Utilization of Fractionated Laser Resurfacing For The Prevention of Non-melanoma Skin Cancer in Geriatric Skin Ericson John Torralba BSc MS-II, Jeffrey Travers MD, PhD

Boonshoft School of Medicine WRIGHT STATE UNIVERSITY

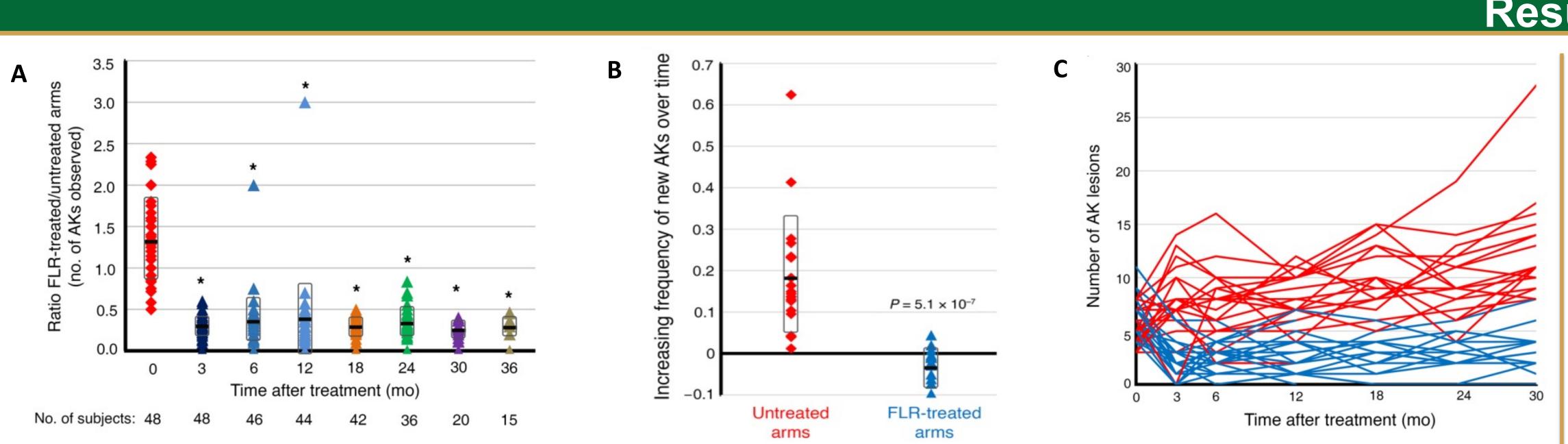
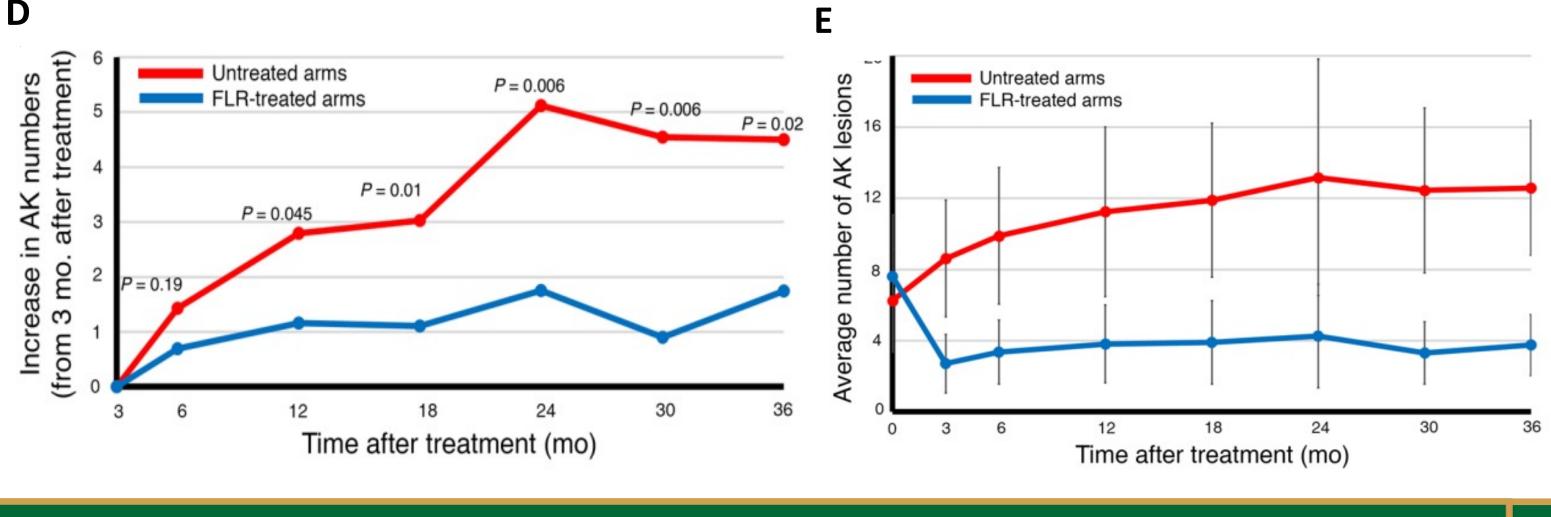


