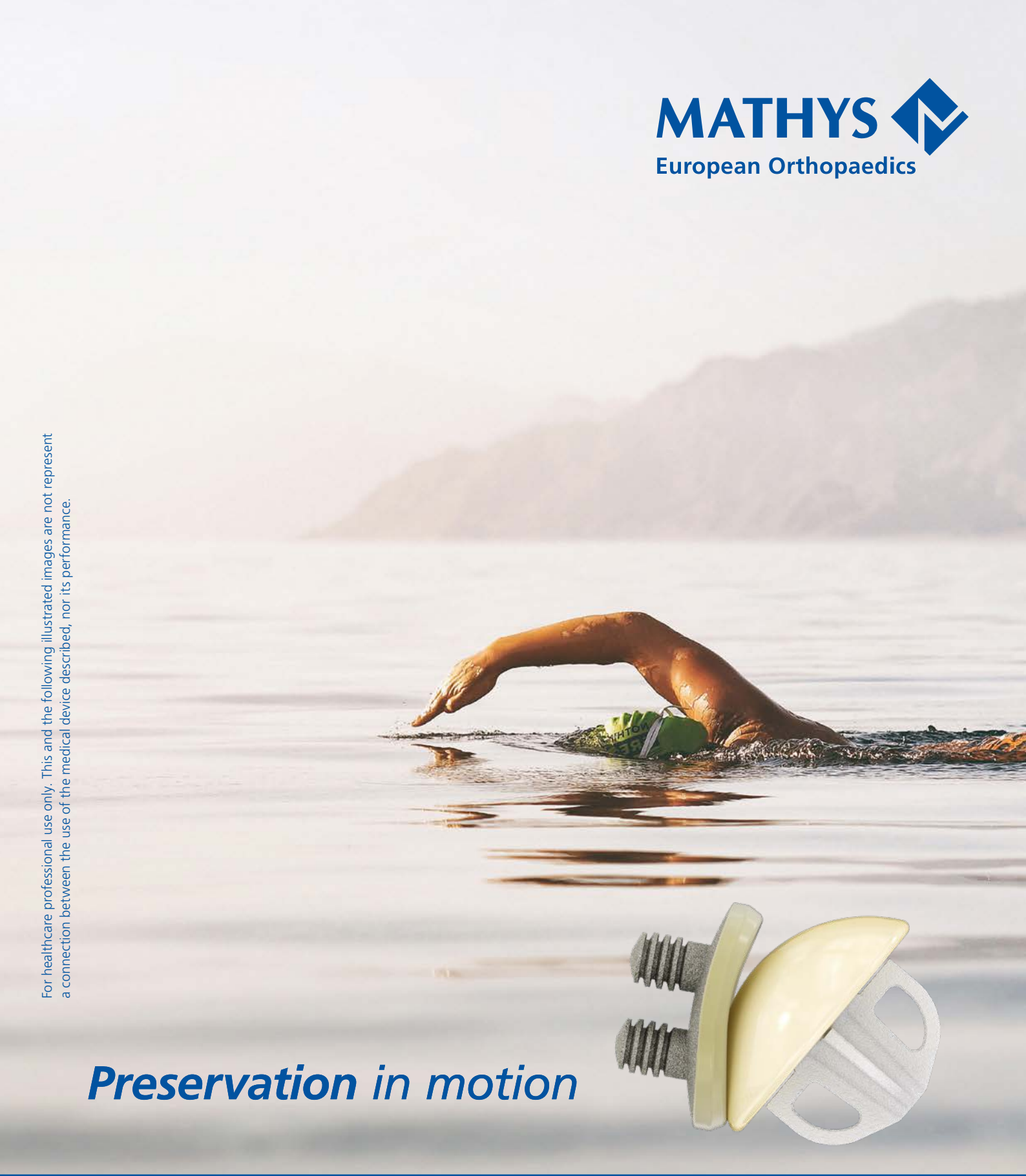
MATHYS
European Orthopaedics



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***Preservation** in motion*

Affinis Short

Stemless shoulder prosthesis

PIONEERING

PIONEERING SHOULDER PROSTHESIS

Mathys has significant experience in the area of the upper extremities. As early as the 1970s, the first prostheses in the shoulder area were marketed and implanted. Mathys achieved a pioneering feat in this development with the stemless shoulder prosthesis. The idea was as simple as it was captivating: Why not combine the advantages of resurfacing with those of stem prostheses?

