

# COVISION MEDICAL TECHNOLOGIES LIMITED

## THE STRAIGHT CEMENTED FEMORAL STEM

### - OPERATIVE TECHNIQUE PROCEDURE-

#### IMPLANTATION OF THE STRAIGHT CEMENTED FEMORAL STEM

Preoperative x-ray templating will have given some indication of the size of the Straight Cemented Stem to be implanted. It is important to try and use the largest size of Straight Cemented Stem that can be inserted following the reaming and rasping of the femoral medullary canal and trochanter. The size of Straight Cemented Stem implant used should match the size of the last rasp/trial used. There are currently seven sizes of Straight Cemented Stem ranging from Size 5 mm to Size 15 mm thereby offering a selection wide enough to suit most patient types. The Straight Cemented Stem is made from medical implant quality Stainless Steel alloy and must always be implanted in conjunction with bone cement. The design rationale of the Straight Cemented Stem is based on the excellent long term clinical results achieved with matt surface finished, collared, dual locking, Stainless Steel alloy cemented femoral stems similar to the original Müller Cemented Stem and the many copies and versions of this design which have been implanted to date.

**NB Please note that the Straight Cemented Stem Size 5 mm is a custom-made implant and should only be used for certain patients who require such a small size of stem. It is also important not to use the smaller sizes of stem in large or overweight patients as this could lead to implant failure.** Please refer to the product package insert for warnings, precautions, indications, contra-indications and adverse effects.

#### STEP 1 - RESECTING THE FEMORAL NECK

The Lesser Trochanter can be used as a visual guide to help with the resection of the femoral neck if this is being eye-balled. The level of femoral neck resection can also be determined during x-ray templating. The Angled Resection/Osteotomy Guide (Item Code 08.5129) with an in-built 45 Degree Angle is provided for those surgeons who prefer to use this to allow them to make a suitable diathermy line to mark both the level and the angle of femoral neck resection required. It is advisable to have more rather than less femoral neck bone left after resection as more of the neck can be removed later on if this should prove necessary. A wide and thick sawblade should be used with a Saggital Saw Attachment to resect the femoral neck.



*Sågguide 45° (08.5129)*

## STEP 2 - OPENING THE FEMORAL TROCHANTER

A Box Chisel or Box Osteotome is then placed as laterally as possible on the superior tip of the Greater Trochanter and in line with the shaft of the femur. Any Box Chisel can be used for this step of the procedure as long as it is rectangular in shape and fits inside the trochanter. The Box Chisel should be impacted into the trochanter using the 500 g Hammer in order to collect enough cancellous bone from the centre of the trochanter. It is only necessary to remove one or two volumes of cancellous bone from the trochanter in order to allow easier access to the femoral medullary canal.



*Öppnande av märkekanalen  
med exempelvis Osteotom,  
Boxmejsel eller Reamer*



*Vidgning av märkekanalen  
med raspar/provstammar  
(08.5147 - 08.5153)*

## STEP 3 - PREPARING THE FEMORAL MEDULLARY CANAL

A Femoral Canal Reamer is used for manual reaming or an AO Attachment Chuck for powered reaming. The tip of the Femoral Canal Reamer should be placed as laterally as possible inside the trochanter and kept in alignment with the femoral shaft at all times. The canal reamer should be inserted as far down the medullary canal as it will comfortably go. This is usually up to the level of the distal fluted section of the femoral canal reamer. It is usually only necessary to insert the canal reamer once in order to open up the femoral canal sufficiently to allow the introduction of the rasp/trials.

## STEP 4 - RASPING THE FEMORAL TROCHANTER

The smallest size of Straight Stem Rasp/Trial deemed appropriate (usually Size 7.5mm - Item Code 08.5148) is attached to the Rasp Handle (Item Code 08.0563) which has a snap-lock mechanism to hold the rasp/trial in place. The Rasp Pin or Tommy Bar (Item Code 08.0501) is inserted into one of the four holes in the shaft of the Rasp Handle to assist with gripping the Rasp Handle and imparting any required anteversion. The tip of the rasp/trial should be positioned as laterally as possible and impacted into the trochanter along the femoral shaft axis using the 500 g Hammer. Only the flattened shoulder of the Rasp Handle should be impacted until the rasp/trial is fully seated inside the trochanter. It is important not to use a rasp/trial that is too large for the femur as this can lead to cracks or, even more seriously, fractures in the cortical bone and the possibility that the definitive Straight Cemented Stem implant will be left proud after inserting it into the bone cement.



*Rasphandtag (08.0563) och  
Rasp/Provstam (08.5147 -  
08.5153) Utslags/Riktpinne  
(08.0501) saknas*

## STEP 5 - SELECTING THE APPROPRIATE SIZE OF STRAIGHT CEMENTED STEM

The procedure outlined in Step 4 should be repeated sequentially by using increasingly larger sizes of Straight Stem Rasp/Trials (Item Codes 08.5147 to 08.5153) until the optimum size of rasp/trial is reached. This is likely to be the same size as the one templated for but the surgeon may be forced to select a different size of Straight Stem based on the quality of the bone stock and the size of the trochanteric cavity achieved. The final rasp/trial impacted should feel solidly in place and should allow little if any rotation of the rasp handle. If it is possible to move the rasp/trial then the next size up of rasp/trial should be used to ensure a tighter fit. Removal of the rasp/trials after fully seating them is achieved more easily by hammering upwards on the Rasp Pin/Tommy Bar. It is not recommended to hammer directly on the shaft of the rasp handle at any time.



