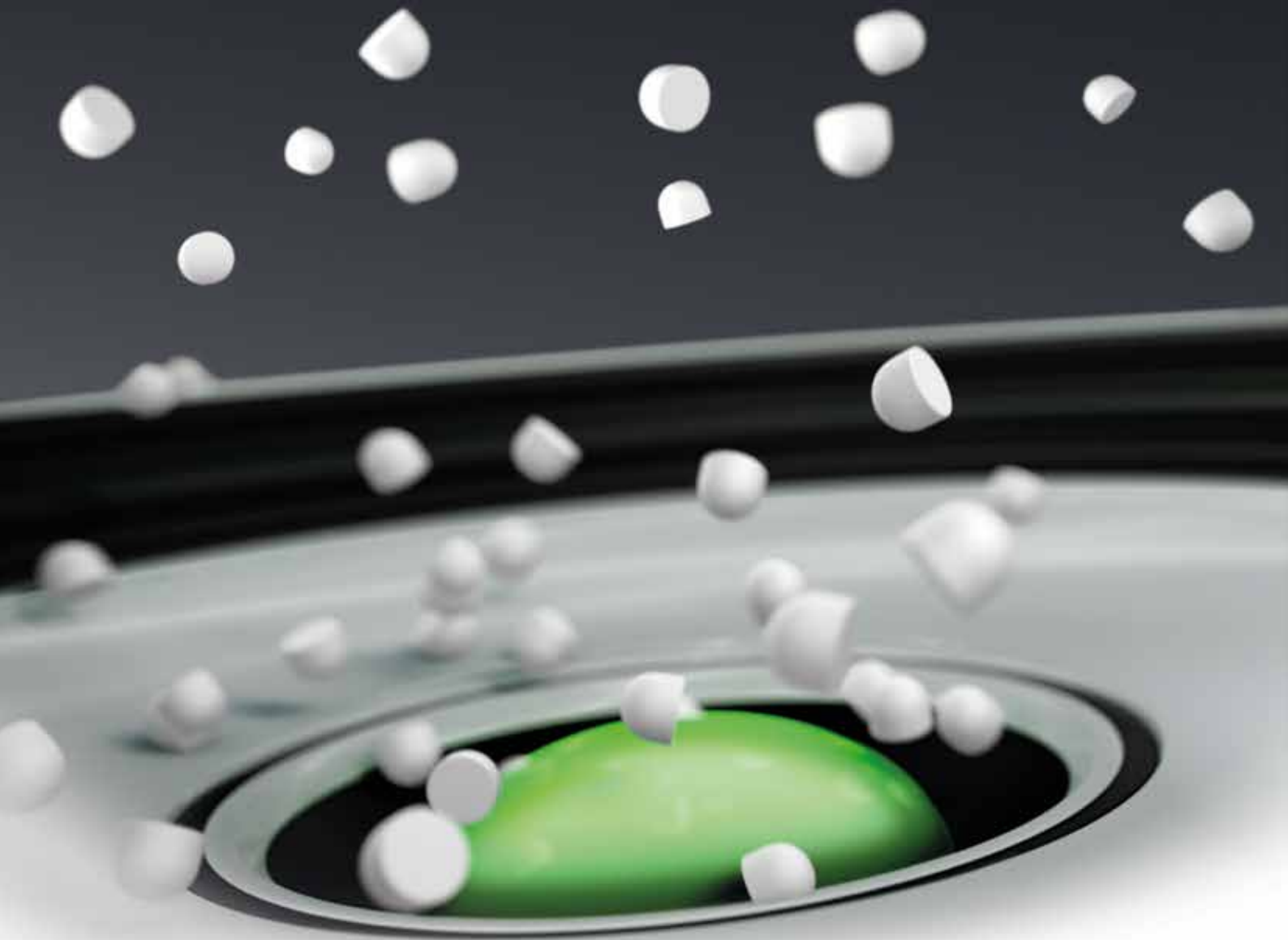


STIMULAN[®]

POWER TO TRANSFORM[™]



STIMULAN[®]

"It's very reproducible... I get
the same outcomes time
and time again"

