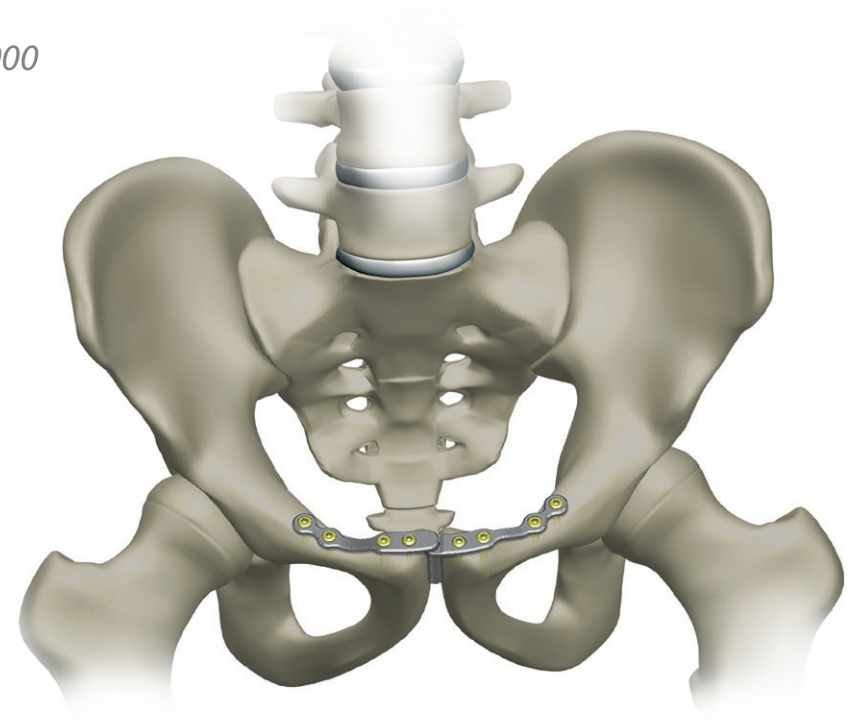
ChM®

STABILIZATION OF THE PUBIC SYMPHYSIS

- *IMPLANTS*
- *INSTRUMENT SET 40.5188.000*
- *SURGICAL TECHNIQUE*



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SYMBOLS DESCRIPTION

	Caution - pay attention to a special procedure.
	Perform the activity under X-Ray control.
	Information about the next stages of a procedure.
	Proceed to the next stage.
	Return to the specified stage and repeat the activity.

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The manufacturer reserves the right to introduce design changes.
Updated INSTRUCTIONS FOR USE are available at the following website: ifu.chm.eu

I. INTRODUCTION

Injured pelvic ring of type B and C resulting from trauma and single fracture of the pubic symphysis occurred during the birth require stabilization.
Stabilization of pubic symphysis in trauma cases is necessary in order to eliminate the rotational and vertical displacement of half of the pelvis as a result of sacroiliac joint ligaments rupture. [Fig. 1].

FIG. 1. Fracture of the pubic symphysis of type B1

The stabilization of sacroiliac joint is necessary in order to perform the fixation of pelvis while carrying stabilization of the pubic symphysis. Otherwise, secondary displacement of pelvis half and migration of implant may occur. [Fig. 2].

FIG. 2. Fracture of sacroiliac joint.

Both bones of the pelvis are connected by motionless amphiarthrosis, which gap filled with cartilage. The motion freedom of amphiarthrosis is controlled by ligaments. In the case of pelvic rupture fixation the three level biomechanical structure of pelvis loses its mobility. The patient may feel pain in the hip joint and cross-lumbar part of spine. Connected by metal constructions the pelvic joints continue to try to be free and as a result of millions of cycles of overloading they may be damaged which may lead to their displacement and migration.
Single, 2cm fracture of pubic symphysis occurred during the birth does not lead to serious consequences. Fractures over 2 cm can lead to so-called. *"duck walk"* and permanent pain of the sacroiliac joint.
Hence the main and basic indication for pubic symphysis stabilization is pelvic instability.
There are two methods of pubic symphysis stabilization with use of:

-rigid plate,
-movable plate *(hinged)*.

I.1. STABLIZATION WITH RIGID PLATES

For stabilization of pubic symphysis, reconstructive rigid plates, as curved and straight [Fig. 3- 4] ones may be used.

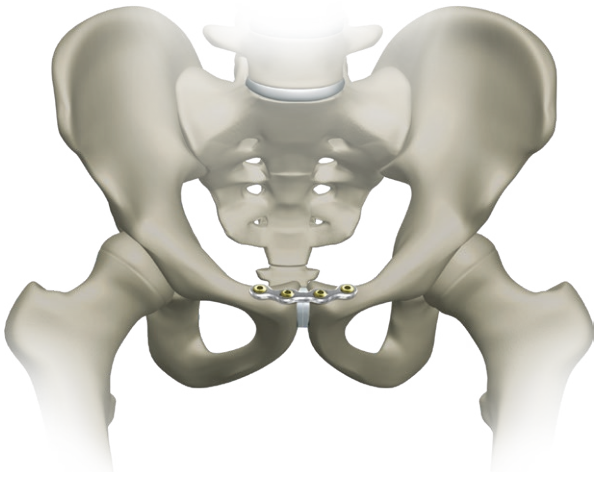


FIG. 3. Stabilization with reconstruction curved plate

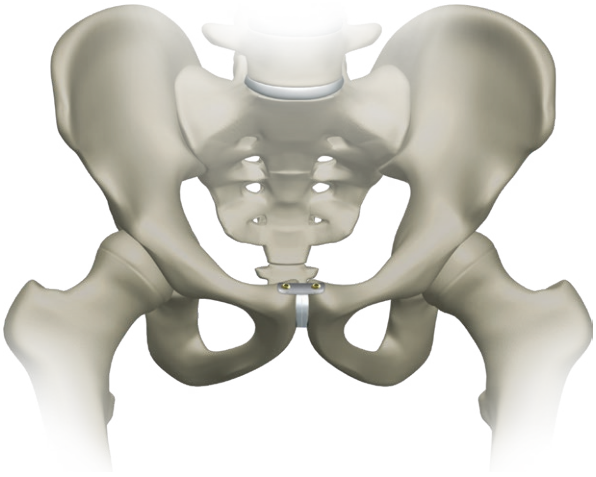


FIG. 4. Stabilization with straight plate

I.2. STABILIZATION WITH MOVABLE PLATE *(HINGED)*

To stabilize the pubic symphysis anatomically preshaped plates are used as they provide horizontal and vertically mirco-movements in the pubic symphysis area. There are left and right version of plates which by closing the hinge stabilize the damaged half of the pelvis. In case of single fracture of pubic symphysis requiring stabilization, the selection between female and male plate is not necessary [Fig. 5].

