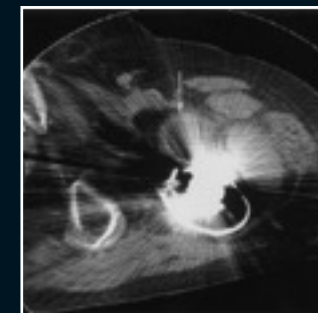
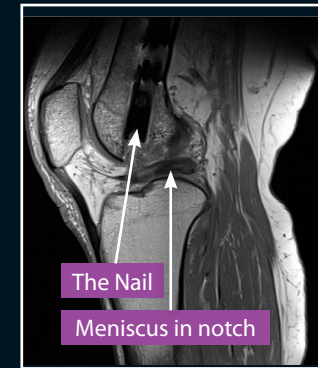




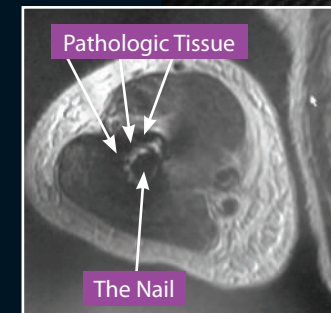
Carbon Fiber Implants – Better Callus Faster*

CarboFix Trauma - Enhance your patient's chance of healing

- **Modulus of Elasticity similar to cortical bone**
 - Earlier and greater callus formation
 - Potentially decreases complications such as stress risers etc.
- **50x Greater fatigue resistance than metal**
 - Prolonged support for delayed union patients
- **Radiolucency**
 - Enhanced reduction and screw placement capabilities
 - Better follow-up of fracture healing process
- **No cold welding or bone ingrowth for facilitating easier hardware removal**
- **Essential in oncology patients**
- **MRI/CT Artifact free**



Conventional

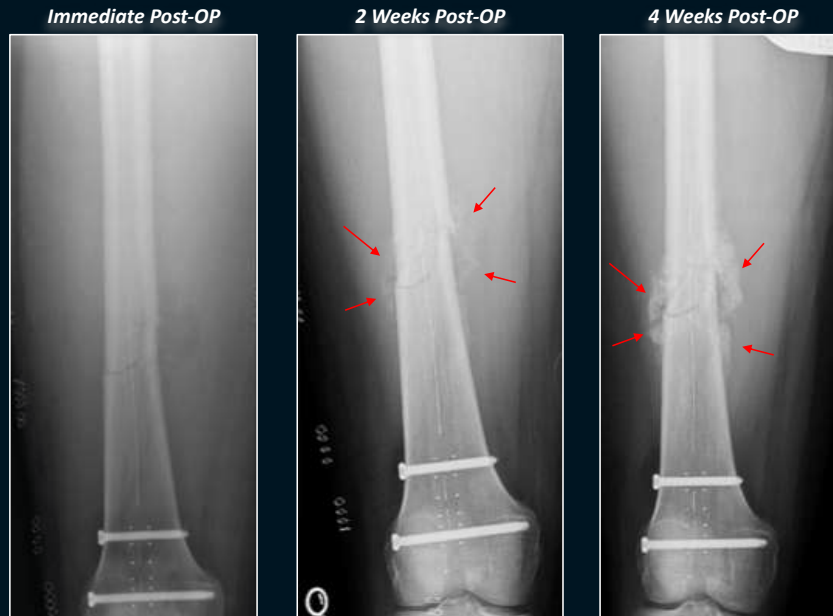


CarboFix

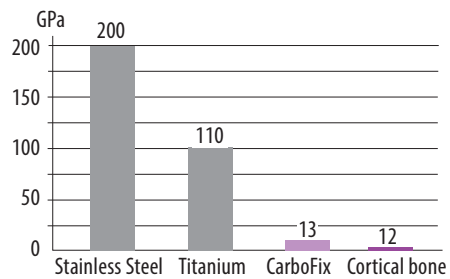


Carbon Fiber Implants – Better Callus Faster*

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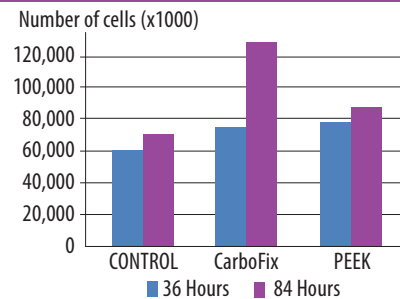


