Volume

1

CBS MEDICAL TECHNOLOGIES, INC.

The Advanced System

MagScan-I™ Operation Guide

THE ADVANCED SYSTEM

MagScan-I™ Operation Guide

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Welcome to the world of MagScan-I™

Congratulation you have made a wise choice in selecting MagScan-I™ to treat musculo-skeletal disorders.

The evolution of the knowledge in pulsed magnetic field for therapeutic applications has dramatically changed the way a number of body disorders can be cured.

CBS Medical Technology Inc. proposes a new, non-invasive approach in the treatment of musculo-skeletal disorders, with the utilization of its new MagScan-I™. A new state of the art microprocessor based system. The result of 17 years of trial and tests to perfect the technology in order to attain a large proportion of treatment success.

MagScan-I™ utilizes a unique variable multi-axial low frequency, low intensity pulsed magnetic field of specific coordinates (polarity, Intensity, frequency and duration) that scan the affected area and has been proven to provide positive results in the treatment of musculo-skeletal pathological conditions that do not respond to conventional therapy.

The therapy consist basically in exposing the affected area to a multi-axial pulsating field generated by MagScan-I™.

Control clinical tests have been conducted and documented with x-ray before and after treatment. In the treatment of shoulder calcified peritendinitis results have shown that pain will be relieved within a week and calcium deposit reduced or eliminated in 4 to 6 weeks with 3 treatments per week.

Gradual movement at the shoulder joint and pain relief will be obtained in almost 100% of the subjects treated according to the specifics coordinates mentioned above. Furthermore, the hydroxyapatite biological complex (calcium phosphate, calcium carbonate) will ionize totally or partially depending on its size.

Chapter

2

Delivery

Check first that all components of the MagScan-I™ are in the shipping box.

At time of delivery your MagScan-I should include the following items,

- **A control unit (MagScan-I)**
- **A cylinder (12') with connector**
- **A support table**
- **A positioning arm**

Installation

Before you install the MagScan-I system, locate the area where you want to give the treatment, it should be in a quiet area, away from passage, and preferably in a treatment room.

The installation of all components of the system is fairly straight forward, but make sure that the positioning arm is inserted all the way in the center hole in the support table, and that all adjusting levers are tights.

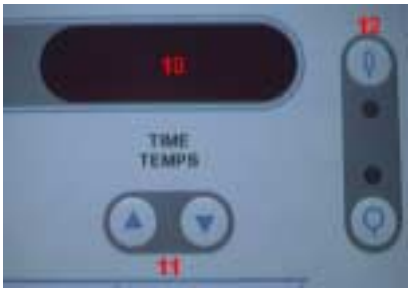
Next, and before you make any wire connections, check on the side of the control unit that it has been set to the proper voltage. (Our MagScan can be operated worldwide and therefore may be adjusted to local electrical voltages). Usually the unit will leave the factory with the voltage pre-set to the voltage used at place of shipment; therefore you should not have to change the setting.

Connect the AC cord to the unit and the cylinder input cord to the control unit.

Chapitre

3

Identification of the controls



1. **Temporary treatment interruption (Pause)**
2. **Treatment Activation (Start)**
3. **Power Monitor display**
4. **Amplitude Display (electromagnetic field)**
5. **Amplitude Programming**
6. **Frequency Display**
7. **Frequency Programming**
8. **Modulation Display**
9. **Modulation Programming**
10. **Treatment time display**
11. **Treatment time set-up**
12. **Modulation & Scanning Selection**

1. **AC power cord connection**
2. **Voltage selector**
3. **On/off switch**
4. **Cylinder cord connector**

MagScan-I is factory pre-set to give upon start up, 10 Gauss, 15 Hz and negative polarity for 30 minutes.

To change set-up, **click on the control pad and choose the set-up most adapted to the therapeutic treatment that you wish to perform.**

Before you start

Make sure that patient is confortably well seated, **since he will have to stay in the same position for 30 minutes.**

Verify that the Cylinder applicator is well positioned, **the applicator should not be resting on the shoulder, but be as close as possible, with the negative side towards the shoulder.**

Verify that the patient does not wear excessive metal objects, **even though there are no danger to wearing metal bracelet or necklace it may affect the multi-axial pulsed signal generated by the applicator cylinder. Patients with pacemaker or pregnant woman should consult their doctor prior to treatment.**