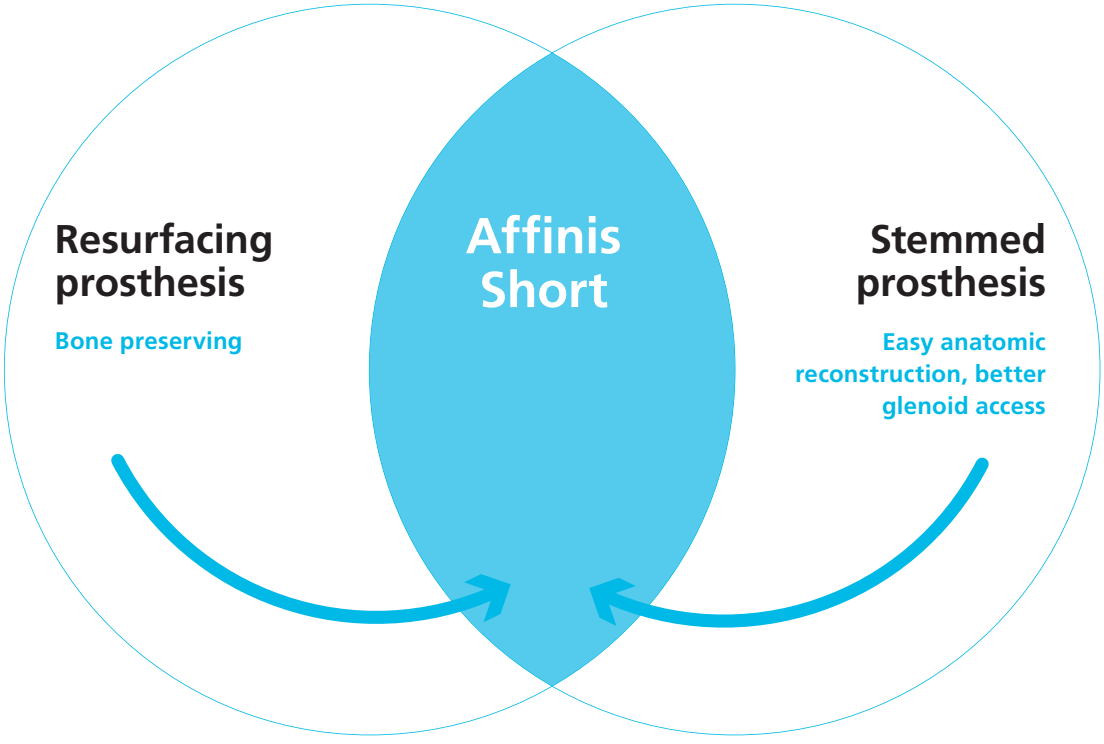
Resurfacing prostheses are indeed bone preserving; the challenge here is the rather complex surgical technique, however. Access to the glenoid is hampered, since the humeral head is not resected. The positioning of the prosthesis can be complex, and overstuffing is observed relatively frequently.

Stemmed prostheses offer an advantage here, because they permit more straightforward and anatomical reconstruction. By contrast, the long stem is very invasive and more difficult to revise, and this can lead to a high degree of bone loss.

Mathys has aimed to develop a solution that combines the advantages of easy, anatomical reconstruction without significant bone loss. The solution: Affinis Short – a combination of the advantages of the resurfacing and stem prostheses.

More than ten years after the first implantation, the prosthesis has established itself and has been considered ever since to be the forerunner of stemless prostheses in shoulder surgery.

With the Affinis Glenoid vitamys uncemented, the next ground-breaking development step has been taken. The RM titanium coating of the isoelastic glenoid component allows completely cementless anchorage of the anatomical shoulder prosthesis Affinis Short.



