FLOWER™
ORTHOPEDICS
STANDARDS FOR ORTHOPEDICS

MTP Fusion Procedure Guide

WITH CONVERGENT PLATE

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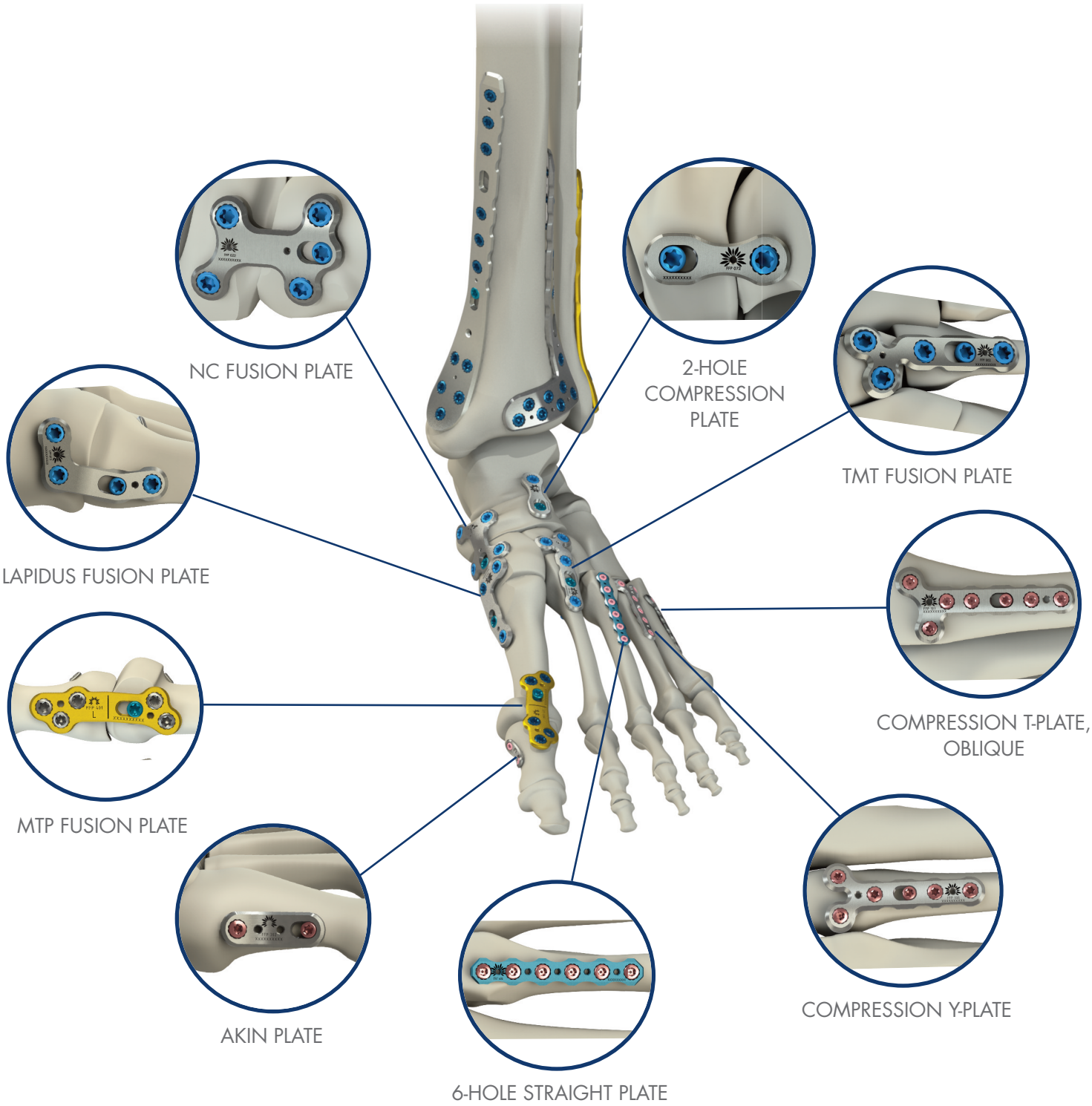
The Flower Foot & Ankle Application



