

PELVIC& ACETABULUM PLATE SYSTEM SURGICAL TECHNIQUE



PELVIC & ACETABULUM PLATE SYSTEM

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4.1.3. Automated Cleaning and Disinfection

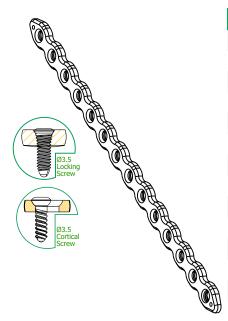


1.1.Pelvic Plate System

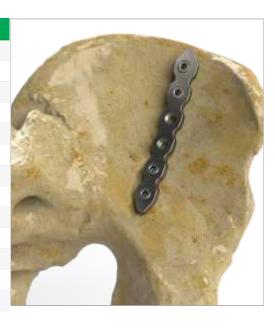
1.1.1.Specification

The Pelvis Bone Plate System consists of for the treatment of sacroiliac joint dislocations and symphysis pubis distortions in fractures, fusions and osteotomies of the acetabulum, sacrum, ilium and the entire pelvic ring. It is used with \emptyset 3.5 mm cortical screw and \emptyset 3.5 mm locking screw. The plate is produced from ISO 5832-2 TiGr3 (ASTM F 67) material.

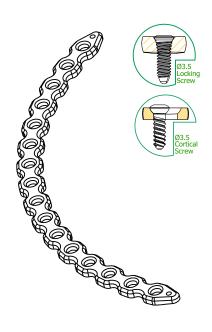
1.1.1.1. Reconstruction Plate



REF. NO	HOLES
1422-0003	3
1422-0004	4
1422-0005	5
1422-0006	6
1422-0007	7
1422-0008	8
1422-0009	9
1422-0010	10
1422-0011	11
1422-0012	12
1422-0014	14
1422-0016	16
1422-0018	18
1422-0020	20



1.1.1.2. Curved Reconstruction Plate



REF. NO	HOLES
1932-0003	3
1932-0004	4
1932-0005	5
1932-0006	6
1932-0007	7
1932-0008	8
1932-0009	9
1932-0010	10
1932-0011	11
1932-0012	12
1932-0013	13
1932-0014	14
1932-0015	15
1932-0016	16

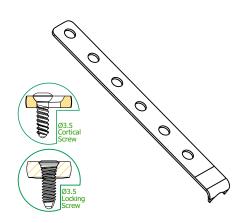




1.1.Pelvic Plate System

1.1.1.Specification

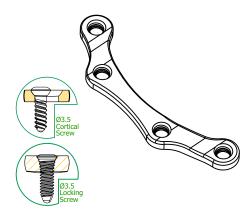
1.1.1.3. Acetabular hook plate



REF. NO	HOLES
9802-0002	2
9802-0003	3
9802-0004	4
9802-0005	5
9802-0006	



1.1.1.4. Symphisis Pubis Pelvic Plate



REF. NO	HOLES	SIZE
9742-0010	4	S
9742-0030	4	M
9742-0020	4	L



1.1.1.5. Superior Sacroiliac Plate











REF. NO	HOLES
9592-1012	12-R
9592-2012	12-L







2.1.Pelvic&Acetabulum Plate System Surgical Technique

2.1.1.Reduction

2.1.1.1.Reduction Forceps

Pelvic reduction forceps are equipped with features that improve handling during reduction maneuvers. The spikes and spherical structure prevent the penetration of bone with a thin cortex. Spikes with sharper ends provide a secure grip on pelvic surfaces. (Fig.1-2)



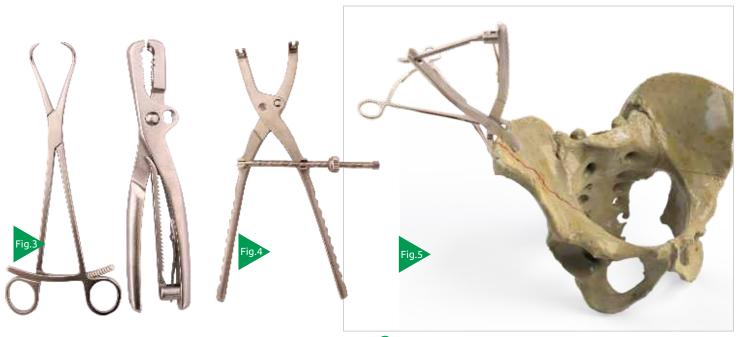


2.1.1.2. Reduction forceps with points

This standard forceps can be applied directly to the surface of the bone, with hooks in drill holes, can be used with other forceps (Fig.3).(Fig.5).

2.1.1.3. Reduction forceps with Screw

Designed for use with 3.5mm / 4.5mm screws to be placed on opposite sides of a fracture line, allowing significant reduction forces and manipulation in all three planes (Fig.4).

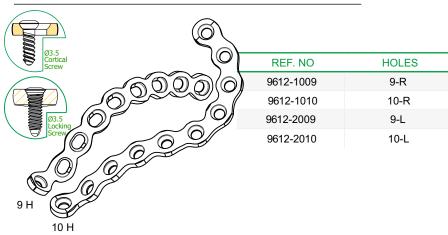




1.1.Pelvic Plate System

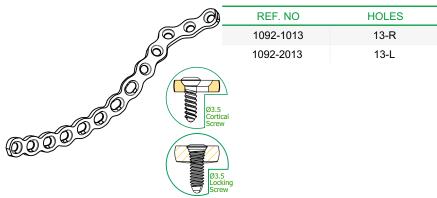
1.1.1.Specification

1.1.1.7.Posterior Wall Acetabular Plates



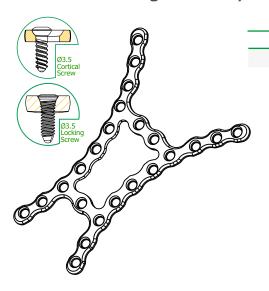


1.1.1.8. Anterior Brim Pelvic Plate





1.1.1.9.Locking Butterfly Pelvic Plate



	0
HOLES	8
23	6

REF. NO 1942-0023



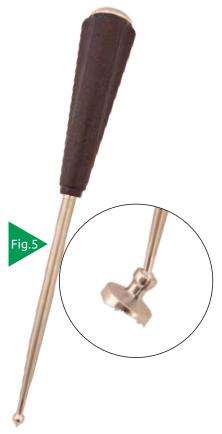
2.1.1.Reduction

2.1.1.4. Pointed ball tip and round disk

Flat ball spikes make it easy to reduce bone fragments. They have a pointed tip and a thin cortex to reduce the risk of the tool slipping through the bone, and a pointed ball point to prevent penetration of the bone. (Fig.5)

Discs can be used with pointed ball reduction forceps or pointed ball type instruments. They can help distribute applied forces over a larger surface area to prevent iatrogenic or compression fractures in poor quality bone (osteoporotic), (Fig.6).







