

# Kirschner Wires and Cerclage Wires.

Multifunctional devices for temporary fixation, tension band, cerclage wiring and percutaneous pinning.

Surgical Technique



This publication is not intended for distribution in the USA.

Instruments and implants approved by the AO Foundation.



---

#### Image intensifier control

This description alone does not provide sufficient background for direct use of the instrument set. Instruction by a surgeon experienced in handling these instruments is highly recommended.

#### **Processing, Reprocessing, Care and Maintenance**

For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:

<http://emea.depuyorthos.com/hcp/reprocessing-care-maintenance>

For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE\_023827) or refer to:

<http://emea.depuyorthos.com/hcp/reprocessing-care-maintenance>

# Table of Contents

---

<b>Introduction</b>	Indications and Contraindications	2
<hr/>		
<b>Quick Steps</b>	Quick Step Cerclage Wiring Technique	3
	Quick Step Percutaneous Pinning	5
<hr/>		
<b>Implants</b>	Overview Kirschner Wire Tip Designs and Cerclage Wire Implants	6
<hr/>		
<b>MRI Information</b>		14

# Indications and Contraindications

---

## **Wires**

### **Indications:**

Wire implants are indicated for a wide range of orthopedic trauma applications including:

- Stand-alone device for fracture fixation
- Fracture fixation in conjunction use with other fixation systems

### **Cerclage wires**

#### **Indications:**

- Orthopedic trauma surgery (incl. periprosthetic fractures, femur fractures, olecranon fractures, patella fractures, humerus and ankle fractures)
- Acromioclavicular dislocation
- Hip and acetabular fractures
- Prophylactic banding in total joint replacements
- Temporary fixation during open reductions
- Reattachment of the greater trochanter following osteotomy in total hip arthroplasty or fractures

# Quick Step Cerclage Wiring Technique\*

---

**Note:** The wire implants are multifunctional devices. The following techniques describe two possible applications of the wire implants.

---

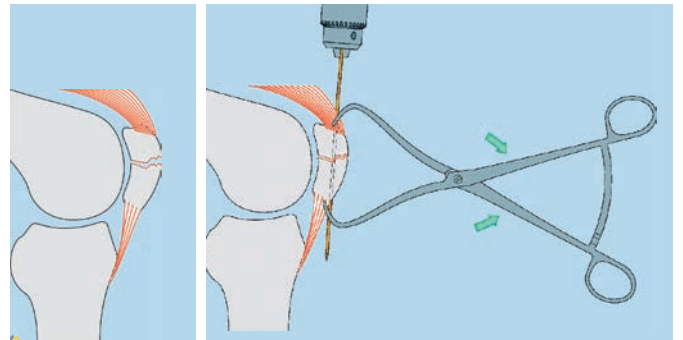
The following section describes step by step the surgical technique for treatment of a 45° transverse fracture with the cerclage wiring.

---

## 1

### Reduce fracture

Reduce fracture with large reduction forceps with points. Preliminary fix it with two parallel 1.6- to 2.0-mm Kirschner wires.



\* Images © AO Publishing, Switzerland  
Credit: Rüedi TP, Buckley RE, Moran CG. AO Principles of Fracture Management.  
Second expanded edition. Stuttgart and New York: Georg Thieme. 2007.

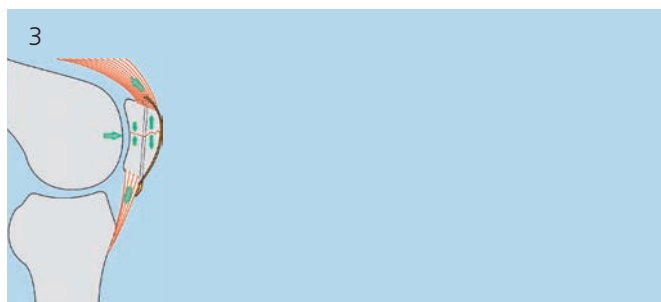
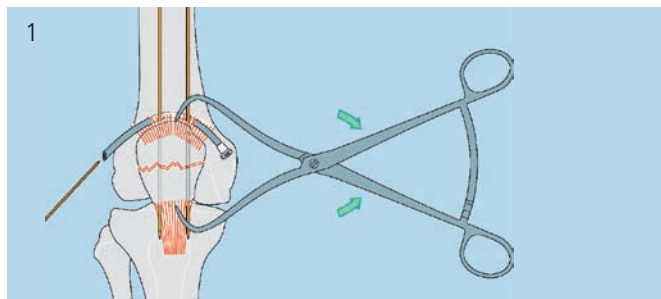
## 2

