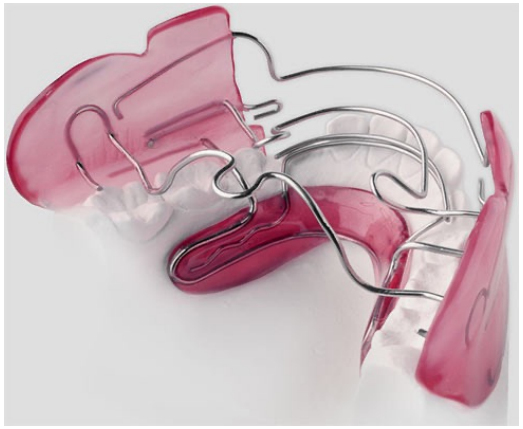

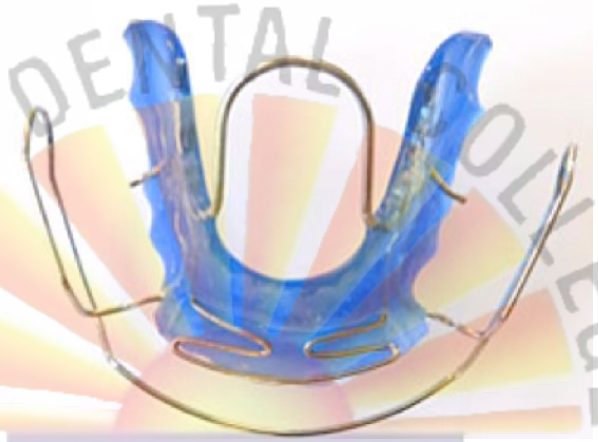

MYOFUNCTIONAL APPLIANCES

DEPARTMENT OF ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

LEARNING OBJECTIVE

1. To understand the importance of growth modulation.
2. To know the indications, contra-indications, limitations of myofunctional appliances.

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PART 1

1. DEFINITION
2. THEORETICAL BASIS FOR THE APPLIANCE
3. HISTORY
4. TREATMENT PRINCIPLES
5. CLASSIFICATION
6. COMPONENTS OF FUNCTIONAL APPLIANCE
7. ACTION OF FUNCTIONAL APPLIANCES
8. CASE SELECTION
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PART 2

11. ACTIVATOR
    i. HISTORY
    ii. DESIGN
    iii. INDICATIONS
    iv. MODE OF ACTION
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PART 3

15. FRANKEL APPLIANCE
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16. TWIN BLOCK
17. FIXED FUNCTIONAL APPLIANCE
18. HERBST APPLIANCE
19. JASPER JUMPER

- “Loose fitting or passive appliance which harness natural forces of the oro-facial musculature that are transmitted to the teeth and alveolar bone through the medium of the appliance.”

WHAT CAN FUNCTIONAL APPLIANCES DO?

THEORETICAL BASIS FOR THE APPLIANCE

NEW PATTERN OF FUNCTION

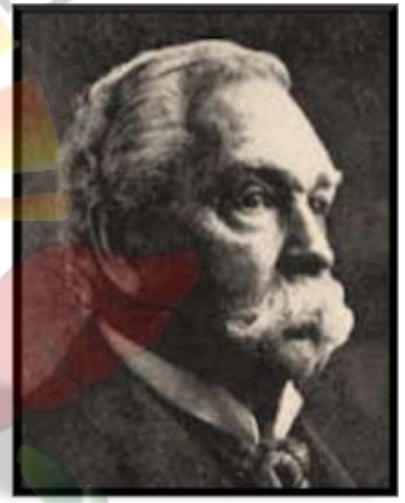
↓

NEW MORPHOLOGIC PATTERN

HISTORY

1879

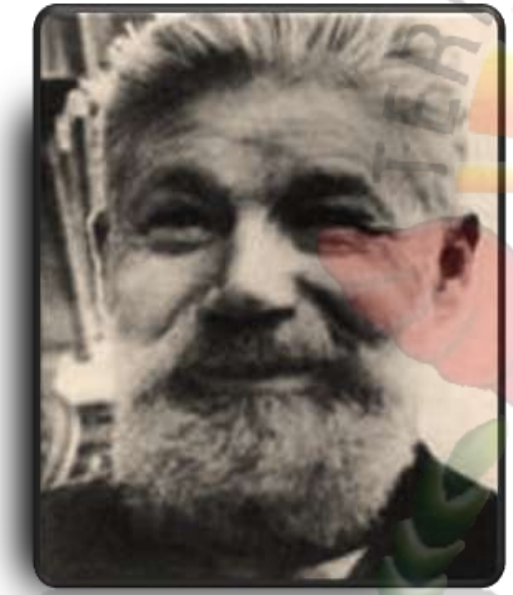
Norman Kingsley-Forward positioning of mandible in orthodontics-Bite plane/Bite-jumping appliance(vulcanite).



Wilhelm Roux-first to study the influences of natural forces and functional stimulation on form.

