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Rotational field quantum magnetic resonance (RFQMR) in treatment of osteoarthritis of the knee joint

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ABSTRACT

Rotational Field Quantum Magnetic Resonance (RFQMR) is a technology that is made to deliver highly complex quantum electromagnetic beams in the sub-radio and near-radio frequency spectrum. The beams can be precisely controlled and focused onto tissues therein generating streaming voltage potentials. In osteoarthritis, this flow in the joint causes forced movement of hydrogen protons in the extra cellular matrix (ECM) due to the alteration in QMR spin in the hydrogen atoms and stimulates the chondrocytes. Thirty-five patients of osteoarthritis were treated with RFQMR focused on both knees for one hour every day for 21 days. They were evaluated before, immediately post treatment and one month after treatment with the Knee Society Scoring System and dynamometry. There was highly significant improvement in Pain Score, Total Knee Score, Total Functional Score, Range of Movement and force of extension, immediately after the treatment vis-a-vis pre treatment values and this improvement persisted when evaluation was repeated after one month. RFQMR is an effective method of treatment of osteoarthritis of the knee joint.

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KEY WORDS: Rotational field quantum magnetic resonance, Osteoarthritis

Rotational Field Quantum Magnetic Resonance (RFQMR) beams are delivered by a new computer controlled device called 'Cytotron' (Fig 1) that generates precise high intensity Quantum Magnetic Resonance beams from 96 specially designed Mn-Pb-Cu guns (Fig 2) that are focused on a target tissue. It is believed to alter the cell membrane potential in a highly controlled fashion [1,2]. Osteoarthritis is a degenerative disease caused by the loss of cartilage from load bearing joints, especially the knees, causing impairment of movement and often severe pain. Many kinds of therapies, including newer drugs have been tried with very little or no success, leaving patients with the only surgical option of joint replacement. This is often beyond the financial reach of patients especially in developing countries [3].

RFQMR Hypothesis in Tissue Regeneration

The study of the interactions between electromagnetic fields and living matter has become a fertile field for research in this century, even though these phenomena have been observed by various civilisations since ancient times. Considerable experimental evidence today points to the possibility of modulating biological functions and structures in a controlled way by inducing electromagnetic (EM) resonance and vice versa, the possibility of detecting and measuring endogenous EM resonance in living organisms and their components as an indicator of biological functions.

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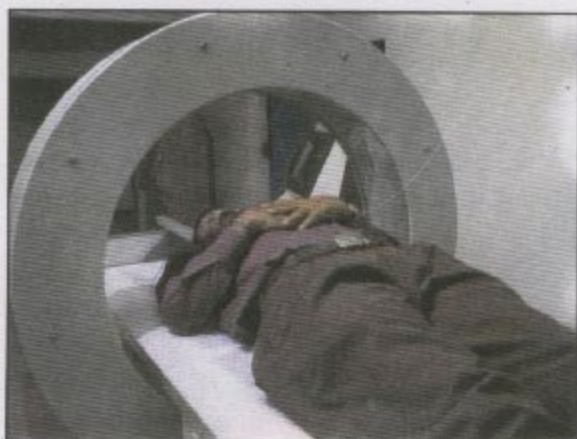


Fig 1: CYTOTRON RFQMR Machine



Fig 2: Typical QM 60 RFQMR Gun.

There are three types of EM effects on living matter: ionising, thermal and non-thermal effects [4]. Thermal effects induce an increase of entropic disorder in the target, until at certain frequencies and power levels, the effects of ionisation develop. The non-thermal effects are not the result of the transfer of erratic movement by means of an increase of kinetic energy, but rather, in line with the theories of the coherence of condensed matter, they can transmit information that would produce order in the biostructures involved. It is like the tissue response to radio frequency pulse during magnetic resonance imaging. The information content of the quantum EM beams would depend specifically on the waveform, the string of waves, and the time sequence of their modulation. In fact, specific variations in the configuration and temporal exposure patterns of extremely weak EM fields can produce highly specific biological responses,

similar to pharmaceutical products [5]. These non-thermal effects are attracting considerable scientific interest mainly because a quantum EM beam is easily modulated and thus is an excellent means for the transmission of information. Studies carried out by various authors suggest the possibility of utilising non-thermal effects even in causing electroporation of the cell membrane [6,7,8,9] to therapeutic advantage.

RFQMR is a technology that is made to deliver highly complex quantum electromagnetic beam pattern in the sub-radio and near-radio frequency spectrum, with precise external command and control.

Based on these studies, it is reasonable to consider patterns in living matter that take into account the EM components of biological structures. Every cell, for instance, is made up of biological and chemical components that can be described in progressively simpler terms down to the elementary molecular constituents of the cells. The cell itself and its internal and external interactions can also be considered in terms of electric and electromagnetic interactions and relationships [10,11,12,13]. Numerous experimental works have shown the possibility of modifying and controlling the selective permeability of the cell membrane by transmitting specialised quantum EM beams. This leads to the possibility of verifying the specific reactions of healthy cells vis-a-vis the reactions of pathological cells and subsequently selecting target cells for therapeutic intervention. Pathological cells are different from healthy cells due to a different tissue composition.

Various authors have reported the modulation of some cell functions, from ionic membrane pumps to many cytoplasmic enzyme reactions, including those connected with cell replication. From these studies it has been seen that the desired effects can be obtained from non-ionising non-thermal RFQMR beams.

Like other tissues, bone and cartilage are constantly being built up and broken down by a variety of metabolic and physical influences. The

major stimulus for bone and cartilage formation is a piezoelectric signal generated when these structures are subjected to tension or compression [14,15]. This explains why bone atrophies in the absence of any significant pressure, like weightlessness during space travel or immobilization in a cast.