*Rasphandtag 08.0563*



*Utslags/Riktpinne 08.0501*



*Rasp/Provstam 5,0; 7,5; 10,0; 11,25; 12,25; 13,75 och 15.  
08.5147 - 08.5153*



*Rasp/Provstam rätt  
nedslagen med flänsen i nivå  
med avsågningen*

## **STEP 6 – INITIAL TRIAL REDUCTION**

If the Straight Cemented Stem is being used as part of a Hemi Hip procedure and Unipolar Modular Femoral Heads ranging from 42 mm to 58 mm in diameter and from minus 3 mm to plus 12 mm (thereby allowing a variation in neck length of 15 mm) are available from Covision Medical. The nine Unipolar trials (Item Codes

**08.0577 to 08.0585) plus the five Trial Sleeves (Item Codes 08.0523 to 08.0527) are included in the Straight Stem Femoral Instrument. These trials are used in combination to determine the optimum modular femoral head diameter and neck length.**



*gul -3; grön+0; röd +4; blå +8;  
svart +12 mm (08.0523 – 08.0527)*



*Provhylsa blå +8 mm  
08.0526*



*Utdragare för provhylsor och implantathylsor (08.0534)*



*Provhuvud Ø 42 - 58 mm  
(08.0577 – 08.0585)*



*Utprovning av huvuddiameter med  
Provhuvud (08.0577 - 08.0585) och  
Handtag till Provhuvud (08.0598)*



*Utprovning av halslängd  
med Provhuvud och  
Provhylsa Röd + 4 mm*

## **STEP 7 - IMPLANTING THE STRAIGHT CEMENTED STEM**

**The definitive Straight Cemented Stem to be implanted should always match the last size of rasp/trial used. For example, if a Size 10 mm rasp/trial was the last size used then a Size 10 mm Straight Cemented Stem should be selected. This will ensure a**

minimum bone cement mantle thickness of one millimetre (1 mm) around the stem to be implanted except for those sections of the Straight Cemented Stem that are in direct contact with the bone. It is important to achieve a tight physical fit between the implanted stem and the surrounding bone as this is the primary fixation method for this design of stem. The bone cement itself should only be considered as a useful filler and as a secondary fixation method. The bone cement pressuriser is then removed and the stem is firmly but carefully inserted into the prepared cavity by hand. Final impaction should be carried out using the Straight Cemented Stem Impactor (Item code 08.0565) which has a short oblong protusion to match the depression on the shoulder of the stem. This also allows a certain amount of control over the final alignment of the stem should it be necessary to alter the degree of anteversion. The Straight Cemented Stem should be impacted firmly and swiftly into the bone cement using the stem impactor and hammer until the collar of the Straight Cemented Stem has reached the level of the neck resection and is resting directly on the surrounding cortical bone. It is important to ensure that the Straight Cemented Stem is not left too proud as this could affect the long term stability of the stem and the overall offset of the joint as well as increase the leg length. It is also strongly recommended to maintain constant bone cement pressurisation throughout the period of bone cement setting time regardless of how long this may be bearing in mind that the collar of the Straight Cemented Stem automatically performs as a bone cement pressuriser on either side of the stem itself. Removal of the Straight Cemented Stem for whatever reason can be achieved by using the EPM Extractor from Dardel Medical [www.dardelmedical.se](http://www.dardelmedical.se).

**NB No PMMA Distal Centralisers are supplied for use with the Straight Cemented Stem as they are not considered necessary. It is essential that the implanted Straight Cemented Stem is locked tightly inside the prepared cavity of the femur which means that a certain degree of physical contact with the surrounding bone is required. Also, the Straight Cemented Stem is not designed to sink inside the bone cement mantle as is the case with polished, collarless cemented stems.**



*Införandet av stammen med  
Staminförare (08.0565)*

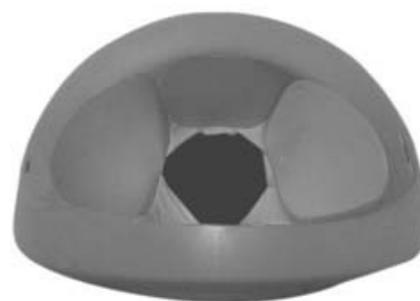
## STEP 8 - INTRODUCING THE MODULAR FEMORAL HEAD

It is strongly recommended that a final trial reduction should be carried out to determine the correct neck length of the definitive Modular Femoral Head implant to be used. There is always a small possibility that the definitive Modular Femoral Head implant required after the stem has been implanted may not have the same neck length as the trial modular femoral head selected during the initial trial reduction described in Step 6. Once the appropriate Covision Medical Modular Femoral Head has been selected (Item Codes 02.8300 to 02.8412 consisting of five 28 mm diameter heads and three 22 mm diameter heads all made from Cobalt Chrome alloy) it should be carefully placed by hand on the clean trunnion of the stem. The plastic end of the Head Impactor (Item Code 08.0573) is then positioned firmly against the modular femoral head and the other end firmly tapped several times with the hammer as shown in Figure 12 at the bottom of the previous page. On those occasions when it is deemed more appropriate to use a Covision Medical Ceramic 28mm Modular Femoral Head (Item codes 02.3000 to 02.3008) extra care should always be taken and it is usually only necessary to gently tap the Head Impactor once.

NB As already advised in Step 6 it is also possible to select either a Bipolar or a Unipolar Modular Femoral Head if a Hemi Hip procedure is being carried out. If such an implant is being used then please refer to the Operative Technique Procedure for the Covision Medical Troy Bipolar/Unipolar Modular Femoral Head System. If a Total Hip procedure is being carried out then please refer to the Operative Technique Procedures for either the Covision Medical Troy Cementless Cup or for the Covision Medical Troy Cemented Cup.



*Implantathylsa  
(02.8903 -  
02.8912)*



*Implantathuvud (02.8942 -  
02.8958)*



*Sammansättning av Huvud  
Hylsa och Stam*



*Påslagning av  
Implantathuvud*