### Insert cerclage wires

Pass the cerclage wires through the ligamentous structures and around the Kirschner wires close to the bone. To do so, it may be helpful to use a curved large bore needle or cannula. (1)

The cerclage wire should lie anteriorly to the patella so as to act as a tension band. (2)

A circular wire is preferable to a figure-of-eight. The lateral view demonstrates the tension band principle, where by flexing the knee, tensile forces are converted into compressive ones (arrows). (3)



## 3

### Implant removal

In case the physician decides to remove the implants, implants can be removed by using general surgical instruments.

# Quick Step Percutaneous Pinning\*

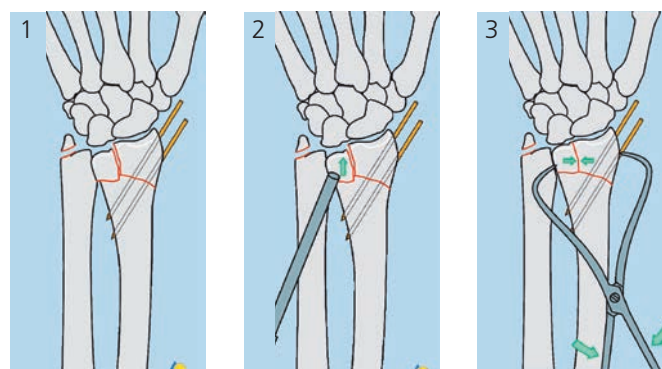
If closed or percutaneous reduction is possible and low forces exist like in upper extremity, the fracture may be stabilized with percutaneous pinning.

The following section describes step by step the percutaneous reduction and Kirschner wire fixation for the treatment of a C1 distal radius fracture.

## 1 Reduce fracture

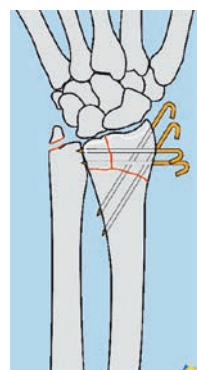
Fragments that can be easily reduced can be fixed by percutaneous pinning. (1)

Certain fragments need to be reduced with the help of an awl or a periosteal elevator through a small skin incision with a minimum of soft-tissue dissection. (2, 3)



## 2 Perform percutaneous pinning

If the fragment is correctly reduced, perform percutaneous pinning.



## 3 Implant removal

In case the physician decides to remove the implants, implants can be removed by using general surgical instruments.

\* Images © AO Publishing, Switzerland  
Credit: Rüedi TP, Buckley RE, Moran CG. AO Principles of Fracture Management.  
Second expanded edition. Stuttgart and New York: Georg Thieme. 2007.

# Overview Kirschner Wire Tip Designs and Cerclage Wire Implants

## Kirschner wires

Double tip (on both ends)



Trocar



Threaded

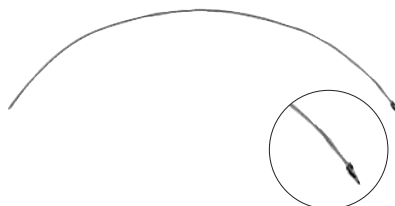


## Cerclage wires

Cerclage



Cerclage with eye



Coil with cerclage



## Implants

### Cerclage Wires, Stainless Steel

Art. No	Ø	Length	Package unit
291.220.10*	0.4 mm	150 mm	10
291.240.10*	0.6 mm	175 mm	10
291.260.10*	0.8 mm	200 mm	10
291.270.10*	1.0 mm	250 mm	10
291.280.10*	1.25 mm	300 mm	10



### Cerclage Wires with Eye, Stainless Steel

Art. No	Ø	Length	Package unit
291.080.10*	0.8 mm	280 mm	10
291.010.10*	1.0 mm	280 mm	10
291.030.10*	1.0 mm	600 mm	10
291.020.10*	1.25 mm	280 mm	10
291.040.10*	1.25 mm	600 mm	10
291.110.10*	1.5 mm	280 mm	10
291.120.10*	1.5 mm	600 mm	10



### Coil with Cerclage Wire, Stainless Steel

Art. No	Ø	Length	Package unit
291.044	0.4 mm	8 m	1
291.070	0.6 mm	8 m	1
291.090	0.8 mm	10 m	1
291.050	1.0 mm	10 m	1
291.060	1.25 mm	10 m	1
291.130	1.5 mm	10 m	1



\* For single Kirschner wires order XXX.XXX.01 instead of XXX.XXX.10.