2.1.2.Fracture

2.1.2.1.Acetabulum Fracture

2.1.2.1.1 Posterior Wall Fracture

Posterior wall fractures cut the edge of the acetabulum and

It affects part of the retroacetabular surface, part of the articular cartilage. The fracture spreads over a wider area than the severity. Usually, part of the posterior column remains intact. (Fig. 1)



Isolated posterior column fractures are rare and are usually associated with posterior dislocation of the hip. Posterior column fractures begin at the greater sciatic notch, pass through the roof or weight-bearing dome, and exit the obturator ring. The result is complete separation of the posterior column.

Because the posterior column rotates around the ischial tuberosity, the fracture is usually displaced posteriorly, medially, and internally.



Anterior wall fracture is a rare form of fracture. The involved bone is usually osteoporotic.

Anterior wall fractures are segmental fractures of the middle anterior column, trapezoidal in shape and typically involving the anterior segment of the acetabulum.

Cranially, the fracture begins at the anterior border of the acetabulum, just below the anterior-inferior iliac spine. It crosses the articular surface and separates the anterior articular facet and a variable portion of the acetabular fossa. Distally, the fracture crosses the upper border of the obturator foramen and cuts the pubic ramus. On the inner surface, the fracture crosses the iliopectineal line 3-4 cm anterior to the SI joint. It descends along the quadrangular surface below the pelvic rim to the superior border of the obturator foramen and cuts the pubic ramus.

Displacement of the anterior wall fragment and marginal impaction of the acetabular roof articular cartilage are often associated with anterior wall fractures.

2.1.2.1.4 Anterior Column Fracture

Anterior column fractures separate a segment of the anterior acetabulum from the rest of the innominate bone. The fracture begins in the middle of the ischiopubic ramus below and then passes through the anterior acetabulum.

2.1.2.1.5 Another Combinations

Anterior wall-column or Posterior wall-colum fractures can be seen together in various ways. T and Y type Both colums etc.











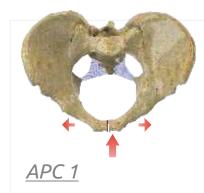
2.1.2.Fracture

2.1.2.2.Pelvic Circle Fracture

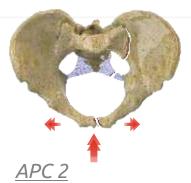
Many of the pelvic circle fracture is being due to with vehicle, industrial and extreme sport accident etc. Normally those fracture related excessive retroperitoneal bleeding trauma in firsth few hour end with moratily.

2.1.2.1 APC Open Book AP compression fractures.

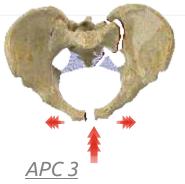
It usually happens with the opening that takes place in engine accidents.



It is formed with a low energy. It does not require surgical treatment in openings less than 2.5 cm.



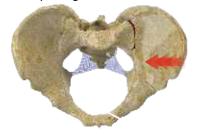
It is performed with a low or medium energy.-Surgery is required because more than 2.5 cm of opening occurs. If a low energy is realized, Symphisis Pubic Pelvic Plate will be sufficient. If it is moderate, Pupic plate and superior sacroiliac plate will be sufficient.



It happens with a high energy. Pupic plate and sacroiliac plate do not provide adequate stabilization because the opening is large. In addition to these two plates, 7.3 cannula screws should be used.

2.1.2.2.2 Lateral Compression

This type of fracture is seen as a result of a force coming from the lateral. It usually happens with a car crash. In some cases, it may occur by falling on this area.



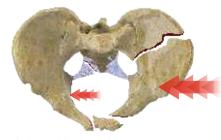
LC 1

It is formed with a low energy. Therefore, a surgical operation may not be required.



<u>LC 2</u>

It occurs at moderate intensity. Anterior plates may be sufficient.



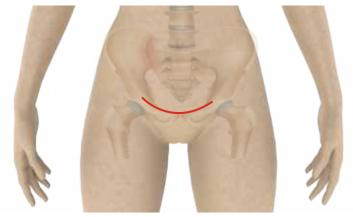
LC 3=LC2+APC

It runs at high intensity. There are also separations in the pelvic ring. Fixation should be performed beforehand. Appropriate plates and screw sizes should be selected according to the type of fracture.

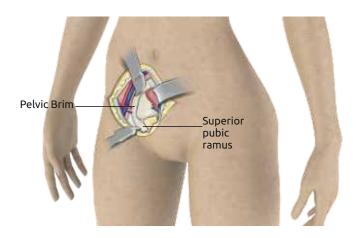


2.1.3.Approach

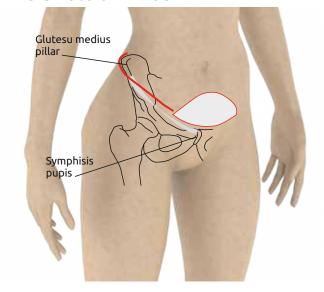
2.1.3.2. Modified Stoppa



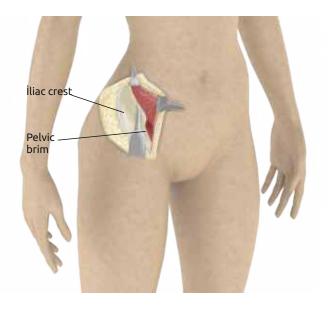
The Pfannenstiel incision is often used placed just above the pubic symphysis, as it allows the incision to be combined with a lateral window incision, similar to that used in the classical ilioinguinal approach.



2.1.3.3.Lateral Window



If more areas need to be looked at, make an arcuate incision starting from the back of the gluteus medius column and extending to the midline incision already made.