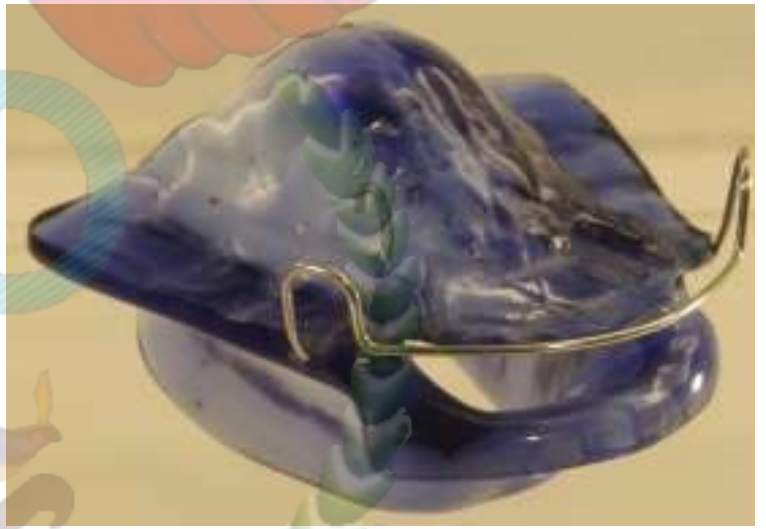
1883

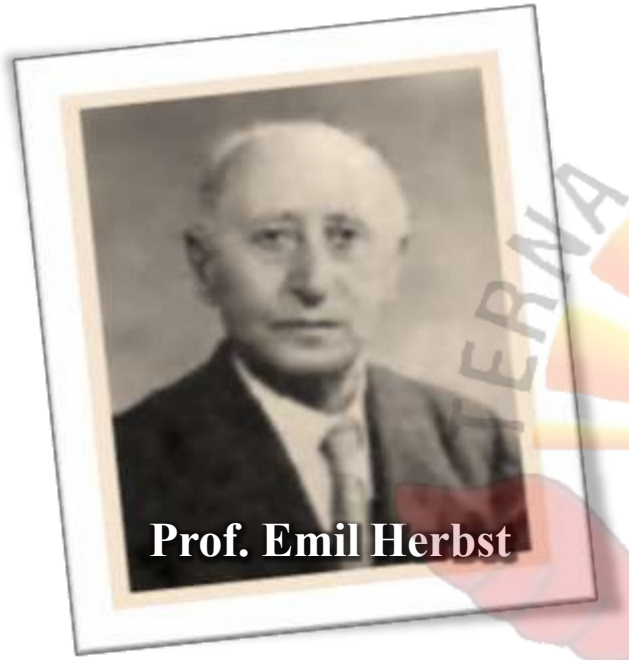
1902-Pierre Robin- first practitioner to use functional jaw orthopedics to treat a malocclusion- Monoblock in children with glossoptosis syndrome.



Viggo Andresen

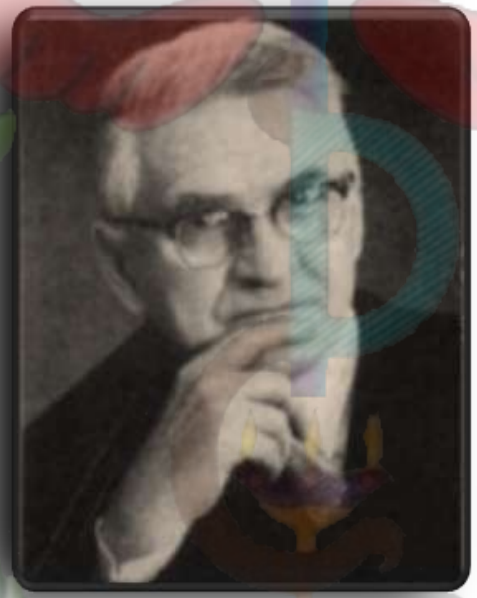
- 1908-Viggo Andresen(Denmark) - modified bite jumping appliance-inspired from Benno Lisher's theory.





1909- Emil Herbst ➔ Herbst appliance

- 1938-Karl Häupl(Germany)- saw the potential of Roux's hypothesis and explained how functional appliances work through the activity of the orofacial muscles.



