

# A Review on effect of matrix rhythm therapy in frozen shoulder

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## ABSTRACT

**Background:** Frozen shoulder is a condition that is characterized by pain, decrease in range of motion, stiffness in shoulder joint. (2,3,4) It also leads to restriction of self care activities such as grooming, combing or eating.(8) Frozen shoulder is reported to affect 2% to 5% of the general population. (2,4) It affects mostly age group above 40 years of age.(2) In frozen shoulder, capsule become hard, thick and tight and there is loss of axillary pouch and joint volume which leads to lack of motion of shoulder joint. Shoulder capsule get thick with mild chronic inflammation and fibrosis along with infiltrate. (1) Matrix rhythm therapy is a new application of vibromassage.(1,3,4) Invented by Dr. Med. Ulrich ,G. Randoll in Germany. (1) Matrix Rhythm Therapy allow cell metabolism to reactivate with depth effective rhythmical micro-extensions and contracted area of musculature will be relaxed. (1) There is growing interest in the Matrix Rhythm Therapy for the treatment of frozen shoulder due to its oscillating effect on body cells with frequency of 18-12 Hz. (1,3) As MRT have vibrating effect, it helps to increase the lymphatic venous perfusion of extracellular space in which anti edematous effect originates (4). Evidences suggest that application of Matrix Rhythm Therapy in frozen shoulder condition can reduce the pain by working at the level of body cells.

**Method:** Review was conducted by researching on search engines like, Google Scholar, PUB Med, Web of science, Cochrane library, from 2013 to 2020 articles. Non indexed journals, Low impact Journals, Paid Journals were excluded from study.

**Conclusion** This review concluded that the Matrix rhythm therapy is proved effective technique for patients with frozen shoulder. (1,3) MRT significantly improves blood flow in areas of its application. (3) MRT improve circulation and provide oxygen and adenosine triphosphate (ATP) which help to gain ROM and reduce pain.(2,4)MRT improve Active ROM , Passive ROM and Muscle Strength. (3)

**Key words** Matrix Rhythm Therapy, Frozen shoulder pain, shoulder joint, Range of motion, Physiotherapy interventions, painful joint.

## INTRODUCTION

Frozen shoulder, also known as adhesive capsulitis or periarthritis is a regional condition which effect the joint – shoulder (1,6).It is commonly characterized by pain, decrease in range of motion, restriction of both active and passive shoulder range of motion due to absence of a known intrinsic shoulder disorder(2,11).In the initial stages, pain is more at night and limited ranges are abduction and internal rotation of shoulder joint but as the disease progress other ranges also start limiting and pain is present throughout (7). Self care, shaving, hair combing, feeding and dressing are all hampered if the right shoulder is involved in a right-handed person; on the opposite hand dressing and region care area unit hampered if left shoulder is involved (8) Frozen shoulder is estimated to occur in 2 to 5% of population. (1,2).Chances ofFrozen shoulder in diabetic patient is double as

compare to non-diabetic patient.(7).It affects mostly age group above 40 years of age (2). Frozen shoulder is more common among work place employee than among labourers, and more common in women as compare to males. The non-dominant shoulder has a higher chance of developing. Previously Frozen shoulder thought to healed naturally one to two years after occurrence (5).In frozen shoulder, capsule become hard, thick and tight and there is loss of axillary pouch and joint volume which results in shoulder joint immobility. Shoulder capsule contracture is caused by adhesion of capsular surface or fibroblastic proliferation caused by cytokine formation. Capsule of shoulder get thick with mild chronic inflammation and fibrosis along with infiltrate (1). Causes of frozen shoulder are not known specifically, but there are certain conditions that can lead to frozen shoulder such as diabetes, thyroid condition, stroke, complex regional pain syndrome, reflex sympathetic dystrophy and trauma (2,6). Frozen shoulder includes three stages which are characterized by 1. Severe pain, 2. Restriction in ROM followed by pain, and 3. Recovery of ROM and pain (1,5). Adhesive capsulitis is a condition in which fibrosis of shoulder joint occur, which leads to tightening of the coracohumeral ligament and due to this external rotation in frozen shoulder is more restricted along with other passive ranges of shoulder (1,8).Physiotherapy is effective treatment for FS ; treatment programs includes exercise, massage, Mobilization, Maitland technique and modality. And with the exception of external and internal rotation, all aspects of shoulder ROM have been recorded to improve (5). Active/passive range of motion (ROM) exercises, stretching, soft tissue mobilisation, myofascial release, proprioceptive-neuromuscular facilitation techniques, ultrasound, ice packs, electrical stimulation, and joint mobilisation techniques are some of the other treatments (2).

