

### **Distal Tibia** Plating System

Anterolateral & Medial Distal Tibia Locking Plates

Securing optimal fixation through versatile anatomic locking plate technology

# Contents

Surgeon Design Team	8
Introduction	9
Anterolateral Distal Tibia Locking Plate	10
Anterolateral Plate Specifications	11
Medial Distal Tibia Locking Plate	12
Medial Plate Specifications	13
Staged Open Reduction and Internal Fixation	14
Surgical Approaches	15
Internal Fixation of Fibula and Malleolus	17
Reconstruction of the Tibia	18
Plate Selection	19
Plates	20
Application of the Plates	22
Screw Insertion	24
Ordering Information	31

1

ŧ



# Low Profile Anatomically Contoured The Distal Tibia Locking Plate System

A low profile helps minimize discomfort and soft tissue irritation

Contoured plates mimic the anatomy of the distal tibia

Anterolateral plate is available in wide and narrow widths, to suit patient size

Bullet tip minimizes soft tissue disruption during insertion

Plate insertion handle simplifies submuscular application

For distal tibia procedures that often involve complex fractures and minimal tissue coverage, the Distal Tibia Plating system provides both strength and low-profile advantages. Having one of the slimmest profiles available and uniquely contoured to align with the distal tibia, these plates may be used successfully to treat even the most challenging cases.

З

Œ



# Fast, accurate surgeries F.A.S.T. Guide<sup>™</sup> and F.A.S.T. Tab Technologies

### F.A.S.T. Guides

Facilitate accurate drilling

Pre-loaded and disposable

Save time in the OR since no intraoperative assembly is required

Color coded guides make identification easy: Red guide=Right, Lime guide=Left

### F.A.S.T. Tabs

Distal tabs of the Anterolateral Plate easily contour to conform to the bone

Threaded holes in the tabs of the Anterolateral Plate allow screws to lock to the plate, providing more stability and greater support

Interlocking alignment of distal screws can create a subchondral scaffold for more rigid fixation

To facilitate surgical procedures even more, our Distal Tibia Plates come pre-loaded with Fixed Angle Screw Targeting Guides-F.A.S.T. Guides - that direct the trajectory of the drill right into the plate. Additionally, our F.A.S.T. Tabs Technology provides a robust interlocking construct for bone fragments.

5

![](_page_7_Picture_0.jpeg)

Ð

# Versatility in construct Locking, non-locking, and multi-directional screw options

Choose locking, non-locking, or multi-directional screws according to need

All options available in each construct

Tapered, threaded screws lock into position when tightened to establish a fixed angle construct for improved fixation or when optimal screw purchase is required

Locking Multi-Directional Screws (MDS) allow for up to 15 degrees of angulation

Non-locking screws can be positioned and used in compression, neutral, and buttress modes

Compression holes for non-locking screws allow up to 3 mm of axial compression

Particularly helpful in challenging fracture cases, the interlocking screw construct of the Distal Tibia Plates provides you with both versatility and strength.

7

## Surgeon Design Team

Roy Sanders, M.D. Chief, Department of Orthopaedics, Tampa General Hospital Director, Orthopaedic Trauma Services, Florida Orthopaedic Institute Tampa, Florida

J. Chris Coetzee, M.D. Orthopedic Foot and Ankle Specialist Minnesota Sports Medicine and Twin Cities Orthopedics Adjunct Associate Professor, University of Minnesota Minneapolis, Minnesota

David Thordarson, M.D. Professor of Orthopaedics, University of Southern California Residency Director, University of Southern California Department of Orthopaedics Los Angeles, California

> Michael Wich, M.D. Deputy Head, Department of Trauma and Orthopaedic Surgery Unfallkrankenhaus Berlin Berlin, Germany

### Introduction

The DePuy Distal Tibia Plating System represents the next generation in anatomic plate design. It combines the benefits of low profile titanium plate metallurgy with the advantages of multiplanar locked screw technology. These features allow the formation of a three dimensional matrix of fixed and variable angle screws to create a true subchondral scaffold that can provide improved fixation in comminuted fractures or osteoporotic bone.

The DePuy Distal Tibia Plating System features TiMAX<sup>™</sup> low profile, anatomically contoured implants. In distal tibial surgery where the soft tissue coverage is at risk, these low profile plates are designed to minimize discomfort and soft tissue irritation matching the anatomy of the distal tibia, while still having the strength needed to permit unimpeded healing.