The transmission of this signal is also impaired following joint injury due to trauma or diseases such as osteoarthritis [16]. RFQMR is designed to characterise and reproduce the piezoelectric signal by altering membrane potential of chondrocytes. This initiates regenerative activities by the induction of a spin in the hydrogen atoms and creates a streaming potential in the extracellular matrix (ECM) similar to that, when bone or cartilage are placed under a load.

In other words, when one takes a step, putting weight on the joint, it compresses the cartilage and thereby displaces the fluid, carrying with it mobile ions, sodium ions and leaves behind the negatively charged proteoglycan carboxyl and sulfate ions. This generates an electric potential due to deneutralisation of negative charges. This is called a Streaming Potential [17].

RFQMR can recreate this Streaming Potential and its restorative rewards in joints impaired due to disease or trauma even though they are at rest. The mechanism of producing this Streaming Potential during resting, natural regeneration while loading and RFQMR induced regeneration of cartilage can be simply put as follows:

(a) **At rest.** No change in equilibrium between hydrogen protons and negative charge carriers in the extracellular cartilage matrix. Therefore no Streaming Potential, no regeneration at rest.

(b) **Natural regeneration.** A Streaming Potential is created in the ECM during load bearing caused by the efflux of fixed negative charged fluid forced out of cartilage tissue with active influx of hydrogen protons.

(c) **RFQMR induced regeneration.**

Generation of streaming voltage potential flow in the joint is caused by forced movement of hydrogen protons in the ECM due to the alteration in QMR spin in the hydrogen atoms, causing stimulation of chondrocytes in the ECM.

The present study embodies the results of a new successful and relatively inexpensive treatment of osteoarthritis by the application of Rotational Field Quantum Magnetic Resonance (RFQMR) simultaneously to both knees.

Material and Methods

Thirty-five random subjects, with radiologically severe osteoarthritis were recruited for the study. The condition of their knee joints was first assessed by X-Ray and ultrasound examination at the Department of Radiology, Institute of Aerospace Medicine (IAM), Indian Air Force (IAF), Bangalore. Physical parameters such as height, weight, thigh girth, length of tibia, alignment and stability, goniometric and dynamometric measurements were carried out at the Department of Human Engineering, IAM, IAF. Goniometric measurements included evaluation of flexion, range of movement, extension lag, lateral and antero-posterior stability. Dynamometric evaluation involved assessment of extension power of each leg measured with weights in the multigym. Subjective factors such as pain and other disabilities were assessed by implementing the widely accepted Knee Society clinical rating system [18]. These measurements were made both before and after treatment. The data was fed into the computer at the Center for Advanced Research and Development (CARD) and the scores were recorded as per the International Knee Society scoring system.

Informed consent as approved by the Institute's Ethics Committee was obtained from all the patients. The knees of the subjects were exposed everyday for one hour for 21 successive days to the RFQMR beams delivered by the Cytotron, developed by CARD for the purpose. After the completion of 21 exposures, the patients

were re-assessed radiologically and by other human engineering parameters. These were based on inputs for the Knee Society scoring system. The results were fed as inputs to the computer software to assess the knee society scores. Ultrasound of the knee was done to plan the dosage and map the region of interest. The assessment was repeated 30 days after completion of the treatment.

Statistical Analysis

For the purpose of statistical analysis, each knee was taken as one case. Normality of the distribution of data was examined using Shapiro Wilks 'w' statistic. Physical attributes of male and female subjects followed normal distribution and therefore were compared using an unpaired 't' Test. Treatment effect measured as Pain Score [P], Range of Movement [ROM], Total Knee Score [TKS] and Total Functional Score [TFS], exhibited significant departure from normality and therefore were compared using Wilcoxon Matched Pairs Test. Comparison of these variables between the male and female groups was done with Mann Whitney test. Spearman's rank order correlation was attempted between physical attributes and treatment effect. All values are given as mean \pm SD.

Results

The Knee Society score consisting of P, TKS, TFS and ROM were analysed. According to the Knee Society scoring, P has a maximum scale of 50 for 'no pain', the TKS has a maximum scale of 100 being 'the best', TFS also has a maximum scale of 100 and ROM has a maximum of 25 indicating 'normal or maximum' range of movement.

Pain

The values indicated against 'Pain' are inversely proportional to the degree of pain. Zero representing excruciating pain-restricting mobility. These patients were almost confined to the wheel chair and they could move their legs only while sitting in the chair. Every patient showed improvement after the course of treatment. In all

the cases there was a significant abatement of pain after the third or fourth day of treatment and the pain progressively reduced during the course of exposure to RFQMR (Fig 3).

The histograms shown below depict centre points as median values, margins of boxes represent 25% and 75% percentiles and whiskers as minimum and maximum values in all graphical representations.

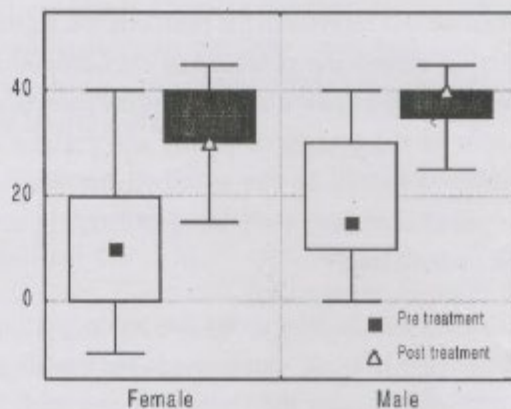


Fig 3 : Pain Score

Range of Movement

The range of movement increased progressively in every patient, the graph below shows the change in ROM during the course of treatment (Fig 4).