Matrix rhythm therapy is a new therapeutic approach which was developed by Dr. Ulrich G Randoll. The research for matrix rhythm therapy carried out in 1989-1997 at the department of oral and maxillofacial surgery and trauma surgery of Erlangen University. Matrix is a cell biological therapy (9). It works on the principle that all the tissues in the body vibrate at the frequency of same as brain's alpha frequency of 8Hz to 12Hz (1, 3). The MRT device activates and rebalances the specific vibration in skeletal muscles as well as nervous system (4). It is considered that homeostasis of the body is maintained at this frequency (3). Any disruption in this frequency due to any injury, trauma or inflammation causes the pain and further loss of function in the body (1). As the device produces vibratory effect, it helps to increase the lymphatic venous perfusion of extracellular space in which anti edematous effect originates (4). Matrix rhythm therapy increases circulation, which increases oxygenated blood, followed by ATP synthesis and dissolution of the tension, can inductively relax the contracted areas of the musculature (9). The combination of Matrix Rhythm Therapy and Physiotherapy intervention evidenced helpful future effect on physical health, functional outcome and beneficial treatment of frozen shoulder patient (4).

MRT is a new approach and more effective technology in the world of physiotherapy. And being a recent modality and effective treatment option to treat frozen shoulder, we did review to analyze its effectiveness in treating frozen shoulder.

## REVIEW OF LITERATURE TABLE

<u>STUDY TITLE</u>	<u>YEAR OF PUBLICATION</u>	<u>AUTHOR</u>	<u>OBJECTIVE</u>	<u>CONCLUSION</u>
Effectiveness of matrix rhythm therapy in frozen shoulder with respect to ROM and pain- An experimental study	2018	VarunNaik, SandeepBhagwat, TanviPathania and FarhanaBootwala	The objective of this study is to check the effect of matrix rhythm therapy on frozen shoulder patient with respect to ROM and pain	Frozen shoulder pain decreased and ranges of shoulder improved with one treatment session, thus confirming the beneficial effects of Matrix Rhythm Therapy in frozen shoulder.

<u>Title</u>	<u>Year of Publication</u>	<u>Author</u>	<u>Objectives</u>	<u>Conclusion</u>
Effectiveness Of Matrix Rhythm Therapy For Frozen Shoulder In Breast Cancer Related Lymphedema Patient : A Case Study	2020	T.V. Gnanasekar	The objective of this study was to check the effectiveness of MRT on frozen shoulder in BCRL patient with respect to ROM, pain and QOL.	The Finding Indicate that MRT along with CDT is Effective Treatment in Frozen Shoulder in BCRL Patient.MRT along with a CDT improving range of motion of shoulder and pain.

<u>STUDY TITLE</u>	<u>YEAR OF PUBLICATION</u>	<u>AUTHOR</u>	<u>OBJECTIVE</u>	<u>CONCLUSION</u>
Comparison of matrix rhythm therapy and stretching exercises on frozen shoulder : Randomised controlled trial	2016	Deryacelik Nilgunturkel	The main objective is to do the comparison b/w MRT & STE and to found which has the superior effects on frozen shoulder. STE was found to be superior to MRT on physical health, function, and satisfaction of the patient.	Both methods were found to be significantly effective in the improvement of ROM, functional status, physical health and satisfaction of the patient over the course of 6 weeks thus confirming the long term effects of STE over MRT

<u>Study title</u>	<u>Year of publication</u>	<u>Authors</u>	<u>Objective of Study</u>	<u>Conclusion</u>
Effectiveness of Matrix Rhythm Therapy on Frozen Shoulder	2017	<ul style="list-style-type: none"> <li>• Dr. Vijay Bhartiya</li> <li>• Dr. Shrikant Darade</li> <li>• Dr. Sandip Bhagwat</li> <li>• Dr. Manjumala Roy.</li> </ul>	To increase physical health, function and satisfaction of the patients with frozen shoulder	The combination of both Matrix Rhythm Therapy (MRT) & Therapeutic exercises were found to be significantly effective in the improvement of ROM, functional status, physical health and satisfaction of the patients with frozen shoulder.



### List of abbreviations:

MRT - Matrix Rhythm Therapy

STE - stretching exercise

HEP - Home exercise program

AAOS - American Academy of Orthopedic Surgeons

ATP - Adenosine triphosphate

FS - Frozen shoulder

## Literature Search

### Data Base

Review was conducted by researching on search engines like Cochrane library, Medline, Google Scholar, PUB Med and Web of science, Scopus.

**Keywords:** Following Key words were used to search over search engines

Matrix Rhythm Therapy

Frozen shoulder pain

Shoulder joint

Range of motion

Physiotherapy interventions

Painful joint

### Inclusion criteria

Journal with Good impact factor were researched and referred for this study. Only Scopus and web of sciences journals were considered.

### Exclusion Criteria

Non indexed journals  
Low impact Journals  
Paid Journals

## DISCUSSION

Review was conducted by researching on search engines like Cochrane library, Medline, Google Scholar, PUB Med and Web of science, Scopus.