The System features F.A.S.T. Guide and F.A.S.T. Tab technology to facilitate surgical procedures and save time in the operating room. F.A.S.T. Guides allow for accurate drilling and placement of screws. F.A.S.T. Guides come preloaded and do not require intraoperative assembly, resulting in significant time savings. F.A.S.T. Tabs are distal versatile tabs with threaded screw holes to lock small distal articular fragments to the plate. Screws placed in these locking holes create an intersecting threedimensional scaffold to support the distal articular surface.

Additionally, the DePuy Distal Tibia Plating System allows the use of locking, variable angle, and standard screws. This hybrid fixation concept allows the surgeon to stabilize the fracture either by the use of lag screw techniques through the plate, or by compression plating techniques. Locking screws serve to provide stability to comminuted, unstable metaphyseal fractures or in osteopenic bone.

## Anterolateral Distal Tibia Locking Plate

![](_page_11_Picture_2.jpeg)

### **Anterolateral Plate Specifications**

Anterolateral Plate	Wide	Narrow
Head Width	39 mm	34 mm
Head Thickness	3 mm	3 mm
Tab Thickness	3 mm	3 mm
Shaft Width	12 mm	12 mm
Shaft Thickness	3 mm	3 mm
Distance between center holes of shaft	14 mm	14 mm
Orientations	Left / Right	Left / Right
Lengths	6H, 9H, 12H, 15H	6H, 9H, 12H, 15H

#### 3.5 mm Locking Cortical Screw:

- Larger core diameter and shallower thread pitch for improved bending and shear strength compared to a standard 3.5 mm cortical screw
- Self tapping tip minimizes the need for pre-tapping and eases screw insertion
- Tapered screw head helps ensure alignment of the screw head into the plate hole
- Tapered threaded head minimizes screw back-out and construct pullout
- T-15 drive
- Available in lengths of 10 70 mm

### 3.5 mm Locking Multi-Directional Screw:

- · Cobalt-Chrome screw with large core diameter
- Multi-directional capability offers 15 degrees of angulation
- Creates own thread in plate to help provide strong and stable construct
- Screw head designed to prevent it from going through the threaded screw hole
- Self tapping tip minimizes the need for pre-tapping and eases screw insertion
- 2.2 mm square drive
- Available in lengths of 20 60 mm

#### 4.0 mm Locking Cancellous Screw:

- Self tapping tip minimizes the need for pre-tapping and eases screw insertion
- Tapered screw head helps ensure alignment of the screw head into the plate hole
- Tapered threaded head minimizes screw back-out and construct pullout
- T-15 drive
- Available in lengths of 10 70 mm

# Medial Distal Tibia Locking Plate

![](_page_13_Picture_2.jpeg)

### **Medial Plate Specifications**

### Medial Plate

Head Width	23 mm
Average Head Thickness	3 mm
Tab Thickness	2 mm
Shaft Width	12 mm
Shaft Thickness	3 mm
Distance between center holes of shaft	14 mm
Orientations	Left / Right
Lengths	6H, 9H, 12H, 15H

### 3.5 mm Locking Cortical Screw:

- Larger core diameter and shallower thread pitch for improved bending and shear strength compared to a standard 3.5 mm cortical screw
- Self tapping tip minimizes the need for pre-tapping and eases screw insertion
- Tapered screw head helps ensure alignment of the screw head into the plate hole
- Tapered threaded head minimizes screw back-out and construct pullout
- T-15 drive
- Available in lengths of 10 70 mm

### 4.0 mm Locking Cancellous Screw:

- Self tapping tip minimizes the need for pre-tapping and eases screw insertion
- Tapered screw head helps ensure alignment of the screw head into the plate hole
- Tapered threaded head minimizes screw back-out and construct pullout
- T-15 drive
- Available in lengths of 10 70 mm

### 3.5 mm Locking Multi-Directional Screw:

- Cobalt-Chrome screw with large core diameter
- Multi-directional capability offers 15 degrees of angulation
- Creates own thread in plate to help provide strong and stable construct
- Screw head designed to prevent it from going through the threaded screw hole
- Self tapping tip minimizes the need for pre-tapping and eases screw insertion
- 2.2 mm square drive
- Available in lengths of 20 60 mm

## Staged Open Reduction and Internal Fixation

![](_page_15_Picture_2.jpeg)

Figure 1

When planning to treat a distal tibia fracture surgically using plates, application of a spanning external fixator should be performed as soon as possible.

### Portable Traction

When planning to treat a distal tibia fracture surgically using plates, application of a spanning external fixator should be performed as soon as possible (Figure 1).

Pin placement distally is dependent on the type of frame employed. Proximally placed tibial pins should be away from planned incisions to avoid pin tracts possibly infecting the surgical site. When placing frames, the surgeon should verify that the tibial shaft is in acceptable alignment, as posterior subluxation of the talus and hindfoot can lead to pressure necrosis of the anterior skin. Once the multi-planar frame has been applied, the patient should undergo a CT scan, with sagittal and transverse reconstructions.

