الجامعة التقنية الشمالية
كلية التقنيات الصحية و الطبية الدور
قسم تقنيات العلاج الطبيعي

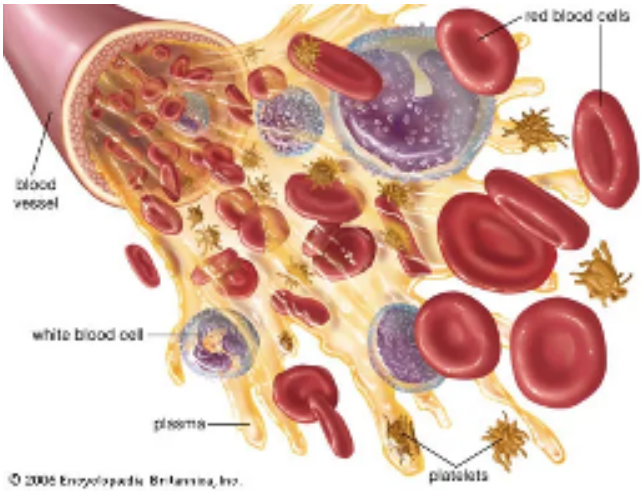
أجهزة العلاج المتخصصة

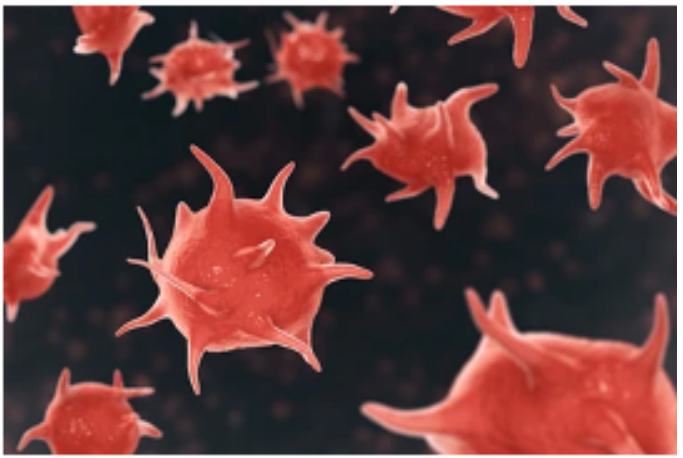
IRAQ
NTU
الجامعة التقنية الشمالية
NORTHERN TECHNICAL UNIVERSITY
2014 م
1435هـ

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Platelets (thrombocytes):

are small, disc-shaped cell fragments (since they lack a nucleus).

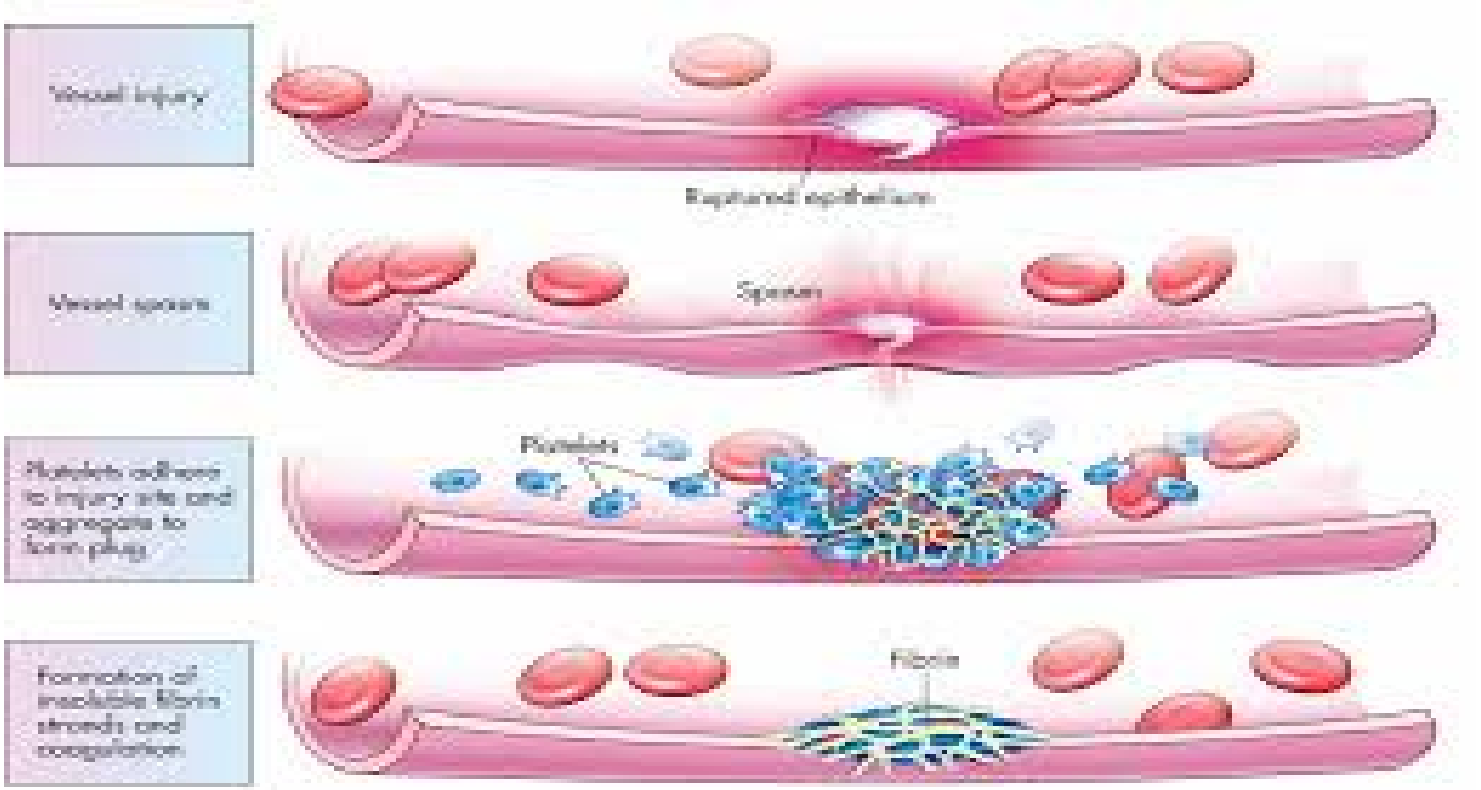




ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Platelets (thrombocytes):

Platelets help form the ***initial plug*** at the site of injury, activate the coagulation cascade to form a ***stable clot***, and release ***growth factors*** that aid in tissue repair.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Platelets (thrombocytes):

Without platelets, the body would struggle to heal wounds or prevent excessive bleeding, highlighting their critical role in overall health.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

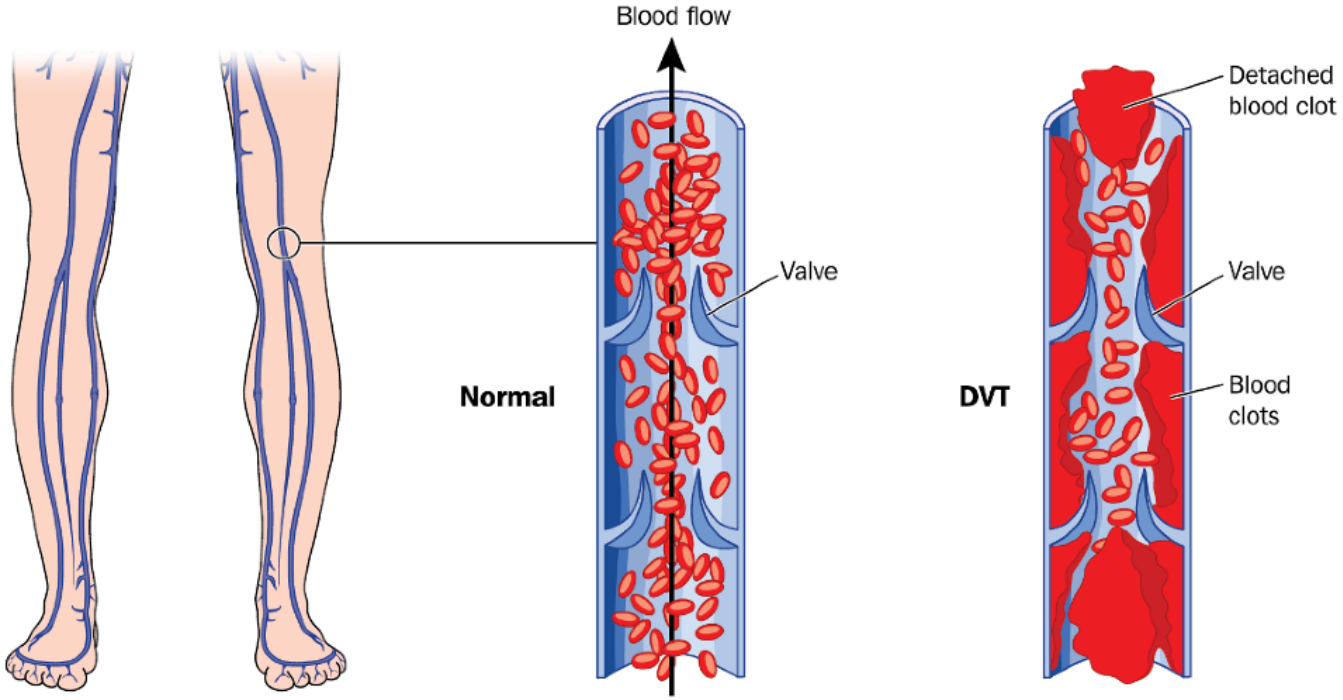
A blood clot (also called a thrombus): is a semi-solid mass of blood that forms when ***blood cells and proteins stick together.***

Normally, blood clotting is a protective mechanism that helps stop bleeding when you're injured by forming a plug over the wound.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

A blood clot (also called a thrombus):

When a clot forms *abnormally or inside a blood vessel without injury*, it can be dangerous and lead to serious health problems.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Types of Abnormal Blood Clots:

When a blood clot forms inside a blood vessel without injury or when it doesn't dissolve properly, it can cause ***complications.*** These include:

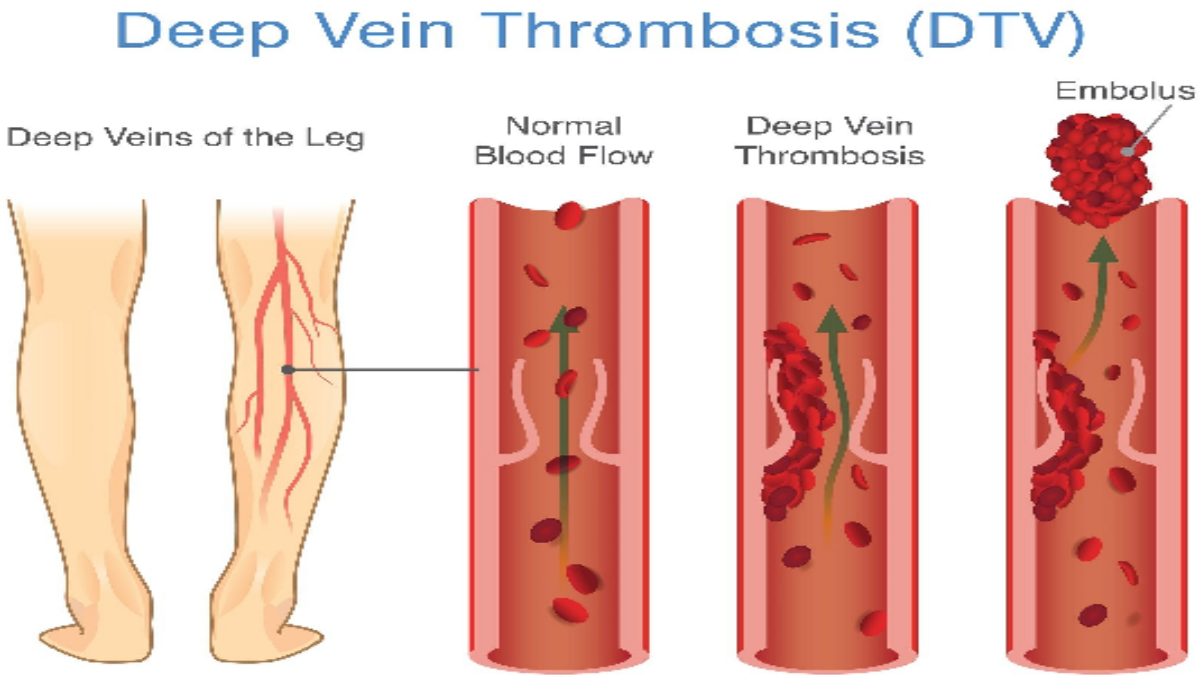
1. Deep Vein Thrombosis (DVT).
2. Pulmonary Embolism (PE).
3. Arterial Thrombosis.
4. Heart Attack (Myocardial Infarction).
5. Stroke.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Types of Abnormal Blood Clots:

Complications:

1. **Deep Vein Thrombosis (DVT):** This type of clot forms in the deep veins, usually in the legs.



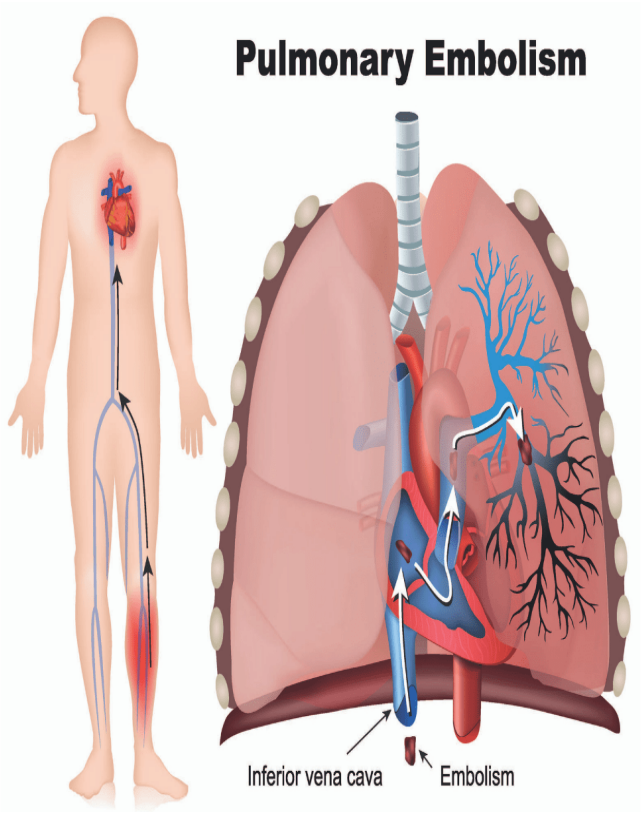
ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Types of Abnormal Blood Clots:

complications:

1. Deep Vein Thrombosis (DVT).
2. **Pulmonary Embolism (PE):**

A pulmonary embolism occurs when a clot breaks loose from another part of the body (usually from the legs in the case of DVT) and travels to the lungs, blocking a pulmonary artery.



This can cause difficulty breathing, chest pain, and even death.

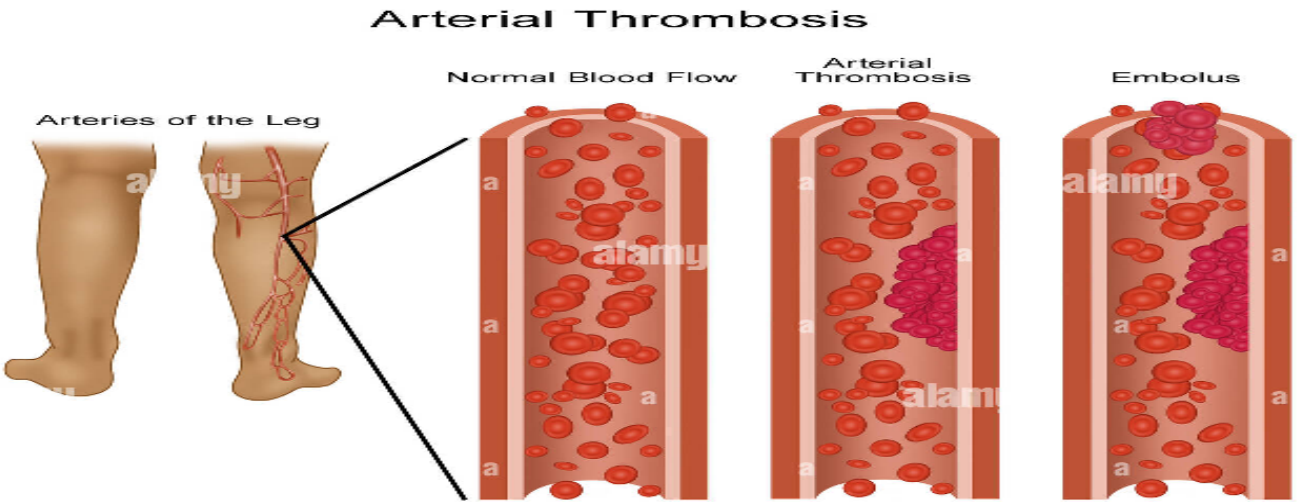
ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Types of Abnormal Blood Clots:

Complications :

1. Deep Vein Thrombosis (DVT).
2. Pulmonary Embolism (PE).
3. **Arterial Thrombosis.**

Clots can also form in ***arteries,*** which carry oxygen-rich blood from the heart to the body. These clots can cause serious conditions, such as a *stroke or a heart attack,* depending on where the clot forms.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

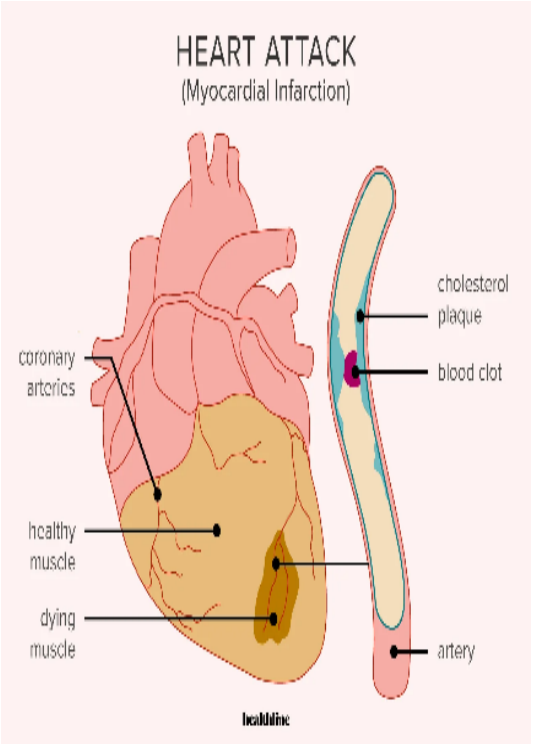
Types of Abnormal Blood Clots:

Complications :

1. Deep Vein Thrombosis (DVT).
2. Pulmonary Embolism (PE).
3. Arterial Thrombosis.
4. **Heart Attack (Myocardial Infarction (MI)).**

A blood clot can form in the coronary arteries, blocking the flow of oxygen-rich blood to the heart muscle, leading to a heart attack.

This usually occurs due to a rupture of plaque in the arteries (*atherosclerosis*), which triggers clotting.



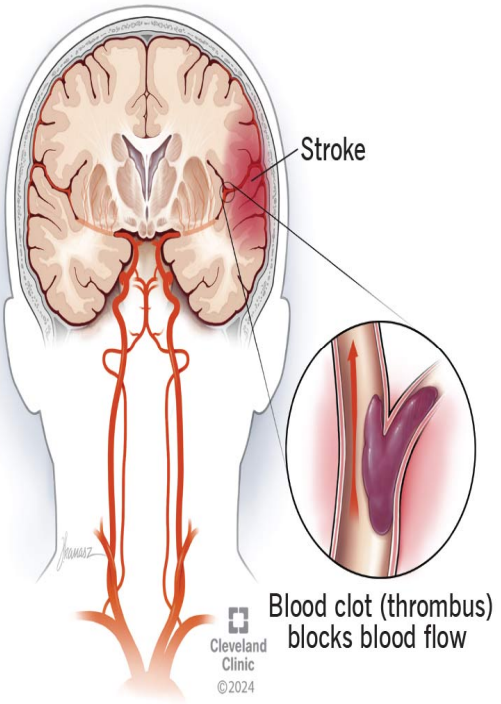
ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Types of Abnormal Blood Clots:

Complications :

1. Deep Vein Thrombosis (DVT).
2. Pulmonary Embolism (PE).
3. Arterial Thrombosis.
4. Heart Attack (Myocardial Infarction).
5. Stroke.

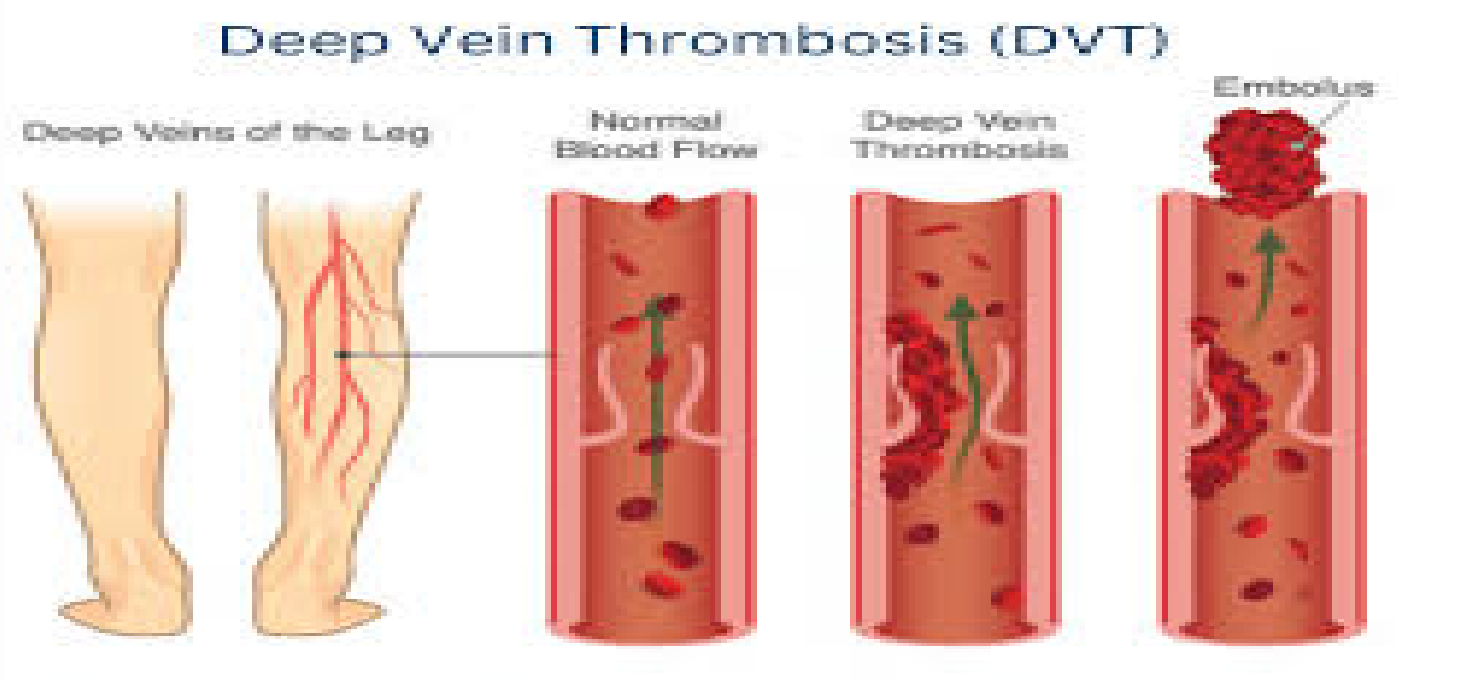
A blood clot can block the blood supply to the brain, leading to an ischemic stroke This usually happens when a clot forms in one of the arteries supplying blood to the brain or when a clot travels from other parts of the body (such as the heart or neck).



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

The most common site for initial of DVT or Arterial Thrombosis are the limbs:

1. The DVT occurs in the deep veins of the legs, particularly in the calf and thigh veins.

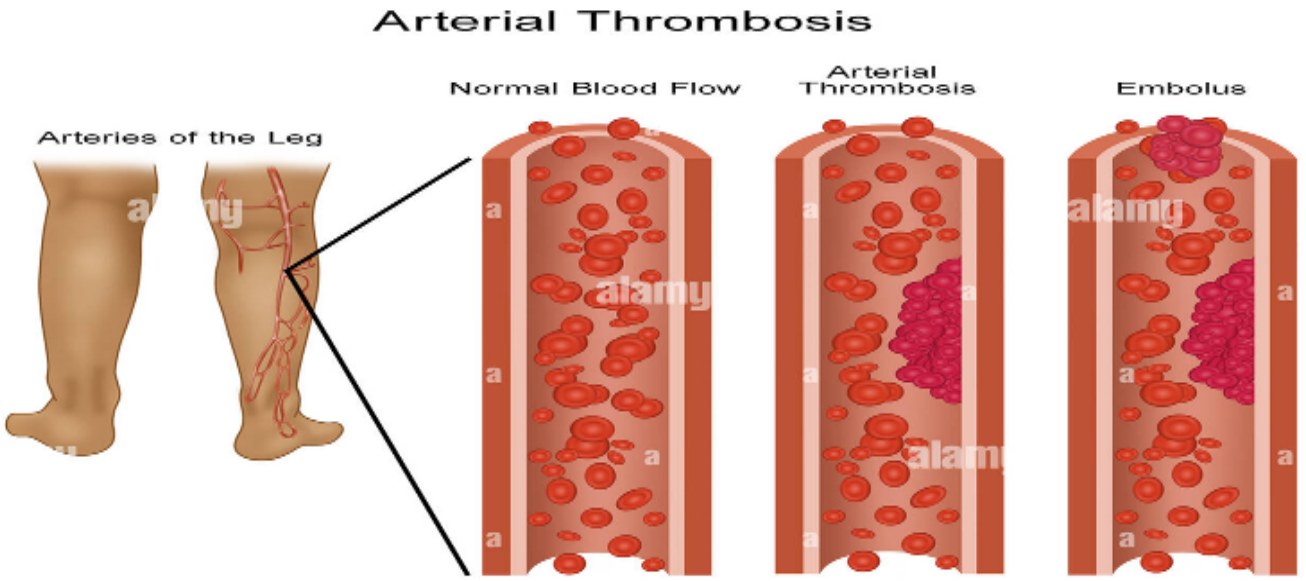


ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

The most common site for initial of DVT or Arterial Thrombosis are the limbs:

1. The DVT.
2. Arterial thrombosis as usually occurs due to a *rupture of plaque in the arteries (atherosclerosis)*

in the coronary arteries *(leading to MI),* the carotid arteries *(leading to strokes)* , and the in *peripheral arteries* (causing pain or damage to *limbs*).



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Intermittent pneumatic compression (IPC)

devices are used to help prevent blood clots in the deep veins of the legs. The cuffs inflate and deflate at regular intervals, mimicking the natural pumping action of muscles during walking.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Intermittent pneumatic compression (IPC)

The devices use *cuffs around the legs* that fill with air and *squeeze* your legs. This *increases* blood flow through the veins of your legs and helps *prevent blood clots*.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Intermittent pneumatic compression (IPC)

Contraindications:

1. Severe peripheral arterial disease (PAD), where blood flow is already restricted.
2. Severe skin conditions or infections in the treated area.
3. Uncontrolled heart or lung disease.

Thank you!

الطلبة الذين تحسن مستواهم في الفصل الثاني

المسائي

احمد سلام رجب
اكتفاء قاسم جاسم
اميره حمدان عبد
بكر حسام علي
حذيفة قصي صالح
بلسم رعد عطية
حسين سالم حسين
زياد خلف عبدالله
صكر محمود احمد
طيبه حسين علوان
عبدالحميد محمد حسين
عبدالله فضيل

المسائي

عبدالله محمد صالح
عبدالمجيد رائد فلاح حسن جاسم
لمياء سعد حاتم
محمد عبد احمد
مصطفى قاسم
مصطفى نجم
ميسم محمد صالح
نزهان سفيان نزهان
ياسين اوس امير
ياسين سعدون

الطلبة الذين تحسن مستواهم في الفصل الثاني

الصباحي

مصطفى احسان

نور الدين خوام

هبة صاحب اللّٰهيبي

important

1-------- provides the basis for SWD dosage.
A. Patient sensation. B. EM energy. C. amplifier. D- oscillations.
2- SWD unit will produce ------- fields.
A. electrical. B. magnetic. C. BOTH A&B D. None of A&B.
3- Physiological Effects of SWD include all Except------.
A. HEMODYNAMIC B. NEUROMUSCULAR C. METABOLIC D. GENETIC
4-SWD Indications include all Except-------
A. Healing B. Relaxation C. Vasoconstriction D. Pain management
5 Physiological Effects in NEUROMUSCULAR Increased all Except------.
A. temperature. B. Pain Threshold. C. muscle spindle D. None of A&B.
6- SWD Indications in Increased blood flow include all Except-------
A. metabolism B. enzyme reactions C. neuropathy

important

1--------: - is a treatment technique that involves applying controlled pressure.

A. Compression. B. increase swelling. C. healing. D- improve circulation.

2- The circulatory system includes all Except------:

A. blood. B. neuron. C. vessels D. heart.

3. Blood Vessels are the tubes for blood flows, include all Except-------.

A. Arteries. B. Veins C. Capillaries. D. None of all.

4- Blood consistency include all Except-------

A. Plasma. B. Red RBCs. C. atria. D. Platelets.

5- Types of Abnormal Blood Clots include all Except-------

A.DVT B. MI C. Stroke D. Trauma.

6------ devices are used to help prevent blood clots in the deep veins of the legs.

