

Prosthetic and orthotic general overview

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This lecture will discuss the most important defects in manufacturing orthosis and prosthesis in Egypt and how to deal with these problems through the available possibilities. Our challenging goal is to improve the overall health and luxury for handicaps.

DR. IBRAHIM A. NASSAR “Prof. Orthop.Surg. Al Azhar University”

Lumbar disc herniation is among the most common causes of lower back pain and sciatica. Operative treatment clearly is indicated in cauda equina and possibly for patients with progressive motor deficit. Otherwise, no one method of non-operative or operative treatment seems definitively to be superior on reviewing the literature. Severe neurologic deficits without pain also may be a good reason to consider operative treatment. Most practitioners would agree that as long as the patient does not have a (progressive or significant neurologic deficit, cauda equina, or severe intractable pain), a minimum of 6 to 8 weeks should be reserved for non-operative treatment. Nonoperative treatment methods should not extend beyond 4 to 6 months if the patient shows only minimal improvement.

Global Osteopathic approach in Physical Rehabilitation

The purpose of teaching this model to health care professionals is to identify the relationships between the structures and function of human body related mainly to the musculoskeletal system. The model includes global and specific tools for evaluation and treatments ideas required to treat common PT cases. This model uses the most modern tools in manual medicine, been there under the principles of osteopathic Medicine and integrated into traditional PT evaluation and treatments system. The results of this will greatly affect the direct cost and efficiency of PT overboard. The anticipated outcome of this lab/ presentation is the identification of the characteristic of somatic dysfunctions in relation to basic concepts of osteopathic principles in PT setting, in particular the Outcomes in the area of orthopedic manual therapy related issues. Also may be useful in treating medical conditions that are related to musculoskeletal disorders in general.

The question is, “What is different about ‘GMOA?’ In my eyes, and in simplest terms, it takes the emphasis off of the “techniques” and puts the entire focus on developing and mastering incomparable, unparalleled, irreplaceable diagnostic skills. To take a step back and evaluate the whole patient, not only acknowledge and understand the patient’s symptoms, but also take a good global look at posture, gait, compensatory patterns, and to manually evaluate temperature, asymmetries, restrictions, texture and to not just take into consideration the area of pain, but the whole body to determine and address where the dysfunction is originating from...THAT is the difference.

Dr. Abd El Aziz Ali

Lecturer of Ph. Th. Faculty of Physical Therapy Cairo University

combined effect of dynamic ankle Foot orthosis with treadmill training on balance in hemiparetic cerebral palsy.

Abstract

The purpose: The purpose was to investigate the combined effect of dynamic ankle Foot orthosis with treadmill training on balance in hemiparetic cerebral palsy.

Subjects: Thirty hemiparetic cerebral palsy children (age ranges from 7 to 11 years were equally divided into two groups; group (A) and group (B). Group (A) Group received the physiotherapy program and treadmill training, while group B received the same physiotherapy program addition to treadmill training with dynamic ankle foot. The subjects were evaluated and scored functionally using Peabody developmental motor scale II), and objectively, using Biodex balance system device utilized to obtain the Antroposterior stability, Mediolateral stability index, at different time intervals; pretreatment and three months later during which they underwent the treatment program.

Results: Significant improvement was observed in all measuring variables when comparing the post-treatment results in both groups. Comparing the post –treatment variables, significant difference is revealed in favor of the study group (B)

Conclusion: The obtained results strongly support the introduction of Dynamic AFO with treadmill training as an additional procedure to the treatment program of hemipartic children.

Key words: hemipartic, balance. Orthosis, treadmill.

Shock Wave therapy & Interferential Therapy (IFT) are very common non-pharmacologic interventions used to control pain in knee osteoarthritis

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ABSTRACT

Introduction: Shock Wave therapy & Interferential Therapy (IFT) are very common non-pharmacologic interventions used to control pain in knee osteoarthritis.

Aims& Objectives: The purpose of the study was an effort to find out the efficacy of Shock Wave therapy & Interferential Therapy to control the pain in osteoarthritis of knee.