- A study was conducted by VarunNaik et al titled “Effectiveness of matrix rhythm therapy in frozen shoulder with respect to ROM and pain. In this, 10 males of age between 40-60 years with frozen shoulder were included. Excluded patients with Diabetes Mellitus, Post Operated cases at shoulder and allergic skin conditions. Outcome measures were used Visual Analog Scale (VAS) and ROM and data for the same was collected before and after the treatment. Study showed the greater and early results in gaining ROM and decreasing pain among frozen shoulder patients which was not seen in other conventional modalities like massage. MRT showed the significant increase in blood flow. According to this study, it could be the vibratory effect of MRT which allows the cell to oscillate on the normal frequency which is same as of the brain’s alpha frequency (8-12Hz). (1)
- Study done by T.V. Gnanasekar named Effectiveness Of Matrix Rhythm Therapy For Frozen Shoulder In Breast Cancer Related Lymphedema Patient : A Case Study showed, Breast Cancer

related lymphedema is a common problem in women now a day. And there are so many complications in BCRL like swelling, tightness, heaviness of arm but breast cancer survivors experienced frozen joint also i.e. reduced ROM and pain in shoulder joint. This pain is due to augmented fluid tension in tissue. In this case study, 50-year old woman diagnosed with radical Mastectomy, visited physiotherapist clinic after two year of surgery. Patient presented with symptoms of pain in right shoulder along with restriction in shoulder movements, had a history of diabetes mellitus and was taking medication for it. Examination revealed axillary lymphadenopathy and restriction in range of motion of right shoulder which was confirmed in X-Ray as well. As an intervention patient was given MRT by physiotherapist. MRT was applied by longitudinal stroking and pushing the probe onto soft tissues (10 sessions with one day break between each session) for 3 weeks. Outcome measure was QOL, LLIS, VAS etc. On first day Pain intensity score was 7/10 in Verbal Rating Scale and result was 2/10 on the VRS. According to author MRT greatly increases blood flow and lymph accumulation in area where it is used which may be due to lymph formation in edematous tissue or extrinsic pumping due to vasomotion. The result in the current study has shown the substantial improvement to ROM, Pain, Limb volume and QOL post – intervention. (3)

- The study was conducted to compare the results of MRT and STE with respect to frozen shoulder. The results of this study show the significant improvement in pain, ROM, functionality and satisfaction of patients in accordance to both the interventions but in more favor to STE group. In this study, 43 patients (mean age of 53.6yrs) with frozen shoulder were taken. The patients were divided into two groups. Group 1 was given MRT along with (HEP) home exercise program. Whereas group 2 was given stretching exercises (STE) along with (HEP), each group for 6 weeks. The range of motion was measured with conventional goniometer. Health status of the patients was evaluated with SF-36 PCS and Global rating of change score. The decreased circulation to the skeletal muscles is believed to be the cause of pain, decreased ROM and functionality. The previous studies showed that due to the vibrating effect of MRT, it improves the circulation of the skeletal muscles by 35%, provide the oxygen and adenosine triphosphate (ATP) which could help in reducing pain and regaining rom. **Jager et al.** have conducted the study to compare the effects of MRT and conservative treatment (heat therapy, electro therapy and exercise) on flexibility and pain in patients with low back ache. In the MRT group, there was reduction in pain and improved flexibility as compared to conservative treatment. However, frozen shoulder is mainly treated with glenohumeral stretching exercises. **Griggs et al** reported that 90% of 75 patients improved with an exercise program including passive stretching exercises in forward elevation, external rotation, horizontal adduction and internal rotation along with home exercise program (HEP). **Celik et al** compared the effects of stretching exercise and manual therapy combined with stretching exercises. The results were in the favor of both the techniques but manual therapy was thought to be more effective. The results in the current study shows significant improvement in pain and ROM in STE group which could be due to the remodeling of soft tissues and neuromuscular dynamic control over the newly gained ROM. As a result, the patients were advised to perform stretching and strengthening exercises at home in order to maintain their range of motion. Limitations: In this study, the follow-up periods were shorter. (2)
- In this study, a 50-year-old male working as a manager (height 172 cm, weight- 67 kg, BMI- 23.18 kg/m<sup>2</sup>, body type- mesomorphic) was taken as a subject complaining of right shoulder pain, trouble lifting things along difficulty in moving from last 3 month. MRI confirmed right side frozen shoulder. Patient received MRT treatment for 3 times per week, for 3 weeks along with active exercises of shoulder joint, wand exercises, pendulum (Codman's exercise), and isometric exercise (self-resisted &

against wall).(4) There was a decrease in discomfort, as well as an improvement in muscle strength and range of motion, since using MRT in conjunction with a physiotherapy exercise programme. The developers of MRT believe that the decreased blood circulation in skeletal muscles causes pain and limited ROM. One of the previous studies indicates that MRT showed significant increase in the blood flow by 35% by providing natural vibration which is same as of brain's alpha frequency (8-12 Hz), which in turn supplies oxygen and adenosine triphosphate (ATP) to the skeletal muscles. (4, 10)

## **Conclusion**

This review concluded that the Matrix Rhythm Therapy shows that it is effective alone or in combination with physiotherapy intervention for patients with frozen shoulder, focusing on reduction in pain, increasing blood flow and muscle strength and hence improving range of motion.

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