ESTABLISHED

ESTABLISHED STEMLESS SHOULDER PROSTHESES

10 YEARS CLINICAL EXPERIENCE

As a pioneer of stemless shoulder prostheses, Affinis Short stands for both ground-breaking implant design and progressive materials. The stable anchoring [1], the anatomical head design [2] and the wear resistant vitamys-ceramic articulation bearing [3] underline these principles.

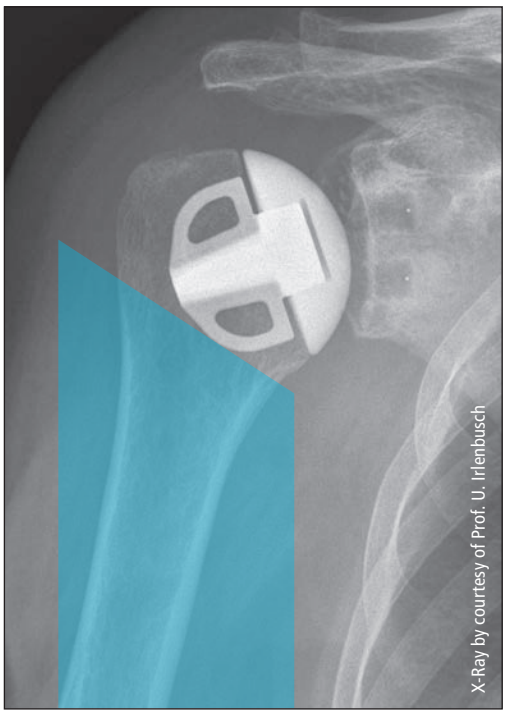
Affinis Short is uncompromising in the placement of the prosthesis and in the size graduation of the heads, and thanks to the stemless, metaphyseal anchoring, it is less invasive than stemmed prostheses are. The bone preserving principle is highlighted by the sophisticated anchoring design. In case of conversion to an inverse prosthesis, this allows not only easy stem extraction, but also preservation of the proximal bone substance [4]. In addition, the improved glenoid vitamys design reduces the rocking-horse effect [1]. Thanks to the RM coating, bone preserving fixation without cement is possible in the glenoid region.

The system is completed by a straightforward tray concept and smart instrumentation, which facilitates workflows during implantation.

More than ten years of clinical experience, good medium-term clinical and radiological results [5, 13, 14] and excellent register data [6] prove the success of Affinis Short and stand for an established stemless shoulder prosthesis.

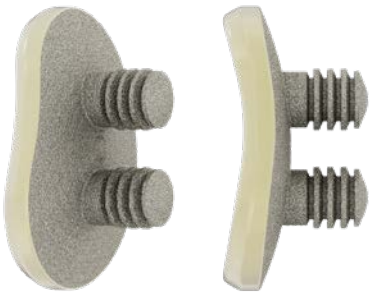
BONE PRESERVING

BONE PRESERVING PRINCIPLE



Affinis Short is extremely bone preserving thanks to its stemless, metaphyseal anchoring, it is less invasive than stemmed prostheses are. This bone preserving principle is crucial for an implant for elective initial implantations, independent of whether it is to be used as a hemiprosthesis or as a conventional total shoulder endoprosthesis.

Even in case of conversion, a bone preserving approach was ensured. Thus, thanks to the collarless stem design, the stem can be released along the fins using a small chisel; this has hardly any effect on the proximal bone substance, which can thus be preserved [4].



The RM coating of the Affinis Glenoid vitamys uncemented contributes to bone preservation, thanks to the cementless fixation of the glenoid component. As no cement is required, the risk of thermal damage to the surrounding bone during curing of the bone cement is eliminated.

In addition to this great clinical benefit in primary implantation, revision surgery is likewise bone preserving, as no cement is required to be removed laboriously from the glenoid bone.

UNCOMPROMISING

UNCOMPROMISING PHILOSOPHY

With Affinis Short, there is no need to compromise during placement of the humeral components. The stem can be placed independently of the humeral canal, in contrast to stemmed prostheses, in which the canal limits positioning.