2.1.2.Fracture

2.1.2.2.Pelvic Circle Fracture

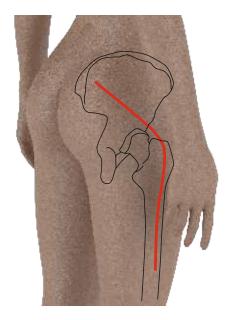
2.1.2.2.3 Vertical Shear

A vertically directed force or forces at right angles to the supporting structures of the pelvis leading to vertical fractures in the rami and disruption of all the ligamentous structures.



high on one leg from distances occurs with a fall. Breaks and splits is observed.

2.1.3.Approach2.1.3.1.Kocher-Langenbeck





2.1.2.2.4 Straddle Fracture



There is birefringence, causing instability, but usually little displacement. Genitourinary injuries are common. İt can be useful curved plates for fixing

The Kocher-Langenbeck approach is an approach to the posterior structures of the acetabulum. Provides direct visualization of the posterior colon and retroacetabular surface. The dorsocranial articular acetabulum can also be accessed either through the fracture opening or after a capsulotomy.

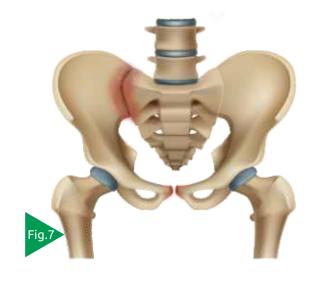
Joint Capsule



2.1.4. Symphisis Pupis Pelvic Plate

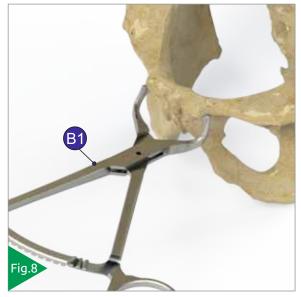
2.1.4.1. Open-Book Fracture APC-2

This type of fracture usually has two or more breaks in the pelvic ring, and the ends of the broken bones do not align (displacement) correctly. This type of fracture is more likely to occur due to a high-energy event(Fig.7).



2.1.4.2. Reduction and Plate Placement

Fracture is reduced with (B1 reduction forceps) (Fig. 8)



Appropriate size plate is placed on the area. *(Fig9)*

(The plate can be temporarily fixed to the bone with the help of the C7 Pointed ball. To prevent it from moving during the drilling phase) (Fig9)

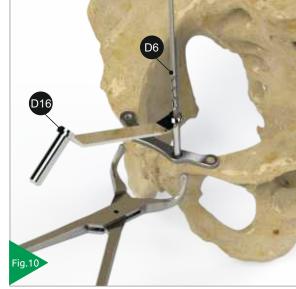




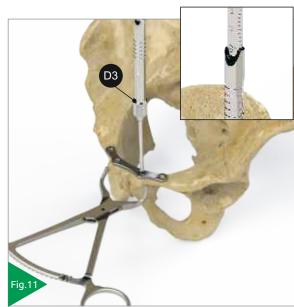
2.1.4. Symphisis Pupis Pelvic Plate

2.1.4.3. Drill

Insert the drill guide (D16). Drill with (D6) drill (Fig.10).

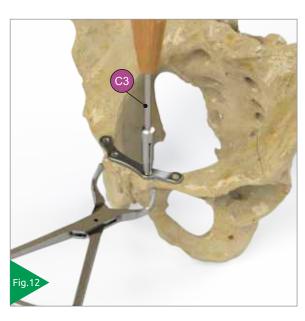


(D3) Screw length is determined with a depth guide (Fig.11).



2.1.4.4. Finish

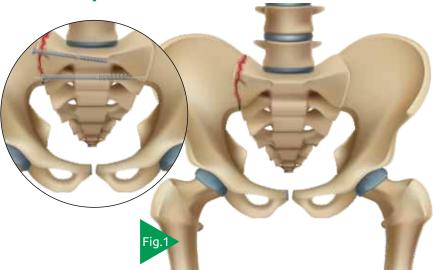
The appropriate size Ø3.5 cortical screw (C3-C8) is attached with a screwdriver (Fig.12).





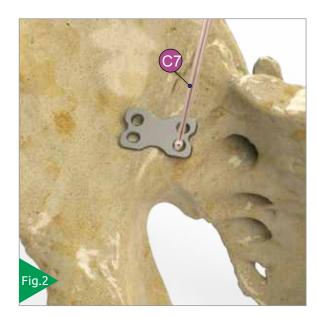
2.1.5.Superior Scroiliac Plate 2.1.5.1.Sacrum fractures

In this type of fracture, there is usually a single fracture of the pelvic ring. Low-energy fractures are usually stable fractures (Fig.1). In high-energy fractures, the sacroiliac plate is insufficient. Screws can be inserted (Ø7.3 cannulated screw)to increase stabilization of the sacrum.



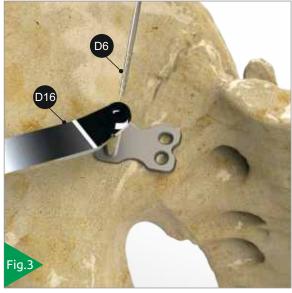
2.1.5.2.Plate Placement

Place the plate appropriately according to the fracture. Temporarily fix the plate with the ball pointer (C7) so that it does not move (Fig.2).



2.1.5.3.Drilling

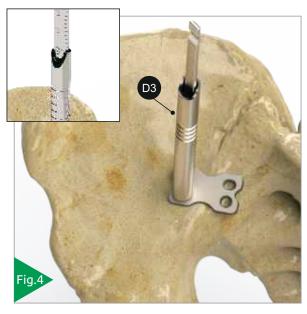
Insert drill guide (D16). drill with (D6).(Fig.3)





2.1.5.Superior Scroiliac Plate2.1.5.4.Determine Screw Lenght

Determine the screw length with the help of the depth guide (D3) (Fig.4).



2.1.5.5.Screw and finish

Send the Ø3.5 cortical screw of which you have determined the length with a screwdriver (C8) (Fig.5).



attach other cortical screw and complete the process (Fig.6). (Fig.6).

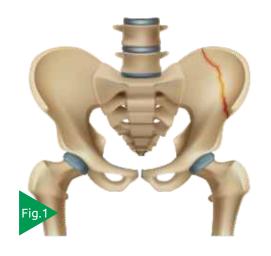




2.1.6.Reconstruciton Plate 2.1.6.1.Illiac Ring Fracture

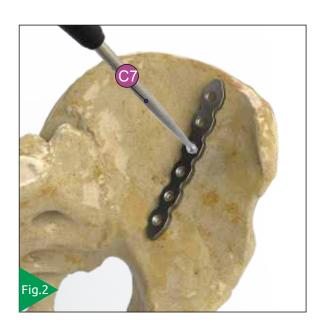
Transverse iliac fractures result from a direct blow to the iliac wing.

