In order for a dental hygienist to perform various dental hygiene functions, fundamental skills need to be mastered if the dental hygienist plans to work with skill and longevity.
Proper operator positioning is critical for the dental hygienist’s physical longevity.
Incorrect operator positioning, over time, will cause physical damage to the body.

Good body ergonomics need to be practiced throughout the duration of one’s career.
Repetitive Strain Disorders can, and will most likely, occur if proper ergonomics are not practiced.

Examples of this are:
- Neck and shoulder pain
- Carpel tunnel of the wrists
- Tendonitis of the joints
Over the next several weeks, you will begin learning various motor skills that will enable you to develop the ability to perform well-controlled, finite movements.
Please consider the following Multidimensional Factors of Dental Hygiene Ergonomics:

- Environmental
- Equipment
- Positioning
- Performance
- Instruments
Factor 1: Environmental

1. Comfortable temperature
2. Comfortable noise level
Factor 1: Environmental

In another words:

What is your work environment like?

Is it pleasant to be in?
Are you comfortable in it?
Is it neat and tidy?
Is it organized?
Is there a place for everything?
Factor 2: Equipment

1. Properly designed clinician chair with freedom of movement
2. Properly designed dental chair
3. Bracket tray and dental light within reach
Take a look at your ‘operatory’:

- Where is your bracket tray?
- Is the bracket tray positioned in a place that is close to you? Is it easily accessible?
- What is on the bracket tray (or what should be on it!)
Factor 3: Positioning

1. Proper clinician positioning
2. Proper patient positioning
Factor 3: Positioning

1. Proper clinician positioning
   a. Multiple possibilities
   b. What defines your positioning?

2. Proper patient positioning
   a. How can the patient be positioned for maximum operator access, visibility and function?
Factor 4: Performance
Factor 5: Instruments

Will be discussed later
**Performance Logic:**

- Body posture is determined from the internal stimuli it receives from muscles, joints, tendons, and organs. These stimuli then dictate how the person acts.

- Balanced posture is when the clinician is prepared to perform acts of great precision with great control with the least amount of physical stress.

- Optimal control posture is the point where the clinician can perform a task with maximum control and precision.
**Basically, we are saying**

- When the dental hygienist sits down to begin intraoral procedures, these procedures are very *finite* in nature.

- Dental hygiene instrumentation procedures are usually very repetitive in nature and involve select muscles in a very small working area.

- Procedures are often very exact requiring great concentration, skill and dexterity.

- These procedures can occur over a long period of time where there is no break or rest periods in technique.
The clinician must find the balance where the body can perform a task successfully without injury to the patient or to the clinician.

The clinician must balance their body so that there is complete control while performing the task.

A clinician’s balance may differ from another clinician’s balance.
Otherwise, incorrect posture can be hard on other parts of the body unless the body is positioned in a way to handle the ‘strain’.
In another words: **Listen to your body!** Your body will tell you what is not a good thing!

Basically, when the body feels good, it can perform its task well for a period of time!
Let’s begin by taking a look at the clinician’s (or operator’s) stool:

- This is *Critical*!!
  - The operator’s chair must be well balanced. This would include:
    - Adjustable backrest
    - Adjustable height range
    - 5 wheels (ideally)
    - High quality
Operator Chair:

- To determine correct height:
  - Locate the head of your fibula
  - The height of the seat should be adjusted so that the top of the seat cushion is **LEVEL** with the head of the fibula
To determine correct height of the Operator’s stool:

1. Locate the head of your fibula

2. The height of the chair should be adjusted so that the top of the seat cushion is level with your fibula.
To determine correct height of the Operator’s stool:

3. When seated, the Operator’s thighs should slope slightly downward.

4. Operator’s feet should be flat on the floor and about 2 feet apart
Height of the Operator’s stool:
(Front view)

Notice that the shoulders and hips are at 90 degrees to the back bone.

Shoulders and hips are in Alignment!
Adjusting the Backrest of the Operator’s stool:

The stool’s backrest should be at the height of your lower back—about where your kidneys are located.

The stool’s backrest should be firmly locked into position once correct height is determined. The stool should not allow the operator to lean too far backward or forward. The operator should be able to rest comfortable against it.
Now that you think you have the correct height of the operator’s chair, let’s check:

1. Sit on the stool with your body positioned squarely on the stool.

2. Are your feet flat on the floor?

3. Are your thighs angled towards the floor?

Now- close your eyes and ‘feel’ if this is within your comfort zone?
4. Do you feel that your weight is even distributed on the stool?

5. Dangle your arms down by your sides:
   a. Close your eyes
   b. Touch both right and left hand index fingers together until they touch. Where is this point? Is it comfortable?

