**THESIS ABSTRACT**

**DESIGN AND FABRICATION A PNEUMATIC SUSPENSION SYSTEM IN TRANSTIBIAL SUPRACONDYLAR PROSTHESIS AND ITS EFFECT ON RESIDUAL LIMB PISTONING.**

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**ABSTRACT**

**BACKGROUND**
Transtibial amputation is the most common amputation in lower limb. To receive transtibial prostheses is essential to preserve and rehabilitate life for transtibial amputees. Transtibial suspension systems play important roles in transtibial prostheses. Daily volume loss of residual limb occurs during daily use of prostheses that results in pistoning between residual limb and prosthetic socket. The goal of this study was to design and fabricate a pneumatic suspension system in transtibial supracondylar prostheses and to evaluate its effect on residual limb pistoning.

**OBJECTIVE(S)**
Five unilateral transtibial amputees were participated in this study.

**METHODOLOGY**
After design and fabricating pneumatic suspension system, its effect on residual limb pistoning was evaluated using photographic method in 5 static stages including full weight bearing, semi weight bearing, non-weight bearing, 30 and 50 loads.

**FINDINGS**
Residual limb pistoning was reduced using pneumatic suspension system during non-weight bearing, 30 N and 50 N static loading.

**CONCLUSIONS**
To use pneumatic suspension system would reduce pistoning because of an air bladder inserted in medial supracondylar transtibial prostheses.

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