

DVR[®] Crosslock Wrist Spanning Plate

Surgical Technique



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System Overview

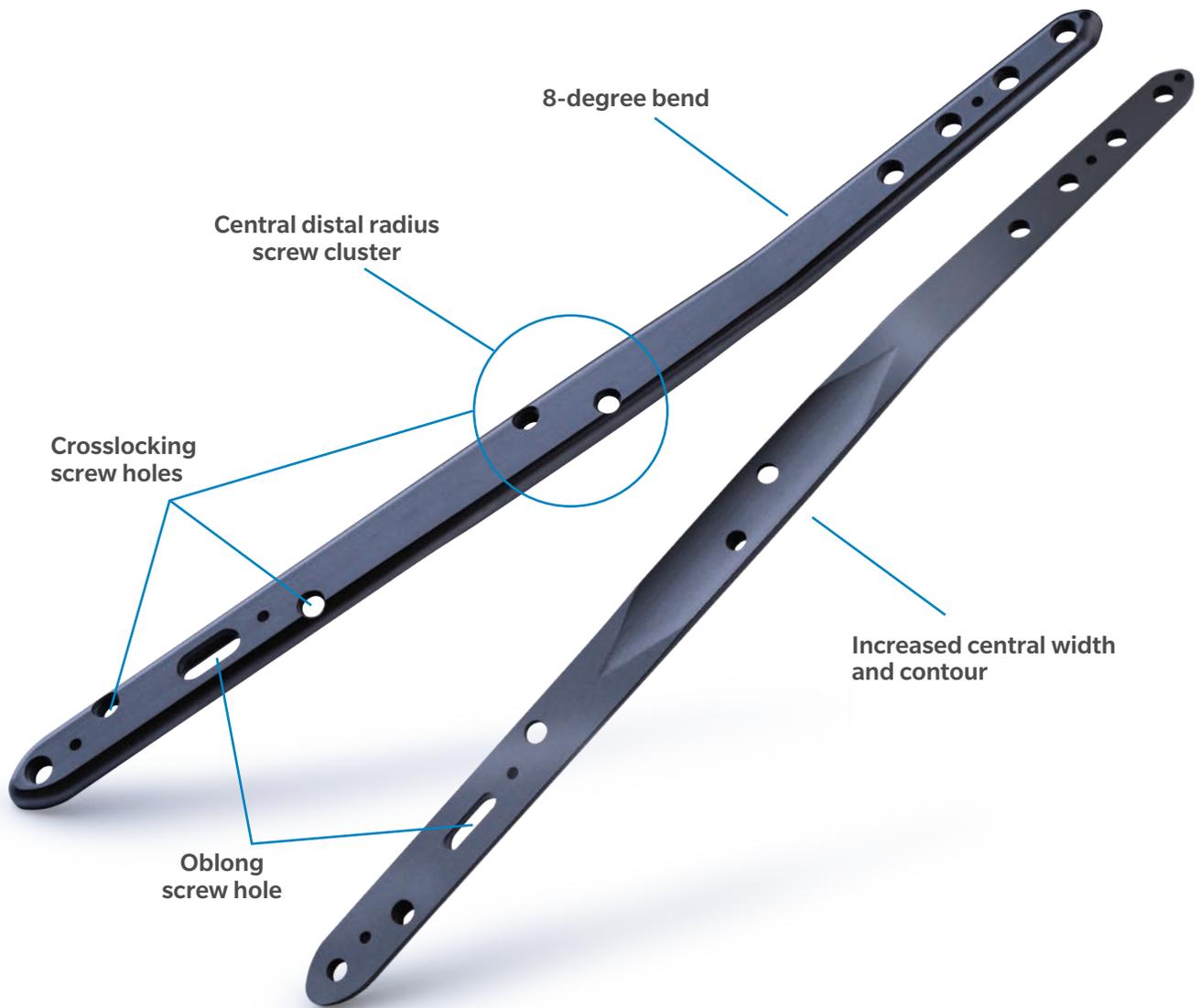
The DVR[®] Crosslock Wrist Spanning Plate is a single-use plate for the fixation of fractures, osteotomies and non-unions of the distal radius. The plate spans the patient's wrist and is placed from the radial shaft to the second or third metacarpal, depending on fracture pattern and patient anatomy. The plate provides ligamentotaxis on a temporary basis while the distal radius heals.