Dr. Herrick Siegel



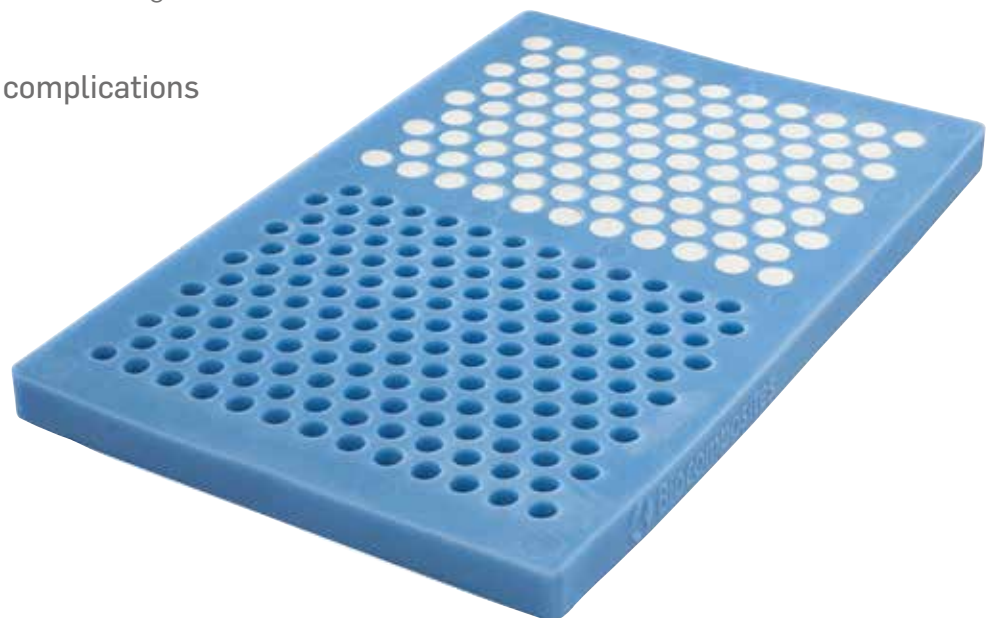
Perfect partner for managing dead space

STIMULAN is a truly absorbable calcium sulfate, specifically designed to complement your dead space management.¹

Can be placed directly into bone voids and defects

Choosing an innovative void management device as part of your patient management strategy is key to:

- ✓ minimising avoidable complications
- ✓ improving outcomes
- ✓ reducing costs



Calcium sulfate, uniquely recrystallised⁵ for consistent and reliable performance

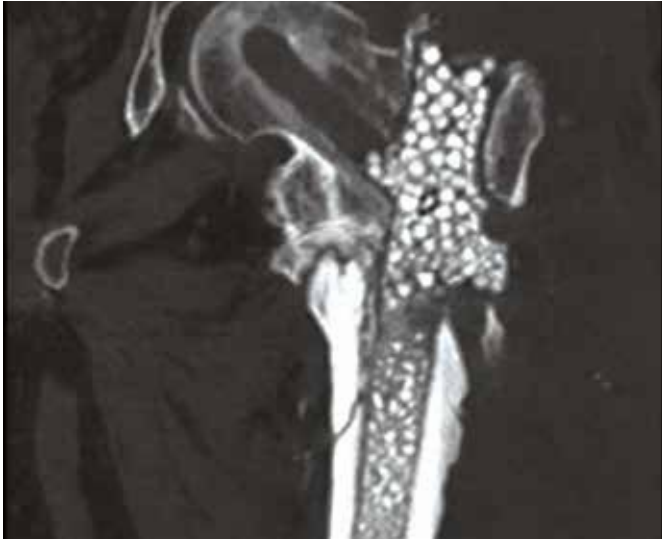
“... happier with this product than anything I've used in the last 30 years”

Dr. Richard Biama

STIMULAN®

See the difference in your cases

STIMULAN can be used to fill a bone void or defect created by a cyst, tumour, traumatic injury or osteomyelitis.



Subtrochanteric fracture²

Patient presented with: previous road traffic accident that resulted in multiple fractures and subtrochanteric fracture of the left femur.

Outcome: at 7 months' follow-up there was complete healing of the non-union and at 1 year patient remains infection free, walking with no pain.



