

# Obtaining normal flexion and extension of knee joints on supine, prone and standing positions in osteoarthritis by topical phyto-therapeutic treatment irrespective of age and sex.

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## Abstract

Osteoarthritis (OA) is not a simply process of wear and tear, but an abnormal remodeling of joint tissues driven by a host of inflammatory mediators, including disorders of specific nerves within the affected joint. The common risk factor of OA includes age, sex, prior joint injury, obesity, genetic predisposition and mechanical factor, including malalignment and abnormal joint shape. This paper reports for the first time that normal flexion and extension of knee joints on supine, prone and standing positions in osteoarthritis by topical phytotherapeutic treatment can be achieved, with sustenance, irrespective of age and sex.

**Keywords:** Knee flexion, Knee extension, Phytomedicine, Osteoarthritis.

## Introduction

The knee is a hinge joint formed by the meeting of the femur and the tibia. The two main actions are Flexion and Extension with the ability to slightly rotate. The knee joint is cushioned by articular cartilage that covers the end of the tibia and femur. The lateral and medial minisci are pads of fibrocartilage that further cushion the joints. Most of the muscles that move these joints located in the thighs with the exception of the gastrocnemius and popliteus. The popliteus helps unlock the knee, when it is fully extended and bearing weight. The patella is the part of joint and helps to increase the mechanical advantage of the quadriceps tendon. The muscles responsible for knee flexion are biceps femoris, originated from tuberosity of ischium, linea aspera and femur inserting to the head of the fibula and nerve root is tibial nerve for long head and common peroneal nerve for short head, semimembranosus, originated from ischial tuberosity inserting to medial surface of tibia and nerve root is sciatic nerve (tibial, L<sub>5</sub>, S<sub>1</sub>, S<sub>2</sub>), semitendinosus, originated from tuberosity of the ischium inserting to pes anserinus (tibia) and nerve root is sciatic nerve (tibial L<sub>5</sub>, S<sub>1</sub>, S<sub>2</sub>).

The muscles responsible for knee extension are vastus medialis originated from medial side of femur, vastus lateralis originated from greater trochanter, intertrochanteric line and linea aspera of the femur, vastus intermedius originated from antero lateral femur and rectus femoris, originated from anterior inferior iliac spine and the exterior surface of the bony ridge which forms the iliac portion of the acetabulum and inserting all muscles to patella via the quadriceps tendon and tibial tuberosity via the patellar ligament and the nerve roots of all the muscles are femoral nerve [1,3]

From this institution it has earlier been reported that in osteoarthritis with topical phytotherapeutic application, complete symmetry of both knees can be achieved [4]. In this presentation for the first time it is reported that topical application of phytochemicals can also achieve, with sustenance, normal flexion and extension (on supine, prone and standing positions) of knees in osteoarthritis in patients.

## Material & Method

### Experimental settings

A total 105 patients of which 58 women and 47 men of age groups(45-60) years and 61 years and above were physically examined and observations were noted before the treatment protocol starts in the support of anatomical conditions such as past treatment histories in order to analyze and justify the present conditions of knee and ankle joints, thigh, back and calf muscles structure and examine the present quantum of damages occur of the muscles responsible for supporting normal knee flexion such as biceps femoris, semimembranosus, semitendinosus, gracilis, sartorius and the muscles responsible for normal knee extension such as vastus medialis, vastus lateralis, vastus intermedius and rectus femoris. The quantum of damages occur in the muscles and joints due to use of hyaluronic acid injections or corticosteroidal injections or arthrocentesis (joint fluid aspiration) used for quick lessening pain and inflammation or artificial knee joint or ankle joint supports, the use of unassessed weight bearing traction, ultrasonic rays, hot water bag mostly prescribed in the form of physiotherapy and list of intoxicated food habit. Measurements of knee gap between the head of biceps femoris and the level of the bed, diameter of the group of muscles connected with the knee joint

-4cm above and below the patella, diameter of calf and thigh muscles are taken and also angles of flexion and extension of knee joints on supine, prone, and standing positions are taken. Present radiological figures of both knee joints, ankle joints (for

calcanea spur) and lumbo sacral spine (L.S spine) are noted.