The DVR[®] Crosslock Wrist Spanning Plate consists of a single 180mm long, sterile-packed plate. The plate features hole clusters consisting of locking screw holes, an oblong slot, a central screw cluster, and K-wire holes for preliminary fixation. There is a dorsal bend at the distal end of the plate to accommodate patient anatomy.

This plate is compatible with the following devices distributed by Zimmer Biomet as part of the DVR Crosslock system:

- Screws:
 - 2.7mm Locking Screws
 - 2.7mm Multi-Directional Screws
 - 2.7mm Non-Locking Screws

- Instruments:
 - 2.2mm Drill Bit
 - Bone Depth Gauge
 - Quick Connect Handle (Blue)
 - 2.2/2.9mm Soft Tissue Guide
 - K-Wire 1.6mm x 127mm
 - 1.7mm Square Driver
 - 2.2mm Locking Drill Guide



Product Features

- Proximal and distal ends of plates are beveled for ease of plate insertion and to help avoid soft tissue disruption
- Low profile to help minimize tendon irritation and adhesions
- Zimmer Biomet compatible multi-directional threaded screws allow for angulation within a cone of 20 degrees for maximum intraoperative flexibility of locking screw
- Zimmer Biomet compatible crosslocking oblique screws in the shaft provide additional three-dimensional fixation in comminuted bone
- 8-degree bend in distal third of plate assists in anatomic plate fit
- Central distal radius screw cluster for optional fragment specific purchase
- Oblong screw hole allows for fine tuning of the plate position and distraction up to 5.5mm (from center of screw)
- Increased width and contouring in center of plate for added strength
- Plate dimensions:
 - Length – 180mm
 - Width – 11mm
 - Thickness – 2.6mm

Surgical Technique



Figure 1

Surgical Approach

The DVR[®] Crosslock Wrist Spanning Plate is intended to be placed from a dorsal approach. Surgeon preference, patient factors and radiographs determine if fracture(s) are appropriate for bridge plate fixation and alternative operative and nonoperative techniques have been discussed and considered.

Patient Positioning

Adjust the patient to the supine position on the operating table with a radiolucent hand table extension (Figure 1). Prep and drape the extremity in the desired fashion. Using fluoroscopy, reduce the distal radius fracture with traction. Traction may be placed either manually or with the aid of a traction tower or weights.

Plate Positioning

The DVR[®] Crosslock Wrist Spanning Plate is 180mm in length. To best determine incision locations, place the plate against skin under fluoroscopy. Determine whether the 2nd or 3rd metacarpal will be used for distal fixation and if screw fixation will be required using the central distal radius holes.

⚠ Caution: Do not bend or contour the plate. The plate has one geometric configuration designed to accommodate varying patient anatomy. Bending / contouring the device can result in defects in surface finish and internal stress concentrations, which can lead to premature device failure.



Figure 2a



Figure 3a



Figure 2b



Figure 3b



Figure 4

Surgical Incision

Once plate placement has been determined, use a surgical marker to mark the respective incision landmarks, as they relate to the plate and screw placement. At surgeon discretion, make the first incision distally overlying the 2nd or 3rd metacarpal and bluntly dissect down to the metacarpal shaft, preserving the extensor tendons and terminal branches of the sensory nerves (Figure 2a or 2b).

At surgeon discretion, make a second incision just proximal to the outcropper muscle bellies of the abductor pollicis longus (APL) and extensor pollicis brevis (EPB). Dissect down through the interval between the extensor carpi radialis longus (ECRL) and extensor carpi radialis brevis (ECRB) to the diaphysis of the radius (Figure 3a or 3b).

Note: If fixation to the third metacarpal is desired based on surgeon discretion, make an additional incision overlying the distal radius to prevent tendon entrapment. Make a third incision overlying Lister's tubercle and release the extensor pollicis longus (EPL) (Figure 4). Subperiosteally elevate the fourth compartment as needed to allow for plate passage. This approach can also be utilized if the central cluster of screws will be needed for fragment fixation. Fixation to the lunate facet in articular distal radius fractures may be utilized.

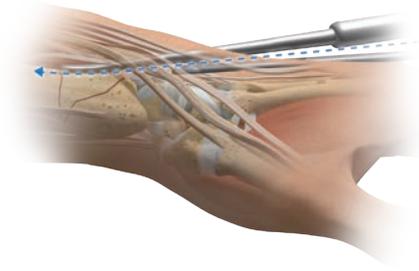


Figure 5a

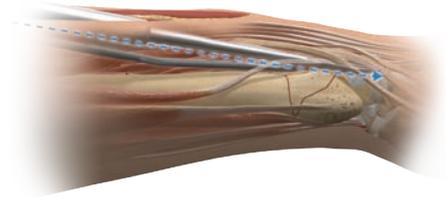


Figure 6a



Figure 5b



Figure 6b

Plate Insertion

The plate is designed to accommodate both antegrade and retrograde insertion. Using a key elevator, create a passage for plate insertion starting at either the distal or proximal end, per the surgeon's discretion (Figure 5a). If inserting retrograde, starting from the most distal incision, slide the plate by hand under the ECRL, ECRB, and EPL (3rd metacarpal) tendons until the desired screw holes line up with their respective fixation points (Figure 5b). Screw holes and fixation points must consider longitudinal traction and effects of ligamentotaxis. If inserting antegrade, start from the proximal incision (Figure 6a) and slide the plate under tendons until the desired screw holes line up with their respective fixation points (Figure 6b).

⚠ Caution: Tendon elevation is very important in creating the plate passageway. The plate must reside properly beneath the ECRL, ECRB, and EPL to prevent tendon lag and/or rupture.

Plate Placement

Achieve temporary reduction utilizing maneuvers to restore the radius to proper length using manual traction, weights, or a traction tower. The plate can then be temporarily affixed to the radius with K-wires, if desired.

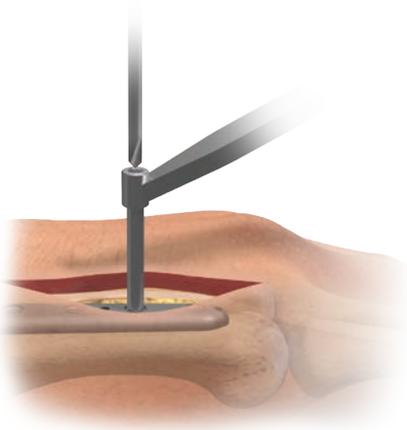


Figure 7

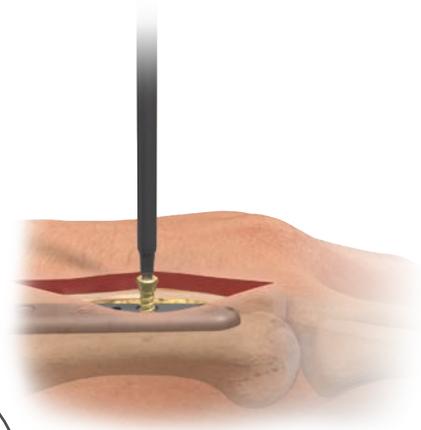


Figure 9

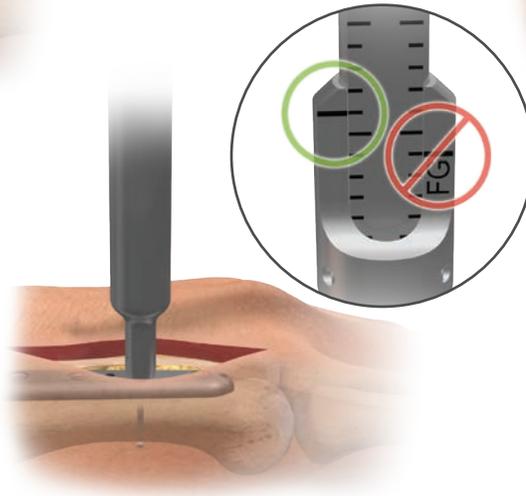


Figure 8

Plate Fixation

There are multiple screw options available, with corresponding drill guides. The 2.2mm Locking Drill Guide is intended to be used with the 2.7mm Locking Screws, while the 2.2mm end of the 2.2/2.9mm Soft Tissue Guide is intended to be used with the 2.7mm Non-Locking Screws and 2.7mm Multi-Directional Screws.

- ⓘ **Note:** The depth gauge has a F.A.S.T. Guide (FG) mark, do not use measurement from the FG side of the depth gauge. The opposing side should be used when determining screw lengths for this plate.
- ⓘ **Note:** Locking screws can be utilized in the locking and oblong holes.
- ⓘ **Note:** Per this surgical technique, adequate fixation may be achieved by having at least three screws proximally, including the two crosslocking holes, and at least three screws distally.

Metacarpal Fixation: Affix the plate distally to the metacarpal using one of the two central locking holes in the distal end of the plate. Using a 2.2mm Drill Bit, drill through the desired hole (Figure 7). Use the Bone Depth Gauge to measure the drilled hole (Figure 8). Using the 1.7mm Square Driver, fill the distal drilled holes with the appropriate length locking or non-locking screw (Figure 9).

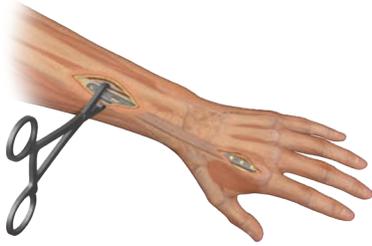


Figure 10

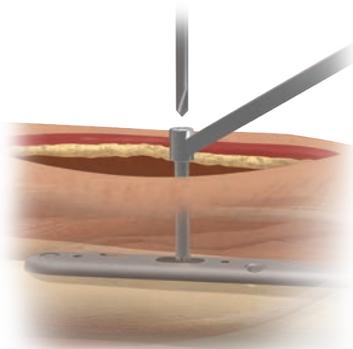


Figure 11

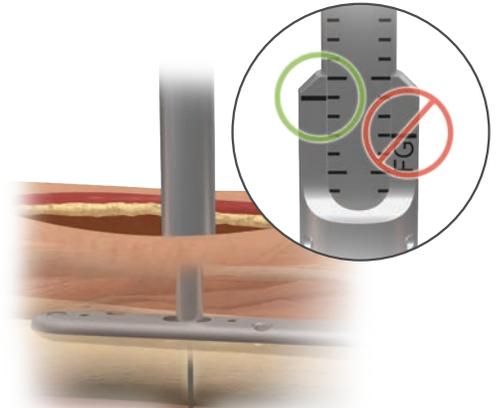


Figure 12

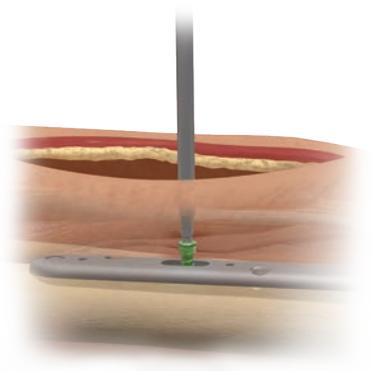


Figure 13

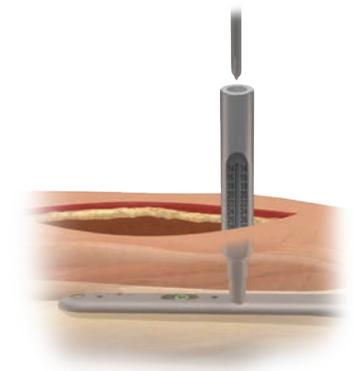


Figure 14

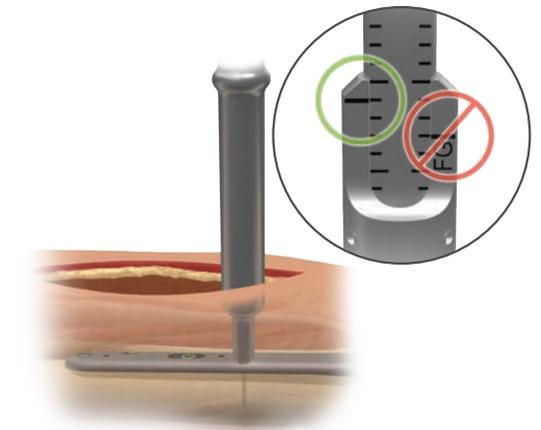


Figure 15

Proximal Radius Fixation: Using a bone clamp, secure the plate to the proximal radial shaft (Figure 10). Adjust the amount of traction as needed until final fracture reduction has been confirmed under fluoroscopy. Drill (Figure 11), measure (Figure 12), and insert a 2.7mm locking screw (Figure 13) into the oblong hole. Remove the clamp and adjust the plate to the desired amount of traction using this distraction slot and then tighten the screw. Drill, and measure for insertion of remaining screws into the proximal portion of the plate (Figure 14 and 15). Insert remaining screws into the proximal portion of the plate.

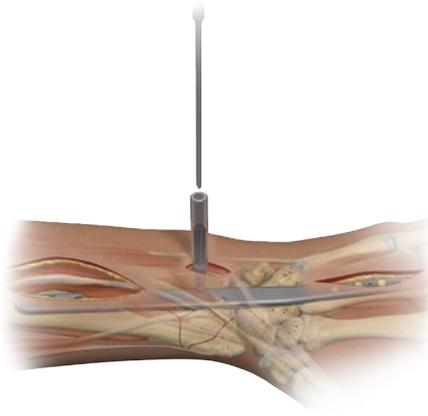


Figure 16

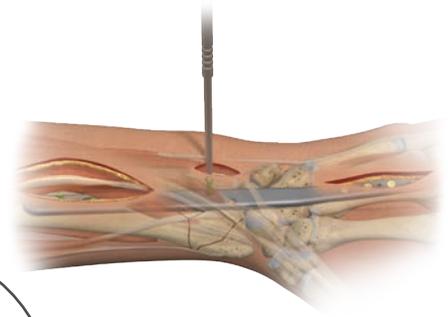


Figure 18

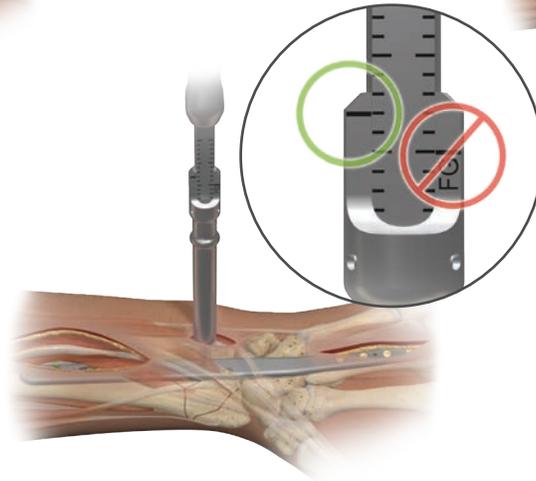


Figure 17

Central Screw Fixation: If the central screw cluster is utilized, dissect down to the distal radius as described above. Additional articular reduction can be performed through direct manipulation of fracture fragments. Drill (Figure 16), measure (Figure 17), and insert locking screws (Figure 18).

ⓘ **Note:** Subchondral bone substitute material may be used as needed.



Figure 19



Figure 21

OR



Figure 20



Figure 22

Final Implant Placement

Confirm there is no tendon entrapment and desired implant placement and fracture reduction has been achieved. Confirm the distal radioulnar joint (DRUJ) is stable and fingers can achieve passive flexion without undue tension (Figures 19 and 20). Once confirmed, proceed to closing the incisions.

Implant Removal

Once desired healing has occurred, the DVR[®] Crosslock Wrist Spanning Plate and all screws should be removed. Remove screws in the order of the surgeon's discretion, then pass the plate through either the proximal or distal end (Figures 21 and 22). Confirm final healing under fluoroscopy.

