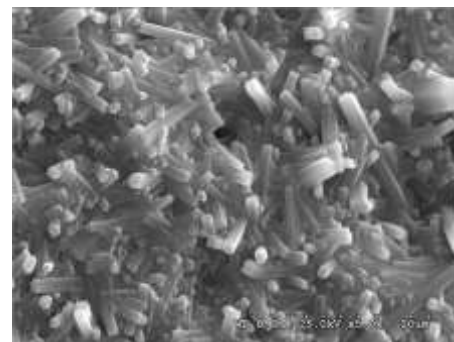


**Medco Forum Presents:  
Research Shows Silicon Nitride (Si<sub>3</sub>N<sub>4</sub>) Exhibits  
Antibacterial Properties, Superior Bone Growth**

*More Effective Bone Attachment Compared to Other Biomaterials,  
and May Lead to Faster Fusion*

Three biomaterials that are used in spinal fusion implants – poly-ether-ether-ketone (PEEK), titanium (Ti) and Silicon Nitride (Si<sub>3</sub>N<sub>4</sub>) – were recently tested to ascertain their respective susceptibility to bacterial infection with Staphylococcus epidermidis, Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli and Enterococcus. Under in-vitro incubation for up to 72 hours, decreased biofilm formation and bacterial colonization were confirmed on both as-fired and polished Si<sub>3</sub>N<sub>4</sub> in comparison with PEEK and Ti. Si<sub>3</sub>N<sub>4</sub> resisted bacterial proliferation despite the absence of antibiotic pharmaceutical agents.



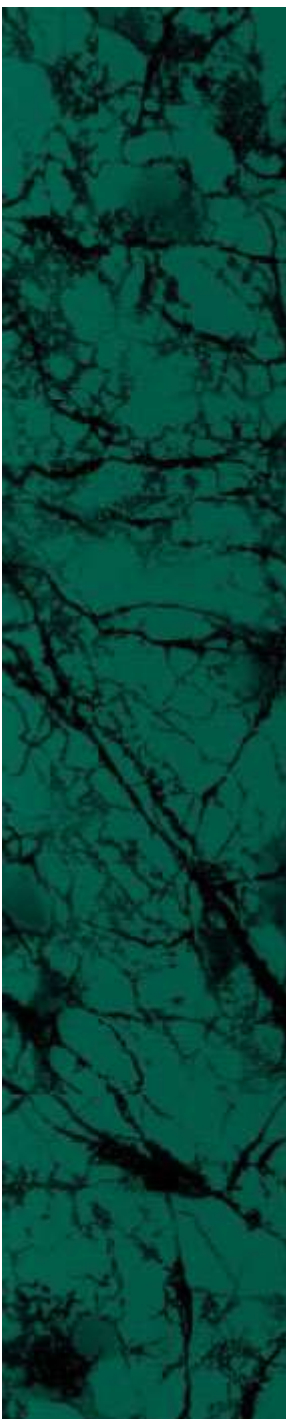
Si<sub>3</sub>N<sub>4</sub> serves as an excellent scaffold for osteoconduction and osteointegration. Push-out strength testing has demonstrated statistically superior bone growth onto Si<sub>3</sub>N<sub>4</sub> as compared with PEEK and Ti. Si<sub>3</sub>N<sub>4</sub> implants were stable due to sufficient juxtaposed tissue growth and showed reasonable osteointegration even at three and seven day time periods. In one study, three months after surgery, the amounts of new bone at the

implant interface and within the surgical defect were 5%, 9% and 23%, and 21%, 26% and 41%, for PEEK, Ti and Si<sub>3</sub>N<sub>4</sub>, respectively.

The proprietary Silicon Nitride, a synthetic non-oxide bioceramic, is supplied by America Corporation (Salt Lake City, UT).

**Grant Skidmore, MD, FACS, a neurosurgeon with Neurosurgical Specialists, Inc. in Norfolk, Va.:**

*"The Silicon Nitride biomaterial appears to be superior to Ti or PEEK in*



*antibacterial properties and osseous fixation. In my experience, patients are healing more rapidly, feeling less pain and progressing to physical activity faster with  $\text{Si}_3\text{N}_4$  implants. Clinically we are seeing evidence of earlier rates of fusion with  $\text{Si}_3\text{N}_4$ . I perform many spinal nerve decompression surgeries and use  $\text{Si}_3\text{N}_4$  to rebuild the area with a stabilizing procedure and to support the disk material. We like the rougher surface, which helps prevent movement.”*

**Chad E. Hartley, MD, a neurosurgeon in Wheatridge, Co.:**

*“Spine surgery is where I use the Silicon Nitride material the most. I use it as an interbody fusion device in spinal fusion surgeries, specifically anterior lumbar interbody fusion (ALIF), posterior lumbar interbody fusion (PLIF) and transforaminal lumbar interbody fusion (TLIF). I’ve definitely noticed post-op x-ray differences. We do a CT scan at about three months for any type of fusion operation, and with the Silicon Nitride, the area looks almost completely fused at three months.”*

**Alpesh A. Patel, MD, FACS, a spine specialist and surgeon in Chicago at Loyola University Medical Center:**

*“In more than four years and a great many patients, I’ve seen bone growth and attachment onto the  $\text{Si}_3\text{N}_4$  devices that I have not seen with titanium or PEEK. From a technical standpoint, the  $\text{Si}_3\text{N}_4$  systems are easy implants for the surgeon to use, and there is a quick learning curve. The benefits the material has for bone formation and fusion formation include the fact that it doesn’t cause the same kind of scatter or artifact that titanium or other metals cause, so if you do need to get a CAT scan or MRI scan on a patient afterwards, it makes for very clean and easy-to-interpret images.”*



***For more information about Amedica’s flagship material Silicon Nitride ( $\text{Si}_3\text{N}_4$ ), and complete product line for spine surgeons, please call (855) 839-3500, visit our website at [www.amedica.com](http://www.amedica.com) or speak to a representative at the 2012 NASS conference, booth #1638.***