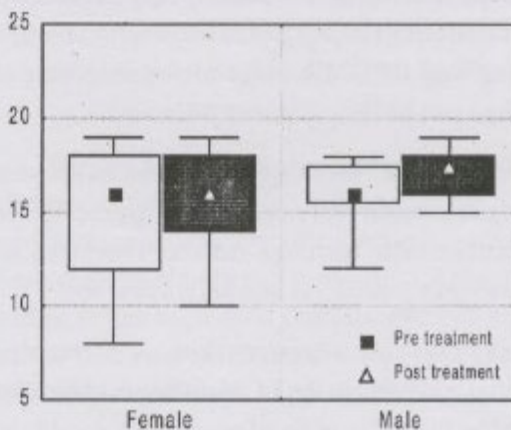


Fig 4 : Range of Movement

Total Knee Score and Total Functional Score

TKS and TFS improved spectacularly in all the patients, who were able to walk comfortably for considerable distances at the end of the treatment (Fig 5 and 6).

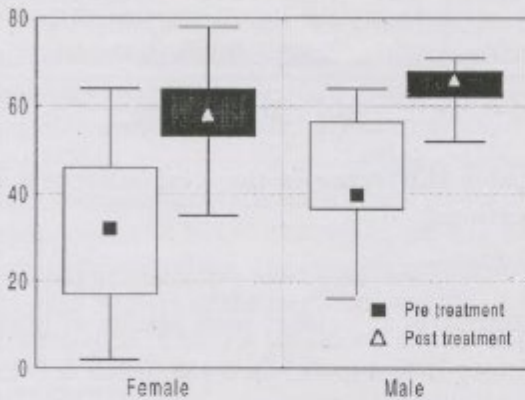


Fig 5: Total Knee Score

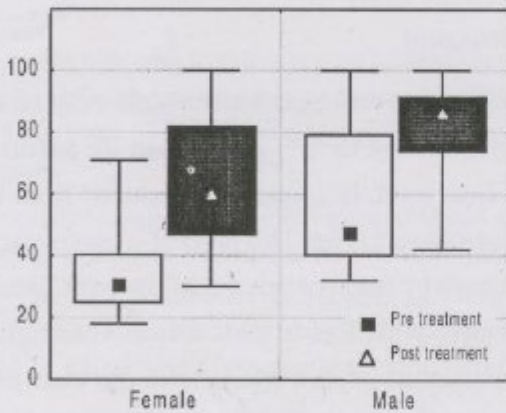


Fig 6: Total Functional Score

While in younger patients the relief was evident within a couple of days of treatment, the rate of relief was slower in older patients who experienced a significant degree of relief on the 6th or 7th day of treatment. However at the end of the treatment the older patients had better TKS and P.

Further, patients with radiologically severe osteoarthritis improved symptomatically better than those who had mild to moderate osteoarthritis. This probably is due to the fact that a small change in these subjects would produce a great amount of

symptomatic relief. Evidently, age of the patient plays an important role in the rate and degree of relief. TKS and P showed significant improvement in older patients. Patients with mild to moderate osteoarthritis reported fairly fast improvement in their pain and walking abilities midway during the treatment.

Dynamometry

Dynamometry was done on all the patients to assess the load bearing capacity of the knee joint. After 21 days of treatment with RFQMR, most patients could push 2 to 3 times the weight they could push before the treatment, indicating that the power of the leg from the thigh to the ankle as revealed by the extension pressure of the whole leg had improved considerably. In other words, they had greater control over their knee joint.

The histogram indicating the dynamometry outcomes before and after the treatment is indicated below (Fig 7).

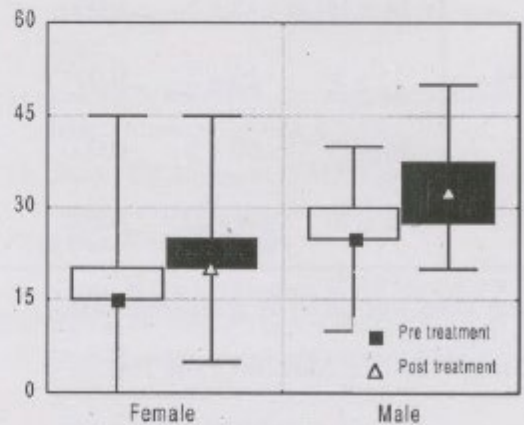


Fig 7: Dynamometry

The two gender groups were comparable in age, male subjects were taller and heavier as in Table 1 ($p=0.756$, 0.000 and 0.011 for age, height and weight, respectively; unpaired student's 't' Test).

Table - 1: Physical attributes of the subjects (N=35)

	Age (yrs)	Ht (cms)	Wt (kgs)	n
F	58±7	154±7	73±13	25
M	59±6	167±4	86±12	10
Pooled	59±7	157±9	77±14	35

Correlation of Patient Attributes with Treatment Benefit

Effect of treatment had no correlation with height or weight. However, age correlated significantly with improvement (difference between pre and post values) in terms of P and TKS (Table 2).

Table - 2: Effect of treatment (N=70*)

	Pre Treatment	Post Treatment	p**
P	14 ± 14	35 ± 8	0.000
ROM	15 ± 3	16 ± 2	0.001
TKS	36 ± 17	60 ± 9	0.000
TFS	42 ± 20	68 ± 21	0.000

* Each knee was taken as a separate case.

** Using Wilcoxon Matched Pairs Test

P, TKS, ROM, TFS and dynamometry did not show any correlation with height, weight or age (Table 3). The statistical treatment here was using Spearman's Rank Order Correlation, considered appropriate for the data type. All the other correlations were non-significant.

Table - 3: Correlation of subjects with treatment benefit

	Pain	ROM	TKS	TFS	DYN*
Age	0.279*	-0.077	0.238**	-0.053	0.064
Ht (cm)	-0.137	0.118	-0.161	-0.015	0.068
Wt (kg)	-0.011	-0.016	-0.025	-0.076	0.175

* p=0.019; ** p=0.047, *Dynamometry

Gender Difference in the Responsiveness to Treatment

There was no gender difference in response to treatment as evident from results of Mann Whitney U Test (p=0.346, 0.158, 0.269 & 0.351 for P, ROM, TKS and TFS, respectively). Details of these data are hence not presented.