Study design & Methodology: The study was experimental, pre & post design. Forty osteoarthritis patients who were suffering with osteoarthritis their age were 40-65 years were chosen for the study& randomly distributed in two groups. Group A (Interferential Therapy) in addition to the conventional therapy program to knee osteoarthritis(Exercises, postural and ergonomic care, hot water fomentation, wore knee brace) and Group B (shock wave therapy) in addition to the same conventional therapy in group A, Shock Wave Therapy 3000 shock one time only) & Interferential Therapy was applied three times weekly for 8 weeks. The severity of knee pain was evaluated by Visual Analog Scale (VAS) in a weight bearing position (walking or standing) in parallel bars, rang of motion of knee flexion & Western Ontario McMaster universities (WOMAC) index of osteoarthritis was used to assess pain, stiffness, and physical function were measured before and after the end of treatment program .

Results: Revealed statistically significant improvement in the measuring variables of both groups when comparing their pre and post treatment mean values. Groups' post –treatment 0.05). <variables, significant difference is revealed in favor of the group (B) (p

Conclusion: The obtained results strongly supported the introduction of shock wave therapy help to reduce pain in *Osteoarthritis* of knee joint

Keywords: *Knee Pain, Osteoarthritis, Shock Wave Therapy, Interferential Therapy, Exercise*

Effect of Shock Wave Therapy in the Treatment of Trigger Finger

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ABSTRACT

Background: Trigger finger (stenosing tenosynovitis) is a condition affecting the movement of the tendons as they bend or flex the fingers or thumb due to inflammation of the tendon. **Purpose:** To investigate the effect of Extracorporeal Shock Wave Therapy (ESWT) on the pain level and the hand grip strength in patients with trigger finger (TF). **Subjects:** Thirty male and female patients with chronic trigger finger were assigned into two equal groups; Group I (study group), Group II (control group) with age ranged from 35-65 years **Methods:** The pain level were measured for both groups at the beginning of the study and at the end by the Numerical Analogue Scale (NAS) ,the hand grip strength were measured both groups at the beginning of the study and at the end by Hand Held Dynamometer. The study group I received ESWT (3000 shocks, 1000 shock/ session, 3 session 2 weeks apart, energy flux density 0.32 mJ/mm², energy level 5-7, pulse rate 160/min., 2-3Hz) and traditional exercises . The control group II received infra red radiation (IRR) and traditional exercises. **Results:** The results showed a highly significant improvement of all measured parameters in the study group as compared to control group. **Conclusion:** ESWT is an important factor to be considered in management of trigger finger patients.

Key word: trigger finger, Extracorporeal Shockwave, Hand grip strength.

Fitting and Aligning of Lower Limb Prostheses

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Objectives of lecture:

The Objectives of lecture includes:

- Understand assembling of lower leg prostheses.
- How to assess the amputated leg for proper fitting of the prostheses.
- Static and dynamic adjustment of lower leg prostheses alignment.
- The gait deviations in case of malalignment of lower leg prostheses.

Effect of unilateral and bilateral use of laterally wedged insoles with arch supports on impact loading in medial knee osteoarthritis

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Background: Increased impact loading is implicated in knee osteoarthritis development and progression. This study examined the initial impact force and first ground reaction force (GRF) peaks, their loading rates, their relative timing to the stance phase timing and the walking speed during unilateral and bilateral use of different inclinations of laterally wedged insoles (LWI) with arch supports. **Methods:** Data were collected from 33 female patients with medial knee osteoarthritis, using an AMPTI forceplate, under five insole conditions (unilateral 6° & 11° and bilateral 0°, 6° & 11°) and a without-insole one. **Results:** Repeated measures MANOVA revealed significant ($p < 0.05$) increase in the impact force in the bilateral 11° vs each of the unilateral 6° and without-insole conditions. The impact loading rate decreased significantly in the unilateral 11° vs the bilateral 6° insole condition. The relative timing of the impact force increased significantly in each of the bilateral 6°, bilateral 11° and unilateral 11° vs the bilateral 0° insole condition and in each of the bilateral 11° and unilateral 11° vs the without-insole condition. Moreover, there were significant ($p = 0.000$) positive correlations between the impact and GRF loading rates and the walking speed and each of the impact force, impact loading rate and GRF loading rate. Finally, the Chi-square test revealed insignificant ($p > 0.05$) association between the insole conditions and the presence of impact forces. **Discussion/Conclusion:** Patients with medial knee osteoarthritis are advised to use unilateral 11° LWI and walk slowly to decrease impact loading. Unilateral use of 11° LWI decreases impact loading possibly through increasing foot pronation.