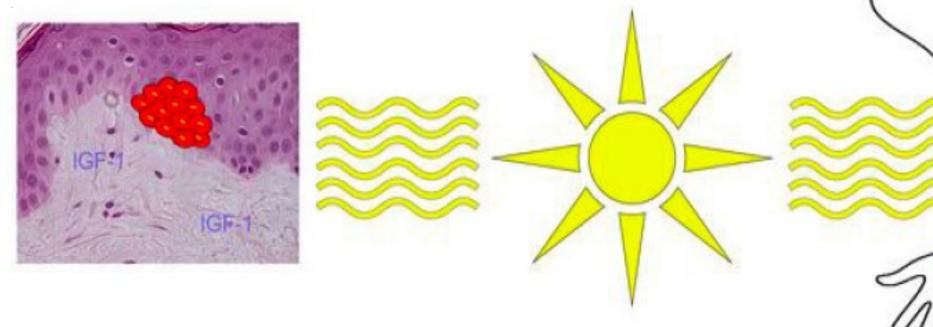
Figure A. The ratio of the number of AKs on FLR-treated arms to the number on untreated arms indicates a decrease in AK lesions following FLR treatment (ratio < 1.0). Heavy black bars denote means and gray boxes indicate standard deviations. Asterisks indicate significant difference between the follow-up time points and the 0 month (P < 10–12). Ratios determined at 3, 6, 12, 18, 24, 30, and 36 months were not statistically distinct.

Figure B. At 30 months (n = 20), the slope of the number of lesions over time was determined. A positive slope value represents increased numbers of AKs counted, and a negative number indicates decreasing numbers of AKs with time. Heavy black bars denote means and gray boxes indicate standard deviations. P values shown are derived from 2-tailed Student t test. Figure C. The number of AKs observed on both the FLR-treated and untreated arm over 30 months (total of 20 individuals).



Introduction

- Actinic keratoses (AK) are pre-cancerous lesions that have been associated with increased age and exposure to ultraviolet light.
- Actinic keratoses are the precursor lesions to non-melanoma skin cancer (NMSC)
- Aging results in the loss of insulin-like growth factor 1 (IGF-1) expression in senescent dermal fibroblasts.
- Fractionated laser resurfacing (FLR) has been used for the treatment of facial lines, sun damage, skin pigmentation, and acne scaring.
- Various wounding therapies such FLR, dermabrasion, and micro-needling have been shown to upregulate IGF-1 levels in geriatric skin.



UVB exposure on aged skin containing low levels of IGF-1 derived from senescent fibroblasts leads to actinic keratosis and non-melanoma skin cancer

Department of Pharmacology and Toxicology, Wright State University, Dayton, OH Boonshoft School of Medicine, Wright State University, Dayton, OH

Results

Figure D. The change in the number of AK lesions for 3 months post-FLR treatment and every 6 months after. Student t test p values are shown.

Figure E. The average number of lesions on both untreated and FLR-treated arms was calculated using the sample numbers of individuals indicated in Figure D. Error bars are the standard deviation. All months were statistically significant.

Figure F & G. The location of basal cell carcinoma (BCC), squamous cell carcinoma in situ (SCC-IS), and squamous cell carcinoma (SCC) on untreated arms (n =24) and treated arms (n=2). The time point at which the NMSC was found at follow up. Figure H, I & J. H and I shows the percentage of NMSCs that occurred out of the total number of AKs counted at the same time are shown for both untreated and FLR-treated arms and the percent of patients with NMSCs for each cohort. Heavy black bards are the mean, and the gray boxes indicates standard deviations J shows the cumulative total of participants who acquired more than 1 NMSC on their untreated arm. Thus far, no participant has more than 1 NMSC on their FLR-treated arm