INDICATIONS FOR USE:

The Flower Small and Medium Implants set is intended for use for internal fixation of fractures and reconstruction of bones, including the scapula, olecranon, humerus, radius, ulna, pelvis, distal tibia, fibula, hand and foot in adults and for use in long bones in adolescents (12-21) in whom the growth plates have fused. Examples of these internal fixations and reconstructions include compression fractures, intra-articular and extra-articular fractures, displaced fractures, osteotomies, non-unions and mal-unions. This system can be used for palmar, ventral, dorsal and orthogonal application.

The Flower Orthopedics Bone Screw set is intended to be used for the fixation of bone structures, fusion of joints of bone reconstruction.

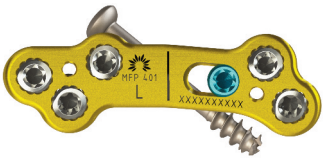
Flower Convergent MTP Fusion – Product Rationale

The Flower Convergent MTP Fusion Plate is a low profile neutralization plate requiring minimal soft tissue dissection and smaller surgical incisions.

The convergent MTP Fusion plate is designed to fit well the proximal phalanx and distal end of metatarsal and offer the option of compression through the plate via a compression slot. The mid-section of the plate will allow for one interfragmentary screw. This plate is an excellent option for end stage arthritis of the first MTP joint or severe hallux valgus with incongruency of the joint where a surgeon would determine an arthrodesis is necessary.

The Flower Convergent MTP Fusion Plate is available in the First Ray IndicationCube™.

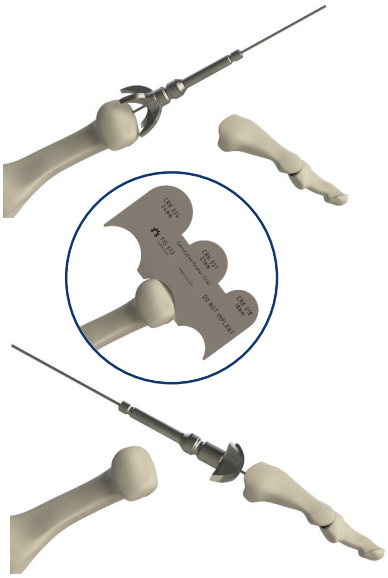
Flower Convergent MTP Fusion – Design Features

	PLATE RATIONALE	SURGICAL BENEFIT
	Clustered screw placement	Results in shorter plate length allowing minimal dissection and clearance from DIP joint
	Convergent screw trajectories	Excellent option for revising failed fusions or arthoplasty devices
	Proximal slot	Allows for up to 1.2mm compression through plate for additional stability
	Robust yet low profile plate design	Strong construct, while allowing the screws to sit flush

Flower Convergent MTP Fusion – Surgical Procedure

Step 1 – Exposure

a. Approach joint in usual fashion. Take care to avoid the EHL tendon and neurovascular structures. Perform capsular release and expose joint.



Step 2 – Reaming of the MTP Joint

Remove cartilage and osteophytes

a. Once joint is exposed, remove osteophytes with saw or rongeur to shape metatarsal head and proximal phalanx to desired contour.

b. Expose metatarsal head and place guide wire provided in the Cannulated Reamer Kit (CRK XXX) down the center of the shaft of metatarsal head. Use cup shaped reamer to shape head removing all cartilage and dense bone down to cancellous bone.

Note: Three sizes of cannulated reamers are available (18mm, 21mm & 24mm). A reamer trial (FIS 613) can be used to determine the appropriate reamer size.

c. Repeat above step on proximal phalanx aiming guide wire down axis of toe and use cone shaped reamer in similar fashion, exposing cancellous bone.

Fenestrate joint surface

a. Place small drill holes with k-wire or 2.0mm Drill Bit (DBK 030) into joint surfaces to increase blood flow to arthrodesis site.