DePuy's temporary spanning fixation device is TempFix<sup>®</sup>. It is offered with a U-ring (Cat. No. 8081-09-000 - Left, 8081-10-000 - Right) or without (Cat. No. 8081-11-000).

After review of the CT scans and plane films, a determination can be made regarding the correct surgical approach and plate application. The fibula should undergo internal fixation after the CT scan has been performed, in order to determine the location of the incisions.

### **Operative Technique**

Regardless of the technique used, the patient must be given intravenous antibiotics immediately prior to surgery. Although many surgeons do not use a tourniquet, it is difficult to evaluate the articular reduction unless visualization is maximized. An Esmarch bandage can be used to exsanguinate the limb, and a high thigh tourniquet can be inflated to 350 mm Hg for 2.5 hours without any adverse effects.

## **Surgical Approaches**

Approaches include a straight anterior incision, a standard medial incision, or the lateral Böhler approach. When plating the fibula through a standard lateral approach, the surgeon should identify the tibial incision first to avoid narrow skin bridges between the two incisions.

### 1. The Antero-Medial Approach

Begin at the level of the distal shaft of the tibia, just lateral to the anterior crest, and continue distally as far as needed, staying medial to the anterior tibial tendon. Take the skin together with the subcutaneous tissue and the periosteum in a full thickness flap to prevent separation of the medial skin from its periosteal blood supply. Expose the joint through major tears in the soft tissue envelope. If needed, the joint capsule can be incised in line with the skin incision, to visualize the articular surface. This approach offers the surgeon an excellent view of the medial and anterior distal tibia, but visualization of the lateral tibial articular surface will be limited (Figure 2).

![](_page_16_Picture_5.jpeg)

Figure 2 One of three surgical approaches can be used. An example of an Antero-Medial approach.

# Surgical Approaches

![](_page_17_Picture_2.jpeg)

Figure 3 Standard Anterior approach.

![](_page_17_Picture_4.jpeg)

Figure 4 Lateral approach.

### 2. The Standard Anterior Approach

Make an 8 - 10 cm skin incision centered over the ankle, with most of the incision proximal to the joint. Distally, the incision stops at the level of the talonavicular joint. Find and protect the superficial peroneal nerve, which crosses the wound from the lateral side. Incise the extensor retinaculum in line with the skin incision, and expose the anterior tibial (AT) and extensor hallucis longus (EHL) tendons. Locate and protect the anterior tibial artery and deep peroneal nerve just medial to the EHL tendon at the level of the joint. Move the neurovascular bundle laterally along with the EHL; the AT should be moved medially. This exposes the ankle capsule. The exposure of the joint should be through the major tears in the soft tissue envelope. Excellent visualization of the medial, and anterior tibial plafond are possible with this approach, but visualization of the lateral tibial plafond again is somewhat limited (Figure 3).

#### 3. The Lateral Approach

Start 5 cm proximal to the ankle joint and slightly medial to Chaput's tubercle. Continue distally in a straight line toward the base of the third and fourth metatarsals. Identify and protect the superficial peroneal nerve and proceed through the subcutaneous tissue to expose the superior and inferior extensor retinaculum, and the tendons of the extensor digitorum longus, peroneus tertius, hallucis brevis, and the extensor hallucis longus. After dividing the extensor retinaculum, the tendons of the extensor digitorum longus and peroneus tertius, the deep peroneal nerve, and the dorsalis pedis artery are moved medially. In the distal aspect of the incision, the muscle belly of the extensor digitorum brevis can be seen, and, if greater distal exposure is needed, this can be mobilized. At completion, the exposure should allow visualization of the entire anterior face of the distal tibia, with excellent visualization of the lateral articular surface of the tibia. It will be impossible to apply a medial plate from this incision (Figure 4).

### Internal Fixation of Fibula and Malleolus

#### Fibula and Posterior Malleolar Reconstruction

The fibular shaft and lateral malleolus should be reconstructed initially, depending on the tibial incision planned. If a midline or antero-medial incision is planned, a straight lateral or posterolateral incision can be used. Standard techniques of fibular plating (Cat. No. 8141-23-0XX) are used (Figure 5). If an anterolateral approach to the tibia is employed, a postero-lateral incision can be used to fix the fibula. Alternately, both tibial and fibular fixation may be performed through the same anterolateral incision. Furthermore, if plain films and CT scan indicate that the posterior malleolus is "free floating", then this fragment must be fixed at the time of fibula fixation so that a stable fragment exists to reconstruct the articular surface against. If this is not performed, the joint will be malreduced at the end of the surgery.