The pelvic crest is often not displaced as it is stabilized by the strong muscle envelope (Fig. 1).



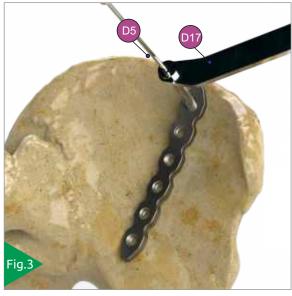
2.1.6.2. Plate Placement

Depending on the fracture type and need, the fracture should be fixed with reduction forceps before placing the plate. The plate is placed in the appropriate area associated with the fracture. The plate is temporarily attached to the bone with a ball point (C7).(Fig.2)



2.1.6.3. Drill

Flexible drill (D5) can be used depending on the approach and need. The drill is placed from the guide (D17) and dirlling is done (Fig.3)

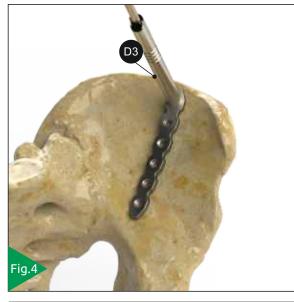




2.1.6.Reconstruciton Plate

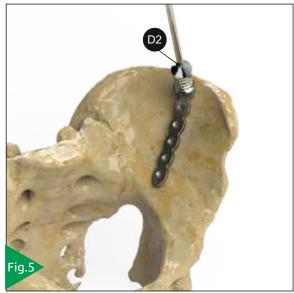
2.1.6.4. Determine Screw Lenght

The screw length is determined with the help of the depth guide (D3). (Fig.4)



2.1.6.5. Screw

Screw is sent with flexible screwdriver (D2). Screw holder can be used(B2).(Fig.5)



2.1.6.6. Finish

Other locking screws are sent, torques are checked and the process is completed. (Fig. 6)





2.1.7.Curved reconstruciton Plate2.1.7.1.Lateral Compression Fracture

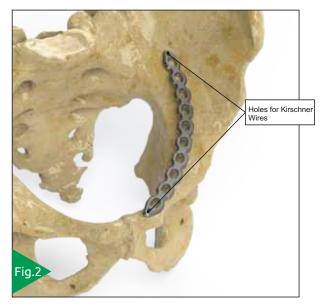
Lateral compression fractures can take various forms, various implants and screws and prior fixation may be required. (Fig. 1)

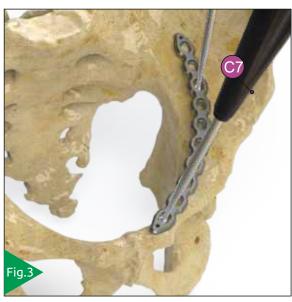


2.1.7.2.Plate Placement

If possible, Kirschner wire can be used for temporary fixation on this plate (Fig. 2).

The plate can be attached to the bone with the help of the point ball *(C7)* holder. *(Fig.3)*



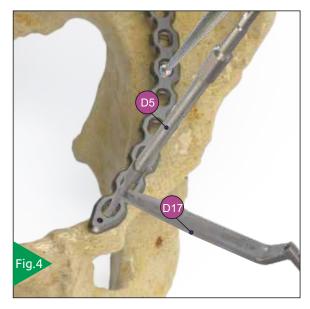




2.1.7. Curved reconstruciton Plate

2.1.7.2. Drill

Drill for Ø3.5 cortical screw with flexible drill (D5) and drill guide (D17).(Fig.4)



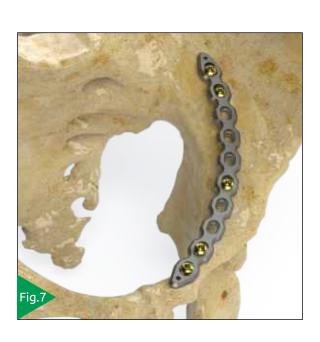
2.1.7.3. Depth Guide

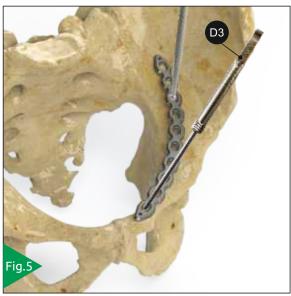
Determine the screw size by measuring the length) (D3)(Fig.5)

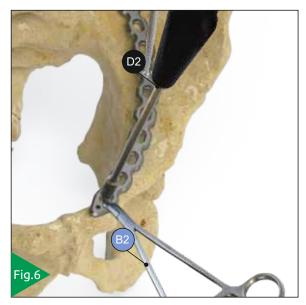


Send Ø3.5 cortical screw with flexible screwdriver (D2). You can use a screw holder (Fig.6)











2.1.8.Acetabular Hook Plate and Posterior Wall Plate

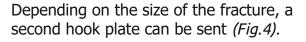
2.1.8.1.Posterior lip Fracture

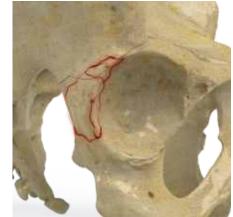
Posterior lip fractures cut the edge of the acetabulum and
It affects part of the retroacetabular surface, part of the articular cartilage. The fracture spreads over a wider area than the severity. Usually, part of the posterior column remains intact.

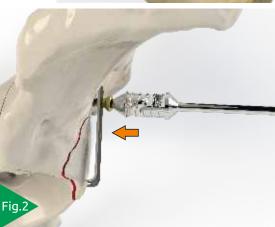
It is seen in posterior hip dislocation



Thanks to the structure of the hook plate in posterior wall fractures, the way of reducing the fracture with the help of cortical screws is shown. (Fig. 2-3)













2.1.8.Acetabular Hook Plate and Posterior Wall Plate

2.1.8.4. Posterior Wall plates

Posterior wall fractures cut the edge of the acetabulum and It affects part of the retroacetabular surface, part of the articular cartilage. When the fracture spreads over a wider area than the severity, the type of plaque needed increases (Fig. 1). Some application forms are seen in the images.

