IMF Screw Set.
For intermaxillary fixation.

Technique Guide

SYNTHES® Instruments and implants
approved by the AO Foundation
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**Implant Features**
- 2.0 mm screws, available in 8 mm and 12 mm thread lengths
- Made of 316L extra-hard stainless steel for maximum strength
- Self-drilling, self-tapping for easy, one-step insertion
- Groove under screwhead secures wires or elastics
- Cruciform head design works with existing Synthes instrumentation
- Two cross-holes of the screw align with the cruciform head slots, simplifying wire passage

**System Features**
- Simplified intermaxillary fixation technique when compared to arch bars
- Reduces application time
- Minimizes the potential risk of wire punctures
- Can easily be applied or removed in the OR, ER or office setting

**Patient Comfort Benefits**
- Minimal hardware
- Reduced trauma to the soft tissues
- Improved postoperative oral hygiene
To provide indirect stabilization of the maxilla and mandible following craniofacial and mandibular trauma or reconstruction.

**Indications**
- Simple, nondisplaced mandibular and maxillary fractures
- Orthognathic procedures
- Edentulous/partially edentulous patient

**Contraindications**
- Severely comminuted and/or displaced fractures
- Unstable, segmented maxillary or mandibular arches
- Combined maxillary and mandibular fractures
**Preparation**

**Note:** The following technique assumes that first screw placement is in the maxilla. However, screw placement, number of screws, and order of insertion are dependent on fracture type, location and surgeon preference. Screws should be inserted either medial or lateral to the long axis of the canine roots. Screws must be positioned superior to the maxillary tooth roots and inferior to the mandibular tooth roots. Advantages of the lateral approach include increased lateral stability and greater control over posterior open bite. For wiring recommendations, refer to Figures 11a and 11b.

1

**Preparation**

Determine the number and position of IMF Screws to be inserted, based on fracture type and location (Figure 1).
2

Locate/identify maxillary tooth roots

Locate and identify the maxillary tooth roots, paying particular attention to the canine root which is the longest of the tooth roots. It is important to avoid the existing dentition as well as infraorbital and mental nerves. A helpful guide to estimating the lengths of the dentition from radiographs can be found in Figure 2.

Be aware that supernumerary, unerupted and developing teeth may be present and should be confirmed or refuted with the appropriate radiograph (panoramic x-ray). Placement of the maxillary screws should be 5 mm superior to the tooth root.

Figure 2
The figure above estimates the average lengths (mm) of the associated teeth including a 20% magnification associated with the radiograph. Actual lengths modified from R.C. Wheeler. *Dental Anatomy, Physiology and Occlusion*. Philadelphia; W.B Saunders Co., 1974. 20.
Insert IMF Screw

3
Insert IMF screw

Instruments

<table>
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<tr>
<th>Code</th>
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<tr>
<td>313.939</td>
<td>2.4 mm/3.0 mm Cruciform Screwdriver Blade, hex coupling</td>
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<tr>
<td>313.94</td>
<td>2.4 mm Screwdriver with Holding Sleeve</td>
</tr>
<tr>
<td>313.97*</td>
<td>Holding Sleeve</td>
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<tr>
<td>530.405*</td>
<td>Handpiece, for Battery Powered Screwdriver</td>
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Using either a 2.4 mm Screwdriver with Holding Sleeve with 2.4 mm/3.0 mm Cruciform Screwdriver Blade or the Handpiece for Battery Powered Screwdriver with Holding Sleeve, load an 8 mm or 12 mm IMF Screw. Insert an IMF Screw into the maxilla (Figures 3 and 4). Advance the screw, making sure that the screw shoulder does not compress the mucosa. The screwhead’s cruciform slots can be used to orient the cross-holes relative to the occlusal plane.

Note: In dense cortical bone, it may be necessary to predrill. When using the Battery Powered Screwdriver, the torque limiting clutch will engage, emitting a chattering/clicking noise if insertion of the screw exceeds the screwdriver’s capacity. Stop insertion immediately, remove the screw, predrill, and reinsert the screw.

Technique Tip: Since the IMF Screws are self-drilling, it may not be necessary to incise and elevate the gingiva. If making an initial incision, an electrocautery device, which helps to control bleeding, may be used rather than a scalpel. This may ensure a smoother insertion.