Note: Anterolateral and Medial Plates are not indicated to treat fibular fractures.

![](_page_18_Picture_5.jpeg)

Figure 5 The fibular shaft should be reconstructed initially using standard techniques.

### Reconstruction of the Tibia

![](_page_19_Picture_2.jpeg)

#### Figure 6

Reconstruct the articular surface by using 1.6 mm K-wires, either with direct reduction of one fragment to another, or by wedging small fragments between larger fragments.

![](_page_19_Picture_5.jpeg)

Figure 7 The reconstructed articular block can then be attached to the meta-diaphyseal shaft.

### **Tibial Reconstruction**

When reducing a long bone fracture, axial alignment is the predominant functional requirement. When reducing an articular fracture, both anatomic reconstruction of the joint surface, as well as axial alignment of the shaft is required. While a millimeter step in the joint will result in mild angular malalignment in the metaphysis, a millimeter offset in the metaphysis will translate to several millimeters of joint incongruity. For this reason, the articular surface should be approached first.

First externally rotate the medial malleolar fragment. Next, apply ligamentotaxis through distraction using either an external fixator or a femoral distractor. In this way, the comminuted central articular surface can be visualized. Reduce the comminuted fragments by using the constant postero-lateral fragment as the key to the articular reduction. Rebuild the articular surface by using 1.6 mm K-wires (Cat. No. 14425-6), either with direct reduction of one fragment to another, or by wedging small fragments between larger fragments. When the surface has been reconstructed, the medial malleolus is reduced and provisionally pinned (Figure 6).

Once satisfied with the articular reduction, the metaphysis is evaluated. Impaction fractures associated with metaphyseal crush require a cancellous bone graft. Once completed, each critical K-wire is replaced with an isolated 3.5 mm cortical, or 4.0 mm cancellous lag screw. The reconstructed articular block can then be attached to the meta-diaphyseal shaft using either isolated lag screws and a neutralization plate, or a plate alone in compression mode, with or without lag screws through the plate (Figure 7).

# **Plate Selection**

Medial plates cannot be applied using a lateral incision. Similarly lateral plates cannot be applied through a medial incision. While a midline incision allows application of a lateral plate, a medial plate can be applied only with difficulty. Therefore:

 If the fracture is unstable, with lateral comminution, and anterior metaphyseal crush is evident, a lateral approach is chosen, and an anterolateral plate is recommended (Figure 8).

![](_page_20_Picture_4.jpeg)

![](_page_20_Picture_5.jpeg)

Figure 8

![](_page_20_Picture_7.jpeg)

Figure 9

 If the fracture is more comminuted medially, and lateral joint involvement is minimal, a medial incision is used and a medial plate is applied (Figure 9).

• If comminution is both anterior, medial and lateral, then a midline incision may be best, coupled with an anterolateral plate (Figure 10).

![](_page_20_Picture_11.jpeg)

![](_page_20_Picture_12.jpeg)

Figure 10

### Plates

![](_page_21_Picture_2.jpeg)

### Figure 11

Anterolateral Plates are available in 4 lengths and in wide and narrow widths. Wide plates have 3 F.A.S.T. Tabs, while narrow plates have 2 F.A.S.T. Tabs.

# Anterolateral Distal Tibial Plate (Cat. No. 8162-0X-0XX).

The Anterolateral Distal Tibial Plate is a low profile, anatomically contoured plate, designed to fit on the anterolateral aspect of the distal tibia. These thin plates are designed to minimize discomfort and soft tissue irritation around the ankle, while still having the strength needed to achieve rigid fixation of the distal tibial fracture. All plates come with F.A.S.T. Guides for accurate drilling and placement of screws, with locking, lagging, or variable angle screw options available in the same construct (Figure 11).

These plates are pre-contoured and need little, if any, secondary adjustments to their shape. In addition, wide and narrow widths are available to accommodate patient size. Wide plates contain 3 F.A.S.T. Tabs, while narrow plates contain 2 F.A.S.T. Tabs.

Contourable F.A.S.T. Tabs with threaded screw holes are present distally to lock small distal articular fragments to the plate. These tabs are adjustable with Plate Tab Benders that fit over the F.A.S.T. Guides for easy and secure control. Contouring can be performed before application, or in situ. Should these tabs not be desired, they are cleanly removed with a few bending cycles, without leaving sharp edges. Alternatively, they may be clipped off with a wire cutter. Screws placed in these rows will create an intersecting scaffold to support the distal articular surface.