Hook plates fixed the fracture. Depending on the spread of the fracture, one or both of the two types of posterior wall plates are attached to these hooked plates and a solid structure is formed on the mountain. (Fig.5-6)









actures seen in lateral compression pelvis fractures.(Fig.8) Depending on the severity of the wall fracture, in extreme cases, double hook plate and double plate are applied in rare

cases. (Fig.7)

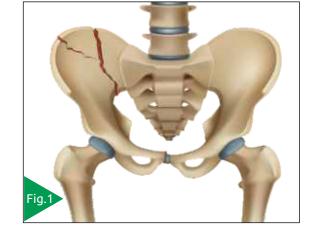


2.1.9.Locking Butterfly Pelvic Plate.

2.1.9.1 Iliac Fracture

Fractures of the ilium that disrupt the continuity of the pelvic ring result in an unstable hemipelvis. Iliac fractures usually occur in the posterior part of the ilium, as the bone in this area is the weakest.

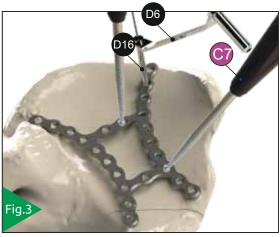
Unstable iliac fractures differ from simple iliac fractures that do not destabilize the pelvic ring. Ilium fractures may extend to the sacroiliac joint. (Fig. 1)



2.1.9.2.Plate Placement

The Butterfly plate system aims to achieve the same function with a single plate instead of placing 2 or 3 separate plates in some of the iliac fractures. Plaque location is determined by determining an appropriate approach (Fig.2). It is temporarily attached to the bone with a ball pointer (C7). Drill Guide (D6) is placed and drilling (D16) is done. (Fig.3)







2.1.9.Locking Butterfly Pelvic Plate.

2.1.9.3.Depth Guide

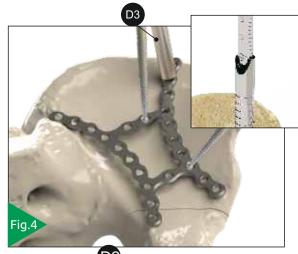
Determine the appropriate screw size with the help of the depth gauge (D3). (Fig.4))

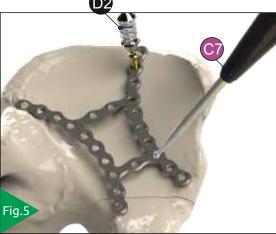
2.1.9.4.Screw

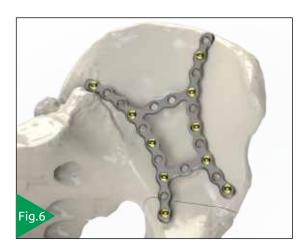
Send the locking or cortical screw with a flexible screwdriver (D2) (Fig.5)

2.1.9.5.Finish

Please send the number of screws you have determined as needed.(Fig.6)







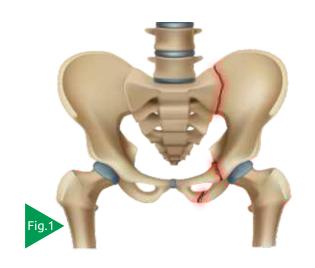


2.1.10. Anterior Brim Pelvic Plate.

2.1.10.1.Lateral Compression Fracture

Lateral compression fractures can take various forms, various implants and screws and prior fixation may be required (Fig.1).

Anterior Brim Pelvic Plate In lateral compression fractures, it may need to be used alone or with additional screws and other relevant pelvic plates, depending on the severity of the fracture.



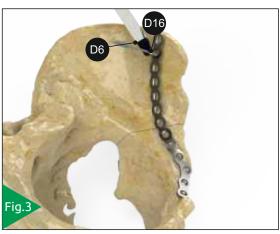
2.1.10.2.Plate Placement

Place the plate according to the anatomy, This plate should be placed according to the relevant bone anatomy.(Fig.2)



2.1.10.3.Drilling

Insert the drill guide from the appropriate area (according to the surgical approach) (D16). Drill (D6). (Fig.3)

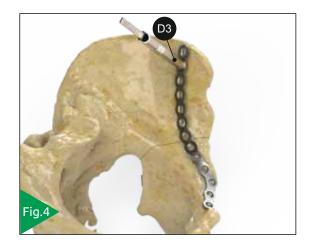




2.1.10. Anterior Brim Pelvic Plate.

2.1.10.4.Depth Guide

Determine the screw length with the help of the ldepth guide (D3).(Fig.4)



2.1.10.5.Screw

ihtiyaca göre tornavida ya da fleksible (C8)tornavida kullanınız. Vida tutucu da kullanılabilir(Fig.5).



2.1.10.6.Finish

Vidaların gönderim işlemini tamamlayınız. İşlemi bitiriniz(Fig.6)

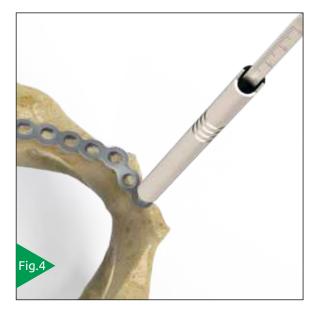




2.1.11. Anterior Illopectineal Pelvic Plate

2.1.11.4. Depth Guide

Determine the screw size by using depth guide(D3)(Fig.5)



2.1.11.5. Screw and Finish

Send Ø3.5 cortical screw with flexible screwdriver (D2). You can use a screw holder (Fig.6)

Install other Ø3.5mm cortical screws







2.1.11.Anterior Illopectineal Pelvic Plate 2.1.11.1.Straddle Fracture

There is birefringence, causing instability, but usually little displacement. Genitourinary injuries are common. İt can be useful curved plates for fixing