Methods

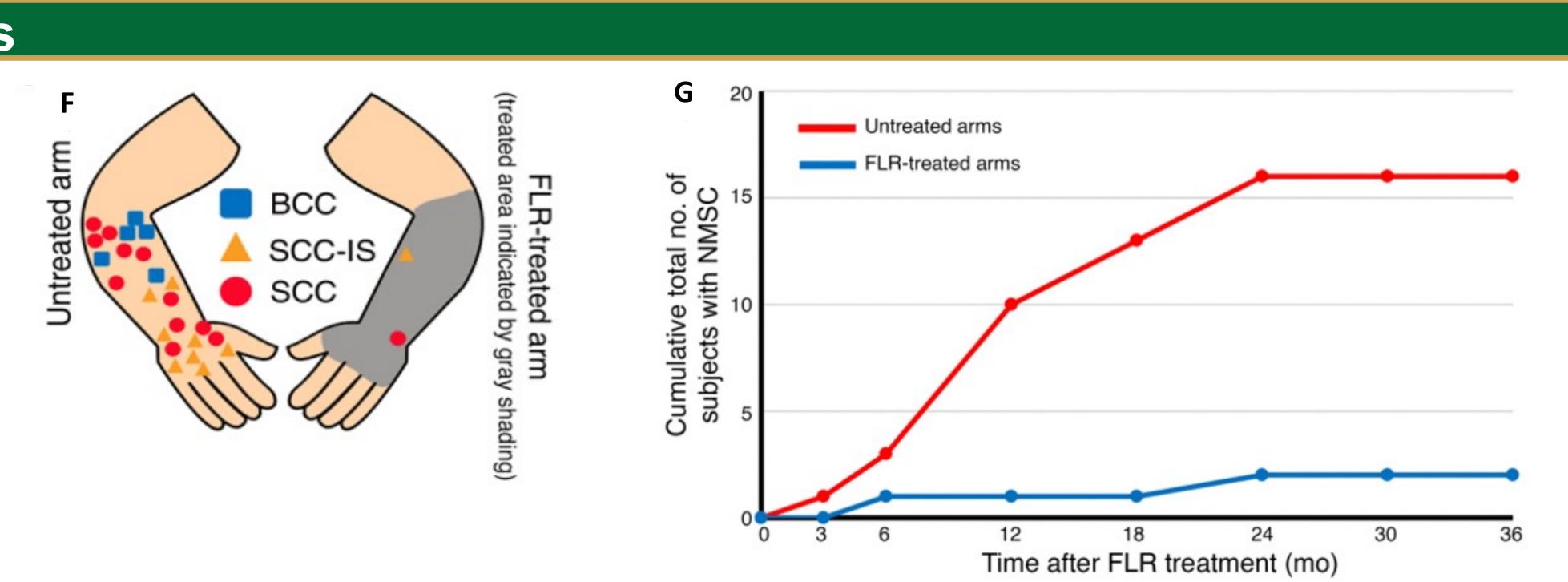


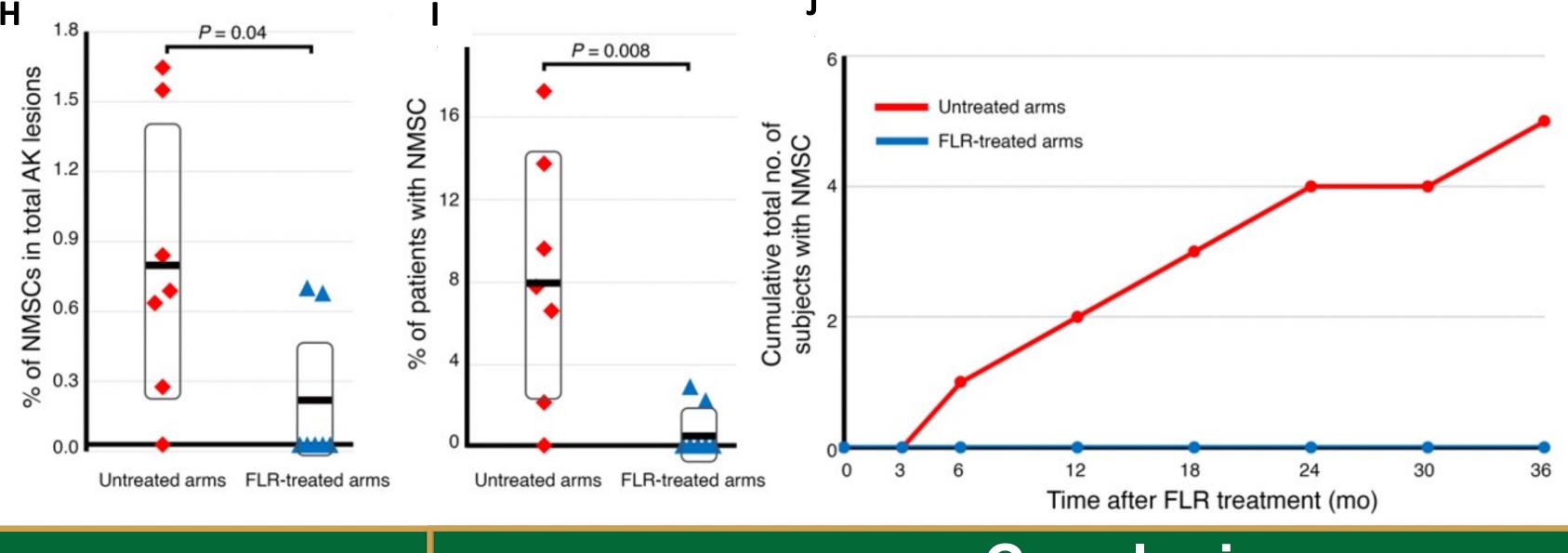
- 48 individuals over the age of 60 with at least 5 AKs on each forearm/wrist were recruited from patients at the Dayton Veterans Administration Medical Center dermatology clinics.
- Subjects were randomly divided into two cohorts: treatment on either the left arm or the right arm.
- The treatment arms were shaved, cleaned, and given 4% xylocaine cream for anesthesia.
- 120 mJ of energy per micro spot were lasered on the treatment arm and the patients were provided with the necessary posttreatment instructions.
- Number of AKs were recorded on day 0. Subjects returned 3-5 and 6-months post-treatment, then every 6 months after for AK documentation in a blinded fashion.