A. Clots B. Intermittent pneumatic compression (IPC). C.SWD D. Thrombosis

7- Intermittent pneumatic compression (IPC) contraindications include all Except-

A. PAD B. Uncontrolled heart or lung disease C. DVT D. Skin

PHYSIOTHERAPY EQUIPMENTS

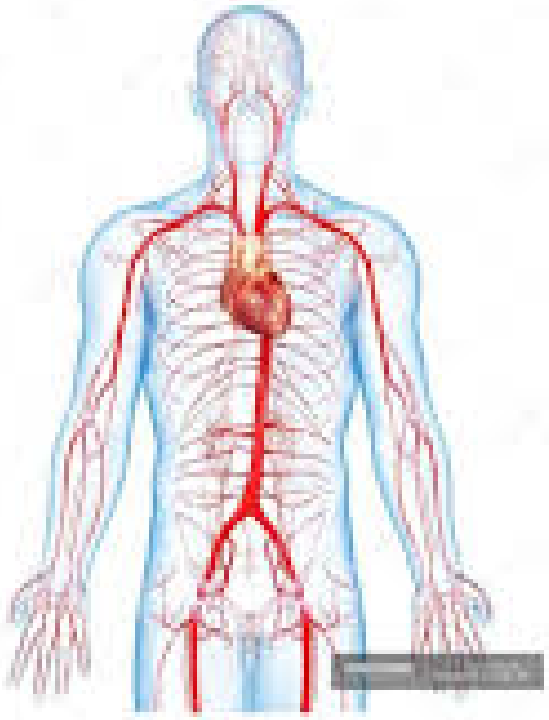
Second year – Lecture 15

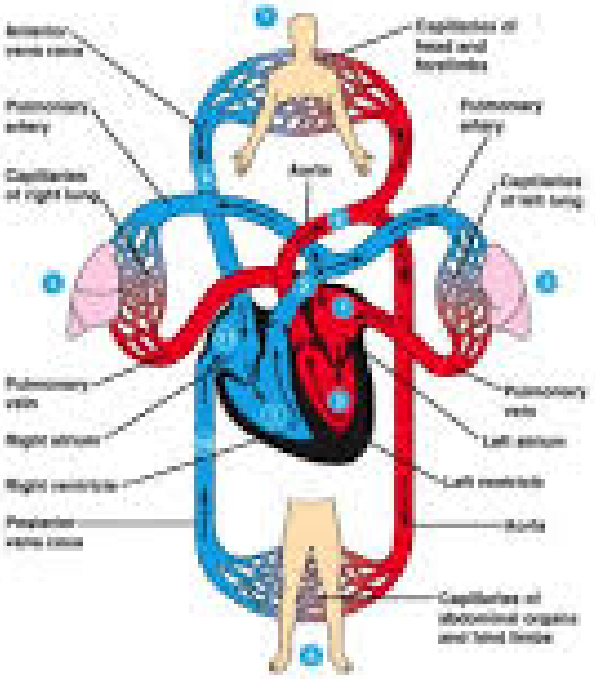
ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Compression therapy : – is a treatment technique that involves applying controlled pressure to a specific part of the body to reduce swelling, improve circulation, and promote healing

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

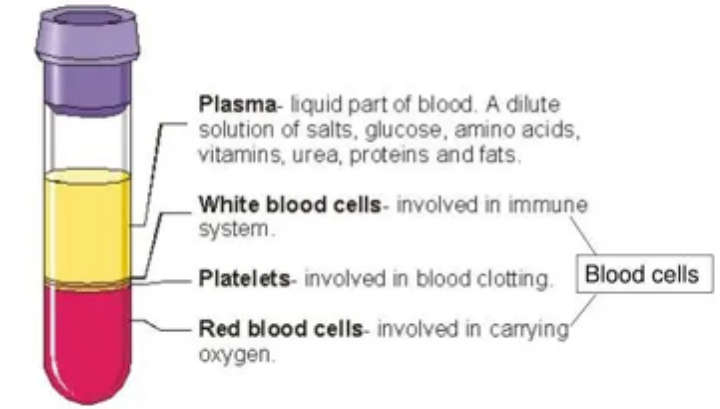
Since compression therapy in physiotherapy is aimed at managing ***circulatory system*** disorders, it is important to have a basic understanding of this system.

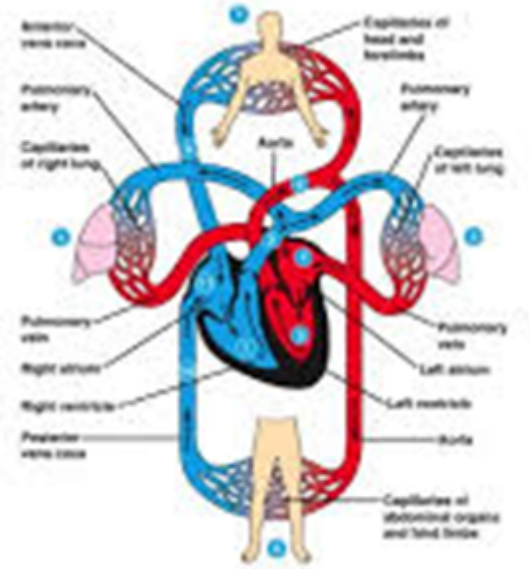




ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

The circulatory system (the cardiovascular system– CVS): is a complex network of a closed circuit of *blood vessels* through which the *blood* is continuously circulated by the repeated contraction of a muscular pump, *the heart*.





ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

The function of the circulation is to: –

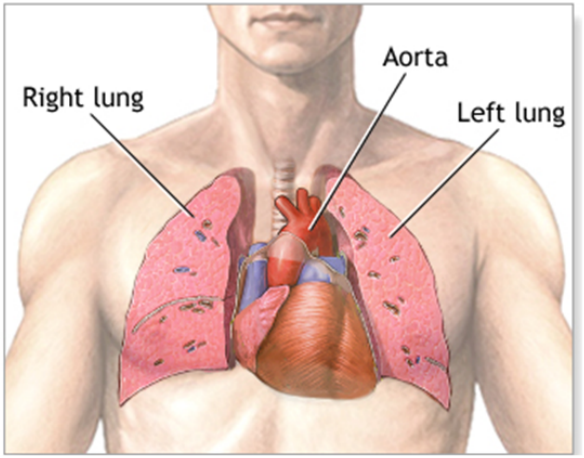
1. service the needs of the body tissues.
2. to transport nutrients to the body tissues.
3. to transport waste products away.

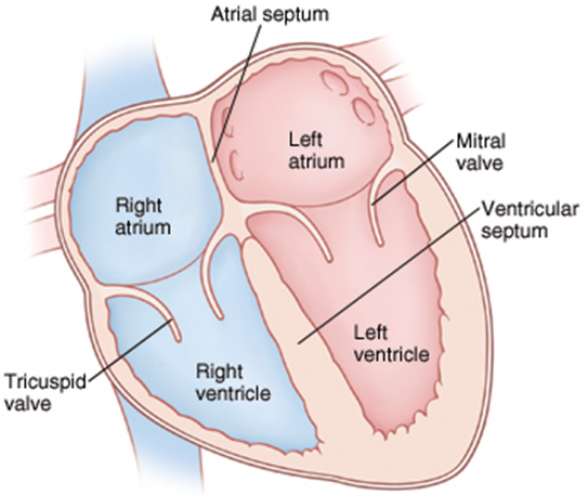
in general , to maintain an appropriate environment in all the tissue fluids of the body for optimal survival and function of the cells.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

The Heart: The heart is a conical, hollow organ found in the mediastinum, between the two lungs, pumps blood throughout the body.

It has four chambers: two atria (left and right upper chambers) and two ventricles (left and right lower chambers).

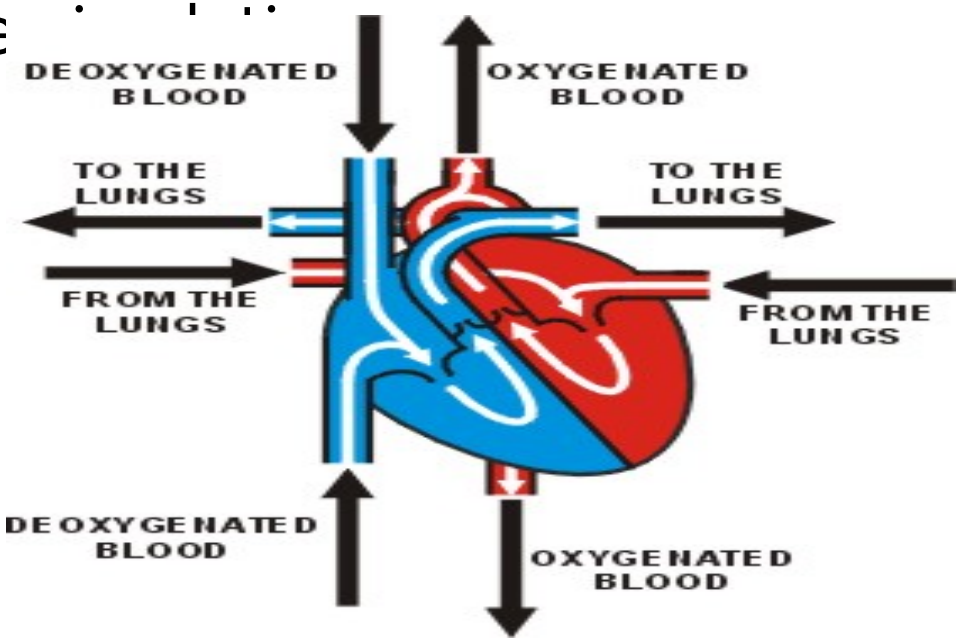




ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Heart: The *right side* of the heart pumps **deoxygenated** blood to the lungs, while the *left side* pumps **oxygenated** blood to the rest of the body.

In clinical terms, the cardiovascular diseases, may be divided into *(cardiac disease)* that affect the heart and *(vascular disease)* those that affect the

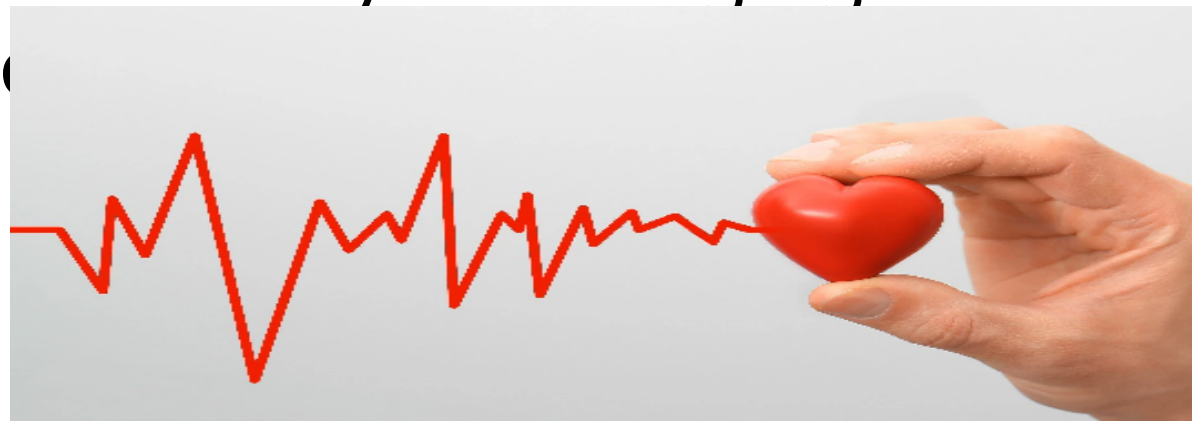


ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Functions of the Heart:

1. Generating blood pressure.
2. Separates pulmonary and systemic circulations.
3. Ensuring one-way blood flow: valves

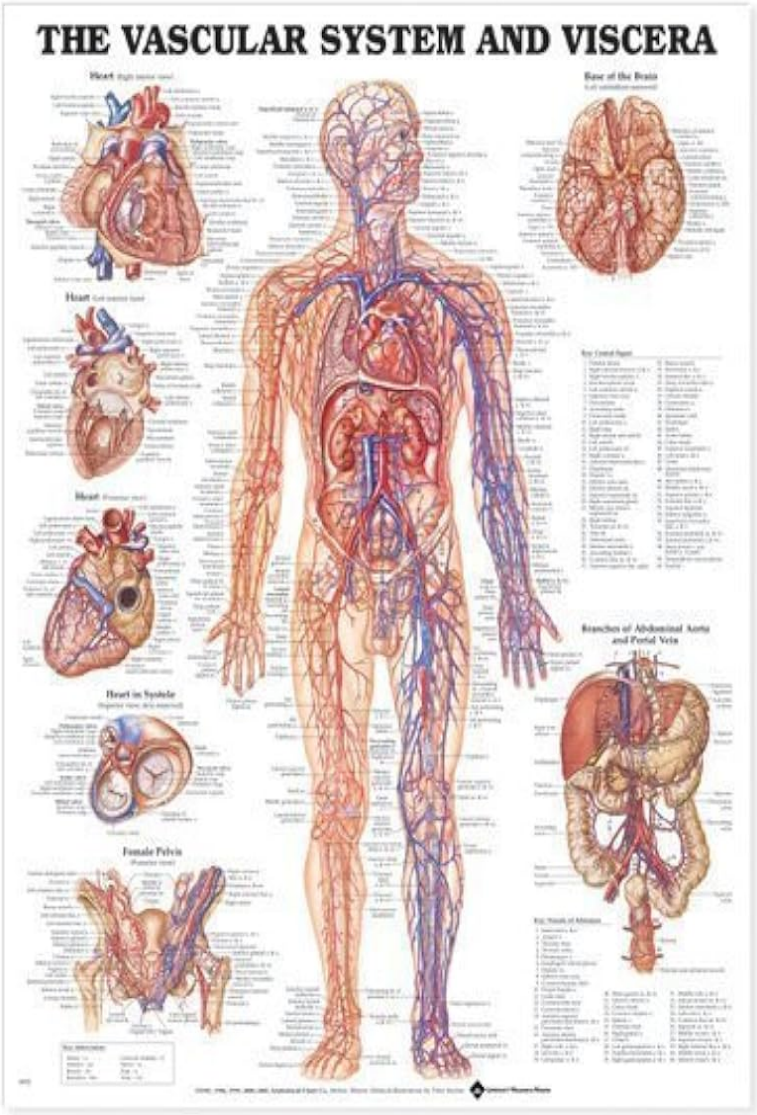
Regulating blood supply, changes in contraction rate and force match blood delivery to changing metabolic nee



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

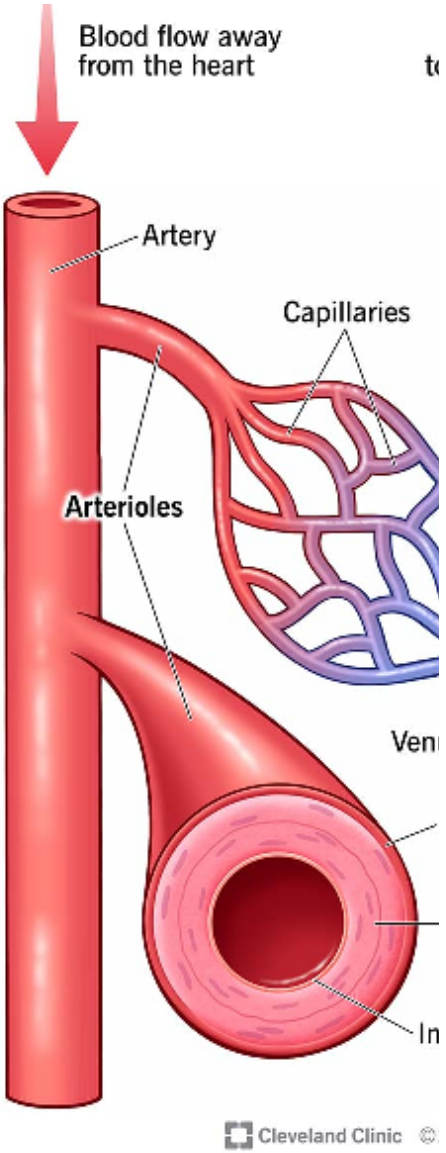
The Blood Vessels : – These are the tubes through which blood flows. Its include:

1. **Arteries.**
2. **Veins.**
3. **Capillaries.**



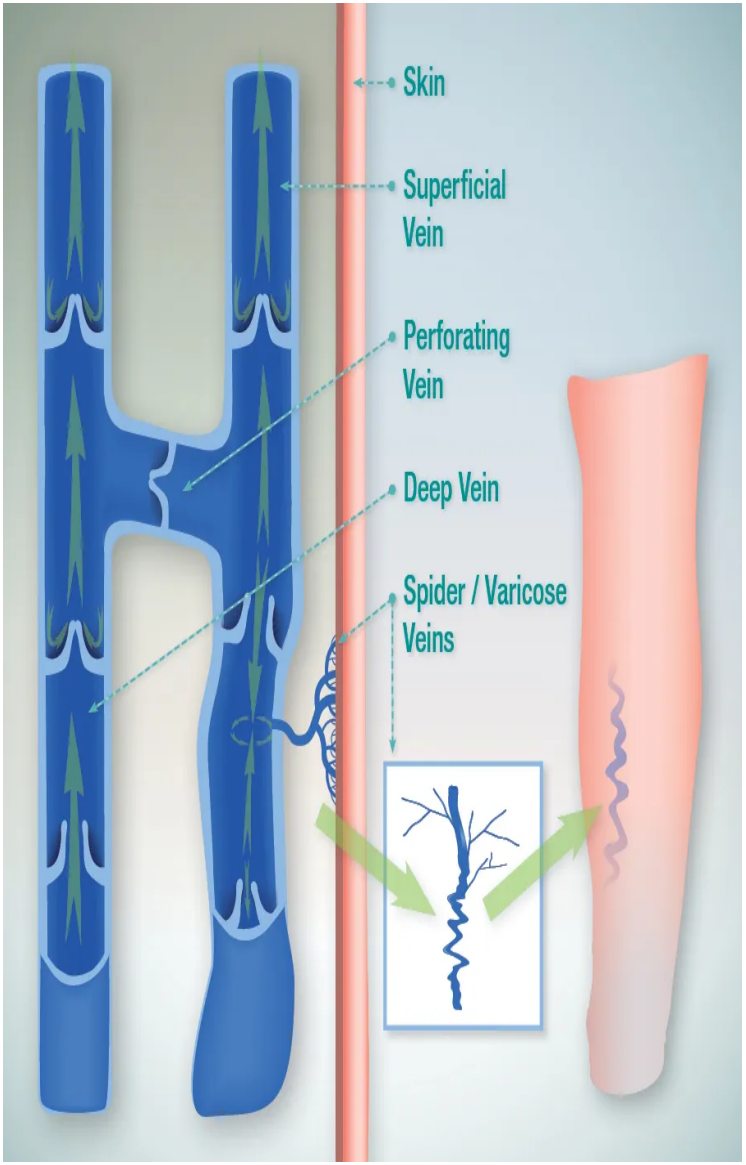
ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

1. ***Arteries:*** Carry *oxygenated* blood *away from the heart to the body* (except the pulmonary artery, which carries deoxygenated blood to the lungs).



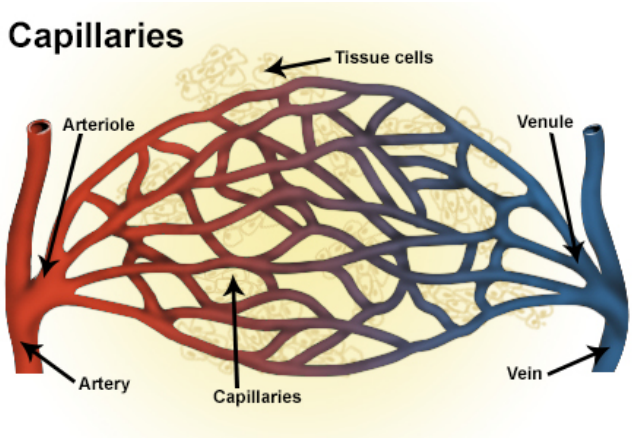
ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

1. ***Arteries:***
2. ***Veins:*** Carry *deoxygenated* blood *back to the heart* (except the pulmonary veins, which carry oxygenated blood from the lungs to the heart).



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

1. ***Arteries:***
2. ***Veins:***
3. ***Capillaries:*** Tiny, thin-walled vessels where the exchange of gases (oxygen and carbon dioxide), nutrients, and waste products occurs between the blood and tissues.

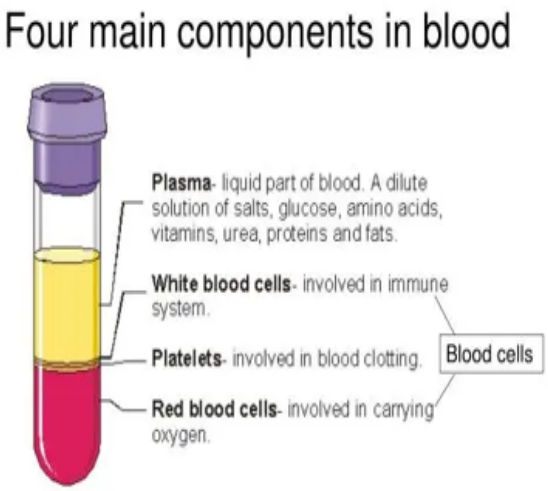


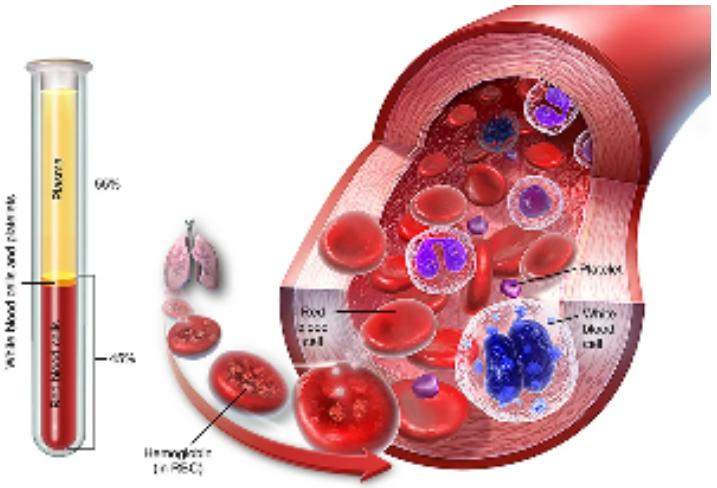
ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Blood: is a fluid that circulates through the blood vessels, carrying oxygen, nutrients, hormones, and waste products.

Blood consists of:

1. Plasma.
2. Red Blood Cells (RBCs).
3. White Blood Cells (WBCs).
4. Platelets.

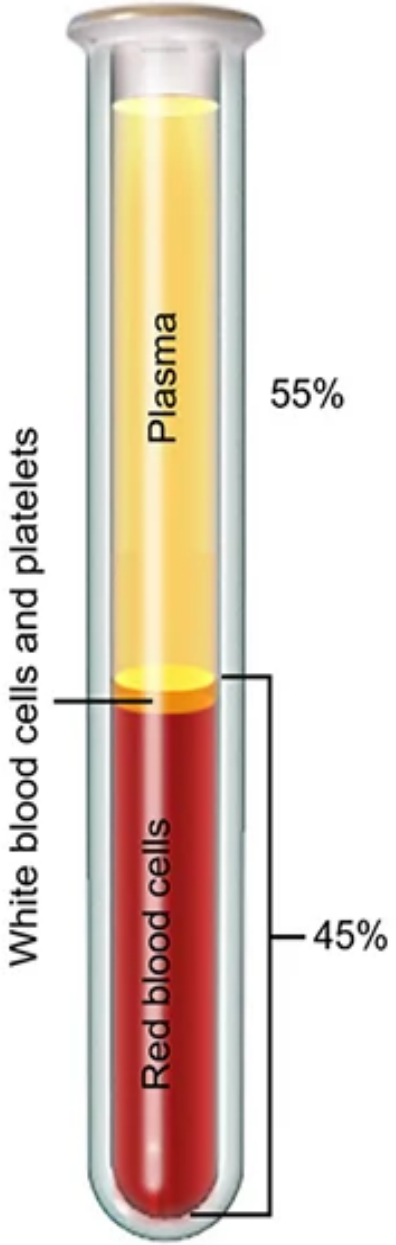




ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Blood consists of:

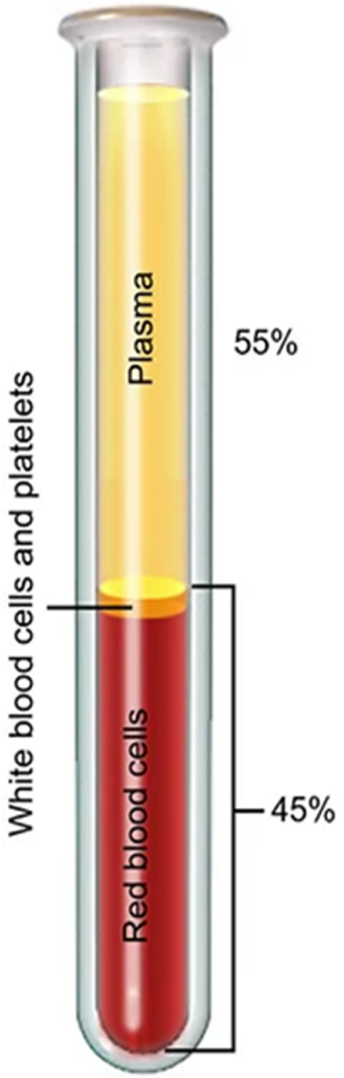
1. **Plasma:** The liquid component of blood that carries water, proteins, and other substances.
2. **Red Blood Cells (RBCs):** Carry oxygen from the lungs to tissues and bring carbon dioxide back to the lungs



ADVANCE PHYSIOTHERAPY EQUIPMENTS – COMPRESSION:

Blood consists of:

1. **Plasma:**
2. **Red Blood Cells (RBCs):**
3. **White Blood Cells (WBCs):** Part of the immune system, these cells help fight infections.
4. **Platelets:** Involved in clotting and wound healing.



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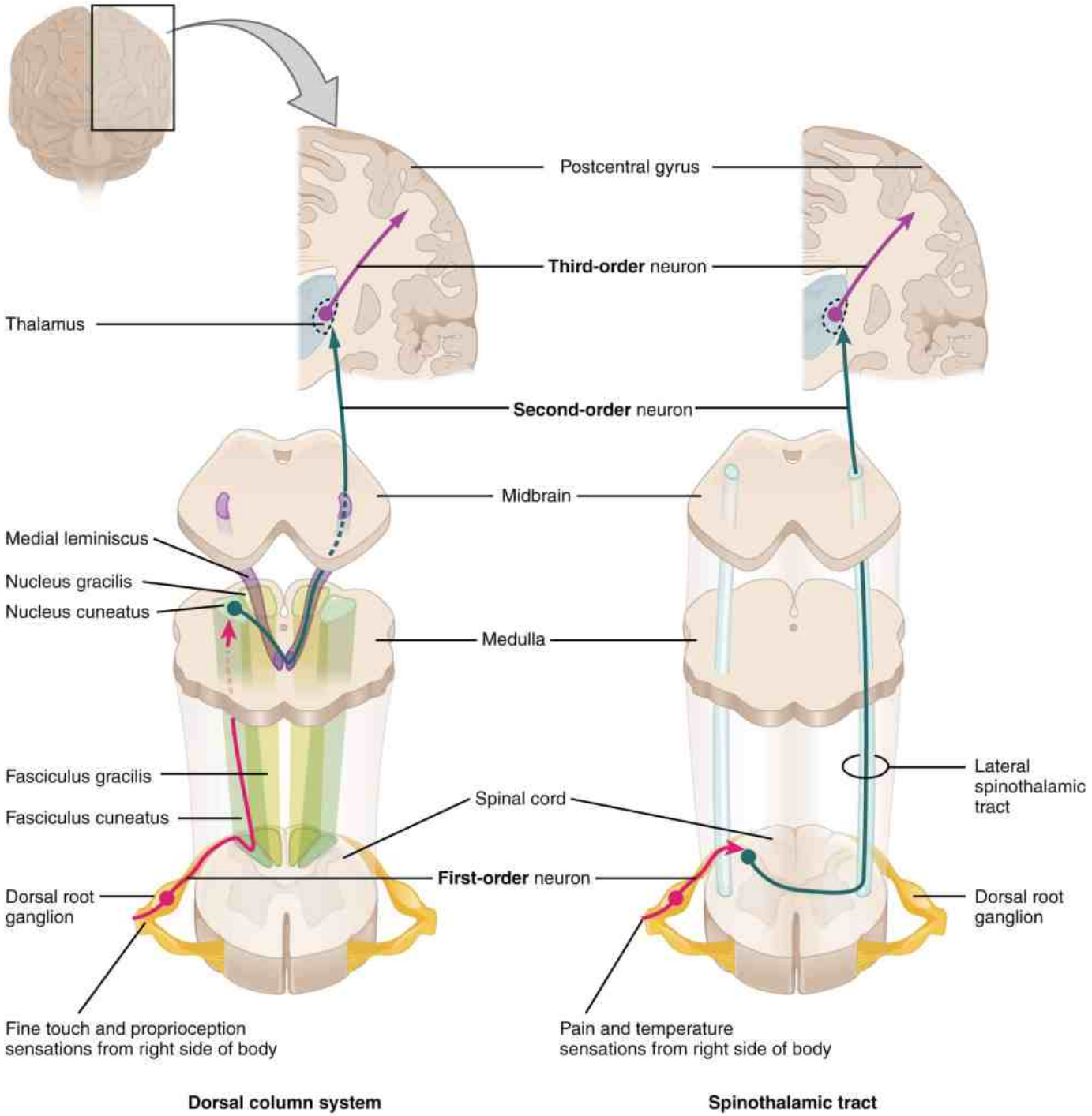

Postcentral gyrus
Third-order neuron
Thalamus
Second-order neuron
Midbrain
Medial leminiscus
Nucleus gracilis
Nucleus cuneatus
Medulla
Fasciculus gracilis
Fasciculus cuneatus
Spinal cord
First-order neuron
Dorsal root ganglion
Fine touch and proprioception sensations from right side of body
Dorsal column system
Lateral spinothalamic tract
Dorsal root ganglion
Pain and temperature sensations from right side of body
Spinothalamic tract