Hopefully, this point is located between the your belly button and waist!
How did this feel?

Did it feel like your feet, hips and shoulders were all equally balanced?

Close your eyes again and feel for any tension areas.

Are there any?  
Where?  
What does that mean?  
How do you fix that?
Shall we take a break? 😊
Next, let’s look at:

Access, Visibility and Isolation
Rational for Access, Visibility & Isolation:

Allows the operator to safely and accurately perform procedure(s).
First, seat the patient in the **Supine Position** for maximum visibility:
Clinician will be seated behind their patient for dental hygiene procedures- as noted in these left and right handed operators.
Adjust Patient Head Position:

- The chin is tilted up for viewing the Maxillary arch.
- The chin is tilted down for viewing the Mandibular arch.
Patient Head Position Variables:

(depending where dental hygiene procedure is being done)

Operator seated behind the patient

1:00 to 2:00

12:00

10:00 to 11:00

L = slight turn to the left

N = neutral position

R = slight turn to the right

DO not over extend the patient’s head too much in either direction.
+ Lighting
Dental Light:  
(Mandibular viewing)  

Notice patient chin is down and overhead light is directly above the patient’s head.
Dental Light:
(Maxillary viewing)

Notice patient chin is up and overhead light is angled from above. Angle can depend on patient size, and range from the patient’s midsection to chest.
Let’s look at the:

Dental Mirror

- Allows for easy access into the mouth when used as a tool for retracting.

- Allows for greater visibility in posterior regions of the mouth by the use of:
  - Trans illumination
  - Direct/Indirect vision
Types of Dental Mirrors:

- Front Surface (Eliminates “ghost” images)
- Plane Surface (May produce a double image)
- Magnifying (concave surface)
Sizes of Mirrors Available:

Identified by numbers.

The larger the number, the larger the mirror diameter.

Range from 5/8 to 2 inches in diameter.
Parts of the Dental Mirror:

- Handle
- Shank
- Working End
Mirrors used for Performance Logic Positioning (working behind the patient) are angled about 3% sharper than a traditional mirror.
Suggestions:

- Use warm water to coat surface
- Or coat mirror with saliva to minimize fog.
- Detergents are also available for this purpose as well.
How to hold the Dental Mirror:
Modified Pen Grasp:
Modified pen grasp:

• The **modified pen grasp** uses the pads of the thumb and index finger, with the side of the middle finger against the shank or placed lower on the handle.

*Right handed clinician*

*Left handed clinician*
Grasp:

- Thumb and index fingers are across from one another at the junction of the handle and shank
- Slight bend in the index finger
- Pad of fingers should be in contact
- All fingers should stay in contact
- No blanching (white nuckles)
Fulcrum:
Provides stabilization
**Fulcrum:** Provides stabilization

- Provides leverage for stroke
- Point where all movement comes from
- Helps control stroke
- Maintains regular amounts of pressure
- Prevents trauma
- Controls length of stroke
- Transmits a feeling of security to patient
Fulcrum (continued)

- Place fulcrum as close to the working area as possible
- Should be in the same arch or quadrant
- Use firm pressure
- **ALWAYS** use fulcrum!
Stabilizing Fulcrum:

Ring finger is securely balanced on surface.

Fulcrum finger
Fulcrum (continued)

- When working on the maxillary arch – Palms Up

- When working on the mandibular arch – Palms Down
Do not do this!

- This is a typical **pen grasp**, with the thumb and index finger grasping handle. The middle finger supports the instrument from underneath. The pen grasp varies from person to person.
Problems

- Missing teeth
  - Use gauze

- Strong lips or tongue
  - Use cotton roll

- Person can only open half way
  - Use mirror for indirect vision, etc.

- Avoid hitting patients teeth

- Avoid excess pressure on the floor of the mouth
Air/Water Syringe:

- The purpose of the air/water syringe is to enhance visibility, improve instrument stabilization, dry intra-oral structures and remove saliva and debris.
Air/Water Syringe Technique:

+ Hold in the dominant hand in a palm grasp, all four fingers contact the handle in the palm of the hand while the thumb is used to activate the syringe.

Supplement air drying with the use of saliva ejector or folded gauze or cotton rolls in the vestibule.
Test buttons outside of the patients mouth.

Use short controlled blasts of air/avoid sharp blasts of air

Forceful application of air may direct saliva and debris out of the oral cavity contaminating work area and operatory and creating aerosols.

Directing air toward the back of patients throat could cause coughing or discomfort.

Remember to sterilize metal tips or use disposable plastic tips.