Ordering Information

DVR® Crosslock Wrist Spanning Plate

Product	Size	Non-Sterile	Sterile
DVR® Crosslock Wrist Spanning Plate	180mm	-	131849181



Zimmer Biomet Compatible Screws

Product	Size	Non-Sterile	Sterile
2.7 mm Locking Screws	8 mm	1312-27-108	-
	9 mm	1312-27-109	-
	10 mm	1312-27-110	1318-27-110
	11 mm	1312-27-111	-
	12 mm	1312-27-112	1318-27-112
	13 mm	1312-27-113	-
	14 mm	1312-27-114	1318-27-114
	15 mm	1312-27-115	-
	16 mm	1312-27-116	1318-27-116
	18 mm	1312-27-118	1318-27-118
	20 mm	1312-27-120	1318-27-120
	22 mm	1312-27-122	1318-27-122
	24 mm	1312-27-124	1318-27-124
	26 mm	1312-27-126	1318-27-126



2.7 mm Multi-Directional Screws	8 mm	1312-27-308	-
	9 mm	1312-27-309	-
	10 mm	1312-27-310	1318-27-310
	11 mm	1312-27-311	-
	12 mm	1312-27-312	1318-27-312
	13 mm	1312-27-313	-
	14 mm	1312-27-314	1318-27-314
	15 mm	1312-27-315	-
	16 mm	1312-27-316	1318-27-316
	18 mm	1312-27-318	1318-27-318
	20 mm	1312-27-320	1318-27-320
	22 mm	1312-27-322	1318-27-322
	24 mm	1312-27-324	1318-27-324
	26 mm	1312-27-326	1318-27-326
28 mm	1312-27-328	1318-27-328	
30 mm	1312-27-330	1318-27-330	



Product	Size	Non-Sterile	Sterile
2.7mm Non-Locking Screws	8 mm	1312-27-208	-
	9 mm	1312-27-209	-
	10 mm	1312-27-210	1318-27-210
	11 mm	1312-27-211	-
	12 mm	1312-27-212	1318-27-212
	13 mm	1312-27-213	-
	14 mm	1312-27-214	1318-27-214
	15 mm	1312-27-215	-
	16 mm	1312-27-216	1318-27-216
	18 mm	1312-27-218	1318-27-218
	20 mm	1312-27-220	1318-27-220
	22 mm	1312-27-222	1318-27-222
	24 mm	1312-27-224	1318-27-224
	26 mm	1312-27-226	1318-27-226
28 mm	1312-27-228	1318-27-228	
30 mm	1312-27-230	1318-27-230	



Ordering Information (cont.)

Zimmer Biomet Compatible Instruments

Product	Description	Label	Part Number
Instruments	Bone Depth Gauge	Non-Sterile	2312-00-100
	2.2/2.9mm Soft Tissue Guide	Non-Sterile	2312-00-104
	2.2mm Locking Drill Guide	Non-Sterile	2312-00-109
	2.2mm Drill Bit	Non-Sterile	2312-00-200
	2.2mm Drill Bit Sterile	Sterile	2120-00-022
	K-Wire 1.6mm x 127mm	Non-Sterile	KW062SS
	K-Wire 1.6mm x 127mm Sterile	Sterile	2312-01-303
	1.7mm Square Driver	Non-Sterile	2312-00-101
	Quick Connect Handle Blue	Non-Sterile	2312-00-106

INDICATIONS FOR USE

The DVR® Crosslock Wrist Spanning Plate is indicated for skeletally mature patients for fixation of fractures, osteotomies and non-unions of the distal radius.

INTENDED USE

The DVR® Crosslock Wrist Spanning Plate is intended to be applied to the dorsal aspect of the wrist for the purpose of providing prolonged internal fixation and may be used as an alternative to external fixation to restore length and neutralize loads.

CONTRAINDICATIONS

- Cases with an active infection
- Conditions which tend to retard healing such as blood supply limitations and previous infections
- Insufficient quantity or quality of bone to permit stabilization of fracture
- Conditions that restrict the patient's ability or willingness to follow post-operative instructions during the healing process
- Foreign body sensitivity / allergic reaction – where material sensitivity is suspected, appropriate tests should be conducted, and sensitivity ruled out prior to implantation
- Cases where the implant would cross open epiphyseal plates in skeletally immature patients

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