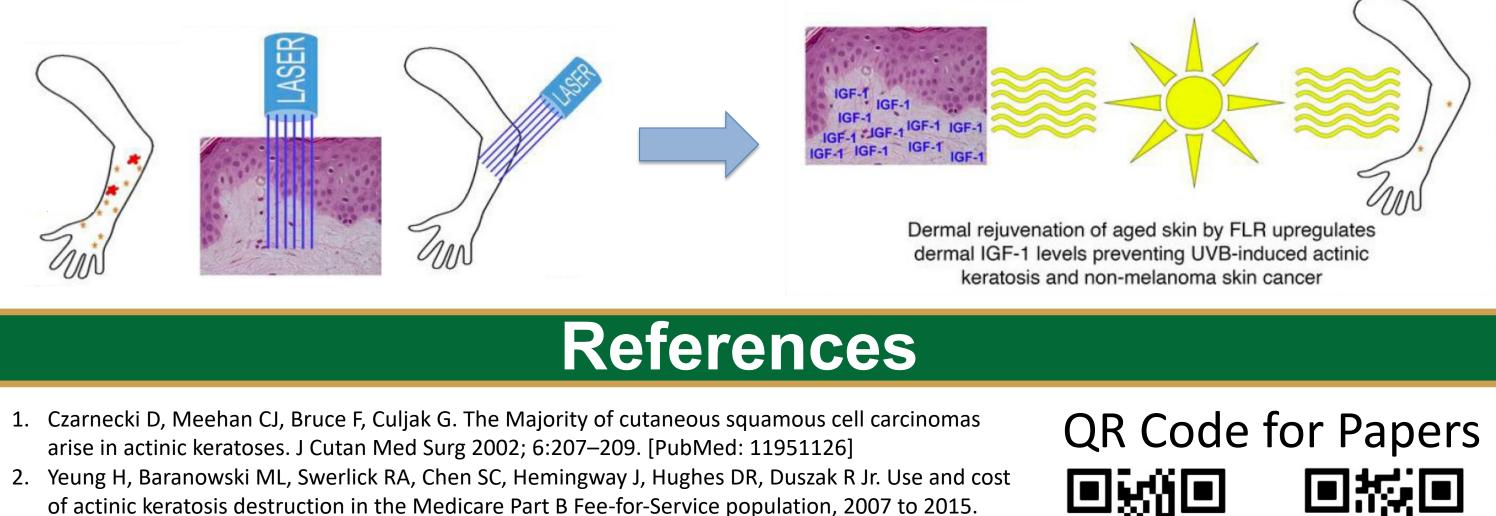
Representative clinical appearance of skin at various times after FLR.





Volunteers must have at leas 5 AKs on each arm In this example at Day 0, the ratio of AKs on FLR-tre arm vs. untreated arm is 1.2 Represents the location of an AK

- high-risk populations.
- potential length of NMSC prophylaxis.



- JAMA Dermatol 2018; 154(11):1281–1285. [PubMed: 30326488] Ratushny V, Gober MD, Hick R, Ridky TW, Seykora JT. From keratinocyte to cancer: the pathogenesis 22293185]





Conclusion

These studies suggest that wounding of geriatric skin

normalizes the pro-carcinogenic UVB response of aged skin.

FLR slows the rate at which new AK lesions appear.

FLR is potentially an effective method for NMSC prophylaxis in

The study is ongoing with current data at 48 months and increasing in sample size. The study strives to measure the

Further studies can aid in understanding the mechanisms of aging and occurence of basal cell and squamous cell cancer.

of actinic keratosis destruction in the Medicare Part B Fee-for-Service population, 2007 to 2015.

and modeling of cutaneous squamous cell carcinoma. J Clin Invest 2012; 122(2): 464–472. [PubMed: