

**Ministry of higher Education and Scientific Research
Foundation of Technical Education
Technical Medical Institute**

**Training package
in
Dental X -Ray

For
Students of second class
Dental Preventive Department**



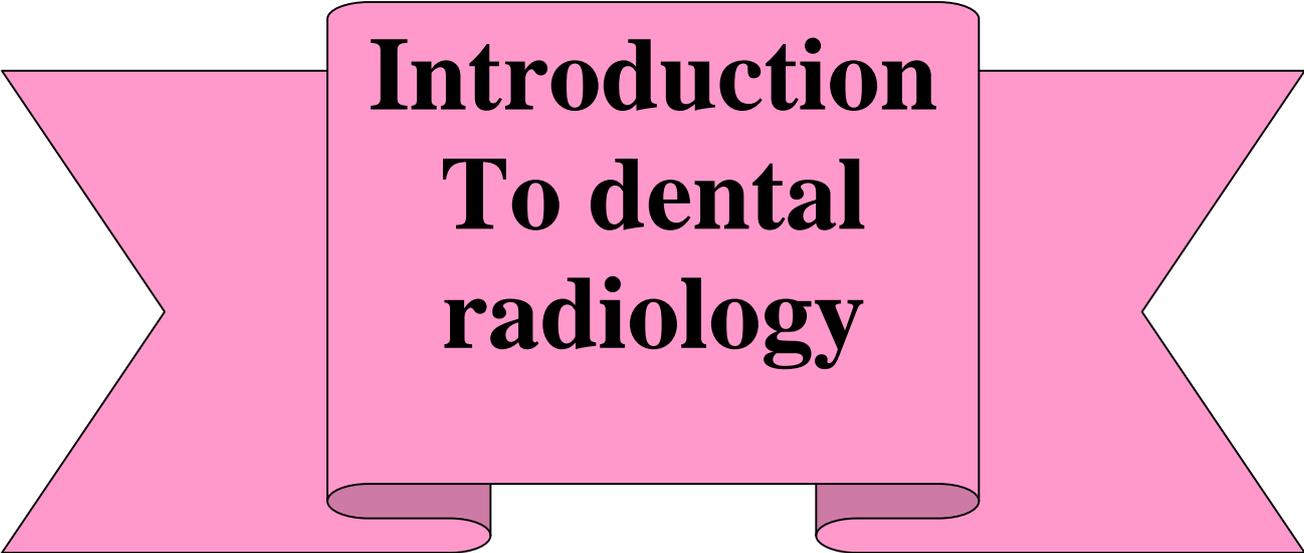
**By
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Jun./2011

FIRST MODULE



Introduction To dental radiology



1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the parts of the X-Ray unit , names of components of each part and its location in the unit so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. Dental radiology definition .
2. historical view .
3. Intensity of radiation .
4. Inverse square law .
5. Transformer .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1- Understand the theory of light.
- 2- Determine the nature of x ray radiation .
- 3- Understand the relation between light theories .
- 4- Describe the inverse square law .
- 5- Mention the benefits of transformer.

3/ Pre test

Put circle around the letter of the correct answer :

1. The x-ray is type of

- a. light
- b. waves
- c. photons
- d. all of them

2. The x ray discovered by

- a. maiman
- b. Roentgen
- c. enishtine
- d. farady

3. These invisible x ray can show the

- a. bones alone
- b. internal body tissue
- c. Tissue & bones
- d. non of the above

4. thick material must be penetrated by

- a. long wave length
- b. low energy photons
- c. short wave length
- d. non of above

5. The long wave length x- ray is

- a. high energy photons
- b. all of above
- c. low energy photons
- d. non of above

6. Intensity of radiation is

- a. Is the number of photons arriving at a given area
- b. Is the number of photons at a given area
- c. Is the number of photons not arriving a given area
- d. A number decrease when the distance between the X-ray source are decreased .

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Dental Radiology and X-Ray Machine:

Dental Radiography is making a photographic image of an object using X-ray. X-ray is a form of energy like visible light, radar, radio waves, ultraviolet light. They belong to a group called Electromagnetic radiation.

These X-rays were discovered by Roentgen in 1895 and at the same time it is called Roentgen Rays. Roentgen found that these invisible rays could cast shadows of internal body tissue and because of the unknown nature of the rays he called them X-rays.

All photons of electromagnetic radiation travel at the speed of 186,000 miles per sec., move through spaces in a straight line and have a wave form, the greater the energy the photon has, the shorter the photon wavelength and the easier it is for the photon to pass through matter.

When a thick material must be penetrated by X-rays the X-ray used must have great energy and short wavelength to give great penetrating power such photons are sometimes called hard X-rays.

Long wavelength, low energy, poorly penetrating rays are called (Soft X-rays).

Self test (1)

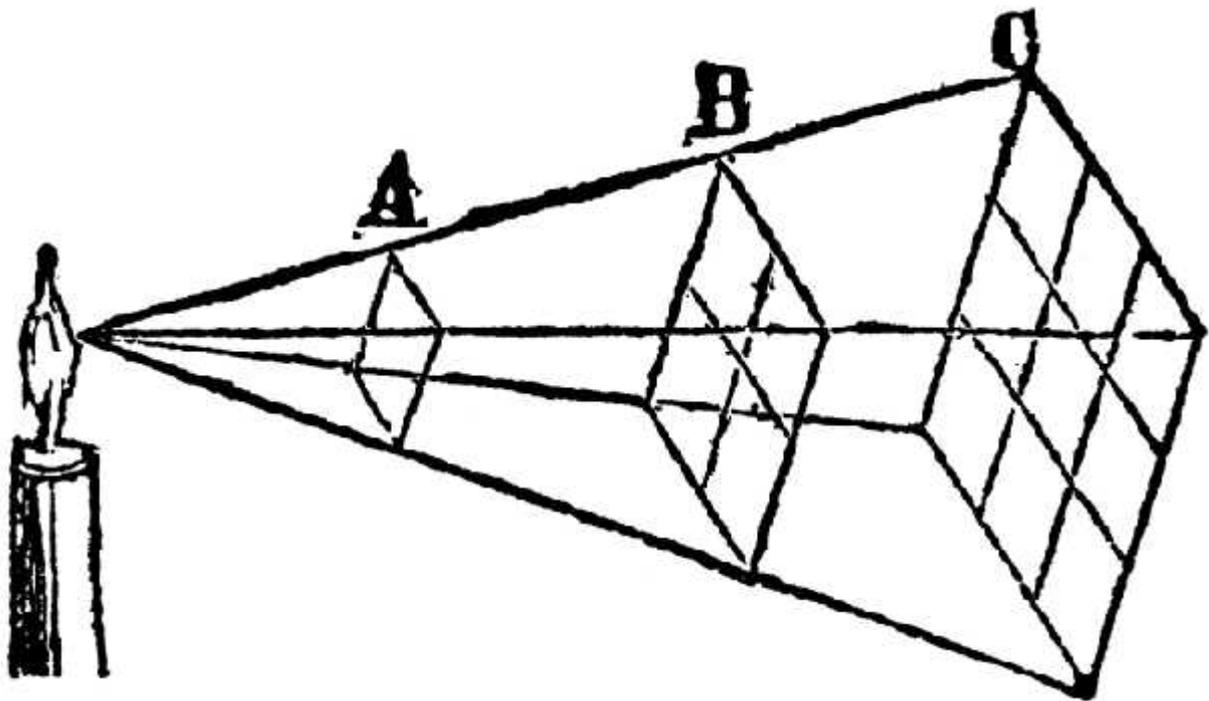
Fill in the blanks with suitable words

- 1- the speed of light is ----- mil/sec .
- 2- the lower photon energy the ----- wave length .
- 3- the higher photon energy the ----- wave length.

- Check your answers in the key answer page at the end of module

Intensity of Radiation:

Is the number of photons arriving at a given area this number decrease when the distance between the X-ray source are increased.



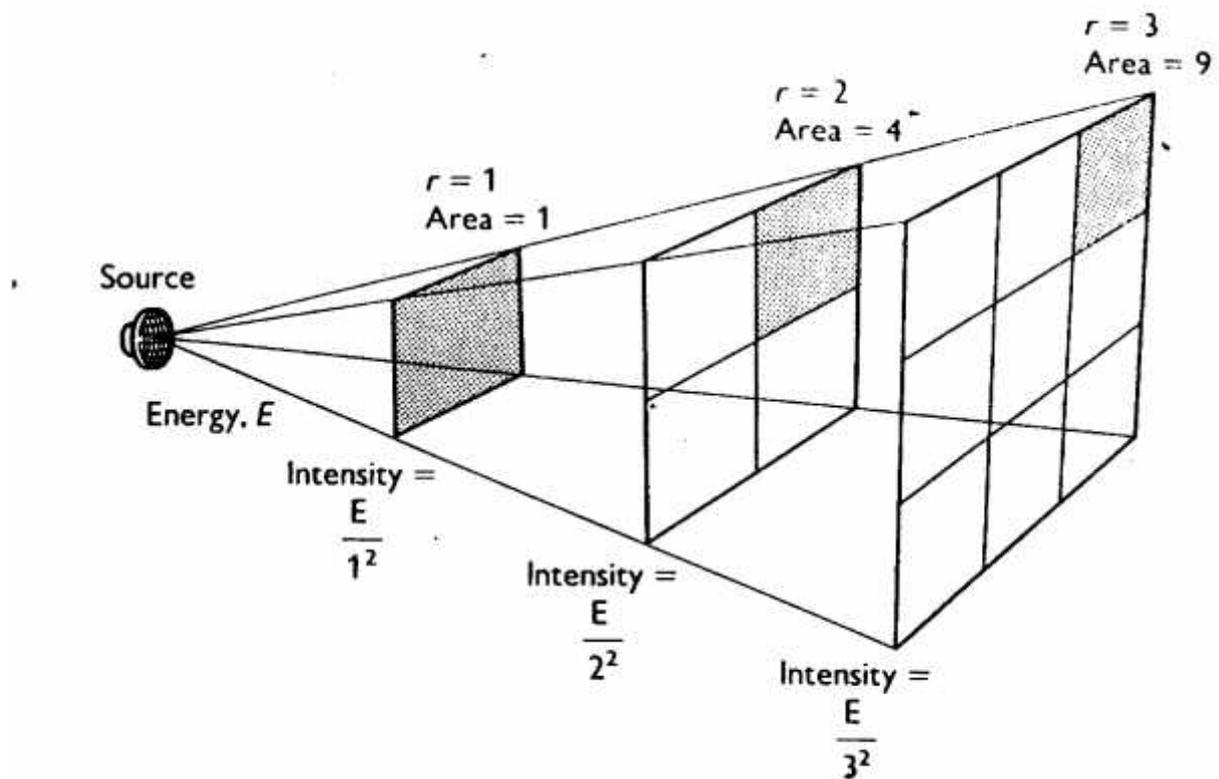
Self test (2)

Who is more photon number that can be reach at each square A & C area ?

- Check your answers in the key answer page at the end of module

Inverse square law :

The intensity of radiation is inversely Proportional Square of the distance measured from the source of radiation



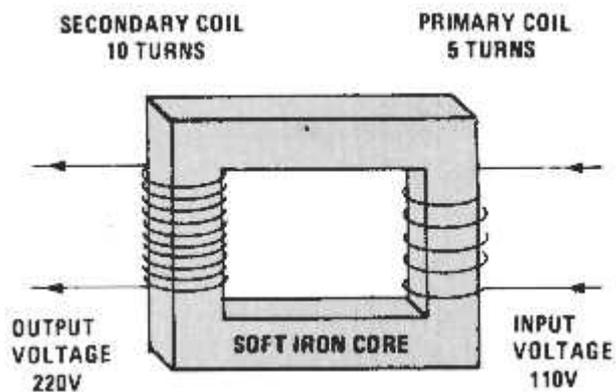
Self test(3)

Mention the the inverse law .

- Check your answer in the key answer page at the end of module .

Transformer:

Is a device that changes the voltage of an electric current it consists of 2 coils wire insulated from each other and connected by a magnetic conductor.



5/ Post test

Put circle around the letter of the correct answer :

1. The x-ray is

- a. like radar
- b. Like sound
- c. non of above
- d. all of above

2. The transformer in x ray machine

- a. change voltage
- b. change current
- c. non of above
- d. all of above

3. The number of photons when the distance increased from the source.

- a. increase
- b. stay same number
- c. decrease
- d. non of above

4. Long wave are

- a. High energy
- b. moderate energy
- c. low energy
- d. non of above

5. short wave are

- a. High energy
- b. moderate energy
- c. low energy
- d. non of above

6. x-ray is named with this name because it is

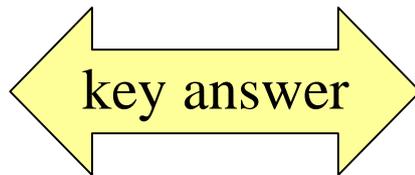
- | | |
|------------|---------------|
| a. visible | b. un visible |
| c. yellow | d. bright |

Note :one degree for each answer

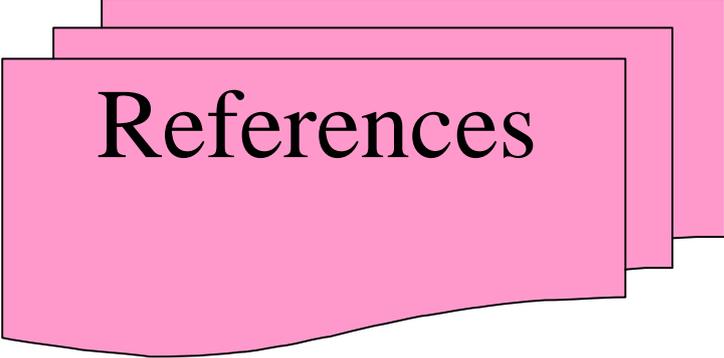
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1-186,000 2- Longer 3-Shorter <u>Self test(2)</u> A <u>Self test(3)</u> Intensity= E/D^2	1	A
2	B		2	A
3	B		3	C
4	C		4	C
5	C		5	A
6	A		6	B
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



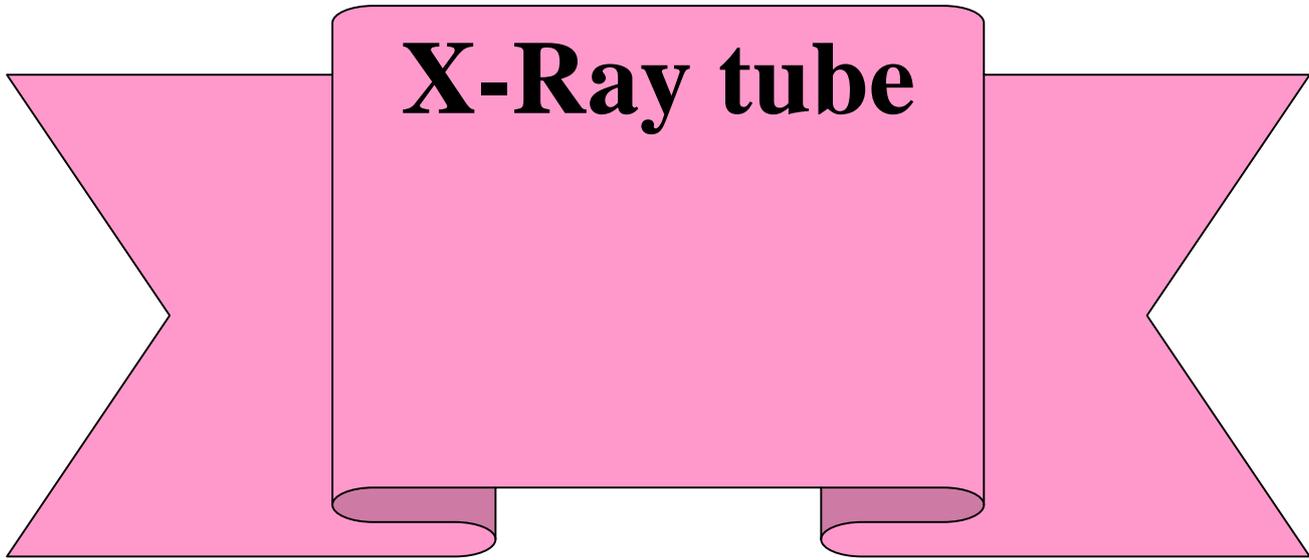
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

SECOND MODULE



1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the X-Ray tube , names of components of each part and its location in the until so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. X-Ray tube definition .
2. production of x-Ray .
3. tube components .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the theory of x-ray production.
- 2-Determine the nature of x ray radiation .
- 3-Understand the relation between tube components .
- 4-Describe the procedure .

3/ Pre test

Put circle around the letter of the correct answer :

1. The x-ray tube is ?

- a. light bulb
- b. glass enclosure
- c. photons source
- d. all of them

2. The x ray tube locate at

- a. base of x ray Machine
- b. Head of x ray Machine
- c. Arm of x ray Machine
- d. non of above

3. The tube is empty from

- a. Ozone
- b. Air
- c. light
- d. non of above

4. the electrodes are separated

- a. by long distance
- b. by short distance
- c. by a Gap
- d. non of above

5. The electrodes are supplied by

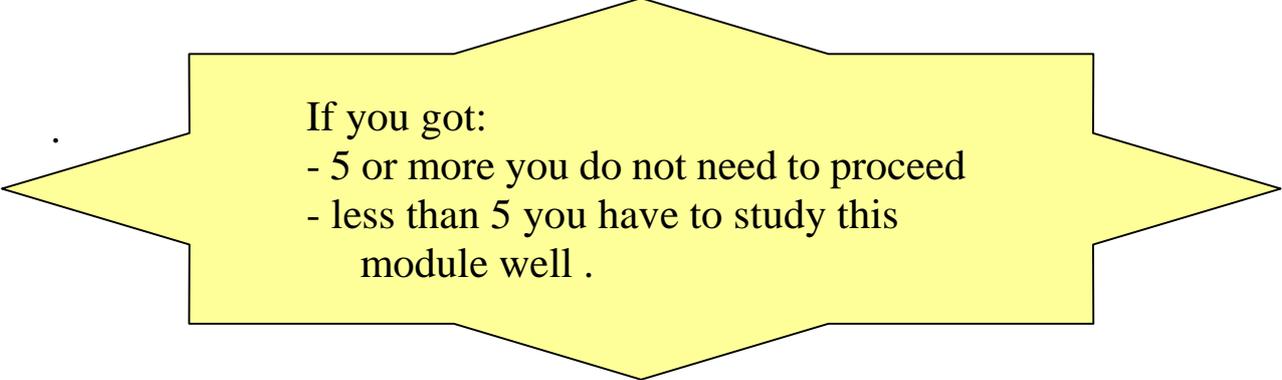
- a. high energy KVP
- b. 60-100 KVP
- c. low energy KVP
- d. non of above

6-The cathode contain

- a. Filament
- b. plates
- c. circles
- d. Non of above .

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

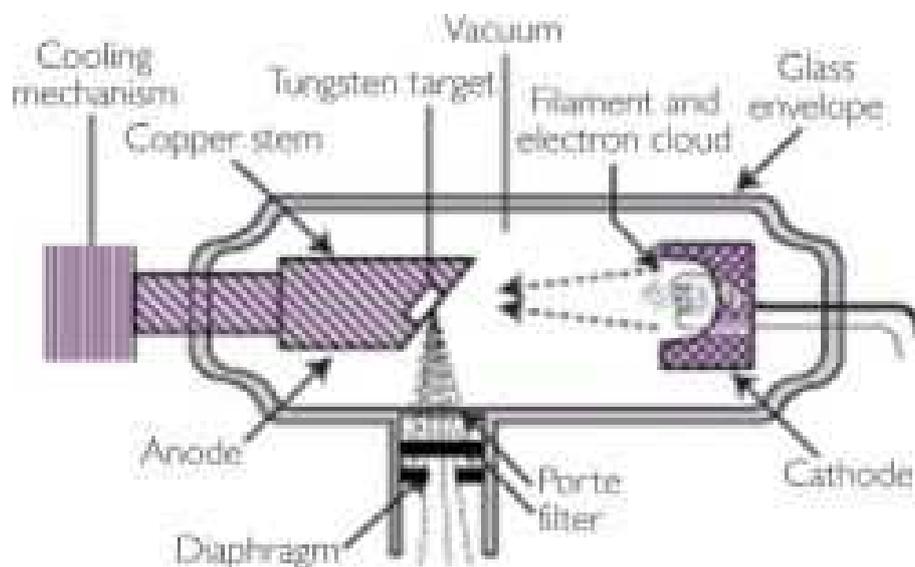


If you got:
- 5 or more you do not need to proceed
- less than 5 you have to study this
module well .

4/ the module contents

Dental X-Ray Tube :

The X- ray tube is situated in the head of the X-ray machine. It consist of a glass enclosure from which all the air has been removed to produce a vacuum. The anode and cathode are separated in the tube by a gap and are supplied with a high voltage electric current (60-100) KVP. The cathode contains a filaments in a light bulb that is connected to a separate electric circuit of low voltage and a little amperage.



Self test (1)

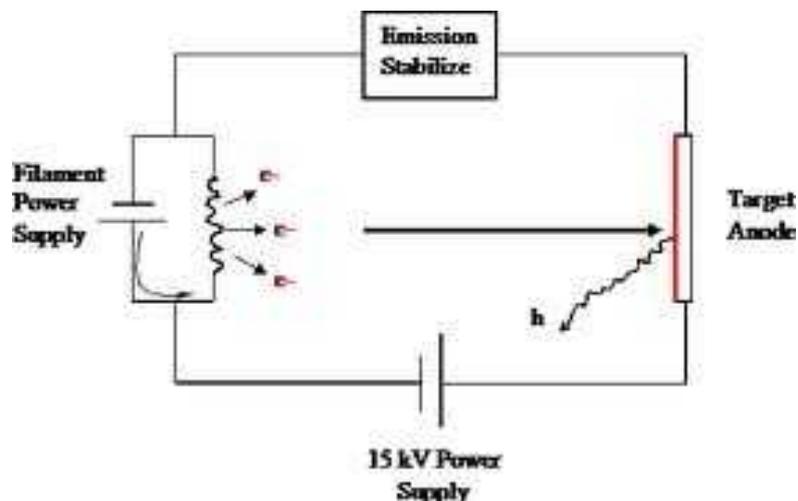
Fill in the blanks with suitable words

- 1-the deference in KV between electrodes is ----- .
- 2-the cathode contain ----- .
- 3-the glass enclosure compose ----- .

- Check your answers in the key answer page at the end of module

X-Ray production:

The filament's current heats the filaments to produce a cloud of electrons around the filament. When a high voltage unit is supplied to the anode and cathode, the electrons are driven from the cathode to the anode. The speed of the electrons depends on the difference in energy potential (Voltage) between the cathode and anode. When electrons encounter the hard solid anode, they are suddenly stopped and the kinetic energy of speed or motion is converted into heat and electromagnetic radiation.



Self test (2)

How do electrons travel from the cathode

- Check your answers in the key answer page at the end of module

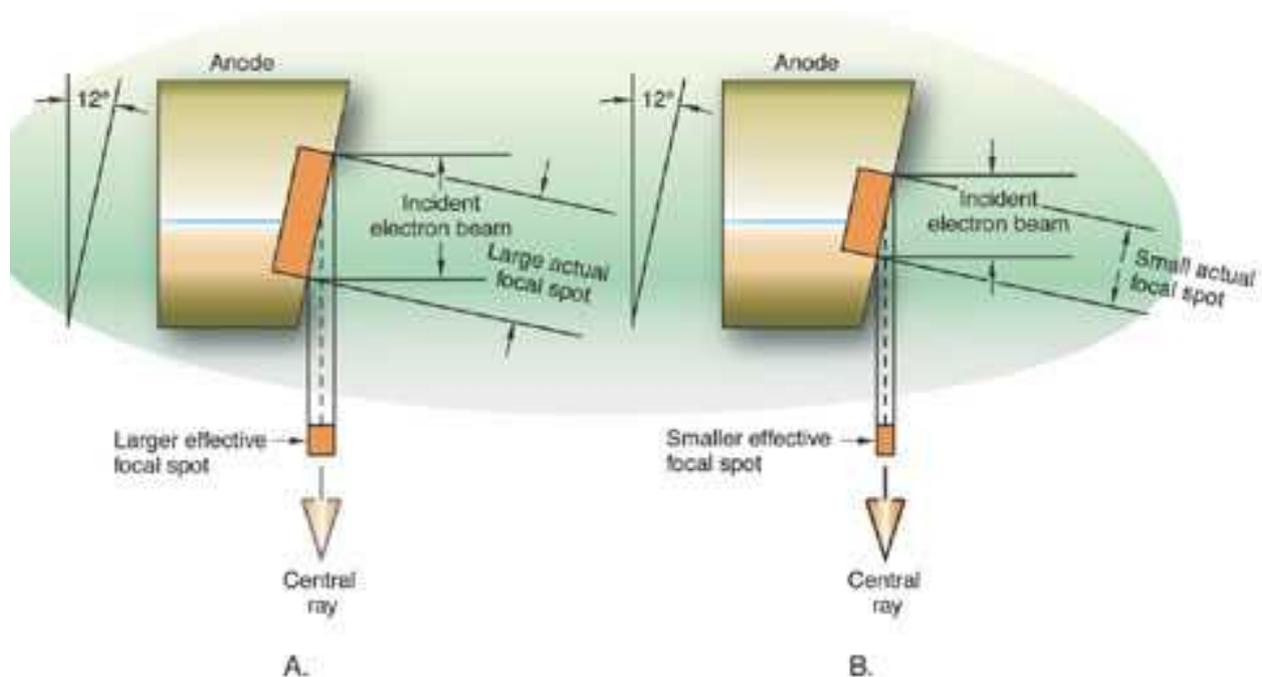
Inverse square law :

The electrons focused or directed to a small area on the anode called (the Focal spot). As small focal spot is desirable in dental X-ray machine.

When the electrons hit the focal spot X-rays of different wave length come out in the direction of the X-ray tube head.

Different voltage potentials between the anode and cathode exist at different times during each cycle of the alternating current, resulting in different electron speeds between the cathode and the anode and thus different energy X-ray photons are produced.

Thus the X-ray beam consists of photons of many wave lengths, the maximum energy or shortest wave length photon produced is determined by the KVP of the electric current of the anode cathode circuit.



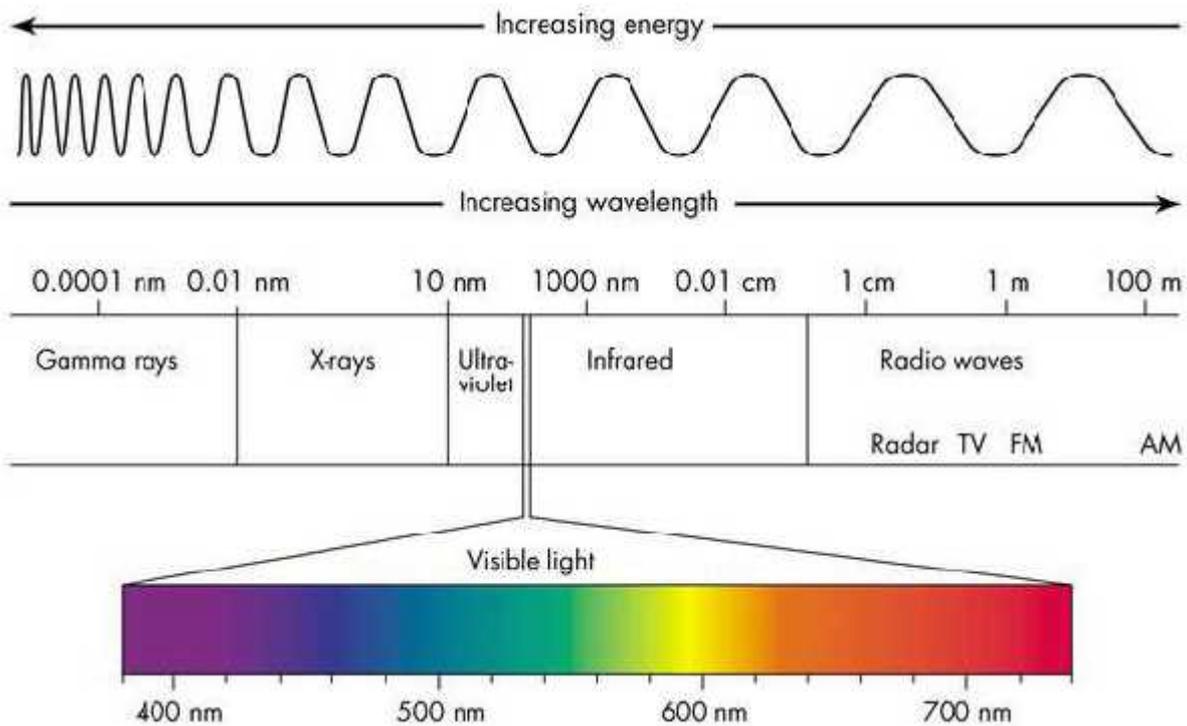
Self test(3)

Mention the benefits of focal spot .

