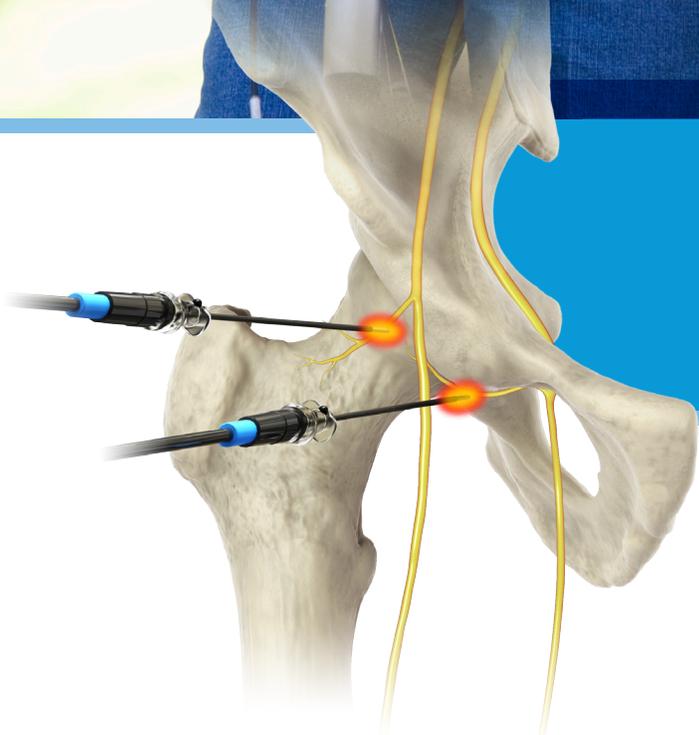




# Hip Joint RF

Non-Surgical Treatment of Chronic Hip Pain



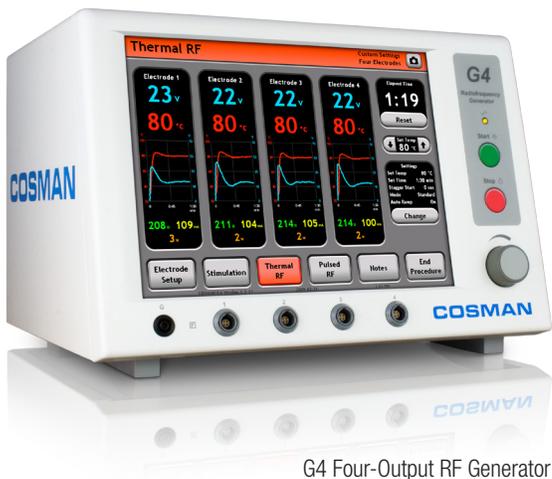
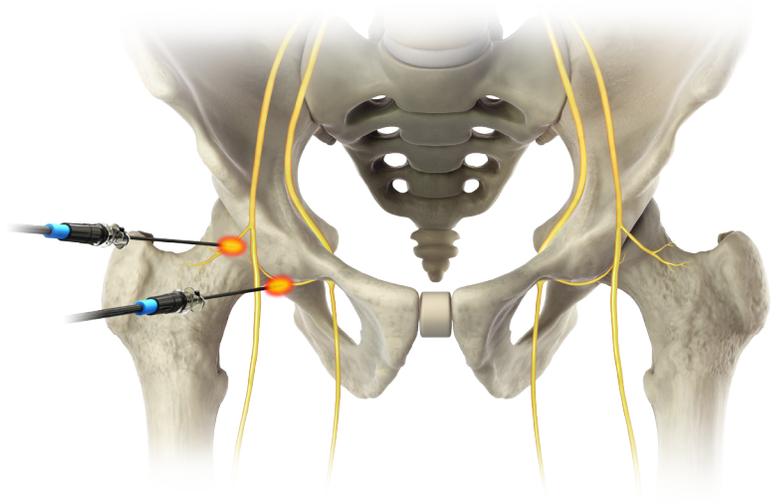
**COSMAN**

*The Leader in RF Medicine Since 1952*

# Radiofrequency Treatment of Branches of the Femoral and Obturator Nerves

## A Simple Treatment for a Widespread Problem

Chronic hip joint pain is a common problem among adults of advanced age.<sup>1</sup> Radiofrequency (RF) is a non-surgical and non-narcotic treatment option for those who are not candidates for invasive surgery.<sup>1-9</sup> Cosman devices are indicated for use in RF heat lesioning of peripheral nerve tissue for the treatment of pain.



