the hip joint, ensure specificity and localization of the technique.

▪ Foot/Ankle Region:

- Candidates must ensure that they are not blocking the posterior joint when they are mobilizing the anterior joint i.e. the calcaneus must be allowed to swing to allow anterior joint movement. Vice versa for the posterior joint mobilization.
- With regards to sub-talar joint loose body, as with loose body manipulations at any joint, it is important to provide adequate strong traction.
- When performing loose body manipulations in the foot and ankle, speed is an essential component of a successful technique.

Quadrant Treatment:

- End range combined movements / quadrants are examinable at any joint (particularly shoulder, hip, elbow, knee) as either assessment or treatment techniques.
- Candidates need to be able to discuss the dosage (grades/ reps/time) for quadrant treatment techniques.

Neurodynamic treatment: (please also refer to the Assessment section)

- When performing neurodynamic treatment, each component should be added sequentially with careful monitoring as each component is added.

Muscle Length / Soft Tissue Release:

- When a scenario calls for the need to demonstrate a muscle lengthening / stretching technique, it is important that the candidate demonstrate their knowledge of the involved muscle and relevant anatomy by the proper patient handling of the tissue including its attachment sites and imparting appropriate ROM vectors to lengthen the target tissue.

Exercise Prescription:

- When asked to demonstrate a home exercise program to maintain mobility at a specific joint, it is important to be localized to and / or monitor the level in question and to keep in mind the specific scenario given including the specific direction of motion restriction as well as associated patient issues.
- When prescribing exercises, parameters (goal, hold times, load, repetitions, sets, frequency) should be reasonable for the scenario given including the various aims of recruitment vs lengthening vs strength vs endurance.
- During exercise prescription of a scenario, it is important to reason the appropriate order of exercises i.e. choosing appropriate exercise progressions, remembering order and priorities throughout progressions...It is also important to continually monitor and instructing the model on how to self-monitor to be able to reproduce the exercise at home.
- When providing exercises remember to take into account the other problems presented (nerve tension, joint laxity, etc.) and provide appropriate recommendations to address the purpose of the exercise.
- The candidate should be prepared to provide a detailed rationale for all prescribed exercises and their associated parameters.
- Exercise management of a *spondylolisthesis* begins with core muscle recruitment but must be followed by posterior pelvic tilt and strength of the whole system not just recruitment. A neutral lumbar spine does not offer enough protection for a symptomatic spondylolisthesis.
- Ensure that if asked to do exercise instruction to the model that the candidate focuses on the model when instructing and monitoring their performance of the exercise.
- Home exercises to maintain the mobilization treatment done often require an application of a localizing external force as well as a muscular contraction of the patient.

Education:

- When a scenario calls for the need to demonstrate regional protection / immobilization, ensure this is appropriate for the scenario including the method and duration of this treatment.