Discussion

Hyaline cartilage, which forms a cap on the long bones and the inner surface of the patella in the knee joint, is constantly produced from the chondroblastic layer. This process is continuously activated by the constant use of the joint. Disuse atrophy, which is a well known biological phenomenon, applies specially to the knee joint since it is the most important load bearing joint in the human body. The disuse of the joint shows its effect in the form of degeneration of cartilage in the articular surfaces of the bones in the knee joint. Overuse, constant impact and injuries lead to early onset of degenerative change. The rate and extent of degeneration depend on the degree of disuse and the process of aging in the individual. Consequently, older persons exhibit a rapid progress of osteoarthritis because the regenerative capacity of the chondroblasts is progressively reduced with age and sedentary habits. Joint pain sets in, this in turn reduces mobility causing disuse atrophy of the

supporting muscles leading to increased loading and the cartilage degenerates further and thus a negative cycle sets in. Hence, the earlier the disease is diagnosed and treated, the greater is the effectiveness in the activation and regeneration of the cartilage.

RFQMR stimulates the chondrocytes and initiates the regeneration process, reduces pain and increases mobility of the joint, thus reversing the negative cycle. This study demonstrates that use of RFQMR treatment for osteoarthritis decreases pain, increases mobility, stability and power of the knee joint and helps normalise the life of an osteoarthritic patient. The patients were followed up after 30 days of the treatment and showed no deterioration in their Knee Scores or pain status.

Conclusion

(a) Younger subjects had earlier subjective and objective relief, which was almost complete at 21 days.

(b) Subjects with lower pain scores (i.e. more pain) showed greater subjective improvements.

(c) No gender difference to treatment was seen.

(d) No significant difference in status at the end of treatment and at one month was noted.

(e) Exposure of the knee cartilage to RFQMR is an effective method of treatment and can be a new line of treatment for osteoarthritis.

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**THE EFFICACY OF ROTATIONAL FIELD QUANTUM NUCLEAR
MAGNETIC RESONANCE (RFQMR) IN TISSUE REGENERATION OF
CARTILAGE CELLS**

Preliminary (pre- exposure) Assessment Protocol for Treatment Schedules Analysis

Tissue Type: _____ Exposure Days 21 days Hr/Exp. 1/2 hr.

A. Biographic Data:

Sl No: DL-047

Name: Mrs. Manorama Shetty

Age: 75

Gender: Female

Address: 21/9, M.G. Road,
Bangalore - 560001
Ph: 25584484

Profession: House wife Height: 152cms Weight: 57kgs

Hip/ Waist Ratio: 94/75

B. Clinical Data:

Affected joint/joints: Both knees Duration: 8yrs

Family history of
arthritis:
(Genetic Predisposition) Nil

- Primary (parents, siblings etc)
- Secondary (parents, siblings)
- Thesauri (Cousins)

Present Medication:

- Paracetamol sos

Physical Examination:BP: Pulse: **C.1 Local: Examination of the affected joint/s**Deformity: Yes No Tenderness: Yes No Movements: Passive Active **D. Radiological Investigation:****D.1. x-ray (both knees- standing preferably with equal weight on both knees):**AP Lateral Skyline D.1.1. Cartilage thickness (Left)
Joint Space/2)

Cartilage thickness (Right)

D.1.2. Average Skin to Target
distance(Left)

Average Skin to Target distance (Right)

E. QMR Exposure:E.1. Date of commencement of exposure E.2. Time Schedule E.3. Period of Exposure per day E.4. Date of completion of exposure F. Adverse reaction (if any) after
Commencement of Exposure

Seen after _____ Exposures

Local:

Systemic:

Type of Reactions:

G. Assessment Questionnaire:

Thank you for taking time to help us better understand how your knee problem affects your daily life.

Please circle the answer that best describes your knee:

H.1. How much pain do you have when you are walking?

- None
- Mild or Occasional
- Moderate
- Severe

H.2. How much pain does your knee cause when going up and down stairs?

- None
- Mild or Occasional
- Moderate
- Severe

H.3. How much pain does your knee cause when you are at rest?

- Mild
- Moderate
- Severe
- Symptomatic plus objective

H.4. How does your knee affect your walking ability?

- I can walk unlimited distances
- I can walk 2 to 4 Kms
- I can walk 1 to 2 Kms
- I can walk 200 to 1000 mts
- I can walk less than 200 mtrs
- I cannot walk at all.

H.5. How do you go up stairs?

- I go up stairs normally one foot in front of the other.
- I use the handrail for balance.
- I use the handrail to pull myself up.
- I cannot climb stairs.

H.6. How do you go down stairs?

- I go down stairs normally one foot in front of the other.
- I use the handrail for balance.
- I use the handrail to support myself.
- I cannot come down stairs.

H.7. How do you get out of a chair?

- I get out of a chair normally without support.
- I use the armrests for balance.
- I use the armrests for push myself.
- I cannot get out of a chair.

H.8. What type of support do you use when walking?

- None
- Cane
- Crutches
- Walker

Clinical Assessment

	R	L
9. Range of Motion		
•	<u>120</u> Degrees	<u>124</u> Degrees
10. Extension Lag		
•	<u>12</u> Degrees	<u>10</u> Degrees
11. Flexion Contracture		
•	<u>100</u> Degrees	<u>100</u> Degrees
12. Medial/ Lateral Stability		
•	<u>2 mm</u> 0-5 mm	<u>2 mm</u> 0-5 mm
•	5-10 mm	5-10 mm
•	> 10 mm	> 10 mm
13. Anterior/ Posterior Stability		
•	<u>1 mm</u> 0-5 mm	<u>1 mm</u> 0-5 mm
•	5-10 mm	5-10 mm
•	> 10 mm	> 10 mm
14. Alignment		
•	<u>0</u> Degrees	<u>0</u> Degrees

Quality of life Assessment (Preliminary)

By ticking one (1) square per line, please indicate how true each statement has been for you during the past 7 days.