### Phyto water extraction from the following Indian medicinal plants used in the therapy

NAME	PARTS USE	PHYTOCONSTITUENTS
<i>Cissus quadrangularis</i>	Whole plant	Alkaloids, Tannins, Phenols, Flavonoids, Saponins.
<i>Heliotropium indicum</i>	Whole plant	Tannins, Saponin, Alkaloids, Flavonoids.
<i>Rosemarinus officinalis</i>	Leaves and flowers	Carnosol, Flavonoids, Rosemarinic Acid, Linalool, Carnosol, Carnosic Acid, Rosmanol, Isorosmanol.
<i>Calotropis gigantea</i>	Root and leaves	Cardenolides, Flavonols, Glycosides, Alkaloids, Tannins, Flavonoids.

### Preparation of plants extract

The plants are dried under shady pulverised & macerated for 48 hrs at  $25 \pm 2^{\circ}\text{C}$  with double distilled water with occasional stirring. The extract was boiled and filtered to remove particulate matters and lyophilised. For topical application the phyto water extracts of above plants are solubilised in sesame oil, castor oil, and wax to make paste.

### Aims, Principles and Theories

The therapy aims to improve the basic cellular and molecular behaviors, the pulsing and impulsing system, lymph and blood circulatory systems, the digestive and excretory systems of the body by assessing the cause of disorder at the cellular and molecular level without suppressing the symptoms at the organ level.

It is a holistic and independent system of treatment developed in author's own institution and with examination procedures, which lead to a permanent solution from pain without using any oral medicines, corticosteroid injections, joint fluid aspiration, traction, laser therapy and surgery for quick lessening pain and inflammation and any chemically composed supplements for pain aids within maximum period of forty two days subject to observance of physiological manifestation.

The therapy is based on well defined principles and theories such as –Scientific fomentation theory, Connective tissue massage theory, Spine and joints manipulation theory, Effect of the joint stimuli theory. Identification of intoxicated food habit theory, Enhancement of impaired pulsing and impulsing systems through electronic muscle stimulator operated by 9 volt DC battery, Muscle re-education theory (exercise) & Psychotherapy and counseling.

### Method of Measurement of diameter of thigh muscles



Figure.1- Showing the method of measuring the group of thigh muscles of right and left legs with the help of measuring tape.

### Method of Measurement of diameter of Calf muscles



Figure.2- Showing the method of measuring the group of calf muscles of right and left legs with the help of measuring tape.

### Method of measurement of diameter of group of muscles connected to knee joints - 4cm above the patella



Figure.3- Showing the method of measuring the group of muscles connected to right and left knee joints - 4cm above the patella

### Method of measurement of diameter of group of muscles connected to knee joints - 4cm below the patella



Figure.4- Showing the method of measuring the group of muscles connected to right and left knee joints - 4cm below the patella



### Method of measurement of Knee flexion on supine position



Figure.5- Showing the method of measurement of knee flexion of right and left knee joints lying on supine position with the help of Goniometer

### Method of measurement of Knee flexion on prone position

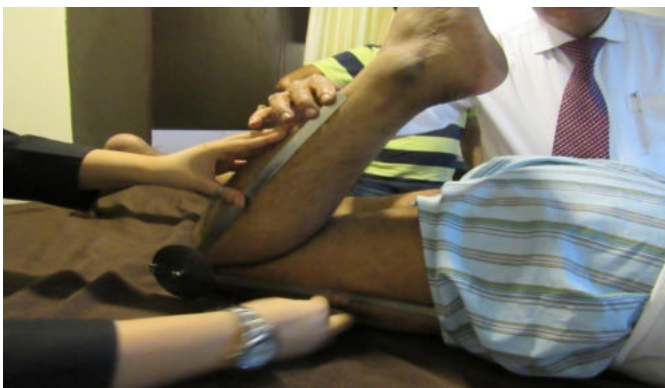


Figure.6- Showing the method of measurement of knee flexion of right and left knee joints lying on prone position with the help of Goniometer

### Method of measurement of Knee flexion on standing position



Figure.7- Showing the method of measurement of knee flexion of right and left knee joints on standing position with the help of Goniometer