PHYSIOTHERAPY EQUIPMENTS

Second year – Lecture 12

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

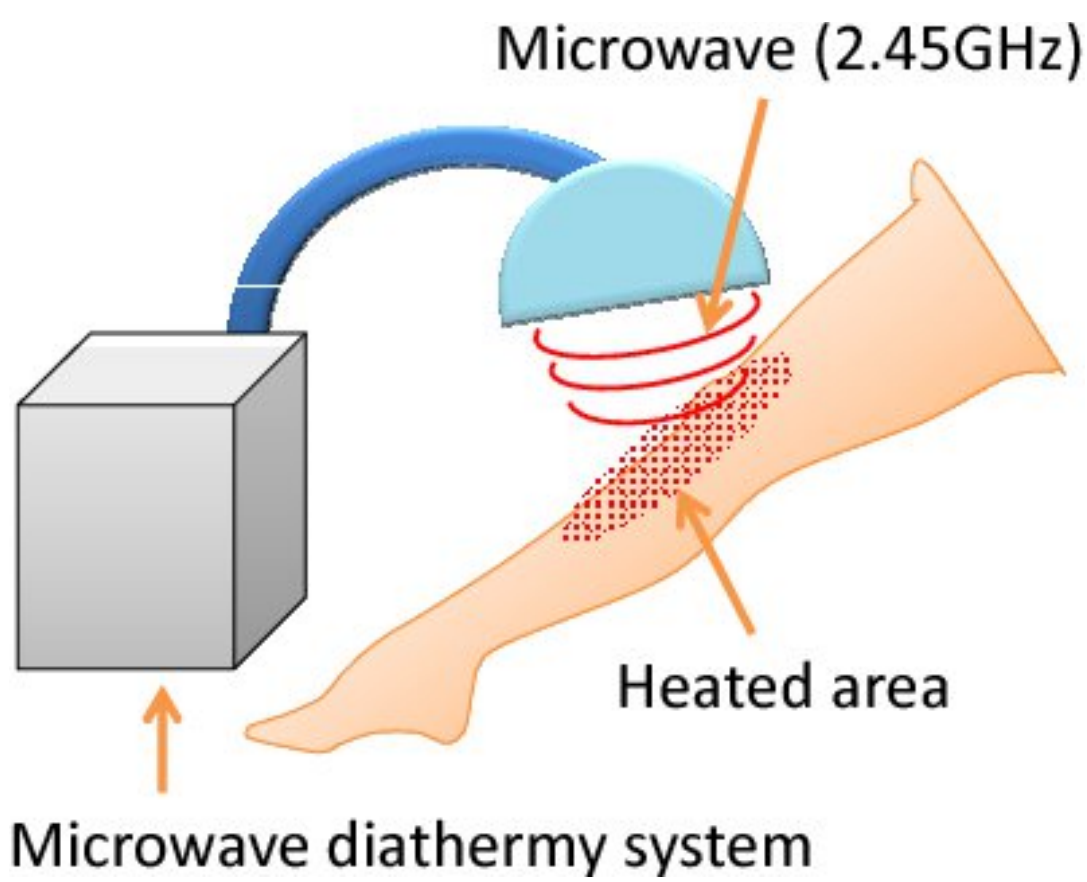
- Microwave diathermy (MWD), is a form of electromagnetic radiations lying between shortwave and infrared waves.
- Microwave diathermy does not penetrate as deep as shortwave diathermy.
- The energy is first absorbed at the surface of the body (skin) and a part of it penetrate and absorbed in deep tissues.
- It generates Strong Electrical Field and relatively Little Magnetic Field.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Frequency and wavelength:

- Microwave has a much *higher frequency and a shorter wavelength* than shortwave diathermy.
- The general frequency of microwave is between *300 MHz to 300 GHz with wave length of 10 mm to 1 meter.*
- The therapeutic microwave generators used frequency of *2450MHz with wave length of 122.5mm.*



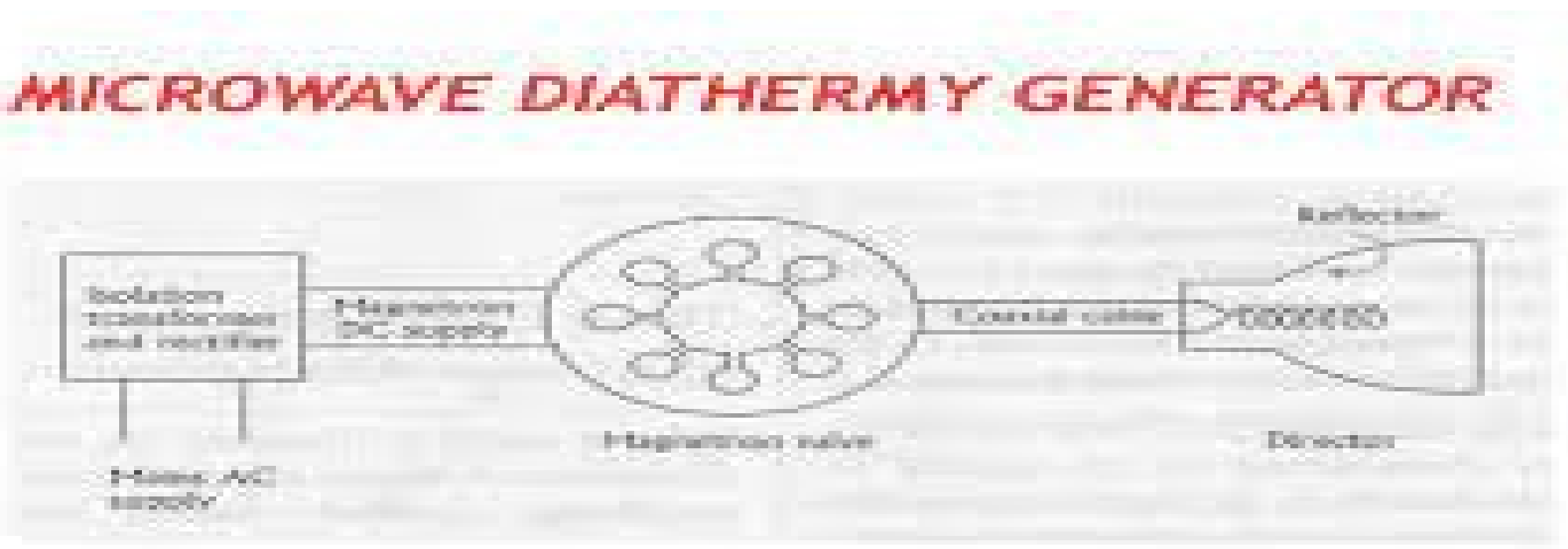
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Microwave Production and Device :

The generator used to produce microwaves has three main components:

- 1- A multi-cavity magnetron valve.
- 2- A coaxial cable.
- 3- A director.



- Power supply
- **Magnetron**
- Timing circuit
- **Applicators** (emitter, a director)

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Microwave Production and Device :

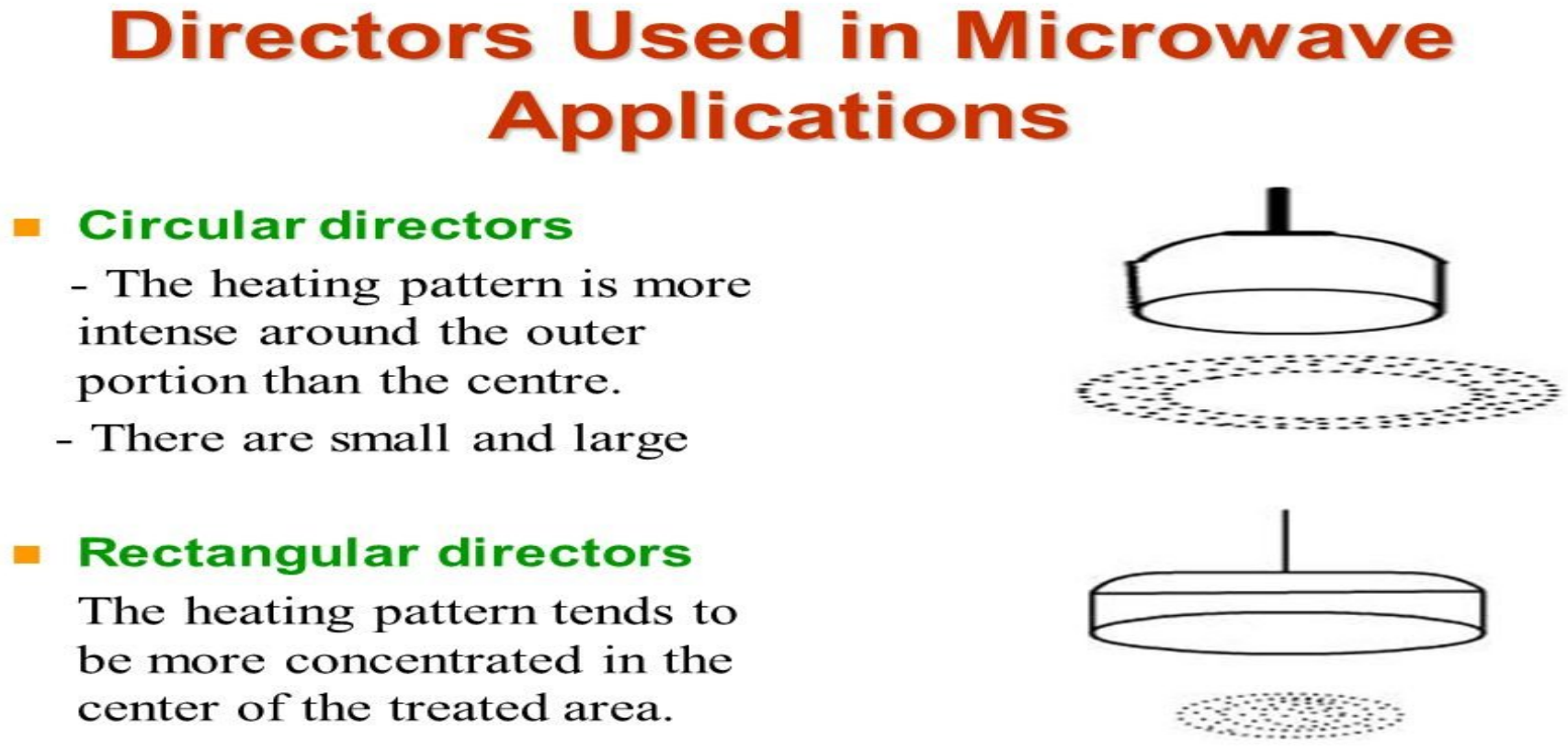
- The magnetron produces a high frequency alternating current which is carried by coaxial cable to the transducer (director).
- The coaxial cable transmits the energy to the director whereas a radiating system comprising an antenna within a reflector that is used to direct the microwave to the patient.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Directors Used in Microwave Applications :

1) Circular directors: - The heating pattern is more intense around the outer portion than the center. There are small and large portion.
2) Rectangular directors: - The heating pattern tends to be more concentrated in the center of the treated area.

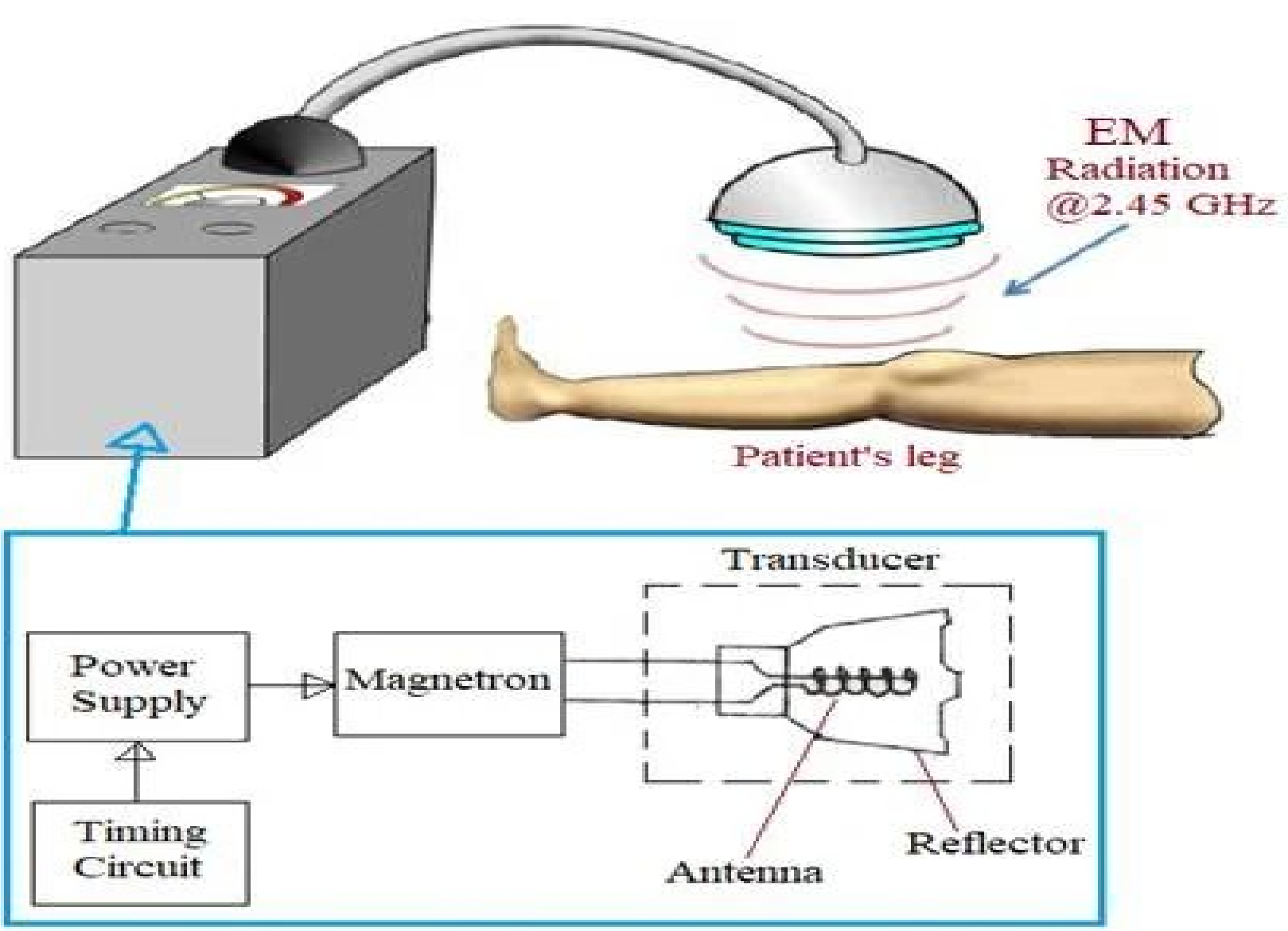


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Therapeutic effect of microwave diathermy :

- Micro waves penetrate more deeply than do infra red rays, *but do not pass right through the tissues in any appreciable density* like the electric field used in short-wave diathermy.

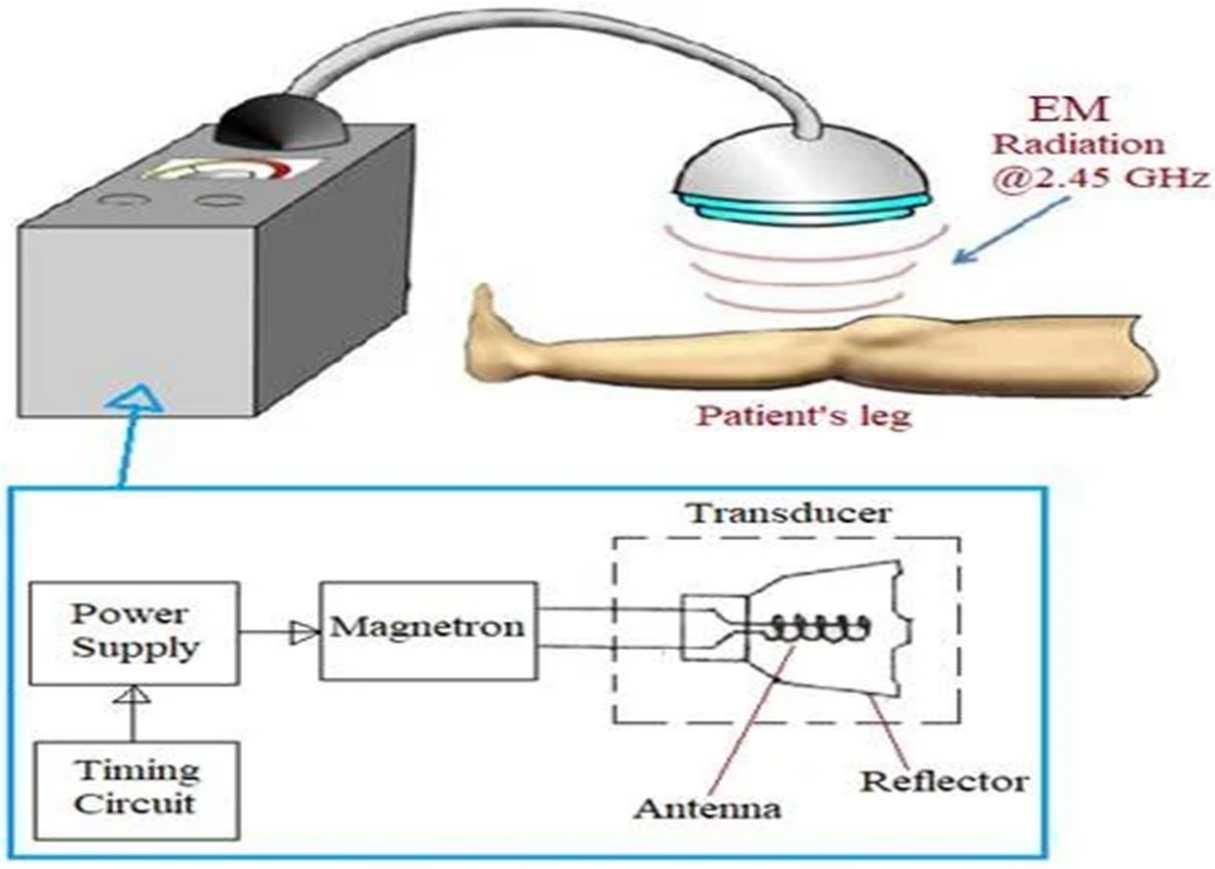


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Therapeutic effect of micro wave diathermy :

- The effective depth of penetration of microwaves diathermy appears to be *about (3 -5cm),* but this depends upon the water content of the tissues through which they must pass.

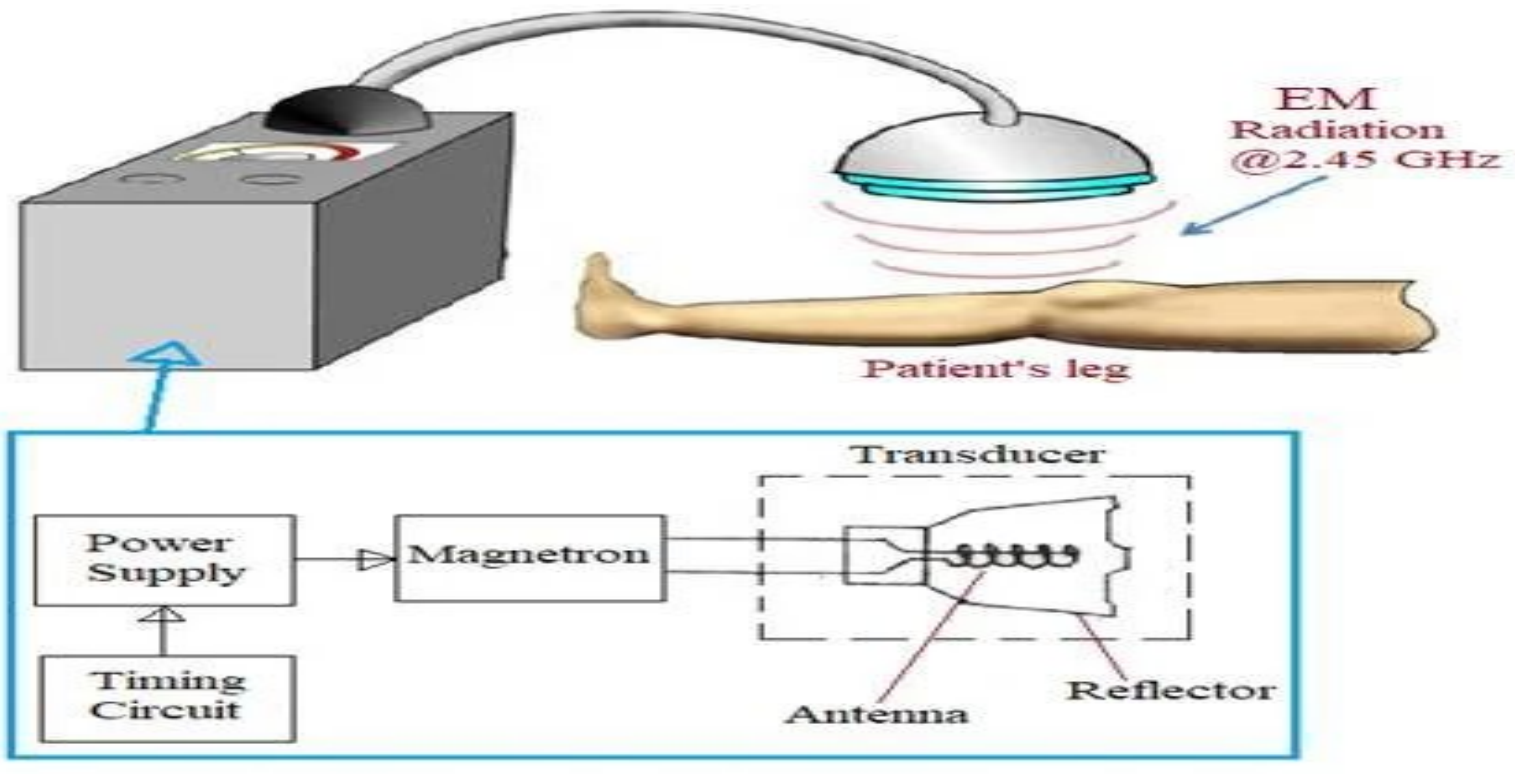


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Therapeutic effect of micro wave diathermy :

Micro waves are *strongly absorbed by water,* so there is appreciable heating of tissues which have *a good blood supply,* such as muscle, but less heat is produced in those with *a low fluid content, such as fat.*

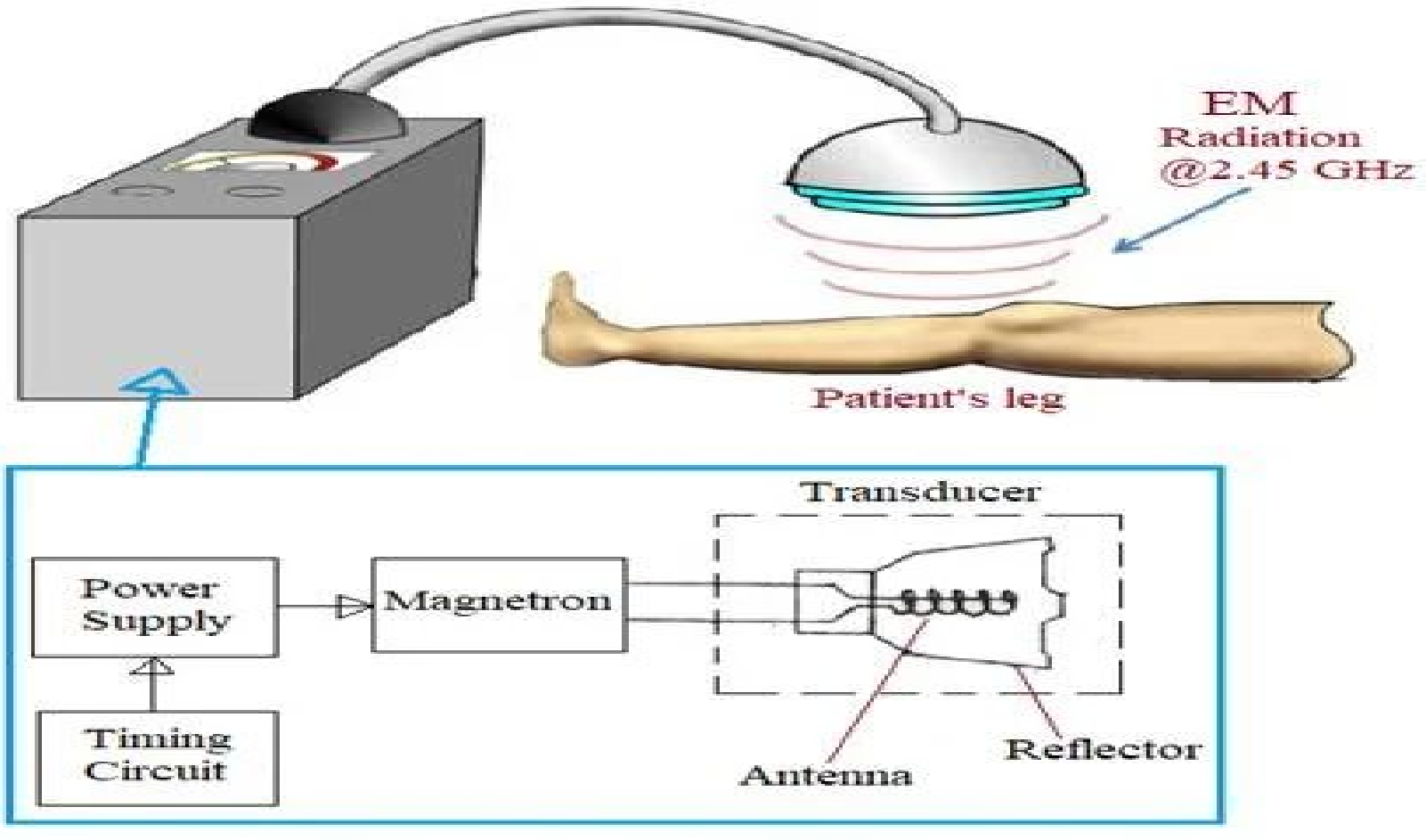


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Therapeutic Effects of Microwave Diathermy :

1. Pain.
2. Muscle spasm.
3. Inflammation.
4. Delayed healing.
5. Infection.
6. Fibrosis.



ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Therapeutic Effects of Microwave Diathermy :

1. **Pain:** Microwave Diathermy is useful in the treatment of traumatic and rheumatic conditions affecting superficial muscles, ligaments and small superficial joints.
2. **Muscle spasm:** which may be reduced directly by Microwave Diathermy or may be reduced by relieving of pain.
3. **Inflammation:** Microwave Diathermy reduces inflammation by increase blood supply that will increase venous return from the inflamed area and aids the reabsorption of edema exudates.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Therapeutic Effects of Microwave Diathermy :

1. **Pain.**
2. **Muscle spasm.**
3. **Inflammation.**
4. **Delayed healing:** Microwave Diathermy promotes healing of open skin by increase cutaneous circulation.
5. **Infection:** Microwave Diathermy can control the chronic infection by increasing the circulation.
6. **Fibrosis:** The heating effect of Microwave Diathermy increase the extensibility of fibrous tissues such as tendons, joint capsules and scars.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Indications of Microwave Diathermy: -The clinical indications for Microwave Diathermy are, more or less, similar to those for SWD. Microwave Diathermy may be preferable to SWD when more concentrated or localize heating is needed.

1. Sprain
2. Muscle & tendon tear
3. Strain
4. Degenerative joint disease
5. Joint stiffness in superficial joints
6. Capsular lesions.
7. Superficial inflammatory or infective conditions.

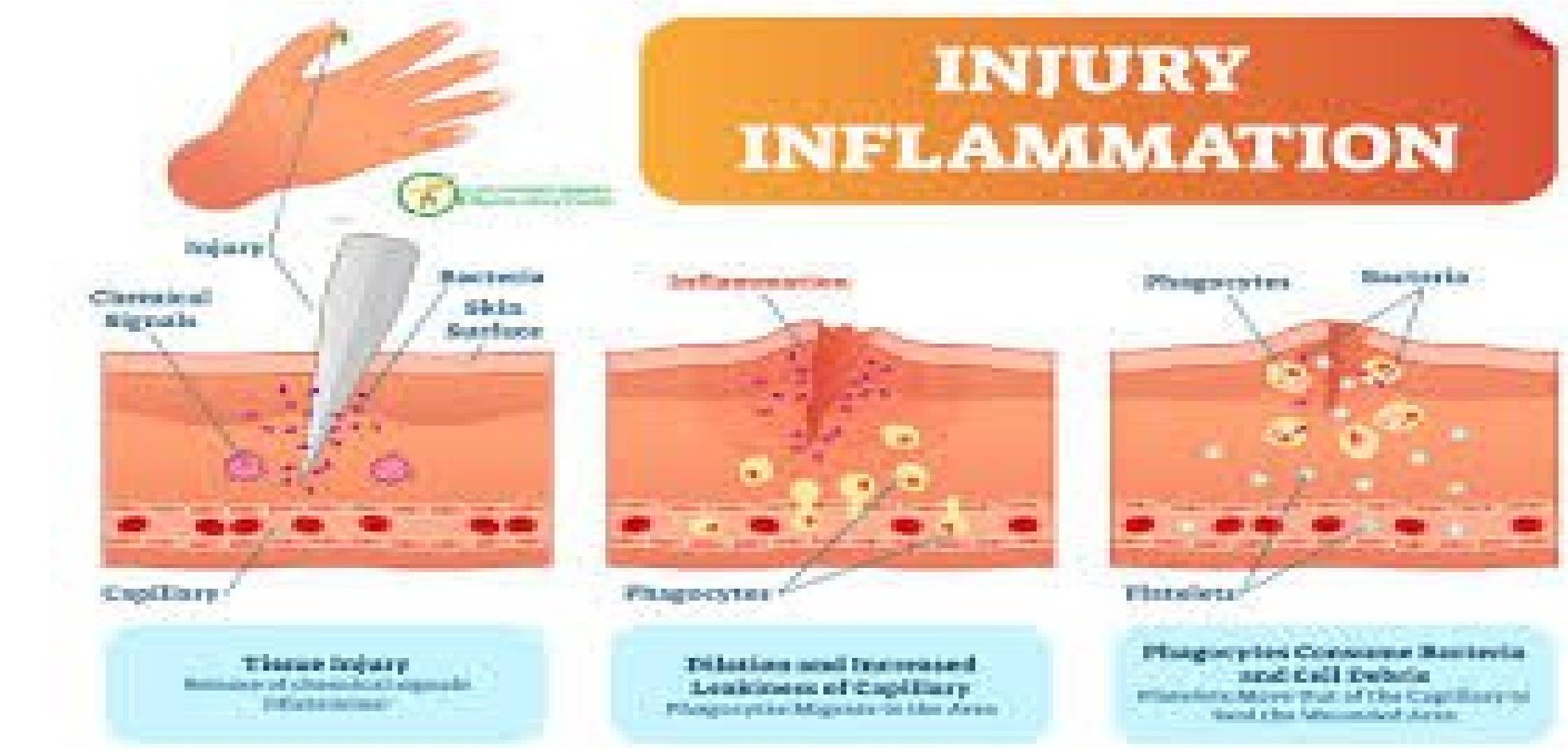
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Indications of Microwave Diathermy: -

Superficial inflammatory or infective conditions:

A. Tenosynovitis
B. Bursitis
C. Synovitis
D. Abscess
E. Infected surgical incisions



ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Micro Wave Diathermy

Contra-indications of Microwave Diathermy:

1. **In Circulatory impaired conditions :-** Over ischemic tissues, hemorrhage, *hypersensitivity* to heat, venous thrombosis or phlebitis, and Severe cardiac conditions.
2. **In reproductive system :-***Male gonads:* repeated irradiation can cause sterility, *Pregnancy:* heat applied to pelvis or hip in pregnancy can lead to alteration in growing bone, hemorrhage and may be miscarriage.
3. **In oncological conditions :-** Over malignant tissues, and recent radiotherapy.
4. **In local trigger abnormal conditions:-**

a)Over wet dressings and adhesive tapes.
b)Metal implants.
c)Pacemaker.
d)Impaired thermal sensation.
e)Acute infection or inflammation.
f)Acute dermatological conditions,


Thank you!