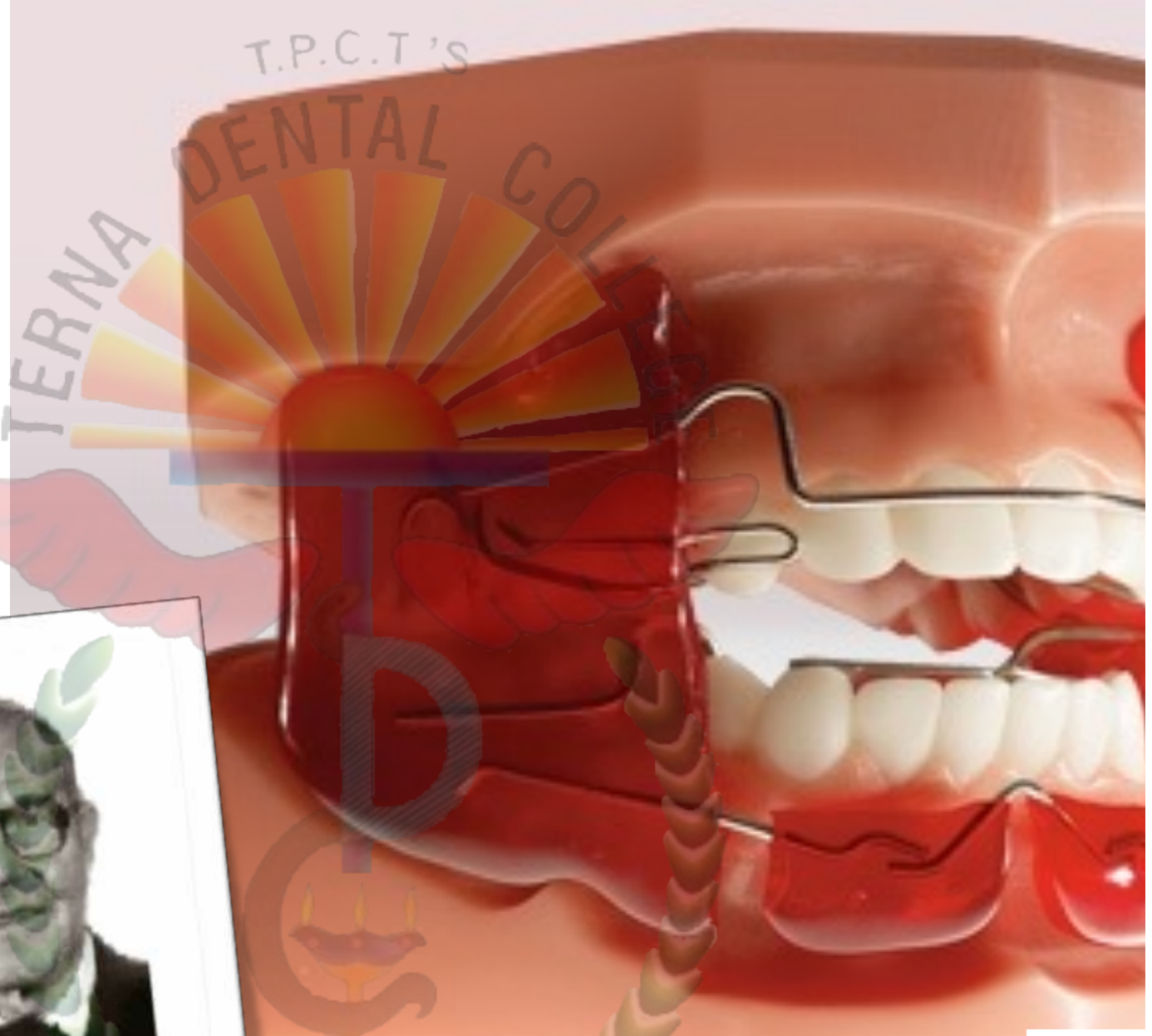
Karl Häupl

Prof.Dr.Wilhem Balters

- 1950-Wilhem Balters- Modified activator by reducing bulk from palate & substituted with a coffin spring ➔ Bionator

Prof. Rolf Frankel

- 1957-Rolf Fränkel- Function Regulator.