* Also available
4

**Insert mandibular screw**

Identify the important anatomic structures before inserting the mandibular screw. Again, special attention should be paid to the canine root, the longest of the tooth roots, and the mental nerve (See Figure 2 on page 5). Insert the second screw into the mandible 5 mm inferior and medial or lateral to the canine root (Figure 5). If placing these screws inferior and lateral to the canine root in the mandible, greater care must be employed to identify and avoid the mental nerve.

5

**Insert additional screws**

Repeat this procedure by inserting at least two additional screws on the contralateral side: one in the maxilla and one in the mandible following the previously outlined procedure.
6
Insert wire

Insert either the 0.5 mm (24 gauge) or 0.6 mm (22 gauge) stainless steel wire through the cross-holes of the maxillary and opposing mandibular IMF Screws. The wire may be wrapped around the screwhead grooves rather than inserting it through the cross-holes (Figures 6 and 7).

**Technique Tip:** Use smaller wire (0.5 mm) medial to the canines and the larger wire (0.6 mm) posterior to the canines.

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7
Establish occlusion

Before tightening the wires, the occlusion should be established. Bring the maxillary and mandibular dentition into occlusion, making sure that each condyle is in its proper position within the glenoid fossa.
Tighten Wires

8

Tighten wires

Instruments

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<td>Wire Twister</td>
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<td>398.909</td>
<td>Wire-Cutting Scissors, straight, pointed</td>
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Tighten the wire by first clamping the free ends in the Wire Twister. Pull the wire taut to hold the jaws in occlusion and then twist the wires to tension (Figure 8). Cut the wires with the Wire-Cutting Scissors and bend the cut wire ends under to prevent soft tissue irritation.

In order to consolidate rather than splay segments, it is important to secure the wire in an X-pattern in addition to the vertical pattern that provides maxillomandibular stabilization and reduces lateral excursion (see Figures 9, 10 and 11).

Note: Due to the tension placed on the wires and screws in this application, there is a potential for loosening if left in postoperatively. The wire should be carefully monitored for this condition during postsurgical evaluations and tightened as necessary.
Verify fracture reduction

Check to ensure that no posterior open bite is produced during tensioning of the wires. The placement of additional IMF Screws, Ernst ligatures or Ivy loops on the posterior dentition may be used to prevent or correct this condition (Figure 12).

Note: Overtightening of the wires could lead to rotation of the segments and interference with the reduction. Verify that the fracture is adequately reduced at the inferior border.

Figure 12
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<tr>
<td>317.72</td>
<td>1.5 mm Drill Bit, Stryker J-latch, with 12 mm stop</td>
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* Also available
## IMF Screw Set (115.630)

### Module
- 304.708 IMF Screw Module

### Implants
- 201.928 2.0 mm IMF Screw, self-drilling, 8 mm, 6 pkgs. of 5
- 201.932 2.0 mm IMF Screw, self-drilling, 12 mm, 6 pkgs. of 5
- 291.230.98 0.5 mm (24 gauge) Precut Cerclage Wire, 175 mm, 2 pkgs. of 10
- 291.240.98 0.6 mm (22 gauge) Precut Cerclage Wire, 175 mm, 2 pkgs. of 10

### Instruments
- 313.939 2.4 mm/3.0 mm Cruciform Screwdriver Blade, hex coupling
- 313.94 2.4 mm Screwdriver with Holding Sleeve
- 317.72 1.5 mm Drill Bit, Stryker J-latch, with 12 mm stop, 2 ea.
- 398.906 Wire Twister
- 398.909 Wire-Cutting Scissors, straight, pointed

### Also Available
- 304.728 IMF Screw Compact Tray (accommodates up to 30 screws, 20 of one wire size, and two 1.5 mm Drill Bits with stop)
- 306.757 IMF Screw Module, Compact for MatrixMANDIBLE System
- 306.760 IMF Screw Module, Full Size for MatrixMANDIBLE System
- 313.97 Holding Sleeve
- 316.652 1.5 mm Drill Bit with 12 mm stop, hex coupling
- 317.82 1.5 mm Drill Bit with 12 mm stop, mini quick coupling
- 398.905 Auto Wire Twister
- 398.907 Wire-Cutting Scissors, Universal
- 398.908 Wire Manipulator
- 530.405 Handpiece, for Battery Powered Screwdriver