**Guide Wire with threaded tip with trocar,  
Stainless Steel**

Art. No	∅	Length	Package unit	Tip
292.655	1.6 mm	410 mm	1	Threaded with trocar
292.722	1.6 mm	150 mm	1	Spade point
292.652	2.0 mm	230 mm	1	Spade point

**Kirschner Wire with trocar tip, Stainless Steel**

Art. No	∅	Length	Package unit
292.060.10*	0.6 mm	70 mm	10
292.060S	0.6 mm	70 mm	1
292.080.10*	0.8 mm	150 mm	10
292.080S	0.8 mm	150 mm	1
292.090.10*	0.8 mm	150 mm	10
292.090S	0.8 mm	150 mm	1
292.100.10*	1.0 mm	150 mm	10
292.100S	1.0 mm	150 mm	1
292.110.10*	1.0 mm	280 mm	10
292.120.10*	1.25 mm	150 mm	10
292.130.10*	1.25 mm	280 mm	10
292.140.10*	1.4 mm	150 mm	10
292.140S	1.4 mm	150 mm	1
292.150.10*	1.4 mm	280 mm	10
292.160.10*	1.6 mm	150 mm	10
292.160S	1.6 mm	150 mm	1
292.180.10*	1.6 mm	280 mm	10
292.170.10*	1.8 mm	150 mm	10
292.170S	1.8 mm	150 mm	1
292.190.10*	1.8 mm	280 mm	10
292.190S	1.8 mm	280 mm	1
292.200.10*	2.0 mm	150 mm	10
292.200S	2.0 mm	150 mm	1
292.000.201	2.0 mm	200 mm	1



\* For single Kirschner wires order XXX.XXX.01 instead of XXX.XXX.10.

---

**Kirschner Wire with trocar tip, Stainless Steel**

Art. No	Ø	Length	Package unit
292.210.10*	2.0 mm	280 mm	10
292.210S	2.0 mm	280 mm	1
292.230.10*	2.0 mm	400 mm	10
292.250.10*	2.5 mm	150 mm	10
292.250S	2.5 mm	150 mm	1
292.000.251	2.5 mm	200 mm	1
292.260.10*	2.5 mm	280 mm	10
292.260S	2.5 mm	280 mm	1
292.280.10*	2.5 mm	400 mm	10
292.300.10*	3.0 mm	150 mm	10
292.300S	3.0 mm	150 mm	1
292.310.10*	3.0 mm	280 mm	10
292.330.10*	3.0 mm	400 mm	10
292.001	2.6 mm	500 mm	1
292.001S	2.6 mm	500 mm	1
02.110.300.10	1.8 mm	150 mm	10
292.000.201	2.0 mm	200 mm	1
292.000.251	2.5 mm	200 mm	1
292.120S	1.25 mm	150 mm	1

\* For single Kirschner wires order XXX.XXX.01 instead of XXX.XXX.10.

---

**Kirschner Wire with trocar tip, Titanium Alloy (TAV)**

Art. No	Ø	Length	Package unit
492.060	0.6 mm	70 mm	1
492.060S	0.6 mm	70 mm	1
492.080	0.8 mm	70 mm	1
492.090	0.8 mm	150 mm	1
492.090S	0.8 mm	150 mm	1
492.100	1.0 mm	150 mm	1
492.100S	1.0 mm	150 mm	1
492.110	1.0 mm	280 mm	1
492.120	1.25 mm	150 mm	1
492.120S	1.25 mm	150 mm	1
492.130	1.25 mm	280 mm	1
492.140	1.4 mm	150 mm	1
492.150	1.4 mm	280 mm	1
492.160	1.6 mm	150 mm	1
492.160S	1.6 mm	150 mm	1
492.180	1.6 mm	280 mm	1
492.170	1.8 mm	150 mm	1
492.190	1.8 mm	280 mm	1
492.190S	1.8 mm	280 mm	1
492.200	2.0 mm	150 mm	1
492.200S	2.0 mm	150 mm	1
492.210	2.0 mm	280 mm	1
492.210S	2.0 mm	280 mm	1
492.230	2.0 mm	400 mm	1
492.250	2.5 mm	150 mm	1
492.260	2.5 mm	280 mm	1
492.280	2.5 mm	400 mm	1
492.300	3.0 mm	150 mm	1
492.310	3.0 mm	280 mm	1
492.330	3.0 mm	400 mm	1
04.110.300.10	1.8 mm	150 mm	10

