

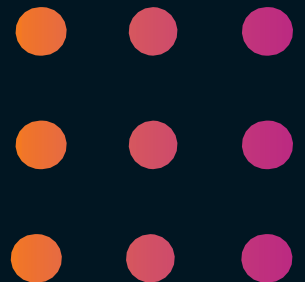


# Occlusion

M A D E E A S Y

Gérard Duminil  
with Olivier Laplanche

Jean-Philippe Ré and Jean-François Carlier



# Contents

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Foreword .....	3
<b>1</b> General notions .....	8
<b>2</b> Functional occlusion .....	19
<b>3</b> Centric relation .....	37
<b>4</b> Mandibular movements .....	49
<b>5</b> Clinical examination of the temporomandibular disorders (TMD) .....	61
<b>6</b> Examination of the occlusion .....	85
<b>7</b> Classification of the TMD .....	111
<b>8</b> Mounting on the articulator .....	131
<b>9</b> Instrumental occlusal analysis .....	153
<b>10</b> Occlusal splints .....	167
<b>11</b> Occlusal adjustment .....	185
<b>12</b> Prosthodontic in daily practice .....	205
Afterword .....	223

# 11 Occlusal adjustment

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During the initial clinical examination, it is frequent to notice occlusal anomalies due to the coronal decay, to abrasion, dental migration, even to the presence of unsuitable prosthetic restorations which generated a pathogenic malocclusion (Fig. 1). Besides, the patient may or may not suffer from changes in the mandibular kinematics, from articular disorders or from modifications of the muscular activity, resulting from movements generated during the occlusal functions. In these clinical situations, the occlusal functions must be improved prior to any treatment, all the more if a prosthetic rehabilitation is envisaged.



1 Pathogenic ICP.

Occlusal adjustment is a therapeutic modification of occlusal tables by subtraction or by addition to restore the occlusal stability of the arches during the occlusion. Most of the time, it refers to adjustment techniques by selective grinding of the enamel structures which oppose each other during the occlusal functions, or during the access to the ICP.

This chapter presents a technique of occlusal adjustment performed at first on the casts mounted on articulator in centric relation, then transferred in the mouth following a timeline noted on a chart of modifications. The occlusal adjustment is performed on a natural complete set of teeth, but the principles can be applied to cases of preprosthetic adjustment and their numerous indications.

## NECESSARY EQUIPMENT

## For the occlusal analysis on articulator

Equipment	Use	Ref
Miller tweezer	Holding in place the marking ribbons	BK 132 Dr Bausch
Shimstock® métal 12 µ	Checking the existence of contacts	BK 35 Dr Bausch
Red articulating paper 8 µ	CR marking	BK 21 Dr Bausch
Green articulating paper 8 µ	Guidance marking	BK 22 Dr Bausch
Blue articulating paper 8 µ	Interferences marking	BK 23 Dr Bausch
Bistoury blades #15	Corrections on plaster	-
Hard toothbrush	Erasing artefacts	-
Pencil 0,5 HB	Marking out the corrected zones	-
LC Blockout Resin or wax	Recreate guidance ridges	-

## For the adjustment in the mouth

Equipment	Use	Ref
Miller tweezer	Holding in place the marking ribbons	BK 132 – 133 Dr Bausch
Fix Clip Bite Frame	Analyzing both sides simultaneously	BK 143 Dr Bausch
Red articulating paper 40 µ	CR marking	BK 10 Dr Bausch
Blue articulating paper 40 µ	Interferences marking	BK 09 Dr Bausch
FG inverted cone bur	Recreate an occlusal anatomy	805.314.01
FG olive bur		8368-204.016 (023)
FG cylinder pointed bur	Correction of external slopes (yellow ring or red ring)	862EF.204.012 8862.204.012
Q tips	Erasing marks between two measurements	
Silicone polisher	Polishing corrections at the end of the sequence	Ceramaster Shofu
Fluid composite resin / Recreate guidance ridges / -	Polishing corrections at the end of the sequence	
Transfer key	Transparent silicone (shore 90)	Memosyl 2 Block Out® Bisico

Historically, we can list at least twenty techniques of occlusal adjustment, which differ according to the nature of the reference position, either articular or muscular, the sequence of correction, the concepts of lateral guidance or the type of stabilization.