Pilon osteomyelitis³

Patient presented with: drainage issues 1 year after pilon fracture repair and then 2 weeks after hardware removal.

Outcome: 6 months after treatment the patient was fully weight-bearing and without restrictions on activity – with complete absorption of STIMULAN.





Bilateral high energy femoral fractures⁴

Patient presented with: right open comminuted distal femoral fracture and tibial plateau fracture, and left closed comminuted femoral shaft fracture.

Outcome: complete absorption of **STIMULAN** and healing of the femoral defect after 4 months. At 1 year, patient was fully independently ambulatory with no pain.



Open calcaneus fracture³

Patient presented with: non-union and hardware failure 6 months after treatment for an open calcaneus fracture.

Outcome: at 13 months the absorption of **STIMULAN** was complete, the patient was weight-bearing and without sign of infection – amputation was avoided.

“It saves the hospital money as it decreases the hospital readmission rate”

Dr. Jorge Casas-Gánem

STIMULAN[®]

Uniquely engineered for the precision and control you demand every time

STIMULAN is a pharmaceutical-grade calcium sulfate with a unique crystal structure that has tightly controlled properties.⁵

- ✓ controlled purity
- ✓ physiologic pH level
- ✓ hydrophilic
- ✓ no hydroxyapatite

Only STIMULAN undergoes a proprietary DRy26™ recrystallisation method which consists of 26 steps over 6 weeks and results in its consistent and reliable performance.⁵

- ✓ truly absorbable
- ✓ absorbs at an optimal rate
- ✓ no third body damage

Truly absorbable and totally synthetic calcium sulfate — absorbs at an optimal rate¹



Post-operative



1 month



11 weeks



6 months



15 months

Hydrophilic for fast, easy mixing

No soaking required.



STIMULAN — mixes with liquid



Competitor calcium sulfate — repels liquid

No third body damage to articulating surfaces^{12,13}

Less scratching than competitor calcium sulfate.¹⁴



STIMULAN



Competitor calcium sulfate



Control

Microscope images (x6.5) of a cobalt chrome plate following damage simulation (360,000 cycles) with third body particles trapped between it and an articulating UHMWPE pin

STIMULAN does not damage total knee replacements when trapped between the articulating surfaces of the implant.

STIMULAN[®]

Flexibility at your fingertips

Every part of **STIMULAN** is optimised to work around the clinical and surgical demands of the individual patient. Whatever the time, shape, accessibility or size constraints, **STIMULAN** gives you a way to adapt to each case.



STIMULAN Rapid Cure
For faster setting times



STIMULAN Kit
More time to sculpt or inject

Hard to reach defect?

STIMULAN Bullet Mat and Introducer

Streamlined, flexible design that simplifies the delivery of **STIMULAN** for deep defects.



Bullet Introducer

Choice of formats



Bead mat available with **STIMULAN** Rapid Cure and **STIMULAN** Kit



Syringe available with **STIMULAN** Kit



Long bullets with a groove down one side to reduce the risk of pressurising the defect site

(See the inside back cover for further details and ordering codes)

Case study

Courtesy of Mr. Hemant K. Sharma

Consultant Orthopaedic Surgeon, Hull, UK

Clinical particulars

35-year-old male involved in a road traffic accident suffered multiple injuries and subtrochanteric fracture of left femur. This was nailed, but subsequently, he developed infection and drainage from both proximal and distal locking screw areas. He went to theatre multiple times and developed wound approx. 15cm on the proximal lateral thigh, which was treated with VAC.

He presented a year later with discharging wound proximally and distally.

Treatment

The femoral nail was removed, followed by reaming of the femoral canal and washout procedure. 40cc of STIMULAN beads were placed in the intramedullary canal.

Outcome

2.5 months' post-operatively x-rays showed almost complete absorption of the STIMULAN beads and at 7 months there was complete healing of the non-union.

At 1 year follow-up, the patient remains infection free, walking with no pain.