1.1. Physical Well Being:

	Not at all	A little bit	Some what	Quit a bit	Very much
1.1.1. I feel lack of energy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.1.2. Because of my knee condition I have trouble meeting the needs of my family:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.1.3 I feel very ill:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.1.4. I am forced to spend time in bed:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.2. Emotional well being:

1.2.1 I feel sad	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2.2 I feel nervous	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1.2.3 I worry that my condition will get worse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1.2.4 I am depressed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

J.1 Functional well being:

J.1.1 I am able to work (including work at home)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J.1.2. My work (including work at home) is fulfilling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J.1.3. I am able to enjoy life	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
J.1.4. I am sleeping well	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
J.1.5 I am content with the quality of my life right now	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Final Assessment:

Total Pain Score _____
Physical Well Being Score _____
Emotional Well Being Score _____
Functional Well Being Score _____

Remarks:

Harriet V. Sking
Patients Signature

Co-Invest

14.6.05

Date

Name of the principle Investigator

Signature

14 Jun 05

Date

Name of the Co-Investigator

Signature

Centre for Advanced Research and Development (CARD)

S-CARD CAMPUS, Bangalore - 49

C No: 010

Knee Society Rating Analysis

Name: Mrs. Manorama Shenoy

Age: 75 Yrs

Id Code: 47

Gender: Female

Height: 152 Cms

Weight: 57 Kgs

BSA: 2 Sqm

Assessment	Max. Score	Pre Treatment		Post Treatment	
		L	R	L	R
Pain	50	35	35	30	30
ROM	25	16	15	14	14
Stability					
A. Medial/Lateral	15	5	5	5	5
B. Anterior/Posterior	10	10	10	10	10
Total Knee Score	100	66	65	59	59
Total Functional Score	100	77	72	69	69