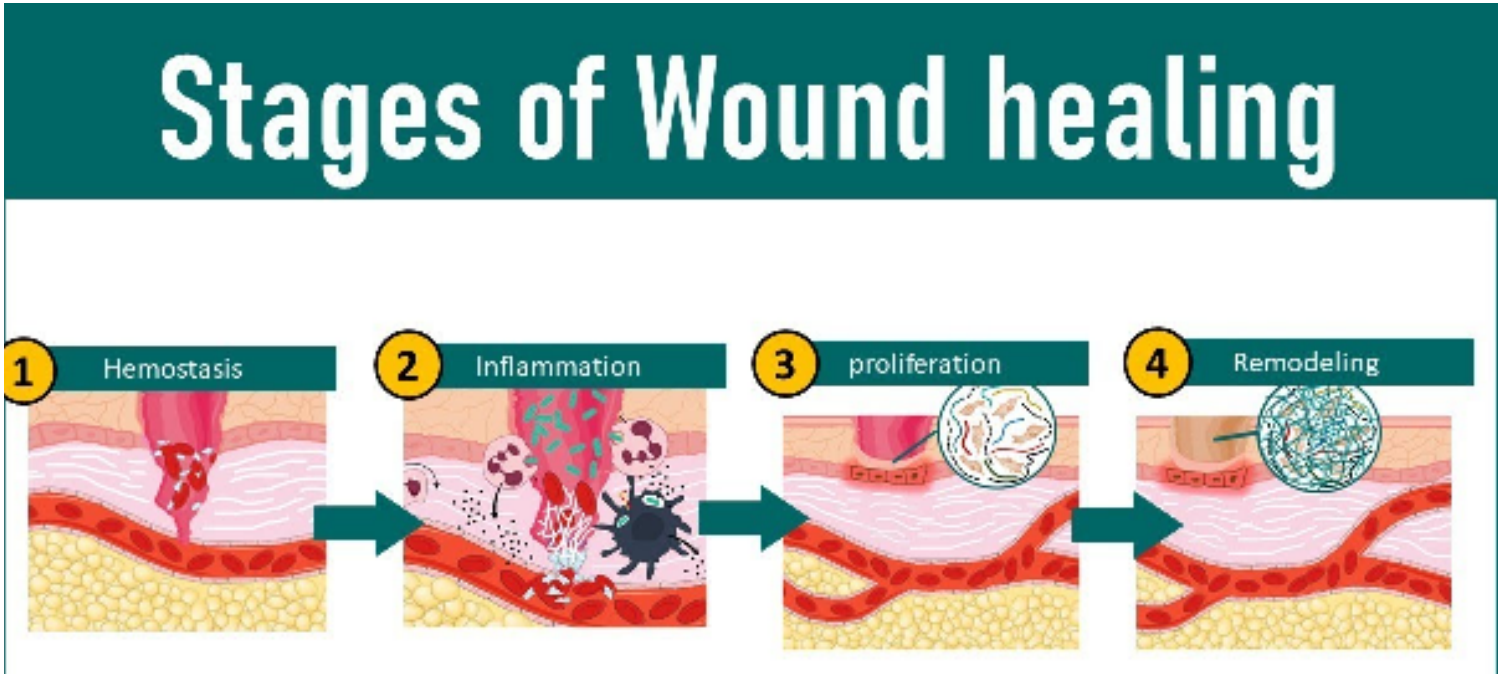
PHYSIOTHERAPY EQUIPMENTS

Second year – Lecture 11

ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

US effects on the Phases of Wound Healing :

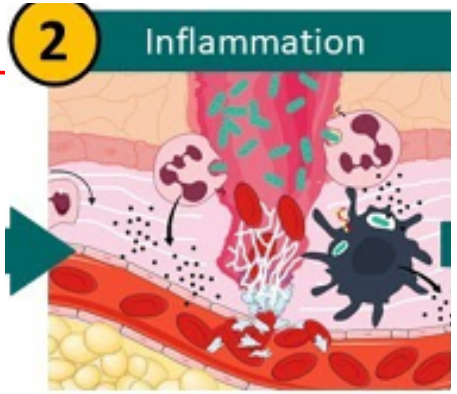
- Inflammatory Phase
- Proliferative Phase.
- Maturation or Remodeling Phase



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

US effects on the Phases of Wound Healing :

- Inflammatory Phase: – In the normal acute inflammatory response, Within the white blood cells are ***mast cells*** which undergo degranulation and *release histamine and other chemical mediators* that attract fibroblasts and endothelial cells to the injured area. This will later result in the formation of *collagen-containing granulation tissue.*

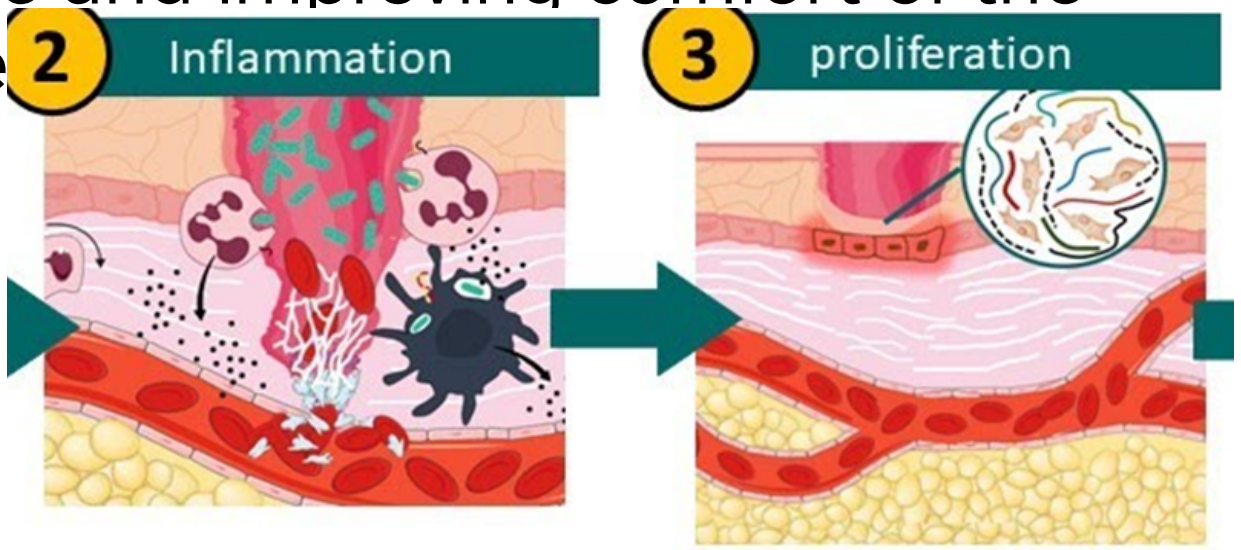


ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

US effects on the Phases of Wound Healing :

- **Inflammatory Phase**

US effects *accelerated* acute inflammatory phase, *moving to a quicker entry* into the proliferative phase and improving comfort of the patie

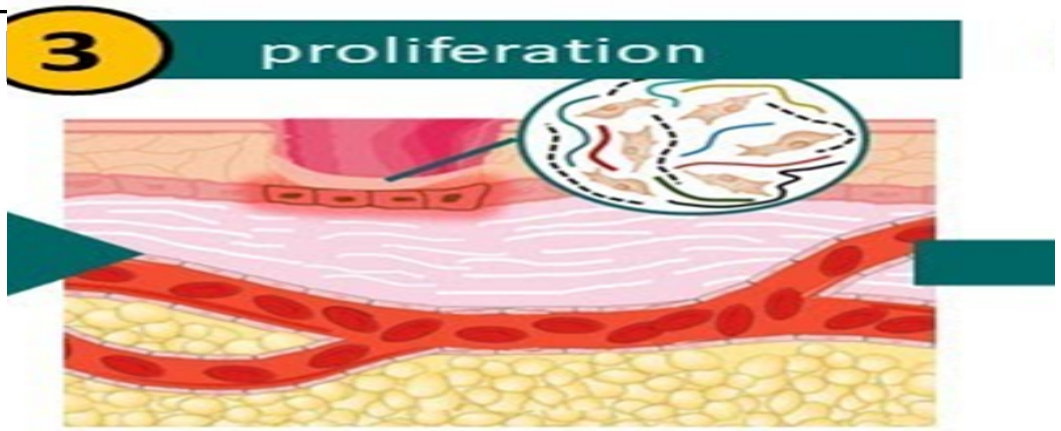


ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

US effects on the Phases of Wound Healing :

- ***Inflammatory Phase.***
- ***Proliferative Phase.*** In this phase, Ultrasound: –
- ***stimulates fibroblast migration and proliferation*** to secrete collagen, improving tensile strength of the healing connective tissues.
- The production of ***vascular endothelial growth factor and angiogenesis are also p***

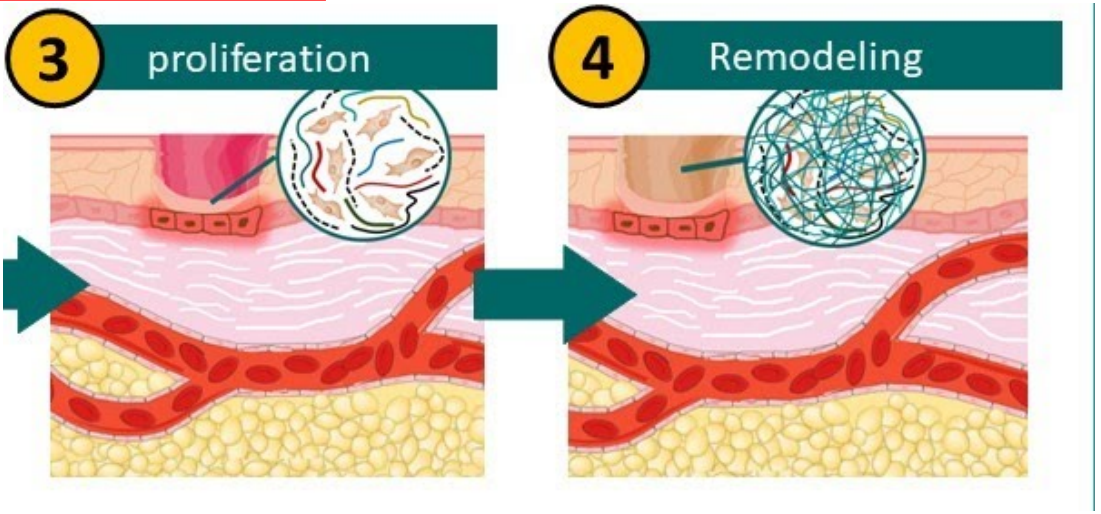
u



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

US effects on the Phases of Wound Healing :

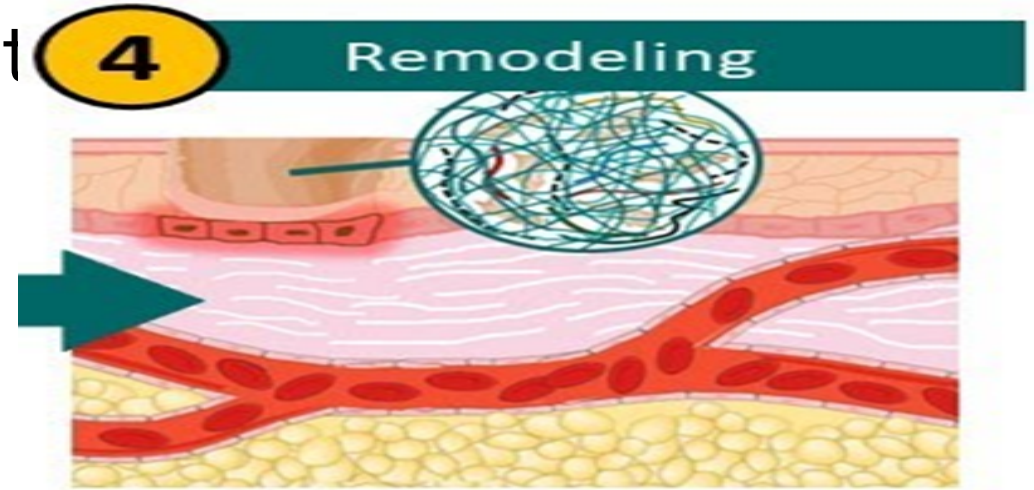
- ***Inflammatory Phase.***
- ***Proliferative Phase.*** In this phase, Ultrasound…In the end
- there is an *accelerated process of wound contraction* as ultrasound may cause the early development of *Myofibroblasts.*
- *Low-intensity, non-thermal ultrasound* within 72 hours following an injury can promote wound contraction which should result in *a smaller scar*.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

US effects on the Phases of Wound Healing :

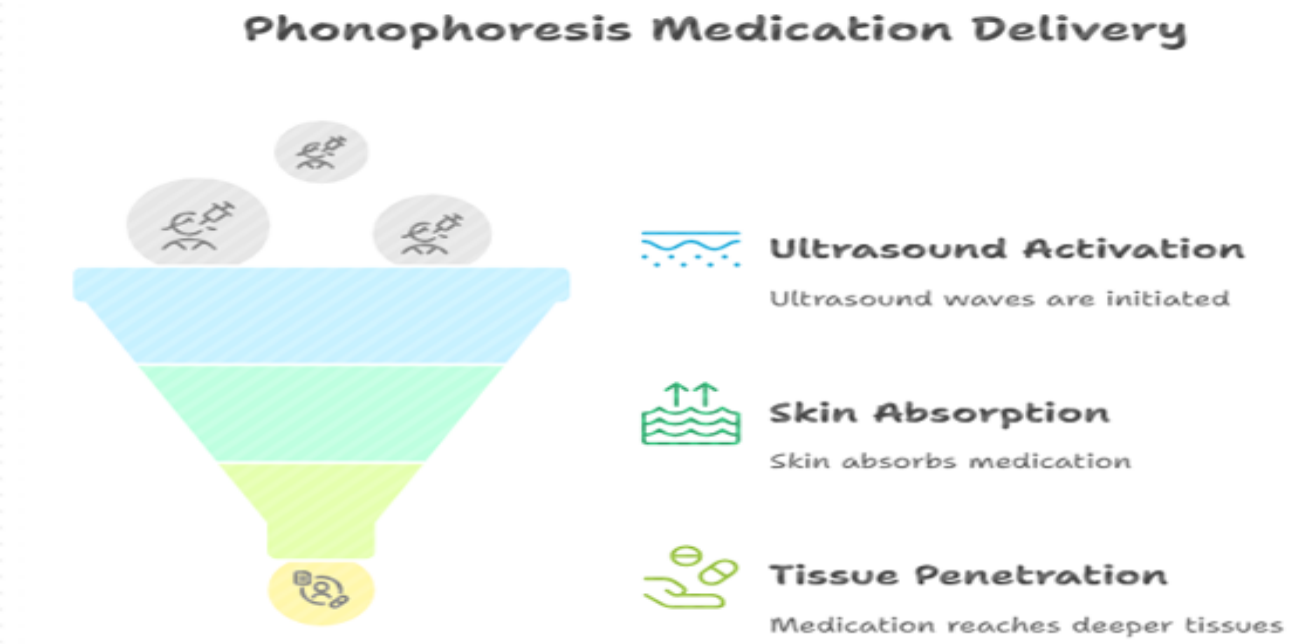
- Inflammatory Phase
- Proliferative Phase.
- Maturation or Remodeling Phase: – Application of thermal ultrasound during this phase affects the *collagen extensibility* and *enzyme activity* and therefore also improves tensile strengt



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Phonophoresis

Phonophoresis:

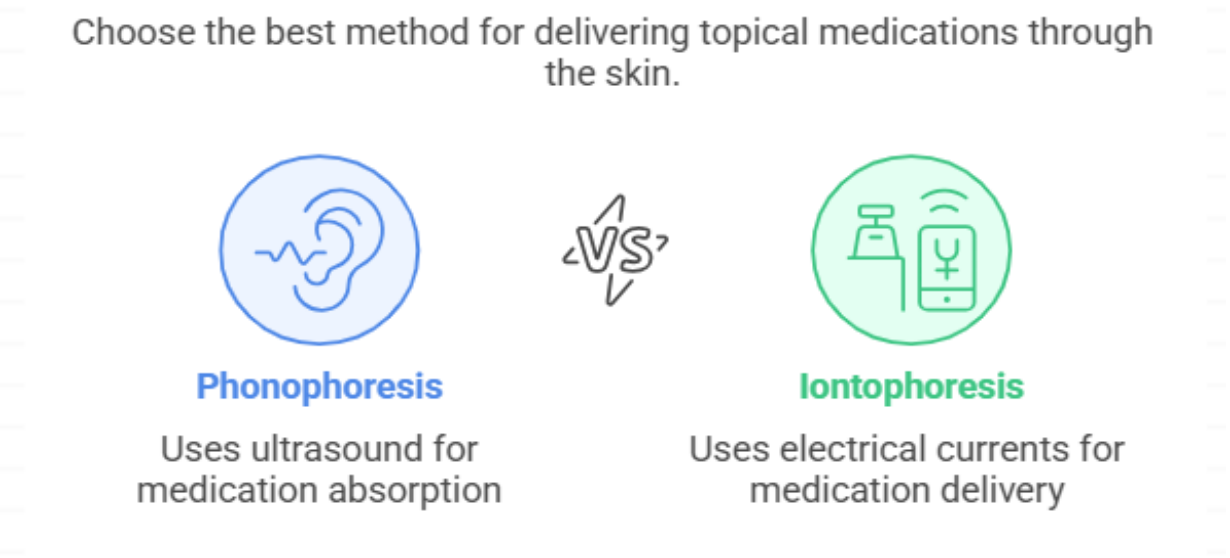
- Phonophoresis is a physical therapy technique that *combines ultrasound and topical medications.* A topical medication is a medication that's applied directly to your skin. *Ultrasound waves then help your skin absorb the medication* into the tissues beneath.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Phonophoresis

Phonophoresis:

- *Phonophoresis* treats inflammation and pain in your muscles, ligaments, and joints. It's similar to iontophoresis.
- *Iontophoresis* delivers topical medications through your skin using electrical currents instead of



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Phonophoresis

Phonophoresis: –Dosages of US.

Several authors concluded that the rise in skin temperature is an important factor .

- But on the other hand, there are studies conclude that continuous US at spatial peak doses, which *lead to cell damage due to cavitation.*
- Use of high intensity US application may also generate a feeling of *warmth and cause pain.*

The choice of US dose should be in accordance in order to optimize beneficial thermal effects and avoid tissue damage.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – Phonophoresis

Phonophoresis Methods of application: –

- First, they will apply a *medicated ointment or gel* to your skin near an injured or inflamed joint or muscle. *Medications commonly used* in phonophoresis include *hydrocortisone,*

ADVANCE PHYSIOTHERAPY EQUIPMENTS – Phonophoresis

Phonophoresis Methods of application: –

- First, they will apply ……
- Second, they will apply ultrasound gel to the area where the topical treatment has been applied. *This gel helps the ultrasound waves travel*

ADVANCE PHYSIOTHERAPY EQUIPMENTS – Phonophoresis

Phonophoresis Methods of application: –

- First, they will apply ……
- Second, they will apply ultrasound gel….
- Finally, they will use an ultrasound head tool on the area where the topical treatment and gel have been applied.

Ultrasound wave frequencies deliver the medication through the skin into the tissue beneath.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – Phonophoresis

Phonophoresis Uses : Phonophoresis can address a wide range of injuries and musculoskeletal conditions

1. Tendonitis: – is a condition characterized by the inflammation of a tendon.
2. Bursitis: – is the inflammation of the bursae.
3. Muscle strains: – reduce muscle spasms and promote healing.
4. Ligament injuries.
5. Arthritis

Thank you!

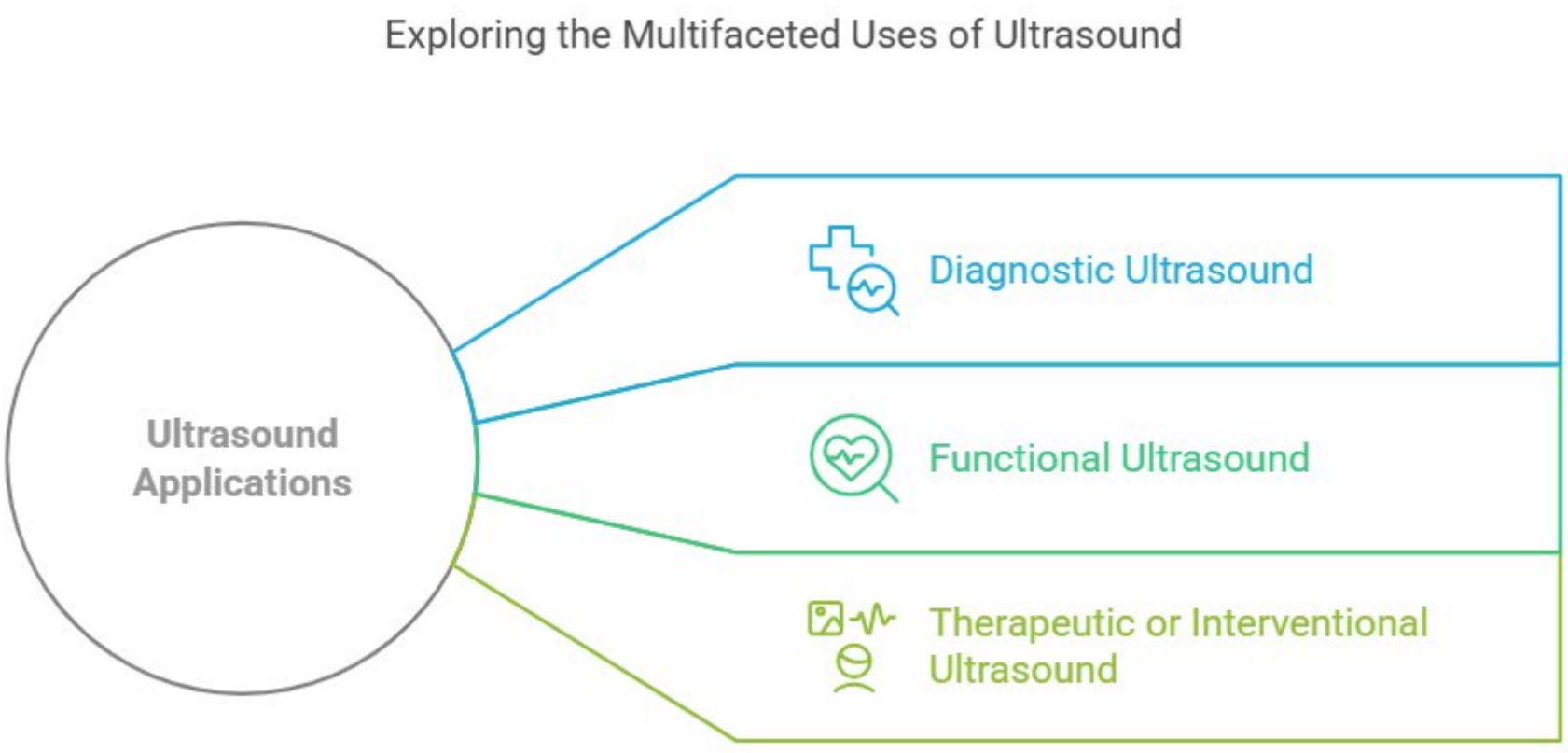
PHYSIOTHERAPY EQUIPMENTS

Second year – Lecture 10

ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of Ultrasounds (US) As :

- Diagnostic ultrasound.
- functional ultrasound.
- Therapeutic or interventional



ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US: As Diagnostic ultrasound.

- is able to non-invasively image internal organs within the body.
- One of the most common uses of ultrasound is during pregnancy, to monitor the growth and development of the fetus.
- Ultrasound images are displayed in either 2D, 3D, or 4D (which is 3D in motion).

ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US: As Diagnostic ultrasound.

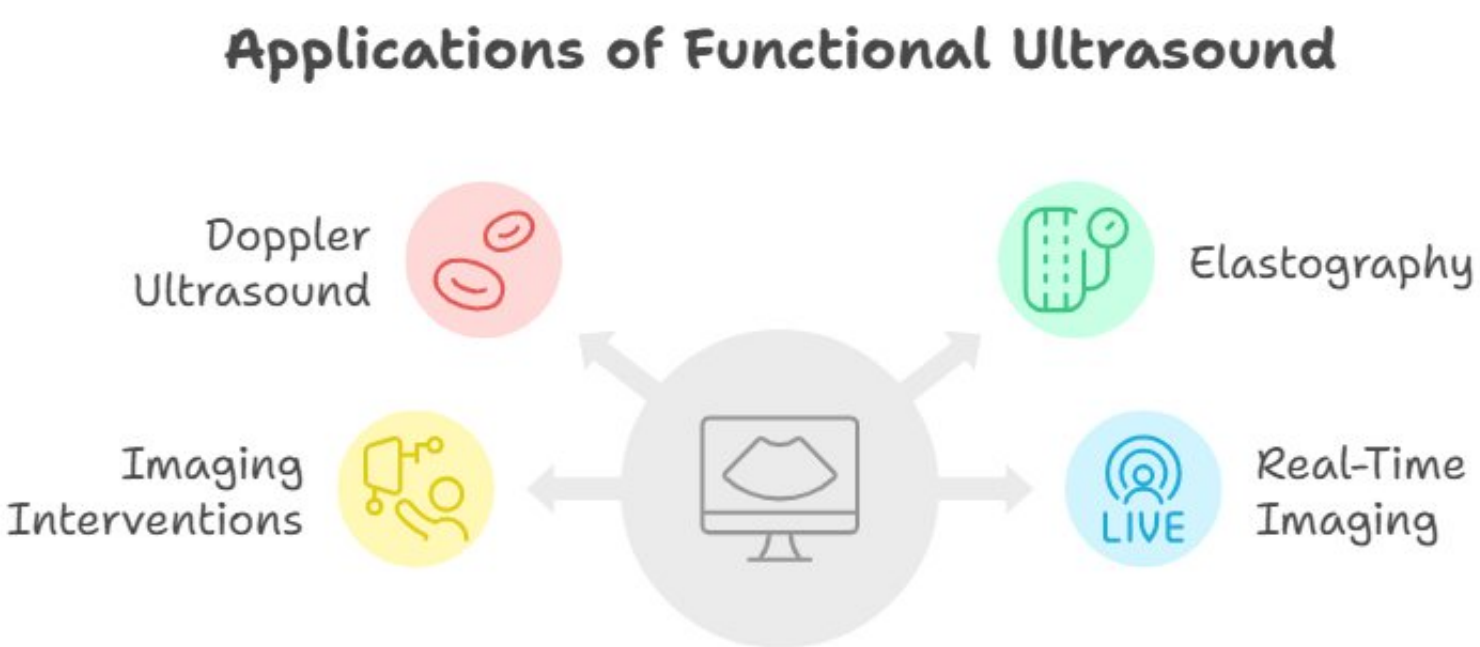
- ***In Musculoskeletal Imaging.*** Ultrasound can be used to assess muscles, tendons, and joints for tears, inflammation, or other injuries, making it valuable in orthopedic and sports medicine.

- ***In Emergency Medicine.*** In trauma cases, ultrasound can quickly assess internal bleeding, especially in abdominal and pelvic regions, and guide treatment decisions.

ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US: as a functional ultrasound.

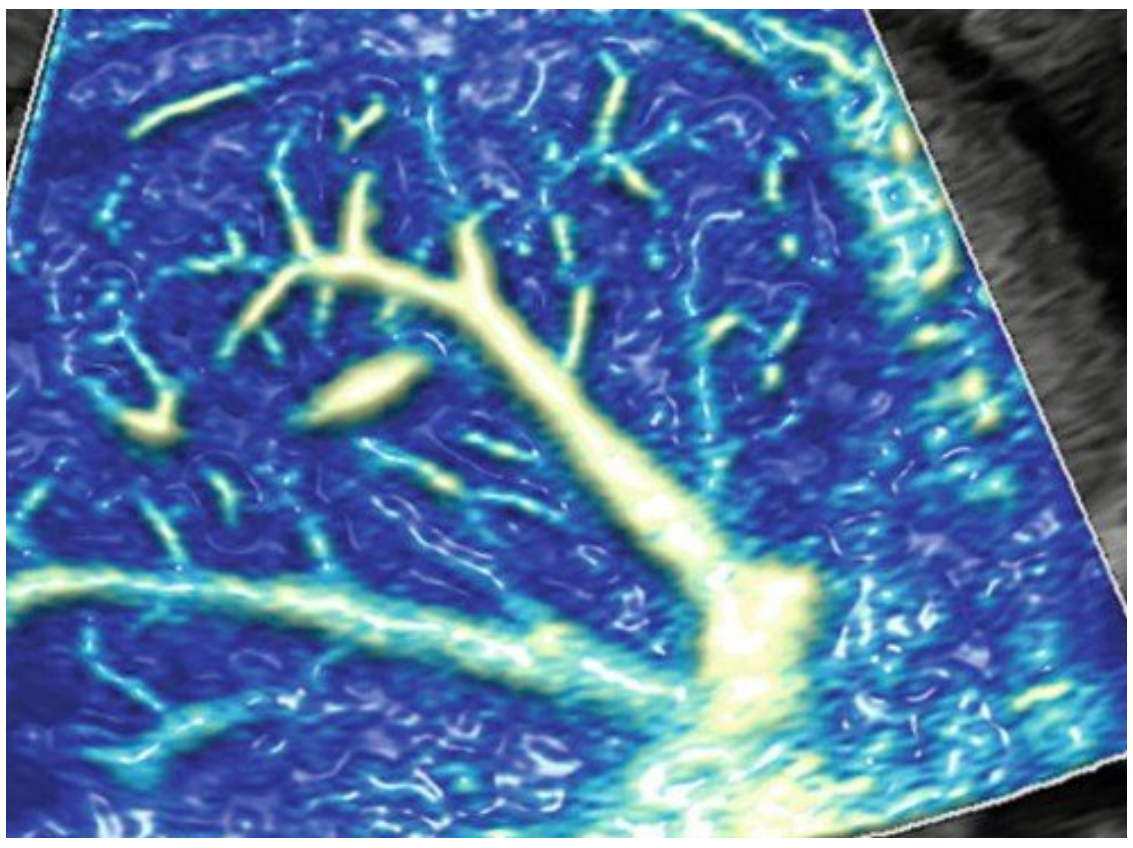
1. Doppler and color Doppler ultrasound.
2. Elastography.
3. imaging interventions in the body.
4. real-time imaging .



ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US: as a functional ultrasound.

- Doppler and color Doppler ultrasound. for measuring and visualizing blood flow in vessels within the body or in the heart.