Dr.William J. Clark

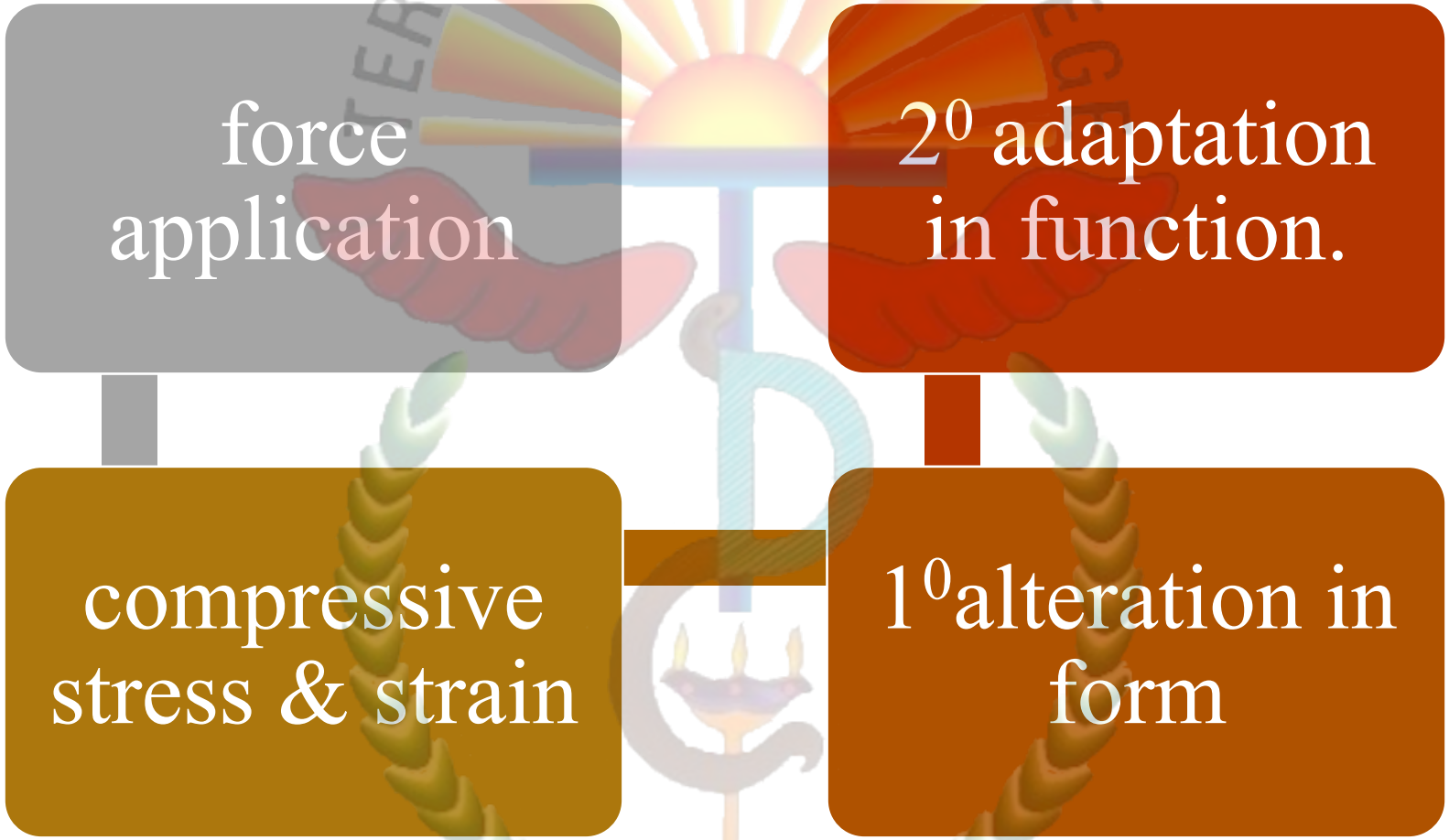
- 1977-Dr.William J. Clarks-Twin Block

TREATMENT PRINCIPLES

- Depending on the type of force applied,2 treatment principles can be differentiated:

I. Force Application

II. Force Elimination


force application
2⁰ adaptation in function.
compressive stress & strain
1⁰alteration in form