Pre-operative x-ray showing non-union



X-ray – 2 months



CT – 2 months



2.5 months



1 year

Case study

Courtesy of Dr. Daniel Schlatterer

Orthopaedic Surgeon, Atlanta, GA, USA

Clinical particulars

73-year-old female with osteomyelitis caused by group B *Streptococcus* and MRSA infection. Presented with exposed hardware and post-operative drainage issues, 1 year after pilon fracture repair and subsequently 2 weeks after removal of all hardware.

Treatment

Hardware removal and repeat debridement on the medial side of the ankle resulted in a large dead space which was managed using **STIMULAN** paste.

Outcome

6 months after treatment the patient was fully weight-bearing and without restrictions on activity – with complete absorption of **STIMULAN** paste.



Presentation



Post-operative



1 month



11 weeks



6 months



15 months

Case study

Courtesy of Dr. Lawrence X. Webb

Orthopaedic Surgeon, Macon, GA, USA

Clinical particulars

50-year-old female presented with bilateral high-energy fractures due to a motor vehicle accident with prolonged extrication. The patient suffered from right open comminuted distal femoral fracture and tibial plateau fracture and left closed comminuted femoral shaft fracture.

Treatment

Day 1: Irrigation and debridement of the right femur was carried out along with placement of a large external fixator bridge for temporary stabilisation. The left femur was stabilised using a retrograde IM nail locked statically with screws.

Day 3: The external fixator bridge was removed and open reduction internal fixation was performed on the distal right femur. **STIMULAN**, cancellous allograft and demineralised bone were used to fill a significant bone deficit just above the femoral condyles. Antibiotic treatment was provided to prevent infection. Open reduction internal fixation was carried out for the tibial plateau fracture supplemented with the use of cancellous allograft.

Outcome

4 months after treatment **STIMULAN** had absorbed and there was complete healing of the femoral defect.

At 1 year follow-up the patient was fully independently ambulatory with a normal gait, normal range of motion and no pain.



Day 1 – Post-operative
Right leg



Day 1 – Post-operative
Right leg



Day 1 – Post-operative
Left leg



Day 3 – Post-operative
Right leg



4 months – Right leg



1 year – Right leg



1 year – Left leg

Case study

Courtesy of Dr. Robert J. Wetzel

Orthopaedic Surgeon, Cleveland, OH, USA

Clinical particulars

31-year-old female with metabolic bone disease who sustained a displaced right femoral neck fracture and a left femoral neck stress fracture after a low-energy fall. Initial surgery included ORIF with a sliding hip screw construct on the right side and placement of a prophylactic sliding hip screw on the left side to prevent fracture completion and displacement. She presented 6 months later with a left sided deep infection, non-union of her stress fracture and persistent pain.

Treatment - Stage 1

The sliding hip screw was removed from the left femur and multiple meticulous excisional debridements were performed. 20cc of **STIMULAN** paste was injected into the proximal femur bone void.

Treatment - Stage 2

At 6 weeks, autologous bone graft and 10cc of **STIMULAN** paste were placed at the femoral neck non-union site. Internal fixation was performed with a blade plate device.

Outcome

6 weeks after stage 1 treatment, the patient was free from infection with complete absorption of **STIMULAN** paste. 4 months after stage 2 treatment, the non-union site appeared to be healed with no hardware failure and complete absorption of **STIMULAN**. Imaging at 1 year after stage 2 treatment confirmed consolidation at the non-union site and stable hardware.

The patient developed heterotopic ossification in her vastus lateralis due to multiple debridement surgeries to treat her infection and extensile distal dissection required to place the blade plate. The heterotopic ossification was asymptomatic and did not require further treatment. At 2 years, the patient is ambulating without an assisted device and remains infection and pain free.



Initial post-operative



Stage 1 - post-operative



Stage 1 - 6 weeks post-operative



Stage 2 - 4 months



Stage 2 - 2 years

STIMULAN®



Overview

STIMULAN Rapid Cure

Paste volume	Bead volume	In the pack	Order code
5cc	12cc	<ul style="list-style-type: none"> • Powder and solution • Mixing bowl • Spatula 	620-005
10cc	25cc	<ul style="list-style-type: none"> • Paste applicator • Bead mat 	620-010
20cc	50cc	<ul style="list-style-type: none"> • Powder and solution • Mixing bowl • Spatula • Paste applicator • 2 x bead mats 	620-020

STIMULAN Kit

Paste volume	Bead volume	In the pack	Order code
5cc	10cc	<ul style="list-style-type: none"> • Powder and solution • Spatula 	600-005
10cc	20cc	<ul style="list-style-type: none"> • Paste applicator • Bead mat • Syringe and extension tube 	600-010

STIMULAN Bullet Mat and Introducer

Bullet dimensions	Reamed diameter	In the pack	Order code
7mm x 20mm	10mm reamed diameter (minimum)	<ul style="list-style-type: none"> • Bullet mat • 7mm (black) inserter 	660-001
9mm x 20mm	12mm reamed diameter (minimum)	<ul style="list-style-type: none"> • 9mm (silver) inserter • Obturator 	

References: **1.** Biocomposites, STIMULAN Instructions for Use (AU). **2.** Biocomposites, Data on file, Mr. Sharma. **3.** Biocomposites, Data on file, Dr. Schlatterer. **4.** Biocomposites, Data on file, Dr. Webb. **5.** Cooper, J.J., Method of producing surgical grade calcium sulphate; Patent. 1999. **6.** Somasundaram, K., Huber, C.P., Babu, V., et al., Proximal humeral fractures: the role of calcium sulphate augmentation and extended deltoid splitting approach in internal fixation using locking plates. *Injury*, 2013. 44(4): 481-7. **7.** Lei D., Zhanzhong, M., Huaikuo, Y., et al., Treatment of Distal Radius Bone Defects with Injectable Calcium Sulphate Cement. In: *Bone Grafting*, A., Zorzi, Editor. 2012. InTech. p. 125-134. **8.** Lei, D., Jing, L., Yang-yong, S., Calcium sulfate versus calcium phosphate in treating traumatic fractures. *Journal of Clinical Rehabilitative Tissue Engineering Research*, 2008. 12. **9.** Lei, D., Ma, Z., Jing, X., Treatment of bone defect with injectable calcium sulfate powder in distal fractures of radius. *Chinese Journal of Bone Tumor and Bone Disease*, 2007. **10.** Aiken, S.S., Cooper, J.J., Zhou, S., Osseointegration of a calcium sulphate bone substitute in a large animal model, in *The 5th International Congress of Chinese Orthopaedic Association*. 2010: Chengdu, China. **11.** Lazarou, S.A., Contodimos, G.B., Gkegkes, I.D., Correction of alveolar cleft with calciumbased bone substitutes. *J Craniofac Surg*, 2011. 22(3): 854-7. **12.** Analysis of the Wear Effect 3rd Body Particulate (Bone Cement) has on UHMWPE, Accutek Testing Laboratory, Fairfield OH, K13107732-1, 2014. **13.** Cowie, R.M., et al., The influence of a calcium sulphate bone void filler on the third-body damage and polyethylene wear of total knee arthroplasty. *Bone Joint Res*, 2019. 8(2): p. 65-72. **14.** Cowie, R.M., et al., Influence of third-body particles originating from bone void fillers on the wear of ultra-high-molecularweight polyethylene. *J Engineering in Medicine*, 2016. Vol. 230(8) 775-783

For indications, contraindications, warnings and precautions see Instructions for Use. Please contact your local representative for further information.

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Patents pending: GB1502655.2, GB1704688.9, EP 18275044.8, US 15/933936, CN 108619579A

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STIMULAN[®]

POWER TO TRANSFORM[™]

- ✓ Perfect partner for managing dead space¹
- ✓ Unique DRy26[™] recrystallisation method for consistent and reliable performance⁵
- ✓ No hydroxyapatite, insoluble impurities or PMMA debris⁶⁻¹¹
- ✓ Provides case-by-case flexibility



All Biocomposites' products are engineered, manufactured and shipped from our facilities in Keele, UK

At Biocomposites, we are proud to be driving improved outcomes across a wide range of clinical applications for patients and surgeons. Our team of specialists is singularly focused on the development of innovative calcium compounds for surgical use. With over 30 years' experience and an unrivalled dedication to quality, the products we research, engineer and manufacture are at the forefront of calcium technology.

Find out more at [biocomposites.au](https://www.biocomposites.au)