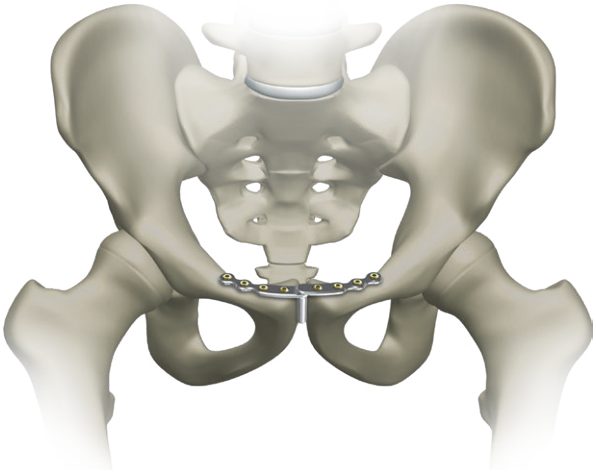


FIG. 5. Stabilization using the straight plates

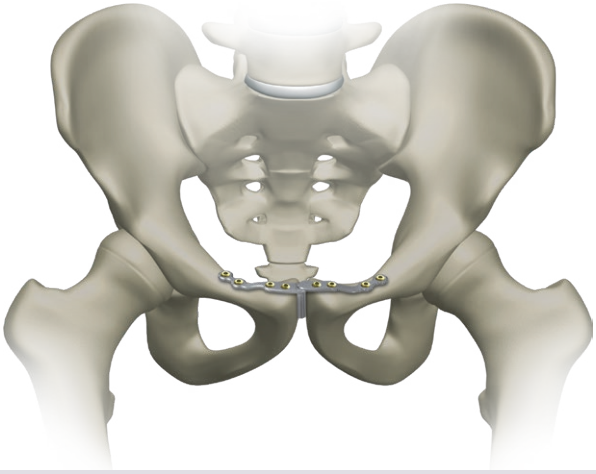
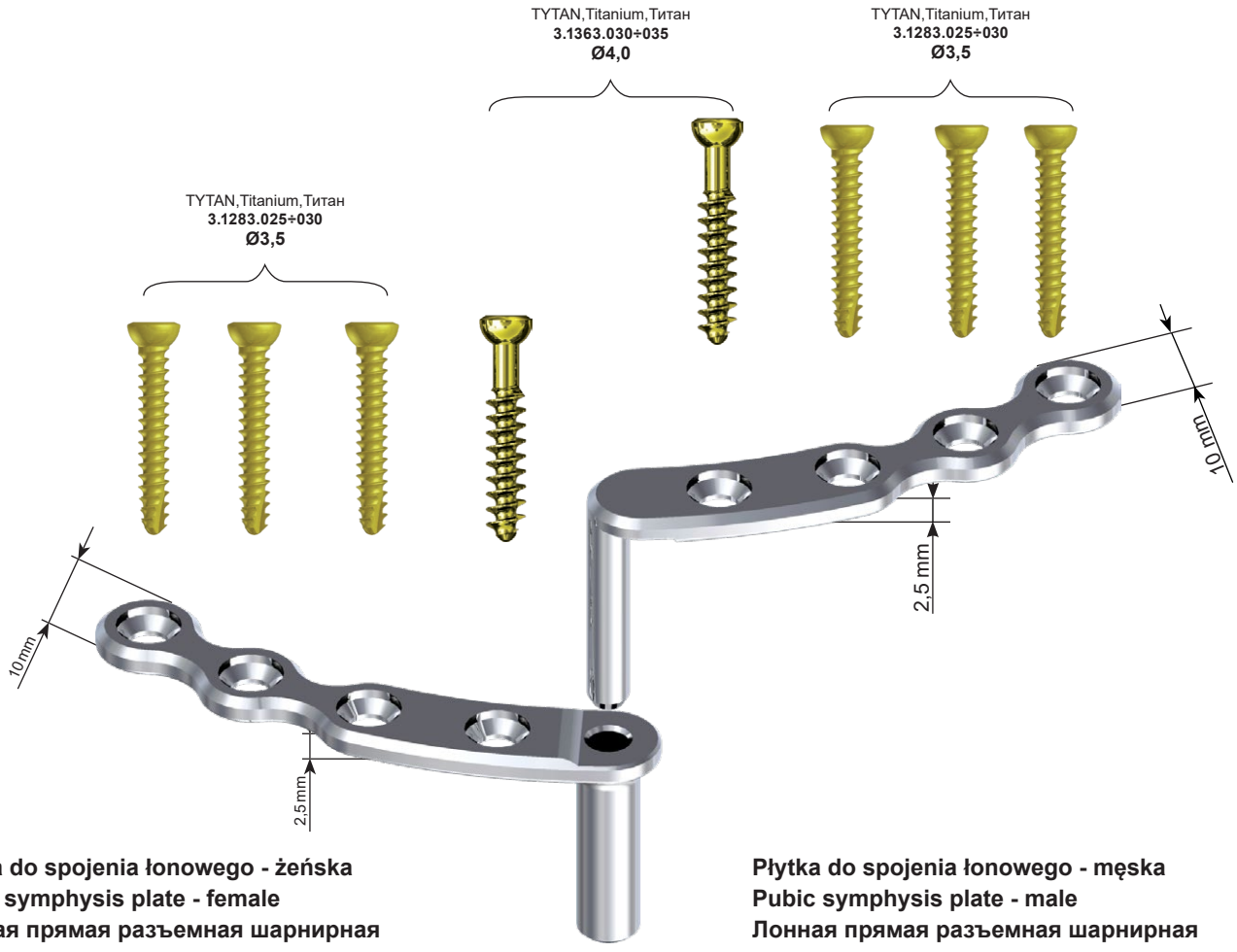


FIG. 6. Stabilization using the curved plates

II. IMPLANTS

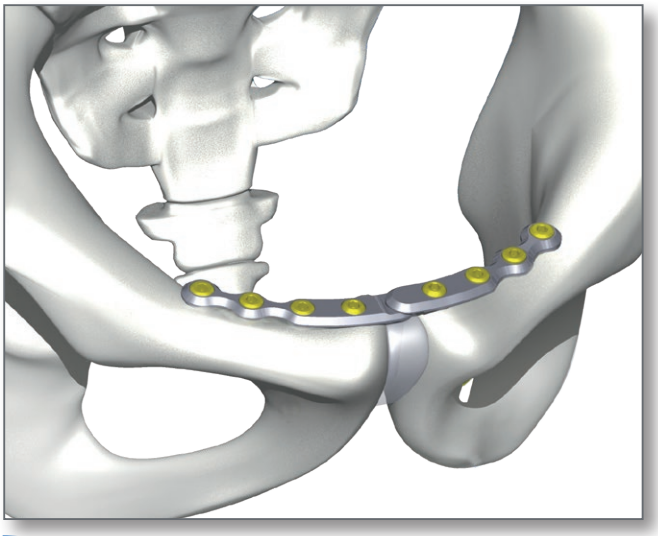


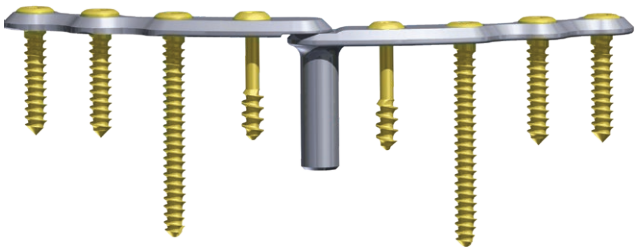
Płytka do spojenia łonowego - żeńska
Pubic symphysis plate - female
Лонная прямая разъемная шарнирная пластина - женская

