

介護動作のバイオメカニクス的研究

- エネルギーを中心に -

愛知県立大学 湯 海 鵬

Kinematic Analysis of Nursing Movemnet

by

Tang Hai Peng

AICHI Prefecture University

ABSTRACT

The purpose of this study is to evaluate the nursing motion from the viewpoint of biomechanic during the bed raising and wheelchair riding of patients helped by nurses. The mechanical works for the whole body of two nurses, one was a trained nurse and the other was the student nurse, were calculated. The changes of the works were compared between the two nurses. The performances of the two nurses were videotaped with three video cameras operating at 30 Hz. Three-dimensional coordinates for determining the mechanical work were computed by using Direct Linear Transformation Method from video data. The trained nurse raised the patient more closely to her body than the student nurse, the trained nurse's motion of the CG on the direction of vertical were smaller, so the less work has be done on the direction, and the energy costed to care a patient may be smaller. But in raising a patient on the bed and moving a patient from the bed to wheelchair, the mechanical work of the trained nurse had greater changes than the student nurse. In this movements, to avoid lower back pain, the trained nurse extended mainly her legs to left patient instead of using the extension of her hip. This kind of movement may

be cost some energy more but will be safety to the hip of helper.

要 旨

本研究は、介護動作をバイオメカニクス的手法を用いて定量的な解析を試みた。上半身起こしと車椅子への移乗という介護動作が、三次元的に撮影され、映像データに基づいて介護者のエネルギーが算出された。そのエネルギーを中心に、理学療法士（PT）と社会福祉学専攻学生の介護動作との比較検討を行い、PTの介護動作の特徴を明らかにした。ベッド起こし動作について、PTは、足をベッドに乗せて、低い姿勢から自分の体重を利用して被介護者を起こしている。その動作は、腰の屈曲・伸展が小さく、エネルギーの消費も小さかった。身体負荷の大きい車椅子への移乗動作については、PTは、できるだけ腰への負担を軽減し、主に大腿の筋群を用いて被介護者を抱き上げ、腰掛けさせるという動作になっている。このような動作は、エネルギーの消費が多くなる可能性があるが、腰の保護には有効だと考えられる。