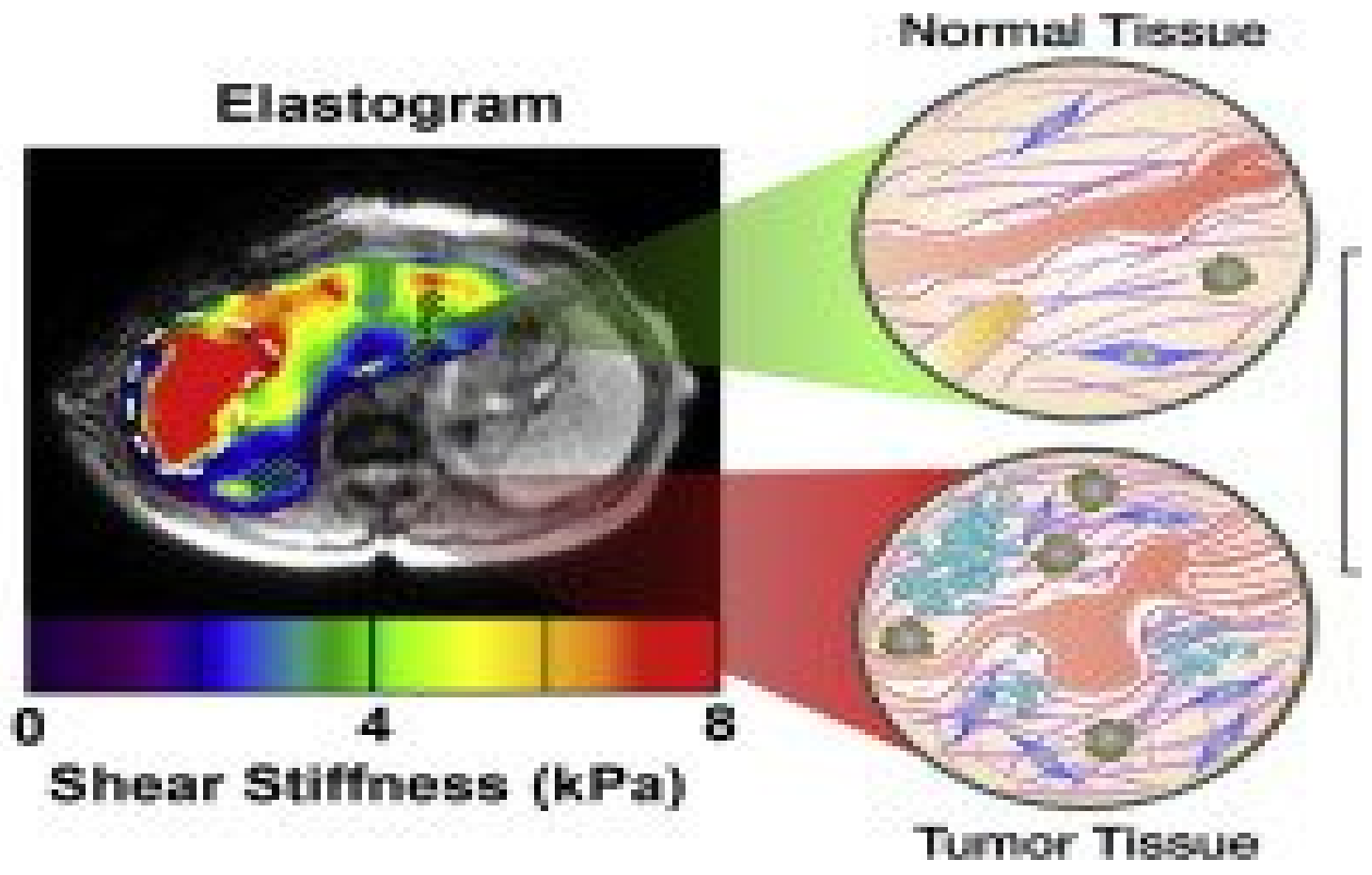


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

Uses of US: as a functional ultrasound.

- Doppler and color Doppler ultrasound.
- ***Elastography:*** a method for measuring and displaying the relative stiffness of tissues, which can be used to differentiate tumors from healthy tissue.

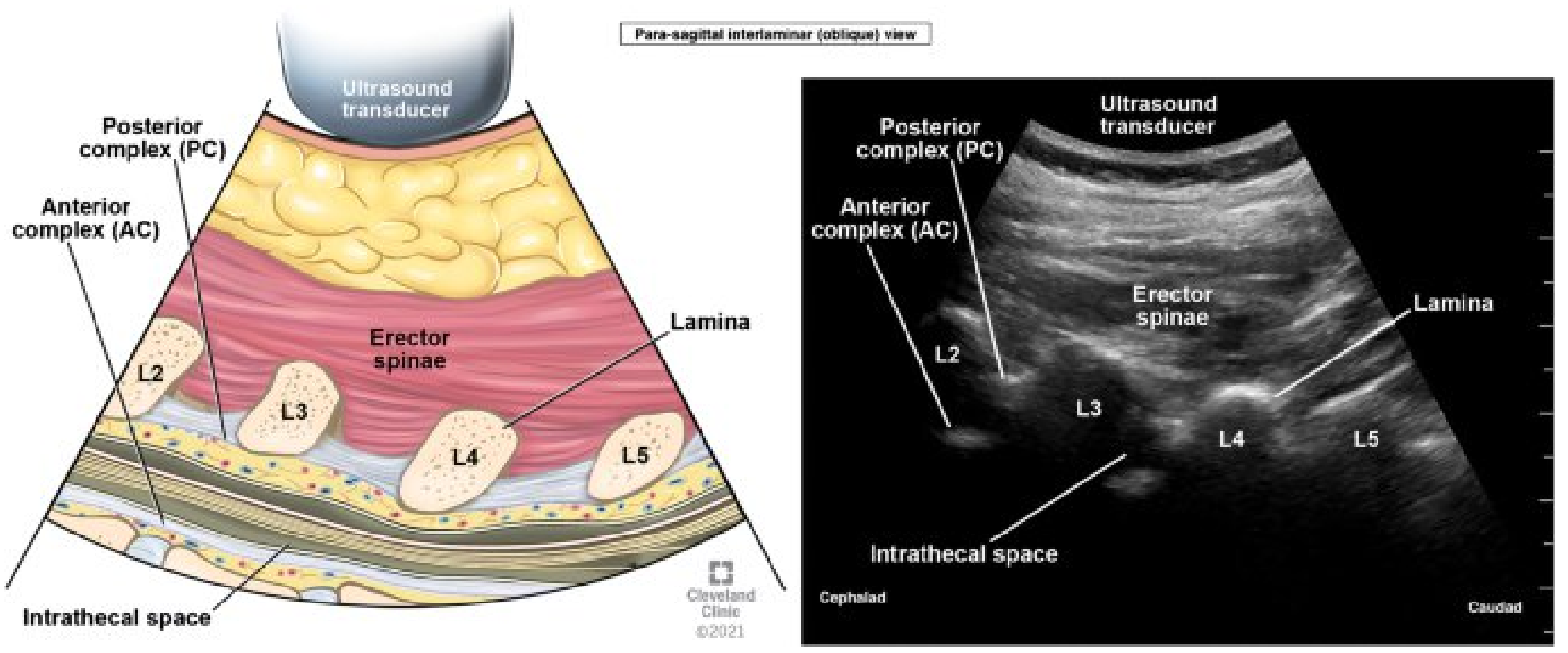


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

Uses of US: as a functional ultrasound.

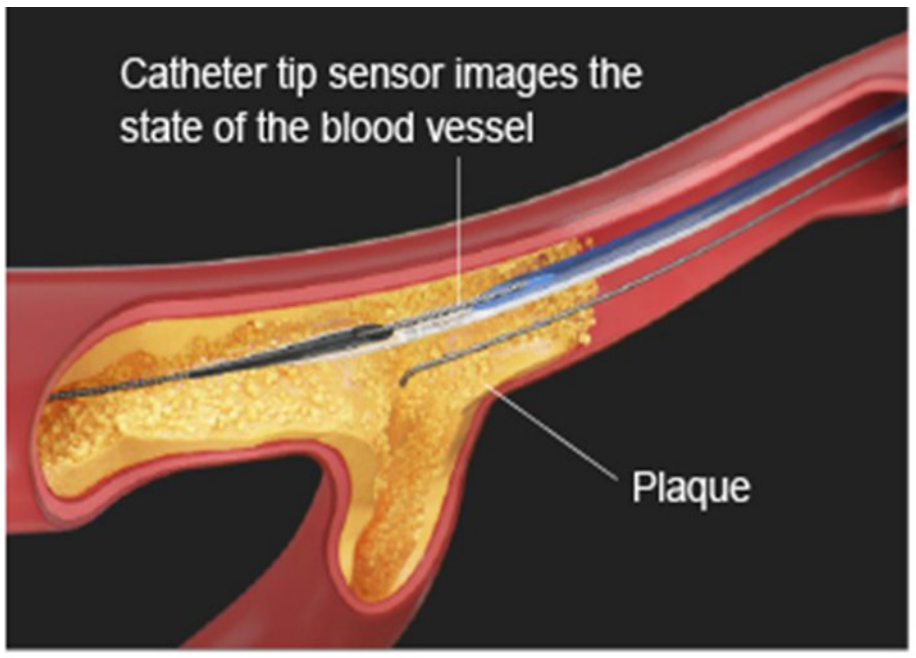
1. Doppler and color Doppler ultrasound.
2. Elastography
3. ***imaging interventions in the body:*** helps physicians see the position of a needle biopsy while it is being to a selected target, such as a mass or a tumor.

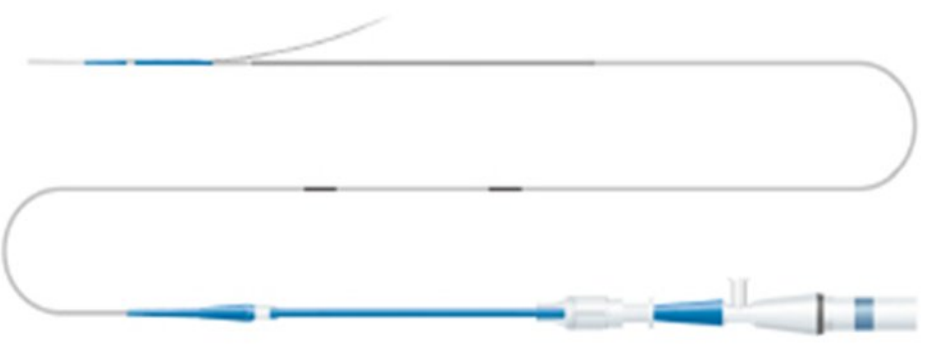


ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US: as a functional ultrasound.

1. Doppler and color Doppler ultrasound.
2. Elastography.
3. imaging interventions in the body.
4. ***real-time imaging:*** real-time imaging of the location of the tip of a catheter as it is inserted in a blood vessel and guided along the length of the vessel.

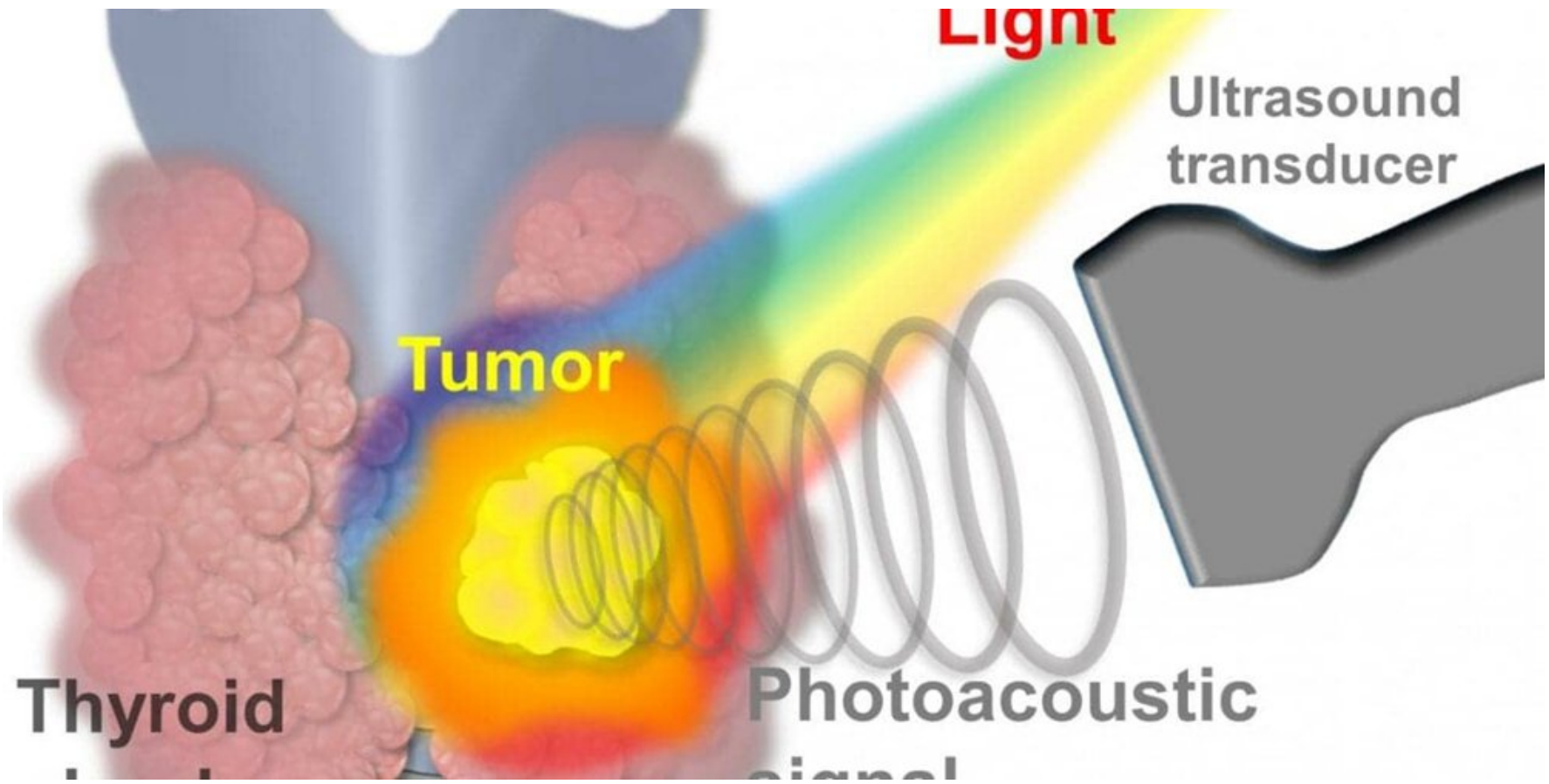




Imaging catheter

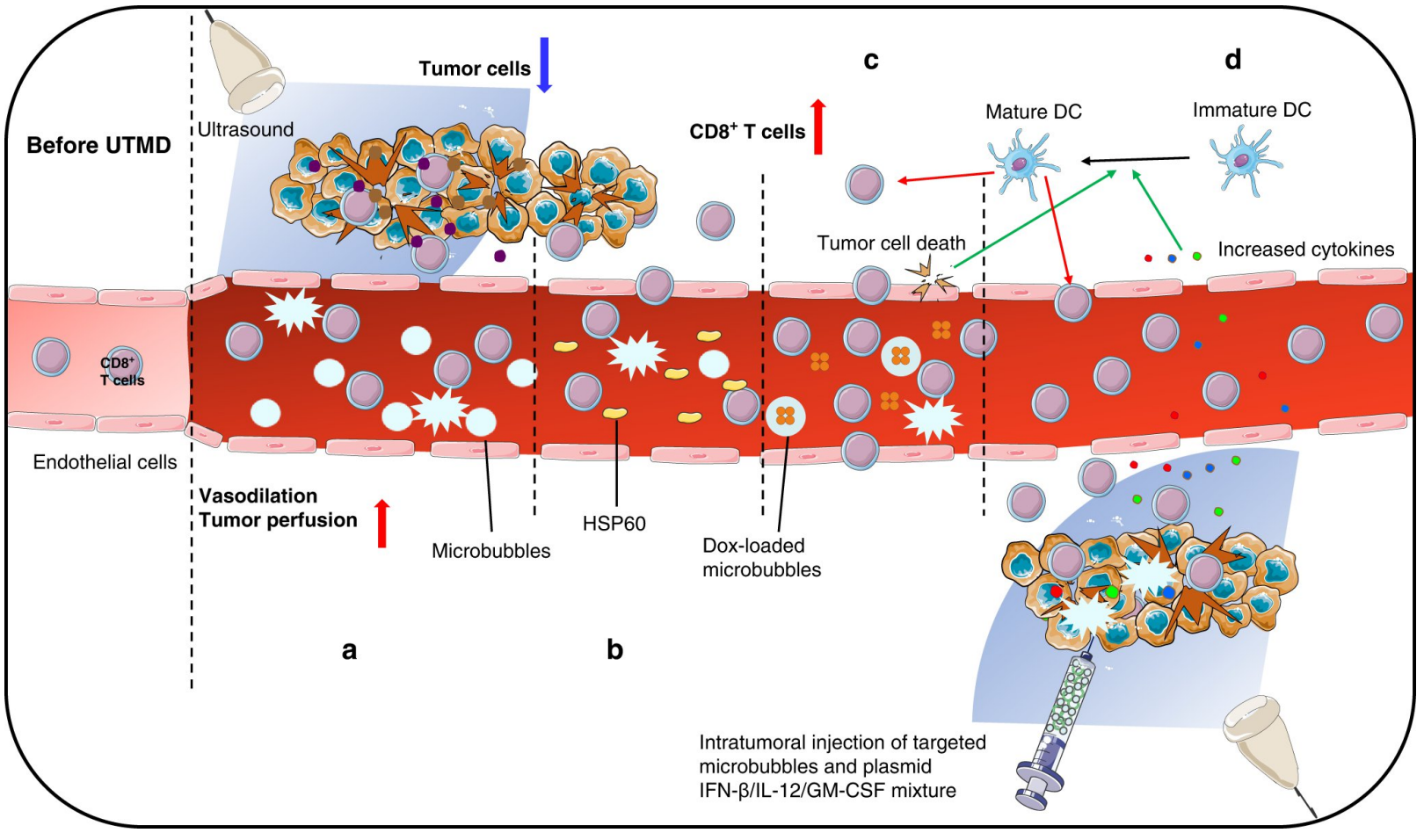
ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US: Therapeutic or interventional ultrasound, by produces high levels of acoustic output that can be focused on specific targets for the purpose of heating, ablating, or breaking up tissue.



ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US: Therapeutic or interventional uses as a method for modifying or destroying diseased or abnormal tissues inside the body (e.g. tumors) without having to open or tear the skin or cause damage to the surrounding tissue.



ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

<u>Uses of US: Therapeutic or interventional by:</u>

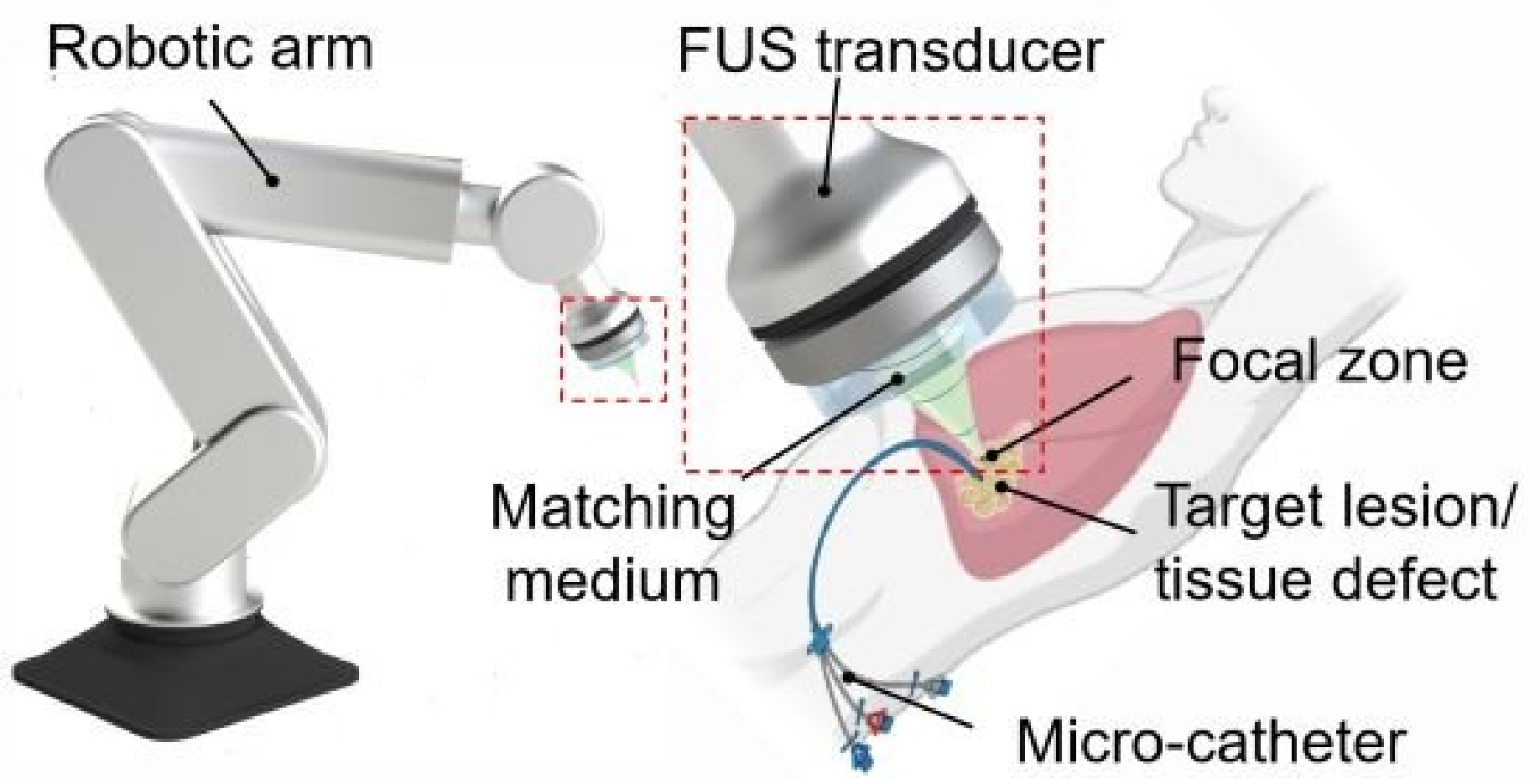
- Identify and target the tissue.
- Therapeutic uses in physical therapy.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

Uses of US: Therapeutic or interventional

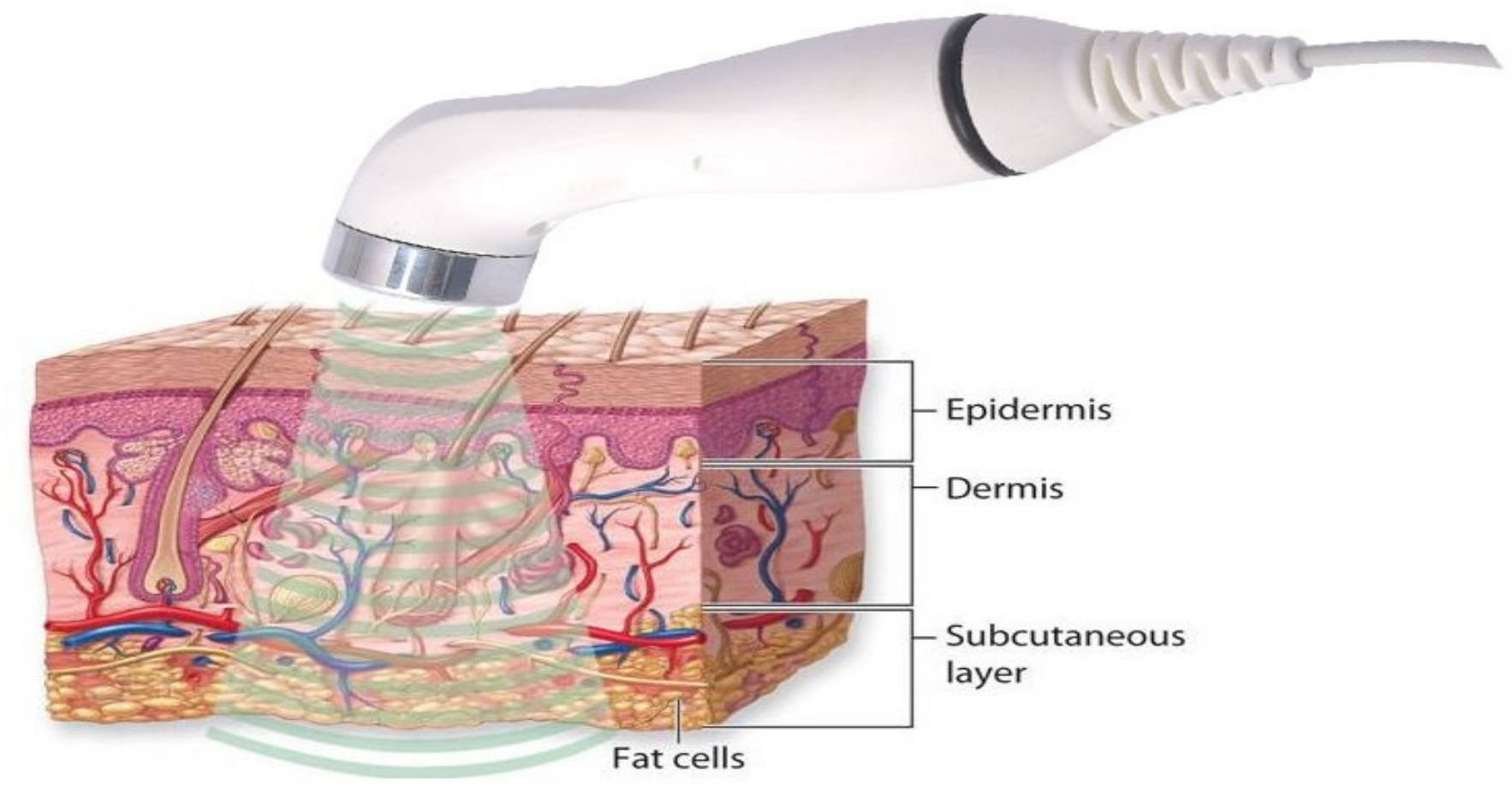
- Identify and target the tissue. to be treated, guide, control and confirm the effectiveness of the treatment.



ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Uses of US:

- Identify and target the tissue.
- Therapeutic uses in physical therapy, ultrasound is used for deep tissue heating to promote healing, reduce pain, and improve blood circulation.



ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

Uses of US:

- **Therapeutic uses in physical therapy,**

  Ligaments, tendons, fascia, joint capsules and scar tissue contain large amounts of collagen and therefore absorb the ultrasound better and benefit from this type of treatment.

- ***Phases that can be repair tissues by ultrasound.***

1. stimulates WBCs activity and activate fibroblasts.
2. pain relief (analgesic effects).
3. healing of fresh fractures.
4. stimulator of new blood vessel growth.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

Indications of US:

- ***Acute conditions (Injuries)*****:** ultrasound may be *pulsed with a low intensity* when a person suffers from an ***injury, joints or soft tissue may become swollen and painful by*****:**

1. Speed up the rate of healing.
2. Enhance the quality of repair.
3. Increase the strength of the soft tissue.
4. Increase strength and enhance scar mobility, by improve the way collagen is laid down when tissue is trying to repair itself

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

Indications of US:

- **Acute conditions (Injuries):**
- ***Chronic Injuries: -***
- may be used in a *continuous mode* for *chronic conditions*, it will increase blood flow to the affected area and start the *healing process and decrease pain.*

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

Frequency Range: - Therapeutic ultrasound typically operates in the frequency range of 1 MHz to 3 MHz .

- **1 MHz frequency:-**

This is used *for deeper tissue penetration* (up to about 5 cm or 2 inches).

because the sound waves *can travel further into the body, but they are less focused*. It is often applied for *deep muscle or joint tissues*.

ADVANCE PHYSIOTHERAPY EQUIPMENTS - ULTRASOUND

Frequency Range: - Therapeutic ultrasound typically operates in the frequency range of 1 MHz to 3 MHz .

- **3 MHz frequency: -** This is used for more superficial tissues (about 1 to 2 cm or up to 0.8 inches).

Because they are *absorbed more quickly* by tissues, which results in *a more focused treatment at shallower depths.* It targets the more superficial layers, such as tendons, ligaments, and muscles near the skin surface. However, *they are better suited for acute conditions or smaller areas.*

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

ultrasound energy is distribution: -

1. Near Field.
2. Far Field.
3. Half-Value Distance.

These factors influence how ultrasound therapy is applied and help in tailoring the treatment to the patient’s specific needs, depending on the injury's location and depth.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

ULTRASOUND

ultrasound energy is distribution: -

1. ***Near Field:*** The region close to the transducer with focused and intense ultrasound energy. It's ideal for more localized and deep tissue treatment.
2. ***Far Field:*** The area where the ultrasound energy spreads out and becomes less concentrated. It is useful for broader, less intense treatments.
3. ***Half-Value Distance***: The distance at which ultrasound energy is reduced by half due to absorption. It varies based on frequency and tissue type.


Thank you!