- Check your answer in the key answer page at the end of module .

X Ray spectrum :

Thus the X-ray beam consists of photons of many wave lengths, the maximum energy or shortest wave length photon produced is determined by the KVP of the electric current of the anode cathode circuit



5/ Post test

Put circle around the letter of the correct answer :

1. The x-ray is produced from

- a. cathode
- b. focal spot at anode
- c. non of above
- d. all of above

2. The x ray spectrum composed from

- a. single wave length
- b. multi wave lengths
- c. non of above
- d. all of above

3. The number of photons when the current increased from the source.

- a. increase
- b. stay same number
- c. decrease
- d. non of above

4. high voltage produce

- a. High energy x ray
- b. moderate energy
- c. low energy
- d. non of above

5. short wave are

- a. High energy
- b. moderate energy
- c. low energy
- d. non of above

6. x-ray is produced inside the x ray tube

a. from cathode

b. from anode

c. non of above

d. all of above

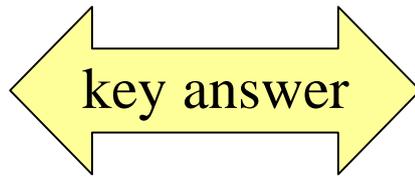
Note :one degree for each answer

-Check your answers in key answer page at the end of module

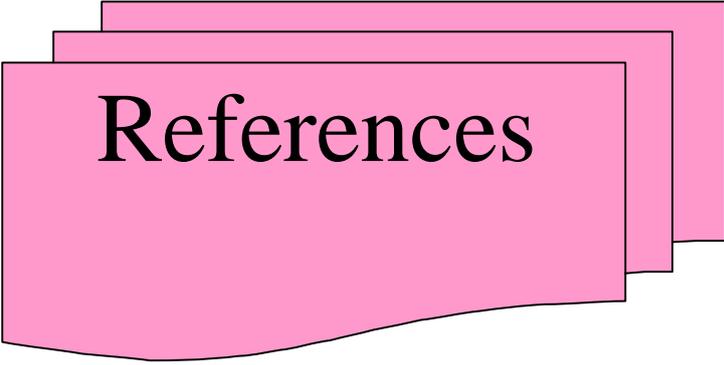
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	1- 60-100KVP 2-FILLIMANT 3-Anod and cathode	1	B
2	B		2	B
3	B		3	A
4	C	Self test 2 Due to the deference in KVP	4	A
5	B		5	A
6	A	SELF TEST 3 The target of electrons	6	B
<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more you do not need to proceed. - less than 5 you have to study this module well . 			<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again 	



References

1- Dental radiology for dental auxiliaries

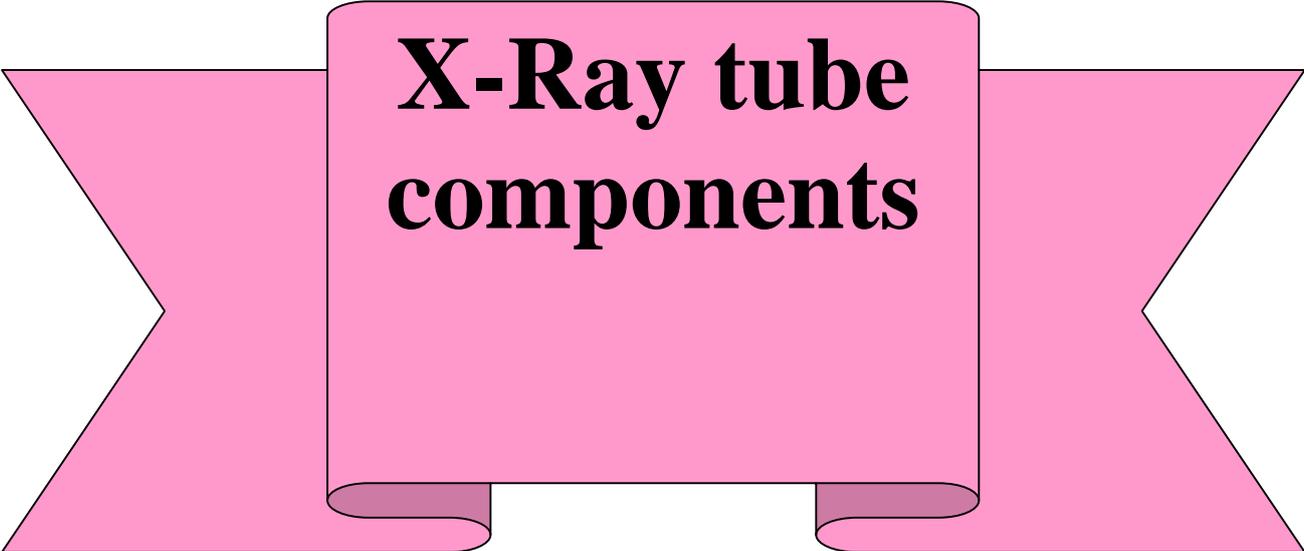
2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

THIRD MODULE



X-Ray tube components



1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the parts of the X-Ray tube , names of components of each part and its location in the unit so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. X- ray tube components .
2. collimation .
3. filtration .
4. cones .
5. Transformer .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 6- Understand the components of x-ray tube .
- 7- Determine the benefit of collimator .
- 8- Understand the filter important .
- 9- Describe the types cones .
- 10-describe the relation between tube components .

3/ Pre test

Put circle around the letter of the correct answer :

1. The x-ray is shaped by

- a. filter
- b. collimator
- c. cone
- d. all of them

2. The x ray filtered by

- a. Filter
- b. collimator
- c. cone
- d. all of above

3. The x ray directed by

- a. Filter
- b. collimator
- c. cone
- d. all of above

4. the weak x-ray absorbed by

- a. Filter
- b. collimator
- c. cone
- d. all of above

5. The long wave length x- ray is filtered by

- a. Filter
- b. collimator
- c. cone
- d. all of above

6- the pointed cone can cause

- a. scattering
- b. re emitting
- c. non of above
- d. all of above

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

x-ray tube components :

A dental X-ray machine consists of 2 basic parts:

A control panel and a tube head.

The tube head and the control panel can be in one unit or separated from each other. The tube head is supported by an extension arm and it provided with horizontal and vertical rotation movements to allow the X-ray beam to be aimed in any direction.

Self test (1)

Fill in the blanks with suitable words

1-The tube head locate at ----- .

2-the tube head is supported by an ----- arm .

3-the rotation arms allow the beam to be ----- in any direction .

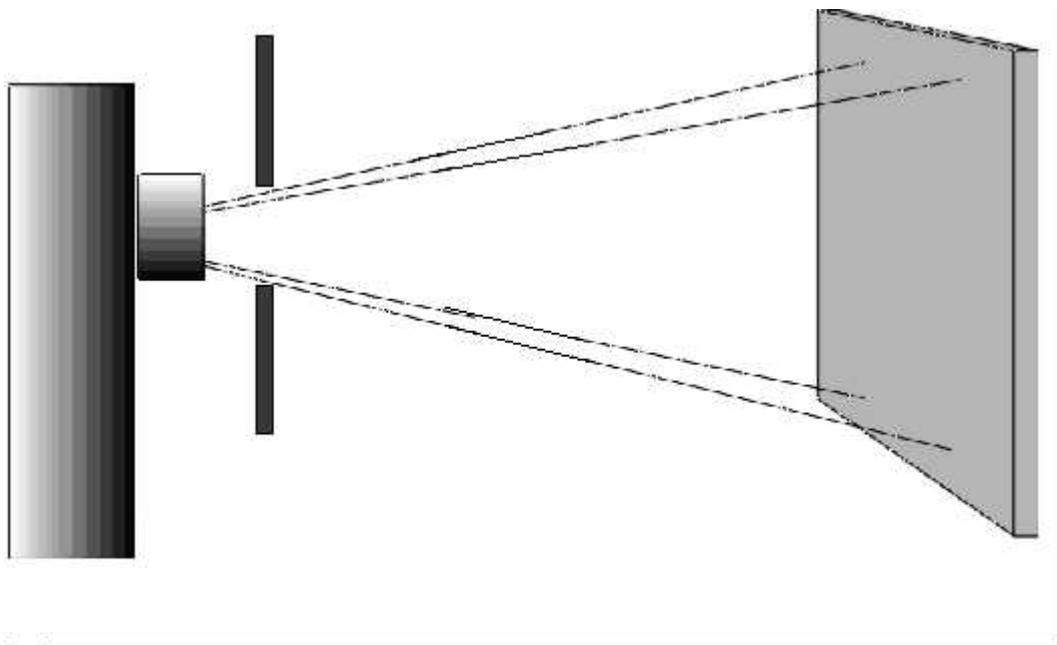
- Check your answers in the key answer page at the end of module

Collimation :

Collimation is a term used to indicate shaping of the X-rays coming from the tube head into a beam X-rays.

The collimators may be metal cylinder or lead washer with a hole in the center. Some X-rays are blocked while other are permitted to pass through the hole in the cylinder.

The X-ray beam can be shaped to any desired shape or size at any distance from the patient by an appropriate collimator that produced a con shaped beam of X-ray that starts at the X-ray tubes focal spot and spread to a circular area $2\frac{3}{4}$ inches in diameter on the patient skin.



Self test (2)

What is the diameter of the X- ray on the patient skin .

- Check your answers in the key answer page at the end of module

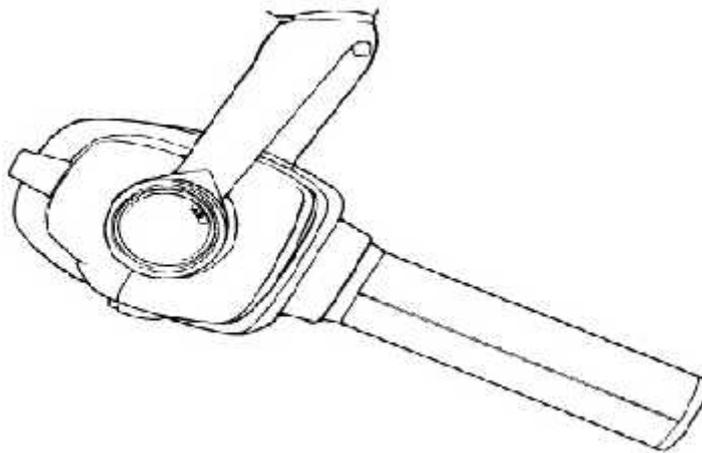
Cones:

Cones are X-ray beam locating devices. A cone is often constructed with a collimation in the base. There are 2 types of cones, open cone and pointed cone.

The open end cone indicates the position and size of the X-ray beam at the end of the cone. The X-ray beam does not strike the plastic cylinder of the open end cone.

The pointed cone indicates the position of the central ray at the point of the cone and the position where the X-ray beam diameter is $2\frac{3}{4}$ inches wide. With the pointed cone the X-ray beam must pass through the plastic material which produces a small amount of scattered X-rays. For this reason most machines are sold with open end cones.

The open end cones are of 2 types, the short one which is 8 inches long and the long one which is 16 inches long.



Self test(3)

Mention the types of cones .

- Check your answer in the key answer page at the end of module .

Filtration :

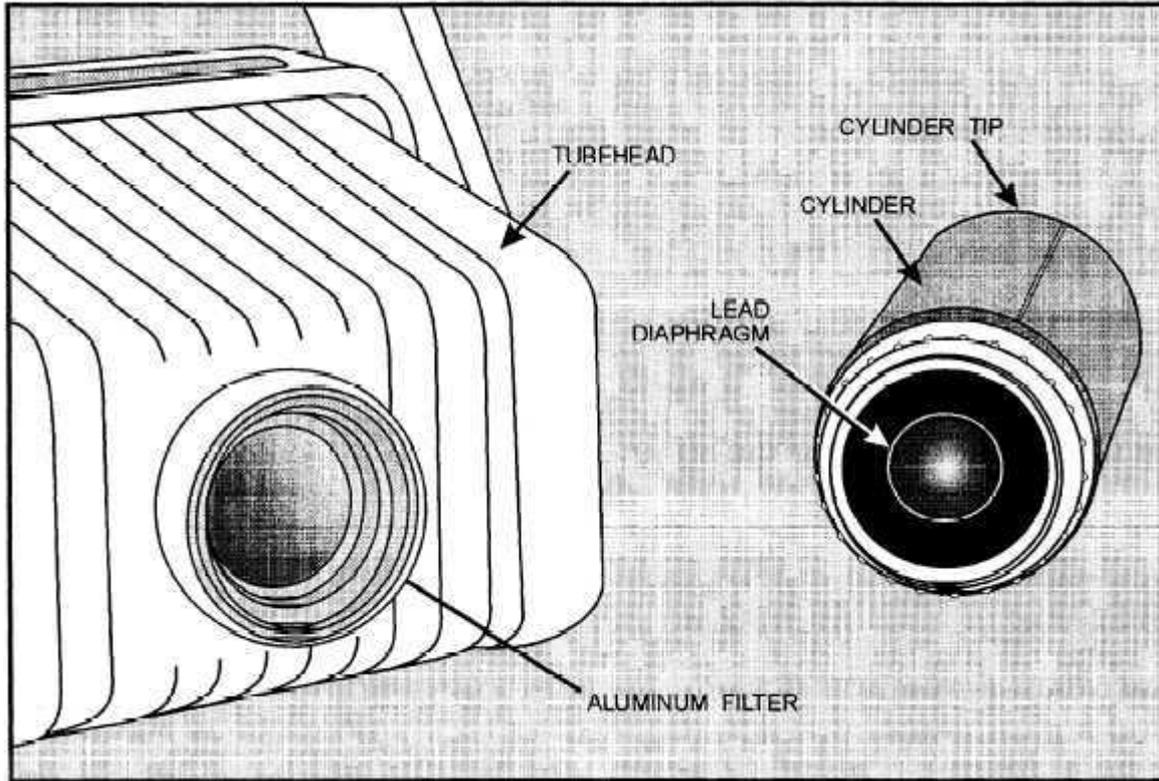
The X-ray beam produced by the X-ray tube consists of photons of many different wave lengths, the long wave length (poorly penetrating) X-rays can not easily pass through teeth and bone. These X-rays are not useful in making dental radiographs and can be absorbed by patients living tissues.

They are therefore removed or filtered out of the X-ray beam by passing the beam through one or more sheets of aluminum.

The thickness of aluminum used is increased until the filtered X-ray beam is similar to the filtration of 1.5 mm. of aluminum.

Thus the X-ray beam is filtered with 1.5 mm Al (equivalent) when the machine is operated at lower than 70 KVP.

Filters are located in the X-ray tube head behind the collimator. This design permits the collimator to assist in blocking the small amount of scattered radiation from reaching the patient.



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5/ Post test

Put circle around the letter of the correct answer :

1. The x- ray filter is

- a. lead
- b. aluminum
- c. non of above
- d. all of above

2. The cone is made from

- a. lead
- b. aluminum
- c. non of above
- d. all of above

3. The collimator is made from.

- a. plastic
- b. metal
- c. decrease
- d. non of above

4. Long wave are removed by

- a. cone
- b. filter
- c. low energy
- d. non of above

5. short wave are directed by

- a. cone
- b. filter
- c. low energy
- d. non of above

6. types of cones

- a. open end
- b. closed end
- c. a& b
- d. non of above

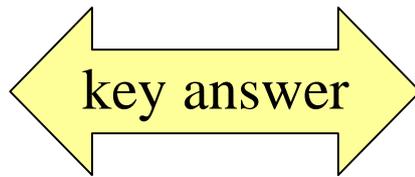
Note :one degree for each answer

-Check your answers in key answer page at the end of module

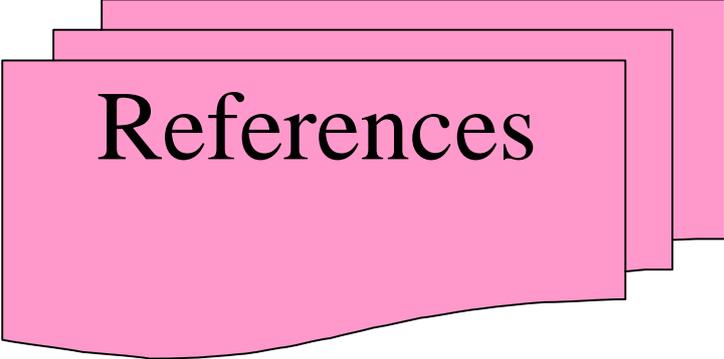
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	Head of x ray machine Articulating arm directed <u>Self test(2)</u> 2 ¾ inch <u>Self test(3)</u> Open end con Closed end	1	B
2	B		2	A
3	C		3	B
4	A		4	B
5	A		5	A
6	B		6	C
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

FORTH MODULE



X-Ray unit components

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the the X-Ray unit , names of components of each part and its location in the until so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. X-Ray unit components .
2. control panel .
3. Relation between components .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the start of x-ray production.
- 2-Determine the types of x ray radiation .
- 3-Understand the relation between unit components .
- 4-Describe the procedure .

3/ Pre test

Put circle around the letter of the correct answer :

1. The control panel is ?

- a. light bulb
- b. part of x ray unit
- c. photons source
- d. all of them

2. The control panel locate at

- a. base of x ray Machine
- b. Head of x ray Machine
- c. with or out x ray Machine
- d. non of above

3. The activator of light is

- a. timer
- b. on /off switch
- c. light
- d. non of above

4. the controller of exposure amount is

- a. on/off switch
- b. timer
- c. Gap
- d. non of above

5. The exposure started by

- a. high energy
- b. timer switch
- c. low energy
- d. non of above

6-The amount of supplied electricity controlled by

- a. KVP regulator
- b. MA regulator
- c. cable
- d. Non of above .

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

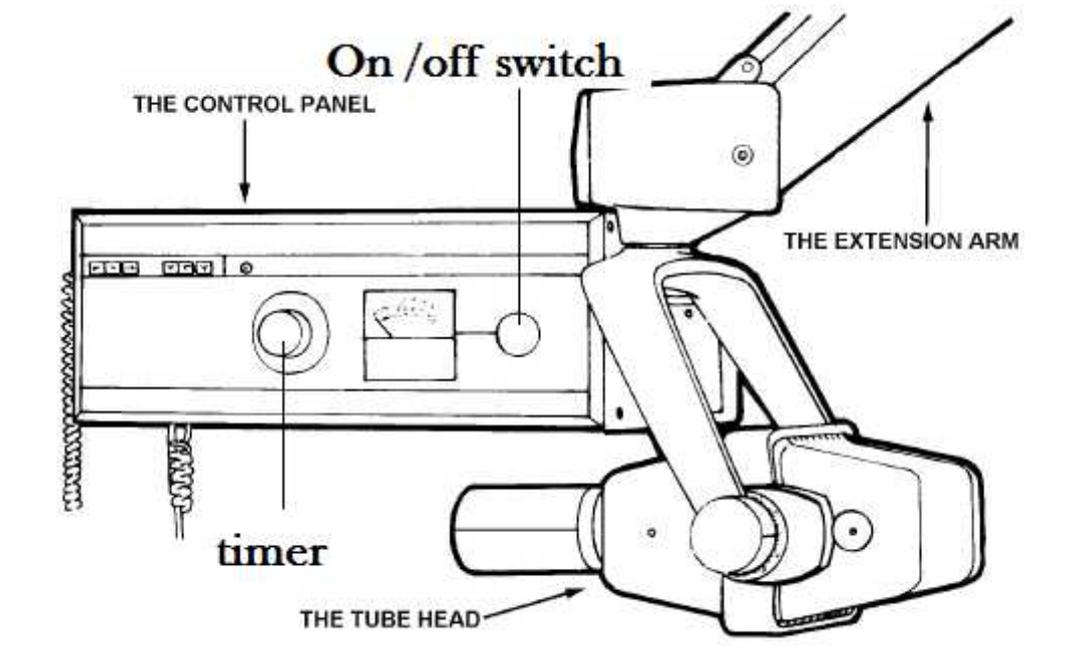
If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

on /off switch :

The control panel consist of an on/off switch which might activate a light. The exposure timer selects the amount Of time that X-ray to be produced, the timer switch start the exposure.



Self test (1)

Fill in the blanks with suitable words

- 1-the exposure time controlled by ----- .
- 2-the cathode activated by ----- .
- 3-the exposure started by ----- .

- Check your answers in the key answer page at the end of module

MA regulator :

The amperage regulator (MA) controls the amounts of electricity supplied to the filaments and the number of electrons produced in the electron cloud which in turn controls the amounts or number of X-rays produced. The MA regulator controls the number of electrons created by the filaments that are subsequently used to transport energy between the cathode and anode.

The MA meter is only activated when X-rays are being created.



Self test (2)

How the electron accumulate at the cathode

- Check your answers in the key answer page at the end of module

KVP regulator :

The KVP regulator controls the voltage sent to the step up transformer attached to the anode cathode circuit of the X-ray tube. It regulates the speed of the electrons between the cathode and anode. This speed affects the amount of energy of the individual X-ray photon produced. High KVP produces more energetic, more penetrating X-rays. No electric current will flow from cathode to anode if no electron cloud is available to carry the energy across the gap, thus no amperage control is needed in the anode-cathode circuit

Self test(3)

Mention the benefits of KVP regulator .

- Check your answer in the key answer page at the end of module .

The exposure Timer:

The exposure switch activates the high voltage between the cathode and anode and starts the productions of X-rays. The switch is of a (dead man) type it means that it must be continuously depressed to maintain X-ray production when the switch is released X-ray productions stops.

The timers starts when the X-ray exposure begins with the closing of the exposure switch and terminates the X-ray productions at the selected time. Some timers are calibrated in seconds, other are calibrated in seconds and impulses. One second equal to 60 impulses

5/ Post test

Put circle around the letter of the correct answer :

1.The x- ray is started by

- a. on /off switch
- b. timer
- c. non of above
- d. all of above

2. The control panel composed from

- a. timer
- b. MA& KVP regulators
- c. non of above
- d. all of above

3.The amount of radiation controlled by.

- a. KVP regulator
- b. MA regulator
- c. decrease electricity
- d. non of above

4. high voltage produce

- a. High energy x ray
- b. moderate energy
- c. low energy
- d. non of above

5. low Amperage produce

- a. High energy
- b. moderate energy
- c. low energy
- d. non of above

6. x-ray stopped from production when

- a. open timer
- b. close timer
- c. open dead switch
- d. all of above

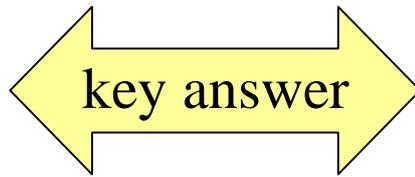
Note :one degree for each answer

-Check your answers in key answer page at the end of module

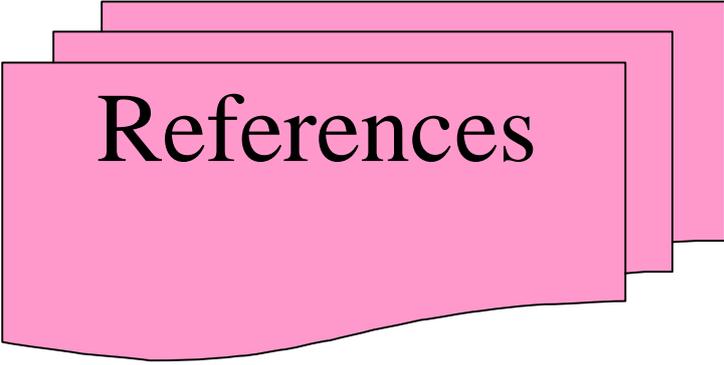
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	1-timer 2-on of switch 3-timer switch__ <u>Self test(2)</u> Control the power of produced radiation	1	D
2	C		2	D
3	B		3	B
4	B		4	A
5	B		5	D
6	A		6	C
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



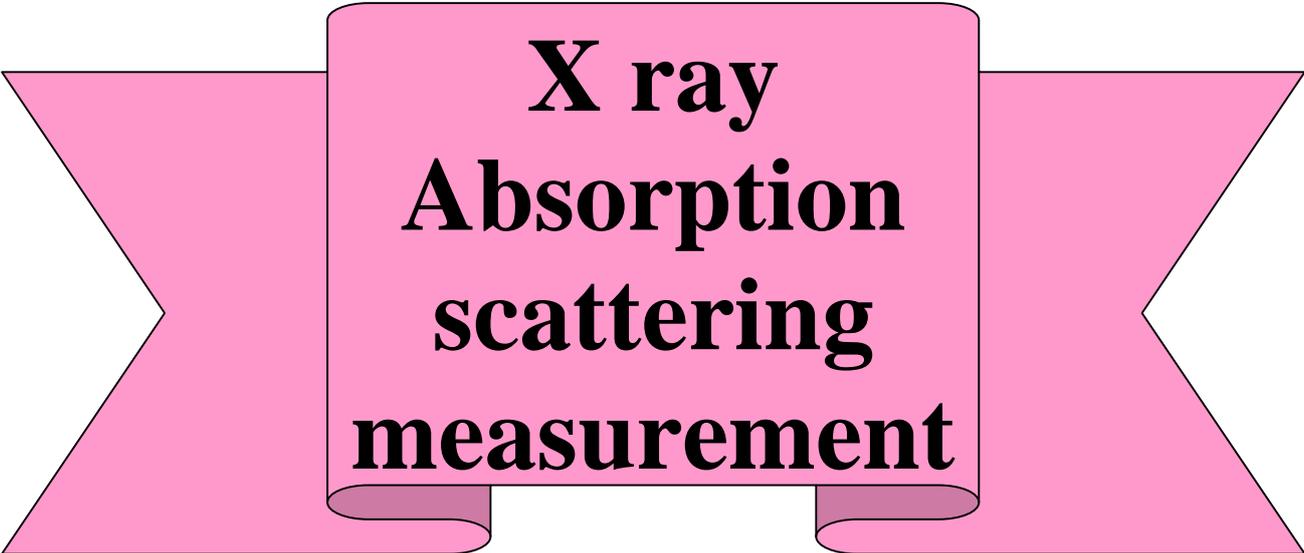
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

FIFTH MODULE



X ray Absorption scattering measurement

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the absorption scattering and measurement , names of each measurement device so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. Dental radiology absorption &scattering .
2. methods for x ray measurement .
3. measurement units .
4. devices for x ray measurement .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

Understand the theory of light absorption .

Determine the nature of x ray radiation scattering .

Understand units of x ray measurements .

Describe methods for x ray measurement .