	Otwory, Holes, Отверстия	Nr katalogowy, Catalogue no., № по кат.
		Stop kobaltu, Cobalt alloy, Сплав кобальта
Prawa, Right, Правая	3	4.3187.003
	4	4.3187.004
Lewa, Left, Левая	3	4.3185.003
	4	4.3185.004

Płytka do spojenia łonowego - męska
Pubic symphysis plate - male
Лонная прямая разъемная шарнирная пластина - мужская

	Otwory, Holes, Отверстия	Nr katalogowy, Catalogue no., № по кат.
		Stop kobaltu, Cobalt alloy, Сплав кобальта
Prawa, Right, Правая	3	4.3184.003
	4	4.3184.004
Lewa, Left, Левая	3	4.3186.003
	4	4.3186.004





The plates can be matched as follows:
- left male **[4.3186]** and right female **[4.3187]**,
- right male **[4.3184]** and left female **[4.3185]**.

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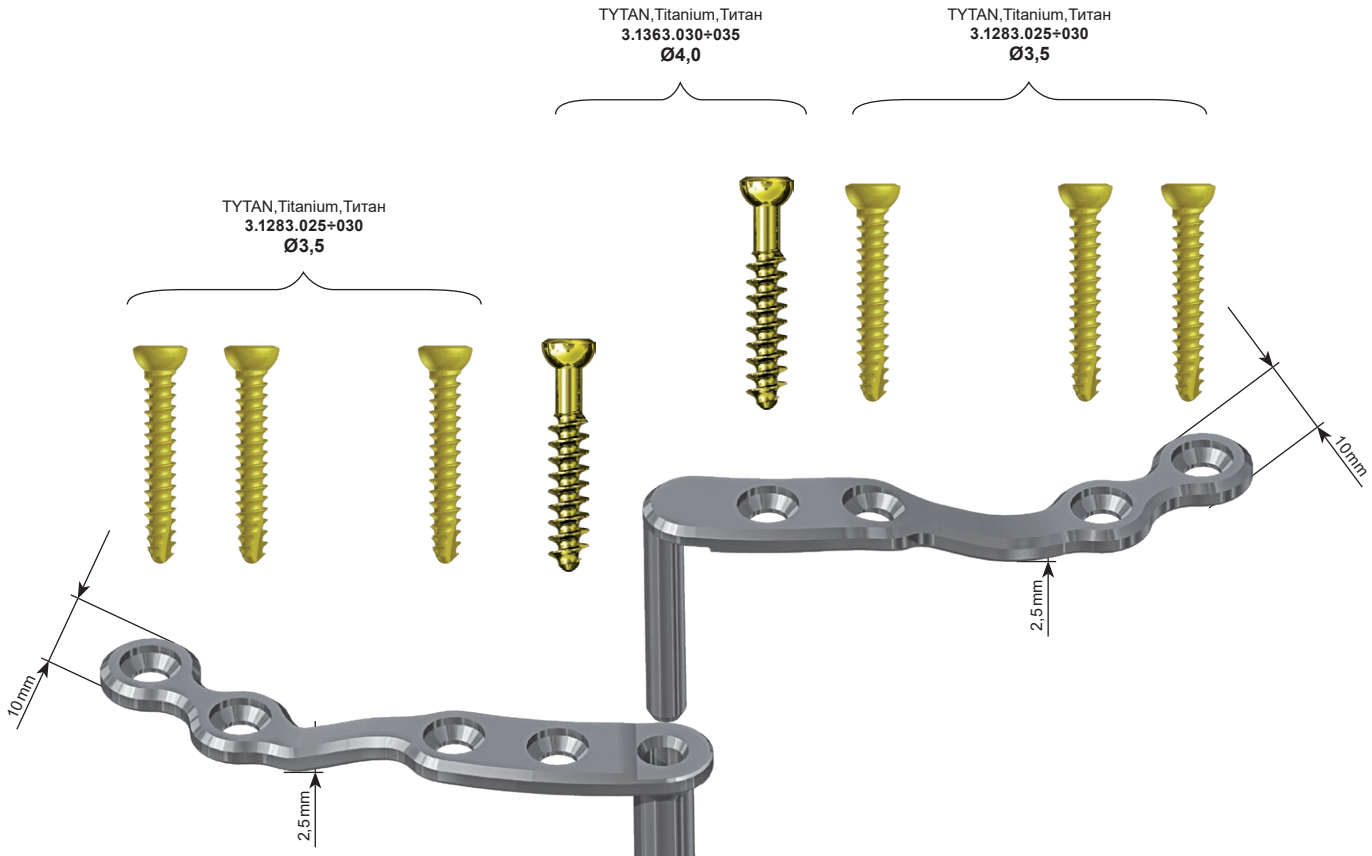
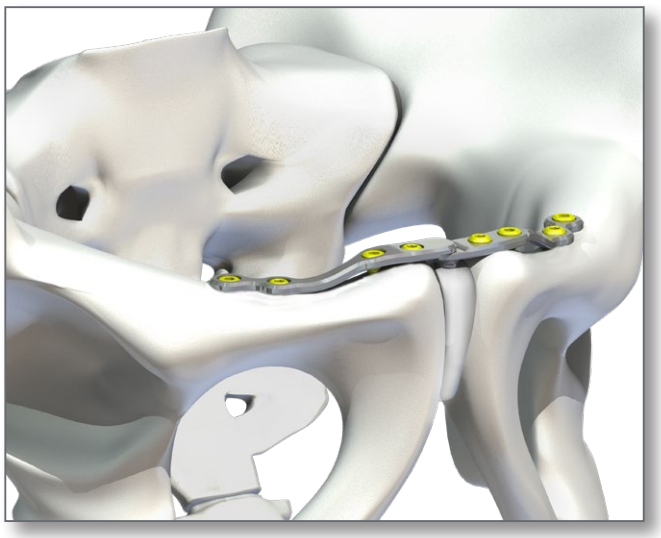