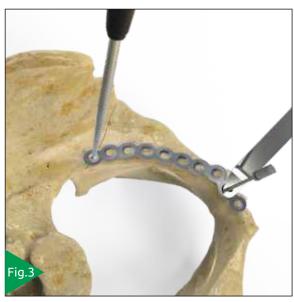
2.1.11.2.Plate Placement

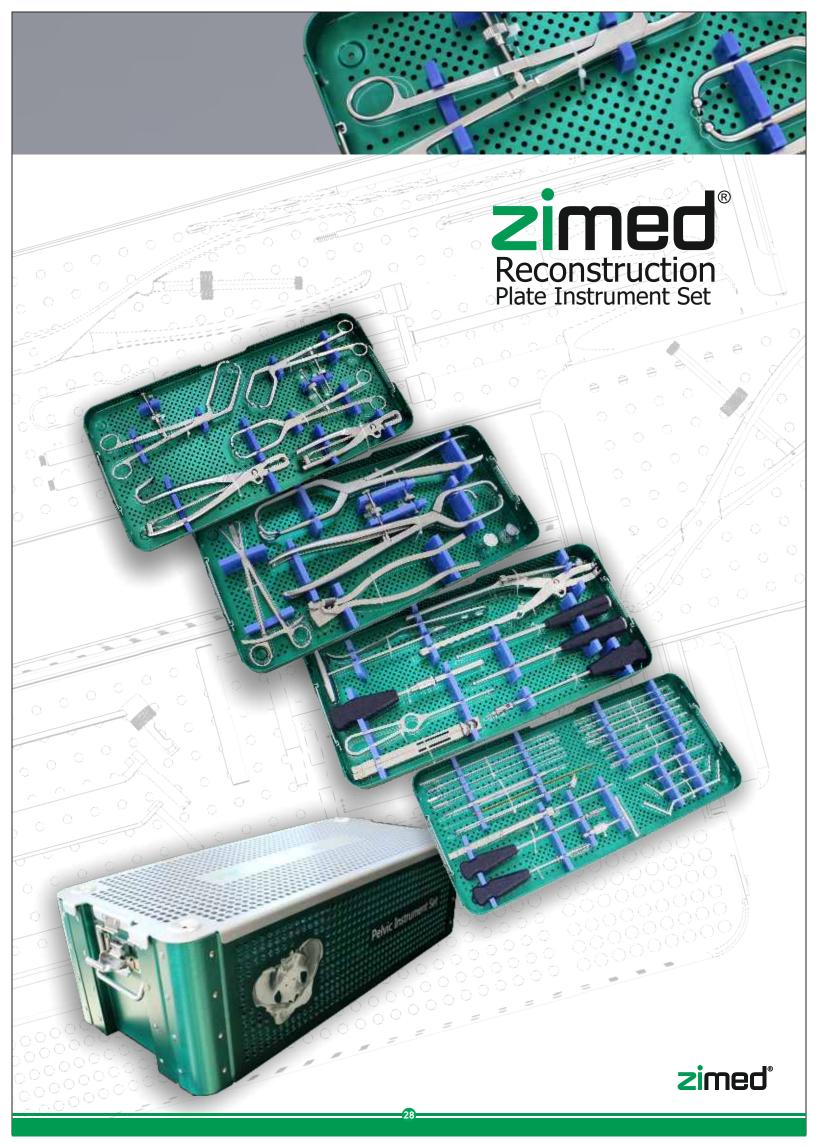
The plate can be attached to the bone with the help of the point ball (C7) holder. (Fig.3)

