



**Orthopaedic Division
Groupe d'orthopédie**



Canadian
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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.

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 the appropriate dialogue and instruction as they perform their techniques.

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

ASSESSMENT:

Clinical Reasoning and Clinical Presentations:

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 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 have a full understanding of the link between the vascular supply distribution of the vertebral artery and the S&S of insufficiency of the vertebrobasilar system.
- When performing vertebral artery positional testing, the testing position includes a progression of rotation, extension and then combined rotation/extension, ensuring that the cervical spine extension components are maintained at full range. The final end stage test should be the full DeKleyn's position. Candidates must ensure for full test position, the neck must be taken into end of range CV and mid C extension and this must be maintained while the component of rotation is added to the test i.e. it is not sufficient to only extend the CV region while the lower cervical spine remains flexed.

Note: The Dekleyn's position is not always performed during a physical examination of the patient, but if there is to be manipulation or end range extension exercises prescribed, the therapist should be prepared to describe, perform as well as justify the usage of this test.

Management and Referral for Further Investigation:

- With all patient scenarios, the candidates must be clear as to when to send patients back to the physician for further investigation.
- Candidates need to be clear on procedures for emergency protocols for serious adverse events, especially monitoring of patients and taking charge of the situation.

Differentiation of regional dysfunction:

- The candidate should be able to demonstrate specific tests to differentiate between SIJ and L5-S1 dysfunction.

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:
 - 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 assessing PAIVMs:
 - Candidates need to demonstrate more than just a linear movement and also include the rock and roll motion within the joint.

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 differentiation of the Z joints and U joints, candidates need to be able to alter the planes of movement. Candidates should consider the vectors to be analyzed (inferomedial/slightly posterior, superolateral/slightly anterior and anterior/posterior). A document on the assessment and treatment focused to the U joints has been uploaded to the orthodived.com website and candidates are encouraged to review this.
- **Thoracic region:**
 - When testing PPIVMs 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 mortise joint at the thoracolumbar junction can be located using rotation PPIVMs from the thoracic region downwards as there will be less movement than the levels above.
- **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
 - PPIVM assessment of the L5/S1 complex, the triplanar movements should include ipsilateral side flexion and rotation incorporating flexion and extension.

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.

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.
 - 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.
- **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 location of joint planes and axis of movement.

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 range should be achieved.
- All stability tests include a sustained loading (for an adequate amount of time) at the end of range in able 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.
 - 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.
 - **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.
 - **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.

Neuroconductivity testing:

- 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).
- **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.

Muscle: Length, Strength as well as Recruitment testing:

- When demonstrating muscle length 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.
 - **Scapular muscles:**
 - Candidates should be knowledgeable of the actions of all stabilizing muscles around the scapula, particularly the various portions of the trapezius muscle.

Anatomy:

- It is important that candidates are able to demonstrate their knowledge of surface anatomy to accurately identify 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 be able to correctly landmark such areas of the Tsp as T2 SP/TP's, 1st and 2nd rib, costo-chondral junctions.
 - 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 but then cross reference to anatomical landmarks and they should correspond.

TREATMENT:

Transverse Frictions:

- 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.

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:**
 - 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 orthodived.com 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.

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:**
 - Treatment of the U joints – candidates should consider the vectors to be analyzed (inferomedial/slightly posterior, superolateral/slightly anterior and anterior/posterior). A document on the U joints has been uploaded to the orthodived.com and candidates are encouraged to review this.
 - 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, the grade should be 3+ or 4+.

- **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 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.
 - 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.

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.

- **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.
- 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.

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 fixations (abduction / adduction), candidates may choose either a medial/lateral glide thrust or an abduction/adduction thrust through the humerus, as long as the amplitude is adequately controlled.
 - Mill's manipulation technique is examinable and candidates should be prepared to demonstrate this technique
 - 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.
- **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.
- **Hip Region:**
 - When demonstrating mobilizations at the hip joint, ensure specificity and localization of the technique.
- **Foot/Ankle Region:**
 - 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.

Exercise Prescription:

- When asked to demonstrate a home exercise program to maintain mobility at a specific joint, it is important to be localized to 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 as well as 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.
- 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.