The first authors, (Stuart, 1930; Schuyler, 1935; Lauritzen, 1965) followed by Ramfjord, Ash (1966), Dawson (1971) and Solnit (1988) suggested adjusting the defective alignment of cusps and fossae (generating a shift in ICP) by a widening of the fossa at the expense of the neighboring zones of contacts in centric relation. They thus made sure to follow the main rule: do not alter the primary cusps, while creating a coincidence between CR and ICP.

Jankelson (1955), Glickman (1958), Wirth (1976), Jeanmonod (1988), Smuckler (1991) and Abjean (1997) developed their approach on a harmonious muscular functioning presenting synchronous and symmetric contractions of the masticatory muscles supposed to result in an optimal ICP. During the first phase, a muscle reconditioning splint is prescribed. The adjustment is then performed by using the re-educated muscles to drive the mandible towards ICP.

The current consensus recommends localizing the therapeutic articular reference position (CR) with the practitioner's help such as it was described in the chapter on centric relation. A muscular reconditioning with a splint might be necessary first (Okeson, 1998).

A meticulous clinical examination associated with an occlusal analysis on articulator allows to put the indication of the occlusal adjustment.

The adjustment of the models on articulator must be a systematic prerequisite which allows to verify the feasibility of the treatment by analyzing the anterior guidance. It allows to quantify the corrections and assess their incidence on the vertical dimension of occlusion. An anterior functional guidance in the VDICP authorizes the adjustment if there is a small number of alterations.

#### Reminders of two important definitions often used in this chapter:

**Occlusal prematurity:** occlusal contact decentering the closing movement when the mandible moves upward in centric relation. It does not affect the translation movements.

**Occlusal interference:** dental obstacle limiting or deflecting the mandibular movements of translation (diduction or protrusion). The interference can be posterior or anterior.

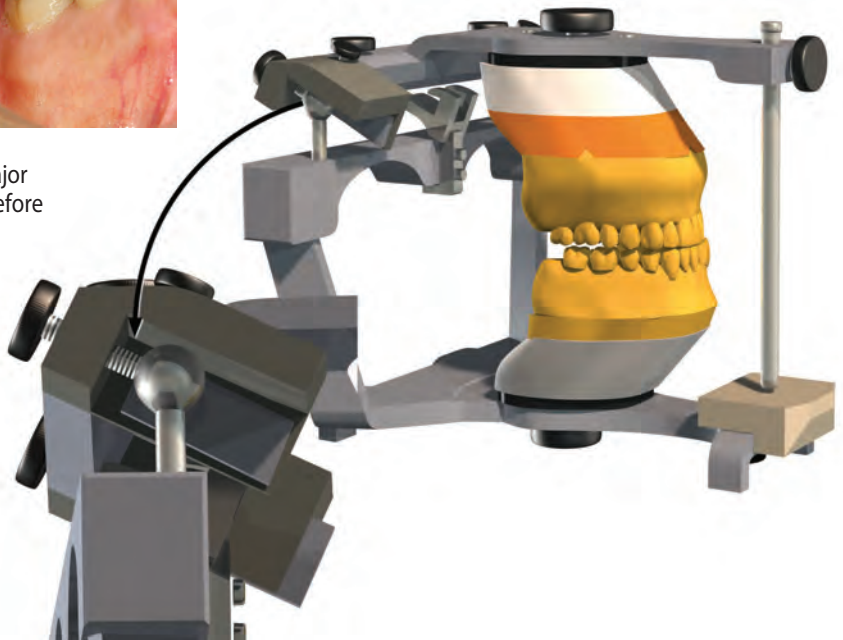
## Adjustment on the articulator



**2** If the egressed tooth creates a major interference, it must be extracted before taking the impression.

188

**3** Activating the protrusion screw allows the preservation of the lateral position.



Before taking impressions, it's better to eliminate very egressed teeth, which are obvious prematurities, and thus an obstacle in excursions (Fig. 2).