PHYSIOTHERAPY EQUIPMENTS

Second year – Lecture 9

ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

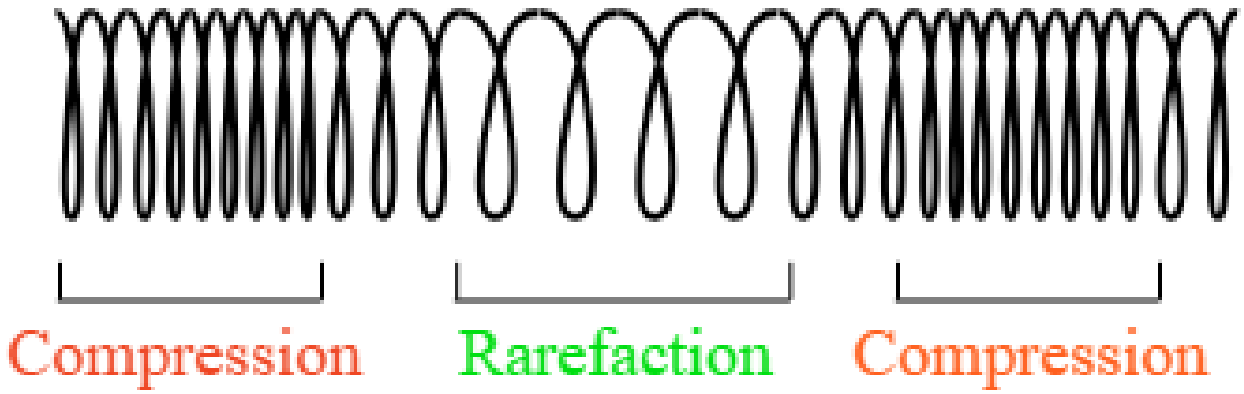
ULTRASOUND

Ultrasound : Ultrasound (US) is a form of mechanical energy, not really electrotherapy at all, but does fall into the Electro Physical Agents grouping.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Sound waves: – are longitudinal waves consisting of areas of ***compression and rarefaction.***

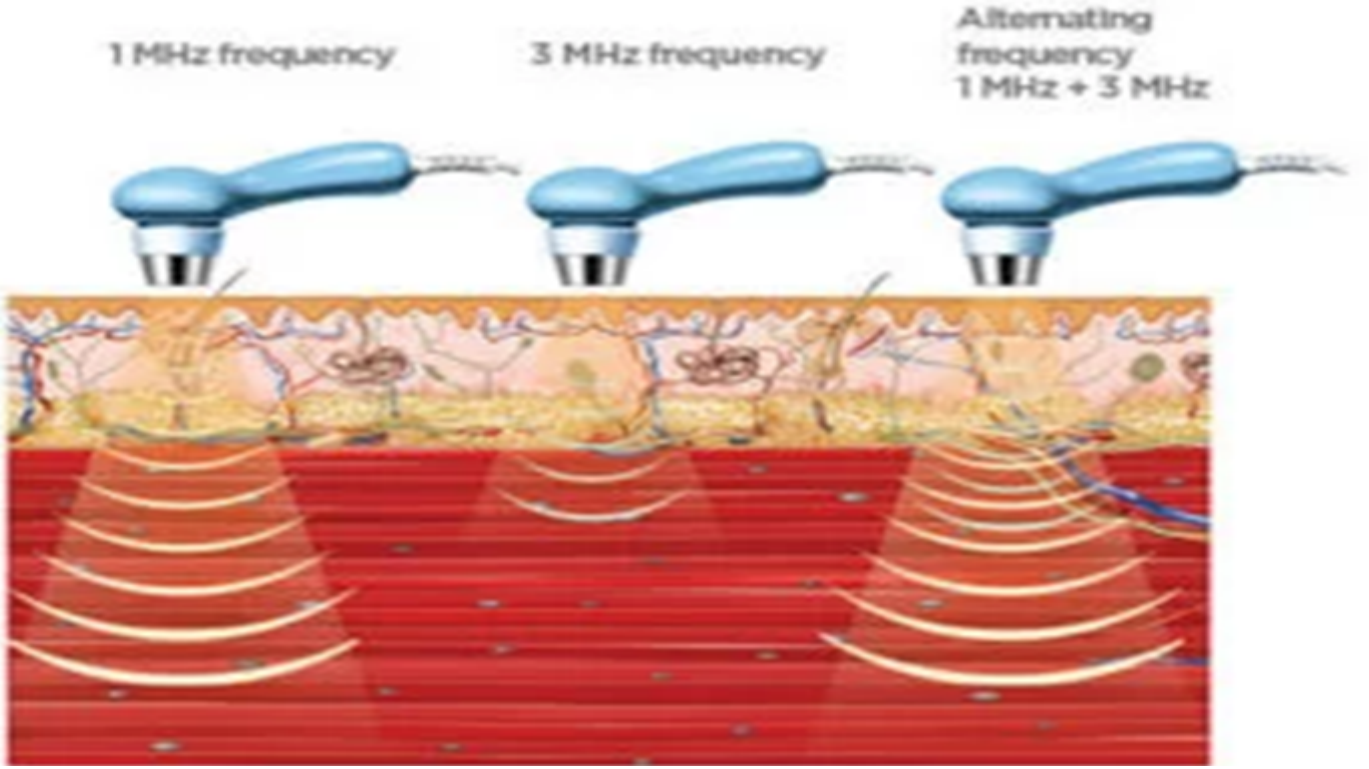
Particles of a material, when exposed to a sound wave will ***oscillate*** about a fixed point rather than move with the wave itself.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

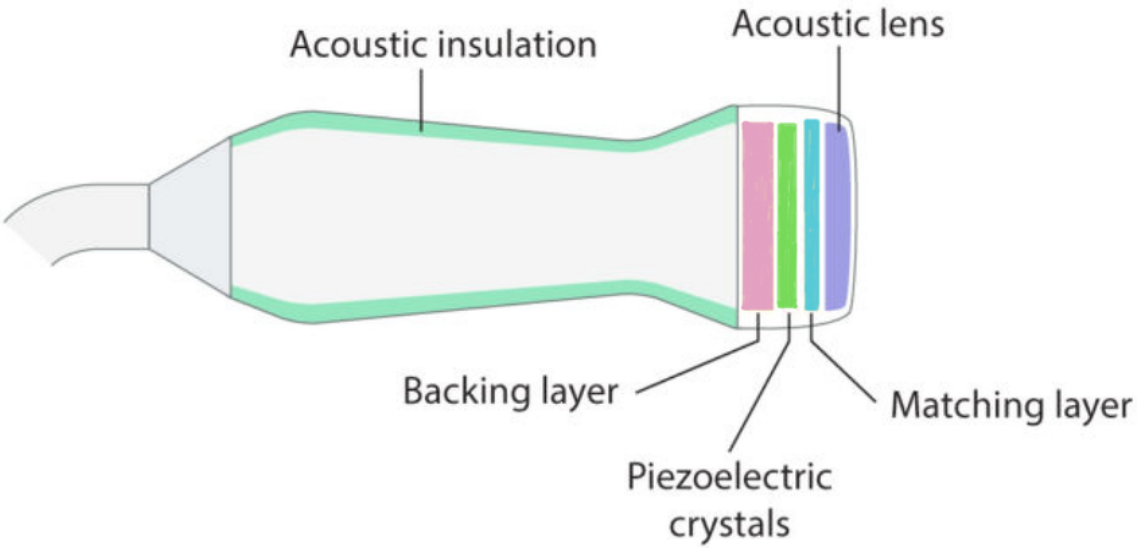
ULTRASOUND

Ultrasound is a form of mechanical energy generated by sound frequencies beyond the typical human hearing range (16 Hz to 20,000 Hz), resulting in



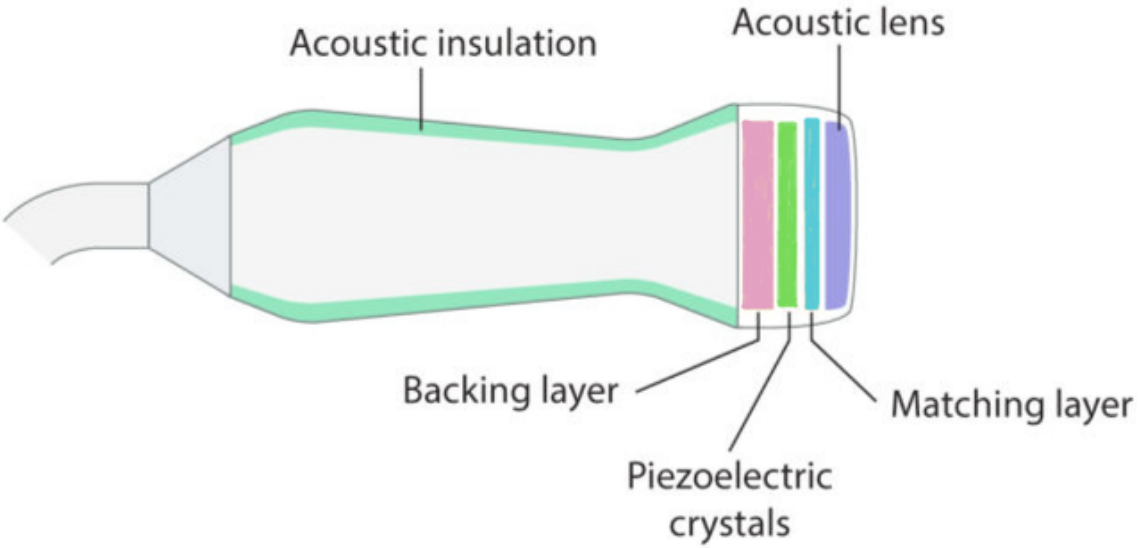
ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Production of ULTRASOUND: – The Ultrasound instrument consists of a high-frequency generator. This is connected to a treatment head or transducer circuit by a co-axial cable for the production of ultrasound waves. 1 MHz or 3MHz frec



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

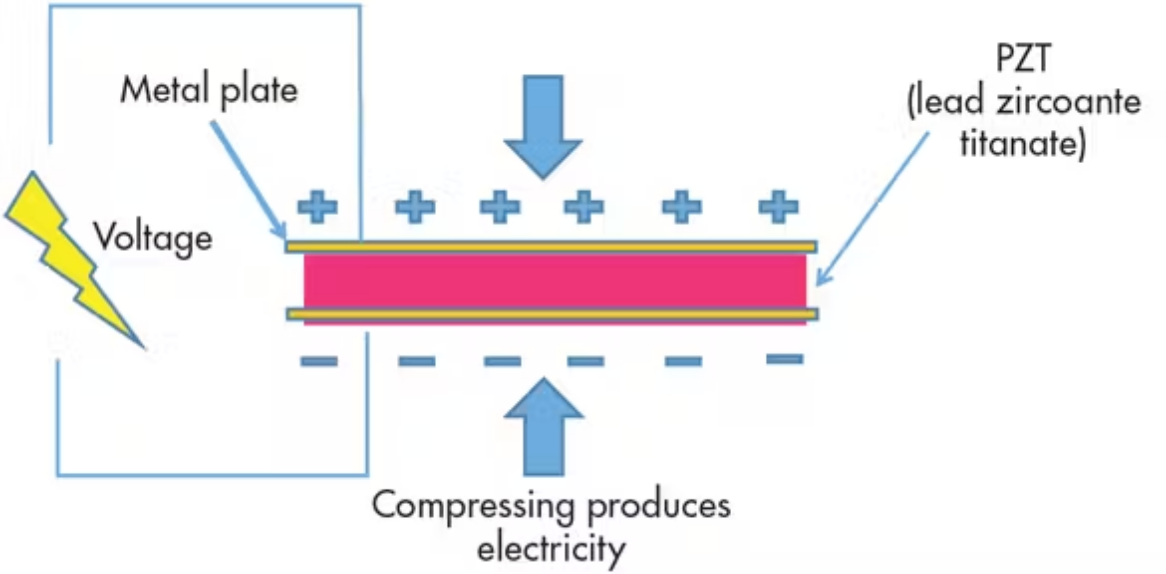
Production of US: – when this varying potential difference or frequency applied on quartz crystal, via a linking electrode, the crystal being fused to the metal front plate of the treatment head.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Production of US: –

Any changes in the shape of crystal (Compressed and Relaxed), produces an ultrasonic wave. It generates ultrasound waves by a Pie



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Coupling Media:

ultrasound waves do not travel well through air, a ***coupling medium*** is necessary.

It is a substances used to facilitate the efficient transmission of ultrasound waves from the transducer to the body.

ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Coupling Media: –

Tow main functions of the coupling media

1. Allow the ultrasound waves to *pass smoothly from the transducer into the tissue,* minimizing energy loss.
2. Helps to *improve the quality of the ultrasound image* or therapeutic effect by ensuring that the sound waves are transmitted at the proper intensity and with minimal

ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

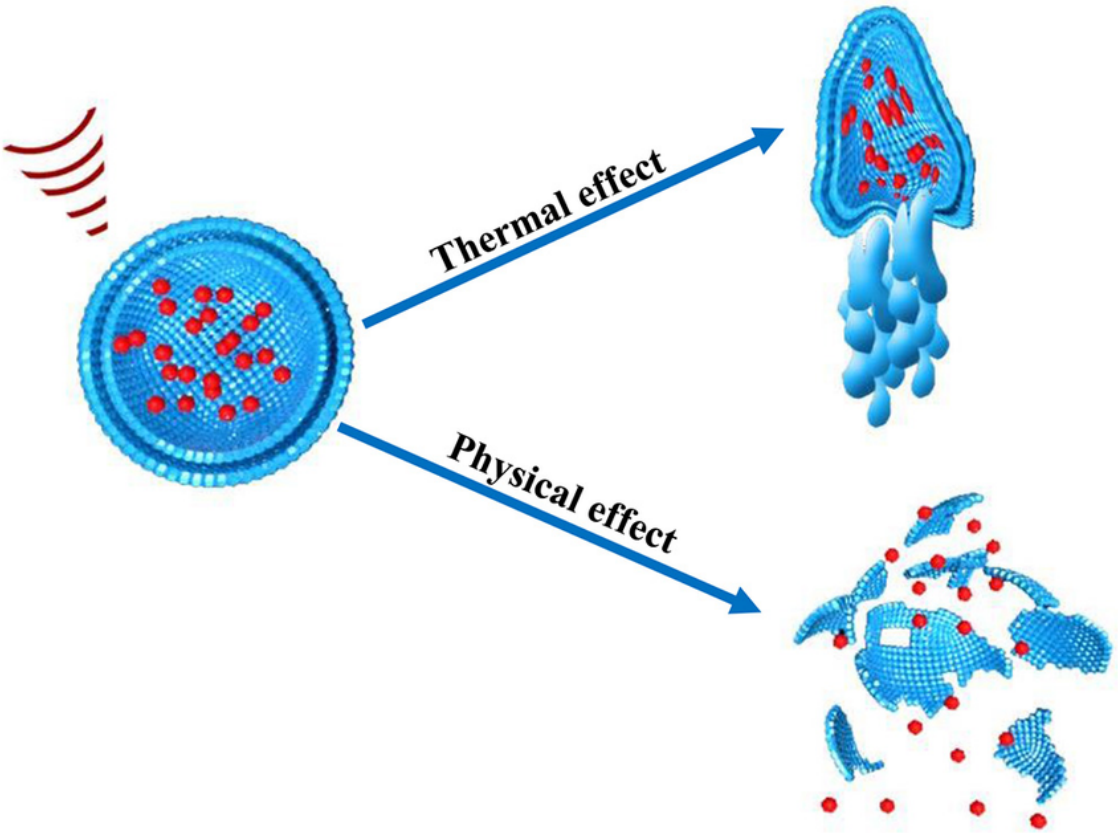
Coupling Media: –

The methods of the coupling media function : –

- ***Prevent Air Gaps:*** Allowing sound waves to pass through the skin without being scattered or reflected.
- ***Ensure Optimal:*** To travel efficiently, ensuring clear diagnostic imaging or effective therapeutic results.
- ***Comfort:*** By providing a smooth and warm interface between the

ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

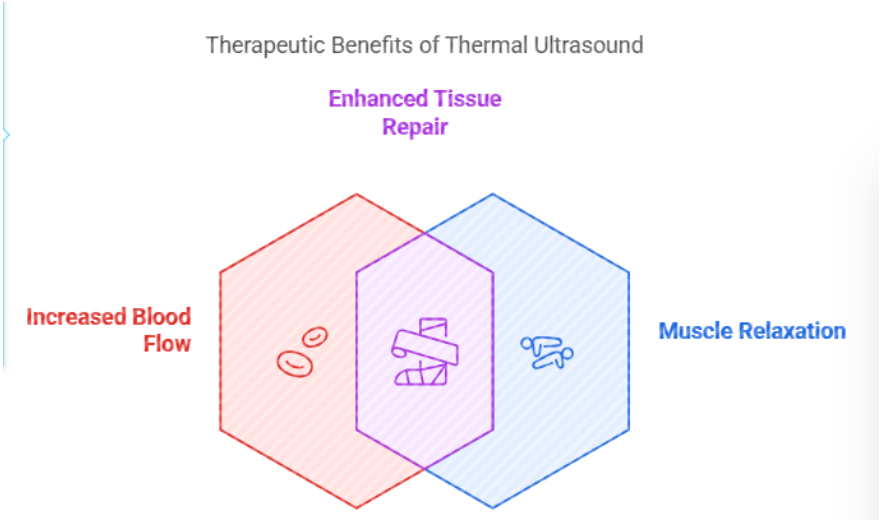
The therapeutic effects of US are generally divided into:
THERMAL & NON-THERMAL (Physical)



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Thermal effects:

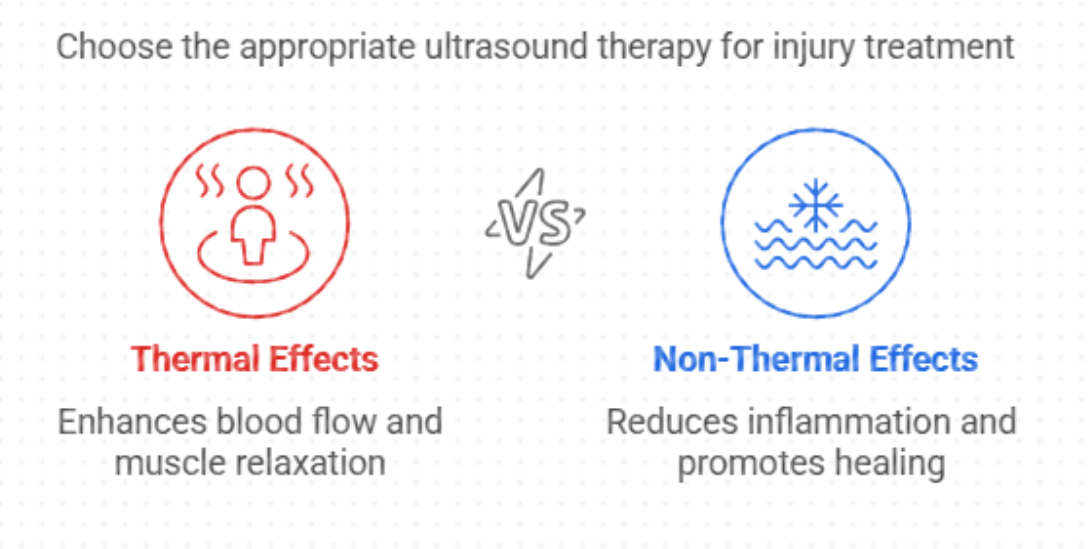
Involves using *continuous waves* of sound to increase tissue temperature. This heat *enhances blood flow, promotes relaxation of muscles, and accelerates tissue repair.* It's commonly used for chronic conditions like tendinitis or muscle tightness.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

The non-thermal effects :

Involves *pulsed sound waves*, which don't generate significant heat but still provide benefits. It's is used for *reducing inflammation and promoting healing* in acute injuries or for conditions like swelling or tendor



ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Contraindications:

- Hemorrhagic conditions
- Eyes, anterior neck, carotid sinus, reproductive organs
- Electronic device
- Deep venous thrombosis or thrombophlebitis (local)
- Malignancy (local)
- Pregnancy (local)
- Tuberculosis (local)
- Recently radiated

ADVANCE PHYSIOTHERAPY EQUIPMENTS – ULTRASOUND

Precautions: –

- Active epiphysis.
- Acute injury or inflammation.
- Skin disease, Damaged or at-risk skin, Infection, and Plastic or cement implants
- Impaired circulation or sensation
- Impaired cognition or communication, an / or Regenerating nerves.

Thank you!

PHYSIOTHERAPY EQUIPMENTS

Second year – Lecture 13

ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

➤ Short –Wave Diathermy (SWD):

Diathermy, "through heating," is the application of high-frequency *electromagnetic energy* that passing through and being absorbed by the body and then *converted into heat i.e. generate heat in body tissues.*

ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

The output resonant tank tunes in the patient as part of the circuit and allows maximum power to be transferred to the patient.

The power amplifier generates the power required to drive the different types of electrodes.

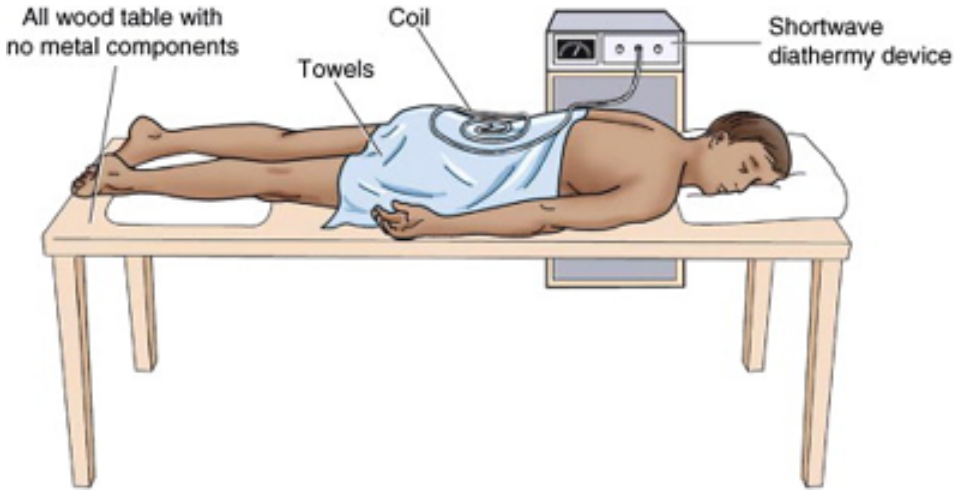
ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short -Wave Diathermy

Most shortwave units have a power output of between 80 and 120 W.

Patient sensation provides the basis *for recommendations of continuous shortwave diathermy dosage* and thus varies considerably with different patients.

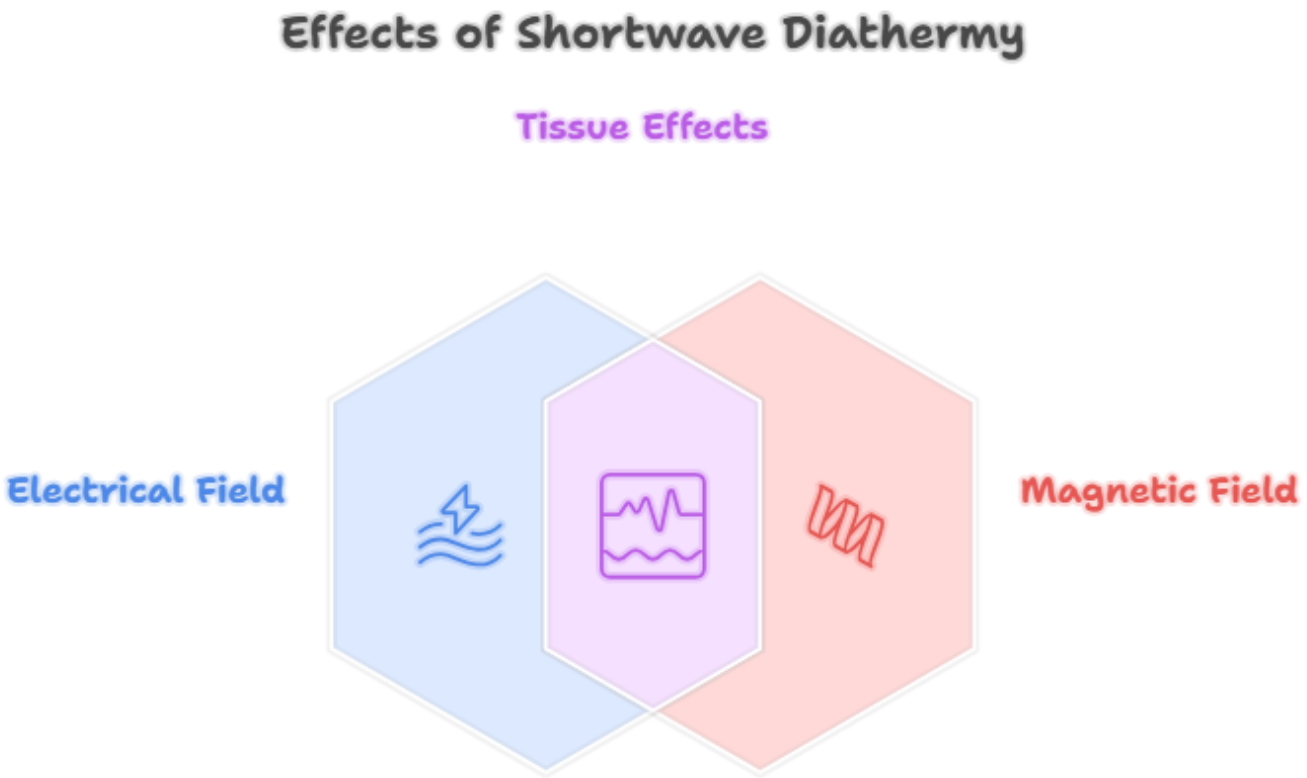
ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short -Wave Diathermy

- The shortwave diathermy unit consists of a *power supply that provides power* to a *radio frequency oscillator.*
- This radio frequency oscillator provides *stable, drift-free oscillations* at the required frequency.



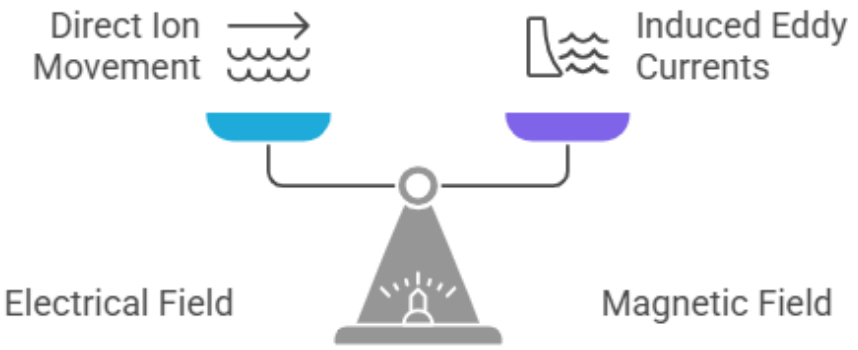
ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short -Wave Diathermy

- A shortwave diathermy unit that generates a high-frequency electrical current will produce both an electrical field and a magnetic field in the tissues.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

- ***Electrical field*** the lines of force exerted on *charged ions* in the tissues by the electrodes, which cause charged particles to *move from one pole to the other*.
- **Magnetic field** Created when current is passed through a coiled cable affecting surrounding tissues by inducing localized secondary currents, called *eddy currents* within the tissues.

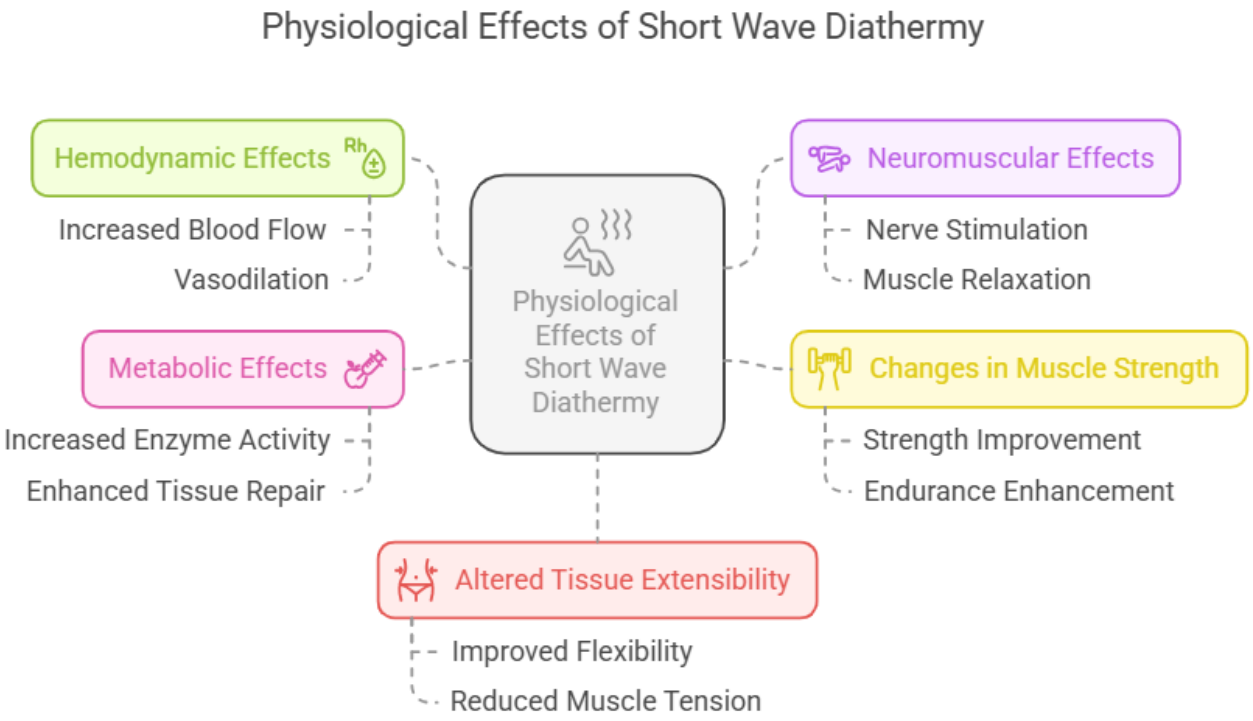


Comparing Effects of Electrical and Magnetic Fields in Tissues

ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short -Wave Diathermy

Physiological Effects of short wave diathermy

1. HEMODYNAMIC EFFECTS.
2. NEUROMUSCULAR EFFECTS.
3. CHANGES IN MUSCLE STRENGHT
4. METABOLIC EFFECTS.
5. ALTERED TISSUE EXTENSIBILITY.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

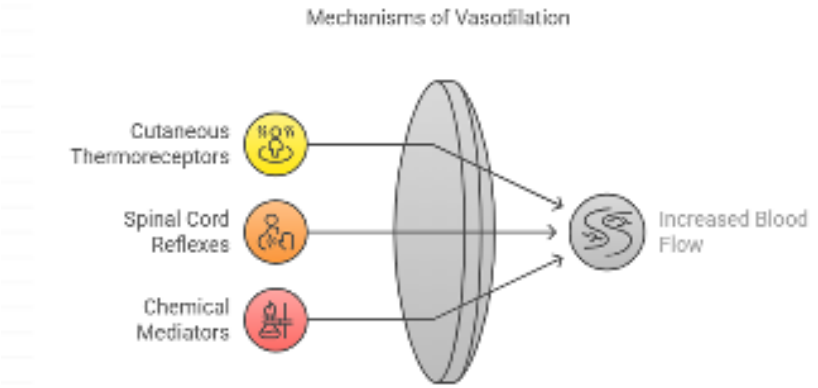
Physiological Effects of shortwave diathermy

1. Hemodynamic Effects

➤ Vasodilation:-

Heat causes vasodilation and thus an increase in the rate of blood flow, thermotherapy may cause vasodilation by a variety of mechanisms, including:

A. Direct cutaneous thermoreceptors.
B. Indirect local spinal cord reflexes.
C. Indirect chemical mediators of inflammation.



