# DENTAL Office Design and Posture

# 

Understand

Advantages and disadvantages of different operatories.

How can you familiar with the correct posture.

Operator and patient contact

Professional diseases that may affect the dentists.

Care of healthy hazards.

# Goal Required in the Practice of Dentistry 1-Approaches high quality dental service. 2-Services as efficiently as possible.

# Dental Procedures including: Preparation Patient treatment Clean up

# A second assistant may be utilized to prepare and clean up allowing first assistant to be full time chair side Thus no down time between patients

# Dental operatories maybe

# Separate room : Are separated by walls.

# Modular cabinetry (open concept).

# Dental principles of decisions.

# Make every operatory identical.

# The "favorite rooms" have a negative effect on dental clinic efficiency.

# Plan the venting system .

# Set-up for use by either a right-handed or left-handed provider.

# There should be a door on the laboratory due to the noises and odors that originate there.

# There should be an exhaust fan in the laboratory.

# Windows in the operatories ,

# Provide a pleasant atmosphere for patients &staff.

# North-facing windows are best, and East-facing is second best.

# Walls paint colors, facilitate the tooth color shades.

# Adequate overhead lighting is to prevent eyestrain.

# Air systems are with their own intake lines.

# Provide a vacuum system is with its own exhaust lines.

# The trap for the vacuum system should be easily accessible for cleaning.

# The discharge point for the exhaust should not be:

# 1- Near a fresh air inlet or open windows.

# 2-Discharge into a supply room or other occupied place.

# Do not run vacuum lines in the ceiling; they must be in or beneath the floor.

# Floor and pollution.

# Windows and curtains.??????

# Furniture's and coatings.???????

# You must have light to see color

# If an object absorbs certain light waves: You do not see these as colors

# If an object reflects certain light waves: You see these as color

# Example: If object absorbs blue and reflects red then you see the red color.

# Light in the Dental Office Most common lighting is either:

# Incandescent(++yellow)

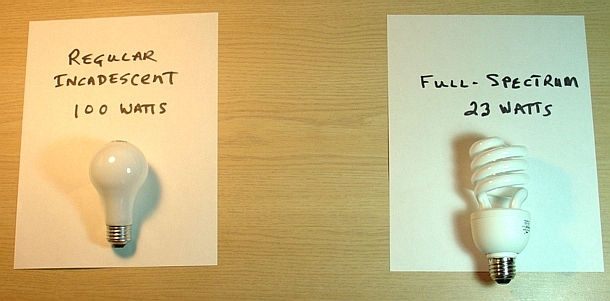
# Fluorescent (++blue)

# Neither is pure white light

# The Measurement of Light.

# -------------------------------------- Northern Daylight is the Standard for shade guide

# This is close to the full spectrum of white light (Led light).

Regular Incadescen Full spectrum

# The most ideal time of day for color selection in the purest light would be at noon on a bright day.

# This is generally not possible to do so you must make allowance for it and use alternate technique. Use multiple light sources or have an operatory of color corrected lights

## The Eye and Color Perception

## • Light enters the eye through the lens and acts on the retina

## Rods: These are located on the edges and toward the center of the retina• They are activated more in low light

## Cones: These are concentrated near the center of the retina at the Fovea

# • These are the principal mediators of color

# • Cones function only in higher light levels which is called Photopic vision

# • They are more highly innervated for more accurate detail and transmission

# • Therefore; for shade selection, you should be directly in front of the object and looking straight at it to get full color effect

# Factors Affecting Color Perception

# Color Adaptation: Cone color perception decreases the longer an object is looked at. (Gets grayer)

# – This suggests that one should not stare at a tooth but look briefly and then look away

# – When looking away, you should look at a neutral or gray background to allow cone sensitivity to return

# DENTAL CHAIR AND POSTURING POSITIONS

# THE DENTAL CHAIR: Changed a lot over the years.

# Originally with a foot-pump action and plush velvet upholstery,

# It is now the focal point for most of the high technology associated with modern practice.

# No longer the split seat, back and footrest. Now the whole is usually molded in one piece. Joints controlled electronically beneath the single, flowing outline of the upholstery. Today designs is curved, for equipment and chairs. 1888DStuck1

# To be cleaned down thoroughly between each patient. Curved areas are much easier to disinfect and a broad expanse of PVC-type material is much easier to manage than the older fabrics. spirit 3004 dental chair

# 1. Horizontal positioning of the patient: Incline of the back and seat to the shape of the patient. Adjusted is performed continuously from 90° (vertically) to 180° (horizontally). 2-Back of the patient chair: a-Thin as possible to allow movement of legs and feet of dentist and not jammed

# b- The backrest should not be:

# So tall.

# Excessive width as this prohibits close work from the 7 o’clock position.

# . 3-upper side of patient chair is rounded.

# Width of the chair is sufficient for supporting the back of the patient, making possible the approach of the mouth by a dentist.

