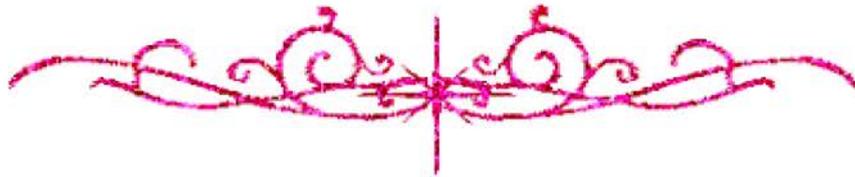


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HOSSAM MAGHRABY



شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم
قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغييرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



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بعض الوثائق

الأصلية تالفة



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بالرسالة صفحات

لم ترد بالأصل



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ABNORMAL GAITS

ESSAY

B12490

SUBMITTED FOR PARTIAL FULFILMENT OF
MASTER DEGREE

IN

ORTHOPAEDICS

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1995

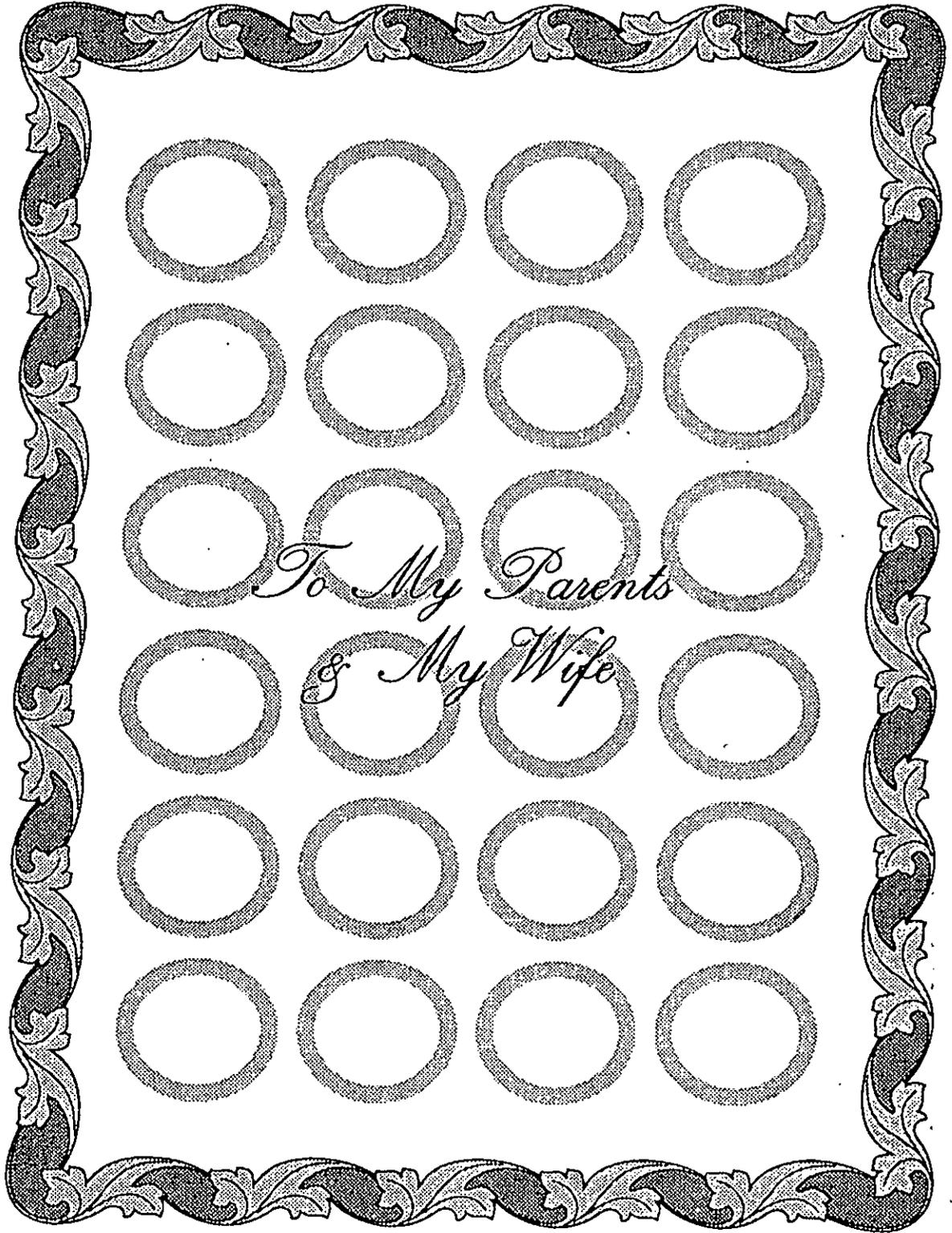
Acknowledgments

I would like to express my deepest gratitude and appreciation to my professor Dr. Mohamed Hany Mohamedy, for his guidance, invaluable advice and supervision, and his kind encouragement that this work come to exist.

I wish also to present my sincere gratitude to Dr. Mohamed Abd El-Khalek, for his guidance and close observation.

I wish also to thank all those who had helped me in accomplishing this work especially my colleagues who helped me directly or indirectly to end this work.

Mohamed Rifaat



*To My Parents
& My Wife*

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INTRODUCTION

Human locomotion is a phenomenon of the most extraordinary complexity (Saunders's, 1953). Gait is the means by which human move in an erect or semierect posture from one location to another, this may be accomplished with the use of ambulatory aids (e.g. crutches, walkers) (Hoffinger, 1991).

Although its objective may simply stated as the translation of the body from one point to another by means of bipedal gait, its analysis requires the collection of an enormous amount of data in order to follow the entire cycle of events (Saunders et al 1953).

Bipedal locomotion is a complex neuromuscular act in which bones and joints are moved by a series of muscles and tendons which require a neural control. Walking is a very primitive learning process, albeit based on reflexes, and thus requires a minimal learning ability (Padula et al 1991).

Normal body posture and locomotion also require intact labyrinthine function, proprioception, and vision (Adams et al 1990).

In children the pattern of locomotion is variable and irregular. Walking skill is learned gradually and is completed in children by the age of approximately five years. The gait of children closely

approximates that of adults by the age of seven years (Zaricznyj, 1984).

The child will stand steady for a short while with supporting hands at the age of 36 weeks, but does not walk alone without support before the age of 12 months. During the following 3 - 6 months, the child will walk without support. It is not until the age of 18 months that the child can run, still stiffly, and at 24 months, he runs without falling (Duthie et al, 1983).

An abnormal gait is often the reason for the child being brought for examination by a doctor. There are various modes of walking peculiar to certain diseases which are important diagnostic clues and improvement of child gait is a goal of much orthopedists who treat children (Schafer, 1982).

Kinesiology of lower extremity

The smoothness of normal gait is achieved by a series of asynchronous actions at the pelvis , hip, knee , and ankle. Timing and strength are determined by graduated muscle control to provide a mechanism of gait that's away from sudden changes in any directions. In addition, the trunk is kept centered over the area between the two feet even though their relationship are constantly changed during the reciprocal change of stance and swing roles. (Saunders et al 1953). (Fig.1) .

Impairment of joint motion or muscular control immediately challenges the effectiveness of the limbs to perform these tasks . Also a deficit in one area requires adjacent segments to modify their action to accomodate for the loss. When this substitution becomes apparent the patient is noted to have a limp . Other compensations are walking more slowly , taking a shorter stride, seeking extra support and lastly to forsake walking entirely. (Perry 1974) .

In order to study kinesiology of lower extremity we have to study both kinematics and kinetics .