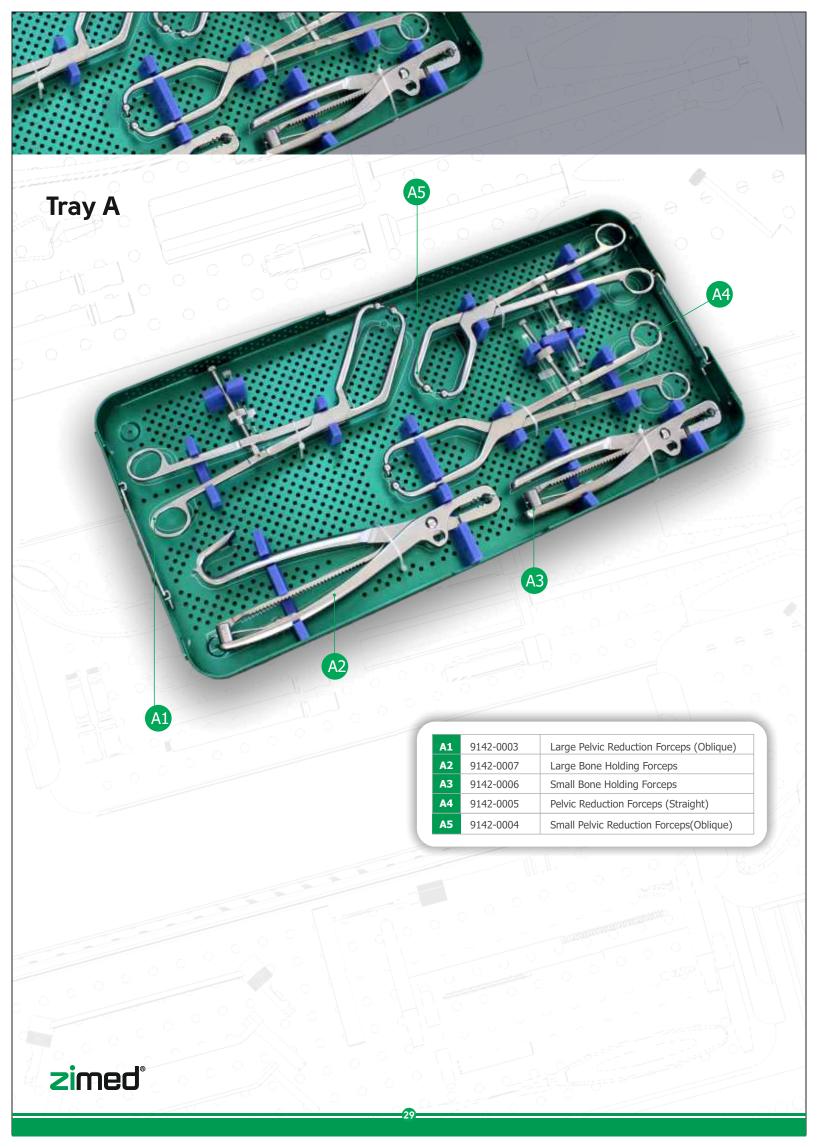


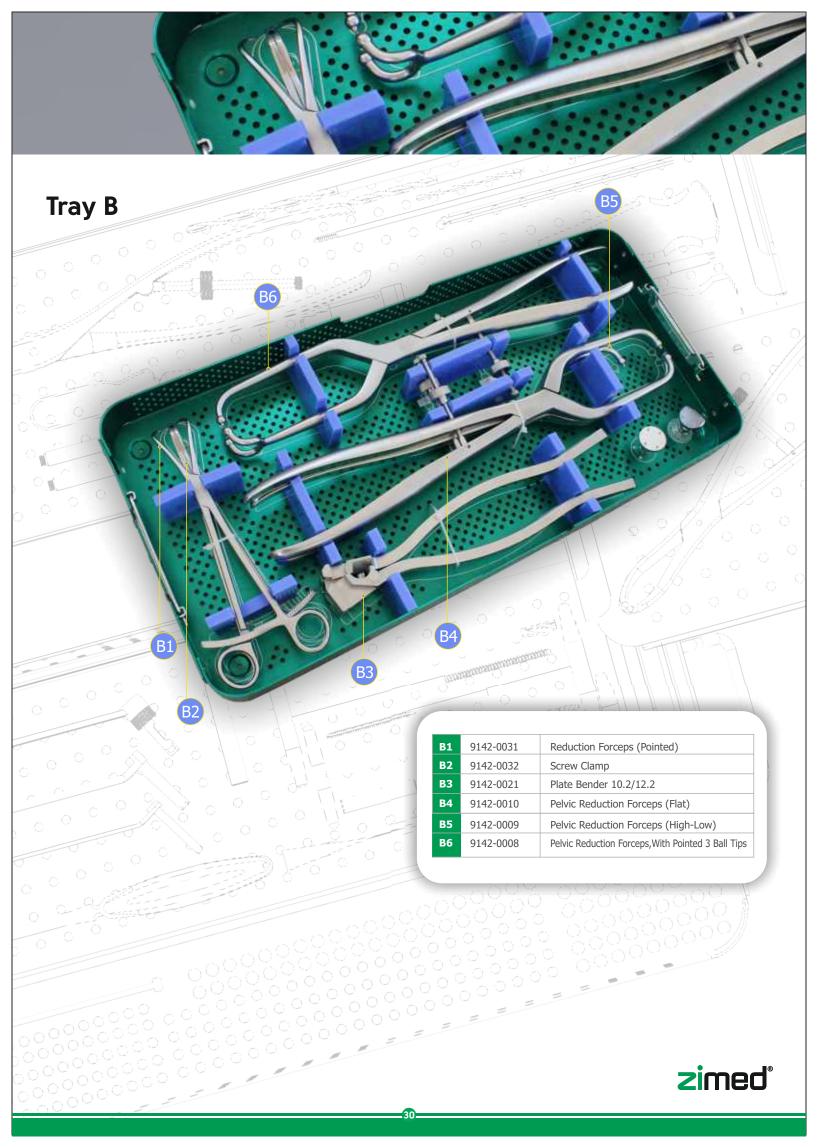
2.1.11.3. Drill

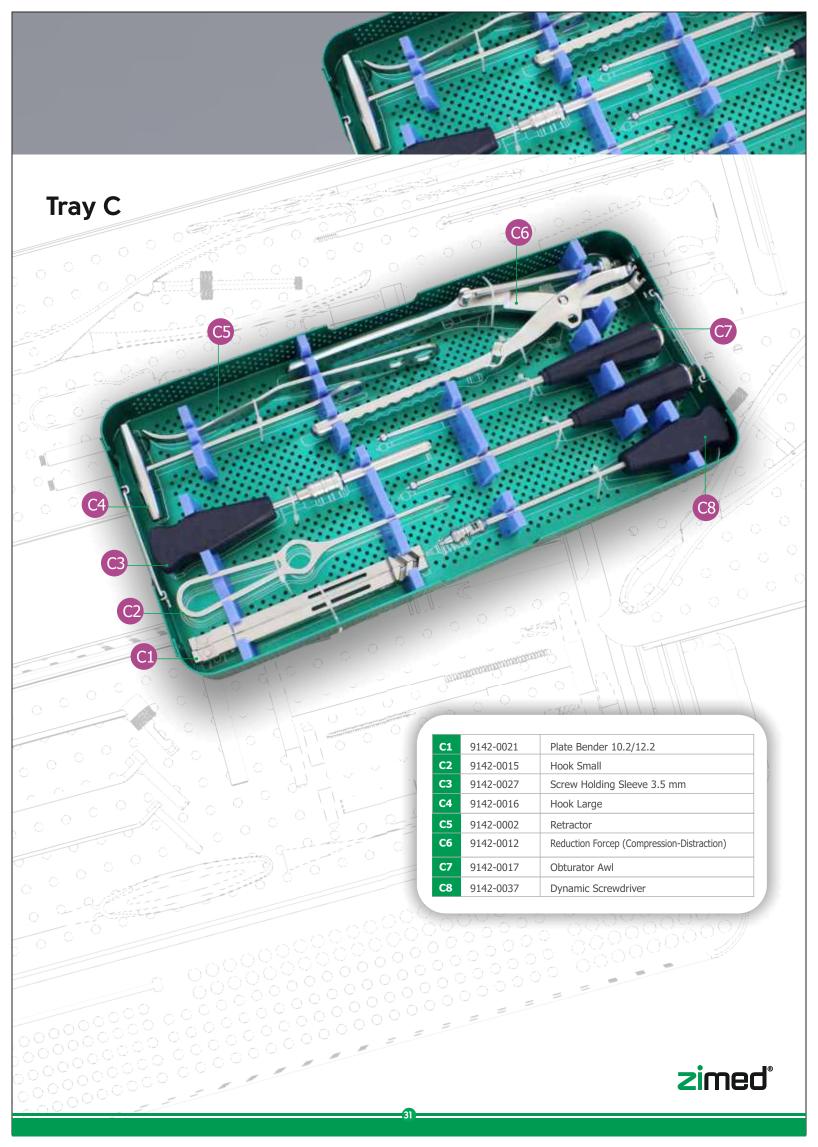
Drill for Ø3.5 cortical screw with flexible drill (D5) and drill guide (D17).