Because of the size graduations of the heads, an almost continuous transition in the area of the implant/bone zone can be achieved, which makes anatomical reconstruction of the glenohumeral geometry possible [2] and helps to reduce overstuffing.

Mathys has also considered the case of a conversion. Because of the deliberately selected collarless design, fast and easy stem extraction is possible during conversion to an inverse prosthesis.

In addition, in contrast to stemmed platform systems, a subsequent inverse prosthesis can be used without compromising, at the optimal height, retrotorsion and inclination.

Uncompromising stem placement

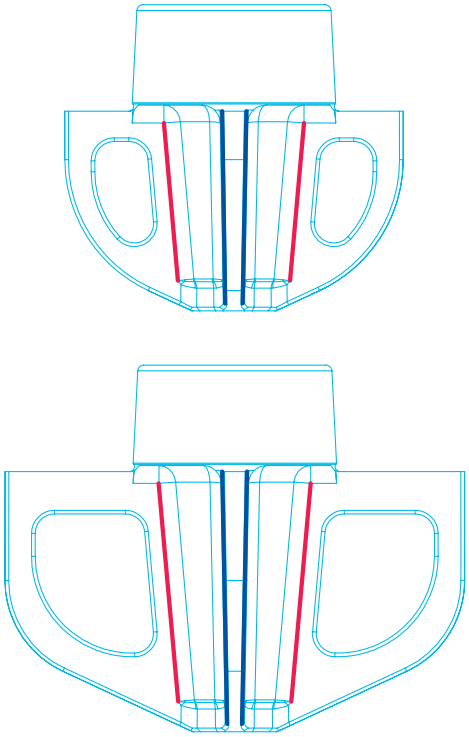
Anatomical reconstruction

The thin monoblock design of the Affinis Glenoid allows placement of the articular surface close to the native glenoid bone. This has the advantage that an optimal reconstruction of the joint line can be created, with a centre of rotation that is anatomical from a physiological point of view. Correct reconstruction of the joint line plays a crucial role in function and clinical outcome [5, 13, 14].

Another advantage of the Affinis Short prosthesis is the reduction of operating time in primary surgery, as the cementless option for implant anchorage does not require processing and curing of the cement.

ADVANCED
& STABLE

PIONEERING DESIGN

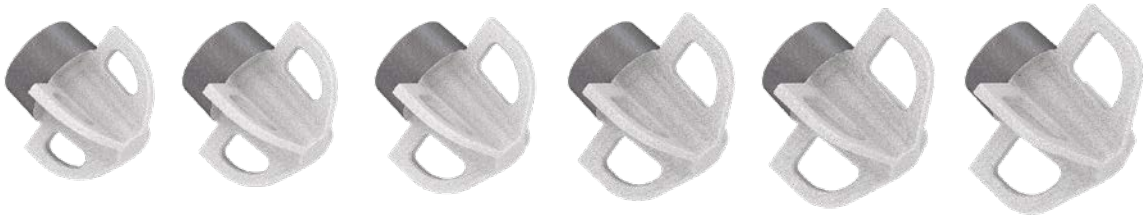


Stem

The Affinis Short stem has four fins for good rotational stability, with integrated bone windows for optimal radiological visibility.

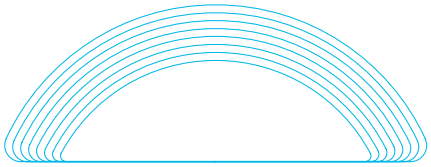
The continuously tapering stem and fin design and the implant bed preparation that has been reduced by 1.2 mm allow good press-fit and enable stable primary anchoring [1, 7]. This is supported with regard to the surgery in that in the stem is not completely driven in in the initial step, but instead is only finally impacted together with the head.

The large-pored titanium structure with calcium phosphate coating allows uncemented implantation. In addition, the coating promotes early osseointegration and ensures good secondary stability [5, 8, 13, 14].