### Kirschner Wire with double tip, Stainless Steel

Art. No	∅	Length	Package unit
292.460.10*	0.6 mm	70 mm	10
292.460S	0.8 mm	70 mm	1
292.480.10*	0.8 mm	70 mm	10
292.480S	0.8 mm	70 mm	1
292.000.502	0.8 mm	100 mm	1
292.000.600.10*	1.0 mm	70 mm	10
292.500.10*	1.0 mm	150 mm	10
292.500S	1.0 mm	150 mm	1
292.520.10*	1.25 mm	150 mm	10
292.520S	1.25 mm	150 mm	1
292.540.10*	1.4 mm	150 mm	10
292.540S	1.4 mm	150 mm	1
292.560.10*	1.6 mm	150 mm	10
292.560S	1.6 mm	150 mm	1
292.570.10*	1.8 mm	150 mm	10
292.570S	1.8 mm	150 mm	1
292.580.10*	2.0 mm	150 mm	10
292.580S	2.0 mm	150 mm	1
292.610.10*	2.5 mm	150 mm	10
292.630.10*	3.0 mm	150 mm	10
292.000.603	1.0 mm	110 mm	1
292.000.604.10*	1.0 mm	100 mm	10
292.000.618.10*	1.25 mm	100 mm	10
292.000.619	1.25 mm	90 mm	1
292.000.620	1.25 mm	110 mm	1



\* For single Kirschner wires order XXX.XXX.01 instead of XXX.XXX.10.

---

**Kirschner Wire with double tip, Titanium Alloy (TAV)**

Art. No	∅	Length	Package unit
492.460	0.6 mm	70 mm	1
492.480	0.8 mm	70 mm	1
492.500	1.0 mm	150 mm	1
492.520	1.25 mm	150 mm	1
492.520S	1.4 mm	150 mm	1
492.540	1.4 mm	150 mm	1
492.560	1.6 mm	150 mm	1
492.560S	1.6 mm	150 mm	1
492.570	1.8 mm	150 mm	1
492.570S	1.8 mm	150 mm	1
492.580	2.0 mm	150 mm	1
492.580S	2.0 mm	150 mm	1
492.610	2.5 mm	150 mm	1
492.630	3.0 mm	150 mm	1

### Kirschner Wire with threaded tip, Stainless Steel

Art. No	Ø	Length	Package unit
292.640.10*	0.8 mm	70/5 mm	10
292.660.10*	1.0 mm	150/5 mm	10
292.600.10*	1.25 mm	100 mm	10
292.600S	1.25 mm	100 mm	1
292.663.10*	1.25 mm	150/5 mm	10
292.663S	1.25 mm	150/5 mm	1
292.703	1.25 mm	200/15 mm	1
292.666.10*	1.4 mm	150/5 mm	10
292.704	1.4 mm	200/15 mm	1
292.708.10*	1.6 mm	100 mm	10
292.710.10*	1.6 mm	150/5 mm	10
292.710S	1.6 mm	150/5 mm	1
292.730.10*	1.6 mm	150/15 mm	10
292.730S	1.6 mm	150/15 mm	1
292.732	1.6 mm	200/15 mm	1
292.770.10*	1.8 mm	150/15 mm	10
292.705	1.8 mm	200/15 mm	1
292.705S	1.8 mm	200/15 mm	1
292.790.10*	2.0 mm	150/15 mm	10
292.792	2.0 mm	200/15 mm	1
292.792S	2.0 mm	200/15 mm	1
292.750.10*	2.5 mm	150/15 mm	10
292.750S	2.5 mm	150/15 mm	1
292.760.10*	2.5 mm	200/15 mm	10
292.699	2.8 mm	280 mm	1
292.699S	2.8 mm	280 mm	1
292.820.10*	3.0 mm	150/15 mm	10
292.706	3.0 mm	200/15 mm	1



### Kirschner Wire with drill tip, Stainless Steel

Art. No	Ø	Length	Package unit
02.108.295	3.0 mm	400 mm	1
02.111.902.01S	2.0 mm	100 mm	1
02.111.902.10*	2.0 mm	100 mm	10
02.111.903.01S	2.0 mm	150 mm	1
02.111.903.10*	2.0 mm	150 mm	10

\* For single Kirschner wires order XXX.XXX.01 instead of XXX.XXX.10.