Mention the benefits of devices

3/ Pre test

Put circle around the letter of the correct answer :

1. The x-ray can be

- a. absorbed
- b. scattered
- c. non of above
- d. all of them

2. The x ray absorption depend on

- a. thickness
- b. density
- c. non of above
- d. all of above

3. The x ray absorbed more by

- a. bones
- b. lead
- c. Tissue
- d. non of the above

4. thick material absorbed x ray with

- a. long wave length
- b. low energy photons
- c. short wave length
- d. all of above

5. The x ray measurement unit

- a. Roentgen
- b. film badge
- c. photons
- d. non of above

6. film badge is

- a. Is package
- b. dental type film
- c. non of above
- d. all of above .

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

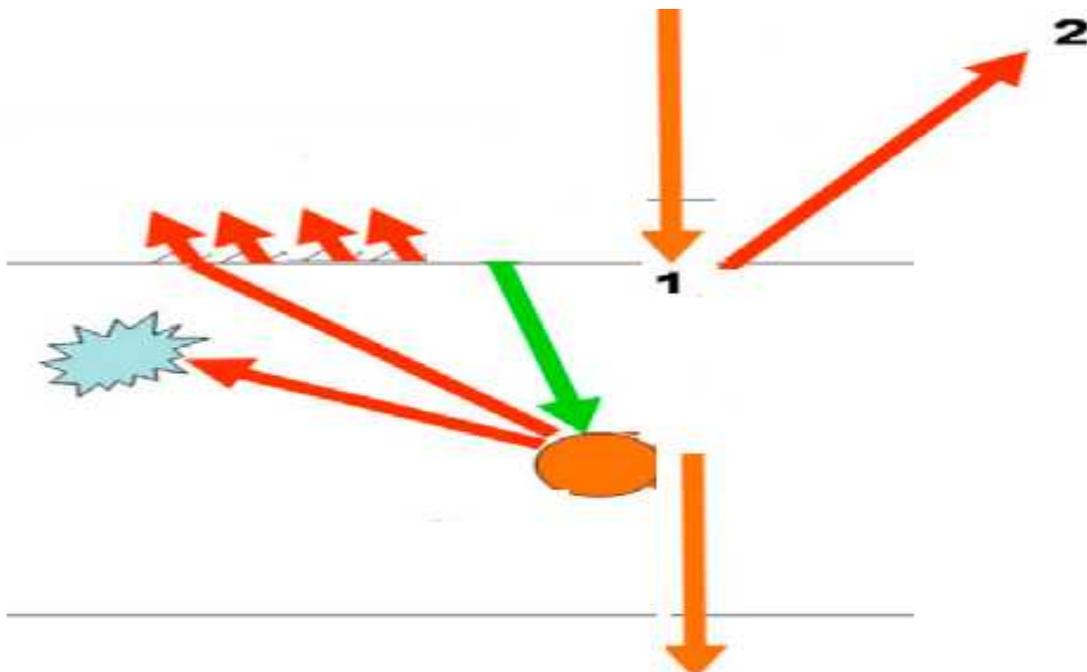
4/ the module contents

X-Ray Absorption and Scattered Radiation

X-rays are absorbed by and form of matter (solid, liquid, and gases).

When a photon of X-ray hit the atom one of these things might occur:-

1. It can pass through the atom without any change occurring to either the atom or the photon.
2. It can deviated from its path by the atom without any change to the atom, thus it becomes a scattered radiation.
3. It can be completely absorbed.
4. The X-ray can hit the atom and gives parts of its energy so it come out having low energy and long wave length.



Self test (1)

Fill in the blanks with suitable words

- 1-The x ray may be absorbed and ----- .
- 2-the x ray absorbed scattered and ----- .
- 3-the x ray may be re emitted and give ----- wave length.

- Check your answers in the key answer page at the end of module

X RAY Absorption :-

The absorption of X-rays is proportional to the density of the material. The heavier the material the more X-ray are absorbed.

Thus it is obvious that lead is the most efficient material for absorbing X-radiation. Heavy materials such as lead, gold and amalgam easily absorb X-ray and are thus difficult for the X-ray to penetrate.

Light weight materials such as acrylic and human soft tissue absorb little radiation so the X-ray beam are easily penetrated.

So lead, amalgam, gold and similar heavy material are said to be radio opaque, acrylic and soft tissue are radiolucent.

Self test (2)

Who is more radiation absorption the heavy material or light materials

- Check your answers in the key answer page at the end of module

Measurements of X-rays

X-rays are measured in (Roentgen). This is a measuring unit used to measure radiation in tissue.

Methods of measuring radiation include film badge, ionizing chamber and rate meter.

A film badge is a dental type film in a package containing various metal filter when the film is developed the blackness or density of the film indicates the amount of radiation reaching the film

Self test(3)

Mention the methods for radiation measurement .

- Check your answer in the key answer page at the end of module .

Ionizing chamber:

is an electrically charged chamber collects the ions reaching it when exposed to X-ray. This amount can be read through a microscope in the same instrument that charges the chamber (charger reader in terms of Roentgen).

A Rate meter has an ion collection chamber that is continually being charged by a battery. This one measures the radiation in air by rad.

Self test(3)

What is the deference between ionizing chamber and rate meter .

- Check your answer in the key answer page at the end of module .

5/ Post test

Put circle around the letter of the correct answer :

1. The x-ray can be

- a. absorbed
- b. scattered
- c. non of above
- d. all of above

2. The x ray can be re emitted by

- a. longer wave length
- b. short wave length
- c. non of above
- d. all of above

3. The ionizing chamber .

- a. collect electrons
- b. ions
- c. photons
- d. non of above

4. Rate meter measure radiation in

- a. tissue
- b. metals
- c. Air
- d. non of above

5. gold absorbe radiation more than

- a. acrylic
- b. lead
- c. non of above
- d. all of above

6. scattering x ray is

a. visible

b. un visible

c. yellow

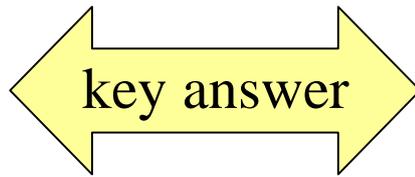
d. bright

Note :one degree for each answer

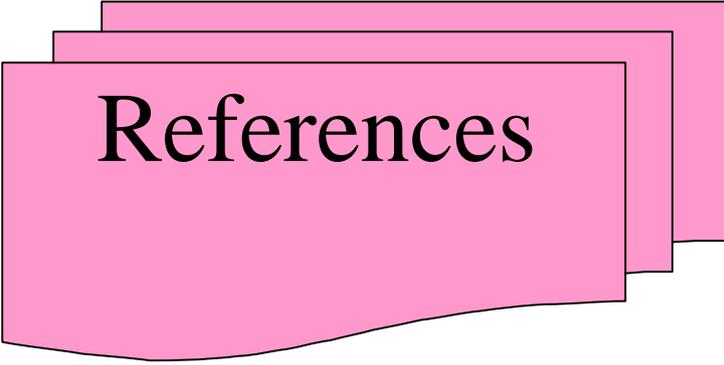
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1-Scattering 2- deviated from its path 3-long	1	D
2	B		2	A
3	B		3	B
4	D	<u>Self test(2)</u> Heavy material like amalgam ,gold	4	B
5	A	<u>Self test(3)</u> Rate meter , ionizing chamber Film badge <u>Self test (4)</u> <u>Ionizing chamber</u> read by roentgen While rate meter by RAD	5	A
6	B		6	B
<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more you do not need to proceed. - less than 5 you have to study this module well . 			<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again 	



References

1- Dental radiology for dental auxiliaries

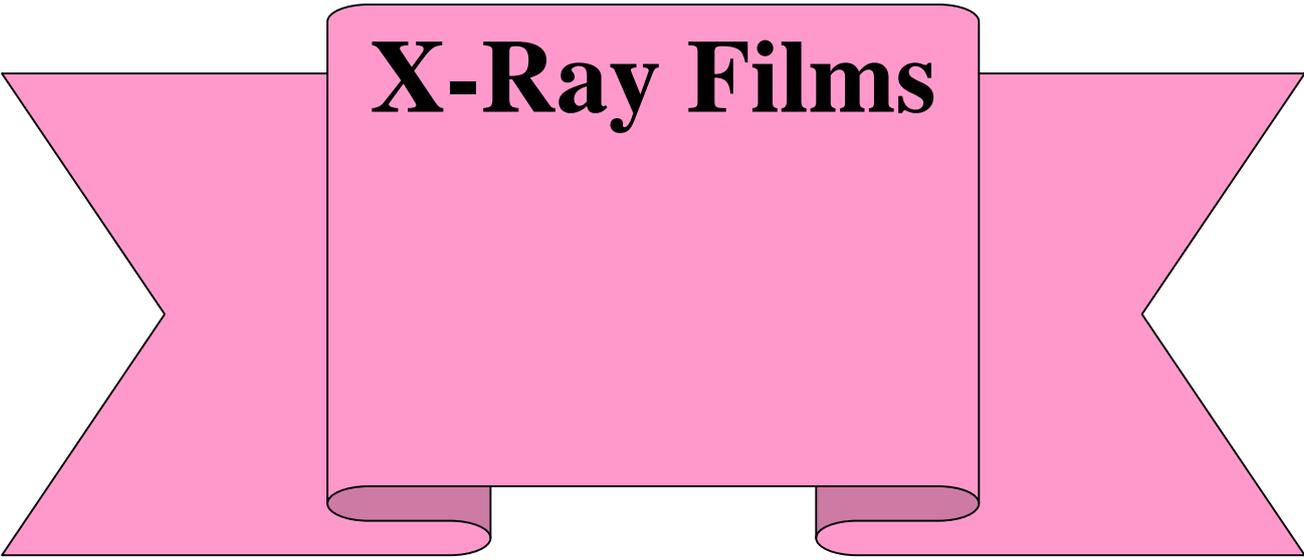
2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

SIXTH MODULE



X-Ray Films



1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the X-Ray films , names of films name of each part so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. X-Ray film definition .
2. types of x-Ray films .
3. types of extra and intra oral films .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the types of x-ray film.
- 2-Determine the components of x ray film .
- 3-Understand the relation between extra and intra oral films .
- 4-Describe the speed of films .

3/ Pre test

Put circle around the letter of the correct answer :

1. The x-ray printed on a film name is ?

- a. radiograph
- b. latent image
- c. radiograph source
- d. all of them

2. The x ray film after processing

- a. latent
- b. Radiograph
- c. x ray
- d. non of above

3. The films types

- a. screen
- b. non screen
- c. all of above
- d. non of above

4. the intra oral film is

- a. screen
- b. non screen
- c. all of above
- d. non of above

5. The extra oral radiograph is

- a. screen
- b. non screen
- c. all of above
- d. non of above

6-The emulsion is sensitive to

- a. red light
- b. light
- c. all of them
- d. Non of above .

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

X-Ray Films

A dental radiograph is made by exposing the patients jaw's to X-ray and capturing the X-ray image on a film placed in the patients mouth. This image is not visible and called a latent image. To make the image visible the film is processed in a darkroom or light tight processing machine and it is called now a radiograph.

The radiograph is then mounted in its proper position in a “film mount” and viewed by a viewer and is ready to be interpreted by a dentist.

Self test (1)

Fill in the blanks with suitable words

- 1-the latent image is ----- visible .
- 2-the film processed in ----- room .
- 4- After film processing it is called ----- .

- Check your answers in the key answer page at the end of module

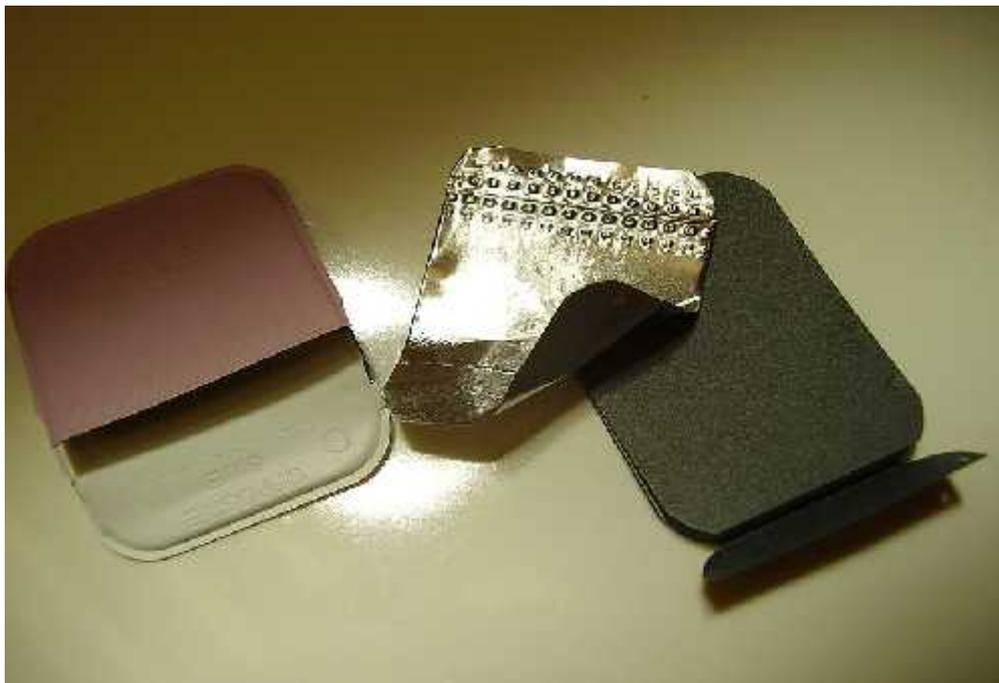
Types of films

Radiographic films are of 2 basic types:

1. Screen films: are exposed mainly to a light given off by fluorescent screens that capture the X-rays and convert it into a visible light which expose the film (e.x. the extra oral film).
2. Non screen film: are exposed directly to X-ray e.x. intra oral films.

Intra oral film

It is a non screen film that consists of an emulsion spread on both sides of a relatively rigid but flexible film base. The emulsion consists of X-ray sensitive crystals of silver bromide embedded in gelatin.



Self test (2)

Mention the components of intra oral film

- Check your answers in the key answer page at the end of module

Extra oral film

The extra oral films are usually made to be put out side the oral cavity.

The are usually of large sized and its emulsion is made to be sensitive to the light given off by the screen when X-rays are absorbed by the screen.

The film is usually put between 2 screens in a light box called cassette.



Self test (3)

Mention the components of extra oral film

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. The types of x-ray films are

- a. screen
- b. non screen film
- c. non of above
- d. all of above

2. The x-ray film composed from

- a. film
- b. black paper
- c. lead foil
- d. all of above

3. The non screen film sensitive to.

- a. x ray
- b. light
- c. A&B
- d. non of above

4. The screen film sensitive to.

- a. x ray
- b. light
- c. A&B
- d. non of above

5. Latent image is

- a. visible
- b. non visible
- c. low energy
- d. non of above

6. x-ray print image on a film

- | | |
|-----------------|---------------------|
| a. immediately | b. after processing |
| c. non of above | d. all of above |

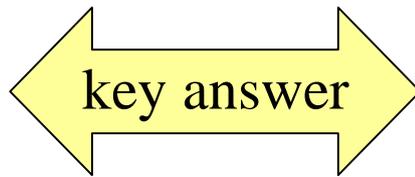
Note :one degree for each answer

-Check your answers in key answer page at the end of module

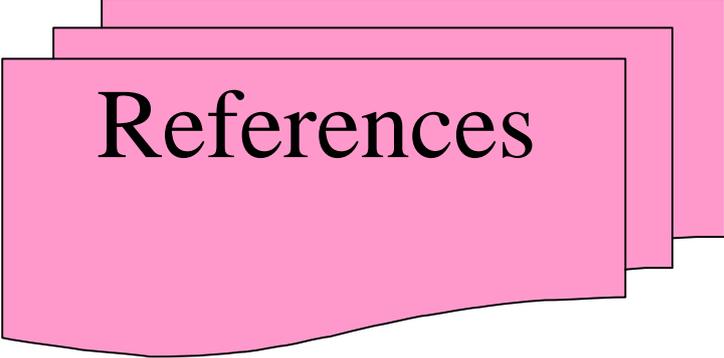
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	Self test (1) 1- IN 2- DARK 3-RADIOGRAPH Self test 2 1 celluloid film 2black paper 3-lead sheet 4-invelop SELF TEST 3 Film Screen Cosset	1	D
2	B		2	D
3	C		3	A
4	B		4	B
5	A		5	B
6	B		6	A
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

SEVENTH MODULE



Intra oral Films

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the intra oral films , names & components of each part and its location in the film so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. intra oral films .
2. components .
3. image production .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

Understand the components of x-ray film

Determine the benefit of each component .

Understand the image formation .

Describe the types intra oral films

.

3/ Pre test

Put circle around the letter of the correct answer :

1. The intra oral film composed from

- a. lead sheet
- b. black paper
- c. film
- d. all of them

2. The x ray print image on

- a. lead sheet
- b. black paper
- c. film
- d. all of them

3. The outer more part is

- a. lead sheet
- b. black paper
- c. plastic envelop
- d. all of them

4. the part that block the light from reach film is

- a. lead sheet
- b. black paper
- c. film
- d. all of them

5. the part that responsible for protection of mouth from additional radiation is

- a. lead sheet
- b. black paper
- c. film
- d. all of them

6- the bit wing film is

- a. screen film
- b. non screen film
- c. non of above
- d. all of above

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

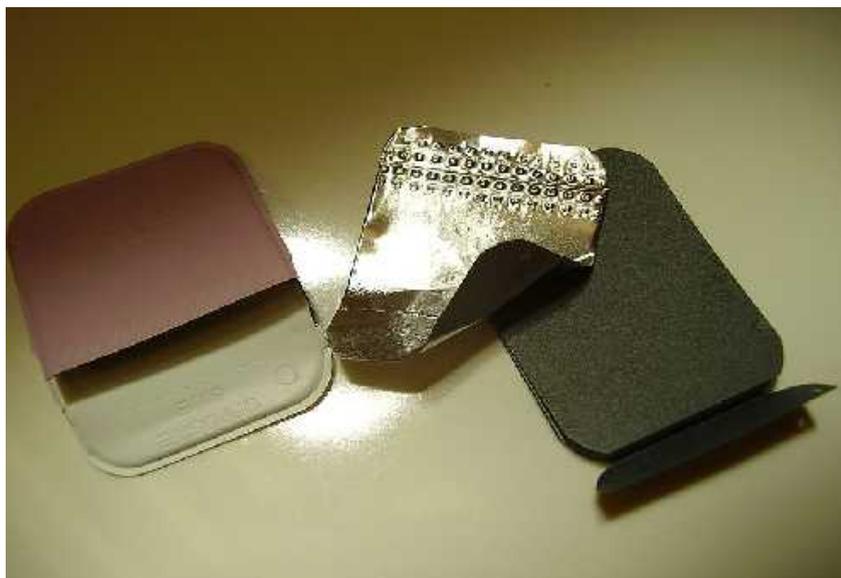
Intra oral film

It is a non screen film that consists of an emulsion spread on both sides of a relatively rigid but flexible film base. The emulsion consists of X-ray sensitive crystals of silver bromide embedded in gelatin.

Because the emulsion is sensitive also to light, the film is placed in an opaque light-tight packet that is also water proof enough to prevent patient's saliva from quickly penetrating the package. The film is protected by paper sheet and is backed by a thin sheet of lead. The lead sheet absorbs most of the X-rays that pass through the film (thus protecting the patient) and also prevents scattered X-rays originating in the patients tissue behind the film from reaching the film and causing an increase in the film fog.

The lead backing has a pattern stamped into it. This pattern appeared on the radiograph when the film is exposed in the wrong side.

The film has an embossed dot stamped into it that appear as a bump on the exposure surface and as a depression on the opposite side.



Self test (1)

Fill in the blanks with suitable words

1-The lead sheet locate at ----- of the film .

2-the envelop is made from ----- .

3-the emulsion is spread on ----- surfaces .

- Check your answers in the key answer page at the end of module

Bite wing film

Internal oral films are of different sizes. Size 0, size I, size 2. We usually used size 2 films as a slandered size.

Bite – wing film is used for taking bite – wing X-ray.

They are manufactured with bite – tab attached to the film packet, or are constructed from peri apical film and bite – wing loops.



Self test (2)

What are the sizes of intra oral film .

- Check your answers in the key answer page at the end of module

Latent image

When a beam of X-ray is passed through an object some X-ray are absorbed by the object and some are not. And also some of the crystals are affected by the X-ray and some are no. So an image is formed in the film which is not seen this image called latent image.

Self test(3)

What is latent image .

- Check your answer in the key answer page at the end of module .

5/ Post test

Put circle around the letter of the correct answer :

1.The intra oral film

- a. screen film
- b. non screen film
- c. non of above
- d. all of above

2. The periapical film is

- a. intra oral
- b. screen film
- c. non of above
- d. all of above

3.The x ray affect .

- a. crystals
- b. metal
- c. all of above
- d. non of above

4. the ordinary film size is

- a. 0
- b. 2
- c. 1
- d. non of above

5. the emulsion is composed from

- a. silver
- b. silver bromide
- c. bromide
- d. non of above

6. the film print image when

- a. exposed to light
- b. exposed to radiation
- c. a& b
- d. non of above

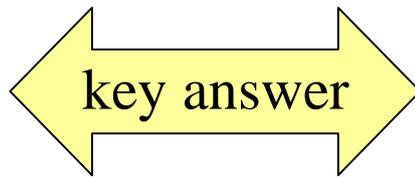
Note :one degree for each answer

-Check your answers in key answer page at the end of module

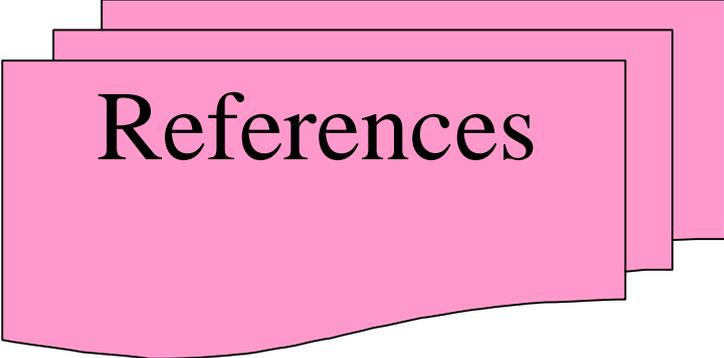
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	Head of x ray machine Articulating arm directed <u>Self test(2)</u> 2 ¾ inch <u>Self test(3)</u> Open end con Closed end	1	B
2	B		2	A
3	C		3	B
4	A		4	B
5	A		5	A
6	B		6	C
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

EIGHTH MODULE



Film processing

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the film processing , names of components of each solution so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. film processing .
2. processing solution .
3. film processing procedure .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea of processing.
- 2-Determine the types solutions .
- 3-Understand the relation between processing solution .
- 4-Describe the procedure .

3/ Pre test

Put circle around the letter of the correct answer :

1. determine who is one of processing solution ?

- a. powder
- b. part of x ray unit
- c. developer
- d. all of them

2. determine who is one of processing solution ?

- a. powder
- b. part of x ray unit
- c. fixer
- d. all of them

3. determine who is one of processing solution ?

- a. powder
- b. part of x ray unit
- c. water
- d. all of them

4. the developer is

- a. alkaline
- b. timer
- c. Gap
- d. non of above

5. The developer consist from

- a. 3 chemicals
- b. 5 chemicals
- c. 2 chemicals
- d. non of above

6-the developer not affect

- a. exposed crystals
- b. un exposed crystals
- c. A&B
- d. Non of above .

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Film processing

To make the latent image visible, the film is removed from its packet in a darkroom and then passed through a series of solutions that process the latent image into a visible image useful in diagnosis film processing can be accomplished by using 3 solutions.

1. Developer.
2. Fixer.
3. Water.

Self test (1)

Fill in the blanks with suitable words

1-the latent image become visible by ----- .

2-the processing done in ----- .

3-the developing solutions are ----- &----- &----- .

- Check your answers in the key answer page at the end of module

Developing the film

The developer is an alkaline solution consist of 5 chemicals. This solution affect the exposed crystal, when the film opened in the darkroom and put in the developer this solution act on the exposed silver crystal and precipitate the silver in these crystal. The un exposed crystals are not affected.

The time of the developer depend on:

1. Concentration of the developer.
2. Temperature of the developer.
3. Whether the solution is new or old and the number of films processed in the developer.

In hand processing usually they does not used a concentrated solution and they develop the film for 5 minutes at 20 c°. But they usually follow the instructions on the package of the processing solution.

Self test (2)

What is the time and temperature for film developing

- Check your answers in the key answer page at the end of module

Fixing the Film

The fixer is an acidic solution consist of 4 chemicals.

This solution affect the unexposed crystals. When the film is removed from the developer and put in the fixer this solution act on the unexposed silver crystal and removes all these crystals. Allowing the light to pass through the film and permitting viewing of the radiographic image.

The time of the fixer is affected by the same factors that affect the developer:

- a. Concentration of the fixer.
- b. Temperature of the fixer.
- c. Whether the solution is new or old and the number of films processed in the fixer.

In hand processing they usually used not concentrated solution and they used to fix the film for 10 minutes at 20 c°.

In hand processing they usually used to rinse the film after developing and before fixing for 20 seconds. Rinsing will remove the alkaling developing solution from the film and prevents this solution from mixing with the acidic fixer and weakening the fixer solution.

Self test(3)

- . What is the time and temperature for fixing
- Check your answer in the key answer page at the end of module .

Film washing

To complete the processing the film is washed to remove the fixer solution attached to the film. Then the film is dried in warm air.

5/ Post test

Put circle around the letter of the correct answer :

1. The time for developing depend on

- a. concentration
- b. time
- c. non of above
- d. all of above

2. The time for developing depend on

- a. temperature
- b. time
- c. non of above
- d. all of above

3. The time for developing depend on

- a. new or old solution
- b. time
- c. non of above
- d. all of above

4. The time for fixing depend on

- a. concentration
- b. time
- c. non of above
- d. all of above

5- The time for developing depend on

- a. temperature
- b. time
- c. non of above
- d. all of above

6. time for rinsing in water after developing is

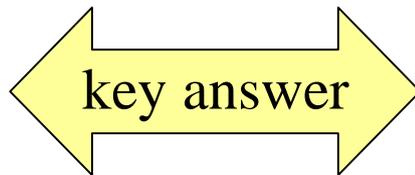
- a. open time
- b. 20 sec
- c. 10 sec
- d. all of above

Note :one degree for each answer

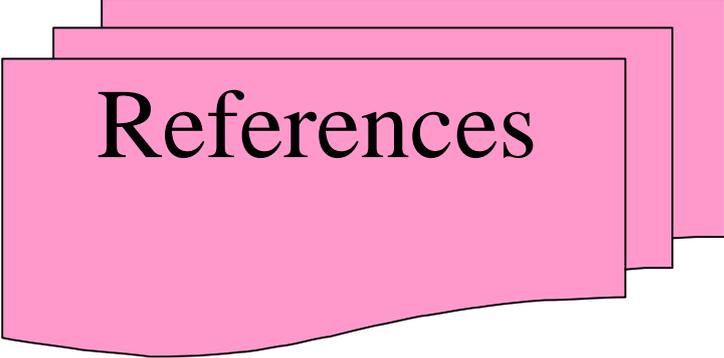
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	C	1-Processing 2-dark room 3-developer,water, fixer <u>Self test(2)</u> 5 min at 20 sec <u>Self test (3)</u> 10 min at 20 sec	1	A
2	C		2	A
3	C		3	A
4	A		4	A
5	B		5	A
6	B		6	B
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

NINTH MODULE



Dark room and solutions preparation

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the film processing solutions , names of components of each solution so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. film processing solutions .
2. processing solution dark room .
3. film processing procedures .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for dark room requirements .
- 2-Determine the types solutions materials .
- 3-Understand the relation between processing solution .
- 4-Describe the procedure for preparation of solutions .