Step 3 – Joint Alignment and Cannulated Screw Insertion

Align Hallux

a. In sagittal plane, align hallux in neutral or slight dorsiflexion <9 degrees.

Tip: Use flat surface to measure dorsiflexion and mark with Bovie on bone.

b. In coronal plane, align hallux in neutral or slight valgus ≤5 degrees.

Insert guide wire

a. Once hallux is in desired position, place guide wire to hold joint together. Guide wire is passed from the medial basilar flare of the proximal phalanx to the lateral aspect of the metatarsal angled slightly dorsal.

Note: Guide wires are provided in the E-Kit (EWK 200).

Insert cannulated screw

a. Confirm position of guide wire visually and on AP and lateral xrays. If position is adequate, guide wire can be used to insert a cannulated screw.

b. Countersinking for the cannulated screw may be achieved utilizing the cannulated depth gauge (EWK 200). Slide the depth gauge over the guide wire and countersink before reading the depth measurement.

c. If countersinking is not desired, simply slide the depth gauge over the guide wire and measure the required screw length with the tip of the countersink on the bone. The measurement is the shaft length of the screw, not including the thickness of the screw head.

d. Pilot hole is drilled using the Flower 2.6mm Cannulated Drill Bit (CDB 026) for 4.0mm Cannulated Screws

e. Using the cannulated screw driver, a 4.0mm partially threaded cannulated screw is threaded over the guide wire compressing the joint. Bi-cortical placement of the cannulated screw is recommended.

Step 4 – Provisional Fixation

Align plate and insert provisional fixation

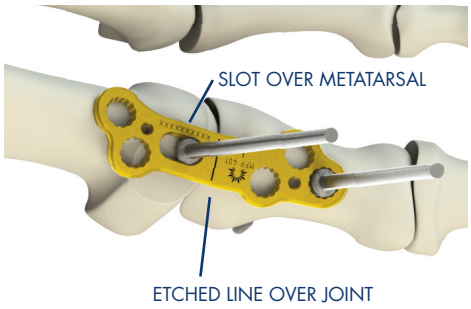
a. Align plate on hallux visually and on xray

Tip: There are two visual markers to aid in plate positioning; the etched line over joint and the slot over metatarsal just proximal to arthrodesis site which can also be seen on xray.

b. The plate has no dorsiflexion. If dorsiflexion is preferred the plate can be bent with plate benders (FIS 213).

c. Once plate is in adequate position, place olive wires in desired position to temporarily hold the plate in place on the bone.

Tip: If placing olive wire in slot, place in the distal end of slot so not to interfere with compression screw later.



Step 5 – Pilot Hole Drilling

a. 3.0mm variable angle locking screws are recommended for the Flower Convergent MTP Fusion Plate. Starting with the distal phalangeal locking holes and using a 2.0mm drill bit (DBK 030), pilot holes are created. Use the locking end of the drill guide for all locking holes in the plate. All screws should be inserted bi-cortically.

Step 6 – Screw Measurement and Insertion

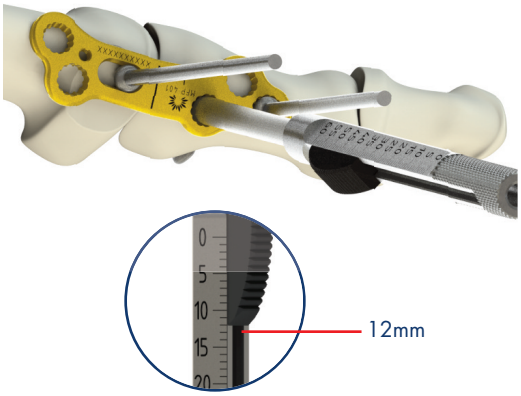
a. Extend the hook probe out of the depth gauge far enough to reach the opposite cortex. Insert the extended hook probe through the pilot hole and engage the opposite cortex.

b. With the hook probe fully engaged, slide the depth gauge down to the plate so that it fully seats into the screw hole. The pilot hole depth can now be read off the distal end of the slider.

c. Place the locking screws into the distal phalangeal screw holes using the Flower cannulated screw driver that is part of the Flower E-Kit (EWK 200).