Chapter 4

Control Settings

Pathological Condition	Intensity * (micro-tesla)	Frequency (Hz)	Scanned	Time (minutes)	Nbr. of sessions
Cervical disk disease (mild)	1	8	No	30	3
(two phases treatment)	2	15	Yes	30	3
Arthritis shoulder (mild) **	2	15	Yes	30	12-16
Arthritis knee (mild) **	2	15	Yes	30	12-16
Calcified bursitis (shoulder) non-fragmented . **	2	15	Yes	30	12-16
If no modification after 6 cessions, proceed as follow.	1	8	No	30	3
	2	15	Yes	30	3-9
Bursitis non- calcified (shoulder)**	2	15	Yes	30	6
If no modification after 6 cessions, proceed as follow .	1	8	No	30	3
	2	15	Yes	30	3-9
Epicondylitis (tennis elbow) **	2	15	Yes	30	12-16
If no modification after 6 cessions, proceed as follow .	1	8	No	30	3
	2	15	Yes	30	3-9
Tendinitis of the knee (internal and external collateral-tibial ligaments.)	1	8	No	30	3
acute phase .	2	15	Yes	30	9

Post-arthroscopic swelling of the knee. **	2	15	Yes	30	6-8
Plantar fasciitis. **	2	15	Yes	30	6-12
Tendinite (great trochanter). ** **If no modification after 6 cessions, proceed as follow .**	2 1 2	15 8 15	Yes No Yes	30 30 30	6-12 3 3-6
Sacro-iliac and sacro- sciatic ligamentitis. **	2	15	Yes	30	8-12
Lumbago and lumbar sprain. **(two phases treatment)**	1 2	8 15	No Yes	30 30	4 3
Tendinitis and sprain wrist.	1	8	No	30	6-9
Tendinitis and sprain ankle.	1-2	10-15	Yes	30	6-9
Pain related to non-union and non-fusion fracture. **	2	15	Yes	30	6-12

*** Amplitude :** **1, 2, 3, 4 (respectively 0.5,1.0,1.5,2.0 micro-tesla)**
Frequencies : **2, 4, 8, 10, 12, 15,30 Hz**
Modulations : **0 (none), 1, 2, 3, 4, 5, 6, 7, 8, 9 (see manual)**
Time Selection : **10, 20, 30, 40, 50, 60, 70, 80, 90 minutes**
Waweform : **Lower selection,**
*** Flashing : scanned sin wave**
*** Non-flashing : stable sin wave**
Upper selection,
*** Flashing : scanned « calmar » wave**
*** Non-flashing : stable « calmar » wave**

** preset value**.**

Note: In acute or chronic musculo-tendinous conditions alternate scanned & non-scanned setup.

Chapter

5

MagScan-I ™

A new state of the art microprocessor based electromagnetic system to treat shoulder-calcified bursitis. The result of 15 years of trials and tests to perfect the technology in order to attain almost 100% treatment success.

Our Strengths

- **A professional approach**
- **Strictly monitored by health professionals**

Key Benefits

- **Extremely effective**
- **Fast pain relief**
- **Eliminate or reduce calcium deposit**
- **No side effect, non-intrusive**

A new approach

- **A new approach to offer to your patients**
- **A specific treatment for calcified peritendinitis and other mulculo-tendinous problems.**

Chapter

6

Technical Specifications

Input

Voltage	**:**	**115/230 VAC**
Frequencies	**:**	**50/60 Hz**
Power	**:**	**0.5 Amp**

Output (selectable)

Frequencies	**:**	**2 to 30 Hertz**
Electromagnetic	**:**	**Multi-axial, 3 dimensional** **5 to 20 Gauss (.5-2.0 micro-tesla)**
Signal	**:**	**Sin, calmar, scanned or pulsed**
Timer	**:**	**0 to 90 minutes alarm & auto stop**

Transducer

Cylinder-I (10')	**:**	**Standard with MagScan-I**
Cylinder-II (24')	**:**	**Optional (available 2nd Quarter 1999)**
Weight	**:**	**Control unit: 6 Lbs. (3 Kgs)** **Cylinder-I: 5 Lbs. (2.5Kgs)** **Cabinet & arm 15 Lbs. (7 Kgs)**
Dimensions	**:**	**Control unit:14"x8" (35x20 cms)** **Cabinet 16" x 16" x 28" (40x40x72 cms)**

Chapter

7

The Parameters

MagScan-I™ effectiveness largely depends on the knowledge of the effect of all different parameters. Here is a brief description of each of them.

Amplitude

The amplitude corresponds to the strength of the magnetic signal generated by the unit. In most cases a 1 or 2 amplitude is used which correspond to 0.005 to 0.010 Tesla; in certain cases very seldom-encountered lower or higher amplitude may be necessary. Do not hesitate to contact us if you have any doubt.