Keywords: Impact loading, Wedged insoles, Osteoarthritis

Effect of Kinesio Tape on Iliocostalis lumborum in Back Myofascial Pain Syndrome /karim Mohamed fawzy ghoweba / Demonstrator of Physical Therapy for Musculoskeletal Disorders and its Surgery Department, Faculty of Physical Therapy, Cairo University Supervisors: Prof. Dr. Alaa Aldeen Abd Al Hakeem Balbaa/Dr. Ghada Mohammed Rashad Koura Faculty of Physical Therapy, Cairo University. and Dr. Ahmed Hazem Abdelazeem faculty of medicine Cairo University.

ABSTRACT

Purpose : Find out if kinesio taping is effective to decrease pain, improve pressure pain threshold and gain functional activity in patients with back myofascial pain syndrome at iliocostalis lumborum.

METHODS: fifteen patients from outpatient clinic of faculty of physical therapy Cairo University had participated in this study (5 males, 10 females) with mean age 30.4 (± 3.35) years, kinesiotape was applied over trigger points of the iliocostalis lumborum bilaterally and was changed every 3 days with one day off for a total 3 times in 2 weeks. Pain intensity, pressure pain threshold and functional disability were measured before and after treatment program.

RESULTS: there is significant differences between before and after application of kinesio taping on the back in pain level, pressure pain threshold and functional disabilities.

CONCLUSION: kinesio taping can be used to reduce pain level, improve pressure pain threshold and function in patients with back myofascial pain syndrome at iliocostalis lumborum .

Key Words: kinesio tape / myofascial pain syndrome / Oswestry disability index

Biomechanical Implications of Prosthetics and Orthotics

Amir A. Beltagi “Lecturer Assistant, Biomechanics Department,
Cairo University”

One primary purpose for prescribing an orthosis or prosthesis for an individual is to improve the performance of functional activities and mobility, including ambulation. To select, fabricate, fit, or train an individual in the use of an orthosis or prosthesis, practitioner must possess a basic understanding of biomechanical principles, normal alignment, movement, and forces acting on the body or body segment. In addition, an understanding of normal gait and common gait deviations is important.

Egyptian Artificial Foot Prosthesis

Prof. Dr. Mohammed Elgendy, Mr/Nasser

Ancient Egyptians were pioneers in the field of fabrication of artificial foot prosthesis. Research and investigations documented that the first artificial prosthetic foot was fabricated by ancient Egyptians with high material quality allowed at that era. Now in Egypt, we use imported artificial foot from Germany and china and other countries. Recently, after a lot of work, we can design and manufacture this product with same quality of imported one.

ORTHOSIS MAY HELP IN FIGHTING MYOFASCIAL PAIN

Prof. Samir Sabbahi

Approximately 70% of all pain is primarily myofascial in origin. While the remaining 30% has other causes, it is often associated secondarily with myofascial pain. The chronic form of muscle pain is referred to as myofascial pain syndrome “MFPS”. MFPS has caused soft tissue irritation to the muscles and limit the joint range of motion. Myofascial referred pain does not follow dermatomal, myotomal or sclerotomal patterns of innervations. A myofascial TP is a hyperirritable locus within a taut band of painful skeletal muscle, located in the muscular tissue and/or its associated fascia

Different treatment methods “modalities, manual therapy, exercises and orthotic therapy” may be used to fight myofascial pain, though blocking the pain receptors that cause the nerves to be irritated due to **MFPS**. Orthotic therapy can be consider as an effective treatment method for reliving muscle pain, through its mechanical impact to neutralize forces working on different parts of locomotor system. Sound understanding of the neurophysiologic basis of different treatment methods, may help the clinician to set up a convenient treatment plan for every patient according to clinical findings and causative factors.

A movable shoulder abduction orthosis for the post-operative management of muscle transfers in patients of obstetric brachial plexus injury: Prof.Dr. Yasser El Safoury, Faculty of Medicine, Dr. Mohamed Taher, Faculty of Physical Therapy, Dr. Mohamed Raafat, Faculty of Physical Therapy, Cairo University.