Disinfect the handle.
Aids used to increase Access and Visibility:

Bite blocks

Tongue blades

Saliva ejector
Which of these clinicians will not develop long term body issues (ailments)?
Your working position should include the following:

- You should be sitting fairly tall - NO SLOUCHING!!!
- Legs separated - not crossed
- Thighs slightly sloped towards the floor
Operator’s feet should be flat on the floor.
Operator’s lower back should be against the chair back so that the lumbar region of the back is supported.
Make sure you adjust your back rest along with the height of the stool.
Operator’s working position:

- Operator’s head should be 14 to 16 inches from the patients oral cavity

- Shoulders relaxed not elevated

- Do not raise arms- elbows should ‘hang’ from the shoulders- maybe slightly out from the body.

- **DO NOT “BODY HUG”!!!** (meaning: do not tighten up your arms! Elbows should not be firmly ‘hugging’ the torso- remember RELAX! Let elbows hang or slightly extend outward.)
This is what you should look like:

Notice nice separation of feet, relaxed shoulders and elbows hanging down from shoulders.

Notice the angle of the elbows and the downward tilt of the clinician’s chin is not too exaggerated.
Notice patient’s forehead is above the clinician’s elbow

More ideally, the patient’s forehead is lower- closer to the clinician’s elbow. Overall effect: prevents clinician’s shoulders from rising (which causes long term stress).
Here, the clinician’s shoulders are relaxed (down) and elbows are bent a little less than 90 degrees.

Patient’s head is situated near the clinician’s lower abdomen.
In Review:
Please don’t do!!!
How does the clinician sit next to the patient? This is referred as to: **Operator Position**

- **Starting point is 12 o’clock**
- **Right handed clinician** – Between 10:00 and 12:30
- **Left handed clinician** – Between 11:30 and 2:00
- **Outside of these ranges the clinician is forced to compromise balance**
This is what you should look like!
(Right handed clinician)

10:00 position
Notice clinician is slightly to the right of the patient’s head. Patient’s head is turned slightly to the right.

12:00 position
Here, the clinician is directly behind the patient’s head. Patient’s head is in the neutral position.
**Walking Sequence (per quadrant):**
*(limited radius)*

For **Right Handed** Clinicians:

<table>
<thead>
<tr>
<th>Area</th>
<th>Patient’s Head</th>
<th>Clock Position</th>
</tr>
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<tbody>
<tr>
<td>UR and LR Buccal</td>
<td>Neutral or Slightly Right</td>
<td>10:00-11:00-12:00 (Anteriors)</td>
</tr>
<tr>
<td>UR and LR Lingual</td>
<td>Right</td>
<td>11:00 12:00 (Anteriors)</td>
</tr>
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Notice that **operator position** and the **direction of the instrument handle** changes at the **canine** on the dominant side.
Maxillary Right-Posterior Buccal

Right Handed Clinician:

10:30 - 11:00 clock position (depends how posterior the tooth is)

Patient’s chin is up (in line with the forehead and tip of nose)

Patient’s head in neutral position or turned to the right slightly
Clinician at 10:30
(right handed clinician)
(right handed clinician)
Maxillary Right-Posterior Lingual

Right Handed Clinician

11:00 clock position

Patient’s chin is up (in line with the forehead and tip of nose)

Patient’s head is turned to the right
Upper Right Lingual
Maxillary Left-Posterior Lingual

Right Handed Clinician

11:00 clock position

Patient’s chin is up (in line with the forehead and tip of nose)

Patient’s head is turned to the right slightly
Maxillary Anterior Facial

Right Handed Clinician

12:00 clock position

Patient’s chin is up (in line with the forehead and tip of nose)

Patient’s head is in Neutral position
Maxillary Anterior Lingual

Right Handed Clinician

12:00 clock position

Patient’s chin is up (in line with the forehead and tip of nose)

Patient’s head is in Neutral position
Mandibular Left Posterior Buccal

Right Handed Clinician

11:00 clock position

Patient’s chin is down

Patient’s head is turned Right
Mandibular Left Posterior Lingual

Right Handed Clinician

10 to 11:00 clock position (depending how posterior tooth is)

Patient’s chin is down

Patient’s head is in a Neutral position or turned slightly to the Right
This is what you should look like!

(Left handed clinician)

1:00 - 2:00 position

Notice clinician is slightly to the left of the patient’s head. Patient’s head is turned slightly to the left.

12:00 position

Here, the clinician is directly behind the patient’s head. Patient’s head is in the neutral position.
Walking Sequence (per quadrant):
(limited radius)

For **Left Handed** Clinicians:

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Notice that operator position and the direction of the instrument handle changes at the canine on the dominant side.
Maxillary Left-lingual

Left hand clinician

At 1:00 position/ Patient’s head turned to the left.