Left Knee ; R - Right Knee

Assessment by

Investigator

RAW DATA FOR REGENERATION (osteoarthritis) CLINICAL TRIAL

Ref: 081104_PatDat_Osteo

ID#	Treatment Date	Name	Age	Gender	Cart Before L	Cart Before R	Cart After L	Cart After R	Delta_L	Delta_R	Delta_B	%Delta_L	%Delta_R	%Delta_B	Height	Weight	PP_L	PP_R	PA_L	PA_R	RP_L	RP_R	RA_L	RA_R	SPM_L	SPM_R	SAM_L	SAM_R	SPA_L	SPA_R	SAA_L	SAA_R	KS_PL	KS_PR	KS_AL	KS_AR	LP_TFS	RP_TFS	LA_TFS	RA_TFS
1	5/21/2005	Concealed	73	M	0.9	0.8	1.1	0.9	0.2	0.1	0.3	0.22	0.13	0.27	160	49	0	0	35	35	15	15	18	18	5	5	10	10	10	10	10	10	30	30	73	73	71	71	95	95
5	5/21/2005	Concealed	65	F	0.7	0.7	0.6	0.9	-0.1	0.2	0.1	-0.14	0.29	0.17	152	54	25	25	30	30	12	9	12	11	10	5	5	10	10	10	10	57	49	57	56	62	67	66	69	
6	5/21/2005	Concealed	56	F	1.1	0.9	0.6	0.6	-0.5	-0.3	-0.8	-0.45	-0.33	-1.33	147	64	0	0	0	0	15	16	14	14	10	10	10	10	10	10	35	36	34	34	-5	0	0	0		
7	5/16/2005	Concealed	64	F	1.9	0.8	1.9	1.1	0	0.3	0.3	0.00	0.38	0.16	155	56	0	0	35	35	14	14	16	16	5	5	5	5	10	10	29	29	66	66	44	39	30	24		
8	5/21/2005	Concealed	62	F	0.6	0.7	1.1	0.9	0.5	0.2	0.7	0.83	0.29	0.64	148	66	10	10	0	0	16	16	16	16	5	5	5	10	10	10	41	41	31	36	65	63	79	79		
9	5/21/2005	Concealed	66	F	1.9	2.3	1.9	2.3	0	0	0	0.00	0.00	0.00	154	56	15	15	35	35	16	15	16	16	5	5	10	10	10	10	46	45	71	71	57	55	92	92		
10	5/21/2005	Concealed	75	F	1.2	1.2	1.1	1.1	0.5	-0.1	0.4	0.71	-0.08	0.33	152	57	35	35	45	45	16	15	15	15	5	5	5	5	10	10	66	65	75	75	77	72	45	45		
12	5/27/2005	Concealed	70	F	0.9	0.9	1.1	1.1	0.2	0.2	0.4	0.22	0.22	0.36	157	77	10	10	25	25	14	16	16	16	5	10	10	10	10	10	39	46	61	61	38	45	25	25		
13	5/27/2005	Concealed	72	F	0.7	0.7	0.6	0.7	0	-0.1	-0.1	0.00	-0.14	-0.14	139	57	0	0	10	10	-14	13	14	14	5	5	10	10	10	10	29	28	44	44	59	54	67	64		
14	5/26/2005	Concealed	81	F	0.8	0.7	0.7	0.7	0	-0.1	-0.1	0.00	-0.13	-0.13	148	67	15	15	15	15	11	12	12	13	10	10	10	10	10	10	46	47	47	48	38	28	42	37		
15	5/26/2005	Concealed	80	M	0.7	0.7	0.7	0.7	0	0.1	0.1	0.00	0.17	0.14	175	74	0	5	15	15	16	16	16	16	5	5	5	5	10	10	31	36	46	46	11	11	38	15		
17	5/28/2005	Concealed	65	M	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	172	85	0	0	15	15	14	16	15	16	10	5	5	5	10	10	34	31	45	46	81	76	66	66		
20	5/25/2005	Concealed	70	F	0.6	0.8	0.6	0.9	0	0.1	0.1	0.00	0.13	0.17	140	92	20	20	25	25	12	14	13	14	5	5	10	10	10	10	47	49	58	54	17	22	25	30		
24	6/11/2005	Concealed	68	M	0.8	0.8	0.7	0.6	-0.1	-0.2	-0.3	-0.13	-0.25	-0.43	161	75	20	20	0	0	16	16	16	17	5	5	10	5	10	10	51	51	36	32	72	72	62	62		
30	6/11/2005	Concealed	29	M	2.3	1.9	2.5	2.1	0.2	0.2	0.4	0.09	0.11	0.16	186	70	30	30	35	35	17	17	17	18	5	5	5	5	10	10	62	62	67	68	100	100	100	100		
33	6/11/2005	Concealed	78	M	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	165	75	0	0	15	15	14	14	16	15	10	10	10	10	10	10	34	34	51	50	50	45	80	75		
35	6/17/2005	Concealed	69	F	0.8	0.8	0.9	0.9	0.1	0.1	0.2	0.13	0.13	0.22	145	65	15	15	10	10	14	11	16	15	10	10	10	10	10	10	49	46	46	45	33	18	28	28		
38	6/16/2005	Concealed	71	M	0.3	0.3	0.7	0.7	0.4	0.4	0.8	1.33	1.33	1.14	158	77	15	15	15	15	14	15	16	16	10	10	10	10	10	10	49	50	51	51	52	52	54	59		
41	6/17/2005	Concealed	63	M	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	168	62	0	0	15	15	16	15	16	15	10	10	10	10	10	10	36	35	51	50	45	45	59	59		