---

**Kirschner Wire with drill tip**

Art. No	∅	Length	Package unit
02.113.001	1.6 mm	200 mm	1
02.113.001S	1.6 mm	200 mm	1

**Kirschner Wire with trocar tip, Stainless Steel**

Art. No	∅	Length	Package unit
02.111.304.01S	1.25 mm	80 mm	1
02.111.304.10*	1.25 mm	80 mm	10
03.010.025	2.0 mm	240 mm	1
03.010.025S	2.0 mm	240 mm	1

**Kirschner Wire with spade point tip**

Art. No	∅	Length	Package unit
03.108.005	2.8 mm	200 mm	1
03.108.005S	2.8 mm	200 mm	1

**Kirschner Wire with threaded tip, Titanium Alloy (TAV)**

Art. No	∅	Length	Package unit
492.640	0.8 mm	70/5 mm	1
492.660	1.0 mm	150/5 mm	1
492.663	1.25 mm	150/5 mm	1
492.666	1.4 mm	150/5 mm	1
492.710	1.6 mm	150/5 mm	1
492.730	1.6 mm	150/5 mm	1
492.732	1.6 mm	200/15 mm	1
492.770	1.8 mm	150/5 mm	1
492.790	2.0 mm	150/5 mm	1
492.792	2.0 mm	200/15 mm	1
492.750	2.5 mm	150/5 mm	1
492.760	2.5 mm	200/15 mm	1
492.820	3.0 mm	150/5 mm	1
492.706	3.0 mm	200/15 mm	1

\* For single Kirschner wires order XXX.XXX.01 instead of XXX.XXX.10.

## **Torque, Displacement and Image Artifacts according to ASTM F 2213-06, ASTM F 2052-06e1 and ASTM F2119-07**

Non-clinical testing of worst case scenario in a 3 T MRI system did not reveal any relevant torque or displacement of the construct for an experimentally measured local spatial gradient of the magnetic field of 3.69 T/m. The largest image artifact extended approximately 169 mm from the construct when scanned using the Gradient Echo (GE). Testing was conducted on a 3 T MRI system.

## **Radio-Frequency-(RF-)induced heating according to ASTM F2182-11a**

Non-clinical electromagnetic and thermal testing of worst case scenario lead to peak temperature rise of 9.5 °C with an average temperature rise of 6.6 °C (1.5 T) and a peak temperature rise of 5.9 °C (3 T) under MRI Conditions using RF Coils (whole body averaged specific absorption rate [SAR] of 2 W/kg for 6 minutes [1.5 T] and for 15 minutes [3 T]).

---

**Precautions:** The above mentioned test relies on non-clinical testing. The actual temperature rise in the patient will depend on a variety of factors beyond the SAR and time of RF application. Thus, it is recommended to pay particular attention to the following points:

- It is recommended to thoroughly monitor patients undergoing MR scanning for perceived temperature and/or pain sensations.
  - Patients with impaired thermoregulation or temperature sensation should be excluded from MR scanning procedures.
  - Generally, it is recommended to use a MR system with low field strength in the presence of conductive implants. The employed specific absorption rate (SAR) should be reduced as far as possible.
  - Using the ventilation system may further contribute to reduce temperature increase in the body.
-











  
Synthes GmbH  
Eimattstrasse 3  
4436 Oberdorf  
Switzerland  
Tel: +41 61 965 61 11  
Fax: +41 61 965 66 00  
[www.depuyssynthes.com](http://www.depuyssynthes.com)

Not all products are currently available in all markets.

This publication is not intended for distribution in the USA.

All surgical techniques are available as PDF files at  
[www.depuyssynthes.com/ifu](http://www.depuyssynthes.com/ifu)

