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## Splints in TMJ: A Review

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### ABSTRACT

Occlusal splints are used for management and treatment of various temporomandibular joint disorders. In this review we are going to discuss about the types of occlusal splints and their uses among how they're employed in management of temporomandibular joint disorders. There are various treatment modalities in tmj includes behavioural therapy, occlusal appliances, physiotherapy, patient education and some cases may need surgical interventions..Occlusal splints provides muscle relaxation , unloading and repositioning of tmj ,occlusal disengagement etc., Two types of occlusal splints are in achieving these actions which are permissive splints and directive splints as it is non-invasive people accepts and understands the treatment modalities.

Keywords: Occlusal splints, temporomandibular joint, muscle, temporomandibular joint disorder

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### Introduction:

Temporomandibular joint disorders is a condition characterized by pain in the temporomandibular joint or its surrounding tissues, functional limitations of the mandible, or clicking in the TMJ during motion[1]. TMDs refer to a group of disorders with symptoms includes pain, grating in joints, clicking noises , chewing difficulties or difficulty opening the mouth[2].Treatment options in cases of TMD include occlusal adjustment, drug therapy, occlusal splint therapy, physiotherapy (ultrasound, acupuncture, laser therapy, TENS, etc.), reassurance (self- care and behavioraltherapy, including patient's education), or even surgical interventions or combined treatments[2] TMDs are multifactorial in origin. But a review of scientific literature reveals five major factors that lead to temporomandibular disorders. They are Emotional stress, Deep pain output, Occlusal condition, Trauma, Parafunctional habits. In this,occlusal splints works to correct structural disharmony of both tmj and occlusion,basically it acts as a muscle reprogrammer and unloads tmj by distracting the condyle or by pivoting on molar contacts with help of pivot splints [1].Despite the fact that occlusal appliances of various types have been used to treat temporomandibular problems for a very long time, there is still much disagreement on their design today. how they should be used, and mode of curing action[3].

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### Occlusal splints and its types:

Occlusal Splints, it can be used to treat TMJ issues, stabilise the occlusal joint, or reduce tooth wear. [2] Different occlusal splint types and designs with various,

#### *Classification of occlusal appliances:*

According to Okeson include :

- 1.Muscle relaxation appliance/ stabilization appliance used to reduce muscle activity
- 2.Anterior repositioning appliances or orthopedic repositioning appliance
- 3.Anterior bite plane
- 4.Posterior bite plane
- 5.Pivoting appliance
- 6.Soft or resilient appliances

According to Dawson include :

- 1.Permissive splints or muscle deprogrammer

2. Directive splints or non-permissive splints Flat plane stabilization splint:

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### **Flat plane stabilization splint:**

Flat plane stabilization appliance is also known as the gnathologic splint, Michigan splint, or muscle relaxation appliance. The maxillary arch is where this appliance is typically made, although some clinicians have suggested that it be put for the mandibular arch to improve aesthetics and prevent speech impediment mandibular arch[3]. Ideally, when a stabilization type of appliance is placed intraorally, there is minimal change to the maxillomandibular relationship other than that produced by the thickness of the material[4].

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### **Anterior repositioning splint:**

The anterior repositioning splint is frequently used to treat temporomandibular joints that click back and forth. This splint lessened joint pain during protrusion, chewing, and while the joint was at rest. Both reciprocal clicking and palpatory muscle and joint pain were reduced. The flat occlusal splint reduced joint discomfort but had no effect on clicking or muscle tenderness[5].

Traditional Anterior biteplane:

These splints are a traditional anterior appliance and are manufactured of strong acrylic resin [6].

These devices are shaped like a horseshoe with palatal coverage and an occlusal table covering six or eight anterior maxillary teeth. Given that posterior teeth are not used for functional or para-functional tasks, proponents of utilising such appliances to treat TMDs argue that they can reduce clenching[2].

The only teeth this splint engages are the maxillary incisors. It induces the reduction of clenching forces across that region and disengages the back teeth. When there is a muscle condition brought on by excessive muscular loading and hyper occlusion, bite plane therapy should be employed since these bite plates help muscles to relax. There is a danger that posterior teeth could over erupt because this appliance solely protects the anterior teeth. It may lead to an anterior open bite. There is a potential that the anterior teeth in the upper teeth holding this device could move unfavourably due to occlusal forces, or that the anterior teeth in the lower teeth could move unfavourably due to single point contact.

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### **Posterior bite plane:**

Repositioning of the mandible Hard acrylate resin is used to create appliances. It should be put on the lower arch. It is made to disocclude teeth in the front. The back teeth, such as the molars and premolars, are provided with hard acrylic tables, with each side joined by a lingual block[G]. Major changes in the vertical dimension and mandibular repositioning are the primary objectives of the posterior bite plane[7].

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### **Pivoting appliance:**

The pivoting appliance has a single posterior occlusal contact in each quadrant and is made of hard acrylic resin. It can cover either the maxillary or mandibular arch[4]. The pivot splint is often referred to as a distraction splint[7]. Patients with osteoarthritis or internal disharmonies were advised to use the pivoting appliance[2]. However, the pivoting appliance has been recommended for the treatment of TMJ osteoarthritis symptoms as well as for the management of an acute unilateral disc dislocation without reduction[8]. The condyles are said to be dragged downward when the pivot is clenched, alleviating traumatic load and allowing the disc freedom to resume its natural position[7].

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### **Soft and resilient appliances:**

The soft appliance is a device made of resilient material that is typically suited to the maxillary teeth[8]. Because soft rubber splints cannot balance the occlusal contacts, they do not offer the qualities required for successful splint therapy and can only be used primarily as mouth guards[U]. The opposing teeth should be in constant, even contact with one another during treatment[10].

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### **Permissive splints:**

The teeth can move freely over the biting or contact surface thanks to the permissive splints. These splints main purpose are to change the occlusion and regulate muscular forces so that the teeth do not prevent the condyles from fully seating[11]. The idea behind a permissive splint is that by changing the occlusion, teeth will no longer obstruct complete seating. This also allows for regulation of muscular activation[9]. they are made to release the condyle so it can move easily into a centric relationship.

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**Directive splints:**

When a painful joint tissue is present, directive splints direct the mandibular condyles away from the completely seated joint position[8]. Directive splints are made to place the mandible in a precise relationship to the maxilla. A directional splint's single function is to place or align the condyle-disk assemblies[3]. They ought to be utilised in intracapsular TMDs[7].

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**Pseudo Permissive splints:**

Pseudo permissive splints are hydrostatic and soft splints. Due to possible early posterior contacts, these splints may take bruxism worse[11].

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**Soft splints:**

They are made to make simultaneous, even contact with the opposing teeth. Since it can be made quickly, patients with acute TMD can receive it as an emergency treatment.

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**Hydrostatic splints:**

They redistribute the occlusal stresses by providing a cushioning effect by having a bilateral chamber on the back teeth that is filled with water[11]. By using water, they are made to equalise the biting pressure. When the hydrostatic cell is introduced between the arches, a series of reorganisations occur throughout the stomatognathic system. All occlusal disharmonies are automatically corrected through the fluid distribution within the cell[7].

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**Conclusion:**

This article is a review of different types of occlusal splints which are used in the treatment of various temporomandibular joint disorders according to the symptoms and with complete assessment of TMJ. With correct diagnosis, the suitable appliance with minimal complications should be given to the patient.

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