**Method of measurement of Knee extension on supine position**

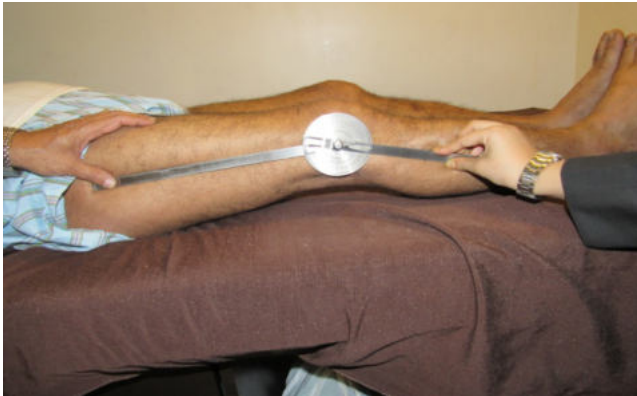


Figure.8- Showing the method of measurement of knee extension of right and left knee joints lying on supine position with the help of Goniometer

**Method of measurement of Knee extension on prone position**



Figure.9- Showing the method of measurement of knee extension of right and left knee joints lying on prone position with the help of Goniometer

**Method of measurement of Knee extension on standing position**

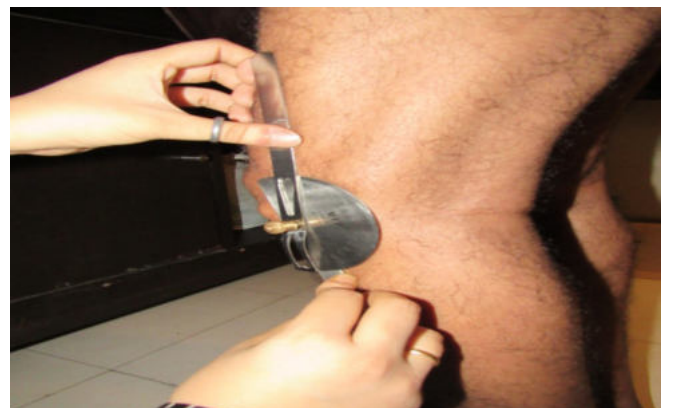


Figure.10- Showing the method of measurement of knee extension of right and left knee joints on standing position with the help of Goniometer



### Treatment protocol

All types of muscles possess the fundamental properties of excitability, conductivity, contractibility, elasticity and viscosity. Although muscle fibers respond to many kinds of stimuli such as chemical, mechanical, thermal & electrical but in physiological conditions, striated muscles are excited exclusively by nerve impulses. Keeping in mind, the widespread inhibition of a tissue & the refractory period of a tissue, different methods are used by way of application of chemical, mechanical, thermal and electrical stimuli for specific irritability of cells in order to achieve and respond with greater ease within the chronaxie depending upon the stimuli after taking well care of latent addition and thus repetitive excitability of large number of tissues and functional system is achieved. The detail of treatment protocol is already described. (4)

### Treatment of patient lying on supine position

In order to nourish the muscles of the anterior part of the thigh such as rectus femoris, vastus lateralis, vastus medialis, sartorius (part of originated area) and the muscles of the anterior part of the lower leg such as tibialis anterior, extensor hallucis longus and extensor digitorum longus and also supply the phytonutrients and chemicals to the descending aorta artery and also nourish the inferior vena cava vein by supplying phytonutrients, the patient is asked to lie down on supine position (Fig-11) and now medicated pads (4) are to be wrapped over the lower back muscles and leg after application of paste of oils and cream (4) with the help of wooden roller and then after application of pulse therapeutic technique. (4)

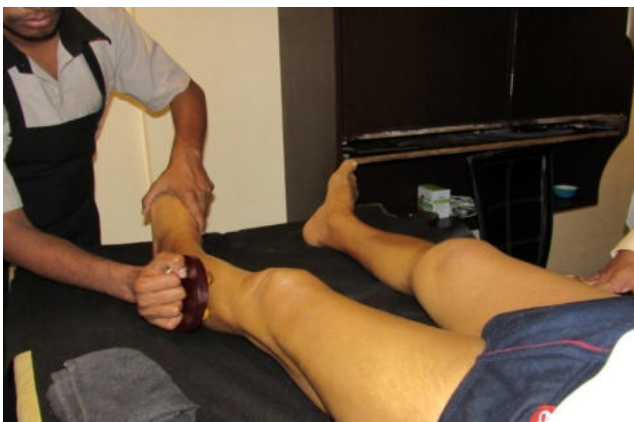


Figure-11 Patient is lying on supine position

### Treatment of patient lying on prone position

To nourish the muscles of the thigh such as semitendinosus, biceps femoris-long head, vastus lateralis, semimembranosus, adductor magnus, gluteus maximus and the muscles of the posterior part of the lower leg such as gastrocnemius and achilles tendon (triceps surae, part) flexor digitorum, flexor hallucis and also nourish the inferior vena cava nerve by supplying phytonutrients and the patient is asked to lie down on prone position (Fig-12) and now medicated pads (4) are to be wrapped over the back, hip and the leg after application of paste of oils and cream (4) with the help of wooden roller and then after application of pulse therapeutic technique. (4)