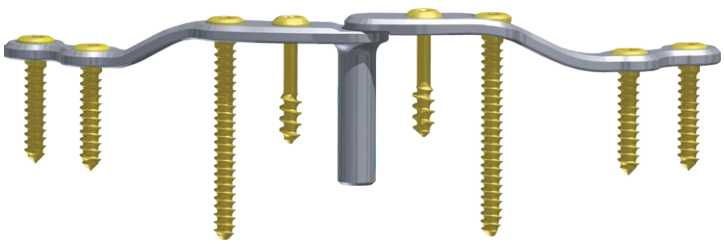
Płytka do spojenia łonowego - żeńska
Pubic symphysis plate - female
Лонная анатомически предизогнутая разъемная шарнирная пластина -женская

	Otwory, Holes, Отверстия	Nr katalogowy, Catalogue no., № по кат.
		Stop kobaltu, Cobalt alloy, Сплав кобальта
Prawa, Right, Правая	3	4.3187.103
	4	4.3187.104
Lewa, Left, Левая	3	4.3185.103
	4	4.3185.104

Płytka do spojenia łonowego - męska
Pubic symphysis plate - male
Лонная анатомически предизогнутая разъемная шарнирная пластина -мужская

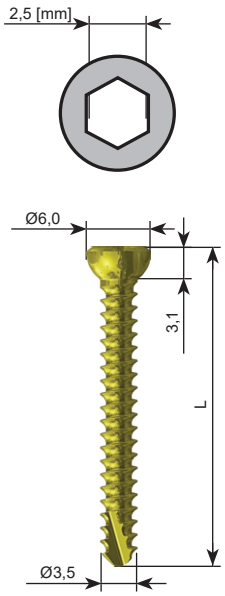
	Otwory, Holes, Отверстия	Nr katalogowy, Catalogue no., № по кат.
		Stop kobaltu, Cobalt alloy, Сплав кобальта
Prawa, Right, Правая	3	4.3184.103
	4	4.3184.104
Lewa, Left, Левая	3	4.3186.103
	4	4.3186.104





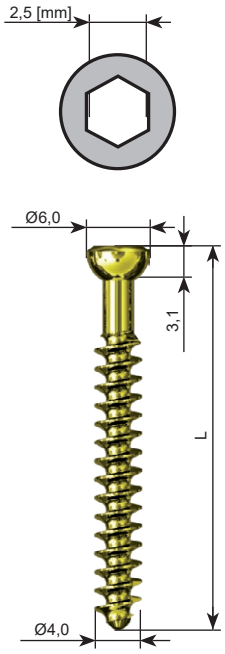
The plates can be matched as follows:
- left male **[4.3186.10x]** and right female **[4.3187.10x]**,
- right male **[4.3184.10x]** and left female **[4.3185.10x]**.

Wkręt korowy samogwintującyØ 3,5
Cortical self - tapping screw 3.5
Винт кортикальный самонарезающий 3,5



	L [mm]	Nr katalogowy, Catalogue no., № по кат.	
		Stal, Steel, Сталь	Tytan, Titanium, Титан
	10	1.1283.010	3.1283.010
	12	1.1283.012	3.1283.012
	14	1.1283.014	3.1283.014
	16	1.1283.016	3.1283.016
	18	1.1283.018	3.1283.018
	20	1.1283.020	3.1283.020
	22	1.1283.022	3.1283.022
	24	1.1283.024	3.1283.024
	26	1.1283.026	3.1283.026
	28	1.1283.028	3.1283.028
	30	1.1283.030	3.1283.030
	32	1.1283.032	3.1283.032
	34	1.1283.034	3.1283.034
	36	1.1283.036	3.1283.036
	38	1.1283.038	3.1283.038
	40	1.1283.040	3.1283.040
	45	1.1283.045	3.1283.045
	50	1.1283.050	3.1283.050
	55	1.1283.055	3.1283.055
	60	1.1283.060	3.1283.060
	65	1.1283.065	3.1283.065
	70	1.1283.070	3.1283.070
	75	1.1283.075	3.1283.075
	80	1.1283.080	3.1283.080
	85	1.1283.085	3.1283.085
	90	1.1283.090	3.1283.090
	95	1.1283.095	3.1283.095
	100	1.1283.100	3.1283.100
	105	1.1283.105	3.1283.105
	110	1.1283.110	3.1283.110

Wkręt gąbczasty samogwintującyØ 4,0
Cancellous self - tapping screw 4.0
Винт спонгиозный самонарезающий 4,0



	L [mm]	Nr katalogowy, Catalogue no., № по кат.	
		Stal, Steel, Сталь	Tytan, Titanium, Титан
	18	1.1363.018	3.1363.018
	20	1.1363.020	3.1363.020
	22	1.1363.022	3.1363.022
	24	1.1363.024	3.1363.024
	26	1.1363.026	3.1363.026
	28	1.1363.028	3.1363.028
	30	1.1363.030	3.1363.030
	35	1.1363.035	3.1363.035
	40	1.1363.040	3.1363.040
	45	1.1363.045	3.1363.045
	50	1.1363.050	3.1363.050
	55	1.1363.055	3.1363.055
	60	1.1363.060	3.1363.060

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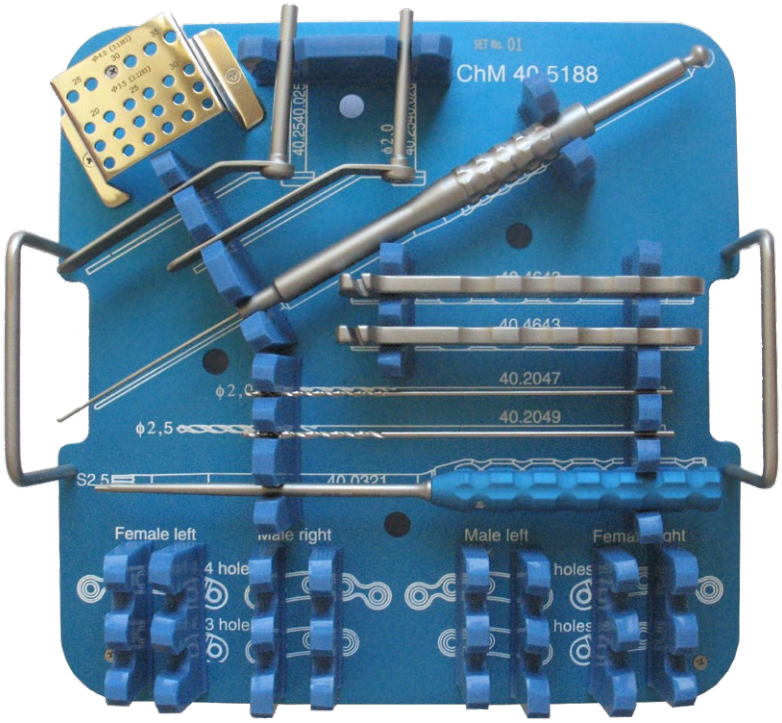
III. INSTRUMENT SET

The instruments sets **[40.5188.000]** shall be used to stabilize the pubis symphysis area. Medical devices are placed in the stand **[40.5189]** and then in the container to carry out the sterilization.