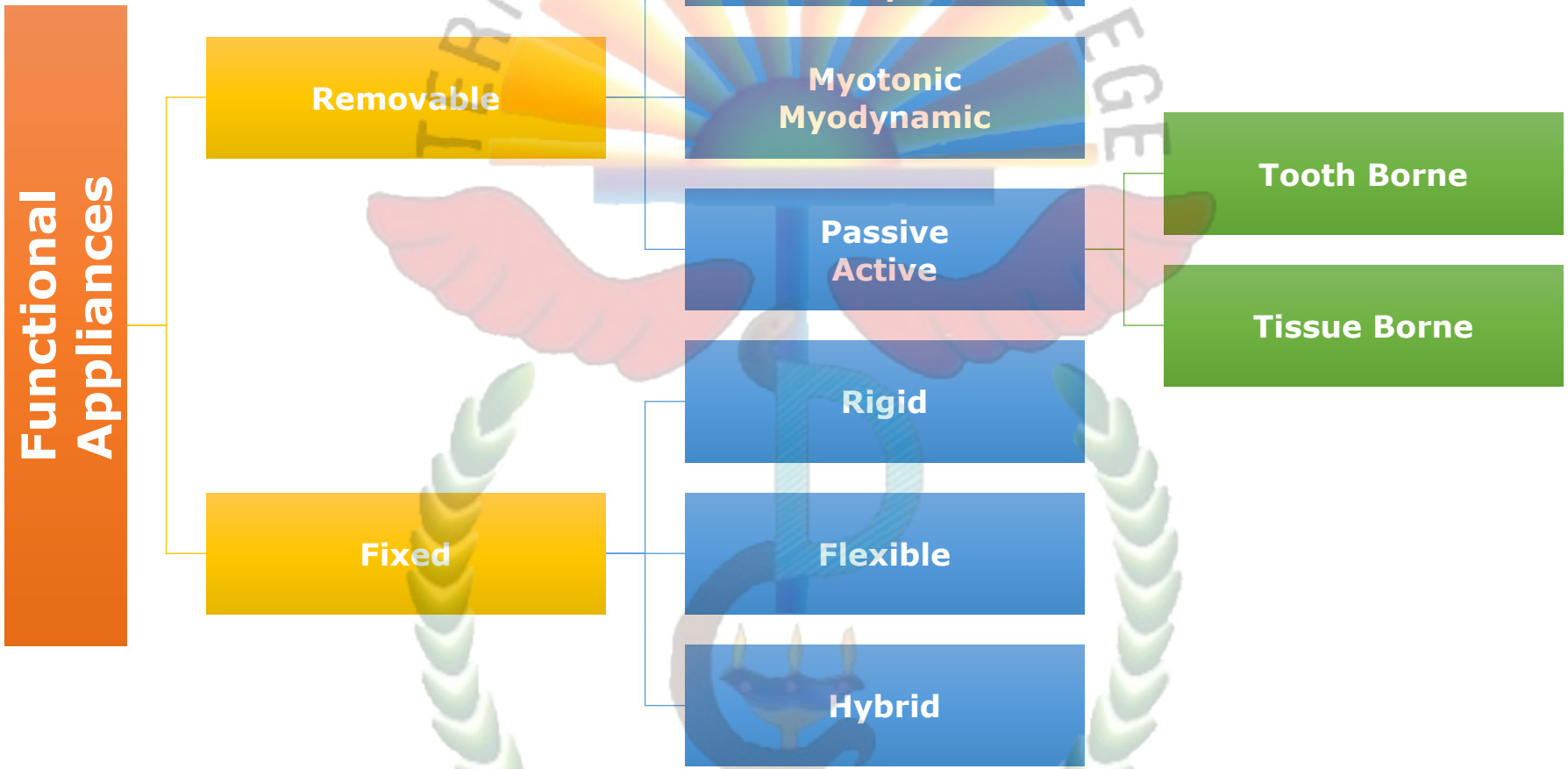
force elimination

Function is rehabilitated & followed by 2^0 adaptation in form.

abnormal & restrictive environmental influences are eliminated

optimal development

CLASSIFICATION



CLASSIFICATION

A. **REMOVABLE FUNCTIONAL APPLIANCES**
Ex.Activator/Bionator/Frankel

B. **FIXED FUNCTIONAL APPLIANCES**
Ex.Jasper Jumper/Herbst appliance

C. **SEMI-FIXED FUNCTIONAL APPLIANCES**
Ex. Den holtz

GROUP A – teeth supported appliances

Ex. **Inclined planes , Catlans**

GROUP II – teeth or tissue supported appliances

Ex. **Original activator & modifications**

GROUP III – vestibular supported appliances with isolated support from teeth/tissue

Ex. **Frankel Function Regulator , Oral-screen**

I. MYOTONIC

Rely on muscle mass

II. MYODYNAMIC

Depend on muscle activity

Ex. **Bimler appliance**

PROFFIT'S CLASSIFICATION

- **I. TOOTH-BORNE PASSIVE APPLIANCES**
- No intrinsic force generating capacity (screws/springs)
- Soft-tissue stretch & muscular activity
- Ex. **Activator**
- **Bionator**
- **Twin Block**