The occlusal analysis on articulator (described in a previous chapter) allows to observe dental arches from all angles as well as their simulated movements in all the directions. During the searching and the marking of contacts, the articulator can be locked either in centric, or on one side only, in order to obtain reproducible lateral positions. Using wedges (or protrusion screws when they exist) allows the preservation of the lateral or protrusion positions (Fig. 3). These elements easily enable to perform an occlusal instrumental analysis compared to what it is possible to make on the patient.

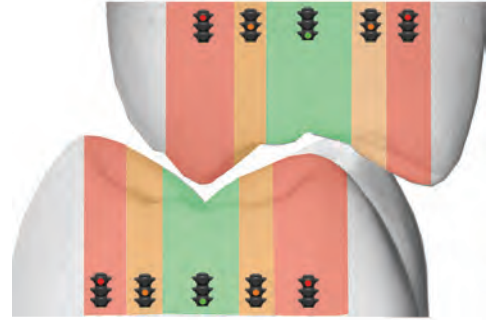
Articulating paper of different colors is used to identify sequences more easily.

According to the adjustment process, the successive corrections are noted in a grinding index form (Fig. 4), indicating the tooth number, the cusp, the involved slope and the corrected cusp slope, or marked on an occlusal diagram (Fig.5). Every corrected zone is marked with a pencil on the plaster model, in order to avoid noting several times the corrections on the same tooth (Fig. 6). The grinding chart allows to write down accurately





Adjustment chronology	
Sequence	Objective
Correction of CR//ICP discrepancy	Centering
Creation of stable contacts	Stabilization
Correction of translatory movements (diduction, protrusion, elimination of the interferences)	Guidance
Improvement of stability in centric	Stabilization



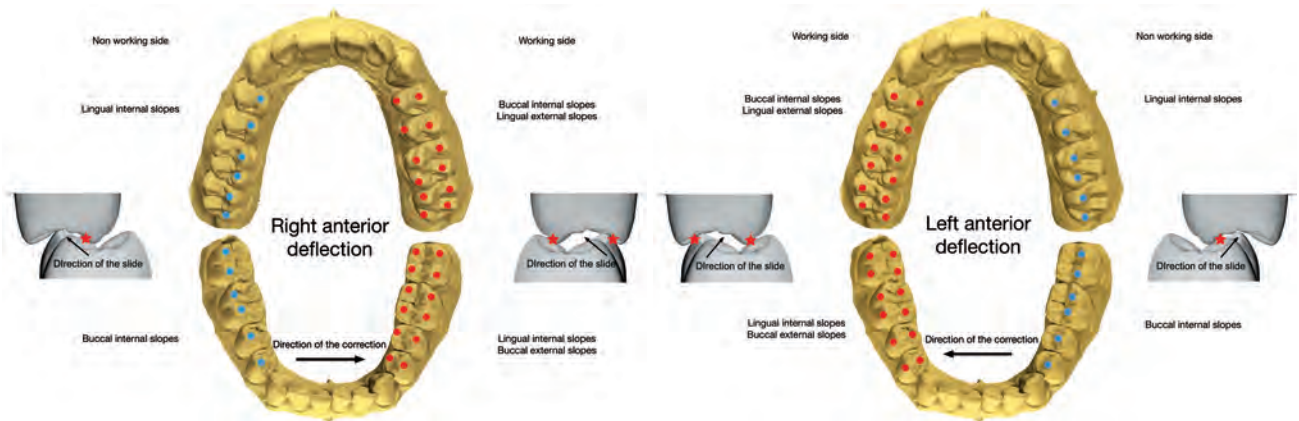
7 Corrections are rather made in fossae and grooves rather than on cuspal tips.

### Correction of CR / ICP discrepancy

During the closing of the articulator, the first contact relates to a position of unstable occlusion. The contact on the prematurities pushes the mandible forwards and towards one side, right or left.

When the mandible slides to the right, re-centering moves it backwards and to the left: the left side is called "working" (W), and the right side is called "non working" (NW).

The articulator is locked in CR and the incisal pin is set on the VDICP (it does not touch the table because of the contacts on the prematurities). Contacts may be found on zones indicated in Fig. 8-9.



8 Localization of zones to correct in the case of a right anterior shift.

9 Localization of zones to correct in the case of a left anterior shift.