Lp.	Nr katalogowy Catalogue no. № по кат.	Nazwa	Name	Название	Szt.
1	40.0321.000	Wkrętak sześciokątny S2,5	Hexagonal screwdriver S2.5	Отвертка под шестигранник S2,5	1
2	40.2047.000	Wiertło 2,0/150	Drill 2.0/150	Сверло 2,0/150	1
3	40.2049.000	Wiertło 2,5/150	Drill 2.5/150	Сверло 2,0/150	1
4	40.2540.020	Prowadnica wiertła 2,0	Drill guide 2.0	Сверло-втулка 2,0	1
5	40.2540.025	Prowadnica wiertła 2,5	Drill guide 2.5	Сверло-втулка 2,5	1
6	40.2667.000	Miarka głębokości otworów	Hole depth measure	Измеритель глубины отверстий	1
7	40.4643.000	Wyginak płytek 4,0	Plates bender 4.0	Выгибатель пластин 4,0	2
8	40.5189.000	Statyw	Stand	Поднос	1
9		Puszka	Tin	Бикс	1



40.5188.000

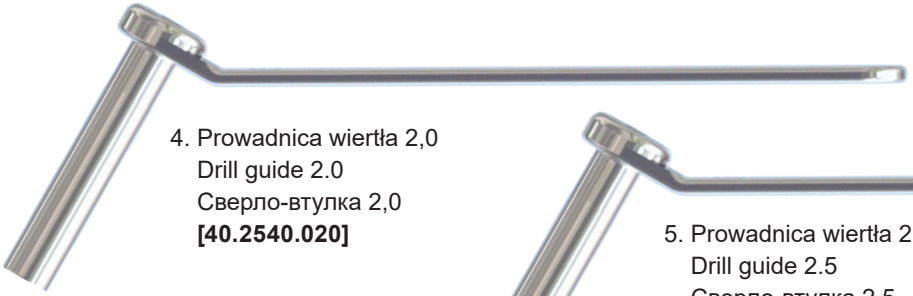
In addition, to perform the surgery following devices are necessary:

- reposition forceps,
- basic sets of orthopedic power devices,
- fluoroscope.

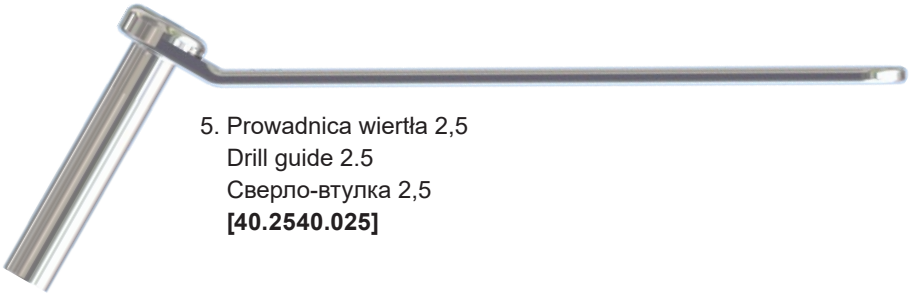
1. Wkrętak sześciokątny S2,5
   Hexagonal screwdriver S2,5
   Отвертка под шестигранник S2,5
   [40.0321.000]

2. Wiertło 2,0/150
   Drill 2.0/150
   Сверло 2,0/150
   [40.2047.000]

3. Wiertło 2,5/150
   Drill 2.5/150
   Сверло 2,5/150
   [40.2049.000]



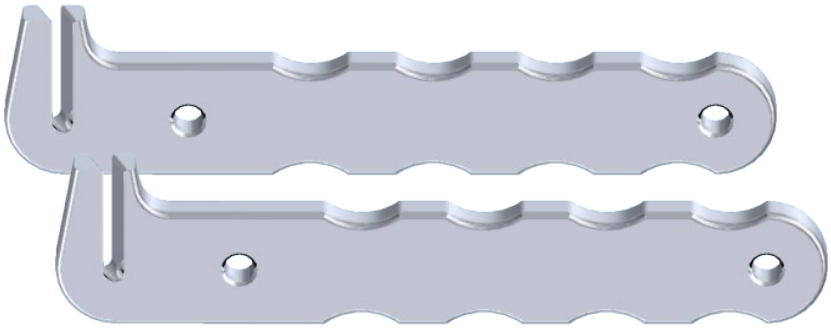
4. Prowadnica wiertła 2,0
   Drill guide 2.0
   Сверло-втулка 2,0
   [40.2540.020]



5. Prowadnica wiertła 2,5
   Drill guide 2.5
   Сверло-втулка 2,5
   [40.2540.025]

6. Miarka głębokości otworów
   Hole depth measure
   Измеритель глубины отверстий
   [40.2667.000]

7. Wyginak płytek 4,0
   Plates bender 4.0
   Выгибатель пластин 4,0
   [40.4643.000]



9. Puszka
   Tin
   Бикс

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IV. SURGICAL TECHNIQUE

IV.1. INTRODUCTION

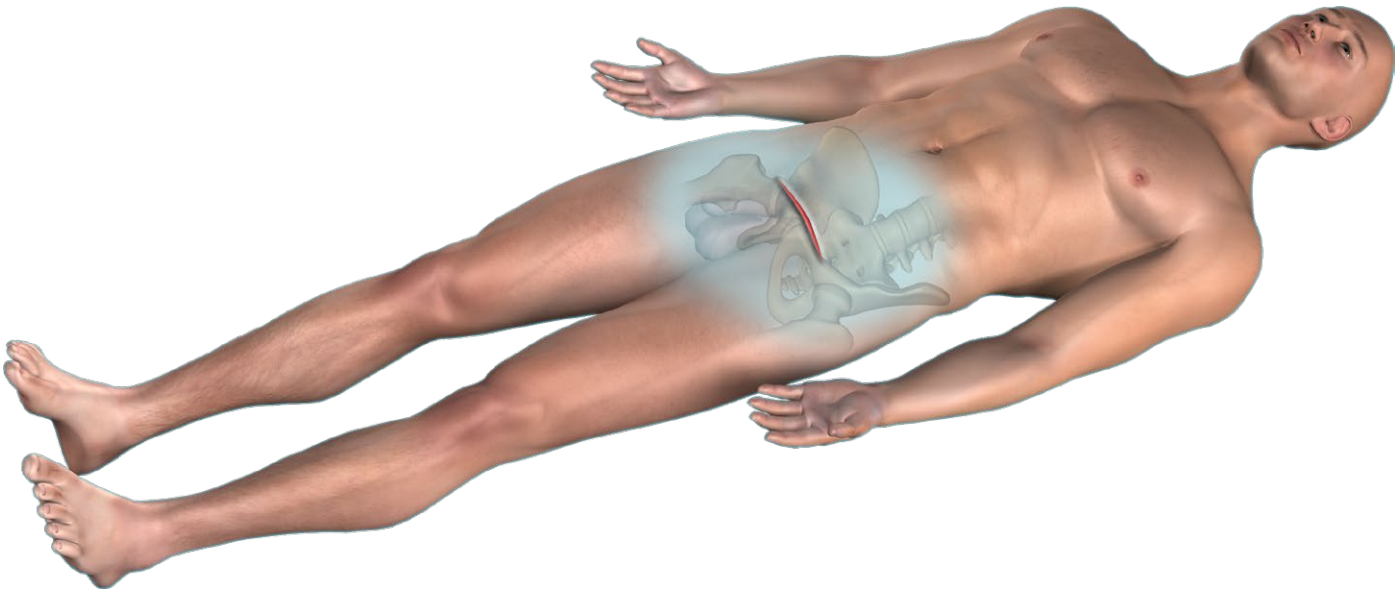
Each stabilization treatment is to be properly planned.