Frequency

The frequency is defined as the number of oscillation of the signal in one second (i.e. 60 impulses/second = 60 hertz). It is important to use the right frequency for a specific treatment to obtain maximum results. Generally (in 90% of the treatment) frequencies of 10 and 15 hertz are giving best result, being very close to the human body own frequency.

Modulation

The modulation is a time base variation of a wave signal; it is the way the pulsed signal is transmitted by the generating unit. Today we recommend that only the modulation "0" be used. We are pursuing our research and to date we have found that positive results can be obtained at other modulations, and we only need to confirm this data with a number of patient before we can release this information. We shall keep you informed of the evolution of our research.

Time (duration)

The length of a treatment can vary between 20 and 30 minutes depending on the pathological condition being treated. Should you require interrupting the treatment, press on the "Pause" button. To restart, just press on the "Start" button.

Length of the treatment

Depending on the pathological condition treated, we recommend 6 to 18 treatments at the rate of 3 per week. (18 treatment for a calcified bursitis)

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How to use & position the transducer

Chapter

9

Development History

Searching to find a new, non-invasive approach in the treatment of calcified supraspinatous tendonitis in humans, we started in October 1983, to use low frequency pulsed magnetic field.

We observed that the subject exposed to low frequency pulsed magnetic field did show partial to total regression of the calcium deposit within 4 to 6 weeks of treatment.

Pain relieved and movement amplitude was regained in most cases within 2 weeks.

From 1983 to 1997 we faced a dilemma in trying to explain why in certain cases there was resorbtion of the calcium deposit at the site of the supraspinatous tendon while in other cases there were no or little changes.

Different theories and technical modifications made it possible to conclude that the calcium deposit had to be scanned in a very specific manner, with a set intensity and signal frequency.

Such specific manner is characterized by the fact that it will scan the calcium deposit on its entire surface and thus compensates for gaps between the magnetic field lines.

This concept is a direct proof of the existence of the Na+-K+ pump that is driven by an H+-OH- pump in which H+ combines with the X and Y molecules on their return trip as proposed by Davis and Keynes in 1960.

In 1997, arthroscopic acromioplasty is one of the most frequent orthopedic procedures being applied to shoulder pain, bursal hypertrophy, partial thickness cuff tears, and calcified tendinitis.

MagScan-I™ (Calcilysing device for Medical Application) is a new, non-invasive approach in the treatment of calcified supraspinatous tendinitis of the shoulder in human and any other pathological conditions of the vasculo-musculo-tendinous system in humans.

Description:

MagScan-I™ ionizes hydroxyapatite biological complex (calcium phosphate, calcium carbonate) found at the site of the supraspinatus tendon in human shoulder.

MagScan-I™ produces a low frequency, low intensity pulsed magnetic field of specific coordinates (polarity, Intensity, frequency and duration) that scan the affected area and causes a breakdown of the hydroxyapatite biological complex.

The shoulder should be positioned at the maximum magnetic flux of the coil, in order to be scanned by a specific induced magnetic field for duration of 30 minutes daily for two weeks and thereafter every second day for 4 weeks, for a total treatment period of 6 weeks.

Gradual movement at the shoulder joint and pain relief will be obtained in almost 100% of the subjects treated according to the specifics coordinates mentioned above. Furthermore, the hydroxyapatite biological complex (calcium phosphate, calcium carbonate) will ionize totally or partially depending on its size.

Chapter

10

New non Invasive Treatment

Low frequency pulsed signal, a new non-invasive treatment in calcified supraspinatous tendinitis.

As a result of 15 years of research, CBS Medical Technology Inc. has developed a new non-invasive electro-therapeutic device for the treatment of calcified supraspinatus tendon in human shoulder.

THE ROTATORY CUFF PATHOLOGICAL CONDITIONS TREATMENT

1) Historical review and evolution

The terminology 'periarthritis humeroscapularis' was introduced by Duplay (Duplay 1872) to describe a pathological condition characterised by pain and stiffness in the shoulder joint. From autopsy observations Duplay determined that this condition seemed to lie in the subacromial or subdeltoid bursa. He concluded that either the destruction or fusion of the bursa probably caused it.

Kuster(Kuster 1882) and Colley (Colley 1889) in Germany concluded as Duplay.

Painter, 1907 recognised with the advent of roentgenography the presence of calcium shadows in the soft parts between the acromion and the greater tuberosity.

The same finding was made by Stieda, (Stieda, 1908) who assumed that these calcium masses were situated in the wall and in the lumen of the subacromial bursa. These new findings were indiscriminately termed bursitis calcarea.

