

## ***Information Integration Exercise—Answer Guide***

***Things you want to know:***

***Chair characteristics:***

***Height***  
***Back support***  
***Seat Pan depth***  
***+/- Arm rests***  
***+/- Foot stool***

***Surface:***

***Height***  
***Adjustable***

***Hardware:***

***Monitor height and distance from eyes***  
***Keyboard position/height/style (split....). Keyboard tray? Same surface as monitor?***

***Input Devices:***

***Effective?***  
***Position/location***

***Phone:***

***+/- headset***

***Pace of work including duration and %age time spent doing different tasks (mouse, keyboard, numbers, phone)***

***Glasses:***

***Appropriate for monitor?***  
***Bifocals?***

***Static awkward postures for neck, shoulders, elbow, wrist***

***Point loading sites (forearm on table, elbow on arm rest, wrist on wrist rest...)***

***Lighting***

***Noise***

***Personal details: relevant medical/surgical history***

***Exercise habits***

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***Pitch for musculoskeletal evaluation (Wait, I'm here to talk about my workstation...not my scapula!!!):***

- Most ergonomic evaluations focus only on the static components of your work space and work demands***
- Therapists are trained in the evaluation of how your body is performing the tasks. There is an optimal way for the body to move.***
- Your body will find the “easiest” way to move which may not be the healthiest for longterm function.***
- Most musculoskeletal pain syndromes are caused by daily repetitive tasks and prolonged static postures***

- *Even though you may not have pain now, our assessment can help prevent pain in the future and prolong your body's capacity to perform work tasks*
- *When pain is present, it is often at the site of hypermobility, but the cause of the pain is often from mechanical faults that exist elsewhere in the system.*
- *Small changes in how you perform activities can make a big difference*

*Scapula position at rest (ideal): 3" from spinous processes, spanning T2-T7, IR 30-40 (frontal plane motion), Ant tilt 10-15, Root of spine of scapula at T3, vertebral border vertical*

*Scapula position at end range elevation: inferior angle to midaxillary line, acromion to level of C6/7, scapular ER to 15-25 degrees, 50-60 degrees upward rotation, posterior tilt 10-20 degrees*

*Palpate: vertebral border, inferior angle, assess tilt and rotation with your flat on their scapula, acromion, spine of scapula*

*The clavicles: they should gently slope up. Horizontal clavicles could indicate scapular depression*

*Long sloped shoulders: Upper trapezius long and weak; abducted shoulder blades, downwardly rotated scapulae, incomplete upward rotation of scapulae with overhead motion, impingement? Upper trapezius will test weak especially in a shortened position. Underperforming serratus anterior.*

*>1/3 of humeral head is anterior to the acromion: might see short, stiff posterior GH capsule, short, stiff cuff external rotators, anterior tilt of scapula, incomplete scapular upward rotation, GH joint resting in extension (especially in the presence of thoracic kyphosis/older age), short/stiff pec minor, weak/lengthened subscapularis and teres major (internal rotators), limited medial rotation of GH joint as tested in supine (tethered by short/stiff posterior capsule and posterior cuff muscles)*

*Humeral head medially rotated: in standing arms will hang in medial rotation, pain with forward flexion (MR during forward flexion decreases subacromial space), short/stiff latissimus, pec major. Ideally, GH joint should externally rotate when we elevate our arms*

*With forward flexion we hope to see external rotation at the GH joint. Increased subacromial space*

*With scapular abduction: weak/long rhomboids, mid/lower trapezius; short/stiff pec major, teres major*

*Strengthen in a shortened position and also in a movement pattern*

*Scapular depression: Scapula positioned lower than T2; horizontal clavicles (instead of slight upward slope), arm appears longer, humerus in abduction relative to scapula, long/weak upper trap and serratus anterior; over active latissimus and lower trapezius, under active upper trapezius*

*Latissimus dorsi length: Pt is supine in a hooklying position (low back stabilized flat on the plinth). Bring the arm into forward flexion. Do not allow internal rotation at the GH joint. If you want to assess contribution of Teres Major, stabilize the scapula on the lateral aspect of the trunk and reassess overhead motion*

**Simple lower trap exercise: Bilateral GH external rotation with loop connecting two wrists**

**Muscle grouping exercise:**

**Scapulohumeral muscles (7)**

Think cuff musculature: Supraspinatus, Infraspinatus, Teres minor, Subscapularis, Deltoid, Teres major, coracobrachialis

**Axioscapular muscles (5)**

Trapezius, Rhomboids, Levator Scapula, Serratus Anterior, Pectoralis minor

**Axiohumeral muscles (2)**

Latissimus Dorsi, Pectoralis major

**Muscles that internally rotate the scapula (2, one is a group of muscles)**

Scapulo-humeral muscles, deltoid (particularly posterior)

**Muscles that externally rotate the scapula (4)**

Serratus anterior, middle trap, lower trap, rhomboids

**Muscles that downwardly rotate the scapula (3)**

Rhomboids, levator scapula, pec minor

**Muscles that upwardly rotate the scapula (3)**

Serratus anterior, upper trapezius, lower trapezius

**Muscles that anteriorly tilt the scapula (2)**

Pec minor, biceps brachii

**Muscles that posteriorly tilt the scapula (2)**

Serratus anterior, lower trap

**Muscles depress the scapula (1)**

Latissimus dorsi

**Muscles that elevate the scapula (2)**

Levator scapula, upper trapezius

**Muscles that abduct the scapula (2)**

Serratus anterior, pec minor

**Muscles that adduct the scapula (2)**

Rhomboids, middle trapezius