Figure-12 Patient lying in prone position

### Treatment of patient lying on right & left contralateral position

In order to nourish the muscles of the lateral part of thigh and hip such as iliotibial tract, vastus lateralis, biceps femoris – longhead, rectus femoris, tensor fascia lata, gluteus maximus, gluteus medius and the muscles of the lateral part of the lower leg such as fibularis (peroneus) longus and brevis, soleus and achilles tendon and gastrocnemius (triceps surae, part), extensor digitorum longus, and the patient is advised to lie down on right contralateral position (Fig-13) to nourish left side of the body and thereafter the patient asked to lie down on left contralateral position (fig-14) to nourish the right side of the body and now medicated pads (4) are being wrapped over the back, hip, and leg after the application of paste of oils and cream (4) with the help of wooden roller and then after application of pulse therapeutic technique (4).





Figure-13 Patient is lying on right contralateral



Figure-14 Patient is lying on left contralateral

### Treatment of a patient lying on right and left super contralateral positions

To nourish the muscles of the medial part of the thigh such as vastus medialis, sartorius, gracilis, semimembranosus, semitendinosus, adductor magnus and the muscles of the medial part of the lower leg such as gastrocnemius and achilles tendon (triceps surae, part), flexor digitorum longus, soleus (triceps surae part) and also to supply the phytonutrients to the inferior vena cava vein and at the same time the nourishment of the lateral part of apposite leg are jointly treated when the patient is asked to lie down on super right contralateral position (Fig-15) and to nourish the muscles of the opposite side of the body with same manner , the patient is advise to lie down on super left contralateral position (Fig-16) and now medicated pads (4) are being wrapped over the back, hip and the leg region after the application of paste of oils and cream (4) with the help of wooden

roller and then after application of pulse therapeutic technique (4).



Figure-15 Patient is lying on right super contralateral position



Figure-16 Patient is lying on left super contralateral position

## Results and Discussion

Tabular form of results showing the improvements of the group of muscles of Thigh and Calf (Table-1) and the improvements of diameter of group of muscles connected with knee joints – 4cm above and below the patella (Table -2) on each 7<sup>th</sup> day of sitting upto 42<sup>nd</sup> sitting (in cm)



Table 1: Showing the improvements of the group of muscles of Thigh and Calf (in cm)

		Thigh Muscles										Calf Muscles									
Patient	No	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
	Sex	F	F	M	F	M	M	M	M	F	F	F	F	M	F	M	M	M	M	F	F
	Age	45	53	49	59	61	75	78	76	47	54	45	53	49	59	61	75	78	76	47	54
0 Sitting	Right	49	51	52	41.5	51	45	41	45	54	42	37	34	37.5	34.5	36.5	34	32	34.5	34	32.5
	Left	50	50	51	41	50	46	40.5	45.5	55	43	36	35	37	34	35.5	33.5	31	34	35	31.5
7th Sitting	Right	49	50	51.5	41.5	50	44	41	47.5	55	44	36.5	34	37.5	33.5	36	33.5	32	34.5	33.5	31.5
	Left	50	51	51	42.5	49.5	45	40	47	55	44.5	36	35	36.5	34	34.5	33	31	35	34	31.5
14th Sitting	Right	49	50	51	41.5	49	43.5	40.5	47.5	55	44.5	36	34.5	37.5	33	34	33	31.5	34	33.5	31
	Left	49	51	50.5	42.5	48.5	44	39.5	47	56	43.5	35.5	35	37	33.5	33.5	32.5	30.5	35.5	33	30
21st Sitting	Right	50	50	51	41.5	48	44	40	47	55	44	36.5	35	37.5	32.5	33.5	33	31	34.5	32.5	30
	Left	50	50	51.5	42.5	47.5	44	39.5	47	56	43.5	36	34.5	37	33	33	32	30.5	35.5	33	30.5
28th Sitting	Right	50	50.5	51.5	41.5	48.5	44.5	40.5	47.5	55	45	37	34	38	33	34	33.5	31.5	35	33	32
	Left	50	50.5	52	42.5	48	45	40	47.5	56	44	36.5	34.5	37.5	33.5	33.5	33	31	35.5	33.5	31.5
35th Sitting	Right	50	50.5	52	42.5	49	45	41	47.5	56	45.5	37	33.5	38.5	33.5	35	34	32	35.5	33.5	33
	Left	50	50.5	52.5	42.5	48.5	45.5	40.5	47.5	56.0	46	37	33.5	38	34	34.5	33.5	31.5	35.5	33.5	32.5
42nd Sitting	Right	51	50.5	52.5	42.5	49	45.5	41	48	56	46	37	34	38.5	34	35	34	32	35.5	34	33
	Left	51	50.5	52.5	42.5	49	45.5	41	48	56	46	37	34	38.5	34	35	34	32	35.5	34	33

