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a. REPORT	b. ABSTRACT	c. THIS PAGE			Jill Clark
U	U	U	UU		19b. TELEPHONE NUMBER (Include area code) (702) 653-3298



**DEPARTMENT OF THE AIR FORCE AND
DEPARTMENT OF VETERANS AFFAIRS**
MIKE O'CALLAGHAN FEDERAL MEDICAL CENTER
NELLIS AIR FORCE BASE, NEVADA



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Prepared for:

Defense Technical Information Center
ATTN: DTIC-OA
8725 John J. Kingman Rd
Fort Belvoir, VA 22060-6218

Submitted by:

Jill M. Clark, MBA/HCM, CCRP, CCRC
Senior Research Associate/Research Manager
Clinical Investigation Program
Mike O'Callaghan Federal Medical Center (MOFMC)
4700 Las Vegas Blvd North, Bldg 1300, Room 1884
Nellis AFB, NV 89191
Phone: (702) 653-3298
Email: Jill.Clark.3.ctr@us.af.mil

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Background: Due to the emergence of improvised explosive devices (IED's) and the widespread use of body armor, there have been a higher proportion of orthopedic injuries from secondary blast injury than in previous conflicts. Since 2003, it is estimated that approximately 32,195 soldiers have been wounded in combat in the Iraq conflict alone. According to the American Academy of Orthopedic Surgeons, more than four and one half million knee arthroscopies and total knee replacements are performed worldwide each year in addition to millions of foot and ankle surgeries. These invasive procedures result in swelling and pain. The side effects of the pain medications are well known and a decrease in their use could prevent adverse effects of sedation and decreased job performance. Auricular acupuncture has been evaluated in multiple trials, and although generally proven to be useful, these trials were not rigorous. This study seeks to determine if modified Battlefield Acupuncture is more effective at relieving acute extremity pain, reducing medication use, decreasing time to full ambulation and improving quality of life than placebo acupuncture or standard care after lower extremity surgery.

Methods: We conducted a multi-site 3-arm randomized, double blind controlled trial of standard care alone versus standard care + placebo auricular acupuncture with ASP needles versus standard care + battlefield acupuncture with semi-permanent needles. We recruited subjects at the pre-operative visit within 2 Air Force orthopedics clinics for lower extremity surgery (knee or below). After consent, we randomized them to the above interventions. After surgery, within 30 minutes of arrival in the post-operative care unit, subjects received their designated intervention. Acupuncture was performed by physician acupuncturists. Subjects reported pain level immediately after acupuncture, 24, 28 168 and 720 hours later to a blinded research associate. Additionally, subjects completed a PIQ-6 30 days post-operatively, and opioid use was tracked for 30 days post-operatively. Statistical analysis with ANOVA, Pearson's correlation, Chi-square and Fisher's exact test, and multivariate analyses were performed on the data.

Results: We enrolled 233 Department of Defense beneficiaries >18 years old (92 females and 141 males) with a mean age of 44.5 years at 2 Air Force Medical Centers. We randomized 81 to modified BFA, 74 to placebo acupuncture and 78 to standard care. Overall pain levels were unchanged at each time point between groups. Subjects with worse pain were noted to take more opioid medication, and subjects older than 50 years who received modified BFA took 398 fewer morphine equivalent units than those who received standard therapy ($p=.09$)

Conclusion: The use of modified battlefield acupuncture protocol does not change pain over 30 days, but both modified BFA and sham acupuncture may reduce use of opioid analgesics in those >50 years of age.