Appropriate bone plates used for stabilization shall be selected by the surgeron. Surgical treatment should not cause urological and sexual complications, and should have minimum amount of pain and scarring.

This Surgical Technique describes stabilization of the pubic symphysis.

IV.2. SURGICAL APPROACH

The patient shall be placed in the supine position on the orthopedic X-Ray table. The catheterization of the bladder is recommended.

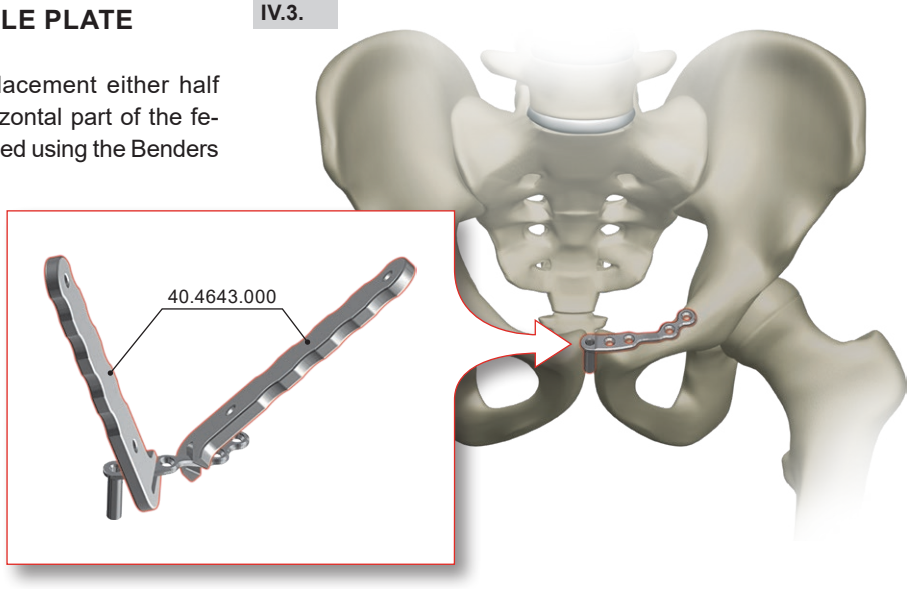


Surgical approach shall be performed by the linear suprapubic skin incision for length of 10 cm.. After cutting the aponeurosis of m.obliqus ext. abdominis, for male patient two sides of Funiculus Spermaticus shall be visualized, and then separated from the surrounding tissues. The extension of aponeurosis of m.rectus abdominis is Lig. Fundiformis penis, which shall be cut *(preliminary suturing easy its reconstruction after the surgery)*. After exposing the pubic branches, separate using the scalpel fixed fibers m. Pyramidalis with periosteum. The symphysis is in full visualization. The protectors shall be used to prevent bladder damage.

IV.3. PREPARATION OF THE FEMALE PLATE

The size of the parting and upward displacement either half of the pelvis shall be determined. The horizontal part of the female half of plate, *„mother"* shall be pre-bended using the Benders and placed on the displaced half of the symphysis pubis in accordance with the anatomical construction of the pubic branches.

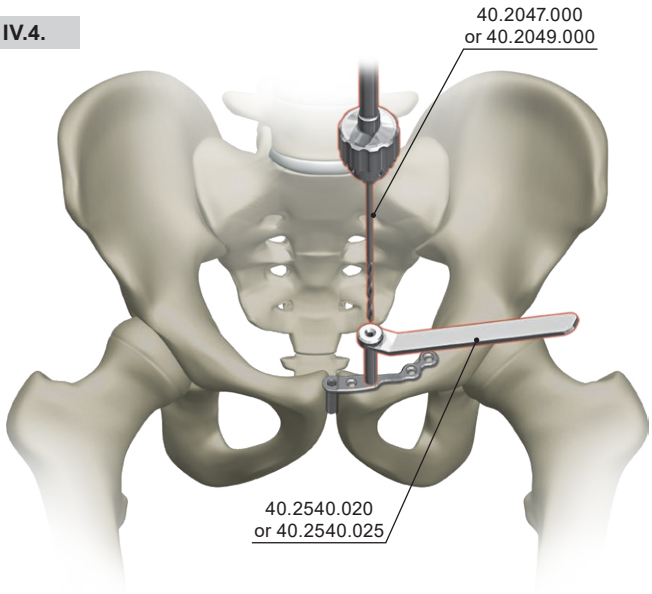
IV.3.



IV.4. DRILLING THE SCREW HOLES

Taking into account the vertical slope of the pubic branches, the proper holes for Screws shall be drilled: closer to pelvis locate the Cancellous Screw 4.0 **[3.1363]** *(with the Drill Guide 2.0 [40.2540.020] and the Drill 2.0 [40.2047.000])*; and then the Cortical Screws 3.5 **[3.1283]** *(with the Guide Drill 2.5 [40.2540.025] and the Drill 2.5 [40.2049.000])*.

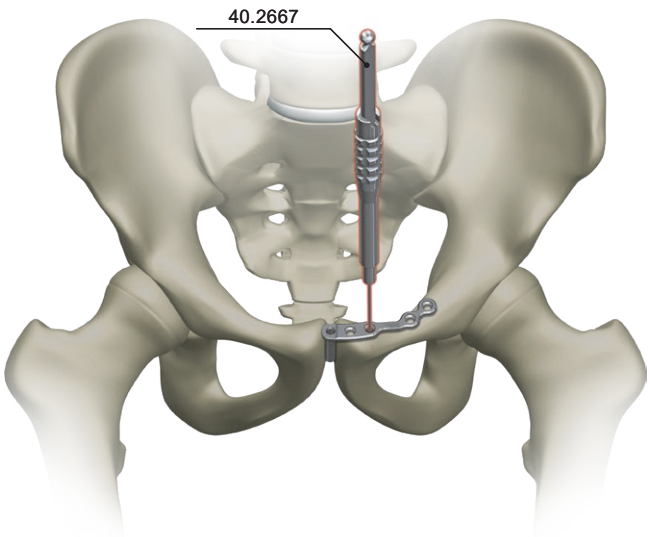
IV.4.