Kinematics

It's the study of motion, which, in gait analysis refers to body

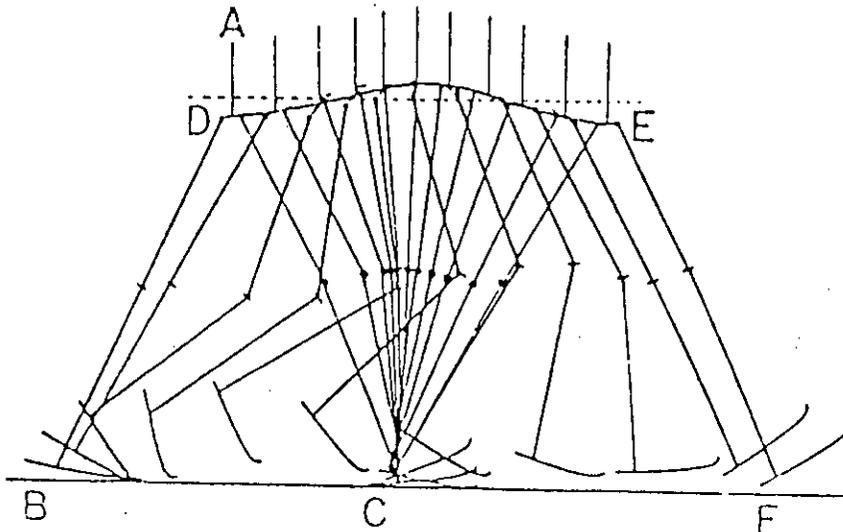


Fig. 1 : Normal Gait by interrupted light photography (20 per sec.) walking is displayed as a series of standing postures. The trunk (A) is maintained approximately mid-way over the real or potential support area provided by the two feet (B to C). The body's center of gravity (D to E interpelvic line) follows a gradual sinusoidal path that deviates slightly from the horizon (dotted line). Advancement of the body is a composite accomplishment of both limbs. Note distances traveled by trunk (D to E) equals half that spanned by the swing limb (B to F) . After (Saunders 1953)

segment displacements and their relation to time .

It's essential first to understand the kinematics of normal mature gait before discussing the maturation of gait and its pathologic deviations. (Tylkowski 1990) .

Events in the gait cycle

The walking cycle is first described in terms of feet placement (Fig. 2) . The cycle begins with right foot strike, followed by left toe off, left foot strike , right toe off, and ends with right foot strike. These five events define one gait cycle and include stance phase and swing phase .

Stance phase : is the period of time during which one or two feet are on the ground .

Swing phase : is the portion of the gait cycle during which a limb is being advanced forward without ground contact.
(Tylkowski 1990)

STANCE PHASE

It's divided into single limb stance and two periods of double limb

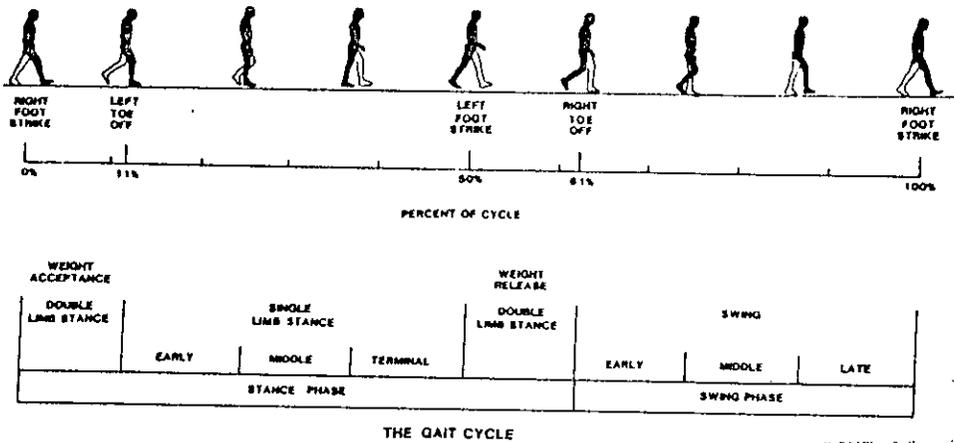


Fig. 2 : Definition of events and phases of the normalized gait cycle and the approximate time percentage at which each occurs .

After (Lovell Winter 1990)