Table 2: Showing the improvements of diameter of group of muscles connected with knee joints - 4cm above and below the patella (in cm)

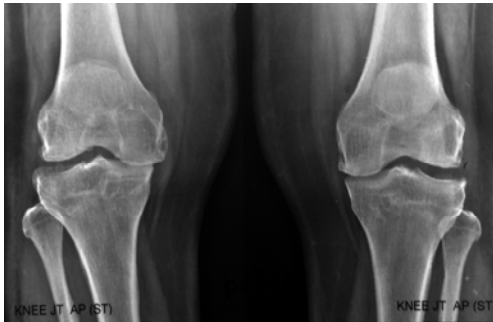
		4cm above the patella										4 cm below the patella									
Patient	No	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
	Sex	F	F	M	F	M	M	M	M	F	F	F	F	M	F	M	M	M	M	F	F
	Age	45	53	49	59	61	75	78	76	47	54	45	53	49	59	61	75	78	76	47	54
0 Sitting	Right	42	44	41.5	37.5	42.5	39.5	35.5	40	44.5	38	34.5	35	35.5	33.5	35.5	34.5	31.5	34	33.5	32.5
	Left	43	43	40.5	37	41.5	40.5	35	41	44	37	34	34.5	36.5	33	35	34	32	35	34	32
7th Sitting	Right	44	43.5	42	37	42	39.5	35.5	40	44	38	34.5	35.5	36	33	35.5	34	31	33.5	34	32
	Left	43	43	41	37	41.5	40.5	35	41	44	37	34	34.5	35.5	32.5	35	33.5	32	34	34.5	31.5
14th Sitting	Right	42	43	42.5	36.5	41	39.5	35.5	41	44	37	34.5	35	35.5	32.5	34	33.5	32	33	34.5	31.5
	Left	42	42	41.5	37	40.5	40	34.5	40.5	44	37	33.5	34.5	35	32.5	34.5	33	31.5	33.5	34.5	31
21st Sitting	Right	43	43.5	41	36	40.5	38.5	35	41.5	44	36.5	33.5	35.5	36	32	35	34	32	33.5	34.5	31
	Left	43	43	41.5	36.5	40	39	34.5	41	44	37	33	35	35.5	32.5	34.5	33	31.5	34	34.5	30.5
28th Sitting	Right	43	44.5	41.5	36.5	41	39	35.5	41.5	44	38	34	35.5	36.5	32.5	35.5	34	32.5	34	34.5	32
	Left	43	43	41	37	40.5	39.5	35	41.5	44	38	34	35	36	33	35	33.5	32	34.5	34.5	31.5
35th Sitting	Right	43.5	44.5	42	37	41.5	40	36	41.5	44	38	34	35.5	36.5	33	36	34.5	33	34.5	34.5	32
	Left	43.5	43.5	41.5	37	41	40.5	35.5	41.5	44	38	34	35	36.5	33	35.5	34	32.5	34.5	34.5	32
42nd Sitting	Right	43.5	44.5	42	37	42	40.5	36	41.5	44	38.5	34	35.5	36.5	33	36	34.5	33	34.5	35	32.5
	Left	43.5	44.5	42	37	42	40.5	36	41.5	44	38.5	34	35.5	36.5	33	36	34.5	33	34.5	35	32.5