# 4-Duration of movements backward and forward of patient: Minimally 10 sec and maximally 20 sec.

# 5-Movements of back and chair: A well balanced movement of the body of the patient in a horizontal and vertical position, without movement along the back.

# 6-Movements to be made possible by the support of head and neck:

# a- Forward for a horizontal position of the lower jaw and

# b- Backward for positioning the upper jaw 25° backward;

# c-To the right or left sideward, in an angle of 30-40° side ward in relation to the length axis of the upper body (during extraction).

# d-To the right and left round a longitudinal axis of the head as during (Preparation).

# e- Lifting or lowering of the patient’s head in relation with treatment and anatomical situation

# Way of supporting the shoulders of the patient:

# ------------------------------------------------------------------- By complete shoulder muscles support i.e. relaxation

# Relaxed movements of the head of the patient and relaxed treatment.

# Way of supporting head and neck of the patient:

---------------------------------------------------------------------------------------- The curvature of the neck has to be supported at the height of C4-Th1 (C1-3 are left free). Able to make movements with the head in 3 directions. Way of supporting the head of the patient: (above cervical vertebral column).

# The dental stool

# Requires much micromotion, must in considerationduring purchase .

# Moves almost every minute as the operator adjusts.

# A one-piece constructed casting metal preferred than soldered one.

# Accommodate five castors.

# Have a compact base.

# Seat: Only a contoured seat firmly padded with the highest quality foam core is able to permit this motion safely.

# A softer padded seat is a strain factor to the operator during reach.

# *Fully height adjustable articulated arm support.* 1-The arms may be fixed in length.

# 2-Rapid height adjustment and full articulation.

# The backrest must at least parallel with the legs,

# Correct Posture or (Effective Posture)

# Principles are:

# 1-To relax the operator and to be comfortable during working.

# 2-The operator remain alert and aware.

# Symmetrical upright posture

# 1-Perform intra-oral operations in a simpler and more precise way;

# 2-More easily implement any posture alterations and movements;

# 3-Keep fatigue and strain to a minimum;

# 4-Restrict posture and motion disorders in the long run.

# Criteria for working in a static working posture

# A description of the correct sitting posture of the dentist starts with a conscious effort to hold the Posture of the body in a straight line.

# The spine should be straight all the way up your back and up through the top of your head. Indicates the limits for a healthy working posture.