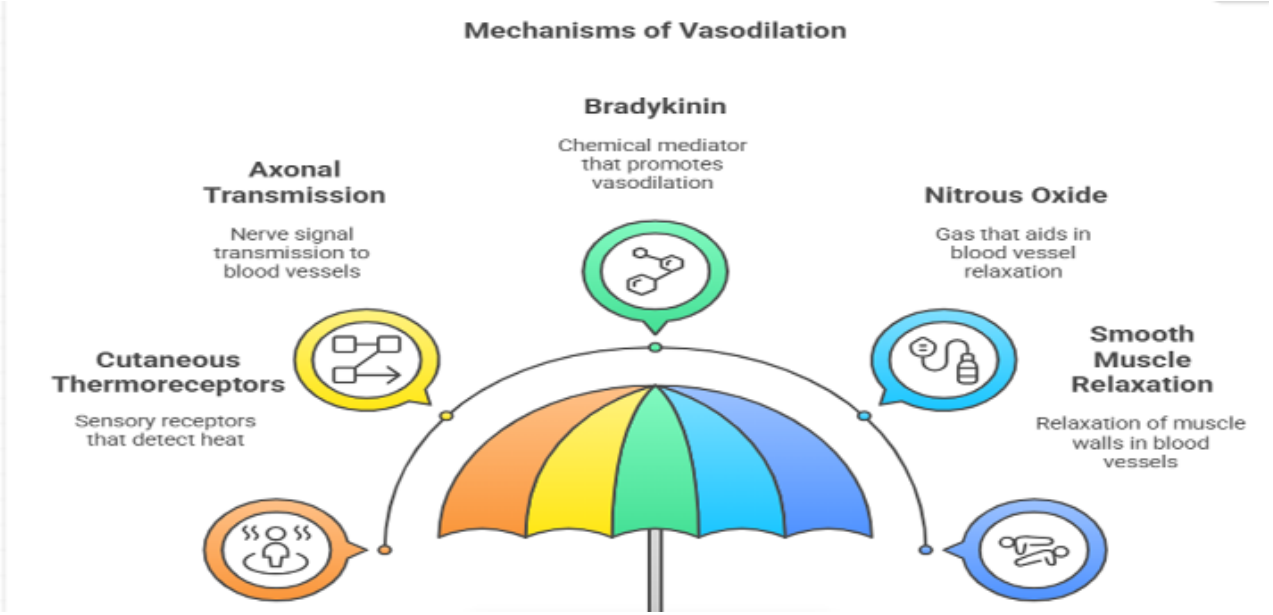
ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

Physiological Effects of shortwave diathermy

1. Hemodynamic Effects

➤ Vasodilation:-

A. Direct cutaneous thermoreceptors. direct reflex activation of the smooth muscles of the blood vessels by release of bradykinin and nitrous oxide, and that bradykinin and nitrous oxide then stimulate relaxation of the smooth muscles of the vessel walls to cause vasodilation in the area where the heat is applied.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

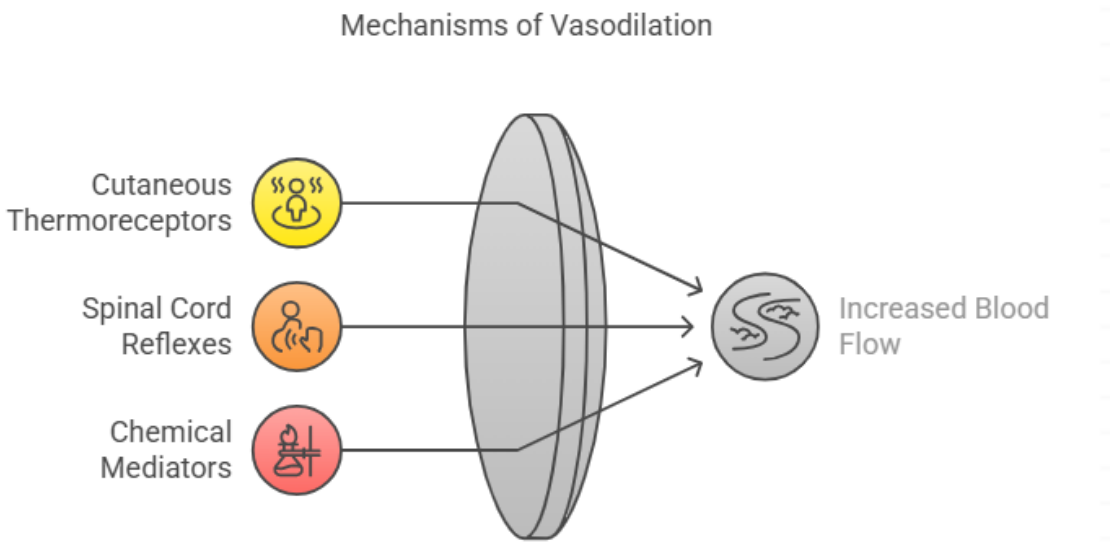
Physiological Effects of shortwave diathermy

1. Hemodynamic Effects

➤ Vasodilation:-

A. Direct cutaneous thermoreceptors.

B. Indirect local spinal cord reflexes. By activation of local spinal cord reflexes by cutaneous thermoreceptors.



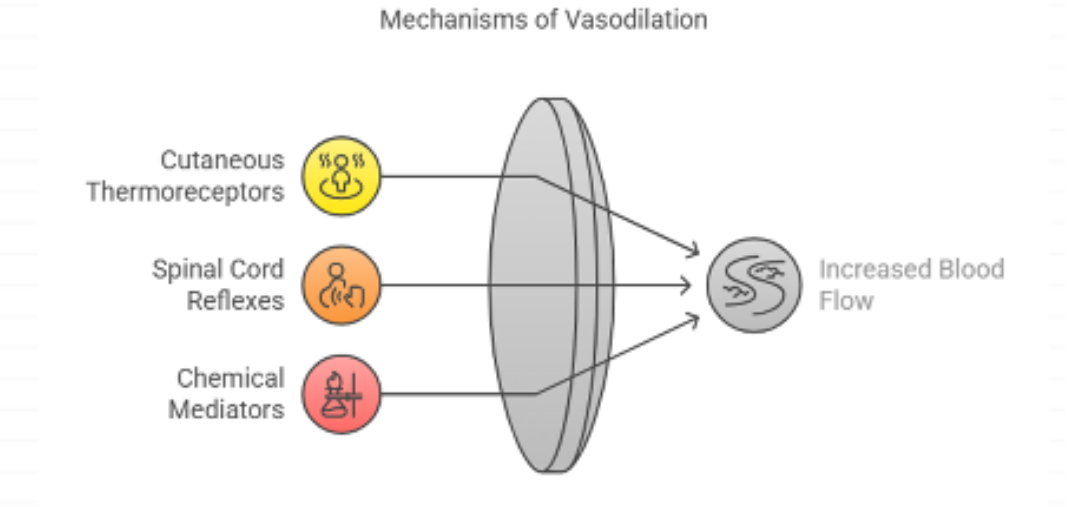
ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

Physiological Effects of shortwave diathermy

1. Hemodynamic Effects

➤ Vasodilation:-

A. Direct cutaneous thermoreceptors.
B. Indirect local spinal cord reflexes.
C. Indirect chemical mediators of inflammation. By activation of local release of chemical mediators of inflammation.



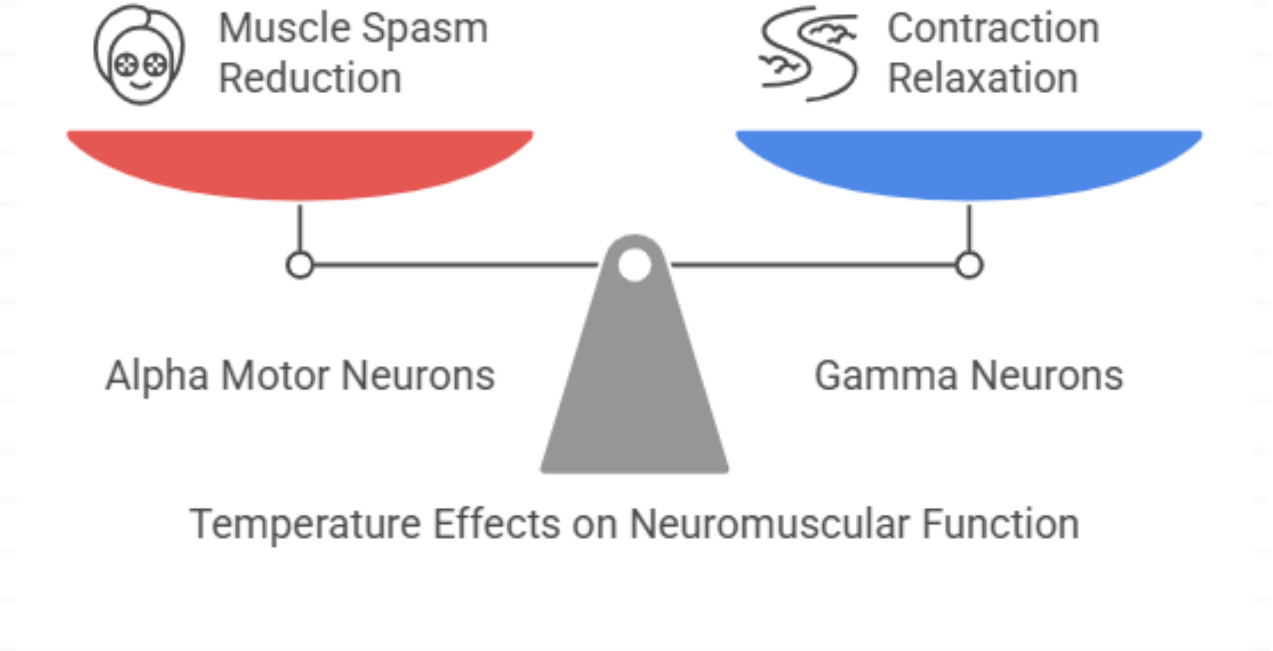
ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

2. NEUROMUSCULAR EFFECTS

Changes in Nerve Conduction Velocity (NCV) and Firing Rate by :-

a) Increased temperature.

b) Increased Pain Threshold



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

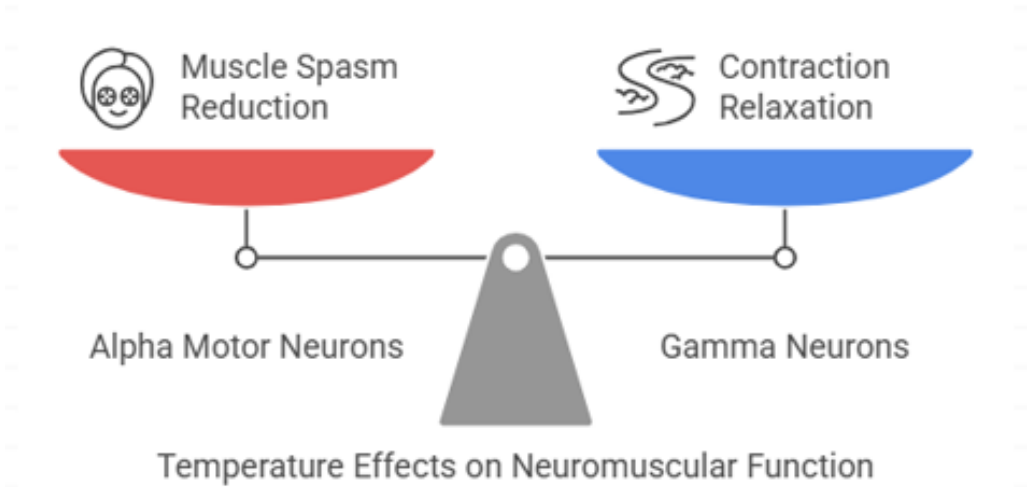
NEUROMUSCULAR EFFECTS :-

Changes in Nerve Conduction Velocity (NCV) and Firing Rate by :-

a) Increased temperature.

Increased temperature increases nerve conduction velocity and decreases the conduction latency of sensory and motor nerves.

NCV increases by approximately 2 m/second for every 1° C (1.8° F) increase in temperature.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

NEUROMUSCULAR EFFECTS :

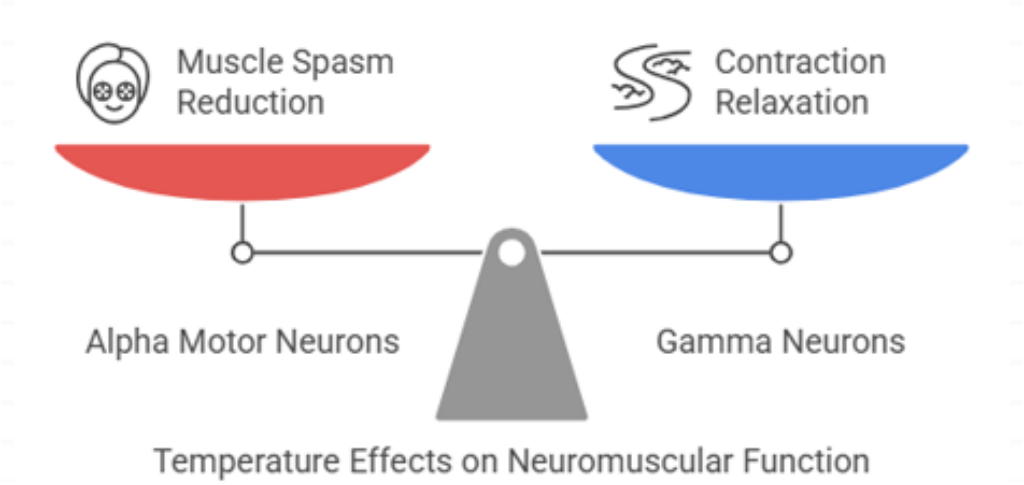
Changes in Nerve Conduction Velocity (NCV) and Firing Rate by :-

a) Increased temperature.

NCV increases by approximately 2 m/second for every 1° C (1.8° F) increase in temperature.

↓ Alpha motor neurons (muscle spindle) → ↓ reduction in muscle spasm

↓ Gamma neuron activity (Golgi Tendon Organ) → relaxation of muscle contraction



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

NEUROMUSCULAR EFFECTS:-

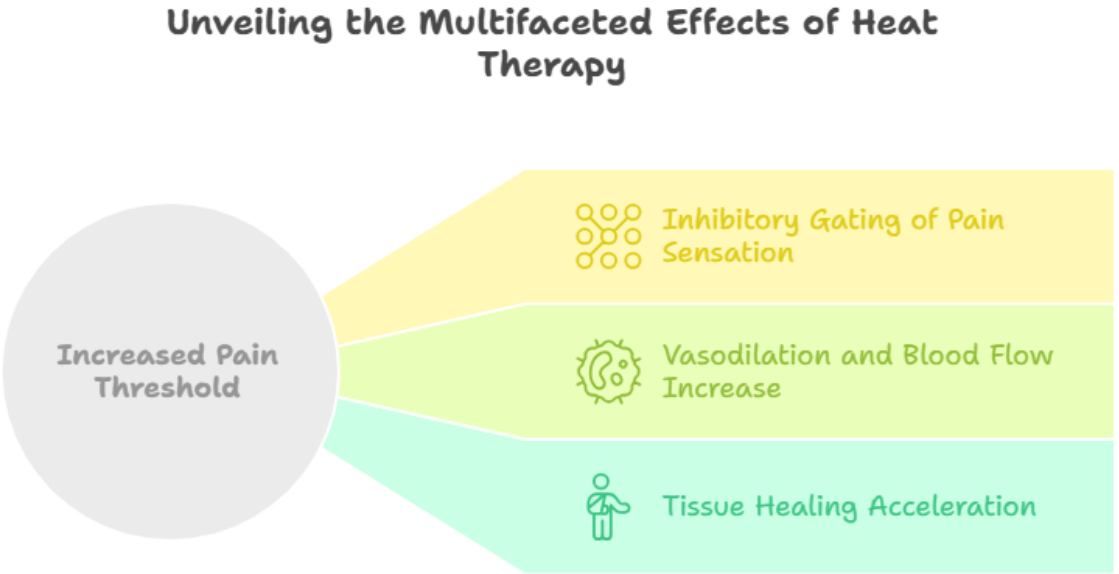
Changes in Nerve Conduction Velocity (NCV) and Firing Rate by :-

a) Increased temperature.

b) Increased Pain Threshold

Increased Pain Threshold by:

1. Cutaneous thermoreceptor stimulation.
2. Vasodilation and increase in blood flow.



ADVANCE PHYSIOTHERAPY EQUIPMENTS – Short –Wave Diathermy

NEUROMUSCULAR EFFECTS: –

Increased Pain Threshold by:

1. Cutaneous thermoreceptor stimulation:-

Heat increases the activity of the cutaneous thermoreceptors, this can have an immediate inhibitory gating effect on the transmission of the sensation of pain at the spinal cord level.

1. Vasodilation and increase in blood flow: -

Stimulation of the thermoreceptor can also result in vasodilation, as described previously, causing an increase in blood flow and thus potentially reducing the pain that caused by ischemia and increase speed of tissue healing.

Thank you!

PHYSIOTHERAPY EQUIPMENTS

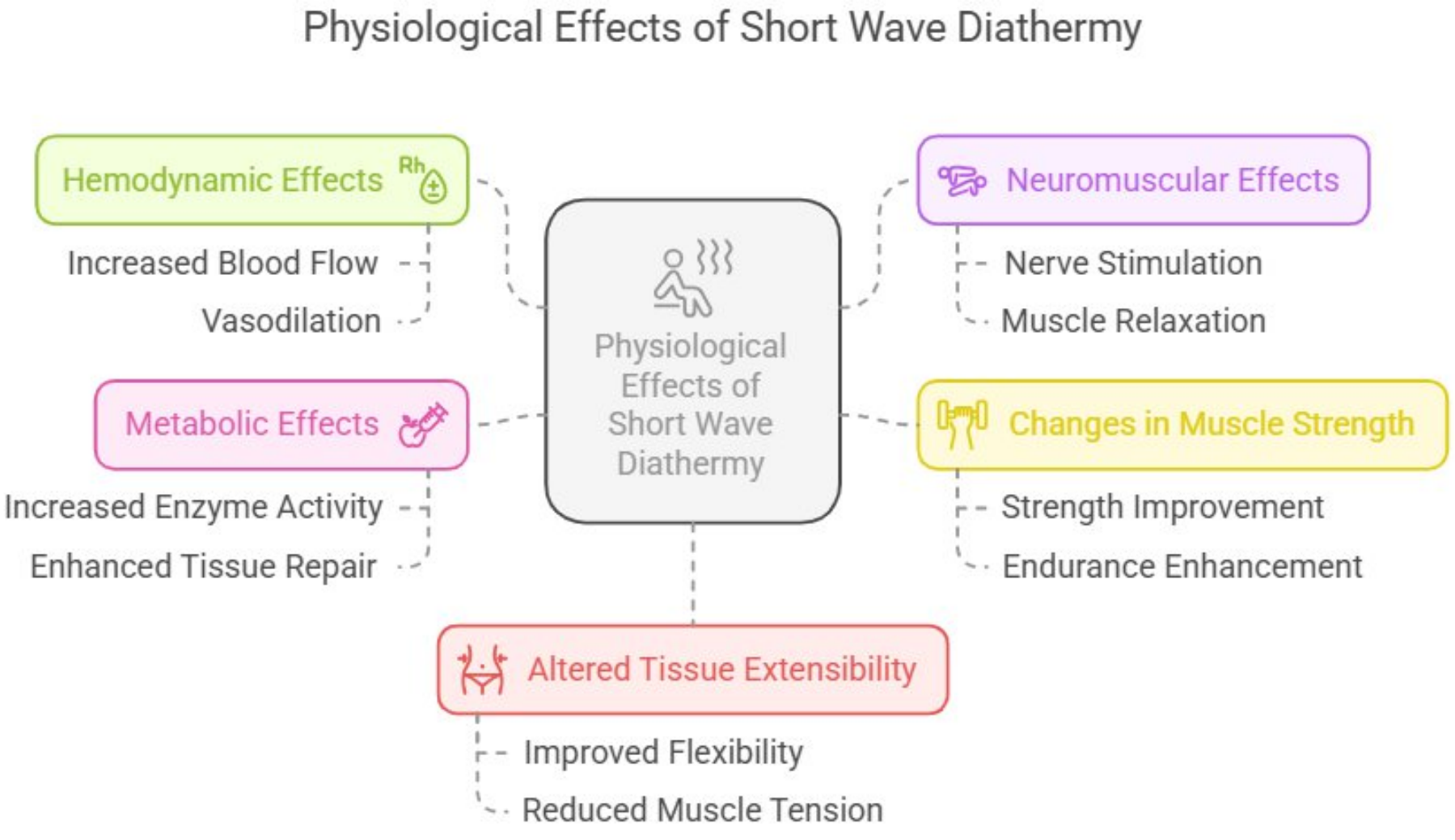
Second year – Lecture 14

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Physiological Effects of short wave diathermy

1. HEMODYNAMIC EFFECTS.
2. NEUROMUSCULAR EFFECTS.
3. CHANGES IN MUSCLE STRENGHT
4. METABOLIC EFFECTS.
5. ALTERED TISSUE EXTENSIBILITY.



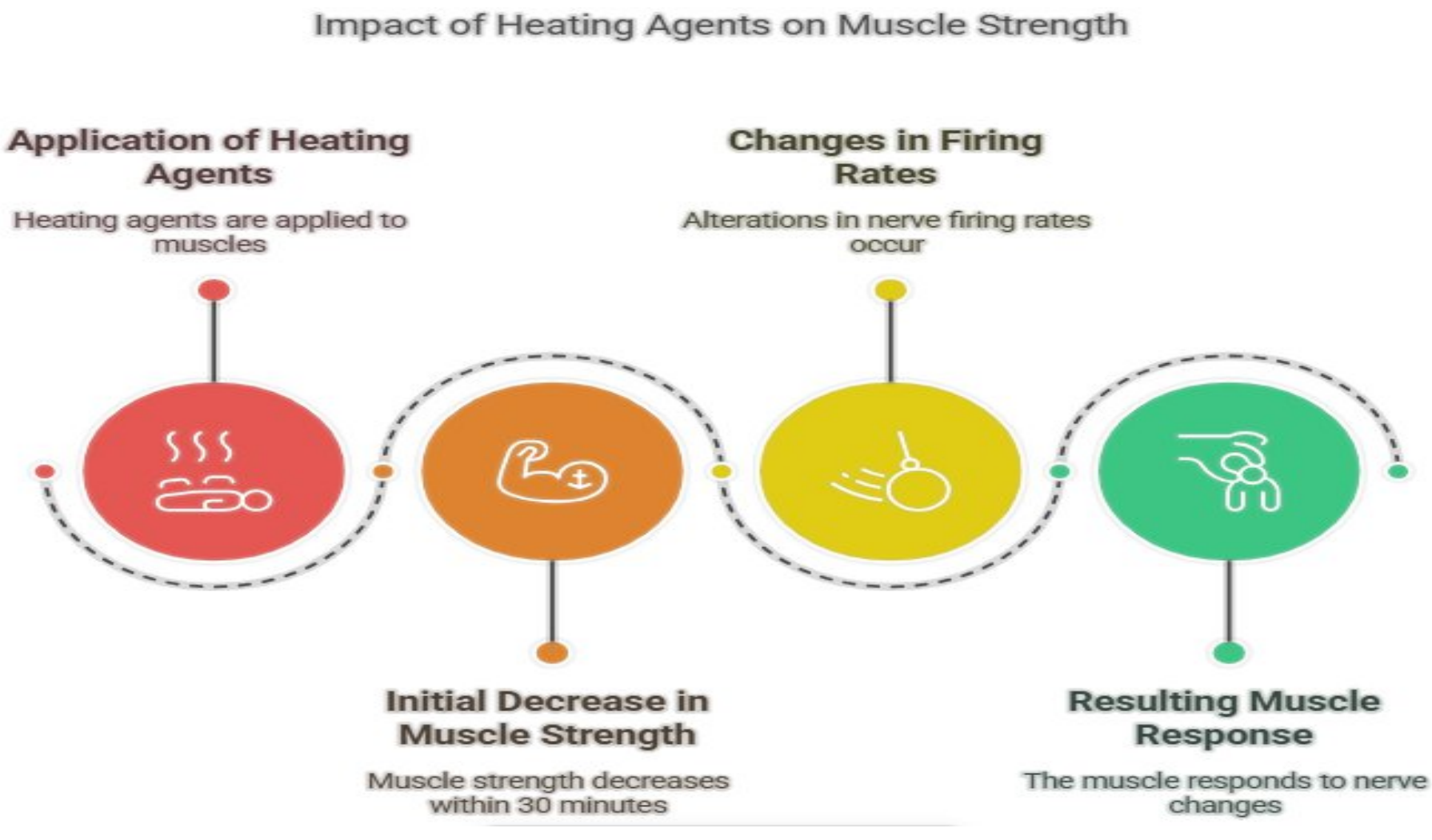
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

3. CHANGES IN MUSCLE STRENGHT

Muscle strength and endurance: -

The application of deep or superficial heating agents to motor nerves results in changes to the firing rates of muscle fibers. These changes contribute to a decrease in muscle strength and endurance within the first 30 minutes.



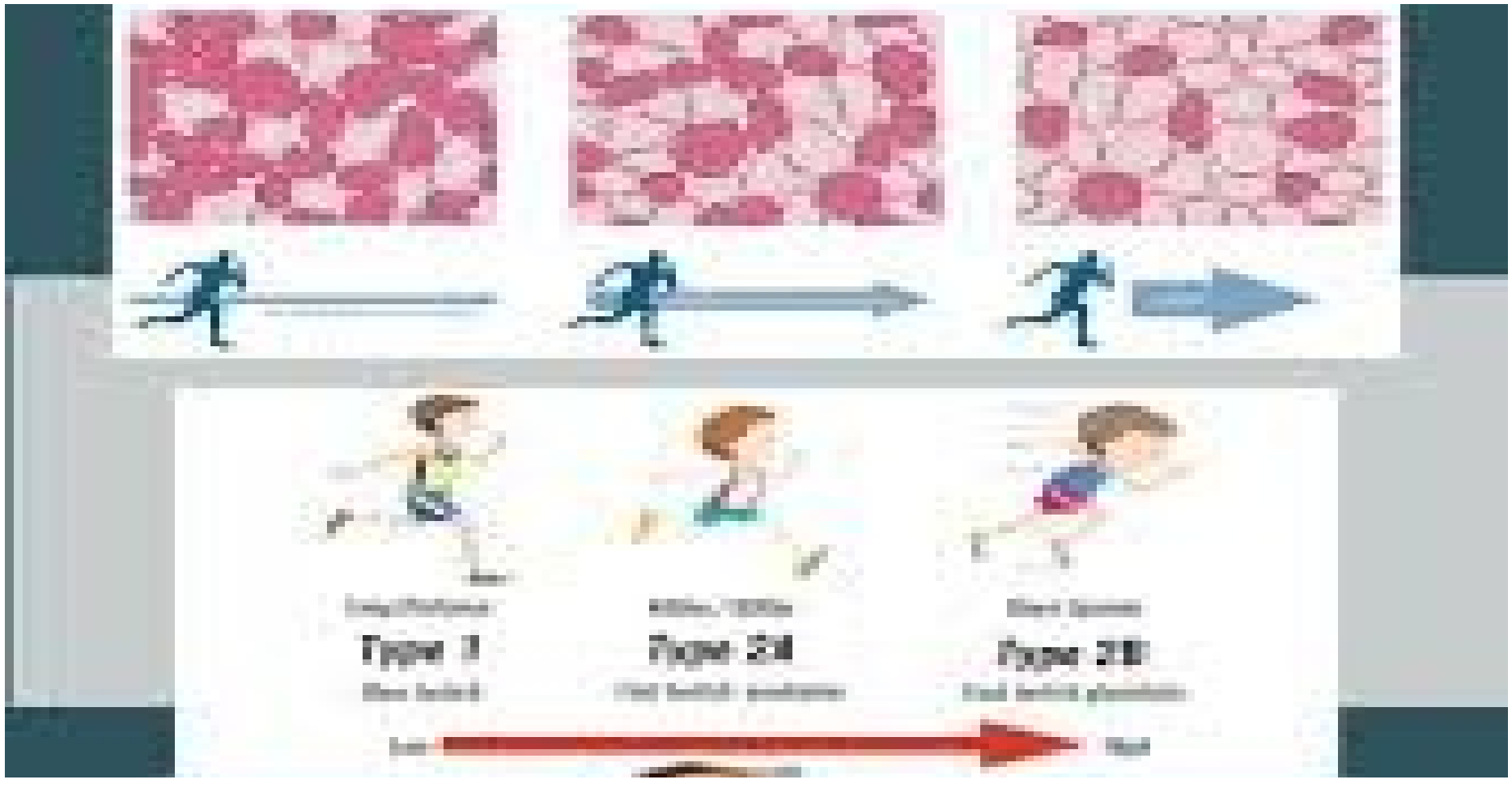
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

3. CHANGES IN MUSCLE STRENGHT

Muscle strength and endurance: -

The types of muscle fibers that affected by heat include type II muscle spindle efferent fibers, gamma efferent fibers, and type Ib fibers from Golgi tendon organs.

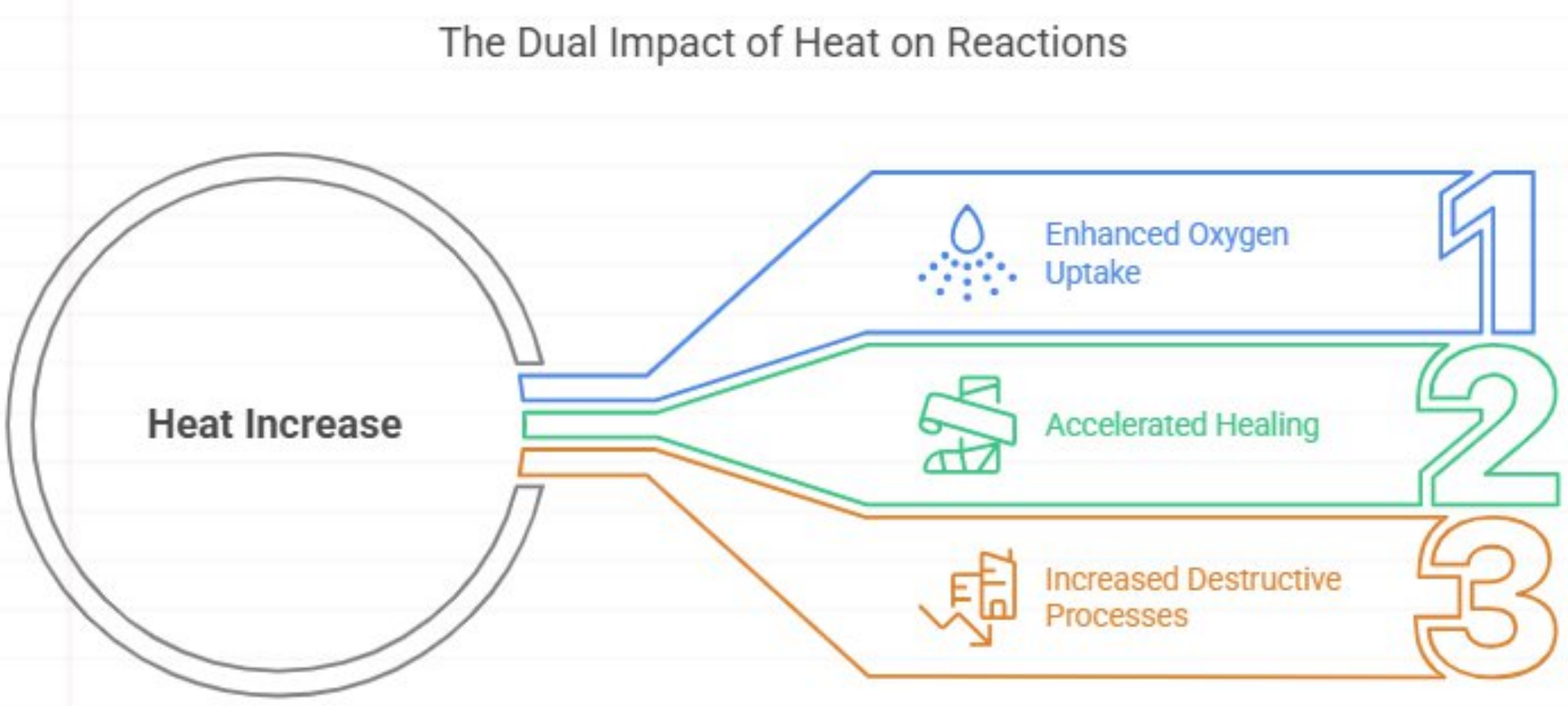


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

4- METABOLIC EFFECTS.

- Heat increases the rate of endothermic chemical reactions, including the rate of enzymatic biological reactions.
- Any increase in enzymatic activity will result in an increase in the rate of cellular biochemical reactions.
- This can increase oxygen uptake and accelerate healing but may also increase the rate of destructive processes.



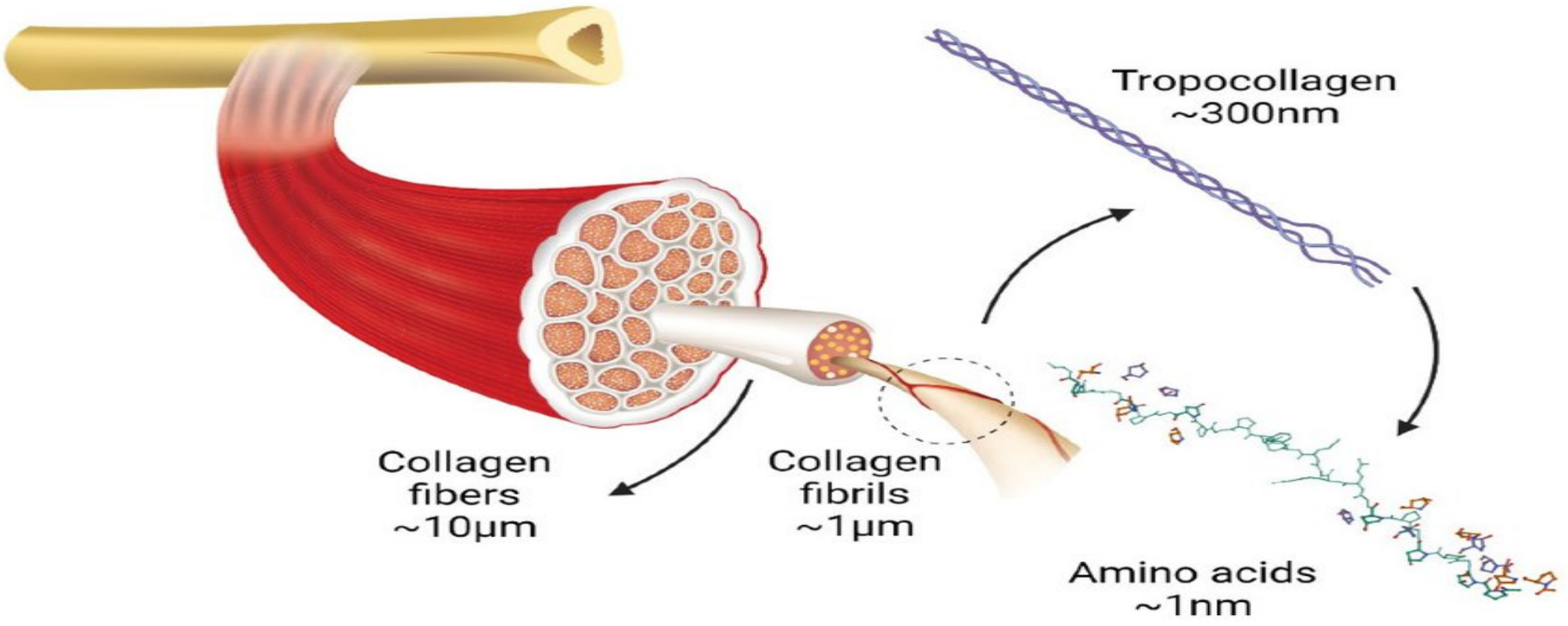
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

4.ALTERED TISSUE EXTENSIBILITY

Increased Collagen Extensibility

Increasing the temperature of soft tissue increases its extensibility. When soft tissue is heated before stretching, it maintains a greater increase in length after the stretching force is applied, *less force is required to achieve the increase in length,* and the risk of tissue tearing is reduced.



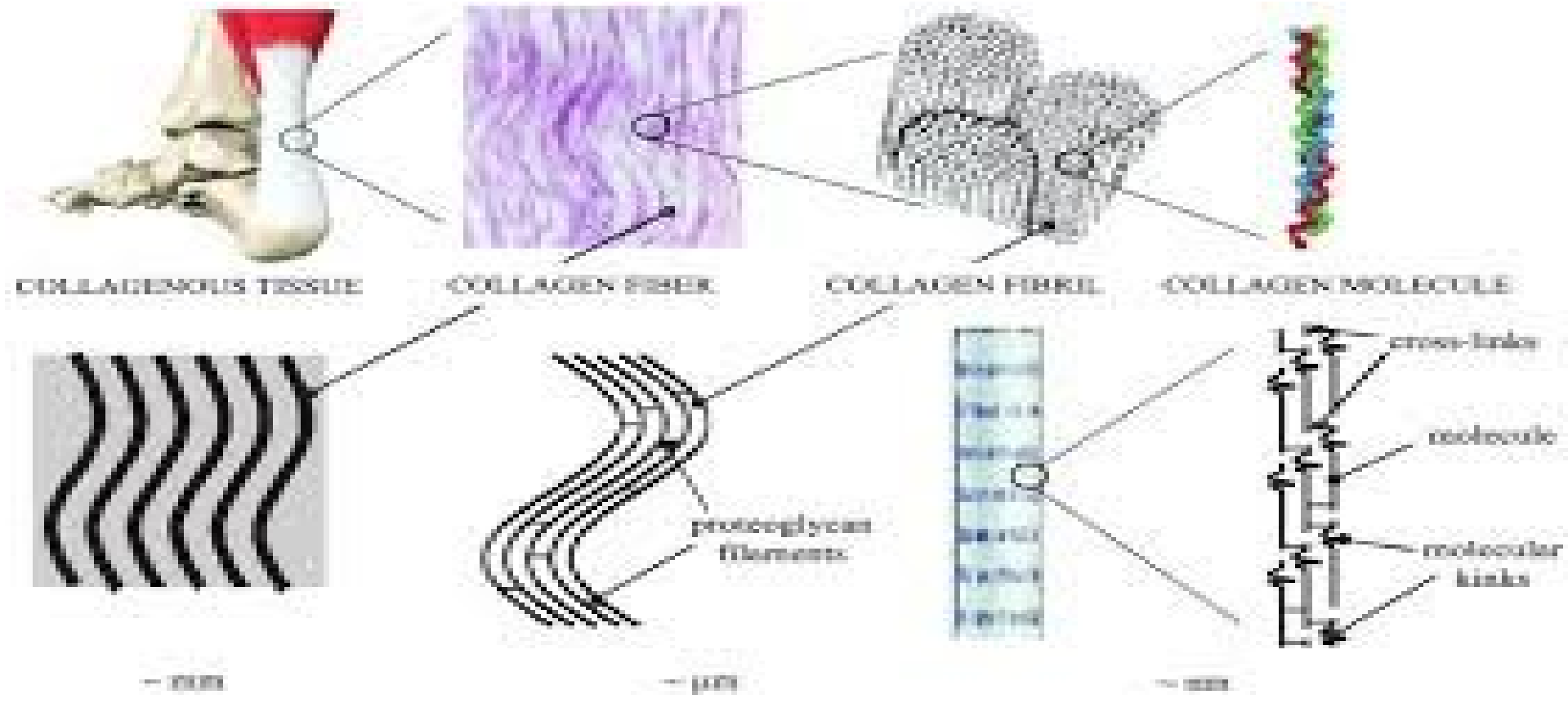
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

4. ALTERED TISSUE EXTENSIBILITY

Increased Collagen Extensibility

If heat is applied to collagenous soft tissue, such as tendon, ligament, scar tissue, or joint capsule, before prolonged stretching, plastic deformation, in which the tissue increases in length and maintains most of the increase after cooling, can be achieved.



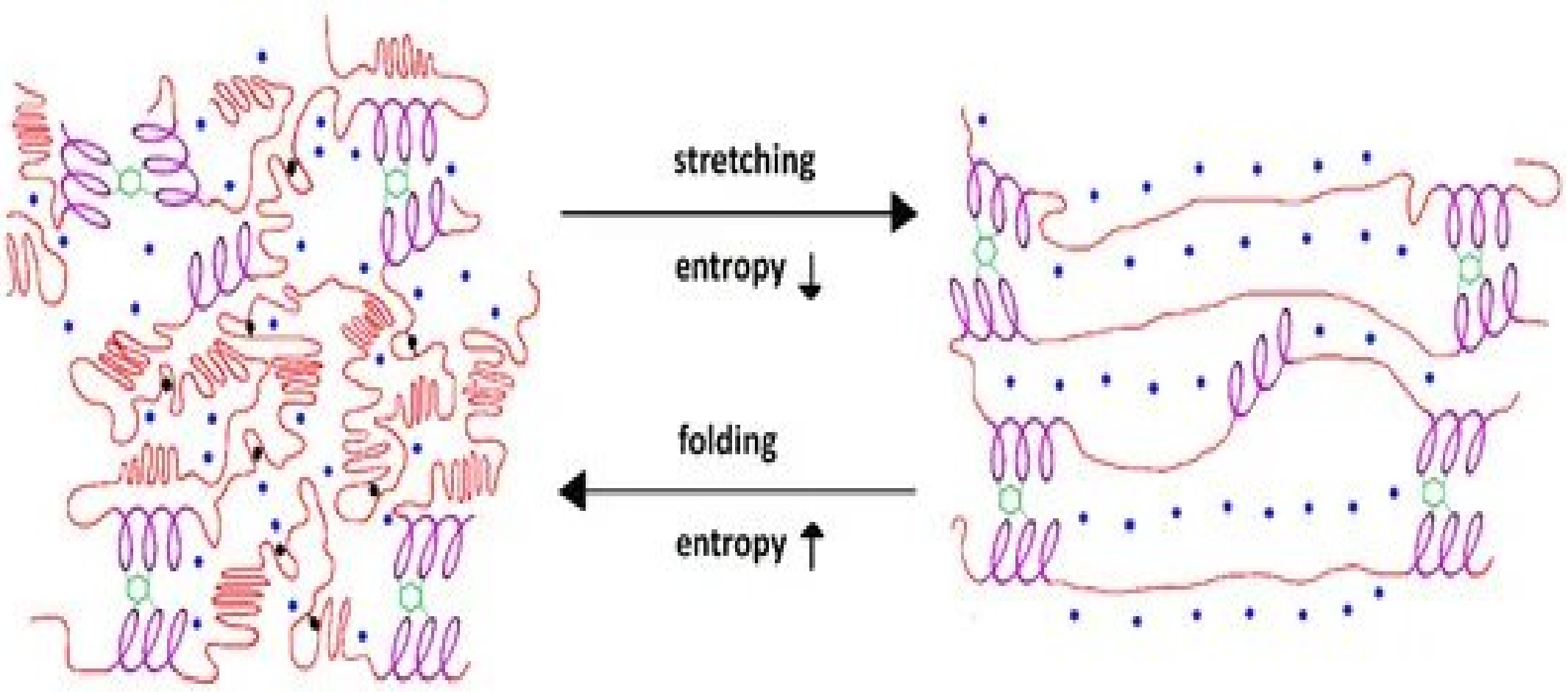
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

4.ALTERED TISSUE EXTENSIBILITY

Increased Collagen Extensibility

A maximum increase in residual length is achieved when the tissue temperature is maintained at 40° C to 45° C for 5 to 10 minutes.

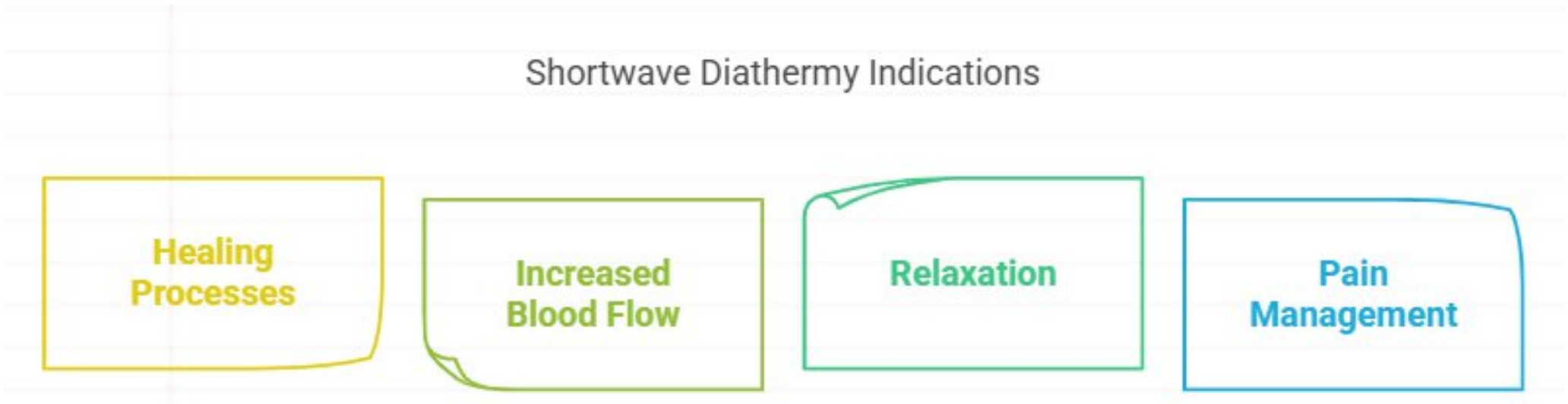


ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Shortwave diathermy Indications in :-

1. Healing processes.
2. Increased blood flow
3. Relaxation
4. Pain management



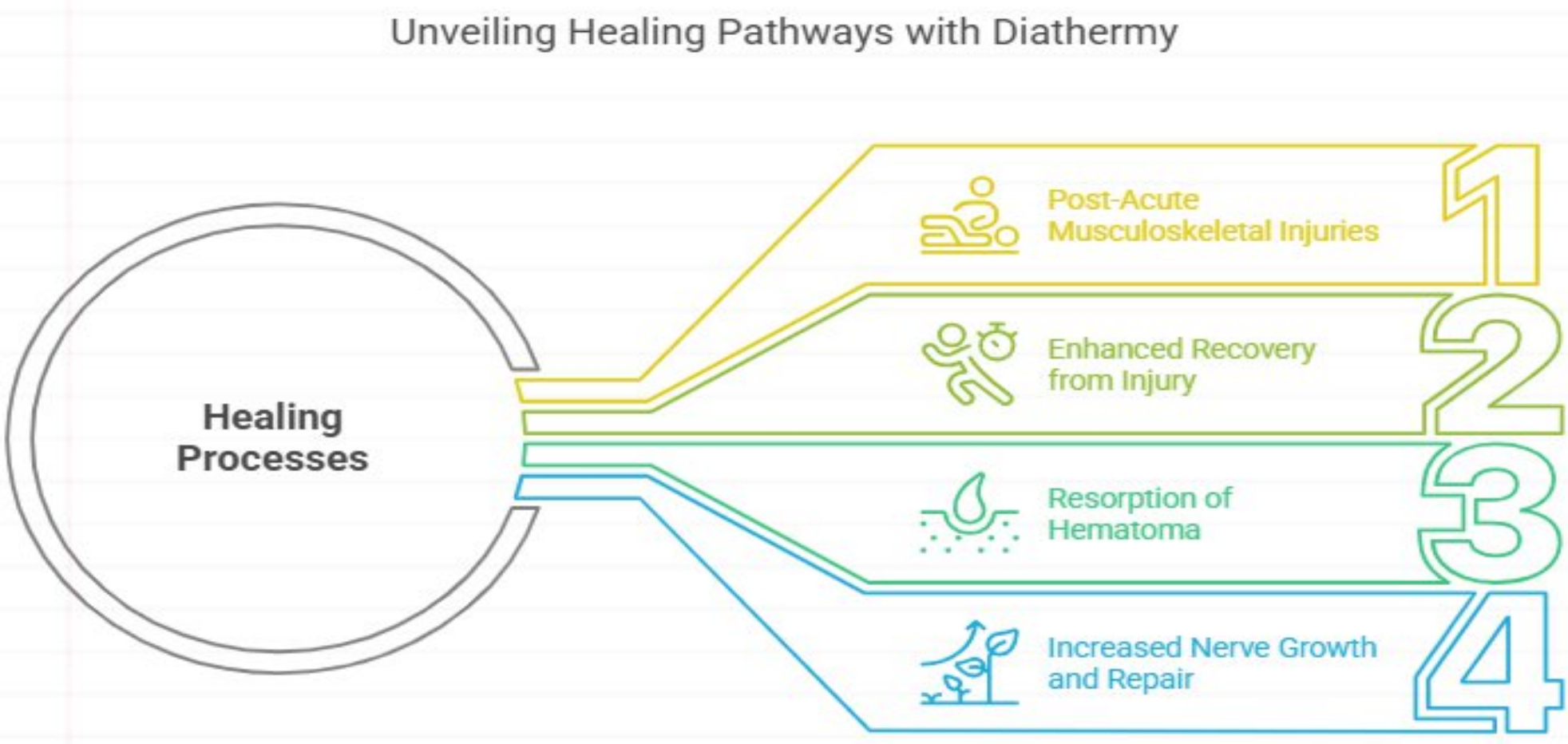
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Shortwave diathermy Indications in :-

1. **Healing processes.**

a) Post-acute musculoskeletal injuries
b) Enhanced recovery from injury
c) Resorption of hematoma
d) Increased nerve growth and repair.



ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Shortwave diathermy Indications in :-

1. Healing processes.

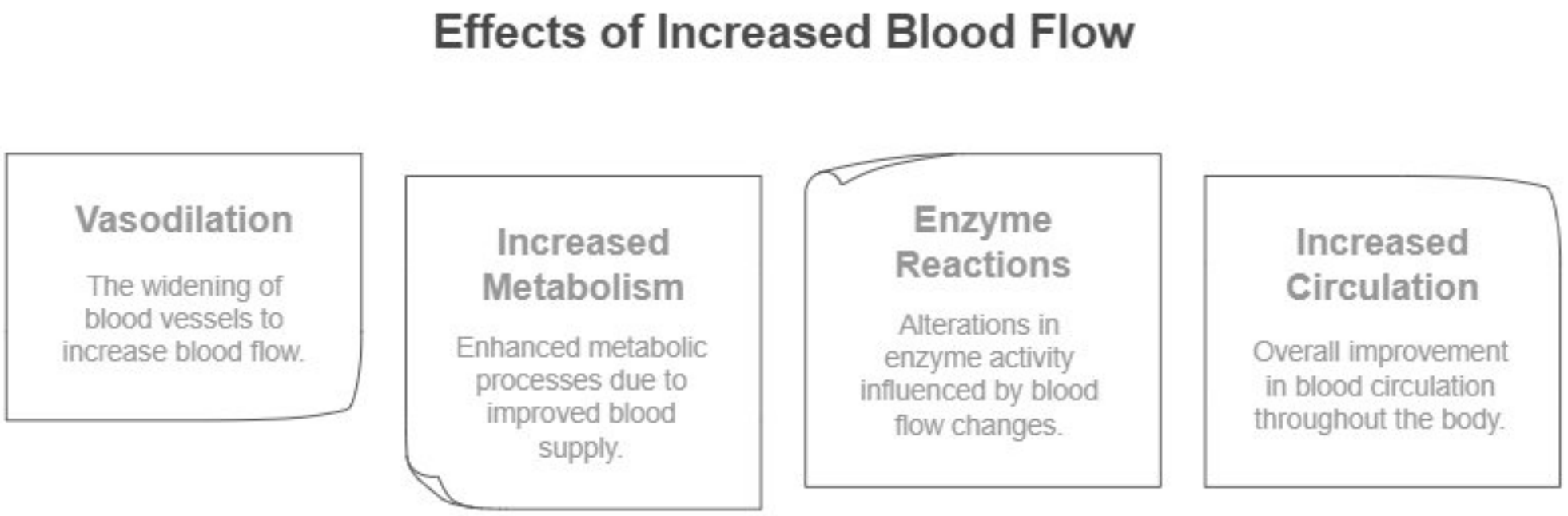
2. Increased blood flow

a) Vasodilation

b) Increased metabolism

c) Changes in some enzyme reactions

d) Increased circulation



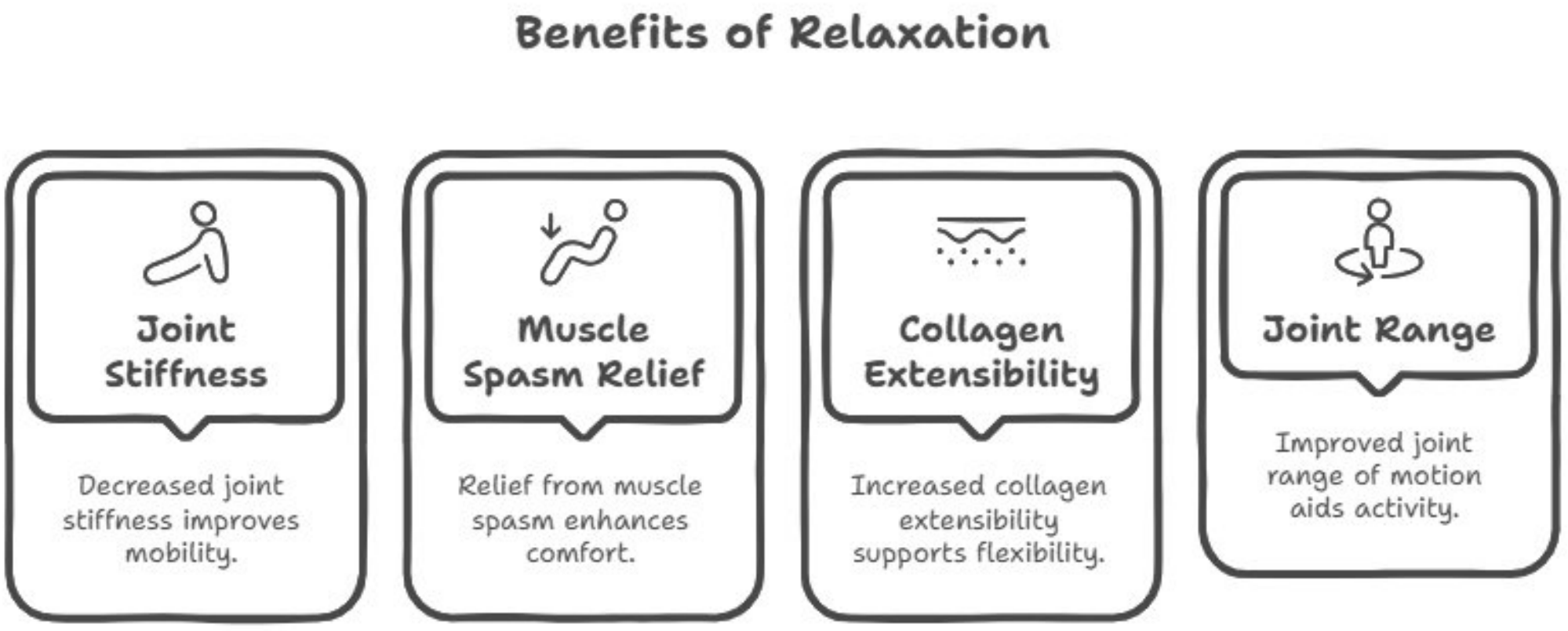
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Shortwave diathermy Indications in :-

1. **Healing processes.**
2. **Increased blood flow**
3. **Relaxation**

a) Decreased joint stiffness.
b) Relief muscle spasm.
c) Increased collagen extensibility.
d) Improved joint range of motion.



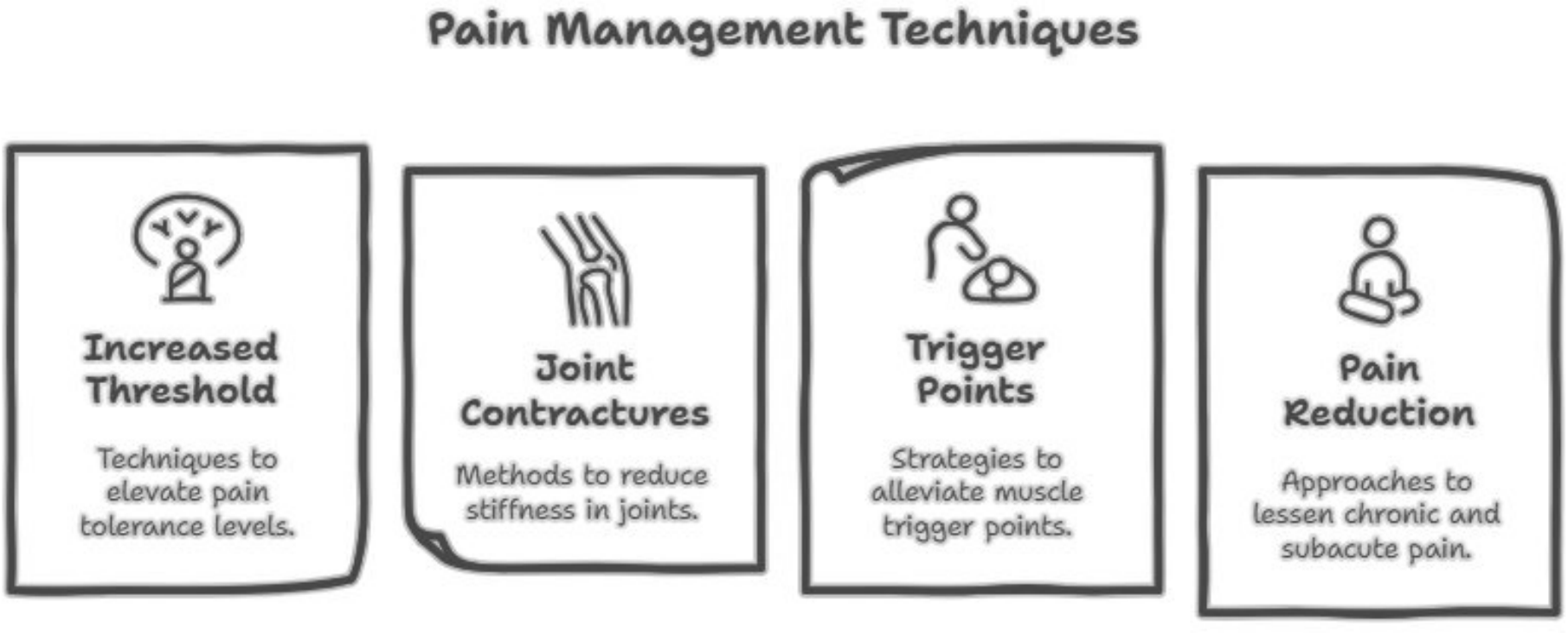
ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Shortwave diathermy Indications in :-

1. **Healing processes.**
2. **Increased blood flow**
3. **Relaxation**
4. **Pain management**

a) Increased pain threshold
b) Decrease Joint contractures
c) Decrease myofascial trigger points
d) Reduced subacute and chronic pain



ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Short -Wave Diathermy is contraindications in patients with:-

- **Circulatory system disorders.**
- **Nervous system disorders.**
- **Site of the lesion.**
- **Type of the lesion.**
- **Sites with implantation or body support aids.**

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

<u>Short -Wave Diathermy is contraindications in patients with:-</u>

- **Circulatory system disorders.**

peripheral vascular disease, bleeding disorders and areas with ischemia

- **nervous system disorders.**

patients with impaired sensation (neuropathy) or impaired ability to communicate/cognitive impairments (dementia or dysphasia) or areas of reduced sensitivity to temperature or pain

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Short -Wave Diathermy is contraindications in patients with:-

- **Circulatory system.**
- **Nervous system disorders.**
- **Site of the lesion.**

1. **Fluid-filled areas or organs**
2. **Over the Eyes:** because increasing the temperature of intraocular fluid may damage the internal structures of the eyes - Contact lenses
3. **Pelvic area: -** because of the risk of adverse effects on fertility caused by increasing local tissue temperature.
4. **Over growing Epiphyseal:** its use is not recommended in these areas because of concern that diathermy may alter the rate of epiphyseal closure.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Short -Wave Diathermy is contraindications in patients with:-

- **Circulatory system.**
- **Nervous system disorders.**
- **Site of the lesion.**
- **Type of the lesion.**

1. Acute traumatic musculoskeletal injuries, Joint effusion, Synovitis
2. Acute inflammatory conditions.
3. Moist wound dressings
4. Malignancies: The increase of metabolism resulting from the increase in temperature could accelerate the rate of growth.

ADVANCE PHYSIOTHERAPY EQUIPMENTS -

Short -Wave Diathermy

Short -Wave Diathermy is contraindications in patients with:-

- **Circulatory system.**
- **Nervous system disorders.**
- **Site of the lesion.**
- **Type of the lesion.**
- **Sites with implantation or body support aids.**

1. Metal implants : Metal is highly conductive electrically and therefore can become very hot with the application of diathermy,
2. Cardiac pacemakers: - may interfere with the functioning of a cardiac pacemaker and thus may adversely affect patients with cardiac pacemakers.
3. Intrauterine devices
4. Watches or jewelry


Thank you!