3/ Pre test

Put circle around the letter of the correct answer :

1.determine who is one of dark room components ?

- a. powders
- b. safe light
- c. evaporator
- d. all of them

2. .determine who is one of dark room components ?

- a. powders
- b. processing tank
- c. evaporator
- d. all of them

3. .determine who is one of dark room components ?

- a. powders
- b. bulb light
- c. Thermometer
- d. all of them

4. .determine who is one of dark room components ?

- a. powders
- b. timer
- c. evaporator
- d. all of them

5.the dark room must be ?

- a. light tight
- b. ventilated
- c. clean
- d. all of them

6-.determine who is one of dark room components ?

- a. powders
- b. safe light situated 3 feet from bench
- c. evaporator
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

The dark room:

The darkroom should be light tight, well ventilated, clean and efficient and it should contain:-

1. Safe light which should be situated at least 3 feet from the bench (usually they used red light).
2. Processing tank.
3. Thermometer.
4. Timer

Self test (1)

Fill in the blanks with suitable words

- 1-the dark room contain ----- light .
- 2-the darkroom must be efficient ----- .
- 3-the safe light must be ----- feet from the bench .

- Check your answers in the key answer page at the end of module

Automatic Processing

Automatic processors manufactured with different sizes and shapes some accept only small intra oral films where as others accept large size films. In automatic processors usually we use a concentrated solution.

This will reduce the processing time. In small tanks processors the solution strengths are easily weakened and under- development and under-fixing of films can result if the solutions are not changed often.

Self test (2)

What is the most concentration is used in automatic processing

- Check your answers in the key answer page at the end of module

Preparing processing solutions

Developer and fixer chemicals come in powder form or in liquid concentrates. Powdered chemicals must be mixed slowly with distilled water.

Liquid concentrates are more easily mixed, they are usually of good strength and are quickly mixed with water.

Processing solutions are changed in time (weakened) and need more time for the film to be fully processed. Many factors affect the strength of the developer solution:

- a. Temperature.
- b. Number of film processed.
- c. Amount of time the developer tank left uncovered.
- d. Force full agitation of the film holder this oxidation of the solution.

Instead of changing a weakened processing solutions the strength of the solution can be restored by adding a replenishing solution which comes usually with the processing solution Box.

Self test(3)

. how you can restore the solutions strength

Check your answer in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1.the processing solutions come in

- a. powder form
- b. mixture
- c. non of above
- d. all of above

2. the processing solutions come in

- a. liquid form
- b. mixture
- c. non of above
- d. all of above

3. the liquid processing solutions are

- a. difficult in mix
- b. easily in mix
- c. non of above
- d. all of above

4. the strength of processing solutions depend on

- a. manufacturer
- b. temperature
- c. non of above
- d. all of above

5- . the strength of processing solutions depend on

- a. manufacturer
- b. number of film processed
- c. non of above
- d. all of above

6. . the strength of processing solutions depend on

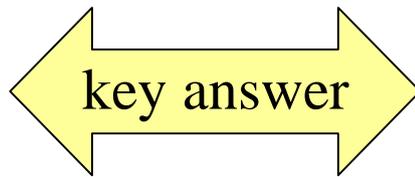
- a. time of un covered processing tank
- b. precipitate
- c. non of above
- d. all of above

Note :one degree for each answer

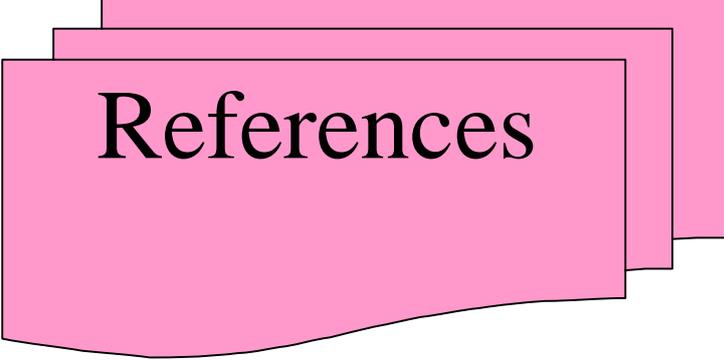
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	Answer
1	B	1-Soft 2-clean 3- 3 <u>Self test(2)</u> Concentrated Self test (3) Adding new fresh solution	1	A
2	B		2	A
3	C		3	B
4	B		4	B
5	D		5	B
6	B		6	A
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



References

1- Dental radiology for dental auxiliaries

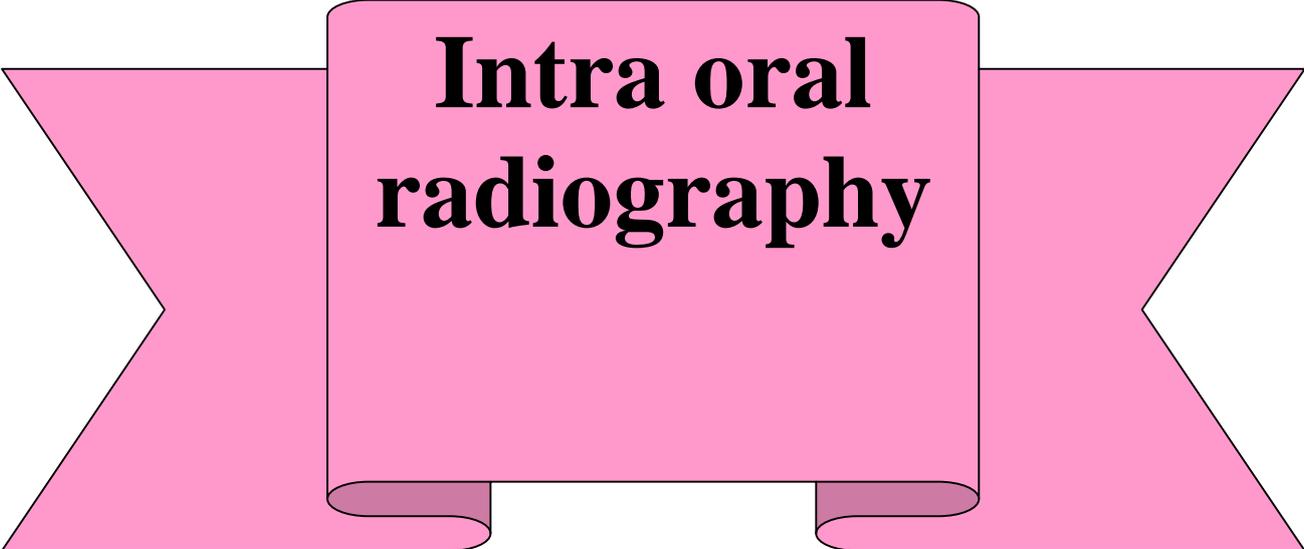
2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TENTH MODULE



Intra oral radiography



1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing the patient , names of components of each technique so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. intra oral radiography .
2. land marks of the face .
3. patient position .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea of patient imaging.
- 2-Determine the types of radiographing techniques .
- 3-Understand the relation between techniques .
- 4-Describe the radiographing procedure .

3/ Pre test

Put circle around the letter of the correct answer :

1. which technique in radiographing is used ?

- a. perpendicular
- b. bisecting the angle technique
- c. develop
- d. all of them

2. .which technique in radiographing is used ?

- a. perpendicular
- b. paralell technique
- c. develop
- d. all of them

3. .the techniques in radiographing are using ?

- a. land marks on the head
- b. extra oral landmarks
- c. develop
- d. all of them

4. one of the land marks of the head

- a. cheek
- b. ala of the nose
- c. ear
- d. all of them

5. one of the land marks of the head

- a. cheek
- b. tragus of the ear
- c. ear
- d. all of them

6- one of the land marks of the head

a. cheek

b. bregma

c.ear

d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Intra Oral Radiography

Intra oral radiography are of two basic techniques:-

- a. Bisecting the angle technique.
- b. Parallel technique.

These technique require the operator to locate the long axis of the teeth and position the X-ray beam. Accurate location of the long axis of the tooth is obtained by observing the crown of the tooth in the patient and using prior knowledge of the anatomy and shape of the tooth and some land marks of the head of the patient

Self test (1)

Fill in the blanks with suitable words

- 1-one of the radiographing technique is ----- .
- 2- one of the radiographing technique is ----- .
- 3-the techniques requires to locate the ----- &-----.

- Check your answers in the key answer page at the end of module

Landmarks on the head

The land marks are:-

1. Ala of the nose.
2. Tragus of the ear.
3. Bregma (soft skull opening found in the top of a baby's head located in the midline of the head slightly anterior to the center of the head.
4. Lower border of the mandible.

In general there are some information about the direction of the teeth:

1. The long axis of the maxillary incisors teeth points up word to the Bregma.
2. The long axis of the maxillary posterior teeth are mid way between the buccal and palatal roots.
3. The long axis of the maxillary canine is directed to the top of the nose.
4. The long axis of the mandibular incisor teeth are varies from tilting slightly foreword to backward.
5. Long axis of mandibular canine are vertical.
6. Long axis of the mandibular molar is the crown slightly tilted inward.
7. All the apicies of the maxillary posterior teeth are located at a line drawn from the ala of the nose to the tragus of the ear.
8. All apicies of mandibular incisor teeth are located less than 1 cm above the lower border of the mandibul
9. The position of the first molar teeth are on a line drawn from the pupil of the eye to the lower border of the mandibile (when the patient is looking forward)
10. The position of the 3rd molar teeth are on a line drawn about 1cm behind the corner of the eye perpendicular to ala tragus line.

Self test (2)

What are the land marks on the head of patient

- Check your answers in the key answer page at the end of module

Patient position

Patient position must be standardized by 2 planes:

1. Vertical plane: position the head with the help of the back of the chair so that the saggital plane is vertical and at right angle to the floor.
2. Horizontal or occlusal plane:

For the maxillary teeth: lower the patient head so that the ala tragus line is parallel to the floor.

For the mandible: move the chin upward and backward until the occlusal plane is parallel to the floor.

Self test(3)

- . What are the patient position
- Check your answer in the key answer page at the end of module .

5/ Post test

Put circle around the letter of the correct answer :

1. The long axes of maxillary incisors pointed to

- a. nose
- b. bregma
- c. non of above
- d. all of above

2. The long axes of maxillary posterior are

- a. between buccal and palatal plate
- b. bregma
- c. non of above
- d. all of above

3. The long axes of maxillary canine pointed to

- a. top of nose
- b. bregma
- c. non of above
- d. all of above

4. The long axes of mandibular incisors pointed to

- a. forwards
- b. backward
- c. all of above
- d. non of above

5- The long axes of mandibular canine is

- a. nose
- b. bregma
- c. vertical
- d. all of above

6. The long axes of mandibular molars are tilt to

- a. nose
- b. inward
- c. non of above
- d. all of above

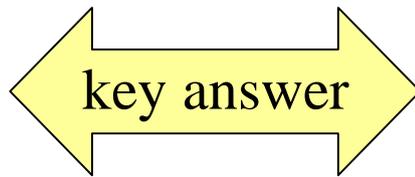
Note :one degree for each answer

-Check your answers in key answer page at the end of module

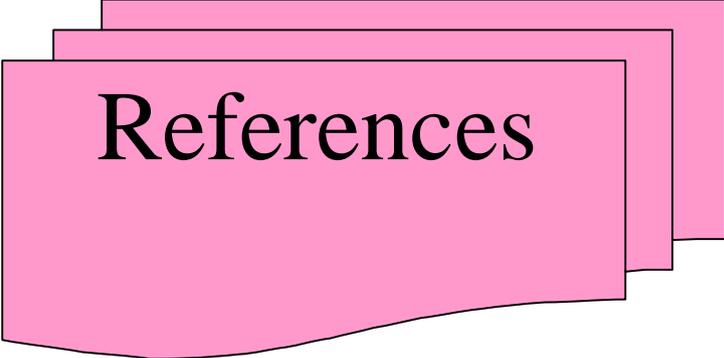
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	Answer
1	B	1-parallel 2-bisecting angle 3-long axes of tooth ,position of x ray beam <u>Self test(2)</u> Bregma Ala of the nose Tregeas of the ear Lower border of mandible <u>Self test (3)</u> Horizontal Vertical positions	1	B
2	B		2	A
3	A		3	A
4	B		4	D
5	B		5	C
6	B		6	B
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



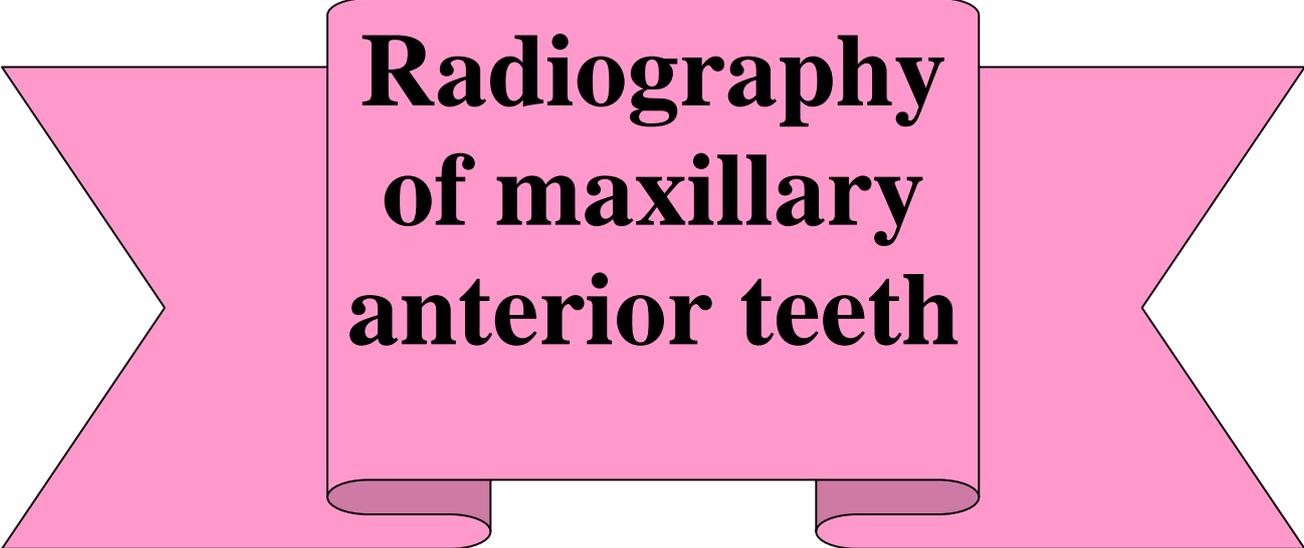
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

ELEVENTH MODULE



Radiography of maxillary anterior teeth

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing of the maxillary incisors ,patient position ,film positioning . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The bisecting angle technique .
2. maxillary incisors radiography .
3. patient ,film ,machine positioning .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for radiographing procedure .
- 2-Determine the positioning of patient .
- 3-Understand the relation between bisector and film .
- 4-Describe the procedure for radiographing .

3/ Pre test

Put circle around the letter of the correct answer :

1.determine who will hold the film inside patient mouth ?

- a. dentist
- b. patient
- c. non of above
- d. all of them

2. .the film edge extend above the incisal edge ?

- a. 0 mm
- b. 2 mm
- c. 3 mm
- d. all of them

3. the film supported inside the patient mouth by ?

- a. thumb
- b. index
- c. all fingers
- d. all of them

4. .the tube head adjusted to cover the teeth with ?

- a. palate
- b. root
- c. whole root with apex
- d. all of them

5.the roots locate at ?

- a. wing of the nose
- b. base of nose
- c. non of above
- d. all of them

6-.the central ray perpendicular to ?

- a. nose
- b. tooth
- c. bisector
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

The Bisecting angle technique

The theory of this technique is depend on the isometric triangle. The triangle used is ABX in which xA is equal to xB.

In Radiography the long axis of the tooth is xB and the film is xA with the film touching the incisal edge of the tooth at x. The operator is visually bisect the angle formed by the tooth and the film, and direct the X-ray beam perpendicular to the identified bisector when this is done the shadow of the apex B is cast on the film A in a distance equal to the long axis of the tooth.

If the central ray of the X-ray beam is directed at right angle to the long axis of the tooth the image is elongated.

If the central ray of the X-ray beam is directed at right angle to the long axis of the film the image is fore shortened.

Self test (1)

Fill in the blanks with suitable words

1-the x ray is perpendicular to the ----- .

2-the 2 sides of triangle are ----- .

3-the one side of the triangle is the film the other is -----.

- Check your answers in the key answer page at the end of module

The Maxillary Incision Radiography

The principles of maxillary incisors radiography are:

1. The film is held vertically by the patient thumb behind the 4 incisors with 2mm. of the film will extend below the incisal edge, so the other edge of the film will touch the palate the thumb is positioned near the incisal edge without excessively bending the film, if this occur a distorted tooth image will produced.
2. The tube head should be adjusted to cover the whole inciser teeth expected that the roots of the anterior teeth located at the wing of the nose.
3. The vertical angulation should be adjusted so the central ray perpendicular to the bisector (between the film and the tooth).
4. Horizontally the central ray is directed as close as possible through the inter proximal space of the central incisor.
5. The exposure time is 1 sec.

Self test (2)

Were the central radiation is adjusted horizontally

- Check your answers in the key answer page at the end of module

Maxillary canine radiography

The principles for maxillary canine radiography are:

1. The film is positioned in the patient mouth vertically behind the canine tooth covering the tooth from the tip of the crown to the apex which is located at the wing of the nose.

In the patients with narrow upper arches the film can not get in its right position so bending of part of the film is required, but the film must not be curved.

2. The tube head should be adjusted to cover the canine region. The central ray should be perpendicular to the bisector. The bisector is located close to a line drawn from the cusp of the same canine to the pupil.
3. Horizontally the X-ray beam is directed between the canine and the first premolar.
4. The exposure time is 1 sec.

Self test(3)

. the vertical angulation is perpendicular to

Check your answer in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1.the exposure time of incisors is

- | | |
|-----------------|-----------------|
| a. ½ sec | b. 1 sec |
| c. non of above | d. all of above |

2. the exposure time of canine is

- | | |
|-----------------|-----------------|
| a. ½ sec | b. 1 sec |
| c. non of above | d. all of above |

3. the x ray horizontally directed between canine and

- a. lateral incisor
- b. 1st premolar
- c. non of above
- d. all of above

4. the canine apex is locate at the

- a. mouth angle
- b. wing of the nose
- c. non of above
- d. all of above

5- . the film cover the suspected tooth and extend to the

- a. whole Neighbor tooth
- b. half the Neighbor tooth
- c. non of above
- d. all of above

6. . the film support must be

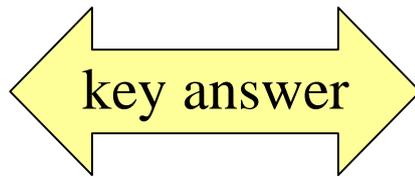
- a. gently
- b. firmly
- c. non of above
- d. all of above

Note :one degree for each answer

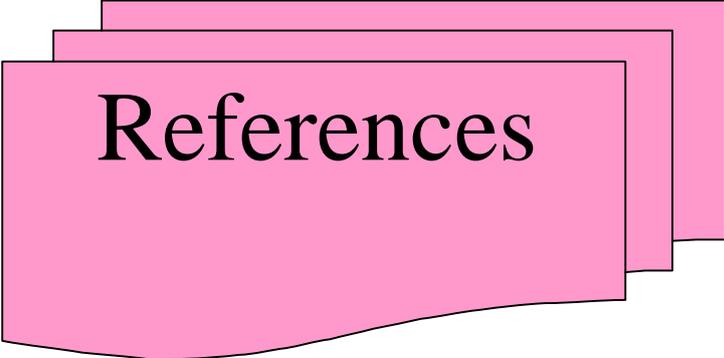
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	1.bisector 2-equal 3- long axes of tooth <u>Self test(2)</u> Inter proximal space between incisors Self test (3) the bisector is locate close to a line drawn from the cusp of the canine to the pupil	1	B
2	B		2	B
3	A		3	B
4	C		4	B
5	A		5	B
6	C		6	A
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



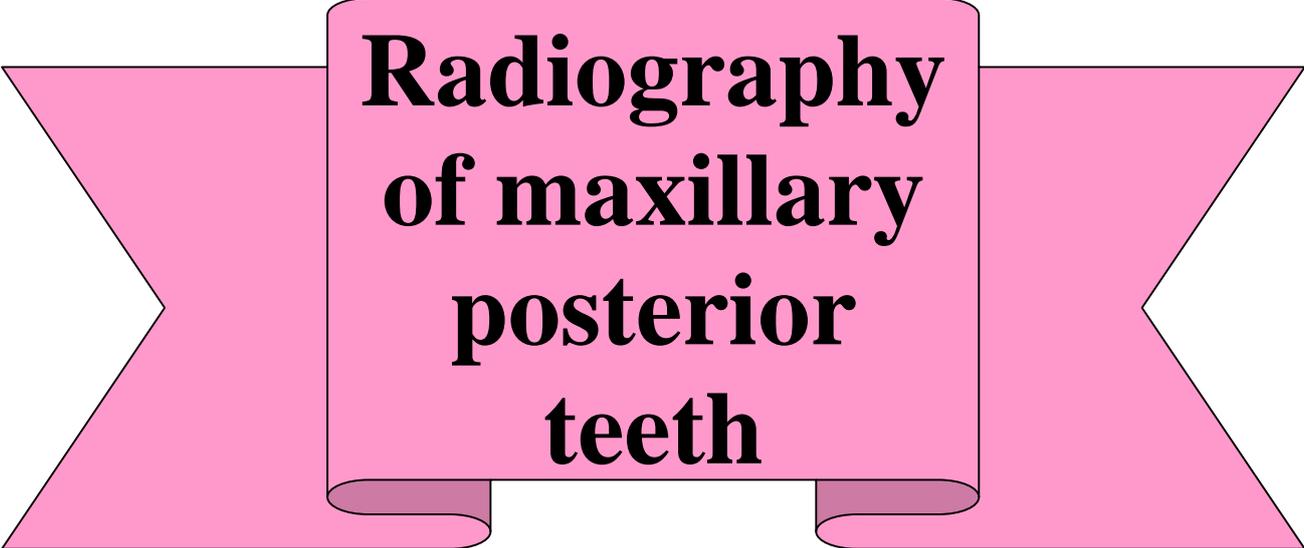
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWELFTH MODULE



Radiography of maxillary posterior teeth

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing of the maxillary posterior teeth ,patient position ,film positioning . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The bisecting angle technique .
2. maxillary posterior teeth radiography .
3. patient ,film ,machine positioning .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for radiographing procedure .
- 2-Determine the positioning of patient .
- 3-Understand the relation between bisector and film .
- 4-Describe the procedure for radiographing .

3/ Pre test

Put circle around the letter of the correct answer :

1.determine who will hold the film inside patient mouth ?

- a. dentist
- b. patient
- c. non of above
- d. all of them

2. .the film edge extend above the incisal edge ?

- a. 0 mm
- b. 1 mm
- c. 3 mm
- d. all of them

3. the film supported inside the patient mouth by ?

- a. thumb
- b. index
- c. all fingers
- d. all of them

4. .the tube head adjusted to cover the teeth with ?

- a. palate
- b. root
- c. whole root with apex
- d. all of them

5.the roots locate at ?

- a. ala tregious line
- b. base of nose
- c. non of above
- d. all of them

6-.the central ray perpendicular to ?

- a. nose
- b. tooth
- c. bisector
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Maxillary premolar radiography

The principles for maxillary premolar radiography are:

1. The film is positioned in the patient mouth horizontally the anterior boarder should be placed at the middle of the canine tooth. The lower boarder of the film should not extent more than 1mm. below the cusps. The film is held in its place with the thumb of the opposite hand of the patient without excessively pressing the film to the palate.
2. The central ray is positioned perpendicular to the bisector. Location of the bisector is obtained by a line connecting the buccal cusps of the premolar and the top of the nose between the eyes of the patients.
3. Horizontally the central ray should be between the premolar teeth.
The cheek should slightly retracted so the operator an see the premolar teeth.
4. The exposure time should be $1(1/4)$ sec.

Self test (1)

Fill in the blanks with suitable words

1-the x ray is perpendicular to the ----- .

2-the 2 sides of triangle are ----- .

3-the one side of the triangle is the film the other is -----.

- Check your answers in the key answer page at the end of module

Maxillary Molar Radiography

The principles for maxillary molar radiography are:

1. The film is positioned in the patient mouth similar to premolar teeth but it cover the molar teeth and posteriorly it should cover the tubercity area of the maxilla. The anterior boarder of the film should be placed at the middle of the second premolar.
2. Horizontal angulation should be adjusted to direct the beam between the molar teeth.
3. Vertical angulation should be adjusted so it is slightly more than that for the premolar teeth.

By adjusting the cone the patient cheek will prevent seeing the teeth so we can use some land mark indicating the positioning of the teeth. If we draw a line from the corner of the eye perpendicular to the ala-tragus line one inch behind this point will be the position of the third molar, roughly.

4. When the third molar is the tooth of interest the film is positioned slightly higher in the oral cavity the vertical angle is slightly greater and the tube head is positioned slightly distally.
5. Exposure time should be $1\frac{3}{4}$ sec.

Self test (2)

Were the central radiation is adjusted horizontally

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. the exposure time of premolars is

- a. $\frac{1}{2}$ sec
- b. $1 \frac{1}{4}$ sec
- c. non of above
- d. all of above

2. the exposure time of molars is

- a. $\frac{1}{2}$ sec
- b. $1 \frac{3}{4}$ sec
- c. non of above
- d. all of above

3. the x ray horizontally directed between premolar and

- a. lateral incisor
- b. premolar
- c. non of above
- d. all of above

4. the posterior teeth apex is locate at the

- a. mouth angle
- b. ala tregious line
- c. non of above
- d. all of above

5- . the film cover the suspected tooth and extend to the

- a. whole Neighbor tooth
- b. half the Neighbor tooth
- c. non of above
- d. all of above

6. . the film support must be

a. gently

b. firmly

c. non of above

d. all of above

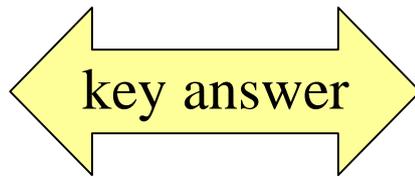
Note :one degree for each answer

-Check your answers in key answer page at the end of module

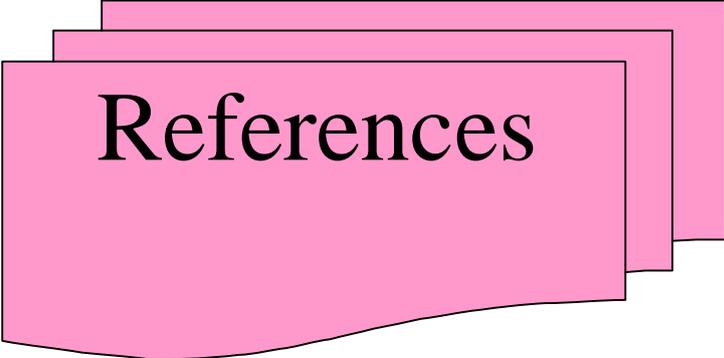
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	1.bisector 2-equal 3- long axes of tooth <u>Self test(2)</u> Inter proximal space between premolars	1	B
2	B		2	B
3	A		3	B
4	C		4	B
5	A		5	B
6	C		6	A
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



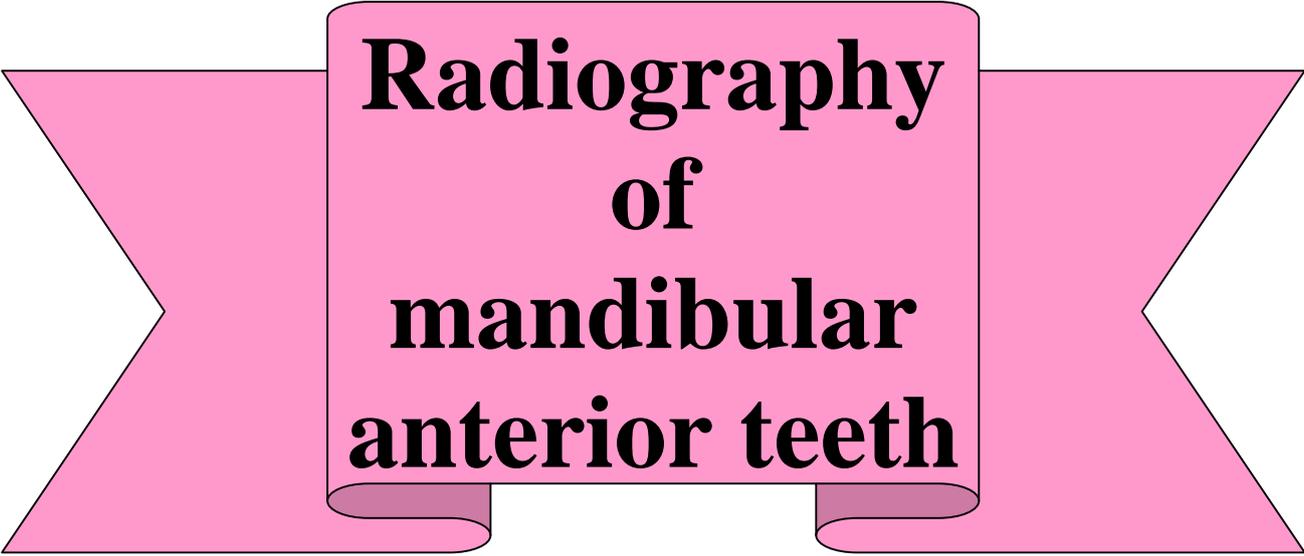
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

THIRTEENTH MODULE



Radiography of mandibular anterior teeth

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing of the mandibular incisors ,patient position ,film positioning . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The bisecting angle technique .
2. mandibular incisors radiography .
3. patient ,film ,machine positioning .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for radiographing procedure .
- 2-Determine the positioning of patient .
- 3-Understand the relation between bisector and film .
- 4-Describe the procedure for radiographing .