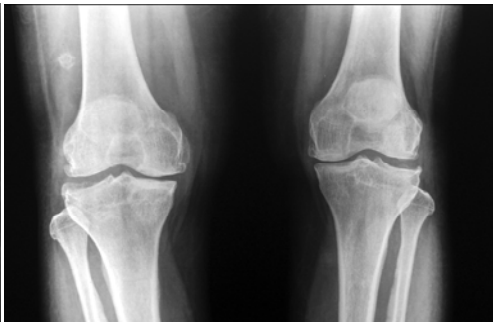
*Radiological reports before and after the treatment*

**Patient No.: 1, Age- 46yrs, Sex - F**  
Before the treatment



Show bilateral degenerative osteo - arthroses - particularly in the medial tibio - femoral compartment - along with genu varum on the right side as well.

After the treatment



Show marked improvement, with opening - up of the joint spaces and reduction of genu varum on right side as well.

**Patient No.: 2, Age- 55, Sex - F**  
Before the treatment



Show marked narrowing of the medial compartments of both the knee joints, along with sclerosis of the opposing articular surfaces, and osteophytic lipping-suggestive of advanced bilateral degenerative osteo-

After the treatment



Show significant opening up of the joint spaces on both sides more on the right side - along with reduction of genu varum and instability of the right knee joint as well - suggesting marked improvement.

**More Radiological reports before and after the treatment of 42 sittings has already been described (4) regarding the improvements of knee joints.**

Many research reports are available on knee flexion and extension in normal and disorder conditions (5-9). Although it is

said that the hamstrings are the primary knee flexors and the quadriceps are the primary knee extensors. The present research has strongly established disrupting blood flow in the inferior vena cava vein and descending aorta artery of the legs in arthritis. These badly affect normal flexion and extension movement of knee joints. To overcome the situation the paste of

phyto oils and cream is applied in specific techniques (4) when the patient is lying on supine and prone positions.

Therefore, the four muscles namely sartorius, gracilis, semitendinosus and semimembranosus all are inserting to tibia (pes anserinus) and 95% of patients suffering with osteoarthritis feel the pain on the particular region of connecting joints of above mentioned four muscles in the medial part of the knee. Hence, different lying positions are chosen for nourishing the particular group of muscles such as supine (fig-11), prone (fig-12), contralateral (fig-13), and supercontralateral (fig-15). The improvements of effusion or muscular wasting above and below the knee joints occur due to prolong use of knee supports or other reasons are noted by assessing the improvement of diameter of the group of muscles – 4cm above and below the patella shown in (Table-2). Without the improvements of above mentioned muscles areas, the normal knee flexion and extension on supine, prone and standing position are not at all possible.

The present paper has shown clearly phytoformulations can not only improve flexion and extension of knee joints on supine, prone and standing position to the normal level in arthritis but definitely improve muscles associated with such actions. For the first time, this is being reported that muscles those are responsible for flexion, namely hamstrings (biceps femoris, semitendinosus, semimembranosus), sartorius, gracilis, popliteus and gastrocnemius are all regenerated by topical phytotherapy in arthritis. Similarly muscles those are responsible for extension namely, rectus femoris, vastus lateralis, vastus medialis are regenerated in arthritis with topical application of phytoformulations.

### Limitation of study

Patients with cuts, wounds or any type of chronic skin disease (eczema, psoriasis etc) in back, legs, pelvic area, inguinal (groin area) and other regions have been excluded.

Patients with known allergy to *Cissus quadrangularis*, *Heliotropium indicum*, *Rosemarinus officinalis*, and *Calotropis gigantea* have been excluded.

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Patients with surgical implants ,pacemaker or a history of cancer have advice to apply the paste of oils and cream , three times a day from groin area to toes lying on supine position (over back) and lower back to toes lying on prone position (over belly) as per specific techniques. (4)

## Conclusion

Arthritis affects millions of people all throughout the world every year. All patients suffer from knee flexion and extension problems during arthritis. For the first time, in this paper, it is reported that both flexion and extension on supine, prone and standing positions in arthritis patients, of all ages and sexes, can be made normal with topical applications of phytoformulations by scientific device and in a methodical way.

### Declaration

Treatment of the patients was done with full consent of the patients. Blood samples were collected for diagnosis with full consent of the patients. The treatment protocols were duly approved by institutional bioethics committee.

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### Conflicts of interest

The author declares that there is no conflict of interests regarding the publication of this paper.

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