

## Appendix

To improve the comprehension of the experiments on electric stimulation of fracture healing or bone growth, a standard information form is proposed.

### Electric Stimulation of Bone Growth and Repair

#### STANDARD FORM

(Please fill in one form for each experimental set-up you are using)

DATE: .....

NAME(s):.....

AFFILIATION: .....

ADDRESS: .....

TEL: .....

#### AIMS OF THE STUDY:

.....  
 .....  
 .....

#### EXPERIMENTAL MATERIAL:

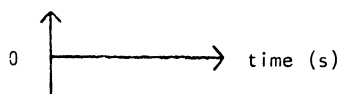
1.  tissue culture, kind .....
- animals , kind ....., number .....
- humans , number .....
2. Bone used: .....
3.  without bone defect
- with bone defect, type of defect .....
- pathological bone, kind .....
4. Type of fixation:
  - internal fixation, type .....
  - external fixation, type .....
  - cast, type .....
  - other:.....

#### TYPE OF STIMULATION:

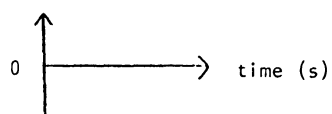
- direct current
- pulsed current
  - " voltage
- alternating current
  - " voltage
- electromagnetic field
- other: .....
- .....

Voltage and current pattern

voltage (V)



current ( $\mu\text{A}$ )



ELECTRICAL PARAMETERS:

amplitude ..... other:.....  
frequency .....  
pulse width .....

STIMULATOR USED CONSISTED OF:

- battery + resistor
- transistor circuit
- other:.....

PLACEMENT AND INSULATION OF STIMULATOR:

1. Placement of stimulator  subcutaneous  
 external
2. Use of a cable or other connection through the skin:  
 yes  no
3. Insulation of implanted materials.....

ELECTRODES:

Type and size of electrodes: .....  
.....  
Electrode position and fixation: .....  
.....  
Electrode material: cathode .....  
anode .....

TIME OF TREATMENT:

Stimulation time: ..... hours/day  
Total time of treatment including possible rest periods:.....  
Rest periods, distribution and length: .....  
.....

EVALUATION METHODS:

- Biomechanical study: .....  
.....
- X-ray: .....  
.....
- Histology: .....  
.....
- Macroscopical study: .....  
.....

- Clinical evaluation: .....
- .....
- Isotop: .....
- Chemical analysis: .....
- Other: .....

RESULTS:

1. Area where the healing process is studied:

- around the electrodes
- in the medullary cavity
- on the periosteum
- at the fracture site
- for an artificial produced bone defect state type and site: .....
- .....
- other: .....

2. Description of the results: .....

.....

.....

.....

.....

3. Complications: .....

.....

.....

.....

REMARKS:

1. Difficulties: .....

.....

.....

.....

2. Suggestions: .....

.....

.....

.....

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# Progress in Orthopaedic Surgery

Volume 1

## Leg Length Discrepancy The Injured Knee

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Basic Rehabilitation Principles of Persons with Leg Length Discrepancy: An Overview. – Etiology and Pathophysiology of Leg Length Discrepancies. – Measurement of Leg Length. – Methodological Errors in Documenting Leg Length and Leg Length Discrepancies. – Equalization of Leg Length with Orthopaedic Shoe Measures. – Subtrochanteric Shortening and Lengthening Osteotomy. – Surgical Lengthening or Shortening of Femur and Tibia. Technique and Indications.

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# Advances in Artificial Hip- and Knee- Joint Technology

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Joint prostheses that are the result of more than 25 years of development are today being used with success in the rehabilitation of many cases, including patients with extremely severe joint pathology.

Despite this fact, artificial joint designs still pose problems with respect to their function, anchoring, materials employed, and the interaction of the prosthesis with the surrounding biological tissues. Some of these problems are associated with considerable therapeutic setbacks.

Further improvement in the artificial joint requires the application of modern experimental and research techniques and the close cooperation of medical doctors, engineers, and scientists.

The major objective of this book is to present, in expanded form, the lectures given by internationally known scientists and clinical researchers in the field of artificial joints in the locomotor system, and to make that information available to a wider public. The experience discussed covers the principles and main methods of joint replacement. Particular emphasis has been put on problems of pressing importance at the present time, such as the improvement of the general design, the fixation systems, and implantable materials for hip and knee joints, as well as the postoperative management of a steadily increasing number of patients.

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