### Plates

### Medial Tibial Plate (Cat. No. 8162-1X-0XX).

Similar to the Anterolateral Plate, the Medial Plate is a low profile, anatomically contoured plate, designed to fit the medial aspect of the distal tibia. These thin plates are designed to minimize discomfort and soft tissue irritation around the ankle, while still having the strength needed to achieve rigid fixation of the distal tibial fracture. All plates come with F.A.S.T. Guides for accurate drilling and placement of screws, with locking, lagging, or variable angle screw options available in the same construct (Figure 12).

In addition, these plates are precontoured and need little, if any, secondary adjustments to their shape.

A plate handle can be attached to the distal end of the plate to facilitate insertion and positioning of the plate. The distal tab with a non-locking hole is present to connect distal fragments to the plate. If this tab is not desired, it can remain unfilled. Alternatively, it can be easily removed with a wire cutter.

![](_page_22_Picture_6.jpeg)

Figure 12 Medial Plates are available in 4 lengths.

### Application of the Plates

![](_page_23_Picture_2.jpeg)

The proper plate length is selected by ensuring at least 3-4 screw holes are present proximal to the most proximal extent of the shaft component of the fracture.

### Application of the Anterolateral Plate

Slide the shaft of the Anterolateral Plate submuscularly along the lateral border of the tibia, beneath the anterior compartment muscles and neurovascular bundle. The optimal position of the distal plate F.A.S.T. tabs in relation to the joint is approximately 2 mm from the anterior articular surface (Figure 13). There should be enough clearance to permit full dorsiflexion of the ankle. Use fluoroscopic imaging during plate placement in both the AP and lateral planes to ensure a safe implant position proximally along the lateral tibia. The Plate Handle (Cat. No. 8163-01-003/4) can be attached to the plate to facilitate insertion and position the plate in either an open or percutaneous manner (Figure 14).

The Plate Handle comes in right (Cat. No. 8163-01-003) and left (Cat. No. 8163-01-004) orientations. The Plate Handle connects to the distal compression hole on the shaft of the plate. The Plate Handle is secured to the plate by tightening the set screw with the T-15 driver. The plate is provisionally clamped to the shaft using the Medium Bone/Plate Forceps (Cat. No. 8163-01-006) proximally (Figure 15).

In most cases the pre-contoured plate will fit without the need for further bending. The distal tabs may be contoured as needed using F.A.S.T. Guides and Plate Tab Benders (Cat. No. 8163-01-001).

To contour the F.A.S.T Tab, place the benders over a F.A.S.T. Guide in each row and exert pressure on the distal bender until the desired contour is achieved (Figure 16).

CAUTION: Bending the distal tabs beyond 25 degrees may result in breakage. Continuous bending will also fatigue the tab and cause it to break.

### Application of the Plates

#### Application of the Medial Plate

Slide the Medial Plate proximally under the soft tissue. The plate conforms to the shape of the distal tibia and the distal end of the plate should conform to the shape of the medial malleolus (Figure 17).

The Plate Handle can be attached to the plate to facilitate insertion and position the plate in either an open or percutaneous manner. The Plate Handle connects to the distal compression hole on the shaft of the plate. The plate handle is secured to the plate by tightening the set screw with the T-15 driver.

#### **Provisional Fixation**

Once the fit of either the Anterolateral Plate or the Medial Plate has been confirmed both visually and fluoroscopically, 1.6 mm K-wires can be placed into the distal K-wire holes to secure the plate to the articular block (Figure 18).

A Provisional Fixation Pin (Cat. No. 8242-99-000/1) may also be used to secure the plate temporarily. The pin has a self-drilling tip and an AO quick connection for power insertion. Advance the pin slowly until the shoulder of the pin contacts the plate and pulls the plate down to the bone. Advancing the pin beyond that point could result in the threads stripping in the bone (Figure 19).

When placing screws in the plate, the plate should be secured from the distal end to the proximal end to prevent the plate from "walking" distally.

If the surgeon desires for the distal end of the plate to sit flush against the bone, then a 4.0 mm non-locked lag screw should be used. Instructions on how to insert a 4.0 mm lag screw can be found in the section titled, "Insertion of a 4.0 mm Non-Locking Screw".

Note: If a lag screw is used in the metaphyseal part of the plate or distal tabs, then that F.A.S.T. Guide needs to be removed prior to drilling.

![](_page_24_Picture_11.jpeg)

Slide the Medial Plate under the soft tissue using Plate Handle.

![](_page_24_Picture_13.jpeg)

Secure plate to the articular block using 1.6 mm K-wires.

![](_page_24_Picture_15.jpeg)

A provisional Fixation Pin may also be used to secure the plate temporarily.

![](_page_25_Picture_2.jpeg)

![](_page_25_Picture_3.jpeg)

### Figure 21

Drill through the F.A.S.T. Guide with the 2.7 mm Drill Bit. Slide the Measuring Drill Sleeve to the top end of the F.A.S.T. Guide and read the measurement of the Locking Screw length from the proximal end.

![](_page_25_Picture_6.jpeg)

Insert the pre-determined Locking Screw using the T-15 Driver attached to Torque Limiting Driver Handle.

Insertion of a 3.5 mm Cortical Locking Screw (Cat. No. 8161-35-0XX) or 4.0 mm Cancellous Locking Screw (Cat. No. 8161-40-0XX) into a Distal Threaded Hole.

Slide the Measuring Drill Sleeve (Cat. No. 8163-01-005) onto the 2.7 mm Calibrated Drill Bit (Cat. No. 2142-27-070) (Figure 20). Drill through the F.A.S.T. Guide until the far cortex is reached. Slide the Measuring Drill Sleeve onto the top end of the F.A.S.T. Guide and read the measurement of the locking screw length from the proximal end of the Drill Measuring Sleeve (Figure 21). Next, remove the F.A.S.T. Guide with the T-15 Driver that is attached to the Ratchet Handle (8261-66-000) and insert the pre-determined locking screw using the T-15 Driver that is attached to the 2.0 Nm Torque-Limiting Screwdriver Handle (Cat. No. 2141-18-001) (Figure 22).

*Tip: Using a power screwdriver is not recommended for insertion of any locking screws. If using power, it should be at a slow speed. Perform all final screw tightening by hand with the torque-limiting screwdriver.* 

Insertion of a 3.5 mm Multi-Directional Locking Screw in a Threaded Locking Hole (Cat. No. 8163-35-0XX).

Note: If a 3.5 mm Multi-Directional Screw is used in the metaphyseal part of the plate or distal tabs, then that F.A.S.T. Guide needs to be removed prior to drilling. Additionally, note that the Torque Limiting Handle should not be used.

Insert the 2.7 mm end of the 2.0/2.7 mm Drill Guide (Cat. No. 9399-99-435) into the plate hole and angle the drill as needed within an arc of 15 degrees (Figure 23). Drill through both cortices with the 2.7 mm Drill Bit (Figure 24).

Measure the drilled hole with the Small Fragment Depth Gauge (Cat. No. 2142-35-100) by taking a direct reading from the LOCK line (Figure 25) and insert the appropriate length 3.5 mm Multi-Directional Screw with the 2.2 mm Square Driver (Cat. No. 8163-01-000) coupled to the Ratchet Handle (Cat. No. 8261-66-000) (Figure 26).

![](_page_26_Picture_6.jpeg)

Figure 23 MDS Screw allows up to 15 degrees of angulation.

![](_page_26_Picture_8.jpeg)

Figure 24 Drill with the 2.7 mm Drill Bit through the 2.0/2.7 mm Drill Guide.

![](_page_26_Picture_10.jpeg)

Figure 25 Take a direct reading from the LOCK Line on the Depth Gauge.

![](_page_26_Picture_12.jpeg)

Figure 26 Insert the MDS screw using the 2.2 mm Square Driver coupled to the Rachet Handle.

![](_page_27_Picture_2.jpeg)

Figure 27 Drill with the 2.7 mm Calibrated Drill Bit reading the depth from the top of the Drill Guide.

![](_page_27_Picture_4.jpeg)

The proximal end of the plate can now be secured to the bone. This can be achieved through the following options:

Insertion of a Locking Screw (3.5 mm Cortical Cat. No. 8161-35-0XX or 4.0 mm Cancellous Cat. No. 8161-40-0XX) in a Threaded Hole.

Screw the 2.7 mm Locking Drill Guide (Cat. No. 2142-07-027) into a threaded plate hole until fully seated. Drill both cortices with the 2.7 mm Calibrated Drill Bit to the desired depth and read the depth measurement from the calibrated drill bit at the top of the drill guide (Figure 27). Remove the 2.7 mm Locking Drill Guide.

Note: If a second method of measurement is desired, measure the drilled hole by taking a direct reading from the LOCK line on the Small Fragment Depth Gauge (Figure 28).

Insert the selected locking screw with the T-15 Driver coupled to the 2.0 Nm Torque-Limiting Screwdriver Handle (Figure 29).

Insert the Locking Screw using the T-15 Driver coupled to the Torque-Limiting Screwdriver Handle.

Neutral insertion of a 3.5mm Non-Locking Cortical Screw (Cat. No. 8150-37-0XX) in a Compression Slot.