Abstract

History: Transfer of Latissimus dorsi muscle / Teres major to the rotator cuff with or without Subscapularis release are a widely used procedure for restoring shoulder abduction and external rotation in obstetric brachial plexus palsy. **Purpose:** After the operation a shoulder abduction orthosis in maximal external rotation and 90 – 100° abduction is utilized following six weeks of immobilization in a shoulder spica cast for protecting the newly transferred muscle from undue elongation. However this in turn may cause contracture of the external rotators. To overcome this problem, a modified shoulder abduction splint with adjustable internal-external rotation ranges was developed. **Methods:** Seventy patients (44 boys, 26 girls; mean age 7.6 years; range 2 to 9 years) underwent transfer of the Latissimus dorsi/ teres major muscles to the rotator cuff. Spinal root involvement was at C 5 –C 6 in 37 patients and at C 5 –C7 in 33 patients. In 55 patients, the subscapularis muscle was released. The glenohumeral joint was evaluated by anteroposterior and lateral x- ray. According to the Waters Peljovich grading system, all the patients had type I or type II deformities. Pre- and postoperative range of motion values by and Mallet scores were compared. The mean follow-up period was 6 months. **Results:** The mean shoulder abduction increased to 130.7° (range 90° to 160°; mean gain 60.3°) and external rotation increased to 80.0° (range 30° to 100°; mean gain 58.7°). The mean postoperative Mallet scores for global abduction and external rotation were 3.9; hand-to-head, to-mouth, and to back scores were 3.7, 3.4, and 2.5, respectively. **Conclusion:** The aim of orthotic and physiotherapy treatment following muscle transfer for OBPP is essentially to restore a physiologic balance between internal and external rotation without jeopardizing the effectiveness of the operation.

Keywords: Obstetric brachial plexus palsy, orthosis, shoulder abduction orthosis, rehabilitation.

Therapeutic Applications of Orthosis in Neurological Conditions:

Prof. Dr. Magdy Arfa

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Aims of orthoses:

The main aims of orthotics application is external force support. these forces have significant neurological implications related to the input to the CNS. The basic functions of orthotic applications include

protection, prevention, facilitation, sensory training, alignment, maintenance, inhibition

Applied Anthropometry

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Anthropometry is measurement of humans for purposes of understanding human physical the variation “this kind of study fall in the scope of engineering anthropometrics. Objectives: the objectives of using anthropometry in the design is to decrease the demand on the human , diminish the risk of injury , stresses for better user convenience use and improve performance.

Involves measurement of: body dimensions that apply to wider range of design problems and other body physical characteristics, e.g. Volumes, center of gravity, masses of body segments.

Anthropometry involves static and dynamic or functional anthropometry.

Anthropometric Design could be a design for the RANGE including adjustable designs , Design for the EXTREME ; for tall people (95%) or design to be reached by short people (5%). In addition to designing for the AVERAGE Public seating, designed to accommodate the median of the population in use. Use of Anthropometry could be on **Individual Level** as screening; one-time assessment and growth monitoring: trend assessment. Moreover it can be applied on the **Population Level** through one-time assessment for long-term planning and trend assessment for timely warning for programme management. The Suggested **Procedure** for using Anthropometric data started with determining body dimensions important in design, Defining population to use facility/equipment ,orthotics e.g. children, women, Egyptian, , Determining principle to be applied i.e. extreme individuals, adjustable range, average , Selecting percentage of population. to be accommodated (e.g. 90%), Find appropriate anthropometric data tables, Adding appropriate allowances (e.g. clothing, shoes) and lastly building full-scale mock-up of facility/equipment, have representative people of large and small users (of the population) test it (very important).

Conclusion: The application of anthropometric data entails the design for different size and / design adjustable orthotics or prosthetics to fit with population in different environment.

Key words: dimension, percentile , anthropometrics , physical characteristics , body segment parameters

Using multi-angle ankle foot orthosis as related to gait parameters in patients with stroke

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3. **Dr. Mahmoud Moustafa Hamed**, physical therapist at Health Insurance Organization

ABSTRACT

Purpose: Purpose of this study was to investigate the effect of multi-angle (ankle foot orthosis AFO) on the gait parameters (stride length, cadence, speed and cycle time), hip and knee joints angular displacement and the percentage of body weight bearing distribution on the affected lower limb bare foot and during wearing AFO with different ankle positions (neutral position and with ten degrees of dorsiflexion) in stroke patients.