Modulus Of Elasticity

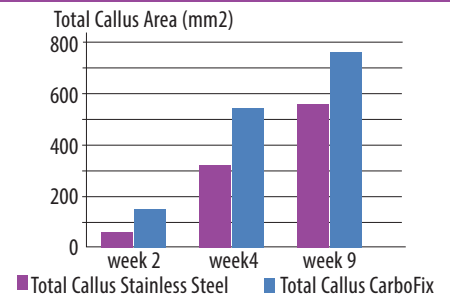


The Modulus of Elasticity of CFR-PEEK mimics Cortical Bone

Carbon Fiber enhances proliferation of osteoblasts¹

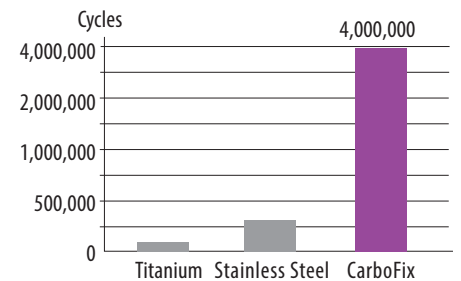


Better Callus Faster using Carbon Fiber Implants²



Callus formation of CFR-PEEK group greater than metal group: 158%, 67%, 33% at 2, 4, 9 weeks respectively

Fatigue Resistance



The CarboFix CFR-PEEK implants have an Unparalleled Fatigue Resistance

¹ C. Morelli, G. Barbanti-Brodano, A. Ciannilli, K. Campioni, S. Boriani, M. Tognon, Cell morphology, markers, spreading, and proliferation on orthopedic biomaterials. An innovative cellular model

² Jo Wilson, PhD, Matthew Cantwell; Polyether Ether Ketone (PEEK) Carbon Fiber Composites May Improve Healing of Fractures Stabilized with Intramedullary Nails. (Basic Science Focus Forum, paper #4, 2014) 155.

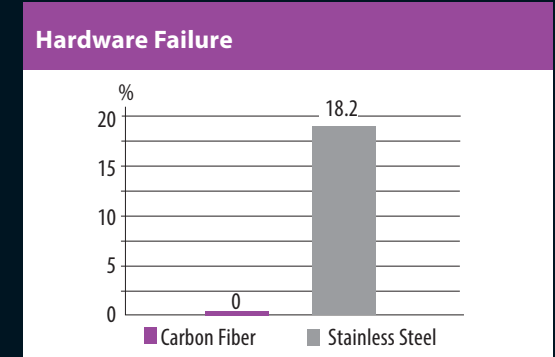
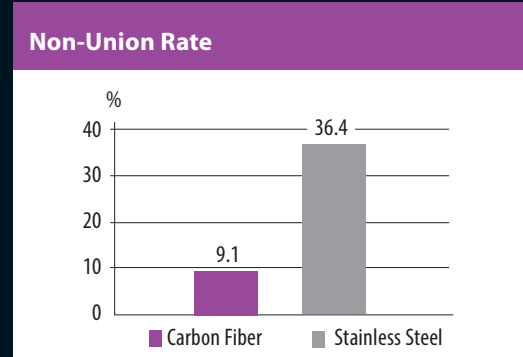


Carbon Fiber Implants – Better Callus Faster*

CarboFix Trauma - Enhance your patient's chance of healing

Distal Femur Carbon Fiber Vs. Stainless Steel Plate Study³

	Carbon Fiber	Stainless Steel
No. of Patients	11	11
Age (Average)	71.7	57.3
Diabetic Patients %	54.5	9.1
Peripheral Vascular Disease %	18.2	0
Avg. Time to Full Weight-Bearing (weeks)	9.8	11.7