# Deviation from these limits, the more stressful and thus unhealthy it is.

# keep your arms in close to the body

# So use the stronger muscles of the body.

# You don’t have to move your neck to various angles to look in your patient’s mouth. –

# Extreme neck flexion for extended periods,

# And movement out of the neutral posture that cause neck pain.

# Typical posture position

# 1-The head separately bent forward 20-25° to the body.

# 2-Neck is relatively erect.

# 3-Upper body is symmetrically upright (about20degrees.)

# Shoulder and thigh are parallel to the floor,

# Back supported,

# A C shape of the back.

# 4- Elbow close to the body.

# 5-The pelvis can be slightly tilted forward.

# Upper arms loosely hanging down the upper body, not more than 10°

# forward.

# Positioning the Operator

# Work environment is adapted to the operator

# 1-The operator is first positioned then followed by

# 2-Patient is the next

# 3-Assistant is after

# 4-Equipments is followed.

# Steps to positioning a Patient

# Adjust back.

# Raise chair.

# Raise arm of chair

# Once patient is seated

# Arm-rest down

# Raise chair to allow the operator to position himself

# Lower back of the chair until patient is about ½ way toward a horizontal position

# Pause to allow patient to adjust

# Continue lower chair back until following relationships exist

# Imaginary line from patients chin to the top of ankles is parallel with floor

# Once seated – Observe Patient

# Legs is slightly lower than head.

# Patient in supine position

# Forehead is also parallel with the floor.

# This put your patient in a comfortable position where they are not using their muscles.

# As treatment progresses,

# Change the chair angle and height, or have your patient turn their head.

# Position of the operating field in the patient’s mouth for the dentist Operating field is placed symmetrically,

# Straight in front of the dentist’s chest

# A distance from operator’s eyes to the patient is between 20-25 cm.

# Position of body, head and jaws The patient’s body is now in the supine adjusted to the dentist’s working height.

# If not, the head is usually too high while the dentist’s legs get jammed.

# 

# The patient’s head (Free to move in all directions) Forward or backward; and

# Tilted to the right or left.

# Round the longitudinal axis of the head to the right or to the left.

# The position of the jaws When treating the occlusal planes in the lower jaw,

# The occlusal plane will be positioned more or less horizontally

# The patient’s head will be turned toward the dentist in a free motions

# and to look at the occlusal planes perpendicularly.

# When treating occlusaly in the lower jaw, from behind the patient

# i.e. (between 10 and 12.00 o’clock),

# The occlusal plane is about 40°.

# In case of a treatment of occlusal planes of teeth in the upper jaw with indirect vision from behind the patient,

# The occlusal plane of the upper jaw is turned about 25° backward.

# Working with indirect vision

# ----------------------------------------- The working on the upper jaw. The dental mirror is held at an angle of about 45° to be able to look at it, perpendicularly. When working with a spray.