Methods: Thirty stroke male patients matched to 15 healthy men participated in this study. Their age ranged from 40 to 59 years and duration of illness ranged from six to eleven months. All subjects were evaluated by three dimensional motion analysis system. Three successive trials were done while using AFO with zero degree, ten degrees and barefoot in patients groups and during barefoot in control group.

Results: Results revealed that there were significant clinical improvement in gait parameters (stride length, cadence, speed and cycle time), percentage of body weight bearing distribution on both lower limb and joint kinematics due to using AFO. The higher degrees of improvement was observed while using AFO with ten degrees of dorsiflexion.

Conclusion: Ankle foot orthosis improved spatiotemporal parameters of gait, percentage of weight bearing and joint kinematics specially with ten degrees of dorsiflexion in stroke patient.

Key words: Hemiplegia, gait parameters, joint kinematics, AFO.

Disability between hope and reality

Mr/ Bassam

The aim of this lecture is to compare between the present conditions of the handicapped persons and what we hope for them. Nowadays, the circumstances in Egypt are not suitable for the handicapped although their percentage is high. Our goal is to help them to overcome and bypass their disabilities and to stand shoulder to shoulder with other healthy persons.

Manufacture of silicon compensatory parts in Egypt

Prof. Dr. Mohammed Elgendy, Mr/ nomeiry

Now in Egypt, we fabricate silicon parts for the missed parts of the body especially in the face, upper and lower extremities with the same international quality. We hope that this idea to spread in Egypt with better service for persons with missed parts like eyes, ears, noses etc. the cosmetic appearance for those persons are important to be involved in the social life without any shame or embarrassment.

Prosthesis for the poor disabled people in Egypt

Prof. Dr. Mohamed Salah

Chairman of pediatric dept. Faculty of Physical Therapy, MUST University

Medical aspects in sports for the disabled

Prof. Dr. Mohamed Salah

Chairman of pediatric dept. Faculty of Physical Therapy, MUST University

Diabetic Foot

Prof. Dr. Mohamed Salah

Chairman of pediatric dept. Faculty of Physical Therapy, MUST University

Impact of Serum Calcium and Physical Activity on Selected Anthropometric Measures in Early Adolescence

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ABSTRACT

Background : Osteoporosis is a major health problem that has a root begin since early childhood and adolescence with cumulative bone modeling that take place . the aim of this study was to identify the association between , selected anthropometry including bone mineral density and physical activity and calcium intake . **Methods** : the study conducted on group of preparatory school boys and girls in Cairo area. Questionnaire was used including level of physical activity , anthropometric measures including weight , height , sitting height , body mass index , arm circumference and bone mineral density. **Results** : the study revealed a significant difference between anthropometric readings in pre post study findings in boys and all findings except BMD in girls . The correlation between BMD , calcium intake, anthropometric measurements and physical activity showed a weak correlation between BMD and daily calcium and a positive correlation with physical activity (p value = 0.002 and in girls = 0.003 while no correlation with daily calcium intake in girls. **Conclusion** : the findings of this study highlight the necessity of physical activity including walking in adolescence to safeguard against the sequelae of lack of activity in the development of musculoskeletal disorders and osteoporosis in adult or elderly.

Key words: Bone mineral density , Body mass index , anthropometry Recommended daily allowance .

Efficacy of Laterally Wedged Insole in Treatment of Medial Compartment Knee Osteoarthritis / Amr Moustafa Yehia Mohammed;
Supervisors;

Prof. Ahmed Hassan Hussien, Cairo University, Faculty of Physical Therapy, Department of Musculoskeletal Disorders and their Surgeries; **Prof. Nadia Abd El-Azim Fayaz**, Cairo University, Faculty of Physical Therapy, Department of Musculoskeletal Disorders and their Surgeries; **Prof. Mahmoud Alm El-Din Abd El-Hafez**, 6th of October University, Faculty of Medicine, Department of Orthopedic Surgery; and **Dr. Mona Hassan Gamal**, Cairo University, Faculty of Physical Therapy, Department of Musculoskeletal Disorders and their Surgeries; M.Sc Thesis; Physical Therapy for Musculoskeletal Disorders and their Surgeries, 2011