IV.5. MEASURING OF THE HOLE DEPTH AND SELECTION OF THE SCREW

After drilling the screw holes, using the Hole Depth Measure **[40.2667]** define their depth in order to select proper Screws for each hole.

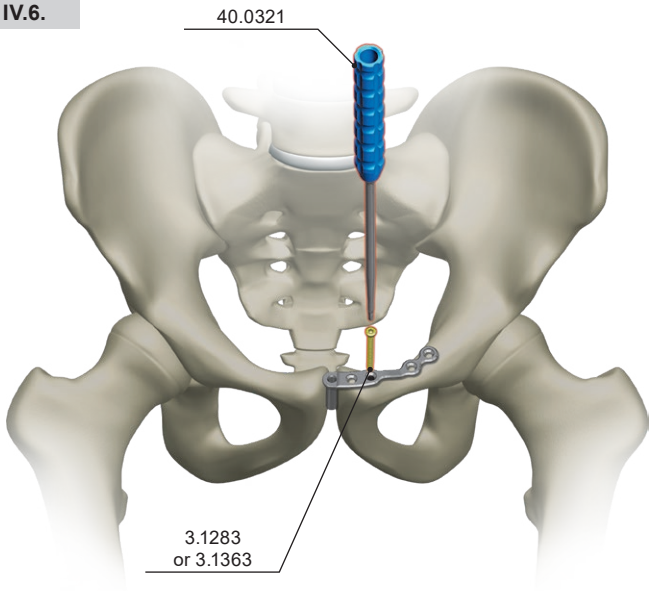
IV.5.



IV.6. INSERTION OF SCREWS LOCKING THE FEMALE PLATE

Use selected screws **[3.1283]** or **[3.1363]**, to lock the plate into the bone using the Hexagonal Screwdriver S2.5 **[40.0321]**.

IV.6.

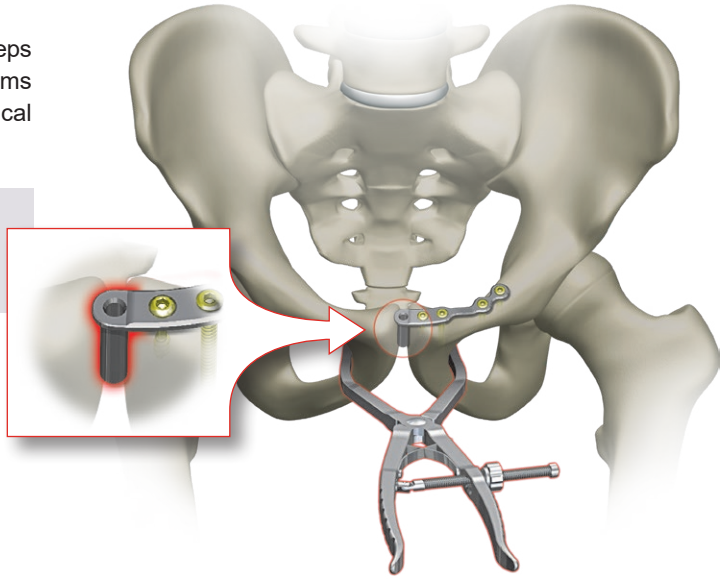


IV.7. REPOSITIONING OF THE PUBIS SYMPHYSIS

Repositioning of the pubic symphysis shall be done by the Forceps *(device not included in the Instrument Set [40.5188])*. The arms of Forceps shall be mounted with the pressure on the vertical pubic branches.

Cylindrical part of female plate shall stay between the bones of pubic symphysis in cartilage area creating a natural distance which was previously formed by cartilage.

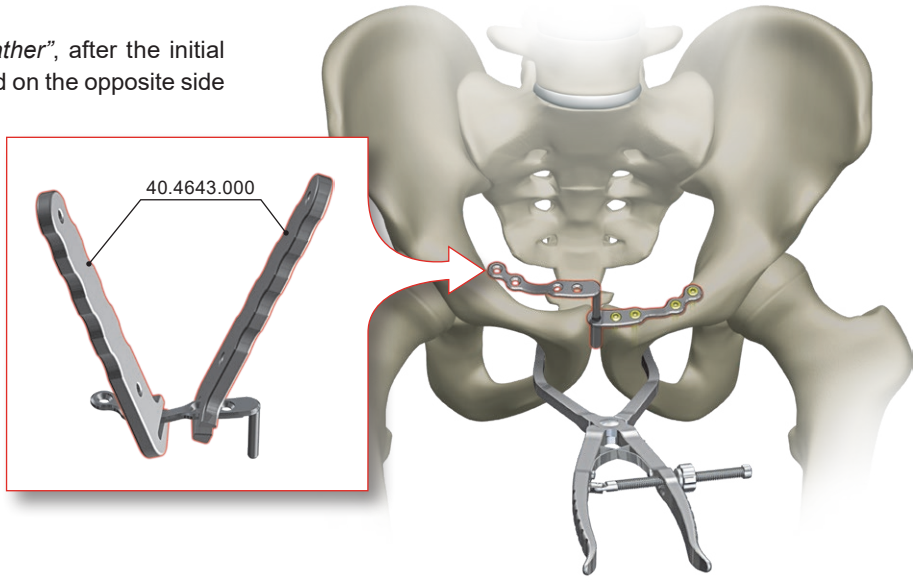
IV.7.



IV.8. PREPARATION OF THE MALE PLATE

Second half of the plate- its male part *„father"*, after the initial matching its horizontal part, shall be placed on the opposite side of the pubic symphysis locking with the vertical sleeve the female part of the plate. This prevents further movement of the unstable part of pelvis. The plate can be additional formed with the Plate Bender 4.0 **[40.4643.000]**.

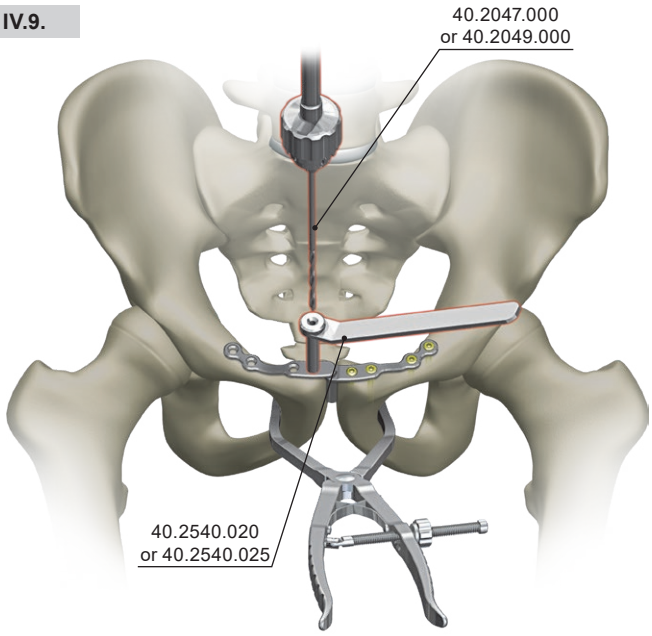
IV.8.