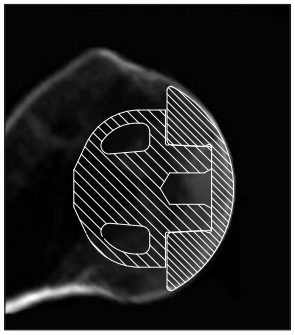
Six stem sizes – Titanium (TiAl6V4, coated with TPS + CaP)

PIONEERING DESIGN

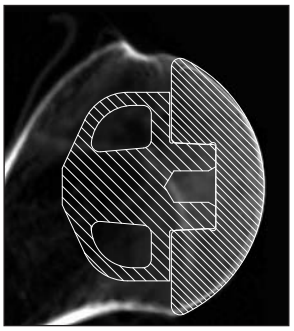


Head

The deliberately selected short stem cone makes it possible to offer a flat, anatomical head with round edges. The combination of accurate surgical technique and finely graduated ceramic heads ensures a seamless transition from bone to implant and avoids overstuffing [2]. Long-term studies have shown that the survival rate of a glenoid component significantly depends on the anatomical humeral head positioning [9].

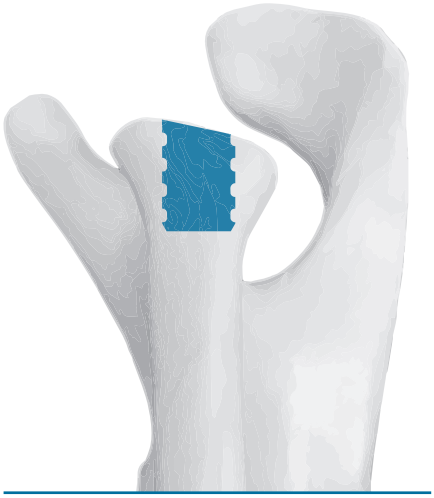


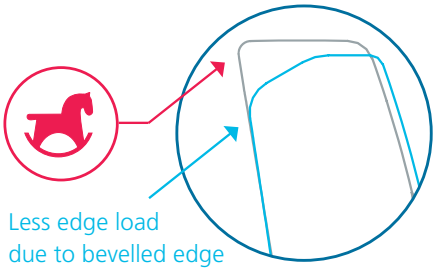
Stem 2 and head 39/13



Stem 5 and head 49/13

Eight head sizes – Bionit ceramic (Al_2O_3)



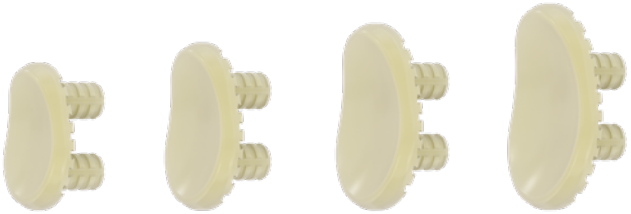


Glenoid

The central 2-peg design enables fixation even in the case of a narrow scapula, with reduced risk of cortical perforations.

The improved glenoid vitamys design, because of its bevelled edge, additionally reduces the edge loading and the rocking-horse effect [1] as a result, facilitating longer service life of the prosthesis.

In addition, the compact monoblock design of the glenoid component eliminates the risk of disconnection of modular components necessitating revision.



Four glenoid sizes – vitamys UHMWPE (cemented)

Isoelastic thanks to the RM coating

In the Affinis Glenoid vitamys uncemented, the titanium particles embedded into the vitamys material surround the two pegs and the back of the glenoid component. The titanium particles are individually anchored in the polyethylene without structural connection to each other. This ensures that the coating does not change the elasticity of the implant. The Affinis Glenoid vitamys uncemented thus remains isoelastic and allows cementless anchorage.

Four glenoid sizes – vitamys uncemented

PROGRESSIVE MATERIALS

Affinis Short is defined by both a pioneering implant design as well as progressive materials.

These include vitamys, a highly crosslinked polyethylene enriched with vitamin E, for the glenoid. The advantages of vitamys are obvious: vitamys is a material with high elasticity. The good mechanical strength allows a material-saving design in the development of the prosthesis component. The high wear resistance reduces wear and thus the risk of osteolyses [16]. The addition of vitamin E also ensures resistance to oxidation and thus high resistance to ageing [10].