3/ Pre test

Put circle around the letter of the correct answer :

1.determine who will hold the film inside patient mouth ?

- a. dentist
- b. patient
- c. non of above
- d. all of them

2. .the film edge extend above the incisal edge ?

- a. 0 mm
- b. 2 mm
- c. 3 mm
- d. all of them

3. the film supported inside the patient mouth by ?

- a. thumb
- b. index
- c. all fingers
- d. all of them

4. .the tube head adjusted to cover the teeth with ?

- a. palate
- b. root
- c. whole root with apex
- d. all of them

5.the roots locate at ?

- a. 1cm above lower of mandible
- b. base of nose
- c. non of above
- d. all of them

6-.the central ray perpendicular to ?

- a. nose
- b. tooth
- c. bisector
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Mandibular incisor radiography

The principle for mandibular incisors radiography are:

1. In all mandibular radiograph the patient should be positioned with the occlusal plane of the mandible parallel to the floor when the patient mouth is opened.
2. The film is positioned vertically and placed gently under the patient tongue covering the lower 4 incisors and touching the incisal edge approximately more than 2mm. of the film will extend above the incisal edge.

The film will held by the thumb or index finger with the elbow is elevated with slight pressure on the lingual surface enough to stabilize the film without bonding the film.

3. Horizontally the tube head should be moved until the central beam is directed between the central incisor.
4. For vertical angulation the operator should identify the tooth axis, vertical film plane and the bisector. The central beam should be perpendicular to the bisector.
5. The exposure time should be (3/4) sec.

Self test (1)

Fill in the blanks with suitable words

1-the x ray is perpendicular to the ----- .

2-the 2 sides of triangle are ----- .

3-the one side of the triangle is the film the other is -----.

- Check your answers in the key answer page at the end of module

The mandibular Canine Radiography

The principles for mandibular canine radiography are:-

1. The film is positioned and held in the patient mouth in a manner similar to that for the incisor radiograph.

The film should be positioned with the canine in the middle of the film and is held by the index finger of the patient of the opposite side.

2. The horizontal angle of the beam is adjusted to direct the central ray between the canine and first premolar tooth.
3. The vertical beam is adjusted similar to that for the incisor teeth.
4. The exposure time is (3/4) sec.

Self test (2)

Were the central radiation is adjusted horizontally

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. the exposure time of incisors is

- a. $\frac{1}{2}$ sec
- b. $\frac{3}{4}$ sec
- c. non of above
- d. all of above

2. the exposure time of canine is

- a. $\frac{1}{2}$ sec
- b. $\frac{3}{4}$ sec
- c. non of above
- d. all of above

3. the x ray horizontally directed between canine and

- a. lateral incisor
- b. 1st premolar
- c. non of above
- d. all of above

4. the canine apex is locate at the

- a. mouth angle
- b. 1cm above lower border of mandible
- c. non of above
- d. all of above

5- . the film cover the suspected tooth and extend to the

- a. whole Neighbor tooth
- b. half the Neighbor tooth
- c. non of above
- d. all of above

6. . the film support must be

- a. gently
- b. firmly
- c. non of above
- d. all of above

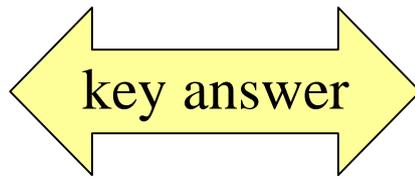
Note :one degree for each answer

-Check your answers in key answer page at the end of module

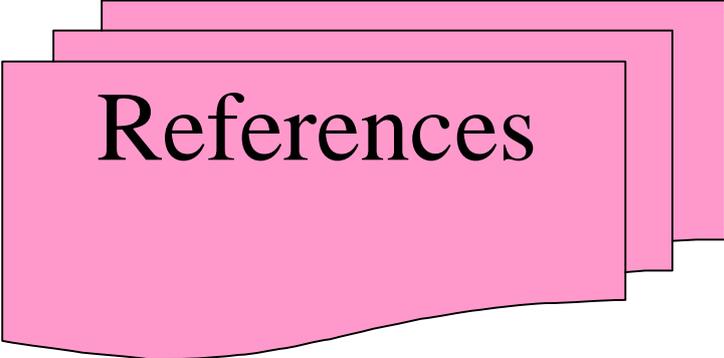
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



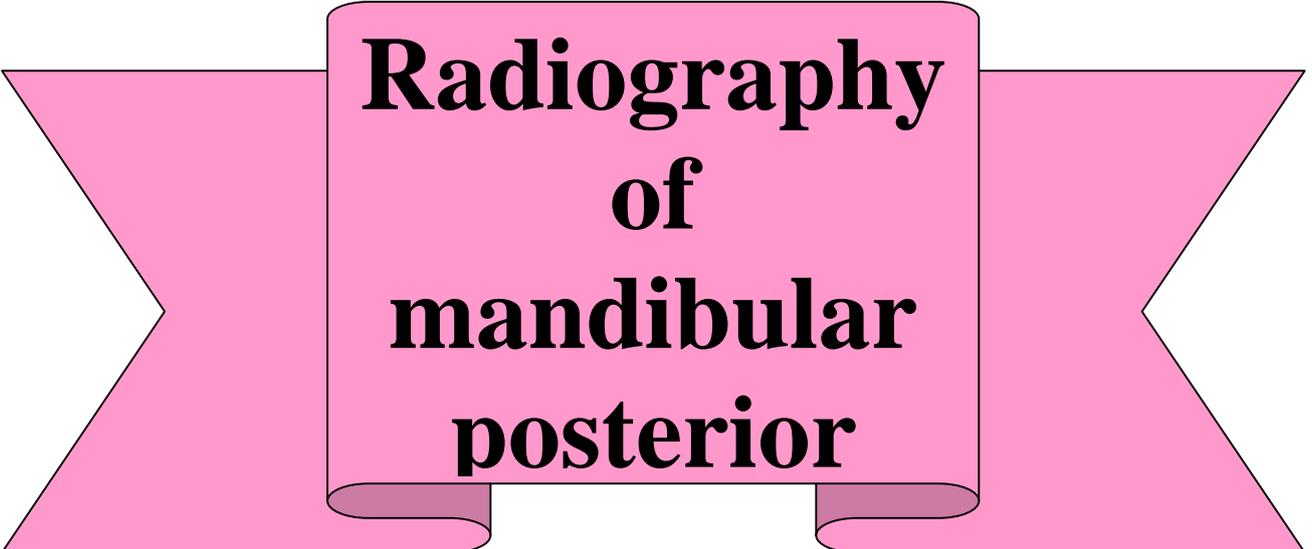
Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	Answer
1	B	1.bisector 2-equal 3- long axes of tooth Self test (2) Between the canine and 1 st premolar	1	B
2	B		2	B
3	A		3	B
4	C		4	B
5	A		5	B
6	C		6	A
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



References

- 1- Dental radiology for dental auxiliaries
- 2- Fundamentals of dental radiology 1978 .
- 3- Oxford Clinical dental radiology

FOURTEENTH MODULE



Radiography of mandibular posterior

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing of the mandibular posterior teeth ,patient position ,film positioning . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The bisecting angle technique .
2. mandibular posterior teeth radiography .
3. patient ,film ,machine positioning .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for radiographing procedure .
- 2-Determine the positioning of patient .
- 3-Understand the relation between bisector and film .
- 4-Describe the procedure for radiographing .

3/ Pre test

Put circle around the letter of the correct answer :

1.determine who will hold the film inside patient mouth ?

- a. dentist
- b. patient
- c. non of above
- d. all of them

2. .the film edge extend above the incisal edge ?

- a. 0 mm
- b. 1 mm
- c. 3 mm
- d. all of them

3. the film supported inside the patient mouth by ?

- a. thumb
- b. index
- c. all fingers
- d. all of them

4. .the tube head adjusted to cover the teeth with ?

- a. palate
- b. root
- c. whole root with apex
- d. all of them

5.the roots locate at ?

- a. 1 cm above lower border of mandible
- b. base of nose
- c. non of above
- d. all of them

6-.the central ray perpendicular to ?

- a. nose
- b. tooth
- c. bisector
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

The Mandibular Premolar Radiography

The principle for mandibular premolar radiography are:

1. The film is placed in the patient mouth horizontally with the anterior boarder of the film at the middle of the canine covering both premolars with about 1 mm of the film above the cusps of these: teeth because of the length of these teeth.

The lower boarder of the film should be placed at the base of the tongue between the fold of the lingual gland and the base of the tongue. Pressure of the film to the lower gingival is painful to the patient because the gingival in this area is thin and there is bone underneath it.

2. The patient should held the film with the index finger of the opposite hand with the elevation of the arm so that well controlled pressure will applied to the film to hold it in its correct place.
3. Horizontally the X-ray beam is directed to pass between the premolar teeth.
4. The vertical angulations is adjusted to be perpendicular to the long axis of the tooth.
5. The exposure time should be 1 sec.

Self test (1)

Fill in the blanks with suitable words

1-the x ray is perpendicular to the ----- .

2-the 2 sides of triangle are ----- .

3-the one side of the triangle is the film the other is -----.

- Check your answers in the key answer page at the end of module

The Mandibular Molar Radiography

The principles for mandibular molar radiography are:-

- 1- The film is placed in the mouth deep in the same way as in the premolar area. The posterior board or of the film should cover the third molar.
- 2- The vertical angle of the beam is approximately
The same as that for the premolar teeth.
- 3- Horizontal angulation is adjusted to direct the X-ray beam between the teeth. Exposure time is $1(1/4)$ sec

Self test (2)

Were the central radiation is adjusted horizontally

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1.the exposure time of premolars is

- | | |
|----------------------|-----------------|
| a. $\frac{1}{2}$ sec | b. 1 sec |
| c. non of above | d. all of above |

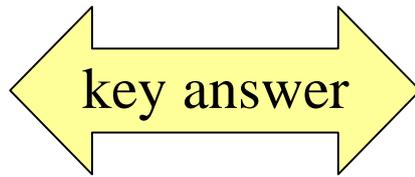
2. the exposure time of molars is
- a. $\frac{1}{2}$ sec
 - b. $1 \frac{1}{4}$ sec
 - c. non of above
 - d. all of above
3. the x ray horizontally directed between premolar and
- a. lateral incisor
 - b. premolar
 - c. non of above
 - d. all of above
4. the posterior teeth apex is locate at the
- a. mouth angle
 - b. 1 cm above mandibular border
 - c. non of above
 - d. all of above
- 5- . the film cover the suspected tooth and extend to the
- a. whole Neighbor tooth
 - b. half the Neighbor tooth
 - c. non of above
 - d. all of above
6. . the film support must be
- a. gently
 - b. firmly
 - c. non of above
 - d. all of above

Note :one degree for each answer

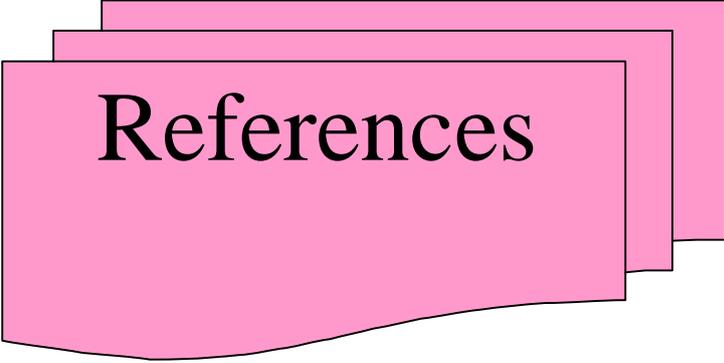
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	1.bisector 2-equal 3- long axes of tooth <u>Self test(2)</u> Inter proximal space between premolars	1	B
2	B		2	B
3	A		3	B
4	C		4	B
5	A		5	B
6	C		6	A
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



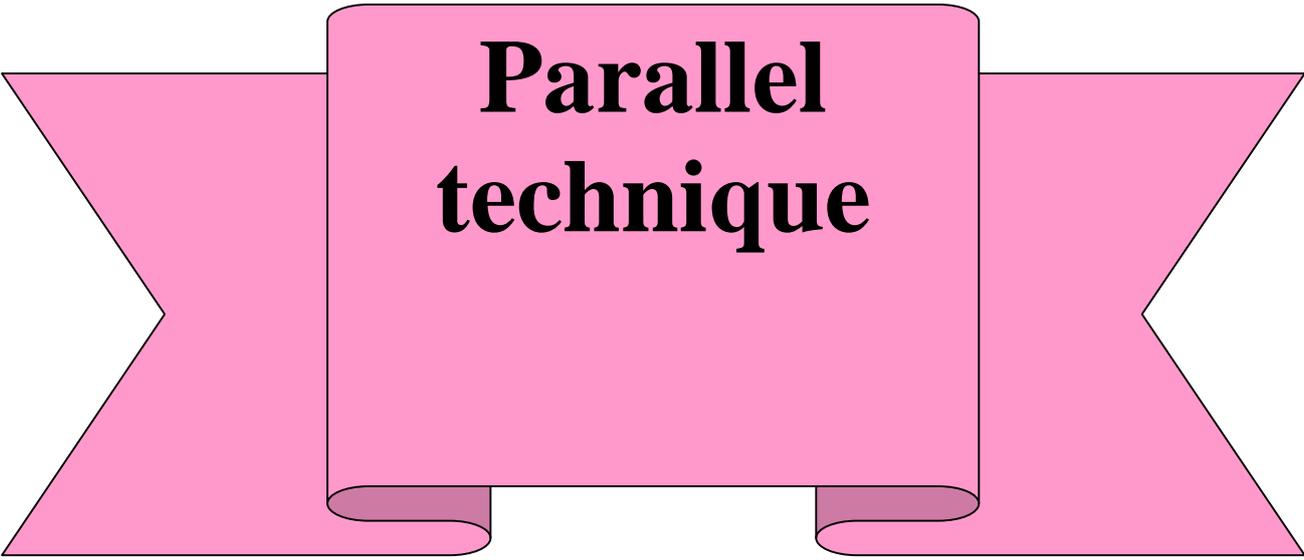
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

FIFTEENTH MODULE



Parallel technique

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing of the teeth with parallel technique . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The parallel technique .
2. film positioning .
3. film holders .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for parallel technique .
- 2-Determine the position of film .
- 3-Understand the relation between the tooth and film .
- 4-Describe the procedure for radiographing .

3/ Pre test

Put circle around the letter of the correct answer :

1. determine who will parallel the film inside patient mouth ?

- a. dentist
- b. long axis of tooth
- c. non of above
- d. all of them

2. .the x ray perpendicular to ?

- a. 0 mm
- b. tooth
- c. 3 mm
- d. all of them

3. .the x ray perpendicular to ?

- a. film
- b. tooth
- c. 3 mm
- d. all of them

4. .the film is attached to ?

- a. palate
- b. root
- c. film holder
- d. all of them

5. the type of cone used with parallel technique is ?

- a. 16 inch
- b. 8 inch
- c. non of above
- d. all of them

6-.for full mouth radiography we need ?

- a. 9 film
- b. 20 film
- c. 21 film
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Parallel Technique

The principle of this technique is positioning the film parallel to the long axis of the tooth and direction of the X-ray beam perpendicular to the tooth and film.

To maintain this position the film is usually attached to a bite-block or some other type of film holder.

Usually in this technique they used long cone device (16 inches) to maintain proper image size and sharpness.

Using this technique the images of the teeth appear more closely resembling the teeth itself and the error of getting the same length of the teeth is less in this technique.

In this technique they used narrow films for the anterior region to permit placing the film in a parallel position to the tooth. So for full mouth radiography they used to have 21 film instead of 14 film.

Self test (1)

Fill in the blanks with suitable words

1-the x ray is perpendicular to the ----- .

2- the x ray is perpendicular to the -----

3-the cone is -----.

- Check your answers in the key answer page at the end of module

Film holders

There are many types of film holders some are simple others are complex, some are disposable, others need autoclaves. The most available types are:

1- Tongue blade: this is used for maxillary teeth it is mostly used because it is easy to be used and cheap and disposable.

2- Bite-Block, is the most common type of film holder.

The film is held in its position in a slit in the block and the patient bit on the horizontal portion of the bite-block. The great advantage of this block is that the patient does not use his hand.

3- Beam-aligning holders:-

This is a complicated device attached to the tube head and holding the film in its place in the patient mouth. All these devices can direct the X-ray beam correctly to the film.

Self test (2)

Are all types of holder disposable

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. most available film holders

- a. plate
- b. tong blade
- c. non of above
- d. all of above

2. most available film holders

- a. plate
- b. Bite - block
- c. non of above
- d. all of above

3. most available film holders

- a. plate
- b. beam aligning holder
- c. non of above
- d. all of above

4. the x ray perpendicular to

- a. mouth angle
- b. film and ooth
- c. non of above
- d. all of above

5- . the type of films are

- a. whole Neighbor tooth
- b. narrow type
- c. .
- c . non of above
- d. all of above

6. . the length of tooth in this technique is

- a. closely to natural
- b. approximate
- c. non of above
- d. all of above

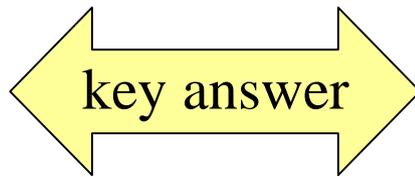
Note :one degree for each answer

-Check your answers in key answer page at the end of module

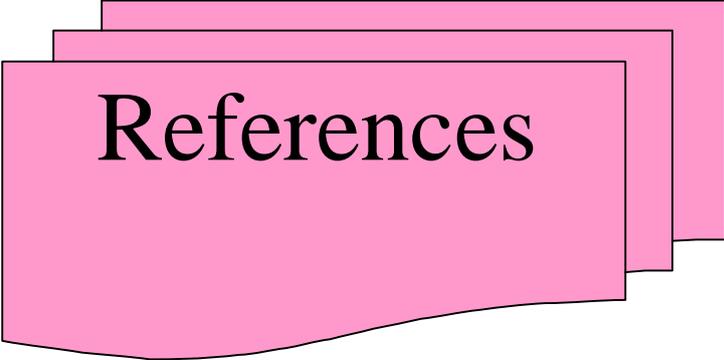
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	1.tooth 2-film 3- 16 inch <u>Self test(2)</u> Disposable and auto cleavable	1	B
2	B		2	B
3	A		3	B
4	C		4	B
5	A		5	B
6	C		6	A
<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more you do not need to proceed. - less than 5 you have to study this module well . 			<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again 	



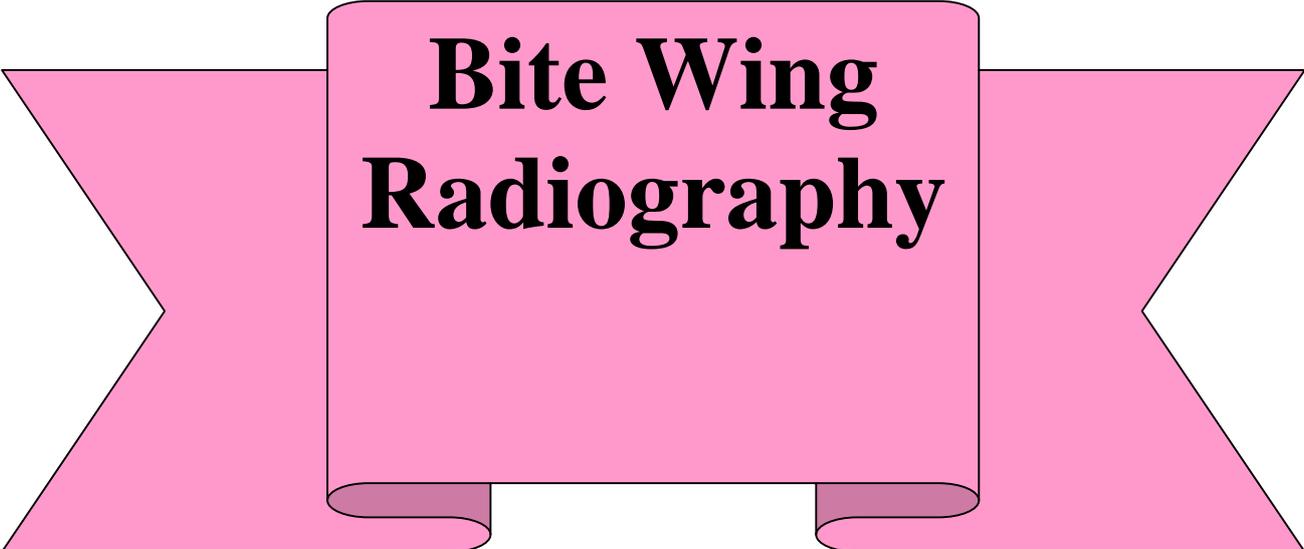
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

SIXTEENTH MODULE



Bite Wing Radiography

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing of the teeth with bite wing technique . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The bite wing radiography technique .
2. film positioning .
3. x ray machine position .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for Bite wing technique .
- 2-Determine the position of film .
- 3-Understand the relation between the tooth and film .
- 4-Describe the procedure for radiographing .

3/ Pre test

Put circle around the letter of the correct answer :

1.the bite wing radiography show ?

- a. teeth
- b. proximal surfaces of teeth
- c. non of above
- d. all of them

2. .the bite wing radiography show ?

- a. teeth
- b. crest of alveolar bone
- c. non of above
- d. all of them

3. .the x ray film of bite wing is ?

- a. film
- b. ordinary PA film
- c. occlusal film
- d. all of them

4. the x ray of bite wing is perpendicular to ?

- a. teeth
- b. PA film
- c. film
- d. all of them

5. the films of bite wing for one side ?

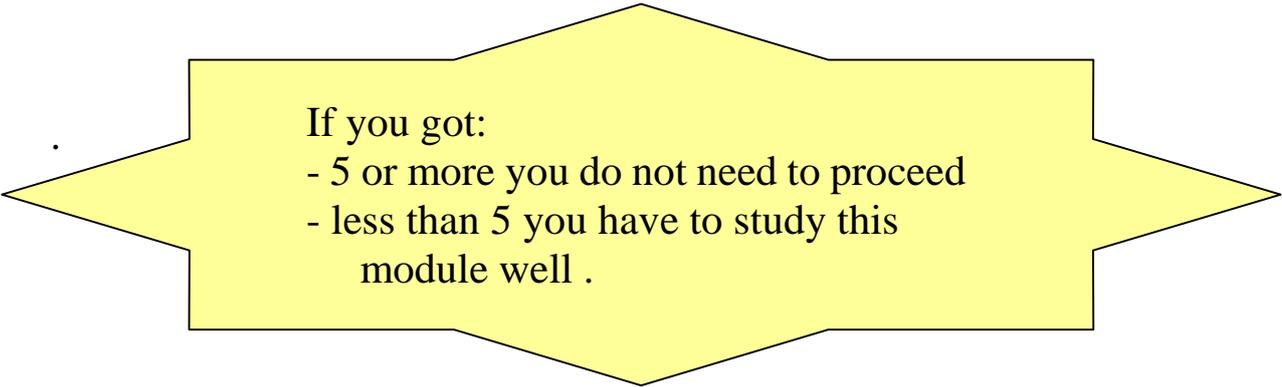
- a. 2
- b. 4
- c. 3
- d. all of them

6-.the machine vertical angulation is ?

- a. 9
- b. 7
- c. +8
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module



If you got:
- 5 or more you do not need to proceed
- less than 5 you have to study this
module well .

4/ the module contents

Bite-wing radiography

The bite-wing radiograph is made to show that proximal surfaces of the teeth and the crest of the alveolar bone of both the maxilla and mandible on the same film.

Two films of the standard peri apical size (one for the premolar and the other for the molar are usually needed on each side of the adult patient.

The bite-wing film has a film tab projecting from one side or it can be constructed by placing a standard peri apical film in a bite-wing loop.

Self test (1)

Fill in the blanks with suitable words

1-the x ray is perpendicular to the ----- .

2- the x ray is perpendicular to the -----

3-the film is -----.

- **Check your answers in the key answer page at the end of module**

Radiographing of premolars

The film for the premolar bite-wing radiograph. Positioned in the patient mouth By placing the lower half between The tongue and mandibular teeth With the anterior boarder at The time of the canine. The

Patient is asked to close slowly and occludes the upper and lower teeth holding the film tab firmly between the teeth.

Mistakes might occur by pushing the film more downward by the gingival or cusps of upper teeth when the film attached to them. This problem can be avoided by using a thin instrument pushing the film slightly keeping the upper edge of the film away from any obstructions when the patient closes his mouth with the film in position

the X-ray beam is directed with a small vertical angle ($+8^\circ$) or the central ray is directed slightly downward to the occlusal plane.

The horizontal angle is obtained by directing the central ray between the premolars.

The molar bite-wing is positioned similar to the premolar film but with the posterior border slightly distal to the third molar. The vertical angulation of the beam is the same as for the premolar and horizontal angulation is direct the beam between the molars.

Patient's with missing teeth can present a problem for proper closure of teeth on the bite-wing film tab resulting in the film being mal positioned. The crowns of missing teeth can be replaced with cotton rolls or patient's denture, if the patient has a denture made with out metal materials.

Self test (2)

The anterior age of the film for premolar is locate at

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1.the horizontal angulation for premolar is directed between

- a. plate
- b. premolars
- c. non of above
- d. all of above

2 the horizontal angulation for molar is directed between

- a. plate
- b. molars
- c. non of above
- d. all of above

3. the vertical angulation for premolar is directed at

- a. +7
- b. +8
- c. non of above
- d. all of above

4. the vertical angulation for molar is directed at

- a. +7
- b. +8
- c. non of above
- d. all of above

5- . for loop support of bit wing film for edentulous patient

- a.Neighbor tooth
- b. cotton rolls
- c. .
- c . non of above
- d. all of above

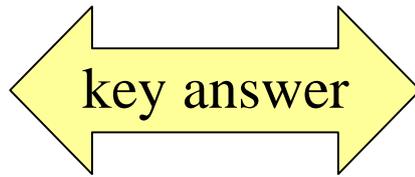
6. . the crest of bon of tooth in this technique is appear
- a. for maxillary and mandibular
 - b. approximate
 - c. non of above
 - d. all of above

Note :one degree for each answer

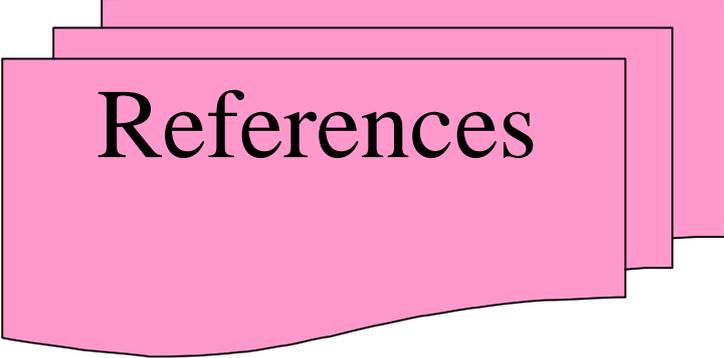
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	B	1.tooth 2-film 3- standard PA film <u>Self test(2)</u> Mid of canine	1	B
2	B		2	B
3	A		3	B
4	C		4	B
5	A		5	B
6	C		6	A



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

SEVENTEENTH MODULE



Radiographic Quality

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphing quality & artifacts . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The radiographing quality .
2. artifacts definition .
3. artifact classification .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for radiografing quality .
- 2-Determine the factors that affect on radiograph quality .
- 3-Understand the relation between the factors .
- 4-Describe the classification of artifacts .

3/ Pre test

Put circle around the letter of the correct answer :

1.the radiographic quality is affected by ?

- a. teeth
- b. density
- c. non of above
- d. all of them

2. the radiographic quality is affected by ?

- a. teeth
- b. contrast
- c. non of above
- d. all of them

3. the radiographic quality is affected by ?

- a. teeth
- b. sharpness
- c. non of above
- d. all of them

4. the sharpness ,density ,contrast affected by ?

- a. KVP
- b. PA film
- c. film
- d. all of them

5. the sharpness ,density ,contrast affected by ?

- a. MA
- b. PA film
- c. film
- d. all of them

6-. the sharpness ,density ,contrast affected by ?

- a. speed of film
- b. PA film
- c. film
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Radiographic Quality and Artifacts

Radiographic quality or the diagnostic quality of the image seen in a radiograph is affected by:

- a. Density.
- b. Contrast.
- c. Sharpness

Density

Is the over all blackening of the film.

Contrast

(or gradation) is the differences in density between the areas of radiograph that have different densities.

Sharpness

(or resolution) is the ability of radiograph to define the image of the object clearly.

There are many factors affecting the density, contrast and sharpness form these factors are:

1. KVP. (Kilo voltage).
2. MA (Milli amperage).
3. Speed of the film.
4. Processing.
5. Collimation and filtration

6. Object film distance.
7. Focal spot- film distance.
8. Movement of (tube, patient, film)
9. Focal spot size.

Self test (1)

Fill in the blanks with suitable words

1-the sharpness is ----- .

2- the density is -----

3-the contrast is -----.

- **Check your answers in the key answer page at the end of module**

Artifacts

In any evaluation of radiograph film faults and artifacts must be considered. This will include errors and artifacts due to:

- a. Radiographing the patient.
- b. Processing technique.

Artifacts and errors due to radiographing the patient

1. Cone cut: this is the most common one which might occur because the beam of radiation did not completely cover the film, so a clear round unexposed area resulted.
2. Film exposed in the opposite side (non exposure side):
When the film is placed with the non exposure side toward the teeth, a light radiograph having a hammering bone or some other characteristic pattern results.
3. Double exposure: when the film exposed twice, excessive density and two image will result.

4. Elongation: when the central beam of the X-ray is directed perpendicular to the tooth (decrease vertical angulations) elongation of the tooth will occur.
5. Shortening: when the central beam of X-ray is directed perpendicular to the film (increase vertical angulations) shortening of the tooth will occur.
6. Curved film: when the film is positioned in the patient mouth curve and not straight distortion of the image will occur.

Self test (2)

The artifacts are divided to

- Check your answers in the key answer page at the end of module

Artifacts due to processing technique

1. Static electricity: when the film are forcefully unwrapped or if the film is flexed to make it less stiff, multiple black linear streaks can result.
2. Pressure by finger nail: a finger nail often cause such a pressure which appear in the radiograph as a crescent-sharped artifact black in color.
3. Undeveloped area: when the film is not completely imonersed in the developer a clear area will developed.
4. Bending the film: when the film is bent a black-line will be produced at the area.
5. Reticulation: when the film is subjected to a great changes in temperature between the different processing solution, film emulsion often cracks and reticulation occur.

6. Finger print: when excessive pressure produced by the finger to the film, a dark lines will appear as a finger markin the radiograph.
7. Drops from hands or from dirty bench are splashed on the film before developing a white spots (radio opaque) area will be produced.

Self test (3)

Mention tree of artifacts due to processing

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. the sharpness ,density ,contrast affected by ?

- a. patient
- b. processing
- c. film
- d. all of them

2 the sharpness ,density ,contrast affected by ?

- a. patient
- b. collimation
- c. film
- d. all of them

3 the sharpness ,density ,contrast affected by ?

- a. patient b. object film distance
- c. film d. all of them

4. the sharpness ,density ,contrast affected by ?

- a. focal spot –film distance b. object distance
- c. film d. all of them

5. the sharpness ,density ,contrast affected by ?

- a. movement of (tube ,patient, film) b. object distance
- c. film d. all of them

6. the sharpness ,density ,contrast affected by ?

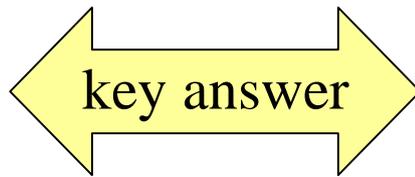
- a. focal spot size b. object distance
- c. film d. all of them

Note :one degree for each answer

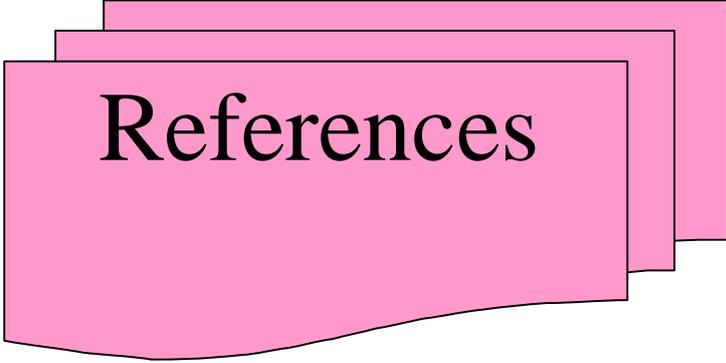
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	<u>Self test (1)</u>	Question no.	answer
1	B	Density Is the over all blackening of the film.	1	B
2	B	Contrast (or gradation) is the differences in density between the areas of radiograph that have different densities.	2	B
3	B		3	B
4	A		4	A
5	A		5	A
6	A	Sharpness (or resolution) is the ability of radiograph to define the image of the object clearly.	6	A
		<u>Self test(2)</u> a. Radiographing the patient. b. Processing technique.		
		<u>Self test(3)</u> Static electricity Pressure by finger Finger print		



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

EIGHTEENTH MODULE



**Radiographic
Anatomy**

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radio graphic anatomy . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The radiographic anatomy .
2. the land marks of maxillary arch .
3. the land marks of mandible arch .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for radio graphical anatomy .
- 2-Determine the land marks of maxilla .
- 3 determine the land mark of mandible .
- 4-Describe the procedure for landmarks identification .

3/ Pre test

Put circle around the letter of the correct answer :

1.the four incisors in mandible are ?

- a. same size
- b. differ in sizes
- c. non of above
- d. all of them

2. .the canine in mandible has ?

- a. curved root
- b. root longer than incisors
- c. 3 mm
- d. all of them

3. .the 1st premolar in mandible has ?

- a. 1 root
- b. 3 roots
- c. 2 roots
- d. all of them

4. the 2nd premolar in mandible has ?

- a. 1 root
- b. 3 roots
- c. 2 roots
- d. all of them

5. the 1st molar in mandible has ?

- a. 1 root
- b. 3 roots
- c. 2 roots
- d. all of them

6-the mental foramen located in mandible at ?

- a. canine root
- b. between roots of premolars
- c. molars
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Land marks of the mandible

The mandibular incisal region has small four teeth that are similar in size and shape. The lower boarder of the mandible is formed by a thick radio opaque cortical plated of bone. The lingual foramen is situated on the lingual surface of the bone below the apices of incisor teeth. In the same area there are bony projections called genial tubercles.

The mandibular canine has a root that is slightly longer than the roots of the incisors. The mandibular premolar have a small lingual cusps and tend to have a single root. But rarely it might have 2 roots. The mental foramen is located in this area and thus it will shows in this radiograph.

Posteriorly the external oblique and my lohyoid lines are heavy bone ridges on the outer and inner surfaces of the body of the mandible. Within the bone the mandibular canals lies below the apices of the molar teeth between its opening at the inner surface of the ramus and the mental foramen. The canal appears radiographically as a radiolucent band of uniform width which sometimes appear to be bordered by tow thin radio opaque lines.

Mandibular molars have two roots and many small cusps. The external oblique line crosses the roots of the second and third molars. The roots and the crowns appear to be tilt posteriorly.

Self test (1)

Fill in the blanks with suitable words

1-the incisors have same ----- .

2- the canine is directed -----

3-the 1st molar roots are -----.

- Check your answers in the key answer page at the end of module

Land Marks of the Maxilla

The maxillary incisor region has teeth of different sizes. Two big central incisors with 2 smaller lateral incisors. Between the two central incisors lies a radiolucent median palatine suture positioned vertically on the radiograph surrounded by a thick bone.

The incisive foramen is an oval shaped radiolucency between the apices of central incisors. The anterior nasal spine appear as a V-shaped radio opacity above the incisive foramen. The nasal cavities are also appear as a 2 radiolucency above the roots of the incisors.

The canine has root which is much longer than the lateral incisor and first premolar. The apex of this tooth lies at the lateral boarder of the floor of the nasal fossa.

Distal to the root lies the maxillary sinus. So in canine radiograph the floor of the nasal cavity with the wall of the maxillary sinus appear as a radio opaque lines crossing each other.

The maxillary premolar and molar region contain the maxillary sinus and sometimes the Zygomatic arch, pterygoid plates with hamular process and maxillary tubercity. Sometimes the coroniod process of the mandible appear.

The Zygomatic arch forms a U- shaped structure at its anterior attachment to the maxilla above the first and second molar tooth. The maxillary sinus varies greatly in size.

The sinus floor may lie above the apicies of the teeth or may dop down between the roots of the teeth. The sinus may also have bony partitions or septa dividing it into more than one compartment. The alveolar ridge ends at the maxillary tubrocity and thus the boarder of bone is directed upward.

Distal to the maxillary tubrocity two thin tpyrygioid bony plates lies. These plates are not commonly seen in the intra oral radiogrpah.

Maxillary sinus septa may or may not be seen in the radiograph, depending on the direction of the X-ray beam during radiography. When the X-ray beam is directed in the same direction as the septa, the septa may absorb enough X-rays to appear as a thin radio opaque line.

Self test (2)

Fill in the blanks with suitable words

- 1-the incisors have ----- .
- 2- the canine is directed -----
- 3-the 1st molar roots are -----.

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1.the four incisors in maxilla are ?

- a. same size
- b. differ in sizes
- c. non of above
- d. all of them

2. .the canine in maxilla has ?

- a. curved root
- b. root longer than incisors
- c. 3 mm
- d. all of them

3. .the 1st premolar in maxilla has ?

- a. 1 root
- b. 3 roots
- c. 2 roots
- d. all of them

4. the 2nd premolar in maxilla has ?

- a. 1 root
- b. 3 roots
- c. 2 roots
- d. all of them

5. the 1st molar in maxilla has ?

- a. 1 root
- b. 3 roots
- c. 2 roots
- d. all of them

6-the incisive foramen located in maxilla at ?

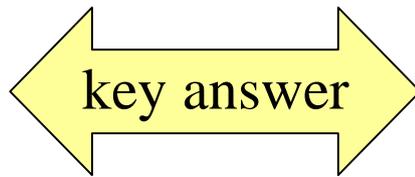
- a. canine root
- b. between incisors roots
- c. molars
- d. all of them

Note :one degree for each answer

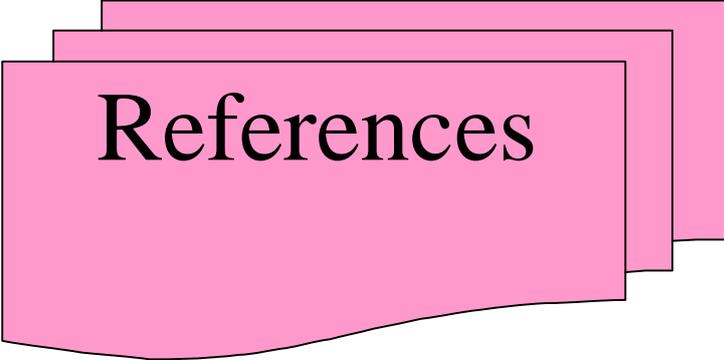
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.roots 2-vertically 3- 3 <u>Self test(2)</u> 1-deferent root length 2-lateral border of the floor of the nose 3- 2	1	B
2	B		2	B
3	A		3	C
4	A		4	A
5	C		5	B
6	B		6	B
If you got: - 5 or more you do not need to proceed. - less than 5 you have to study this module well .			If you got: - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again	



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

NINETEENTH MODULE



Film mounting

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the film mounting . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The film mounting .
2. the steps for film mounting .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for film mounting .
- 2-Determine the steps of film mounting .
- 3 determine the land mark of film mounting .
- 4-Describe the procedure for film mounting .

3/ Pre test

Put circle around the letter of the correct answer :

1.the 1st step is to determine ?

- a. same size
- b. dote on the film
- c. non of above
- d. all of them

2. the 2nd step is to determine ?

- a. same 1st step
- b. the film for maxilla or mandible
- c. non of above
- d. all of them.

3. the 3rd step is to determine ?

- a. same1st step
- b. same step 3
- c. Determine the side
- d. all of them.

4. the 4th step is to determine ?

- a. same1st step
- b. same step 3
- c. Determine the side
- d. the teeth area

5. after mounting the apices must be directed ?

- a. out ward
- b. in ward
- c. non of above
- d. all of them

6-the mesial side of maxillary premolars is ?

- a. mesial to canine
- b. distal to the canine
- c. distal to molars
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Film Mounting

Film mounting mean identification of the tooth area in the radiograph and placing the radiograph in its correct position in the mount. To do this procedure the following steps should be recognized:

1. The first step in film mounting is identification of the dot on the film. All the intra oral films contain dots and a depression of the other side. So the radiograph should be hold with the raised bumb facing the operator.
2. The second step is to determine whether the radiograph is for the maxilla for the mandibule usually in the mandibular teeth the image of the cortical plate beyond the apiceis of the teeth can be seen while in maxillary teeth the radiolucancy of the sinus or nasal cavity can be seen. The zygomatic bone shadow can also be seen only on maxillary molar radiograph. A large canal and a thick cortical plate can also be seen distal to the third molar area of the mandible. A tubrocity and hamular process distal to the third molar area is seen only in the maxilla. Maxillary teeth have unequally sized incisors, two rooted premolars with two large cusps, and three rooted molars while mandibular teeth have small similarly sized incisors, single rooted premolars with un evenly sized cusps, and two rooted molars.

When the radiograph is identified as a maxillary or mandibular radiograph, it is positioned with the apices of teeth pointed up word for the mandible. The operator is cautioned not to “turn over” the radiograph as this would reverse the first step of the film mounting and identify the patient’s side incorrectly in the next step.

3. The third step in film mounting is to identify the side of the patient seen in the radiograph. This is done by identifying which border of the radiograph is the mesial border and which is the distal. In cases of the incisors radiograph both sides of the radiograph are the distal side.

Obviously incisors are mesial to the canine and the canine are mesial to the molars. Usually the roots of the teeth tend to curve distally. The zygomatic arch curves distally from its U-shaped image above the maxillary first and second molars. The mandibular canal travels distally from the mental foramen.

The maxillary tubercity and external oblique line are at the distal ends of the alveolar ridge. The incisive and lingual foramen. The anterior nasal spine, and genial tubercles are all in the mesial midline.

When the third step completed, the radiograph is identified as being in a particular quadrant of the dentition, that is in the maxillary left or right region or mandibular left or right region.

4. The final step is to identify whether the radiograph shows the incisor, canine, premolar, or molar area.

The radiograph is now identified as to area, right or left, and mandible or maxilla, it is now placed in its correct position in the film mount.

When all the films are mounted the operator should look at the set as whole and be sure that all the root apices are directed out word and that the area of each radiograph overlap properly with the adjacent radiographs.

Self test (1)

Fill in the blanks with suitable words

1-film mounting mean ----- the tooth area .

2- all the dental film contain -----

3-the raised dome must ----- the operator .

- [Check your answers in the key answer page at the end of module](#)

5/ Post test

Put circle around the letter of the correct answer :

1.the four incisors in maxilla are ?

- | | |
|------------------|--------------------|
| a. in the middle | b. differ in sizes |
| c. non of above | d. all of them |

2. .the canine in maxilla is ?

- | | |
|----------------|------------------------|
| a. curved root | b. mesial to premolars |
| c. 3 mm | d. all of them |

3. the premolars in maxilla ?

- a. 1 root
- b. 3 roots
- c. mesial to molars
- d. all of them

4. molars in maxilla are ?

- a. 1 root
- b. larger
- c. 2 roots
- d. distal to premolars

5. the incisors of mandibul are locate ?

- a. in the middle
- b. 3 roots
- c. 2 roots
- d. all of them

6-the maxillart sinus is located at ?

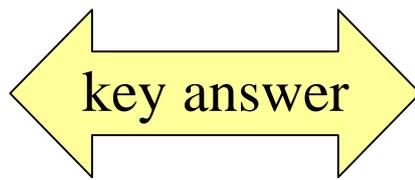
- a. canine root
- b. maxillary teeth
- c. molars
- d. all of them

Note :one degree for each answer

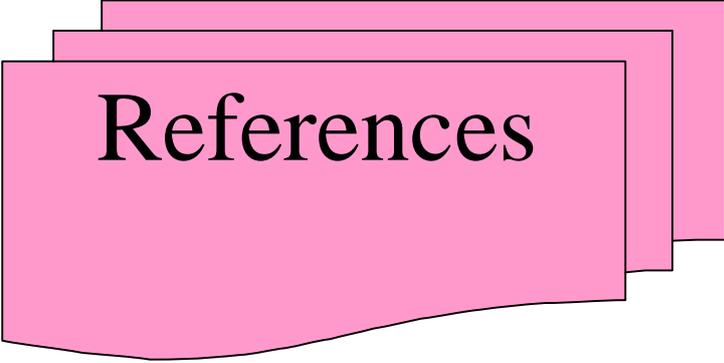
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.identification 2-dots 3-facing	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B
<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more you do not need to proceed. - less than 5 you have to study this module well . 			<p>If you got:</p> <ul style="list-style-type: none"> - 5 or more so congratulation your performance go on studying the second module . - less than 5 , go back and study the first module or any part of it then do the post test again 	



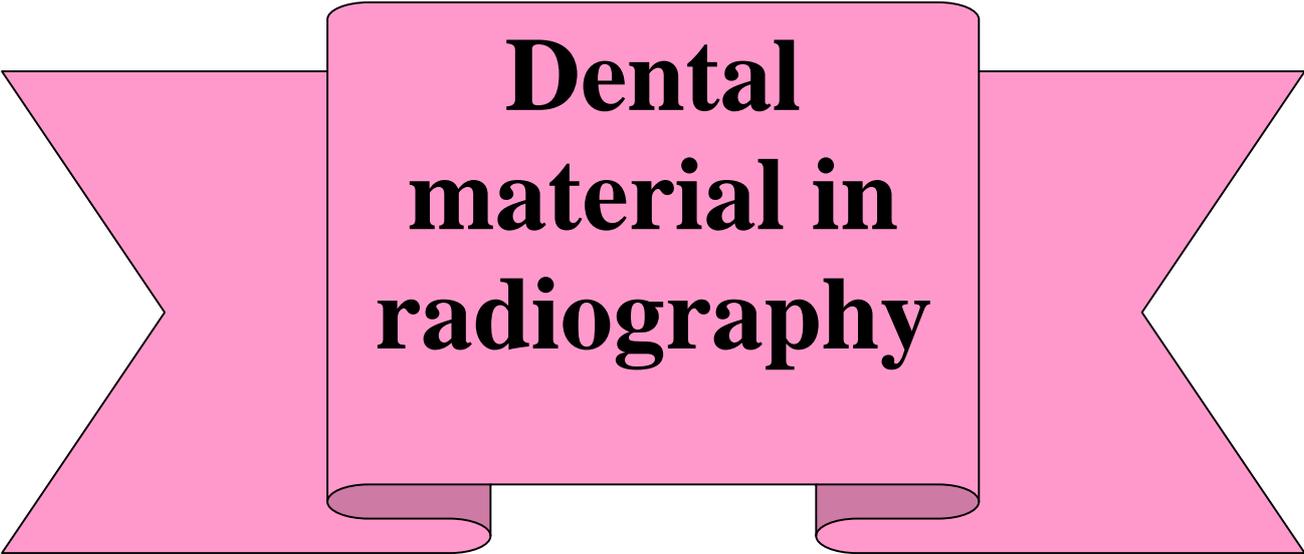
References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTIETH MODULE



Dental material in radiography

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the dental material in radiography . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The dental material radiograph .
2. Radio opaque .
3. radio lucent .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea of material appearance .
- 2-Determine the radio opaque & radio lucent .
- 3-Understand the relation between the materials .
- 4-Describe the procedure for material differentiation .

3/ Pre test

Put circle around the letter of the correct answer :

1. the acrylic in radiograph appear ?

- a. radio lucent
- b. Radio opaque
- c. non of above
- d. all of them

2. the gold in radiograph appear ?

- a. radio lucent
- b. Radio opaque
- c. non of above
- d. all of them

3. the pulp in radiograph appear ?

- a. radio lucent
- b. Radio opaque
- c. non of above
- d. all of them

4. the enamel in radiograph appear ?

- a. radio lucent
- b. Radio opaque
- c. non of above
- d. all of them

5. the bone marrow in radiograph appear ?

- a. radio lucent
- b. Radio opaque
- c. non of above
- d. all of them

6-. the calcified part of bone in radiograph appear ?

- a. radio lucent
- b. Radio opaque
- c. non of above
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Material in radiograph

If we take a three spherical balls one made of steel the other made of aluminum and one made of plastic and radiograph them. The steel ball appear to be circular white area in the radiograph (radio opaque) while the plastic ball appear as a light shadow spherical in shape (radio lucent).

Radio Opaque

Is that material that appear clear (white area) in radiograph or in other meaning is that material that absorb most of the X-ray beam and appear clear like gold metal.

Radio lucent

Is that material that appear dark (black area) in the radiograph or in other meaning is that material that pass most of the X-ray beam through is like acrylic, soft tissue. Bone is made of calcified plates, calcified trabeculae and soft tissue marrow. The bone marrow is radiolucent and the trabeculae are radio opaque.

The lamind dura or the boney tooth socket is a thin bony plate and appears as a radio opaque line separated by the tooth by radio lucent line that represent the periodontal membrane.

A developing tooth appears first as a spherical radio lucency representative of the toothe follicle. Later on when the roots and the crowns begins to form more calcified area appear in the radiograph. When the tooth is fully developed the parts of the tooth can be recognize in the radiograph. The enamel which is the hardest tissue in the body appear

radio opaque. The dentin appear to be less radio opacity than the enamel, the pulp is radiolucent.

Self test (1)

Fill in the blanks with suitable words

1-the radio opaque material appear ----- .

2- the radio opaque material appear -----

3-the metal appear -----.

- **Check your answers in the key answer page at the end of module**

Dental Material in Radiography

All the dental materials including restorations and instruments are made of material which appear in the radiograph as a radiolucent or radio opaque. The density of restorations seen in the radiograph also depend on the thickness of the material in the path of the X-ray beam.

The restorative materials that appear radio opaque in radiograph are gold, silver amalgam, zinc phosphate cement, zinc oxideeugenol, silver points, guttapercha, metal wires, cupper bands, and aluminum crown.

The materials that appear radio lucent in radiograph are acrylic, silicate, calcium hydroxide, porcelain and some composite restorative materials.

Some calcium hydroxide pastes and composite restorations contain added radio opaque material that gives the filling material enough X-ray absorbing ability to make it appear radio opaque clinically.

Self test (2)

Some of composite appear radio opaque

- **Check your answers in the key answer page at the end of module**

5/ Post test

Put circle around the letter of the correct answer :

1. the restorative material that appear radio opaque

- a. gold
- b. acrylic
- c. non of above
- d. all of above

2 the restorative material that appear radio opaque

- a. acrylic
- b. amalgam
- c. non of above
- d. all of above

3. the restorative material that appear radio opaque

- a. silicate
- b. acrylic
- c. silver points
- d. all of above

4. the restorative material that appear radio opaque

- a. gold
- b. metal wire
- c. cupper bands
- d. all of above

5- . the restorative material that appear radio lucent

- a. gold
- b. acrylic
- c. non of above
- d. all of above

6. the restorative material that appear radio opaque

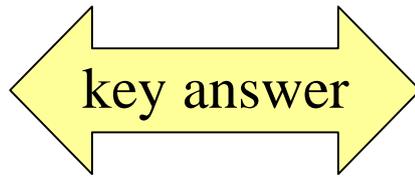
- a. gold
- b. calcium hydroxide
- c. non of above
- d. all of above

Note :one degree for each answer

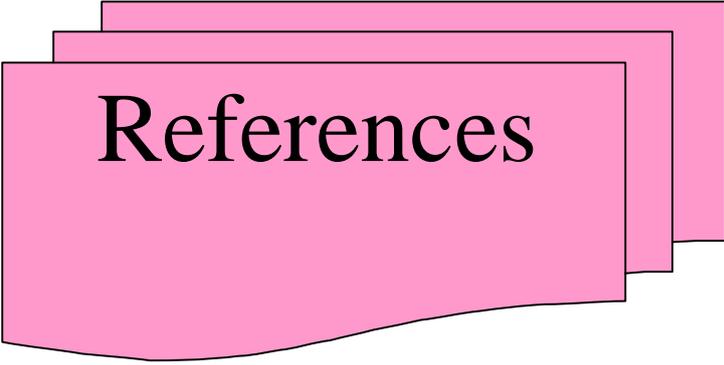
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.white 2-dark 3- radio opaque <u>Self test(2)</u> Due to adding radio opaque material	1	A
2	B		2	B
3	C		3	C
4	A		4	D
5	B		5	A
6	C		6	B



References

1- Dental radiology for dental auxiliaries

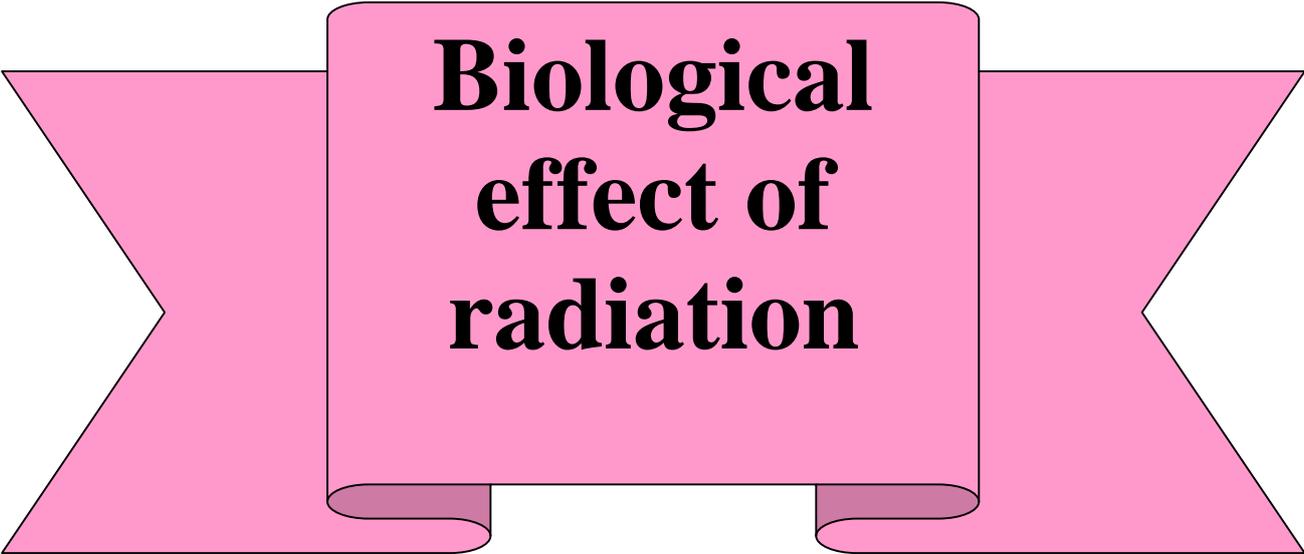
2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY FIRST MODULE



Biological effect of radiation



1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the biological effect of radiation . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The biological effect of radiation .
2. Effect on tissue .
3. clinical manifestation .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the biological effect of radiation .
- 2-Determine the effect on specific tissue .
- 3-Understand the clinical manifestation .
- 4-Describe the effect in dentistry

3/ Pre test

Put circle around the letter of the correct answer :

1. who is more radio sensitive ?

- a. Blood cells
- b. skin
- c. non of above
- d. all of them

2. who is more radio sensitive ?

- a. skin
- b. reproductive cells
- c. non of above
- d. all of them

3. who is more radio sensitive ?

- a. glands
- b. skin
- c. young bone
- d. all of them

4. who is more radio responsive ?

- a. Blood cells
- b. young bone
- c. non of above
- d. skin

5. who is more radio responsive ?

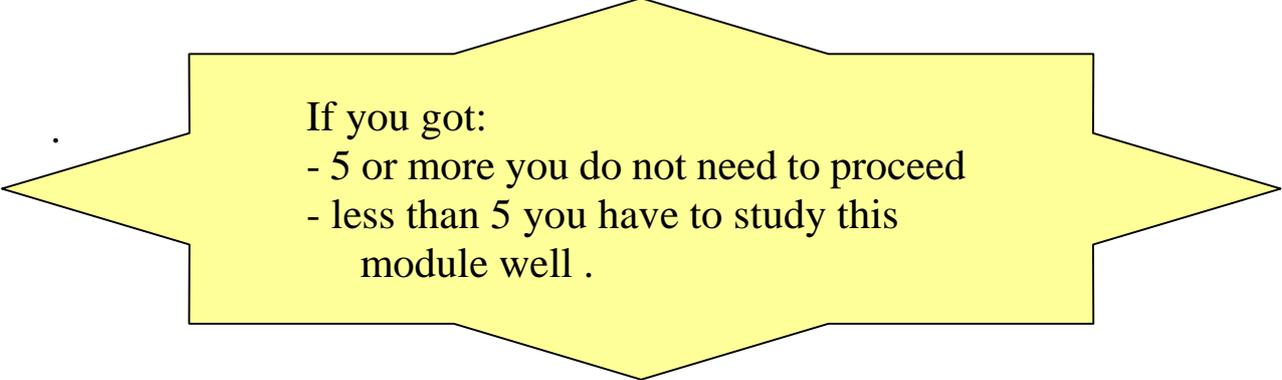
- a. glands
- b. young bone
- c. non of above
- d. all of above

6-. who is more radio resistant ?

- a. Blood cells
- b. muscle
- c. non of above
- d. all of above

Note : one degree for each answer .

- Check your answers in key answer page at the end of module



If you got:
- 5 or more you do not need to proceed
- less than 5 you have to study this
module well .

4/ the module contents

Biologic Effect of Radiation

The effects of radiation upon human damage were seen in peoples using radio active materials, patients under going radiation therapy, and the atom bomb victims.

X-ray can bring changes in the body, these changes can be chemical, cells, tissues and organic changes.

The chemical effects results from the ability of X-rays to ionize atoms and break the chemical bonds.

Other effect might occur on the cells and tissues not all the cells exposed to radiation are damaged.

Some may get Brocken chromosomes and get a vacuoles in the cells, some under go abnormal mitosis and giant cells may be formed.

Tissues that are rapidly growing shows greater radiation affect or they are more sensitive to X-ray. That is why malignant tumors or cancers are treated by X-rays because these tissues are rapidly growing so they are more sensitive to radiation.

Thus radiation can treat cancers but can also cause cancers depending on the amount of radiation and the sensitivity of the tissue.

Self test (1)

Fill in the blanks with suitable words

1-the x ray make changes in body , which may be ----- changes.

2- the x ray make changes in body , which may be ----- changes

3- the x ray make changes in body , which may be ----- .changes

- **Check your answers in the key answer page at the end of module**

Tissue sensitivity to radiation

In the human body some cells are more sensitive to radiation than others.

This list shows the types of cells in boarder of sensitivity to X-rays.

1- Blood cells	}	Radio – Sensitive
2- Reproductive cells		
3- Young bone		
1- Skin	}	Radio – Responsive
2- Glands		
Muscle	}	Radio – Resistant
Nerves		
Mature bone		

The case of diagnostic X-rays in dentistry is of great value and the information gained through their use benefits the patient. But, even though, exposure of the patient to even theses small amounts of X-rays, may involve some elements of risks. Thus, radiographs are made when it is anticipated that the information they can provide for the good of the patient will out weigh the possible hazard.

Self test (2)

Mention the radio resistant tissue

- Check your answers in the key answer page at the end of module

Clinically Manifest Effect

Clinical effect may be seen on patients who have undergone radiation therapy. The skin in the treated area appears as if a very hot object had been placed upon it. This is called (radiation burn). When the salivary glands are in the therapy region, the amount and quality of saliva are affected, a dry mouth and a rampant form of caries often results from these radiation effects.

In the early days of dental radiography some dentists held the film in the patients mouth. This dangerous practice resulted in the dentist's fingers being exposed to the primary X-ray beam and repeated doses of X-rays. Over a period of years (about 20 years) the exposed tissues becomes so damaged that healing of small breaks is difficult and in some cases parts of the hand had to be amputated.

Most of the information about radiation is obtained mainly from animal experiments and from humans who have been exposed to X-rays for other purposes.

Self test (3)

Mention the clinical signs of excessive radiation

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1.the effect of radiation on chemical composition is

- a. ionize atom
- b. burning
- c. non of above
- d. all of above

2 the effect of radiation on chemical composition is

- a. thermal burning
- b. brake the chemical bonds
- c. non of above
- d. all of above

3. the effect of radiation on cell is

- a. ionize atom
- b. burning
- c. brake of chromosomes
- d. all of above

4. the effect of radiation on cell is

- a. ionize atom
- b. burning
- c. formation of chromosomes
- d. production of vacuoles

5- . the effect of radiation on cell is

- a. abnormal mitosis &giant cell formation
- b. burning
- c. non of above
- d. all of above

6. the malignant tissues are treated by x –ray because

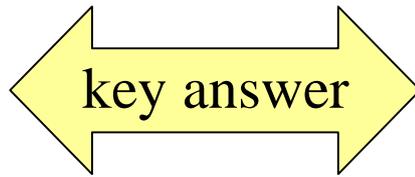
- a. gold
- b. these tissue are sensitive due to rapidly grown
- c. non of above
- d. all of above

Note :one degree for each answer

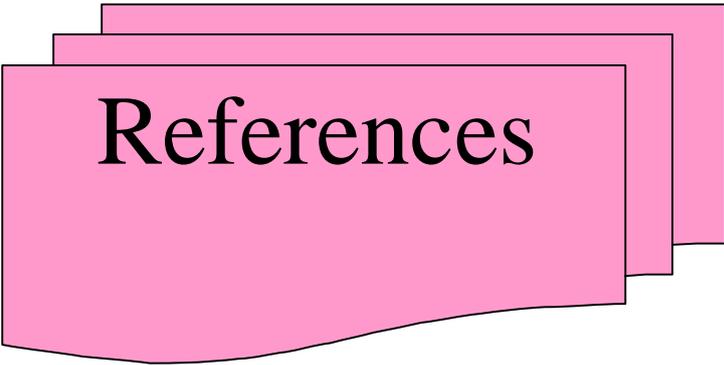
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.chemical	1	A
2	B	2-cell	2	B
		3- organ		
		<u>Self test(2)</u>		
3	C	Muscles	3	C
		Nerves		
4	D	Mature bone	4	D
		<u>Self test(3)</u>		
5	A	Burning	5	A
		Redness and		
6	B	rampant cares	6	B
		Delay healing and		
		puss		



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY SECOND MODULE



x- ray protection

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the protection from radiation . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The protective measures .
2. protection of patient .
3. protection of the environment .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the protection from radiation .
- 2-Determine the affected groups .
- 3-Understand the protection measures .
- 4-Describe the procedure for protection

3/ Pre test

Put circle around the letter of the correct answer :

1. protective measures will describe for ?
 - a. patient
 - b. skin
 - c. non of above
 - d. all of them

2. protective measures will describe for ?
 - a. skin
 - b. operator
 - c. non of above
 - d. all of them

3. protective measures will describe for ?
 - a. children
 - b. skin
 - c. the immediate environment
 - d. all of them

4. protection of the patient can be achieved by ?
 - a. Blood cells
 - b. young bone
 - c. non of above
 - d. use of fast film

5. protection of the patient can be achieved by ?
 - a. filtration
 - b. skin
 - c. non of above
 - d. all of them

6-. protection of the patient can be achieved by ?

- a. patient
- b. collimation
- c. non of above
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

X-Ray Protection

Protective measures that are useful and practical will be described for:-

- a. The patient.
- b. The operator.
- c. The immediate environs.

A- Protection of the patient

This will be described first because any X-ray dose reduction achieved for the patient automatically reduces the dose to all others concerned. The dose of X-radiation to the patient can be reduced to a very small amount.

Protection of the patient is achieved by a single wing:

1- The Use of Fast Film

Thirty years ago dental films required an exposure time of 3-4 seconds. Now a day using the same type of radiation and the same circumstances it is possible to make similar radiographs in (1/4) seconds. This is a result of using faster films that require much less

Group A
Very Slow

Group B
Slow

Group C
Medium

Group D
Fast

Radiation to produce a diagnostic image. So the use of fast film considered to be the most effective method of reducing the patient's exposure to X-ray. But by using these fast films a very light-tight dark room is necessary since these films also have increased sensitivity to light, and

an accurate X-ray machine timer is also needed for the short exposure times used.

2- Filtration

The beam of X-rays produced by the dental X-ray machine consists of X-ray photons of many different wave-length or energies. These X-rays that can not penetrate the soft tissues, teeth and bone are unable to reach the film.

In order to remove these useless X-ray and prevent the unnecessary exposure of the patient, the X-ray beam is filtered by passing the X-ray beam through aluminum filters placed over the beam at the exit port of the X-ray machine.

The filters used is 1.5 mm of aluminum. The effect of using proper filtration in the new manufactured machine is to reduce the patient's exposure to as much as 50% without any observable loss in the quality radiograph.

3- Collimation

Collimator is a lead washer or diaphragm placed at the opening of the machine head. Its action is to reduce the beam size at the patient skin. The beam size at the patient skin should be no more than $2\frac{3}{4}$ inches in diameter. A beam of this size is quite adequate to cover regular peri apical size of dental film which has a diagonal measurements of less than 2 inches.

The benefit of reducing the size of the X-ray beam is

To reduce the amount of radiation to the patient skin. Technical experience is necessary to avoid cone cutting.

4- Apron Shields

The apron shields is useful to absorb scattered radiation going to the patient body. The shields are usually flexible and are manufactured with different X-ray absorbing abilities. Most dental shields thickness are equivalent to 0.25 mm thickness of lead. This thickness will absorb the scattered radiation specially that radiation affecting the gonadal tissue.

5- Open end Cones

Using a pointed plastic cone on a dental X-ray machine it is necessary for the X-ray to penetrate through the plastic of the cone thus producing a small amount of scattered radiation.

The use of an open end cone gives the same purposes without requiring the X-rays to pass through any plastic material, so the scattered radiation will be eliminated.

6- Film exposure technique

Technical experience of the operator is essential. When films are exposed improperly, it is necessary to retake them. Films that are ruined by improper processing procedures must also be taken again. Retaking radiographs exposes the patient to additional X-ray, this should be avoided.

A good X-ray machine and proper processing technique in addition technical experience of the operator are necessary to achieve minimizing radiation the patient.

Self test (1)

Fill in the blanks with suitable words

1-in filtration it is use ----- mm aluminum .

2- the most fast film is group -----

3- the protection of the patient can be achieved by -----reduction

- **Check your answers in the key answer page at the end of module**

Protection of the operator

There are two important sources of radiation that the operator had to protect him self. These are the primary X-ray beam and the scattered radiation from the patient irradiation tissues. So procedures for protecting the operator include:

1- Avoiding the primary beam

The first and most important rule is to stay out of the primary beam. This include not only standing out of the beam but also never holds the film for the patient.

2- Distance

The second important procedure is to move a way form the other major source of radiation (patient head). Aluminum distance of 6 feet is recommended. The X-ray machine must have a coiled timer cord that can

permit this distance the effect of increasing the distance of the operator from the patient is to reduce the intensity of scatter radiation reaching the operator.

3- Shields

It is better for the operator to stand behind a lead shield instead of getting 6 feet away from the patient. Lead shielded room or a standing shield compartment will absorb the scattered radiation from the patient.

4- Operator's Position

If there is no shield, in addition to standing 6 feet from the patient the operator may further reduce exposure by standing in certain areas relative to the patient during film exposure.

The areas of least scattered are those that are at right angles to the patient from the X-ray beam and toward the back of the patient. Less scattered radiation reaching to these areas by use scatter originates in the patients oral tissues and must pass through the shell of the patient before it can get to these areas of the room.

5- Avoiding holding the tube head

A small amount of leakage radiation passes through every dental X-ray machine tube head. The operator should not hold the X-ray tube head during exposure. If the tube head is not steady it should be adjusted.

Self test (2)

What is the cause of never holding the tube

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. protection of the patient can be achieved by ?

- a. A prone shield
- b. dentist
- c. Assistant
- d. all of them

2 protection of the patient can be achieved by ?

- a. dentist
- b. open end cone
- c. Assistant
- d. all of them

3. protection of the patient can be achieved by ?

- a. assistant
- b. dentist
- c. film exposure technique
- d. all of them

4. protection of the operator can be achieved by ?

- a. A prone shield
- b. dentist
- c. Assistant
- d. avoid primary beam

5- protection of the operator can be achieved by ?

- a. safe distance
- b. dentist
- c. Assistant
- d. all of them

6. protection of the operator can be achieved by ?

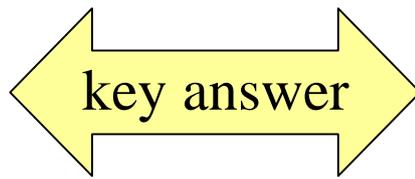
- a. A dentist
- b. shield
- c. Assistant
- d. all of them

Note :one degree for each answer

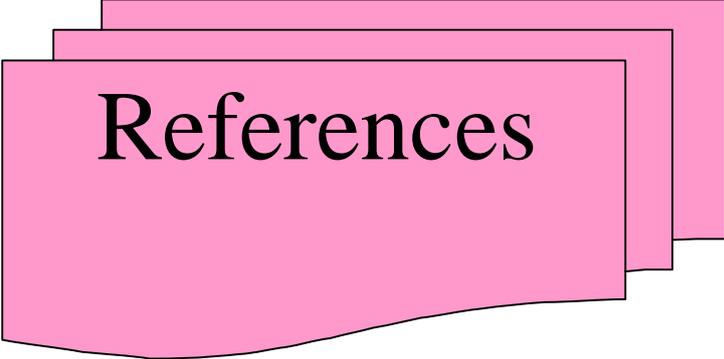
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.1,5 mm 2-D 3- dose <u>Self test(2)</u> Because the hazard of micro leakage	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY THIRD MODULE



x- ray protection II

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the protection from radiation . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The protective measures .
2. protection of patient .
3. protection of the environment .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the protection from radiation .
- 2-Determine the affected groups .
- 3-Understand the protection measures .
- 4-Describe the procedure for protection

3/ Pre test

Put circle around the letter of the correct answer :

1. protective measures will describe for ?
 - a. patient
 - b. skin
 - c. non of above
 - d. all of them

2. protective measures will describe for ?
 - a. skin
 - b. operator
 - c. non of above
 - d. all of them

3. protective measures will describe for ?
 - a. children
 - b. skin
 - c. the immediate environment
 - d. all of them

4. protection of the patient can be achieved by ?
 - a. Blood cells
 - b. young bone
 - c. non of above
 - d. use of fast film

5. protection of the patient can be achieved by ?
 - a. filtration
 - b. skin
 - c. non of above
 - d. all of them

6-. protection of the patient can be achieved by ?

- a. patient
- b. collimation
- c. non of above
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

X-Ray Protection

Protective measures that are useful and practical will be described for:-

- d. The patient.
- e. The operator.
- f. The immediate environs.

C- Protection of the Environs

The primary beam of radiation should never be directed at any one other than the patient. The patient should be so positioned that the X-ray beam is aimed at a wall of the room and not through a door or other opening to where people may be located. If this occur people in the adjacent rooms may be necessary exposed to radiation.

Measuring of scattered radiation around the room of X-ray may be done by using a film badges. A film badge uses a film similar to the intra oral dental film. The blackness or the density of the processed film indicates the amount of radiation it has received.

Self test (1)

Fill in the blanks with suitable words

1-in filtration it is use ----- mm aluminum .

2- the most fast film is group -----

3- the protection of the patient can be achieved by -----reduction

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. protection of the environs can be achieved by ?
 - a. direct primary beam to patient only
 - b. dentist
 - c. Assistant
 - d. all of them

- 2 protection of the environs can be achieved by ?
 - a. dentist
 - b. direction of x ray to wall not widows
 - c. Assistant
 - d. all of them

3. protection of the environs can be achieved by ?
 - a. assistant
 - b. dentist
 - c. never direct x ray to people location
 - d. all of them

4. protection of the environ can be achieved by ?
 - a. A prone shield
 - b. dentist
 - c. Assistant
 - d. measure of scattered radiation

- 5- protection of the environ can be achieved by ?
 - a. never direct radiation to openings
 - b. dentist
 - c. Assistant
 - d. all of them

6. scattered radiation can be detected by ?

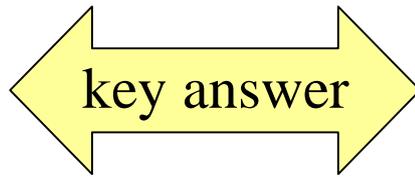
- a. A dentist
- b. film badges
- c. Assistant
- d. all of them

Note :one degree for each answer

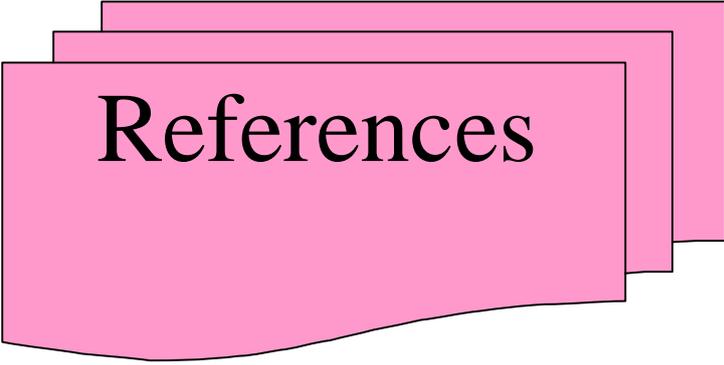
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	<u>Self test (1)</u>	Question no.	answer
1	A	1.1,5 mm 2-D 3- dose <u>Self test(2)</u> Because the hazard of micro leakage	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY FOURTH MODULE

**OCCLUSAL
FILM**

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the occlusal film . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The occlusal film .
2. occlusal film for maxillary arch
3. occlusal film for mandibular arch .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand what is the occlusal film .
- 2-Determine the group which it is belong .
- 3-Understand the maxillary and mandibular radiographing.
- 4-Describe the procedure for radiographing

3/ Pre test

Put circle around the letter of the correct answer :

1. The occlusal film is ?

- a. package like intra oral film
- b. PA film
- c. non of above
- d. all of them

2. The occlusal film dimensions ?

- a.4
- b. 3 X 2 ½ inches
- c. non of above
- d. all of them

3. The occlusal film is ?

- a. medium speed
- b. slow
- c. fast film group D
- d. all of them

4. The occlusal film is ?

- a. perpendicular
- b. parallel
- c. non of above
- d. placed occlusaly in oral cavity

5. The occlusal film is placed ?

- a. between the teeth
- b. skin
- c. non of above
- d. all of them

6-. The occlusal film is held inside edentulous patient by ?

- a. dentist
- b. patient fingers or cotton rolls
- c. non of above
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Occlusal Film

In many cases the intra oral dental X-ray film do not show the entire lesion that needs to be observed.

This a accomplished by using larger radiographs in the oral cavity which is called the occlusal film.

The occlusal film is packaged like the intra oral dental film (peri apical) and is approximately $3\frac{1}{2}$ inches in size, the film speed is fast film group D. this film is made to be placed inside the oral cavity in the occlusal plane.

The film is put in the patient mouth gently between the teeth. If the patient is edentulous. It can be held by the patient fingers or we can use cotton roles or wax to hold the film in places and support it.

The film is placed as far back into the mouth as can be tolerated by the patient with the stippled surface facing the beam of radiation.

Usually radiography of one position is of interest i.e. right, middle, or left side of the jaw is being examined.

Basically, occlusal radiography is used to get a topographic projection or cross-sectional projection of an area.

Self test (1)

Fill in the blanks with suitable words

1-the dimensions of occlusal film is ----- inch.

2- the occlusal film is like -----

3- the support of film is by -----

- Check your answers in the key answer page at the end of module

Occlusal Film for Maxillary Teeth

These radiographs are made with the patient in the dental chair in the same position used for intral oral radiography. The principle involved the technique of Bisecting angle technique of intra oral Radiography. The bisector of the angle formed by the film and the long axes of the teeth is first determined then the central ray of the cone is directed perpendicular to it.

When there are no teeth the operator can use the buccal or labial surface of the alveolar bone as a guide for the other side of the angle. The horizontal angulation is to direct the central ray between the teeth of interest.

Occlusal Film for Mandibular Teeth

Occlusal film for mandible are usually called cross-section radiographs. It is used to localize objects or lesions such as impacted teeth, root tips, fractures and foreign bodies that are first detected on a standard peri apical film. It is easily accomplished by placing the film in the mouth in a position similar to that used for the maxilla.

The central ray is directed along the saggittal plane as nearly perpendicular to the film as possible. Here the patient must move his head backward.

This projection is important in finding the relationship of the object to the teeth in the horizontal plane buccelingually and thus provide the information of localization of an object with the obtained peri apical film.

Self test (2)

Exposure of maxillary occlusal film depend on

- Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. mandibular occlusal radiography is called ?
 - a. cross section radiograph
 - b. occlusal radiograph
 - c. pA radiography
 - d. all of them

2. mandibular occlusal radiography is used to ?
 - a. view apex
 - b. localize objects
 - c. non of above
 - d. all of them

3. mandibular occlusal radiography is ?
 - a. very large
 - b. small
 - c. similar to that used for maxilla
 - d. non of above

4. the x ray for mandibular occlusal radiography is ?
 - a. vertical
 - b. parallel
 - c. non of above
 - d. perpendicular to film

- 5- in mandibular occlusal radiography the patient must tilt his head
 - a. backward
 - b. forward
 - c. non of above
 - d. all of them

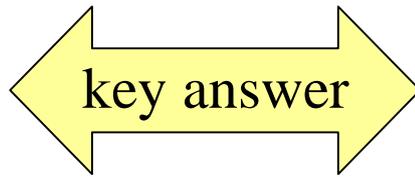
6. mandibular occlusal radiography is used to ?
- a. determine the object
 - b. localize objects
 - c. non of above
 - d. all of them

Note :one degree for each answer

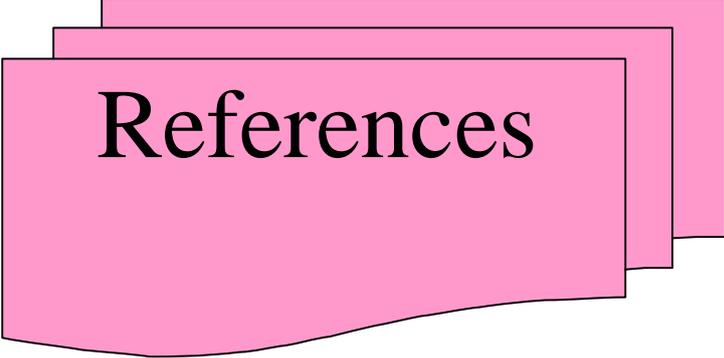
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1. 3x2 1/2 2-PA film 3- teeth <u>Self test(2)</u> Bisecting angle technique	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY FIFTH MODULE

**Extra oral
radiograph**

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the extra oral radiograph . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The extra oral radiograph .
2. projections of extra oral radiography .
3. film components .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the components of extra oral radiograph .
- 2-Determine the types of projections .
- 3-Understand the idea from use this type.
- 4-Describe the procedure for radiographing extra oral radiograph

3/ Pre test

Put circle around the letter of the correct answer :

1. extra oral radiograph are used to exam ?
 - a. large area
 - b. small area
 - c. non of above
 - d. all of them

2. . extra oral radiograph are used to exam ?
 - a. small area
 - b. skull
 - c. non of above
 - d. all of them

3. . extra oral radiograph are used to exam ?
 - a. oral area
 - b. small area
 - c. patient cant open his mouth
 - d. all of them

4. extra oral radiograph are used to exam ?
 - a. oral area
 - b. small area
 - c. non of above
 - d. child cant open his mouth

5. extra oral radiograph are used to exam ?
 - a. specific part of skull
 - b. small area
 - c. non of above
 - d. all of above

6-. extra oral radiograph are used to exam ?

- a. oral area
- b. un conscious patient
- c. non of above
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Extra Oral Radiography

These are made to examine large areas such as face or skull. Whenever peri apical and occlusal radiograph do not show the entire picture of a pathologic condition, extra oral projections are necessary. It might also be the only radiographic survey possible, e.x. when the patient can not open his mouth or for a child that can not open his mouth.

Many extra oral projections are designed to examine the entire skull or specific parts of the skull.