G4 Four-Output RF Generator

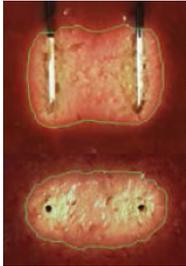
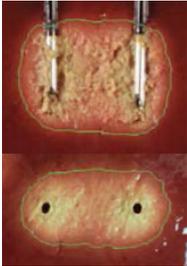
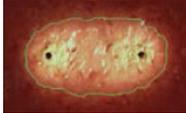
## Treat Multiple Nerves at the Same Time

Treating multiple nerves at the same time with conventional RF electrodes saves time and reduces costs. Cosman's G4 generator can operate up to four electrodes using thermal or pulsed RF, and monopolar or bipolar RF.

## Larger Lesions than Cooled RF

A physician can adjust ablation size by selection of cannula size and generator settings.<sup>10</sup> Conventional monopolar and bipolar radiofrequency applied for 3 minutes can create larger ablation zones than cooled RF.\*

Monopolar RF		
Cooled	16ga/6mm	18ga/10mm
60/77°C	85°C	90°C
		
W = 9.9 L = 8.9	W = 10.2 L = 11.3	W = 9.9 mm L = 13.4 mm

Bipolar RF		
10mm tips	90°C	s=12mm
20ga	18ga	
		
		
W = 18.1 L = 10.8 D = 9.2	W = 18.7 mm L = 12.9 mm D = 9.4 mm	

# Studies on Conventional RF for Chronic Hip Pain<sup>2</sup>

Study	No. of Patients: Treatment Details	Pathology Types	Results	Adverse Events	Notes
Chaibin et al <sup>1</sup>	1: TRF femoral and obturator bilateral, 80°C for 6 seconds. 22 gauge 5mm active tip.	OA	P: 80% reduction at 3 months F, M: N/A	None	Ultrasound and fluoro guidance. Used sensory and motor stimulation. Selected based on time limited response to bursa and joint injections. Patient continued anticoagulation.
Rivera et al <sup>3</sup>	17: TRF femoral and obturator branches, 90°C for 90 seconds. 22 gauge 5mm active tip.	OA, post THA, post girdlestone	P: 30% avg reduction at 6 months, 8 patients >50% relief F: Improved Harris Hip and WOMAC scores M: N/A	3 Transient hematomas	Diagnostic blocks (3cc). Inserted needle medial or lateral to femoral artery for obturator. 5mm active tip. Sensory and motor stimulation used. Switched to Locher <sup>11</sup> method during course of study.
Wu and Groner <sup>4</sup>	2: PRF femoral and obturator branches, 45°C for 120 seconds. 22 gauge 10mm active tip.	FHN, post THA	P: 50% to 60% reduction at 3-4 months F: Improved ambulation M: N/A	None	Diagnostic blocks (0.5cc to 1cc). Sensory stimulation.
Shin et al <sup>5</sup>	1: Femoral and obturator branch TRF.	Metastasis	P: 50% reduction	None	Korean Language.
Malik et al <sup>6</sup>	4: Femoral and obturator, TRF 75°C to 80°C for 90 seconds. Cannula size not reported.	OA, FHN, metastasis	P: 30% to 70% NRS at 3 months F: Improved ¾ pt M: Reduced ½ pt	Thigh numbness, 1 patient	AP approach. Diagnostic blocks (1cc LA).
Kawaguchi et al <sup>7</sup>	14: Obturator and/or femoral branch, TRF 75°C to 80°C for 90 seconds. Cannula size not reported.	OA, metastasis, DL	P: 50% relief, 86% patients avg 4.2 months (1-11 months) F,M: N/A	None	Suggested pain location predicted articular nerve involved, no block for femoral component. Volume for IA or obturator diagnostic block.
Fukui et al <sup>8</sup>	1: Femoral and obturator branch, TRF 90°C for 180 seconds. 22 gauge 4mm active tip.	OA, infection	P: 70% relief until 4 months; pain increased at 6 months F: Improved walking with cane M: Stopped use until 6 months	None	Diagnostic blocks with contrast (3cc LA). Sensory stimulation. Obturator cannula walked to obturator canal from superior pubic ramus. Introduced idea of cryoanalgesia for denervation of articular branches. Procedure not repeated because overall pain reduced.
Akatov and Dreval <sup>9</sup>	13 (15 hips): Obturator nerve proper, TRF 80°C for 120 seconds.	OA	Increased range of motion in 9 patients, remainder of results not clear. Followed for up to 3 years.	Sensory loss in all but one patient.	Needle technique not well described. Unclear if live fluoro used. Additional treatment for myofascial pain in 3 patients. Unclear if diagnostic blocks used, but 2cc to 3cc of LA injected prior to lesion to ensure pain resolved.