We use high-quality ceramics for the heads. Low wear rates, high strength and toughness, good wettability and biologically inert behaviour [3, 11, 12] are among the advantages offered by this material. These advantages make ceramics a treatment solution not only for young and active patients.

For the Affinis Short stems, the titanium alloy Ti6Al4V, which has proven its worth for many years in medical technology, is used. The quality of the alloy is distinguished by a controlled homogeneous structure and the high strength of the material, and it permits nickel-free anchoring in the bone.

V

vitamys

C

Ceramics

T

Titanium

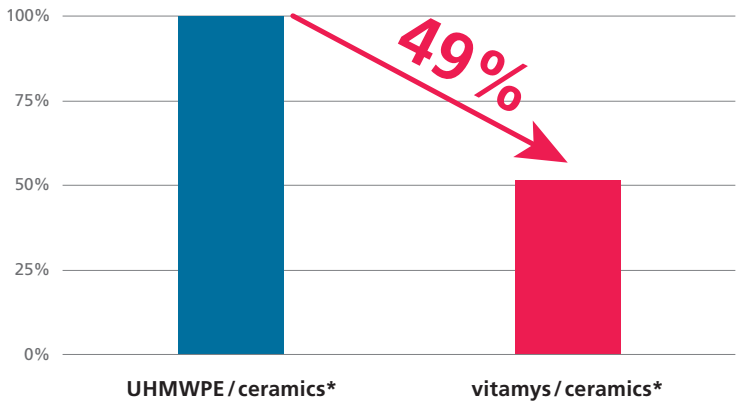
REDUCED WEAR

The combination of the Affinis Short head with the glenoid as an articulation bearing shows significantly reduced wear in the simulator test. The reduction in wear of the vitamys/ceramic coupling versus the UHMWPE/ ceramic pairing is 49 % [3].

Affinis Glenoid

Reduction of wear [3]

Wear reduction in % of the Affinis Glenoid sliding couplings



* Bionit (Al_2O_3)

Cementless

For anchorage in the humerus, the Affinis Short stem with its large-pored titanium structure and a calcium phosphate coating already offers a cementless solution.

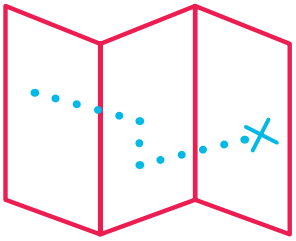
Now the Affinis Glenoid vitamys uncemented allows cementless anchorage on the glenoid side as well. The titanium particles embedded in the vitamin-E-enriched, highly cross-linked Polyethelene, vitamys, surround the two pegs and the backside of the glenoid component.

HYPOALLERGENIC

In joint replacement, allergic reactions to metal ions are a significant issue that concerns patients and doctors alike. For patients with a possible hypersensitivity to nickel, cobalt, chromium and molybdenum ions, implants such as the Affinis Short and the Affinis Glenoid vitamys uncemented, consisting of the materials ceramic, titanium and vitamys, are an excellent solution.