The extra oral radiography requires screen film in cassettes equipped with screen, these films requires much less radiation to produce a diagnostic radiograph. So the exposure time is short enough to minimize the blurring effect caused by movement of the patient.

The size of the cassette differs according to the type of projections, and the size of the area examined. Some projections need a cassette holder to hold the cassette in it's position while the patient is sitting on a patient stool.

Cassette also have L and R letters made of lead placed on the exposure side.

The processing tank used should accommodate films 8x10 inches which is the largest film we use.

The darkroom used should contain a safe light which is safe for screen films. Safe light filters specially made for intral oral film usually allow light in the darkroom that is un safe for screen film, while safe light

designed for screen film are also safe for intral oral film they allow much less light in the darkroom.

The emulsion of these films are made to be sensitive mainly to the light given off by screens when X-rays are absorbed by the screen. The screens are much more efficient to absorb X-rays that is why it need much fewer X-rays to expose the film.

Self test (1)

Fill in the blanks with suitable words

1-the emulsion is sensitive to ----- .

2- the screen absorb -----and emit light

3- the dark room is safe for processing of -----radiograph

- [Check your answers in the key answer page at the end of module](#)

5/ Post test

Put circle around the letter of the correct answer :

1. the size of extra oral film is ?

a. 8 X 10 Inch

b. 8 X 11 inch

c. non of above

d. all of them

2. the safe light in dark room is suitable for ?

- a. red filtration
- b. screen film
- c. non of them
- d. all of them

3. the safe light in dark room is suitable for ?

- a. intra oral
- b. screen film
- c. both of them
- d. non of them

4. cassette contain identification letters made from ?

- a. wood
- b. acrylic
- c. plastic
- d. lead

5- the size of cassette depend on ?

- a. type of projection
- b. patient
- c. Assistant
- d. all of them

6. the size of cassette depend on ?

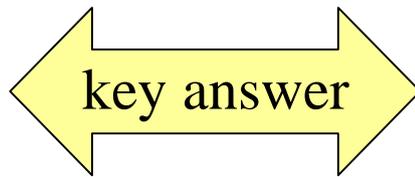
- a. patient
- b. size of area
- c. Assistant
- d. all of them

Note :one degree for each answer

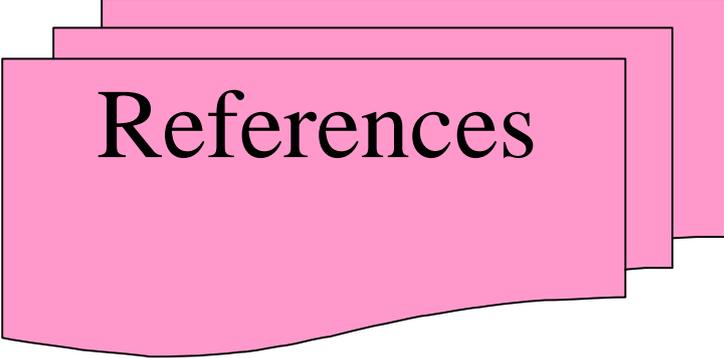
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	<u>Self test (1)</u>	Question no.	answer
1	A	1.light 2 x ray 3- PA film	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY SIXTH & SEVENTH MODULE

**Extra oral
radiograph**

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the extra oral radiograph . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The extra oral radiograph .
2. projections of extra oral radiography .
3. film components .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the components of extra oral radiograph .
- 2-Determine the types of projections .
- 3-Understand the idea from use this type.
- 4-Describe the procedure for radiographing extra oral radiograph

3/ Pre test

Put circle around the letter of the correct answer :

1. The projection of extra oral is ?
 - a. lateral Jaw radiography
 - b. small radiograph
 - c. non of above
 - d. all of them

2. The projection of extra oral is ?
 - a. lateral radiography
 - b. lateral sinus radiograph
 - c. non of above
 - d. all of them

3. The projection of extra oral is ?
 - a. lateral radiography
 - b. small radiograph
 - c. lateral skull radiograph
 - d. all of them

4. The projection of extra oral is ?
 - a. lateral radiography
 - b. small radiograph
 - c. non of above
 - d. posterior anterior skull radiograph

5. The projection of extra oral is ?
 - a. postero–anterior mandibular radiograph
 - b. small radiograph
 - c. non of above
 - d. all of them

6-. The projection of extra oral is ?

- a. lateral radiography
- b. posterior –anterior sinus radiograph
- c. non of above
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

The projection's of extra oral radiography are:-

- 1- Lateral Jaw radiography (lateral oblique of the mandible).
- 2- Lateral sinus radiograph.
- 3- Lateral skull radiograph.
- 4- Postero-anterior skull radiograph (P.A).
- 5- Postero-anterior mandible radiograph(P.A. of the mandible)
- 6- Postero- anterior sinus radiograph (P.A. of the sinus)
- 7- Bregma- menfum radiograph.
- 8- Tempro mandibular joint radiograph.
- 9- The inferior-superior zygomatic arch radiograph.

Self test (1)

Mention three projections

Check your answers in the key answer page at the end of module

Panoramic Radiograph

Panoramic radiograph is a view of a large area of the mandible and maxilla seen in a single large film. It can be made with the X-ray tube, patient, and film moving relative to each other during film exposure. In this machine a slit collimator is used to make the X-ray beam as narrow as possible the patient is still while the X-ray tube head and the film are moving relatively.

There is another slit shaped hole on the film carrier in front of the film. The importance of this slit is to make the X-ray beam appear as a slit on the film.

Panoramic machine uses the principle of scanography and Tomography. Scanography is scanning, of an object using a thin moving beam of X-ray (slit –shape collimator is used).

While tomography is making a sharp image of a layer of tissue with layers above and below it being un sharp or blurred, so the radiograph is made by moving the X-ray tube and film parallel to each other in opposite direction during film exposure.

The radiograph shows both sharp and blurred X-ray shadows. The width or the thickness of the sharp layer called the focal through (Zone of sharpness).

Tomography is used when object can not be seen in the usual diagnostic radiographs due to the superimposition of the images of the other skull structures.

The obstructing images of structures above or below the objects a dentist wished to see, can often be blurred or removed by tomography. The basic factor in curved layer tomography are shown in this figure. A narrow beam of X-ray is used to scan a stationary object. The X-ray tube head and film carrier are connected to each other. They circle around the stationary object. While the tube and film carrier are moving, the film moves behind a scatter guard which prevents scattered radiation from reaching parts of the film not being exposed by the X-ray.

The film moves through the X-ray beam at the same rate as the layer being imaged in the object, in other words when one inch of film moves

through the X-ray beam, the layer in the object where one inch had been scanned by the beam appears sharp in the radiograph

Self test (1)

What is the name of projection which view both arches

- **Check your answers in the key answer page at the end of module**

5/ Post test

Put circle around the letter of the correct answer :

1. panoramic radiograph is view of ?
 - a. large area of mandible and maxilla
 - b. 8 X 11 inch
 - c. non of above
 - d. all of them

- 2 panoramic radiograph is use ?
 - a. large area principle
 - b. principle of scanograph
 - c. non of above
 - d. all of them

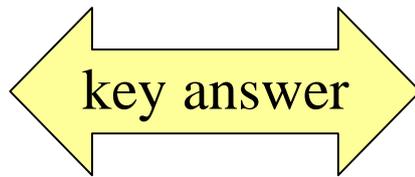
3. tomographic radiograph is used when ?
 - a. large area of mandible
 - b. area more 8 X 11 inch
 - c. object can not seen in ordinary radiograph
 - d. all of them

4. tomographic radiograph is used when ?
- a. large area of mandible
 - b. area more 8 X 11 inch
 - c. object can not seen
 - d. superimposition of images
- 5- the size of cassette depend on ?
- a. type of projection
 - b. patient
 - c. Assistant
 - d. all of them
6. in panoramic radiograph the cone ,slit and film ?
- a. fixed
 - b. move to each other
 - c. non of them
 - d. all of them

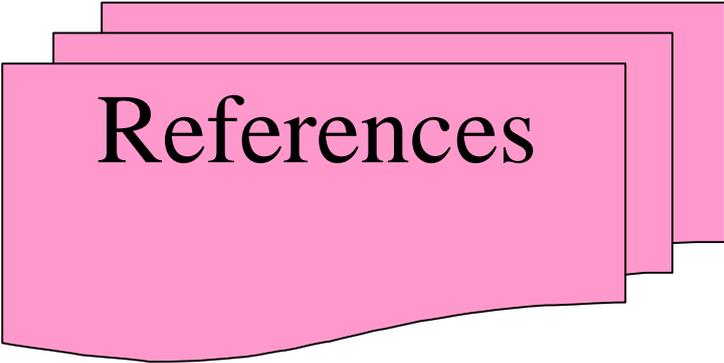
Note :one degree for each answer

-Check your answers in key answer page at the end of module

If you got:
- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.anterior skull 2 anterior sinus 3-anterior mandible <u>Self test(2)</u> Panoramic radiograph	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B



References

1- Dental radiology for dental auxiliaries

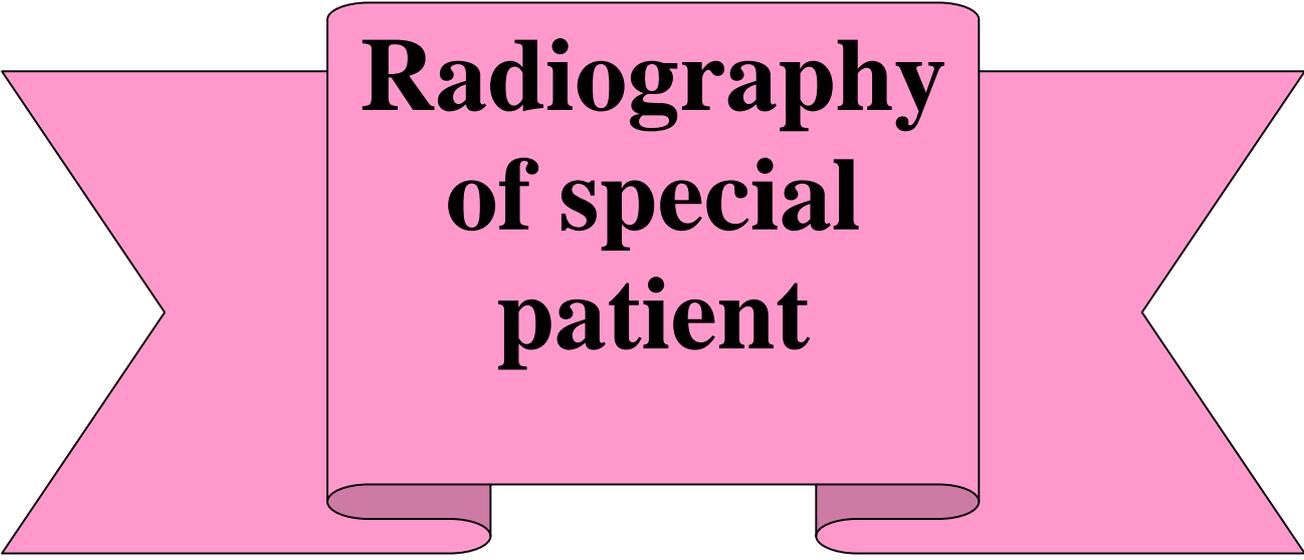
2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY EIGHTH MODULE



Radiography of special patient



1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the radiography of special patient . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The radiography of special patient .
2. hyper active patient .
3. treatment of special patient .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand who is the special patient .
- 2-Determine the need for those patient .
- 3-Understand the idea from use these technique .
- 4-Describe the procedure for radio graphing

3/ Pre test

Put circle around the letter of the correct answer :

1. The radio graphing of hyper active patient is done by ?
 - a. Extra oral radio graph
 - b. only intra oral radiograph
 - c. non of above
 - d. all of them

2. The radio graphing of edentulous patient is done by ?
 - a. Extra oral radio graph
 - b. only intra oral radiograph
 - c. non of above
 - d. all of them

3. The radio graphing of children patient is done by ?
 - a. Extra oral radio graph
 - b. only intra oral radiograph
 - c. non of above
 - d. all of them

4. The radio graphing of endodontic patient is done by ?
 - a. Extra oral radio graph
 - b. only intra oral radiograph
 - c. non of above
 - d. all of them

5. The radio graphing of limiting mouth opining patient is done by ?
 - a. Extra oral radio graph
 - b. only intra oral radiograph
 - c. non of above
 - d. all of them

6-. The radio graphing of unsteady patient is done by ?

- a. Extra oral radio graph
- b. only intra oral radiograph
- c. non of above
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

The hyper active patient:-

Many patients can not keep their bodies motionless such as a very young patient or mentally retarded and a hyper active child. A fast exposure technique is used, in addition it may be necessary to have some one assist the patient in holding the film in the patient mouth or to keep the patient head motionless. This person should be an adult and preferable a relative of the patient.

The Edentulous Patient

Patients without teeth need to have their jaws examined to detect the presence of pathology or objects embedded in the jaws. Usually a panoramic radiographs is used to survey the edentulous patient. When this projection is used is should be supplemented with intra oral peri apical radiographs of any unclear suspicious objects seen in a panoramic radiograph.

For intra oral radiography a 14 film intra oral per apical will be enough for edentulous survey, the intra oral technique generally used with adentulous patient is the bisecting angle technique care should be taken to prevent is the bisecting film bending against the palate or in the lingual region of the mandible.

The long axis of the area should be taken as the long axis of the missing teeth and the bear should be perpendicular to the bisector formed by the film and the alveolar bone.

Children:-

Radiography of children is often difficult because of the small size of the oral cavity, lack of control of the tongue and muscles, and the lack of cooperation.

Small size film should be used for child patient specially for child who has only deciduous teeth, but normal peri apical film is used in the posterior region when the child has the first permanent molar erupted.

The technique used here is the bisecting the angle technique:

The parallel technique is not practical for two reasons, first the apices of the permanent molar teeth tend to lie above the palate in the young maxilla and below the floor of the mouth in the underdeveloped mandible. These positions prevent the image of the Apices of these teeth to be projected into the oral cavity. When the child grows up the oral cavity becomes larger and the palate higher and the floor of the mouth deeper. The second reason is that it is desirable to examine the area beyond the apices of the teeth in children specially when there is permanent tooth underneath. In some uncooperative child it is desirable to place the film (peri apical film) in the occlusal plane the same like the occlusal film. Useful radiographs of the anterior teeth can be obtained in this manner.

Posterior radiograph is difficult in uncooperative child. Instead of this panoramic radiography or extra oral lateral oblique of the mandible is preferable and a wide view of posterior teeth can be seen.

In children with a very small mouth or very young child these children may be cooperative but have a very small mouth. In these cases for anterior region occlusal technique using on adult peri apical film for the anterior teeth. For posterior teeth bending of the film can be done to form a tab like a

bitewing tab. The film is placed in the mouth with the patient closing the upper and lower teeth on the tab to hold it in place. The tongue can hold the film in position when the patient closes the mouth.

The difficulty here is the operator can not see the film so he can use some external anatomical land marks to direct the X-ray beam.

Some times in a very difficult children they used to take tow bite- wings and a single panoramic which can give a best radiographic surveys with these children.

Usually with children they use a fast exposure technique to decrease the effect of movement of the film or the child during exposure thus preventing blurring of the image.

Endodontic Patient

These patient required radiographs which are sharp enough to see the canal of the teeth, and have an accurate length of the tooth. The technique of choice is the parallel technique because we can get an accurate length of the tooth and the chance of error is less. Treatment of root canals required the use of work ding radiographs to identify the position of edodontic instrument protruding form the crown of the tooth and with the tooth isolated by a rubber gam.

With this circumstances the operator need more experience to position the film holder with these instruments the mouth. In the anterior region of the mouth it is simple to use the tongue blade as film holder but posteriorly film holder with parallel technique should not require patient to bite upon it with the tooth being treated. Since the tooth have instrument protruding from it.A common problem in endodontic patients is the super imposition of buckle and palatal or lingual root apices. The root images can be

separated in the radiograph by using a different horizontal angulations of the X-ray beam.

Self test (1)

Mention the types special need patient

Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. treatment of mentally retarded patient done by ?
 - a. extra oral radiograph
 - b. start with molers
 - c. non of above
 - d. all of them

- 2 treatment of very young patient done by ?
 - a. extra oral radiograph
 - b. start with molers
 - c. non of above
 - d. all of them

3. treatment of mentally retarded patient done by ?
 - a. have some parent assistant
 - b. start with molers
 - c. non of above
 - d. all of them

4. treatment of edentulous patient done by ?
 - a. panoramic radiography
 - b. start with molers
 - c. non of above
 - d. all of them

- 5- treatment of children patient done by ?
 - a. PA film in occlusal position
 - b. start with molers
 - c. non of above
 - d. all of them

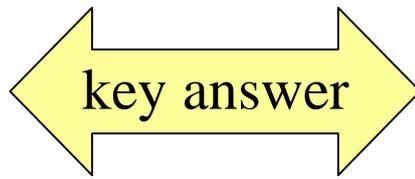
6. treatment of un cooperative patient done by ?
- a. panoramic or extra oral radiograph
 - b. start with molars
 - c. non of above
 - d. all of them

Note :one degree for each answer

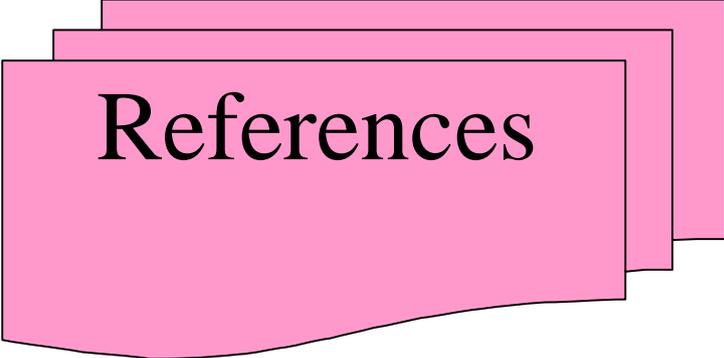
-Check your answers in key answer page at the end of module

If you got:

- 5 or more so congratulation your performance go on studying the second module .
- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	<u>Self test (1)</u>	Question no.	answer
1	A	1.childrens 2 handicapped 3.edentulous	1	A
2	A		2	A
3	A		3	A
4	A		4	A
5	A		5	A
6	A		6	A



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

TWENTY NINTH MODULE



Communication with patient & assistant

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the communication with patient and assistant . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The communication with patient .
2. the communication with assistant .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for communication .
- 2-Determine the need for those patient .
- 3-Understand the idea from communication with assistant .
- 4-Describe the procedure for communication

3/ Pre test

Put circle around the letter of the correct answer :

1. The dentist must inform the patient that the panoramic radiograph

- a. is less radiation than full set of PA b. like extra oral radiograph
c. non of above d. all of them

2. The dentist must inform the patient that the panoramic radiograph

- a. like extra oral radiograph b. use screen so les exposure need
c. non of above d. all of them

3. The dentist must not inform the patient that

- a. no need for extra oral radiograph b. more exposure need
c. x ray is safe d. all of them

4. The dentist must not inform the patient that

- a. no need for extra oral radiograph b. more exposure need
c. x ray is not safe d. led aprone absorb 95 %

5. The dentist must inform the patient that

- a. we use less than the environment daily received b. no exposure
c. x ray is safe d. all of them

6-. The dentist must not inform the patient that

- a. no radiograph hazard
- b. explain the benefits of protection
- c. x ray is safe
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Communication with patient

Are these big panoramic X-ray more dangerous? Panoramic radiographs exposed the patient to much less radiation than a complete set of intra oral radiographs, panoramic film use cassettes with screens and need much less X-rays than peri apical film to be exposed.

Are these X-ray safe? Or I think I am pregnant these X-ray might harm my baby?

This question is not usual but if it happen and you asked this question you should not answer that these X-rays are safe or Dental X-ay do not harm you.

But you should say that the amount of X-ray we use are very little and lead. Aprrone absorb 95% of the radiation, and also the radiation you received is less than that you receive daily form the back ground radiation we receive from our environment. It is also less than the radiation exposure we receive from the outer space when we travel or a few hours in an airplane high above the clouds.

Self test (1)

Mention who is the daily sources of radiation

Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. patient must understand the radiation benefits ?
 - a. in simple method
 - b. fogey method
 - c. non of above
 - d. all of them

- 2 patient must understand the radiation hazard ?
 - a. in horrible method
 - b. simple method
 - c. non of above
 - d. all of them

3. patient must understand the radiation protection ?
 - a. in careless method
 - b. in fogey method
 - c. benefits
 - d. all of them

4. patient must understand the radiation dose is ?
 - a. huge
 - b. more than environment radiation
 - c. non of above
 - d. les than environment radiation

- 5- patient must understand that the radiation protection dose is ?
 - a. absorbed around 95 %
 - b. more than environment radiation
 - c. non of above
 - d. les than environment radiation

6. treatment of un cooperative patient done by ?

a. rough manner

b. friendly manner

c. non of above

d. all of them

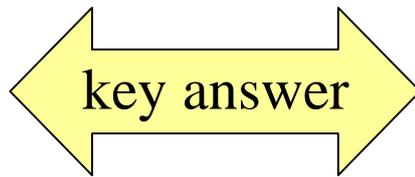
Note :one degree for each answer

-Check your answers in key answer page at the end of module

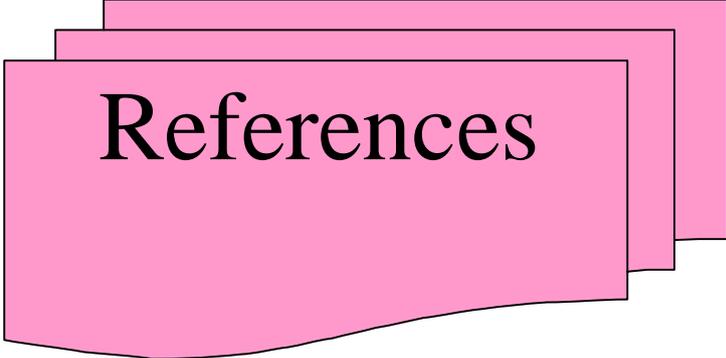
If you got:

- 5 or more so congratulation your performance go on studying the second module .

- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.space 2 electricals 3.earth	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology

THIRTIETH MODULE



**Communication
with patient
& assistant**

1/ Over view

1 / A –Target population:-

This module directed to class two students in dental preventive department of technical medical Institute .

1 / B –Rationale :-

This module designed in Dental X- Ray to give the students a good knowledge about the communication with patient and assistant . so all this information will made the student in the future when he become dental assistant have a good communication with the dentist.

1 / C –Central Idea :-

Central idea of this module include

1. The communication with patient .
2. the communication with assistant .

1 / D –Instructions:-



- 1- Study the material very well .
- 2- Identify the aims of modules .
- 3- Do the pre test . if you got :
 - a. five degree and more so you don't need to study the module then consult the instructor .
 - b. less than five degree so you need to study the module and continue in your studying the module .
- 4- After your study the module content do the post test . if you got :
 - a. five and more then pass to study the second module .
 - b. less than five degree then go back to study the first module or any part of it then do the post test again .

2/ Performance Objectives

After studying the first module , the student will be able to:-

- 1-Understand the idea for communication .
- 2-Determine the need for those patient .
- 3-Understand the idea from communication with assistant .
- 4-Describe the procedure for communication

3/ Pre test

Put circle around the letter of the correct answer :

1. The dentist must inform the assistant that the panoramic radiograph

- a. is less radiation than full set of PA
- b. like extra oral radiograph
- c. non of above
- d. all of them

2. The dentist must inform the assistant that the panoramic radiograph

- a. like extra oral radiograph
- b. use screen so les exposure need
- c. non of above
- d. all of them

3. The dentist must not inform the assistant that

- a. no need for extra oral radiograph
- b. more exposure need
- c. x ray is safe
- d. all of them

4. The dentist must not inform the assistant that

- a. no need for extra oral radiograph
- b. more exposure need
- c. x ray is not safe
- d. led aprone absorb 95 %

5. The dentist must inform the assistant that

- a. we use less than the environment daily received
- b. no exposure
- c. x ray is safe
- d. all of them

6-. The dentist must not inform the assistant that

- a. no radiograph hazard
- b. explain the benefits of protection
- c. x ray is safe
- d. all of them

Note : one degree for each answer .

- Check your answers in key answer page at the end of module

If you got:

- 5 or more you do not need to proceed
- less than 5 you have to study this module well .

4/ the module contents

Communication with assistant

The dentist must lead the communication with the assistant so explain
Is the big panoramic X-ray more dangerous? Panoramic radiographs exposed the patient to much less radiation than a complete set of intra oral radiographs, panoramic film use cassettes with screens and need much less X-rays than peri apical film to be exposed.

Are these X-ray safe? Or the patient ask "I am pregnant these X-ray might harm my baby"?

This question is not usual but if it happen and you asked this question you should not answer that these X-rays are safe or Dental X-ay do not harm you.

But you should say that the amount of X-ray we use are very little and lead. Approne absorb 95% of the radiation, and also the radiation you received is less than that you receive daily form the back ground radiation we receive from our environment. It is also less than the radiation exposure we receive from the outer space when we travel or a few hours in an airplane high above the clouds.

Self test (1)

Mention who is the daily sources of radiation

Check your answers in the key answer page at the end of module

5/ Post test

Put circle around the letter of the correct answer :

1. Assistant must understand the radiation benefits ?
 - a. in simple method
 - b. fogey method
 - c. non of above
 - d. all of them

- 2 Assistant must understand the radiation hazard ?
 - a. in horrible method
 - b. simple method
 - c. non of above
 - d. all of them

3. Assistant must understand the radiation protection ?
 - a. in careless method
 - b. in fogey method
 - c. benefits
 - d. all of them

4. Assistant must understand the radiation dose is ?
 - a. huge
 - b. more than environment radiation
 - c. non of above
 - d. les than environment radiation

- 5- Assistant must understand that the radiation protection dose is ?
 - a. absorbed around 95 %
 - b. more than environment radiation
 - c. non of above
 - d. les than environment radiation

6. treatment of un cooperative patient done by ?

a. rough manner

b. friendly manner

c. non of above

d. all of them

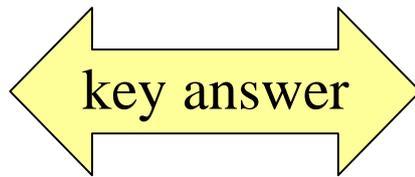
Note :one degree for each answer

-Check your answers in key answer page at the end of module

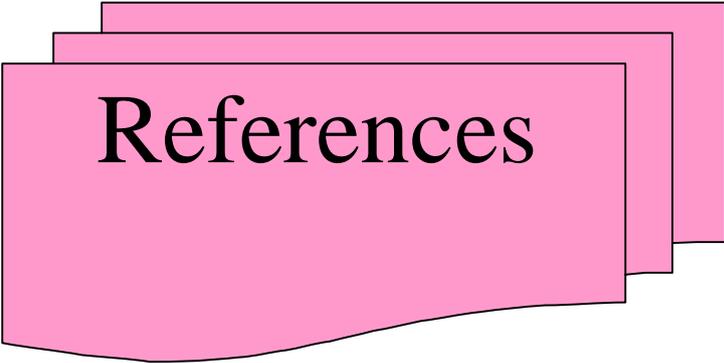
If you got:

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- less than 5 , go back and study the first module or any part of it then



Pre test		Self test	Post test	
Question no.	answer	Self test (1)	Question no.	answer
1	A	1.space 2 electricals 3.earth	1	A
2	B		2	B
3	C		3	C
4	D		4	D
5	A		5	A
6	B		6	B



References

1- Dental radiology for dental auxiliaries

2- Fundamentals of dental radiology 1978 .

3- Oxford Clinical dental radiology