The term "bursoliths" was even used by Haudek (Haudek, 1911) and Holzknecht.(Holzknecht, 1911)

Wrede, (Wrede, 1912) who, on the basis of one surgical case and several cases in which X rays had revealed calcium shadows in the region of the greater tuberosity, was able to show that the calcium deposits were localised in the supraspinatus tendon.

Codman (Codman, 1984) made an important contribution to the question when he drew attention to the important role played by changes in the supraspinatus in the clinical picture of subacromial bursitis. Codman was the first to point out that many cases of inability to abduct the arm are due to incomplete or complete ruptures of the supraspinatus tendon.

With Codman's findings it was proved that humeroscapular periarthritis was not only a disease condition localised in the subacromial bursa, but that pathological changes also occurred in the tendon aponeurosis of the shoulder joint.

In 100 dissected scapulaes, Neer found eleven with a "characteristic ridge of proliferative spurs and excrescences on the undersurface of the anterior process (of the acromion), apparently caused by repeated impingement of the rotator cuff and the humeral head, with traction of the coracoacromial ligament.

In 1972 Neer described the indications for acromioplasty as:

(1) Long-term disability from chronic bursitis and partial tears of the supraspinatus tendon or
(2) Complete tears of the supraspinatus.

He pointed out that the physical and roentgenographic findings in these two categories were indistinguishable, including crepitus and tenderness over the supraspinatus with a painful arc of active elevation from 70 to 120 degrees and pain at the anterior edge of the acromion on forced elevation.

The proposed goal of acromioplasty was to relieve mechanical wear at the critical area of the rotator cuff. Surgery was not considered until any stiffness had resolved and until the disability had persisted for at least nine months. Even in-patients, who had had a previous lateral cromionectomy with continuing symptoms, Neer considered anterior acromioplasty, having found that many still had problems related to subacromial impingement. Neer also reported that the rare patient with an irreparable tear in the rotator cuff could be made more comfortable and could gain surprising function if impingement were relieved, as long as the deltoid origin was preserved. (Neer, 1983)

Neer (Neer, 1983) recommended resection of small unfused acromial growth centres and internal fixation of larger unfused segments in a manner that tilted the acromion upwards to avoid impingement)

Additional approaches to subacromial abrasion have been proposed including coracoacromial ligament section, (Hawkins and Kennedy, 1980, Jackson, 1976, Kessel and Watson, 1977, Penny and Welsh, 1981) resection arthroplasty of the acromioclavicular joint, (Kessel and Watson, 1977) extensive acromionectomy, (Armstrong, 1949, Diamond, 1964, Hammond, 1962, Hammond, 1971, McLaughlin, 1944, Michelsson and Bakalim, 1977, Moseley, 1969, Smith-Petersen, Aufranc, 1943, Watson-Jones, 1960) and combined

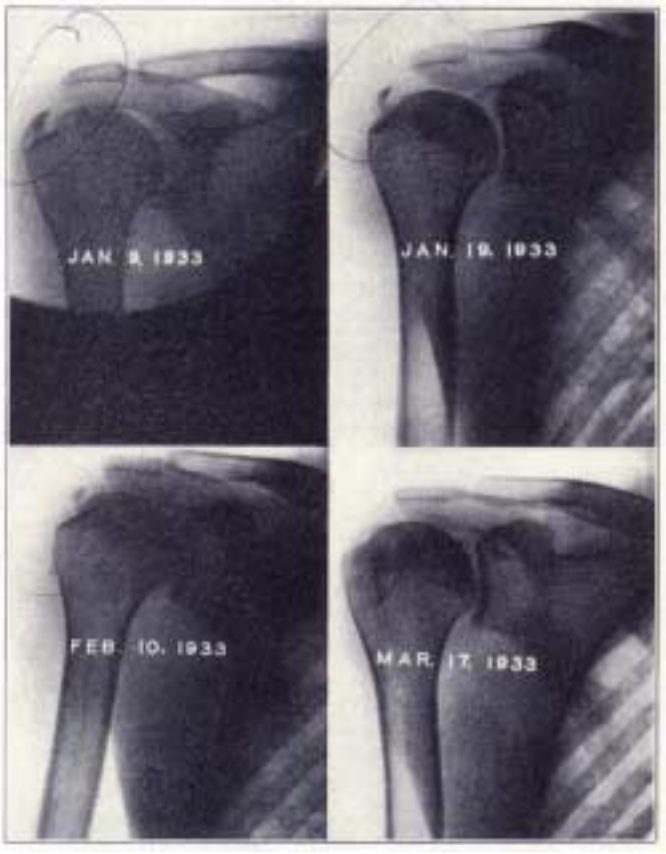
procedures such as acromioplasty, incision of the coracoacromial ligament, acromioclavicular resection arthroplasty, and excision of the intra-articular portion of the biceps tendon with tenodesis of the distal portion of the bicipital groove.(Ha'eri, Orth, 1982, Neviaser, Neviaser, 1982, Pujadas, 1970)

Recently, arthroscopic acromioplasty has been introduced. The frequency with which this procedure is performed has increased dramatically as the strictness of Neer's original indications for acromioplasty have been allowed to relax.