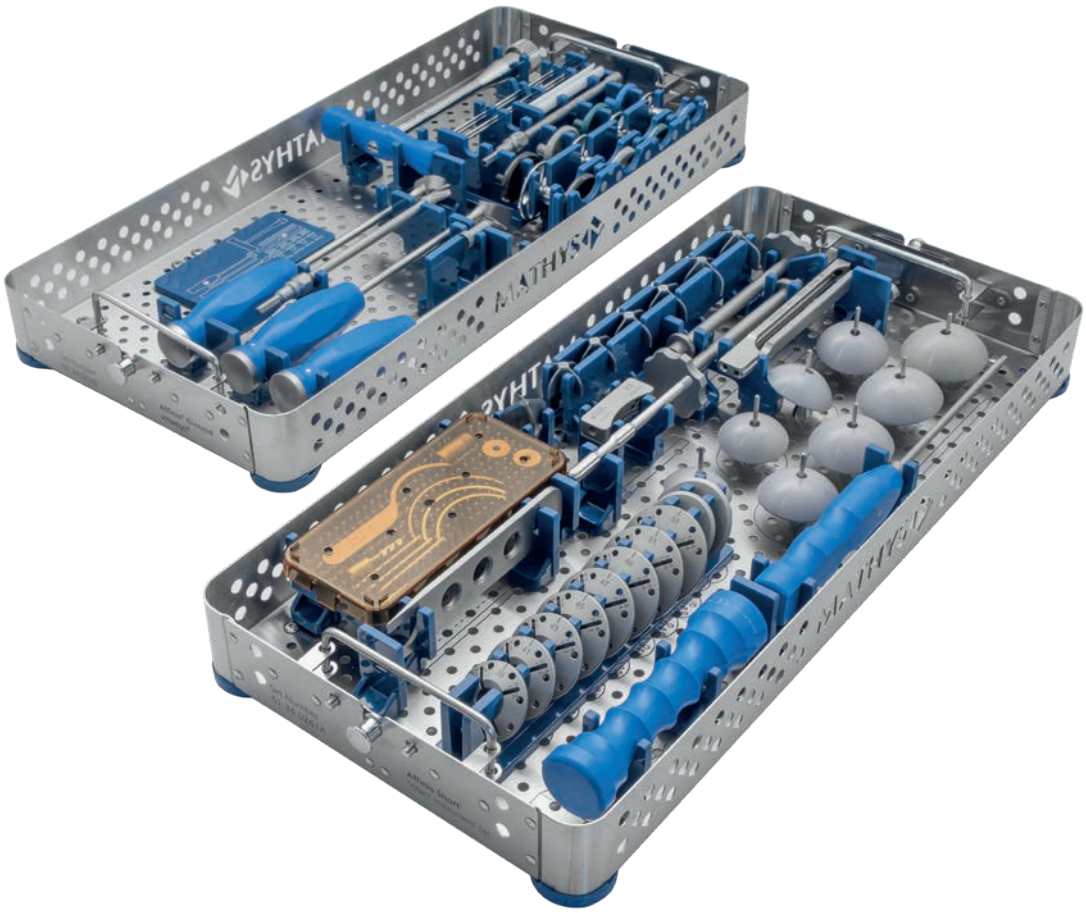
SMART

SMART INSTRUMENTATION



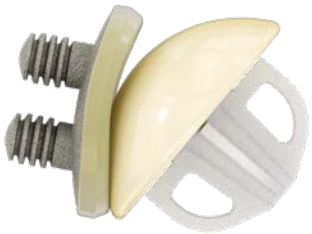
Affinis Short offers smart instrumentation, and as a result, it allows convenient operation with simple and logical workflows for efficient installation of the prosthesis. In addition, all surgical steps are instrumentally guided. Free-hand manipulations are avoided, hence reproducible results can be achieved.

The instruments are arranged in a straightforward tray concept that ensures overview of the entire instrumentation at all times.



AFFINIS SHOULDER SYSTEM

The Affinis Shoulder System covers a wide range of indications: Whether primary treatment, fracture or revision prosthesis – the Affinis shoulder prostheses solve orthopaedic challenges systematically and uncompromisingly and are defined by sophisticated implant design as well as by progressive materials.



Affinis Short

Stemless anatomical

Affinis Classic

Anatomical

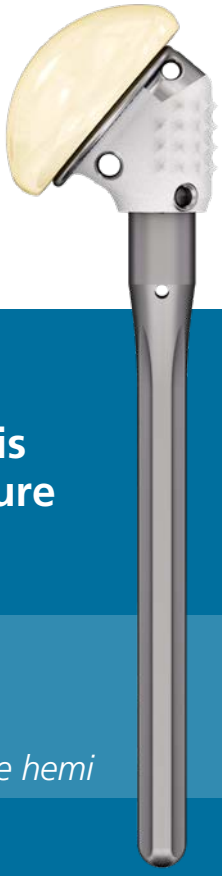
Affinis Inverse

Inverse

Osteoarthritis of the shoulder

Rotator defect arthropathy

«A system for a wide range of indications.»



Affinis Fracture Inverse

Fracture Inverse

Affinis Fracture

Fracture hemi

Proximal humeral fracture

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Preservation *in motion*

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