Non/Delayed Union Risk Factors⁴

Risk Factor	Demographic Summary of Adults With Fracture and Comorbid Condition			OR (95% CI)		P Value
	No. (%)		Non-union Fracture	Univariate	Multivariate	
	Fractures	Normal Healing				
Male gender	130378 (42.1)	123368	7010	1.18 (1.14-1.21)	1.21 (1.16-1.25)	≤ .001
Cardiovascular disease	96209 (31.1)	90221	5988	1.46 (1.41-1.51)	0.94 (0.90-0.98)	≤ .05
Allergy	60386 (19.5)	57310	3076	1.04 (1.00-1.08)	0.90 (0.86-0.93)	≤ .001
Osteoarthritis only	42928 (13.9)	39418	3510	1.96 (1.89-2.04)	1.45 (1.39-1.52)	≤ .001
Past or current smoker	31610 (10.2)	29297	2313	1.62 (1.54-1.69)	1.20 (1.14-1.26)	≤ .001
Obesity	23719 (7.7)	21882	1837	1.70 (1.62-1.79)	1.19 (1.12-1.25)	≤ .001
Type 2 diabetes	23681 (7.7)	21958	1723	1.60 (1.52-1.68)	1.15 (1.07-1.24)	≤ .001
Renal insufficiency	19255 (6.2)	17678	1577	1.80 (1.71-1.90)	1.11 (1.04-1.17)	≤ .001
Vitamin D deficiency	12661 (4.1)	11796	865	1.44 (1.34-1.54)	1.14 (1.05-1.22)	≤ .001
Osteoporosis	11683 (3.8)	10774	909	1.67 (1.55-1.78)	1.24 (1.14-1.34)	≤ .001
Nutritional deficiency	7282 (2.4)	6612	670	2.00 (1.84-2.16)	1.09 (1.00-1.19)	.05
Alcoholism	5616 (1.8)	5198	418	1.57 (1.42-1.73)	1.05 (0.94-1.17)	.36
Type 1 diabetes	3194 (1)	2856	338	2.42 (2.16-2.71)	1.40 (1.21-1.61)	≤ .001
Phlebitis	3100 (1)	2786	314	2.20 (1.96-2.47)	1.10 (0.97-1.24)	.15
Osteoarthritis and rheumatoid arthritis	2668 (0.9)	2396	272	2.51 (2.21-2.84)	1.58 (1.38-1.82)	≤ .001
Rheumatoid arthritis	1920 (0.6)	1804	116	1.42 (1.17-1.71)	1.14 (0.93-1.38)	.20

- The rate of fracture non-union is estimated to be between 5%⁵ and 10%⁶
- Patients with high risk to delayed/non-union: type 2 diabetes, cardiovascular disease, smoking, obesity, osteoporosis, osteoarthritis⁴, oncology
- Tibia/Fibula and Femur fracture non-union rates are as high as 14% and 13.9%, respectively⁴

³ Mitchell M et al. Early Comparative Outcomes of Carbon Fiber Reinforced Polymer Plate in the Fixation of Distal Femur Fractures. *Journal of Orthopaedic Trauma* Publish Ahead of Print DOI: 10.1097/BOT.0000000000001223

⁴ R.Zura et al. Epidemiology of Fracture Nonunion in 18 Human Bones. *JAMA Surg.* 2016;151(11):e162775. doi:10.1001/jamasurg.2016.2775

⁵ Tzioupis C, Giannoudis PV. Prevalence of long-bone non-unions. *Injury.* 2007;38(suppl 2): S3-S9.

⁶ Calori GM, Mazza E, Colombo M, Ripamonti C, Tagliabue L. Treatment of long bone non-unions with polytherapy: indications

* Dr. B.Ziran - OTA 2017

CarboFix Trauma Products

FDA cleared & CE marked

Diaphyseal
Narrow - 7, 9 holes
Broad - 9, 11, 13 holes

Prox. Humerus
3, 4*, 6, 8, 12* holes
ø 8 mm
150 mm

Prox. Humerus
ø 8 mm
150 mm

Humerus
ø 8.5 mm
180-280 mm

Distal Femur
6, 8, 10, 12, 14, 16 holes

Trochanteric (PF) Nail
ø 11 mm
130° / 125°
180, 300-420, 440*, 460* mm

Distal Fibula
3*, 4, 5*, 6, 9, 11 holes

MTP Fusion
Standard / Narrow - DF: 0°, 5°

One Third Tubular
5, 6, 7, 9, 11 holes

Arthrodesis
ø 10, 12 mm
160, 200, 240 mm

Tibia
ø 10, 11 mm
260-400 mm

Femur
ø 10, 11, 12 mm
300-420 mm

Lapidus (!)
Flat / 1 mm / 2 mm

Distal Radius
Standard - 3, 4, 7 holes
Narrow - 3, 4 holes
Triangular - 3, 4 holes

* Special order

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E-Mail: info@carbo-fix.com

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48163 Münster Germany

Patent protected

(!) Non-CE product



Rx ONLY



www.carbo-fix.com

P/N 19267 Rev.06 / 11.2018