II. TOOTH-BORNE ACTIVE APPLIANCES

Include expansion screws/springs to move teeth

Activator modifications bearing active components

Ex – **Expansion activator**

III. TISSUE-BORNE APPLIANCES:

Located in vestibule

Little or no contact with bone/teeth

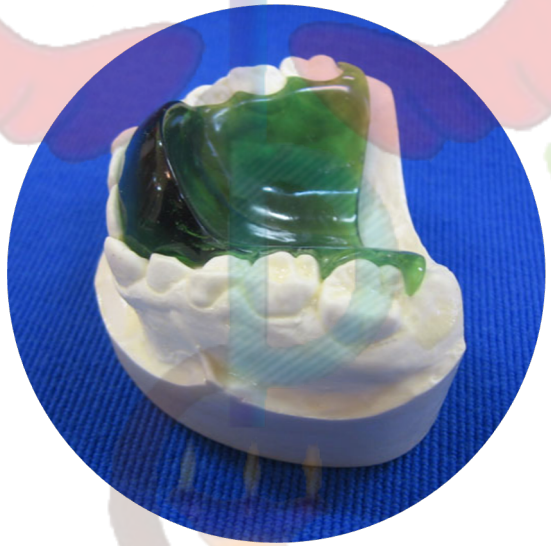
Ex. **Function Regulator**

COMPONENTS OF FUNCTIONAL APPLIANCE

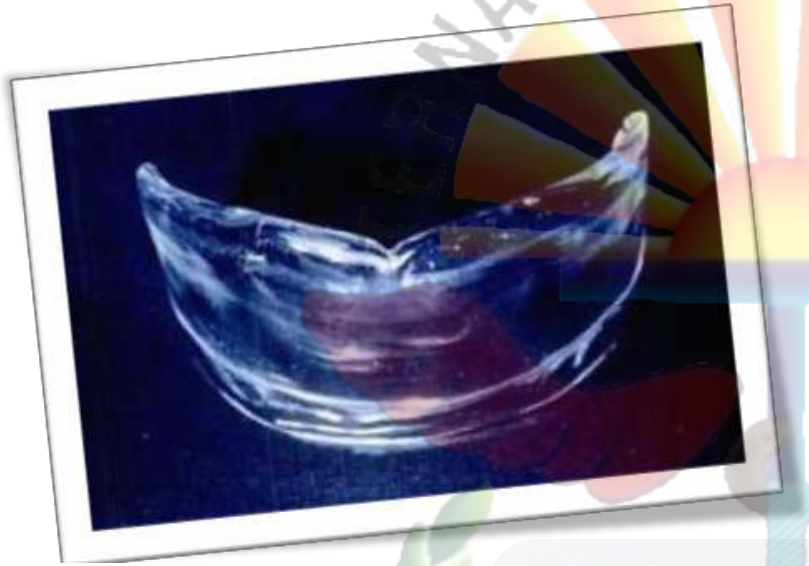
Assembly of few simple components

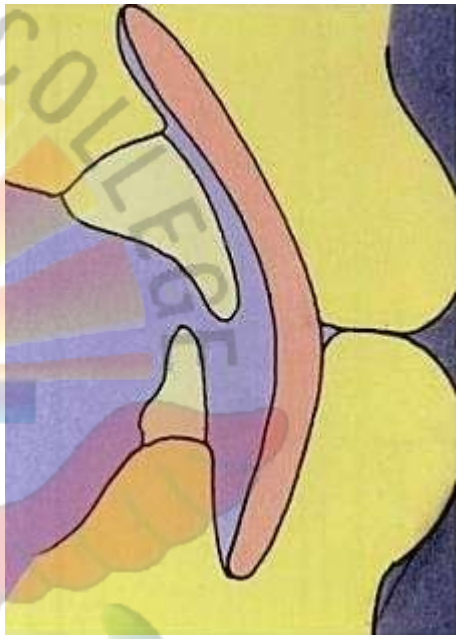
- Bite planes
- Shields or screens
- Construction or working bite

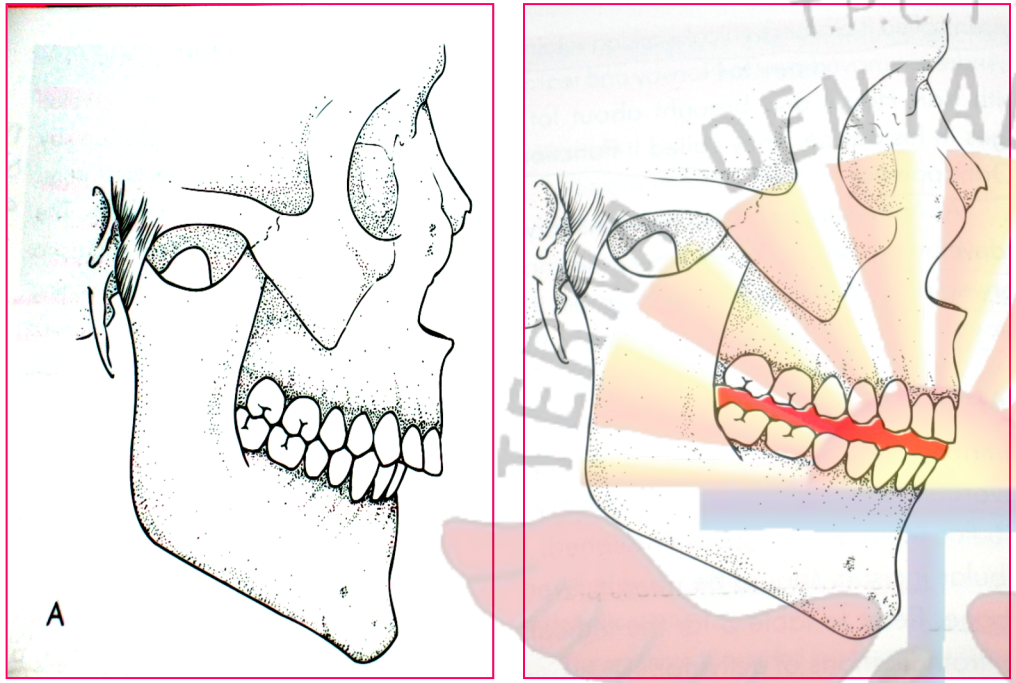
Bite planes



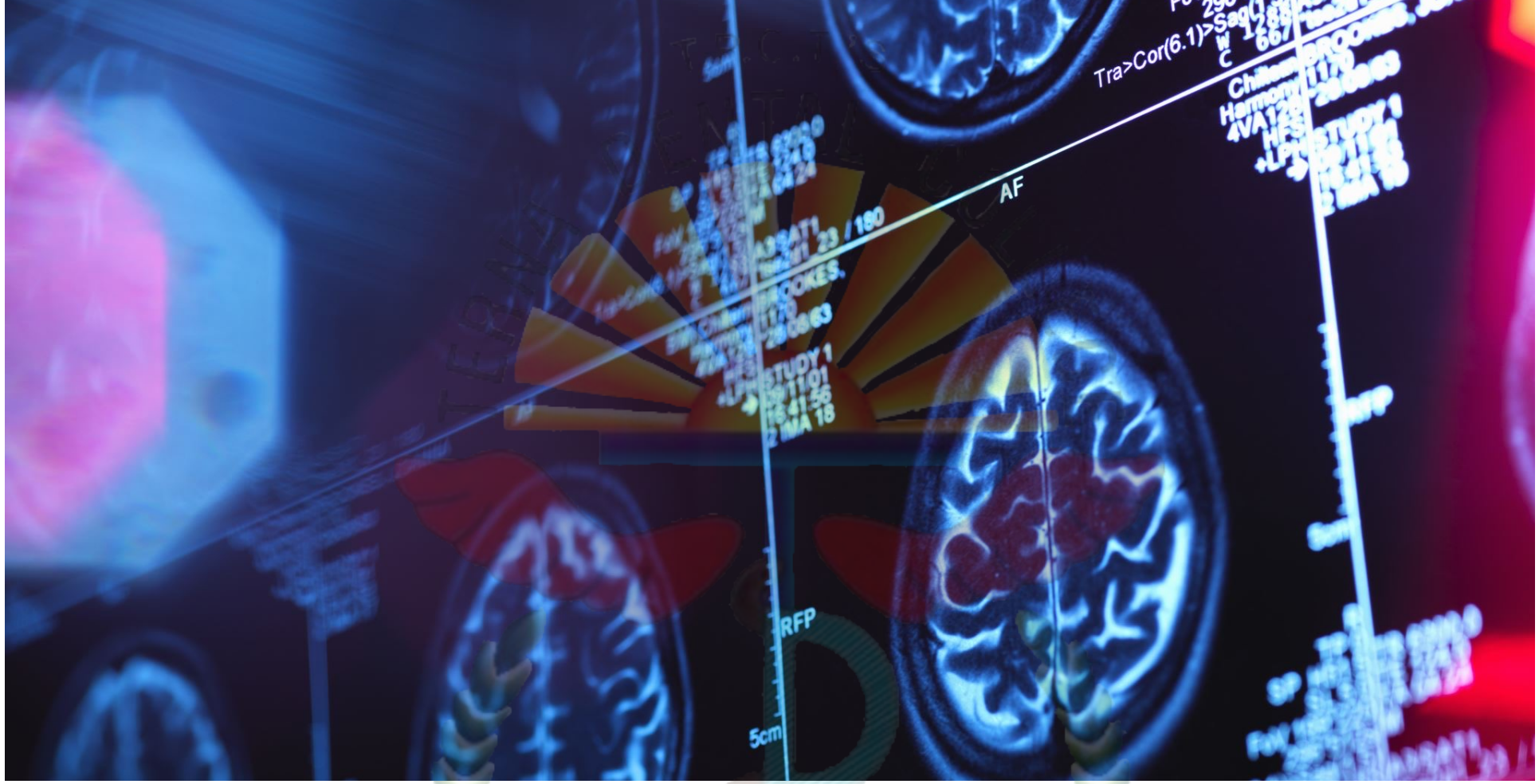
Shields or screens







Construction / working bite



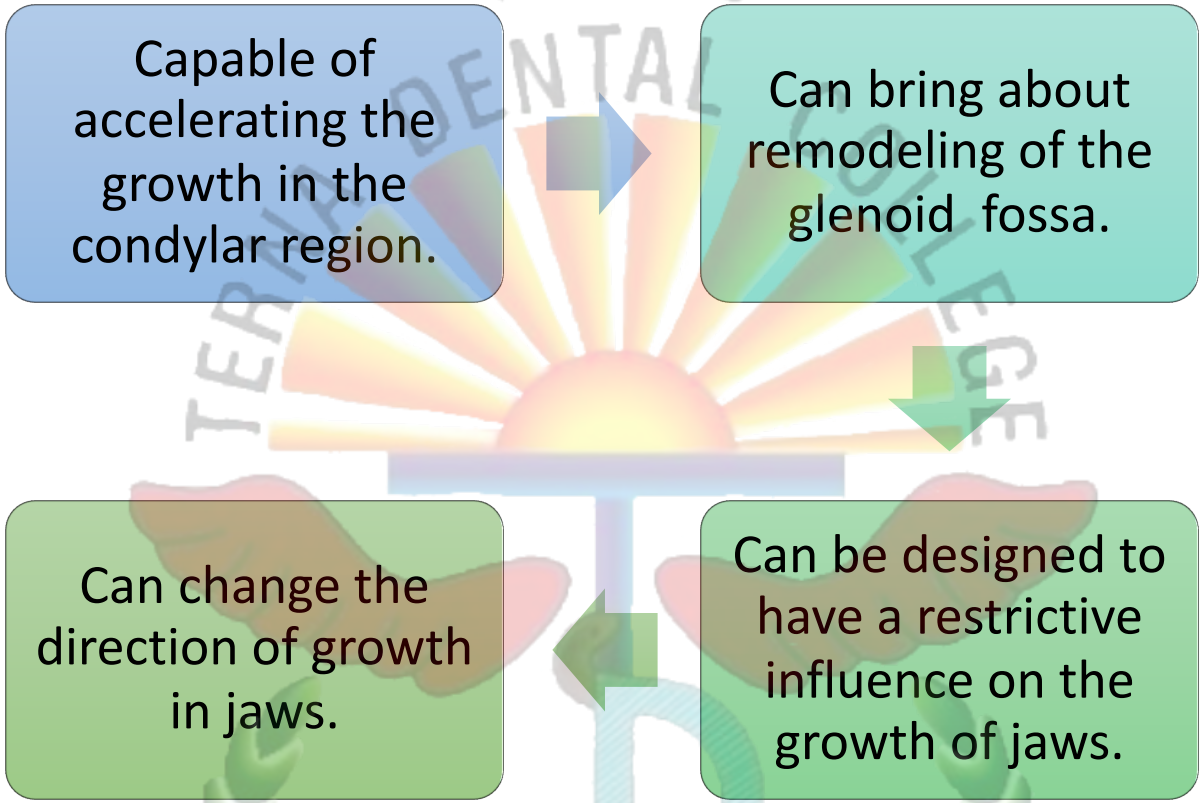
ACTION OF FUNCTIONAL APPLAINCES

- Functional appliances can bring about the following changes:

i. Orthopaedic Changes

ii. Dento-alveolar changes

iii. Muscular & Soft Tissue changes



Orthopaedic Changes

Dento-alveolar changes

- Changes in sagittal, transverse & vertical directions.
- Sagittal plane - Retroclination of the upper incisors.

  Proclination of the lower incisor.
- Transverse plane- Expansion by incorporating screws/ shielding

  buccal muscles away from the arch
- Vertical plane- Selective eruption

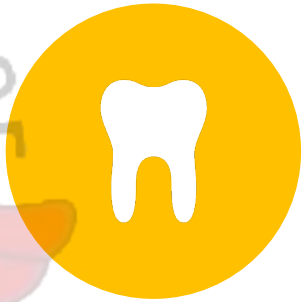
Muscular & Soft Tissue changes

- improve the tonicity of the orofacial musculature.

CASE SELECTION

Age: only in growing patient. Opt. Age for functional appliance therapy b/w 10 years & pubertal growth phase

Social considerations:



Dental considerations: ideal case one devoid of gross local irregularities

- **Skeletal Considerations:** Moderate to severe Class II div 1 malocclusion cases – class II tendency due to retrognathic mandible
- Low angle cases- respond well
- High angle cases — deepbite — respond well
  - openbite
  - problematic
- Mild Class III malocclusion with a reverse overjet & an average overbite – potentially treatable

VISUAL TREATMENT OBJECTIVE

An imp. diagnostic test undertaken before making a decision to use a functional appliance.

Enables us to visualize how the patient's profile would be after FA therapy.

Performed by asking the patient to bring the mandible forward.

- An improvement in profile ---- positive indication.
- Profile worsens ---- negative ----other R_x modalities considered.

Photographs taken with forward mandibular posture – patient motivation.

Advantages of functional appliances

ELIMINATION OF ABNORMAL MUSCLE FUNCTION

TREATMENT CAN BE INITIATED AT **AN EARLY AGE**.

PSYCHOLOGICAL DISTURBANCES CAN BE AVOIDED.

LESS CHAIR SIDE TIME

The frequency of the patient's visit to the orthodontist is less than in case of fixed or removable appliances.

They do not interfere with **oral hygiene maintenance**.

Most functional appliances are worn during the night. Thus **patient acceptance** is good.

Limitations Of Functional Appliances

They cannot be used in **adult** patients

They cannot be used to bring about **individual tooth movement.**

patient cooperation is essential for the success of the treatment.

They may require **pre-functional orthodontic tooth movement**

Fixed appliance therapy may be required at the termination of treatment

CONCLUSION

- Myofunctional appliances are used for growth modulation in young children to correct skeletal malocclusions thereby avoiding its severe consequences.

TAKE HOME MESSAGE:

Diagnosis and treatment of skeletal malocclusion can be initiated at an early age by the use of myofunctional appliance.

Hence identification of malocclusion at an early age can prevent the possible consequences at a later age.

PROBAVLE LAQS AND SAQS

SAQ:

1. DEFINITION AND CLASSIFICATION OF FUNCTIONAL APPLIANCE
2. TREATMENT PRINCIPLES
3. ACTION OF FUNCTIONAL APPLIANCE
4. INDICATIONS AND LIMITATIONS OF FUNCTIONAL APPLIANCE
5. VISUAL TREATMENT OBJECTIVE