Note: This is NOT a torque limiting screw driver. Use three-finger technique. The screws are fully inserted once flush with the top of the place. Do not overtighten. For screws that are not locking due to bone purchase, beware of osteoporotic bone/fragmented bone being pushed back.

d. Insert remaining distal locking screws following same technique as above.



Step 7 – Axial Plate Compression through the Plate

a. 3.5mm Non-Locking Compression Screws are recommended for dynamic compression. Place the compression end of the drill guide (DBK 035) in the proximal end of the slot with the arrow pointing toward the joint. Drill the eccentric pilot hole.

Note: The addition of the compression screw in the slot hole to achieve plate compression increases the stability of the construct and is a recommended technique.

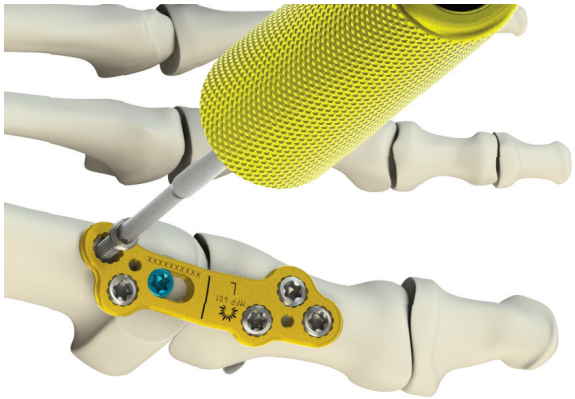
b. Remove the olive wire before placing the non-locking compression screw.

c. Measure pilot hole using the Flower Depth Gauge and place a 3.5mm compression screw.

Note: This is NOT a torque limiting screw driver. Use three finger technique for screw insertion. Screws are fully inserted once flush with the top of the plate. Do not overtighten. For screws that are not locking due to bone purchase, beware of osteoporotic bone/fragmented bone being pushed back.

Step 8 – Proximal Screw Insertion

Use same technique to insert Proximal Locking Screws as for Distal Screws (described in Step 6).



Final Construct

Final construct sits flush to bone with compression of arthrodesis site. Multiple staggered screw holes distal and proximal allow for excellent fixation without encroachment on DIP joint or requiring excessive proximal dissection. Variable angle locking screws allow for angling of screws away from joints for fixed angle construct.

Flower Convergent MTP Fusion – Implant Selection

VARIABLE ANGLE LOCKING SCREWS

Screw Diameters	Product Description	Lengths
2.7mm	2.7mm Variable Angle Locking Screw	8mm-30mm
3.0mm	3.0mm Variable Angle Locking Screw	8mm-30mm
3.5mm	3.5mm Variable Angle Locking Screw	10mm-30mm

VARIABLE ANGLE NON-LOCKING COMPRESSION SCREWS

Screw Diameters	Product Description	Lengths
2.7mm	2.7mm Variable Angle Compression Screw	10mm-26mm
3.5mm	3.5mm Variable Angle Compression Screw	10mm-30mm
4.0mm	4.0mm Variable Angle Compression Screw	10mm-30mm

CANNULATED, PARTIALLY THREADED SCREWS

Screw Diameter	Product Description	Lengths
3.0mm	Partially Threaded Cannulated Screw	10mm-34mm
3.5mm	Partially Threaded Cannulated Screw	10mm-40mm
4.0mm	Partially Threaded Cannulated Screw	16mm-60mm
4.5mm	Partially Threaded Cannulated Screw	30mm-70mm

FLOWER CONVERGENT MTP FUSION PLATE PORTFOLIO

Part #	Product Description	Lengths
MFP 401	MTP Plate, Left	6-hole
MFP 402	MTP Plate, Right	6-hole

Flower Convergent MTP Fusion – Single-Use Instrument Overview

MTP PLATE TRIALS

Part #	Content of Kit
FIS 613	Cannulated Reamer Trials

DRILL BIT KITS

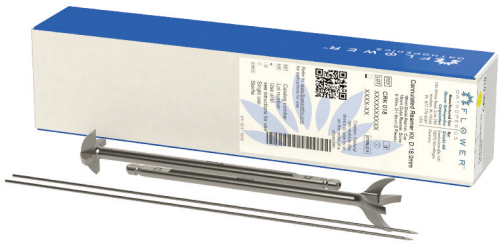
Part #	Contents of Kit
DBK 027	2.0mm Drill Bit and Drill Guide
DBK 030	2.0mm Drill Bit and Drill Guide
DBK 035	2.5mm Drill Bit and Drill Guide
DBK 040	3.0mm Drill Bit and Drill Guide

CANNULATED DRILL BIT KIT

Part #	Content of Kit
CDB 020	2.0mm Cannulated Drill Bit
CDB 024	2.4mm Cannulated Drill Bit
CDB 026	2.6mm Cannulated Drill Bit
CDB 030	3.0mm Cannulated Drill Bit

CANNULATED REAMER KITS

Part #	Diameter
CRK 018	18mm Cup and Cone
CRK 021	21mm Cup and Cone
CRK 024	24mm Cup and Cone



FLOWER E-KIT

Part #	Content of Kit
EWK 200	T15 Cannulated Screwdriver Cannulated Depth Gauge and Countersink Plating Depth Gauge 1.8mm Olive Wires (2) CoCr Guide Wires (2)

PLATE BENDERS

Part #	Content of Kit
FIS 231	Plate Benders

NOTES

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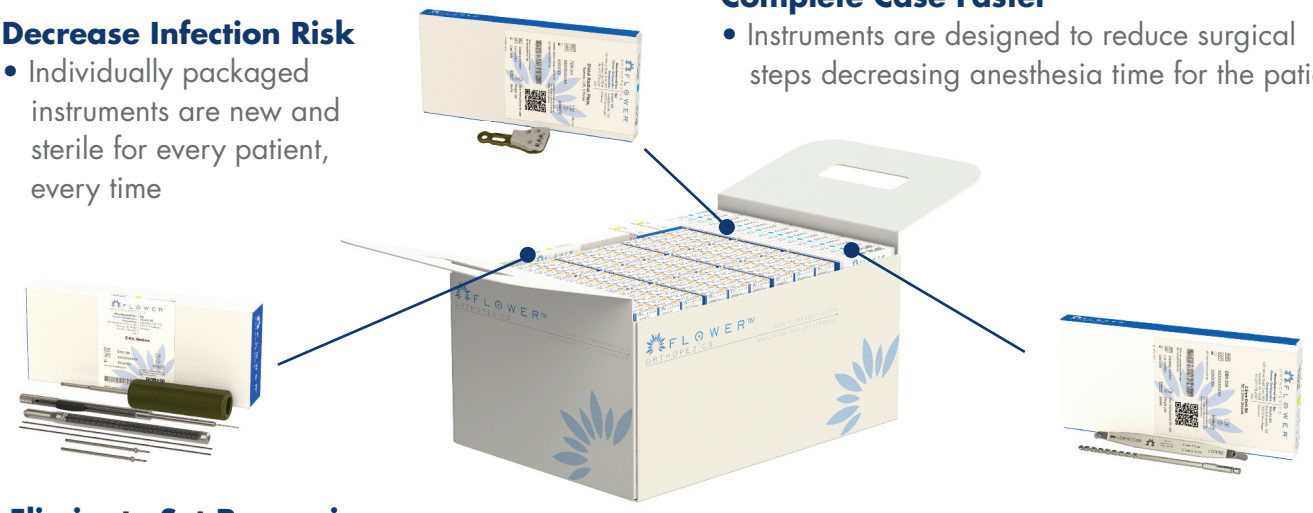
Decrease Infection Risk
- Individually packaged instruments are new and sterile for every patient, every time

Complete Case Faster
- Instruments are designed to reduce surgical steps decreasing anesthesia time for the patient



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