IV.9. DRILLING THE SCREW HOLES

Taking into account the vertical slope of the pubic branches, the proper holes for Screws shall be drilled: closer to pelvis locate the Cancellous Screw 4.0 **[3.1363]** *(with the Drill Guide 2.0 [40.2540.020] and the Drill 2.0 [40.2047.000])*; and then the Cortical Screws 3.5 **[3.1283]** *(with the Guide Drill 2.5 [40.2540.025] and the Drill 2.5 [40.2049.000])*.

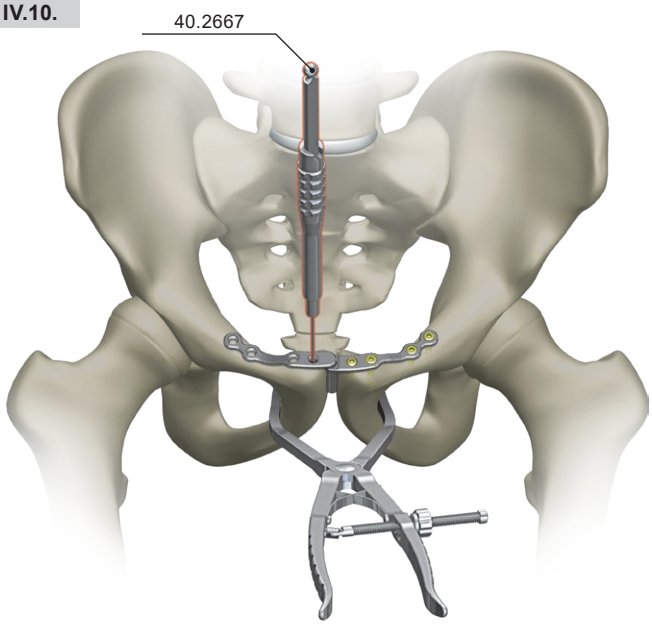
IV.9.



IV.10. MEASURING OF THE HOLE DEPTH AND SELECTION OF THE SCREW

After dirilling the screw holes, using the Hole Depth Measure **[40.2667]**define their depth in order to select proper Screws for each hole.

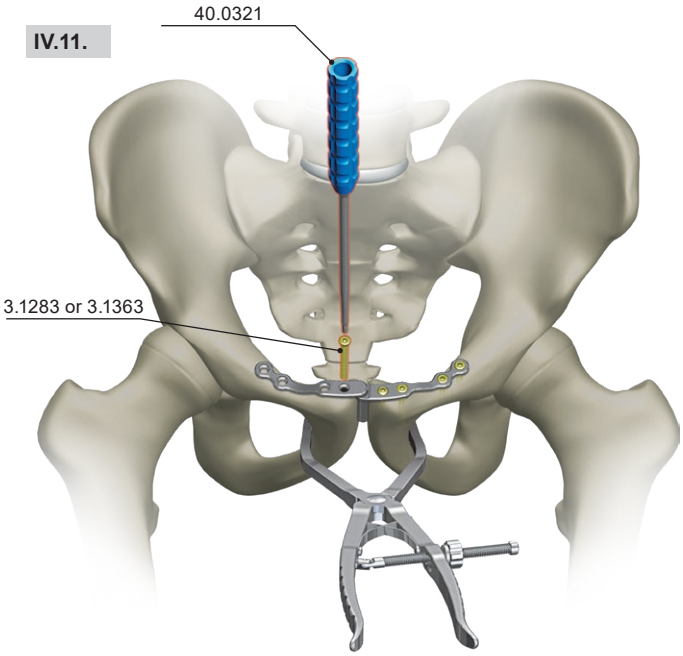
IV.10.



IV.11. INSERTION OF SCREWS LOCKING THE MALE PLATE

Use selected Screws **[3.1283]** or **[3.1363]**, to lock the plate into the bone using the Hexagonal Screwdriver S2.5 **[40.0321]**. The insertion of the screws into the plate shall be started from a distal hole thus facilitating close contact plate and the pubic bone.

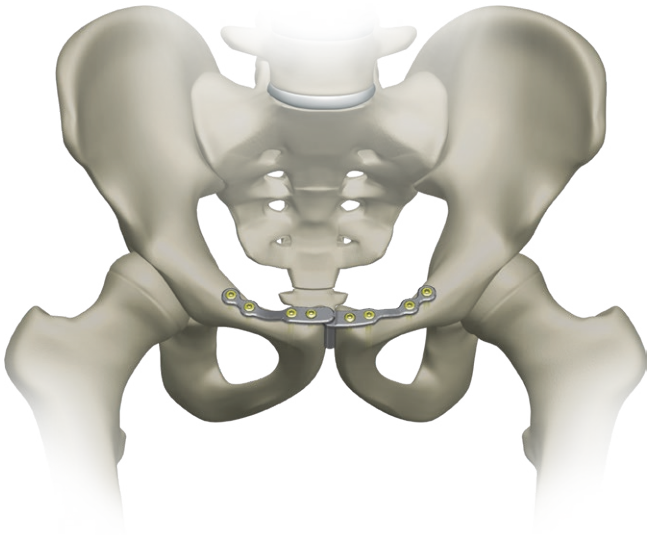
IV.11.



IV.12. CHECKING THE CORRECTNESS OF THE STABILIZATION

Fluoroscopic control of repositioning and location of the plate shall be performed before closure of surgical wound.

IV.12.



IV.13. STABILIZATION OF THE FRACTURE TYPE B2-3, C1

For fractures type B2-3, C1, it is necessary to stabilize the posterior half-ring of the pelvic on the side of the sacroiliac joint. Stabilization may be performed by percutaneous method for Cannulated Cancellous Screws 6.5 by inserting by back to front and outside to inside. The surgery shall be performed with patient placed on the opposite side at 45 degees of forward trunk inclination. Such position enables drilling the canal and save insertion of the screws into the mass of sacrum.

FIG. 7. Radiograph of the pelvis after stabilization of the pubis symphysis and sacro-iliac joint

IV.14. POST-OPERATIVE REHABILITATION

The patient does not require external immobilization, and can start walking with the aid of crutches on the second day after surgery but shall not overload the fixed pelvis. X-Ray control is required within 6 weeks after surgery. In case of lack of patient's complaints and the proper alignment of the pubic symphysis and the connecting cartilage, it is recommended to walk with full load.

The above description is not detailed instruction of conduct. The surgeon decides about choosing the operating procedure.

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