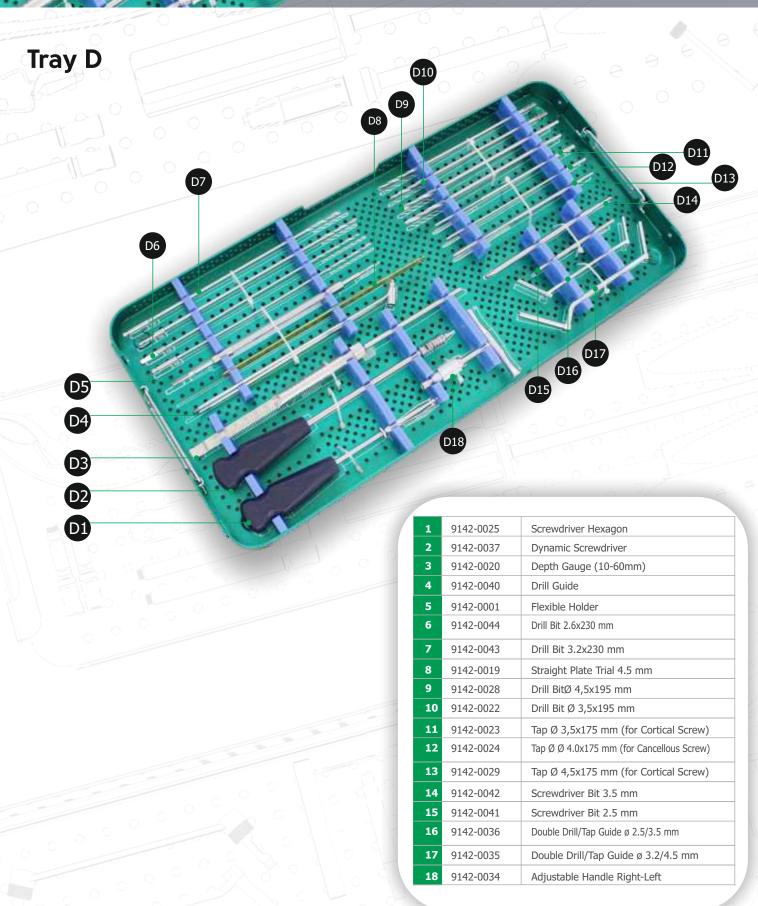








Instrument Set RECONSTRUCTION PLATE





4.1 DEVICE CLEANING CONDITIONS

Do not use metal brushes or rubbing pads during Decontamination of the tools should be performed immediately after the surgical procedure is completed. Contaminated tools must not be allowed to dry before reprocessing.

Excessive blood or debris must be removed in order to prevent the drying on the surface. All users must be qualified staff with documented evidence of training and competence. Training should include the current guidelines, standards and hospital policies. Even if they are made of high-grade stainless steel, the surgical tools must be thoroughly dried in order to prevent rust formation. Prior to sterilization, all the tools should be examined for the cleanliness of the lumens of the joints of the surfaces. manual cleaning process. Use cleaning agents with low-foam surfactant to be able to see the tools in the cleaning solution. Rinse the cleaning materials easily from the tool in order to prevent residue formation.

Mineral oil or silicon lubricants should not be used on Zimed tools. Neutral pH enzymatic and cleaning materials are recommended for cleaning the reusable instruments. It is very important to neutralize and rinse the alkaline cleaning materials thoroughly from the tools. Anodized aluminum should not contact with certain cleaning or disinfectant solutions. Avoid strong alkaline cleaners and disinfectants and solutions containing iodine, chlorine or certain metal salts.

4.1.1 Manual Cleaning/Disinfection

Prepare the enzymatic and cleaning materials at the dilution rates and temperatures as recommended by the manufacturer. New solutions should be prepared when the existing solutions are heavily contaminated. Place the tools in the enzymatic solution so that they are completely immersed. Operate all the movable parts so that the detergent contacts with all the surfaces.

Keep in the fluid for minimum 20 min. Use a nylon, soft-bristled brush to gently rub the tools until all visible debris is cleaned. Pay particular attention to the accessible areas and use a suitable bottle brush. In order to remove the dirt in the open springs, coils or flexible parts, wash the recesses with plenty of cleaning solution. Rub the surface with a scrubbing brush to remove all the visible dirt from the surface and the recesses. To ensure that all the recesses are cleaned, turn the component while rubbing. Remove the tools and rinse them for minimum 3 min. under running water. Pay particular attention to the cannulas and use a syringe to pass the fluid through the hard-to-reach areas. Place all the tools that are completely immersed in water, in an ultrasonic unit containing teh cleaning solution. Operate all the movable parts so that the detergent contacts with all the surfaces. Expose the tools to sonification process for minimum 10 min..

Remove the tools and rinse with deionized water for at least 3 minutes or unless all the blood or dirt traces are eliminated in the rinsing water. Examine the tools under normal light to verify that visible dirt is removed. If

visible dirt is present, repeat the above mentioned sonification procedure and the rinsing steps. Remove the excessive moisture on the tool with a clean, absorbent, lint-free cloth.

4.1.2 Combination Manual / Automated Cleaning and Disinfection

Prepare the enzymatic and cleaning materials at the dilution rates and temperatures as recommended by the manufacturer. New solutions should be prepared when the existing solutions are heavily contaminated. Place the tools in the enzymatic solution so that they are completely immersed. Operate all the movable parts so that the detergent contacts with all the surfaces. Keep in the fluid for minimum 10 min. Use a nylon, soft-bristled brush to gently rub the tools until all visible debris is cleaned. Pay particular attention to the accessible areas and use a suitable bottle brush. A sonicator will help to clean the instruments thoroughly. The use of a syringe or a water fountain will facilitate passing of the liquid from the low-spaced areas and difficult-to-access areas. Remove the tools from the enzyme solution and rinse them for minimum 1 min. under deionized water. Place the tools in a suitable washer / disinfector basket and perform a standard washer / disinfector cycle. Specific minimum parameters are essential for a complete cleaning and disinfection. These parameters are given in a below mentioned table.

4.1.3 Automated Cleaning and Disinfection

Automated washing / drying systems are not recommended as the only cleaning method for surgical tools. An automated system can be used as a follow-up operation after manual cleaning. To ensure an effective cleaning, tools must be thoroughly examined before sterilization. For detailed information on Washing and Disinfection see

Specific minimum parameters used for a complete cleaning and disinfection:

	Definition
1	Pre-washing for 2 minutes with cold tap water
2	enzyme sprey for 20 seconds with hot tap water
3	Immersion in enzyme after 1 minute
4	rinsing for 15 seconds with cold tap water (Should be repeated twice)
5	Washing with detergent for 2 minutes with hot tap water
6	rinsing for 15 seconds with hot tap water
7	Rinsing with 10 seconds with optional lubricated purified water
8	Drying for 7 minutes with hot air

Note: Follow the isntruction of the washer/disinfector manufacturer

■ Zimed Medical, as the manufacturer of this device, and their surgical consultants do not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and utilizing the appropriate techniques for implanting the device in each individual patient. Zimed and their surgical consultants are not responsible for selection of the appropriate surgical technique to be utilized for an individual patient.