## Glossary:

AS - Ankylosing spondylitis

DL - Dislocation (congenital or trauma)

F - Functional improvement

FHN - Head necrosis (AVN, trauma, Legg-Calve-Perthes)

IA - Intra-articular

LA - Local anesthetic

M - Medication reduction

NRS - Numerical rating score

OA - Osteoarthritis

P - Pain reduction

post THA - Post total hip arthroplasty

PRF - Pulsed radiofrequency

RA - Rheumatoid arthritis

TRF - Thermal radiofrequency

The above table was reproduced with permission of the author.<sup>2</sup> The table and procedure steps in this brochure summarize the clinical methods and results reported in the medical literature. They are not intended to be used as a medical guide, instruction, or comprehensive report on referenced articles. Refer to the original articles for further information. The treatment of any patient is the sole responsibility of the administering physician. Refer to the instructions for use for all devices before treatment. Cosman Medical does not advise on use of products for a particular patient.

# Radiofrequency Treatment for Chronic Hip Pain

## Conventional RF Hip Procedure<sup>3</sup>

1. The patient is placed in supine position on an x-ray fluoroscopy table. The surgical site is prepared for aseptic technique, and the skin is numbed at the cannula insertion sites using local anesthetic.
2. Aseptic technique and fluoroscopic guidance are used throughout cannula placement and during treatment.
3. The sensory branch of the obturator nerve innervating the hip joint is targeted for ablation as follows. The femoral artery is located by palpation. An RF cannula is inserted 3cm lateral to the femoral artery, forming a 70° angle with the sagittal plane and a 20° angle with the transverse plane to avoid blood vessels. Using fluoroscopic guidance, the cannula tip is placed at the site below the inferior junction between the ischium and the pubis.
4. With the patient awake, cannula position is confirmed by requiring a response to Sensory stimulation (50Hz, 1msec) at less than 0.7 Volts. To prevent inactivation of motor nerves, increasing levels of Motor stimulation (2Hz, 1msec) at less than 0.9 Volts is applied to exclude muscle contractions.
5. After ruling out intravascular placement, lidocaine (1cc of 1%) is injected through the cannula.
6. A temperature-sensing RF electrode is inserted into the cannula, and radiofrequency is applied for the desired time and temperature. The patient is continuously monitored for signs of discomfort.
7. The sensory branch of the femoral nerve innervating the hip joint is targeted as follows. An RF cannula is inserted via an anterolateral approach with the tip below the inferior anterior iliac spine near the anterolateral margin of the hip joint. Steps 4-6 are repeated.
8. Following RF procedure, the cannula is withdrawn and a bandage is placed over the skin insertion site.

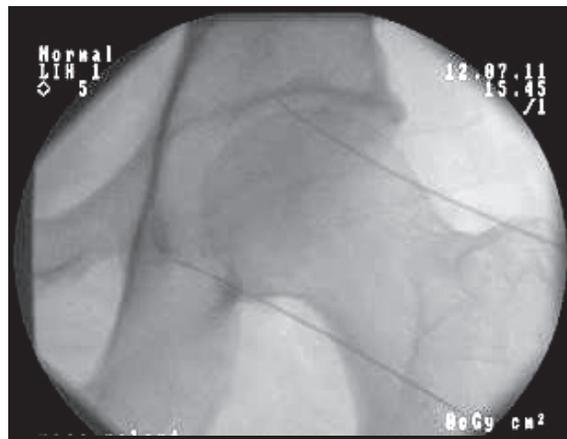


Figure 1. Radiofrequency denervation of the femoral and obturator branches of the left hip joint.<sup>2</sup>

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\* Average lesion size is assessed by color change in fresh bovine liver ex vivo. Ex vivo lesions may differ from clinical lesions.<sup>10</sup> Compared to cooled RF configuration for SIJ denervation.<sup>12</sup>