# Sit Down Dentistry has the advantages

Body mechanics/task performance studies

Uses 27% less energy. Has 17% greater life expectancy

Production increases from 33 – 78%

Seated in a balance posture concept

# Objectives of a Favorable Seated Position

# Access to the operative field

# Good visibility

# Comfort for the operative team

# Relative comfort and safety for the patient

# Upper arms loosely hanging down the upper body, not more than 10° forward.

# Zones of Activity

# Patient in a supine position

# Using center of patients face as a clock

# Zones designated as time

# Right Handed Operator

# 1-Operator zone is from 7 – 12o’clock

# 2-Static zone is from 12 – 2o’clock

# 3-Assistants zone is from 2 – 4 o’clock

# 4-Transfer zone is from 4 – 7 o’clock

# Left Handed Operator

# Operator zone is from 12 - 5 0’clock

# Transfer zone is from 5 – 8 o’clock

# Assistant zone is from 8 – 10 o’clock

# Static zone is from 10 – 12 o’clock

# Positioning the Patient and the Operative Team

# Right side in-front to perform work on: Anterior teeth

# Both hands of the operators will be in front of the patient’s mouth

# Right side behind to perform work on: Maxillary teeth & Lower left side?

# Plus the operator in between 8&11 o’clock

# Left handed? Can be applied as before and modified to the left side

# Patient Dismissal

# Patient dismissal should be accomplished by reversing the steps of seating the patient

# Remember to pause for the patient on the way up as well.

# Most important patient dismissal precaution

# Encourage the patient to remain seated to reestablish their equilibrium

# Further flections forward or sideward

# Especially rotations is the most hazardous position

# 

# Arm support: Lack of adequate arm support contribute to:

# 1-Thoracic outlet syndrome

# 2-Carpal tunnel syndrome.

# ERGONOMIC EQUIPMENT

# Generally

# Offers flexibility

# Obtaining/replacing instruments

# Requires less movement with this design.

# 

# 

# INSTRUMENTS

# Hands should be in a neutral posture (no wrist bend) when using.

# Lubricate moving parts.

# Reduces amount of force required.

# Consider ordering gloves in different sizes to fit different hand sizes.

# Should be light weight and well balanced.

# Need sharp working edges.

# Number of repetitions needed

# Hollow is more ergonomic than solid.

# Carbon steel is preferable to stainless steel

# Use ones with larger-diameter handles

# Reduces pinching effect

# Allows a more comfortable grip

# Distributes forces over a larger area

# Reduces muscle tension in hand

# Grasping instruments (e.g., hemostats) should be selected to fit the size of the hand

# 

# HANDPIECES

# Should be lightweight and balanced

# When appropriate, use at maximum power to reduce time

# Rotates with minimal effort

# A cross-hatched surface is preferable to a smooth one

# Requires less force

# WAYS TO PREVENT ERGONOMIC INJURIES

# Identify risk factors

# Identify symptoms as soon as they become apparent

# Intervene quickly

# Change human behavior

# Buy ergonomically-designed patient chairs, operator stools, hand/foot controls, and instruments

# WORKPLACE INTERVENTION

# Minimize extreme joint position

# Keep wrist in neutral (i.e. straight) position

# Keep joints held at midpoint of range of motion

# Reduce the use of excess force

# Reduce highly repetitive movement

# OPTIMAL BODY POSTURE

# Characterized by

# Balanced as stated

# Avoid remaining in one position for an extended period of time

# The direction of the unit light and your line of sight should have a similar axis

# Take breaks every 30-60 minutes

# Examples are

# back bends,

# stretching,

# walking

# DENTISTS

# Symptoms

# Aches, pain, and discomfort in:

# back,

# neck,

# shoulders,

# elbows,

# wrists,

# hands

# BACK PAIN

# Risk factors (cont’d)

# Poor posture

# Increased body

# Poor positioning of patient (i.e., patient located too far forward)

# Disc problems affecting back/neck

# Due to poor posture

# Bursitis, shoulder muscle pain

# Due to working with elbow/shoulders raised

# CTS and ulnar nerve entrapment of elbow

# Due to improperly positioned (bent) wrist(s)

# or wearing ill-fitting gloves

# Sign of MSDs

# Decreased range of motion.

# Deformity.

# Decreased grip strength.

# Loss of muscle function.

# SYMPTOMS OF MSDs

# Pain

# Numbness

# Tingling

# Burning

# Cramping

# Stiffness

# HAND/WRIST INJURIES

# Are occupational disorders due to

# Forceful and repetitive small movements

# 

# Carpal Tunnel Syndrome (CTS)

# Occurs following compression of median nerve through carpal canal in wrist

# Symptoms include pain, paresthesia, and numbness along wrist/hand

# Palmar surface of thumb, index, middle fingers are primary areas involved

# Symptoms worsen at night and with repetitive activity

# PREVENTION OF CTS

# Maintain wrist in neutral position as much as possible

# Rest forearms as much as possible

# Never use side-to-side motion

# Avoid long periods of flexed/extended positions

# Fingers should not pinch or be used with tip joints bent backward

# Fingers should be slightly flexed to avoid ligament stress

# OTHER PREVENTIVE MEASURES

# Limit use of digital motion

# Use hard-tissue fulcrum close to cutting edge of instrument

# Move entire hand, wrist, forearm as a unit

# Use, purposely, applied force in a directed manner allowing relaxation between strokes

# Maintain sharp instruments

# OTHER PREVENTIVE MEASURES

# Take periodic breaks, alternate tasks, alternate treatment procedures, alternate difficult with easy patient appointments

# Exercise

# Stretch fingers, rotate wrist in small circles

# Keep hands above level of heart

# Removes blood from carpal tunnel

# Maintain neutral wrist and light grasp when using mechanical devices

# USING FINGER AND ARM RESTS

# Elbow, hand, and finger rests are important

# Rest upper arms and the elbows against side of operator’s body

# Keep forearms parallel to floor

# Fingers should be close to work site

# DENTAL ERGONOMIC STRESSORS

# Sustained/awkward postures

# Repetitive tasks

# Forceful hand exertions

# Vibrating operational devices

# Time pressure from a fixed schedule

# Coping with patient anxieties

# Precision required with work

# Legs slightly spread, not more than 45° to prevent an extreme and fixing position of the hip joint.

# Legs must be positioned perpendicular to the floor or slightly backward;

# Feet flat on the floor and straight forward.

# Adopting a symmetrical posture,

# When parallel lines run therefore through>

# Eyes, Ears,

# Shoulders, Elbows,

# Hips, knees and

# Ankles

# A relaxed sitting position.

# An asymmetrical operating posture involves a strained and thus harmful posture.

# 1-muscle activity

# 2-low back disc pressure leads to pain and potential disability.

# increase with :a forward lean position.

# decreases when the trunk is supported.

# With decreased muscle activity

# increase in blood supply to the tissue

# leading to a healthier

# more comfortable back.

# You wouldn’t sit back in your recliner without?.

# The Effect of Wearing High Heels:

# 1-Head forward of its centre of gravity.

# 2-Thoracic area of spine rounded.

# 3-Lumbar area hollowed.

# 4-Pelvis rotated forward and

# abdominal area sagging.

# 5-Shortening of leg muscles.

# The Rotator Cuff

# Four muscles in your shoulder, termed the "rotator cuff", provide stability to your shoulder.

# Are prone to tears and strains, if :-

# 1-Overuse your arm,

# 2-have poor posture,

# 3-Muscle tightness and/or weakness.