42	6/17/2005	Concealed	80	F	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	147	58	0	0	15	15	12	14	14	15	10	10	5	5	10	10	32	34	44	45	33	28	33	33		
43	6/17/2005	Concealed	67	M	0.7	0.9	0.9	1.1	0.2	0.2	0.4	0.29	0.22	0.44	165	76	15	15	15	15	14	14	14	14	10	10	10	10	10	10	49	49	49	50	77	72	81	81		
44	6/17/2005	Concealed	73	F	0.6	0.5	0.9	0.7	0.3	0.2	0.5	0.50	0.40	0.56	148	78	0	0	10	10	14	14	15	14	10	10	10	10	10	10	34	34	45	44	58	58	43	43		
45	6/16/2005	Concealed	65	F	0.7	0.6	0.9	0.8	0.2	0.2	0.4	0.29	0.33	0.44	155	83	0	0	15	15	15	12	16	14	10	10	10	10	10	10	35	32	51	49	92	87	40	35		
48	7/1/2005	Concealed	51	F	0.6	0.3	0.5	0.9	-0.1	0.6	0.5	-0.17	2.00	1.00	160	60	10	0	15	15	16	16	17	17	10	10	10	10	10	10	46	36	52	52	42	42	70	70		
49	7/5/2005	Concealed	62	M	0.9	0.8	1.0	1.2	0.1	0.4	0.5	0.11	0.50	0.50	171	76	0	0	15	15	15	15	15	17	5	10	5	5	10	10	30	35	45	37	60	65	84	89		
50	7/2/2005	Concealed	76	M	0.6	0.4	0.8	0.8	0.2	0.4	0.6	0.33	1.00	0.75	170	73	10	10	0	0	15	16	14	15	10	10	10	10	10	10	45	46	34	35	18	18	27	25		
56	7/1/2005	Concealed	72	F	0.6	0.3	1.1	0.7	0.5	0.4	0.9	0.83	1.33	0.82	174	79	10	10	45	45	15	15	17	17	10	5	5	5	10	10	45	40	77	77	27	32	59	59		
57	7/8/2005	Concealed	66	M	0.6	0.4	0.8	0.7	0.2	0.3	0.5	0.33	0.75	0.63	167	66	15	15	10	10	13	14	13	14	10	10	10	10	10	10	48	49	43	44	10	15	10	10		
58	7/7/2005	Concealed	58	M	0.6	0.4	0.9	0.9	0.3	0.5	0.8	0.50	1.25	0.89	150	65	10	10	10	10	11	12	12	14	10	10	5	5	10	10	41	42	37	39	10	10	-5	-5		
59	6/28/2005	Concealed	80	F	0.7	0.9	1.1	1.1	0.4	0.2	0.6	0.57	0.22	0.55	148	53	35	35	40	40	12	14	15	16	10	10	10	10	10	10	67	69	75	76	47	52	46	46		
62	7/8/2005	Concealed	69	F	0.4	0.6	0.7	1.1	0.3	0.5	0.8	0.75	0.83	1.14	146	47	0	0	15	0	9	11	13	15	10	10	10	10	10	29	31	48	35	10	10	10	10			
63	7/9/2005	Concealed	79	M	0.4	0.6	0.8	0.7	0.4	0.1	0.5	1.00	0.17	0.63	165	70	0	0	0	0	16	15	17	17	5	10	10	10	10	10	31	35	37	37	43	43	38	48		
64	7/9/2005	Concealed	68	F	0.4	0.3	0.8	0.8	0.4	0.5	0.9	1.00	1.67	1.13	151	70	0	0	0	0	14	13	15	16	10	10	5	10	10	10	34	33	35	31	32	27	36	36		
65	7/8/2005	Concealed	55	F	0.6	0.5	0.8	0.8	0.2	0.3	0.5	0.33	0.60	0.63	155	85	5	5	15	15	15	12	16	16	10	10	10	10	10	40	37	51	51	32	27	45	45			
66	7/7/2005	Concealed	74	F	0.8	0.8	1.1	1.1	0.3	0.3	0.6	0.38	0.38	0.55	159	70	25	25	35	35	12	11	14	15	5	5	10	5	10	10	52	51	69	65	35	40	45	45		
67	7/7/2005	Concealed	65	F	0.4	0.6	0.7	0.6	0.3	0	0.3	0.75	0.00	0.43	155	65	35	5	45	45	12	13	14	15	10	10	10	10	10	10	67	38	79	80	56	56	59	59		
68	7/22/2005	Concealed	58	F	0.6	0.4	0.7	0.7	0.1	0.3	0.4	0.17	0.75	0.57	164	85	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
69	7/24/2005	Concealed	68	M	0.4	0.3	0.7	0.5	0.3	0.2	0.5	0.75	0.67	0.71	173	90	0	0	15	15	5	14	6	15	10	5	10	5	10	10	25	29	41	45	13	13	23	23		
71	7/22/2005	Concealed	70	M	0.5	0.3	0.7	0.7	0.2	0.4	0.6	0.40	1.33	0.86	159	65	0	0	0	0	16	15	17	16	5	5	10	10	10	10	31	30	37	36	25	25	30	30		
72	7/23/2005	Concealed	82	F	0.8	0.8	1.1	1.1	0.3	0.3	0.6	0.38	0.38	0.55	148	70	0	0	15	15	16	15	17	17	5	5	10	10	10	10	31	30	52	52	49	44	52	47		
73	7/23/2005	Concealed	66	F	0.8	1.0	0.8	0.8	0	-0.2	-0.2	0.00	-0.20	-0.25	148	77	10																							

