

# Hoffman II External Fixator Techniques – A Work-Around to use Small Pins in Large Clamps.

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## Abstract

We describe a novel technique to allow use of small pins in medium pin size clamps. Slipping a second 3 mm pin into the same clamp hole as the first allows the 5 mm clamp to bite securely on a 3 mm pin. This enables construction of an external fixator frame utilising 3 mm and 5 mm pins, as required to span the elbow, wrist and ankle. This extends the capabilities of the 5 mm clamp and reduces the need for extra materiel such as sets containing clamps to connect 3 mm pins to standard size rods.

## Introduction

Deployed British Military Hospitals regularly deal with patients with severe ballistic injuries, with limbs fractured in multiple sites or at joints. Current management of ballistic open fractures includes an initial debridement and stabilisation prior to medical evacuation to mainland United Kingdom. Present equipment tables include the compact and standard Hoffman II fixator (Stryker Trauma, Plan-les-Ouates, Geneva, Switzerland). This system provides 3 mm and 5 mm diameter threaded pins, clamps and connecting rods. The pins are screwed into a pre-drilled hole in the bone fragment and are then affixed to the connecting rods by clamps. The pin diameter is selected in proportion to the size of the bony fragment and frequently 3mm and 5mm size pins are required when stabilising the elbow, wrist and ankle.

## The Problem

When the elbow, wrist or ankle needs to be bridged we run into a simple problem of pin size compatibility and availability. The clamps are designed to grip either 3 mm pins or 5 mm pins. The operating set contains 5 mm pin clamps but does not routinely contain 3mm pin clamps. The limitations of materiel supply are an accepted facet of military surgical practice, where the 'just-in-case' equipment cannot take the place of essential materiel.

## The Solution

We describe a novel technique to allow secure use of 3 mm pins in the 5 mm clamp. A second 3 mm pin is slipped into the clamp alongside the functional pin, increasing the volume inside the clamp to allow excellent grip. Figure 1 shows a 5 mm pin uppermost with 3 mm pins middle and bottom. The protruding pin tips are then cut off with bolt-croppers or covered with end-caps to prevent damage to the other limb, the bed or carers.

## Conclusion

We present a novel technique which has not been previously described in either the product manuals or the academic literature to increase the veritility of the Hoffman II external fixator.

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