ABSTRACT

The purpose of this study was to compare between the effect of laterally wedged insoles combined with conventional exercise program versus conventional exercise program on 1st peak knee adduction moment and WOMAC subscales (pain intensity, stiffness and physical function) in patients with medial compartment knee osteoarthritis. Twenty patients from both sexes randomly assigned into 2 equal groups participated in the study. Their mean \pm SD age, weight, and height were 49.3 (\pm 3.9 years), 80.5 (\pm 10.52 Kg) and 157.5 (\pm 9.525 cm) for group (A) and 49.5 (\pm 7.821 years), 80.5 (\pm 10.52 Kg) and 156.2 (\pm 8.025 cm) for group (B) respectively. Group (A) used 5° laterally wedged insoles in addition to the conventional exercise program that was also used in group (B). Kinetic gait parameters were collected using three dimensional motion analysis system in conjunction with a force plate unit. Findings revealed that there were significant reductions in knee adduction moments in both groups after the 4-week duration of receiving the treatment with no significant difference between groups. Moreover, there were significant reductions in total WOMAC scores in both groups after treatment, indicating improvement in pain, stiffness, and physical function subscales but more significant in group (A). With the knee adduction moment being similarly reduced in both groups after receiving the treatment, using the laterally wedged insoles together with the conventional exercise program still proves to be more beneficial than using the conventional exercise program alone owing to the significant improvement in the WOMAC subscales.

Keywords: Laterally wedged insoles, knee osteoarthritis, Adduction moment, WOMAC scores.

Effect Of Kinesio® Tex Tape On Function In Fibromyalgia Syndrome

Maha Mostafa Mohammed, Khaled El Sayed Ayad, Lilian Albert Zaki,
Sherif Ahmed Khalid

Abstract

Introduction: Fibromyalgia syndrome (FMS) is the most common chronic pain syndrome encountered in the medical practice, affecting females than males, and characterized by widespread pain , tenderness and commonly associated with sleep disorder, fatigue and impaired work performance. Fibromyalgia impact questionnaire (FIQ) is a valid and reliable questionnaire that was developed to comprehensively evaluate the patient functional activity and other FMS symptoms. Kinesio® Tex tape (KTT) is an elastic tape used widely in clinical practice. **Purpose of this study:** Was to investigate the effect of KTT on the functional activity and other symptoms of FMS using the FIQ. **Subjects and Methods:** Eleven FMS female patients (with mean 30.6 ± 5.5 and 4.9 ± 5.4 years, age and duration of illness respectively) were asked to fill a FIQ before the first and third sessions and at follow up (after one week from the fourth session). Hole technique of KTT was applied to all patients for four times (twice per week for two weeks) bilaterally on the upper fibers of the trapezius muscle at the FMS tender points. **Results:** The results showed significant improvement of the FIQ scores ($p < 0.05$) after treatment and at follow up. **Conclusion:** Kinesio® Tex tape is effective in improving function in FMS.

Key words: Fibromyalgia Syndrome- Fibromyalgia Impact Questionnaire- Function, Kinesio® Tex Tape- Function

Case studies of using of orthosis in treatment of poliomyelitis

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What is polio?

Polio (or poliomyelitis) is a disease caused by poliovirus. It can cause lifelong paralysis (can't move parts of the body), and it can be deadly. But, the polio can protect against polio.

What are the symptoms of poliovirus infection?

Most people who get infected with poliovirus do not have any symptoms.

A small number of people (4 to 8 people out of 100) will have flu-like symptoms. These symptoms usually last 2 to 5 days then go away on their own.

In rare cases, poliovirus infection can be very serious. About 1 out of 100 people will have weakness or paralysis in their arms, legs, or both. This paralysis or weakness can last a lifetime.

How serious is polio?

The risk of lifelong paralysis is very serious. Even children who seem to fully recover can develop new muscle pain, weakness, or paralysis as adults, 30 or 40 years later.

About 2 to 5 children out of 100 who have paralysis from polio die because the virus affects the muscles that help them breathe.

Aims of orthoses at polio:

The main aims of orthotics application is external force support. these forces have significant neurological implications related to the input to the CNS. The basic functions of orthotic applications include: protection, prevention, facilitation, sensory training, alignment, maintenance, inhibition.