EVOLUTION IN THE TREATMENT OF CALCIFIED SUPRASPINATUS TENDON IN HUMAN

Troedson B. S. (Archive of Physical Therapy,19,166 (1938) observed roentgographic changes of the calcium deposit at the shoulder joint after short-wave diathermy.

It was believe that short wave diathermy was the causative agent for such modification of the calcium depot (Electrotherapy and Light therapy by Kovac 1942, page 579).



The proposed mechanism from the illustration found at page 248 in Kovac textbook Electrotherapy and Light Therapy is that an induced magnetic field was the causative agent that modified the calcium deposit.

In a search to find new, non-invasive approach in the treatment of calcified supraspinatus tendonitis in human, we started in October 1983; to use low frequency pulsed magnetic field treatment.

We observed that a number of subjects exposed to low frequency pulsed magnetic field did show partial to total regression of the calcium deposit within 4 to 6 weeks of treatment.

Pain relieved and movement amplitude was regained in certain cases within 2 to 3 weeks.

From 1983 to 1997 we had the dilemma to explain why in certain cases there was resorbtion of the calcium deposit at the site of the supraspinatus tendon and in other cases no changes.

Different theories and technical modifications made it possible to conclude that the calcium deposit had to be scan by a multi-axial magnetic field.

Such a three dimensional magnetic field is characterized by the fact that it will scan the hydoxy apatite biological complex on its entire surface and therefore do not leave any untreated fragments between the electromagnetic field lines, like one observes in a mono- axial systems).

Furthermore, it was experimentally found that the co-ordinates (intensity, frequency and polarity) that cause lysis of the calcium deposit where specifics, is always the same.

In 1998, arthroscopic acromioplasty is one of the commonest orthopaedic procedures being applied to shoulder pain, bursal hypertrophy, partial thickness cuff tears, and calcified tendonitis.

Low frequency pulsed signal treatment should be part of the physician armamentarium, with the understanding of it's application and limitation.

The results obtained in calcified supraspinatus tendon of the human shoulder confirm the benefit of its utilisation on this specific pathological condition.

CBS Medical Technology Inc. a Canadian company, is offering it's MagScan-I™ as a new, non invasive approach in the treatment of calcified supraspinatus tendonitis of the human shoulder.

ADDENDUM

There is increasing evidence that electric energy influences biological systems. Several reviews of these effects are well known in the scientific literature (1,2,3,4,5,6) and demonstrate an evolution in modern investigation.

While these reviews are mainly concerned with bone application and it's piezoelectricity, this piezoelectric nature (and possible 'electrosensitivity') of other tissues have also been recognised (7,8,9,10,11,12,13)

A wide variety of philogenetically dependent and probably dose related tissue interactions with nonionizing electromagnetic fields has been described by Adey W.R. (14).

Prior to modern rediscovery of electrically induced osteogenesis (4), electric effects on soft tissue elements were being investigated (15). In 1920,Ingvar (16) reported in vitro growth of fibrocytes along the vectorial gradient of a low density current.

Lengyel in 1933 (16) and 1934 (17) observed increased cellular production, atypical cell and matrix disorganisation in embryonic chick cells grown in a constant magnetic field.

Huzella (18) at the same time demonstrated a polarizing effect of fibril deposition in cultures grown in a varying field.

Fardon and all (19) in 1940 described a 'bar magnetic filing pattern of growth' between two neighbouring cell cultures, implying some electromagnetic control of proliferation and orientation.

Lenzi in 1940 (12) observed changes in the course and appearance of mitotic figures in a constant magnetic field that apparently improved ordering and orientation of culture elements in an alternating field .He also noted that in vivo, both cutaneous and bone wounds were initially inhibited and followed by a 'compensatory increase' in healing when subjected to what would currently be called medium-intensity, very low-frequency pulsed electromagnetic fields.

This evidence suggests that both collagen-producing cells and/or collagen itself are affected by pulsed magnetic field of very low frequency, low intensity and of specific polarity.

Review of literature modified from (20)(21).

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