Apply the neutral (green) end of the 2.5 mm ACP Drill Guide (Cat. No. 8241-68-000) onto a compression slot in the plate, with the arrow pointed toward the fracture line (Figure 30). Drill through both cortices with the 2.5 mm Drill Bit (Cat. No. 8290-29-070).

Measure the drilled hole with the Small Fragment Depth Gauge (Figure 31) by taking a direct reading from the NON-L line.

Insert the 3.5 mm Non-Locking Cortical Screw with the Screw Holder Sleeve (Cat. No. 8241-66-000) over the 2.5 mm Hex Driver (Cat. No. 8241-57-071) in the Ratchet Handle (Cat. No. 8261-66-000) (Figure 32).

Caution: The arrow on the neutral (green) end of the 2.5 mm ACP drill guide must point toward the fracture site to ensure neutral screw placement.

![](_page_28_Picture_7.jpeg)

Figure 30 Drill with the 2.5 mm Drill Bit in the neutral position.

![](_page_28_Picture_9.jpeg)

Insert the 3.5 mm Non-Locking Cortical Screw using the 2.5 mm Hex Driver.

![](_page_29_Picture_1.jpeg)

Drill with the 2.5 mm Drill Bit in the eccentric position.

![](_page_29_Picture_3.jpeg)

Dynamic compression using a 3.5 mm Non-Locking Cortical Screw in a Compression Slot.

Apply the compression (gold) end of the 2.5 mm ACP Drill Guide onto the compression slot with the arrow pointed toward the fracture line (Figure 33). Drill through both cortices with the 2.5 mm Drill Bit.

Measure the drilled hole with the Small Fragment Depth Gauge (Figure 33) by taking a direct reading from the NON-Line (Figure 34).

Insert the appropriate length 3.5 mm Non-Locking Cortical Screw with the Screw Holder Sleeve over the 2.5 mm Hex Driver coupled to the Ratchet Handle (Figure 35).

Insert the 3.5 mm Non-Locking Cortical Screw using the 2.5 mm Hex Driver.

# Insertion of a 3.5 mm Non-Locking Cortical Screw in a Threaded Hole.

Insert the 2.5 mm end of the 2.5/3.5 mm Drill Guide (Cat. No. 8241-96-000) into the threaded hole and drill through both cortices with the 2.5 mm Drill Bit (Figure 36).

Measure the drilled hole with the Small Fragment Depth Gauge (Figure 37) by taking a direct reading from the NON-L line.

Insert the appropriate length 3.5 mm Non-Locking Cortical Screw with the Screw Holder Sleeve over the 2.5 mm Hex Driver coupled to the Ratchet Handle (Figure 38).

![](_page_30_Picture_6.jpeg)

Figure 36 Drill with the 2.5 mm Drill Bit through the 2.5/3.5 mm Drill Guide.

![](_page_30_Picture_8.jpeg)

Figure 38 Insert the 3.5 mm Non-Locking Cortical Screw using the 2.5 mm Hex Driver .

![](_page_31_Picture_2.jpeg)

Figure 39 Drill using 2.9 mm Drill Bit through 2.9/4.0 mm Drill Guide.

![](_page_31_Picture_4.jpeg)

4.0 mm Non-Locking Screw (Cancellous Full Thread Cat. No. 8153-41-0XX or Cancellous Lag Cat. No. 8155-40-0XX) into any Plate Hole.

Insert the 2.9 mm end of the 2.9/4.0 mm Drill Guide (Cat. No. 2141-29-400) into a plate hole and drill through both cortices with the 2.9 mm Drill Bit (Cat. No. 8290-31-070) (Figure 39).

Measure the drilled hole with the Small Fragment Depth Gauge by taking a direct reading from the NON-L line (Figure 40).

Insert the appropriate length 4.0 mm cancellous screw with the screw holder sleeve over the 2.5 mm Hex Driver coupled to the Ratchet Handle (Figure 41).

Once completed, a tension free closure is ideal, using nylon Denoti type stitches for the skin. Wound closure is performed with the tourniquet inflated if time permits. If the tourniquet is deflated, the tissues will swell and the surgeon should wait several minutes before closing. If tension is evident, then multiple relaxing incisions may be performed, or a vacuum assisted closure device can be applied (V.A.C., Kinetic Concepts, Inc., San Antonio, TX). Drains are not routinely used. After closure, the leg is placed in a bulky Jones dressing with a splint with the ankle in neutral flexion.

Figure 41 Insert the 4.0 mm Non-Locking Screw using the 2.5 mm Hex Driver.

# **Ordering Information**

### Anterolateral Distal Tibia Locking Plates:

	Orientation	Width	Holes	Length
8162-00-006	Right	Wide	6	115 mm
8162-00-009	Right	Wide	9	157 mm
8162-00-012	Right	Wide	12	199 mm
8162-00-015	Right	Wide	15	241 mm
8162-02-006	Right	Narrow	6	114 mm
8162-02-009	Right	Narrow	9	156 mm
8162-02-012	Right	Narrow	12	198 mm
8162-02-015	Right	Narrow	15	240 mm
8162-01-006	Left	Wide	6	115 mm
8162-01-009	Left	Wide	9	157 mm
8162-01-012	Left	Wide	12	199 mm
8162-01-015	Left	Wide	15	241 mm
8162-03-006	Left	Narrow	6	114 mm
8162-03-009	Left	Narrow	9	156 mm
8162-03-012	Left	Narrow	12	198 mm
8162-03-015	Left	Narrow	15	240 mm

### Medial Distal Tibia Locking Plates:

	Orientation	Holes	Length
8162-10-006	Right	6	142 mm
8162-10-009	Right	9	184 mm
8162-10-012	Right	12	226 mm
8162-10-015	Right	15	268 mm
8162-11-006	Left	6	142 mm
8162-11-009	Left	9	184 mm
8162-11-012	Left	12	226 mm
8162-11-015	Left	15	268 mm

# **Ordering Information**

#### Screws:

3.5 mm Cortical Screws, Locking 8161-35-0XX
10 - 60 mm in 2 mm increments
60 - 70 mm in 5 mm increments

**3.5 mm Multi-Directional Screws, Locking 8163-35-0XX** 20 – 60 mm in 2 mm increments

3.5 mm Cortical Screws, Non-Locking 8150-37-0XX
10 – 50 mm in 2 mm increments
50 – 70 mm in 5 mm increments

4.0 mm Cancellous Screws, Full Thread, Locking 8161-40-0XX
10 – 50 mm in 2 mm increments
50 – 70 mm in 5 mm increments

4.0 mm Cancellous Screws, Full Thread, Non-locking 8153-41-0XX
10 – 50 mm in 2 mm increments
50 – 70 mm in 5 mm increments

4.0 mm Cancellous Screws, Partial Thread, Non-locking 8155-40-0XX
14 – 30 mm in 2 mm increments
30 – 70 mm in 5 mm increments

4.0 mm Cannulated Cancellous Screws, Partial Thread, Non-locking 14376-XX 10 – 50 mm in 2 mm increments

50 - 70 mm in 5 mm increments

#### Important:

This Essential Product Information does not include all of the information necessary for selection and use of a device. Please see full labeling for all necessary information.

#### Indications:

The use of bone plates and screws provides the orthopaedic surgeon a means of bone fixation and helps generally in the management of fractures and reconstructive surgeries. These implants are intended as a guide to normal healing, and are NOT intended to replace normal body structure or bear the weight of the body in the presence of incomplete bone healing. Delayed unions or nonunions in the presence of load bearing or weight bearing might eventually cause the implant to break due to metal fatigue. All metal surgical implants are subjected to repeated stress in use, which can result in metal fatigue.

### Contraindications:

- Active infection
- Conditions which tend to retard healing such as blood supply limitations, previous infections, insufficient quantity or quality of bone to permit stabilization of the fracture complex
- Conditions that restrict the patient's ability or willingness to follow postoperative instructions during the healing process
- Foreign body sensitivity
- Cases where the implant(s) would cross open epiphyseal plates in skeletally immature patients
- Cases with malignant primary or metastatic tumors which preclude adequate bone support or screw fixations, unless supplemental fixation or stabilization methods are utilized

#### Warnings and Precautions:

Bone screws and plates are intended for partial weight bearing and non-weight bearing applications. These components cannot be expected to withstand the unsupported stresses of full weight bearing.

### Adverse Events:

The following are the most frequent adverse events after fixation with orthopaedic plates and screws: loosening, bending, cracking or fracture of the components or loss of fixation in bone attributable to nonunion, osteoporosis, markedly unstable comminuted fractures; loss of anatomic position with nonunion or malunion

with rotation or angulation; infection and allergies and adverse reactions to the device material.

![](_page_35_Picture_17.jpeg)

![](_page_35_Picture_18.jpeg)

DePuy Orthopaedics, Inc. 700 Orthopaedic Drive Warsaw, IN 46581-0988 USA

Tel: +1 (800) 366 8143 Fax: +1 (574) 371 4865 **DePuy International Ltd** St Anthony's Road Leeds LS11 8DT England Tel: +44 (0)113 387 7800 Fax: +44 (0)113 387 7890

![](_page_35_Picture_22.jpeg)

Printed in USA. ©2008 DePuy Orthopaedics, Inc. All rights reserved.