913/2005	Concealed	55 F	0.8	0.9	0.9	1.0	0.1	0.1	0.2	0.13	0.11	0.22	158	84	5	0	0	0	12	13	12	14	5	0	0	0	0	0	0	0	0	22	13	12	14	18	18	35	28
913/2005	Concealed	51 F	0.6	0.6	0.8	0.7	0.2	0.1	0.3	0.33	0.17	0.38	156	58	0	15	35	30	16	16	16	17	5	5	10	10	0	0	0	0	0	21	36	61	57	53	53	75	75
1012/2005	Concealed	58 F	0.8	0.9	1.1	1.1	0.3	0.2	0.5	0.38	0.22	0.45	172	83	0	0	20	20	14	16	14	16	0	0	0	0	0	0	0	14	16	34	36	51	41	61	56		
926/2005	Concealed	66 F	0.6	0.7	0.9	0.9	0.3	0.2	0.5	0.50	0.29	0.56	159	78	15	15	15	15	12	12	13	15	0	0	0	0	0	0	0	27	27	28	30	46	49	46	46		
926/2005	Concealed	64 F	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	166	69	10	10	15	15	15	15	16	17	0	0	0	0	0	0	0	25	25	31	32	25	28	35	38		
926/2005	Concealed	76 M	0.8	0.7	1.0	0.8	0.2	0.1	0.3	0.25	0.14	0.30	178	98	0	0	0	0	14	15	16	16	0	0	0	0	0	0	14	15	16	16	15	15	10	10			
927/2005	Concealed	46 F	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	167	78	0	0	15	15	16	15	16	16	0	0	0	0	0	0	16	15	31	31	10	25	27	42			
930/2005	Concealed	60 M	0.7	0.7	1.1	0.9	0.4	0.2	0.6	0.57	0.29	0.55	178	98	0	0	15	15	14	15	15	16	0	0	0	0	0	0	14	15	30	31	25	25	52	45			
930/2005	Concealed	56 F	0.8	0.8	1.1	1.1	0.3	0.3	0.6	0.38	0.38	0.55	162	87	0	0	0	0	12	11	14	12	0	0	0	0	0	0	12	11	14	12	20	15	25	25			
929/2005	Concealed	60 F	0.7	0.9	0.9	1.1	0.2	0.2	0.4	0.29	0.22	0.44	160	79	0	0	15	30	15	16	16	16	0	0	0	0	0	0	15	16	31	46	49	49	59	49			
1012/2005	Concealed	74 M	0.7	0.7	0.8	0.8	0.1	0.1	0.2	0.14	0.14	0.25	173	75	0	0	10	15	14	14	15	15	0	10	5	10	0	0	14	24	30	40	20	23	23	23			
927/2005	Concealed	67 F	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	155	80	15	15	45	45	14	15	15	16	5	0	0	0	0	0	34	30	60	61	52	49	62	62			
103/2005	Concealed	60 F	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	152	61	30	30	45	45	16	14	16	14	0	0	0	0	0	0	46	44	61	59	54	59	69	84			
103/2005	Concealed	45 M	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	172	83	5	5	15	15	12	14	13	16	0	0	0	0	0	0	17	19	28	31	18	23	28	33			
103/2005	Concealed	62 F	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	152	78	10	10	0	0	16	15	16	15	0	0	0	0	0	0	26	25	16	15	59	59	59	44			
102/2005	Concealed	65 F	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	152	80	5	10	10	10	11	13	12	14	0	0	0	0	0	0	16	23	22	24	20	35	70	75			
104/2005	Concealed	52 F	0.7	0.8	1.1	1.1	0.4	0.3	0.7	0.57	0.38	0.64	147	68	0	0	30	30	16	16	16	17	0	0	0	0	0	0	16	16	46	47	20	25	27	32			
1028/2005	Concealed	65 F	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	155	63	10	10	30	30	10	9	10	9	0	0	0	0	0	0	20	19	40	39	49	37	40	42			
112/2005	Concealed	65 M	0.8	0.9	0.8	0.9	0	0	0	0.00	0.00	0.00	168	75	30	30	15	15	16	16	16	16	0	0	0	0	0	0	46	46	31	31	84	84	87	87			
1028/2005	Concealed	70 F	0.7	0.7	1.1	1.1	0.4	0	0.4	0.57	0.36	0.61	161	80	10	10	15	10	14	12	15	12	0	0	0	0	0	0	24	22	30	22	40	38	52	42			
1027/2005	Concealed	73 F	0.6	0.4	0.8	0.5	0.2	0.1	0.3	0.33	0.25	0.38	150	87	0	0	15	15	10	10	10	10	0	0	0	0	0	0	10	10	25	25	8	8	31	41			
103/2005	Concealed	43 F	0.7	0.7	0.8	0.9	0.1	0.2	0.3	0.14	0.29	0.38	155	71	40	40	30	30	15	16	16	16	0	0	0	0	0	0	55	56	46	46	49	49	86	86			
111/2005	Concealed	61 F	0.7	0.5	0.9	0.7	0.2	0.2	0.4	0.29	0.40	0.44	152	69	0	0	15	15	10	15	12	16	0	0	0	0	0	0	10	15	27	31	10	15	34	39			
927/2005	Concealed	59 F	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	155	73	0	0	10	10	14	14	15	14	0	0	0	0	0	0	14	14	25	24	49	49	49	49			
1030/2005	Concealed	57 F	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	151	91	10	10	35	20	15	12	16	14	0	0	0	0	0	0	25	22	51	34	60	55	69	69			
1029/2005	Concealed	62 F	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	159	62	30	30	35	35	16	16	16	16	0	0	0	0	0	0	46	46	51	51	86	86	84	84			
114/2005	Concealed	68 M	0.6	0.6	0.8	0.7	0.2	0.1	0.3	0.33	0.17	0.38	173	105	0	0	20	20	14	14	15	15	0	0	0	0	0	0	14	14	35	35	10	15	47	46			
114/2004	Concealed	45 M	0.7	0.7	1.4	1.1	0.7	0.4	1.1	1.00	0.57	0.79	161	62	0	0	25	10	16	16	16	16	0	0	0	0	0	0	16	16	41	26	86	86	81	81			
114/2004	Concealed	47 M	0.7	0.7	1.1	1.1	0.4	0.4	0.8	0.57	0.57	0.73	166	76	0	0	30	15	16	16	4	16	0	0	0	0	0	0	16	16	34	31	75	75	75	80			
113/2005	Concealed	72 M	0.7	0.7	0.8	0.9	0.1	0.2	0.3	0.14	0.29	0.38	153	100	15	15	30	30	13	14	14	15	0	0	0	0	0	0	28	29	44	45	17	25	26	41			
114/2005	Concealed	73 M	0.7	0.7	1.0	0.9	0.3	0.2	0.5	0.43	0.29	0.50	165	84	0	0	30	30	15	16	16	16	0	0	0	0	0	0	15	16	46	46	59	59	49	54			
1031/2005	Concealed	50 M	0.9	0.9	1.1	1.1	0.2	0.2	0.4	0.22	0.22	0.36	174	99	30	30	35	35	15	16	16	16	0	0	0	0	0	0	45	46	51	51	60	60	70	70			
114/2005	Concealed	62 F	0.4	0.4	0.6	0.6	0.2	0.2	0.4	0.50	0.50	0.67	169	107	15	15	30	30	14	13	15	15	0	0	0	0	0	0	29	28	45	45	20	18	28	28			
113/2005	Concealed	52 F	0.5	0.5	0.7	0.7	0.2	0.2	0.4	0.40	0.40	0.57	156	83	0	0	30	35	13	12	14	14	0	0	0	0	0	0	13	12	44	49	32	27	52	32			
111/2005	Concealed	43 F	0.8	0.7	0.9	0.9	0.1	0.2	0.3	0.13	0.29	0.33	172	83	35	35	35	35	16	16	16	16	0	0	0	0	0	0	51	51	51	51	80	80	87	87			
1119/2005	Concealed	68 F	0.5	0.4	1.0	0.9	0.5	0.5	1	1.00	1.25	1.00	155	83	15	15	30	30	15	14	15	15	0	0	0	0	0	0	30	29	45	45	49	49	69	69			
1118/2005	Concealed	72 M	0.5	0.5	0.9	0.7	0.4	0.2	0.6	0.80	0.40	0.67	165	72	15	30	35	40	14	14	15	15	0	0	0	0	0	0	29	44	50	55	66	66	56	66			
1123/2005	Concealed	54 F	0.8	0.6	0.9	0.9	0.1	0.3	0.4	0.13	0.50	0.44	147	65	0	0	20	20	14	11	14	11	0	0	0	0	0	14	11	34	31	37	27	19	37				
1121/2005	Concealed	62 F	0.4	0.4	1.1	0.9	0.7	0.5	1.2	1.75	1.25	1.09	151	65	10	10	10	10	11	10	12	11	0	0	0	0	0	0	21	20	22	21	31	56	56	56			
1118/2005	Concealed	58 M	0.4	0.4	0.7	0.7	0.3	0.3	0.6	0.75	0.75	0.86	158	66	35	35	35	35	15	16	16	18	0	0	0	0	0	0	50	51	51	53	74	74	39	29			
1117/2005	Concealed	75 F	0.7	0.7	0.9	0.9	0.2	0.2	0.4	0.29	0.29	0.44	157	72	0	0	0	0	15	13	15	14	0	0	0	0	0	0	15	13	15	14	20	10	28	23			
1122/2005	Concealed	69 M	0.5	0.5	0.7	0.7	0.2	0.2	0.4	0.40	0.40	0.57	160	72	0	0	15	15	14	15	15	16	0	0	0	0	0	0	14	15	30	31	46	51	40	40			
1122/2005	Concealed	62 F	0.5	0.5	0.7	0.7	0.2	0.2	0.4	0.40	0.40	0.57	141	68	35	35	45	45	15	16	16	16	0	0	0	0	0	0	50	51	61	61	80	80	55	70			
1124/2005	Concealed	64 M	0.8	0.7	0.8	0.8	0	0.1	0.1	0.00	0.14	0.13	172	65	30	30	30	30	16	12	17	13	0	0	0	0	0	0	46	42	47	43	75	75	57	57			
1125/2005	Concealed																																						

