Fitting the pieces together B U R N S

Fiona Wood
Foundation

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Identification of factors predicting scar outcome
after burn injury in children a case-control study

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Government of **Western Australia**
Department of Health

A prospective case-control study was conducted
among 186 children who sustained a burn injury in
Western Australia.

Logistic regression was used to explore the
relationship between explanatory variables and a
defined outcome measure:

Scar height measured by a modified Vancouver Scar
Scale (mVSS).

The study aimed to examine the association between selected patient, injury and clinical factors and the development of raised scar after burn injury.

Novel patient factors were investigated including selected comorbidities

asthma, eczema and diabetes

skin pigmentation Fitzpatrick skin type).

Genetic influence on scar outcome after burn injury: genome-wide association study and pathway analysis. Hilary J Wallace, Gemma Cadby, Phillip E Melton, Fiona M Wood, Sian Falder, Lisa J Martin, Karen Marlow, Sarah V Ward, Mark W Fear. Submitted JID 2017

The overall correct prediction rate of the model was 80.6%;
80.9% for children with raised scars > 1mm
80.4% for children without raised scars ≤ 1mm

After adjustment for other variables
1% increase in burn %TBSA increased the odds of raised scar by 15.8% (95% CI = 4.4% - 28.5%)
Raised scar was also predicted by
time to healing of longer than 14 days
(OR=11.621; 95% CI= 3.727-36.234) and
multiple surgical procedures (OR=11.521; 1.994-66.566).

Standard of Care;

first aid, Acticoat primary dressing
clinical assessment at 48 hours
conservative V surgical care
surgery technique relates to depth of injury

Wood, F. Tissue engineering of skin(2012) Clinics in Plastic Surgery, 39 (1), pp. 21-32.

18 month old toddler

Black tea scald

Good first aid

Acticoat dressing from 7 hours post

Streptococcal infection treated with antibiotics

Seen 8 days post injury compared with 6 months post injury

Treated day 8 with dermabrasion and ReCell

Wood, F., Martin, L., Lewis, D., Rawlins, J., McWilliams, T., Burrows, S., Rea, S.
A prospective randomised clinical pilot study to compare the effectiveness of Biobrane ® synthetic wound dressing, with or without autologous cell suspension, to the local standard treatment regimen in paediatric scald injuries (2012) Burns, 38 (6), pp. 830-839.

65%TBSA Flame burn excision and Integra
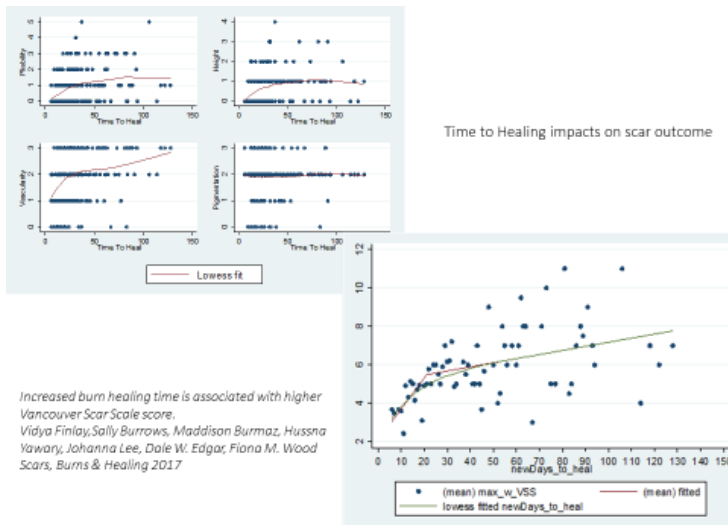day 3 meshed SSG and CEA epidermal repair

Todler burn injury from a camp fire
treated with a combination of;
Meshed dermis and glaberous cells
harvested from the dermal epidermal
junction to the palm
Meshed Split thickness skin graft on
deeper areas of the dorsum of the hand
with cells sprayed over all areas of viable
dermis to reduce the time to healing and
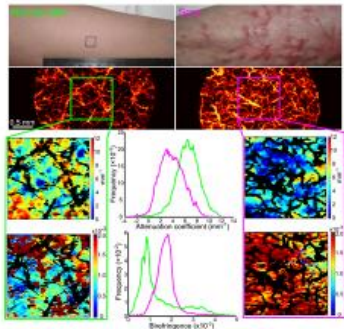reduce the scar potential.

A prospective study of time to healing and hypertrophic scarring in paediatric burns: every day counts

Elizabeth Chipp , Lisa Charles, Clare Thomas, Kate Whiting, Naiem Moiemen and Yvonne Wilson

Time to Healing impacts on scar outcome

Increased burn healing time is associated with higher Vancouver Scar Scale score.
Vidya Finlay, Sally Burrows, Maddison Burmaz, Hussna Yawary, Johanna Lee, Dale W. Edgar, Fiona M. Wood Scars, Burns & Healing 2017

Multi modality Scar Assessment

P. Gong, McLaughlin, R.A., Liew, Y.M., Munro, P.R., Wood, F.M., Sampson, D.D.Assessment of human burn scars with optical coherence tomography by imaging the attenuation coefficient of tissue after vascular masking J. Biomedical Optics 19(2), 021111, Feb. 2014

Patient opinion of scarring is multidimensional: An investigation of the POSAS with confirmatory factor analysis Helen M. DeJong, Michael Phillips, Dale W. Edgar, Fiona M. Wood

A Train of Thought

Harper, A., Rea, S., Wood, F. Hepatocellular carcinoma in a young survivor of major burns (2008) Burns, 34 (4), pp. 572-574.

Is there a relationship between burn survival and life long risk of malignancy?

Can Data Linkage answer the question?

30 000 burn hospitalisation a in WA since 1988 now linked to all other health and geospatial data bases.

Yes surviving a burn has an impact for life

In the data base 96% of children and 84% of the adults have burn injuries less than 20% TBSA

In patients surviving burn injury at 65 years of age the average life expectancy drops from 12 to 7 years, predominately cardiovascular disease and malignancies

Duke, J., Bauer, J, Fear, M.W., Rea, S., Wood, F.M., Boyd, J., Burn injury, gender and cancer risk: population-based cohort study using data from Scotland and Western Australia. BMJ open (2014) 17;4(1)e003454.

Commented [FW1]:

Survival data of patients burn injury < 15 years old

Kaplan-Meier survival estimates
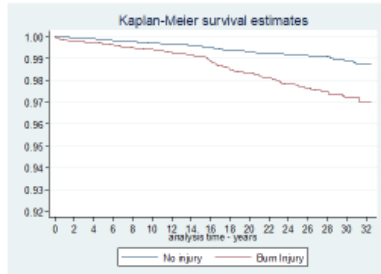
Adjusting for confounders U15 yrs burn patients ^1.6x mortality than general population attributable risk 38%
Could 59 of the 154 deaths in this group been prevented if they had not been burnt?
96%<20%TBSA in this cohort

Duke, J., Boyd, J.H., Rea, S., Randall, S.M., Wood, F.M., Mortality following Burn Injury in Children: a 33-year Population-Based Study Pediatrics (2015)135(4)e903-910.

Scar is abnormal

- Architecture
- Chemistry
- Cell phenotype

Scar is an abnormal structure tolerated by the host immune system
What role does the change in the immune surveillance and response play in life long impact of burn?
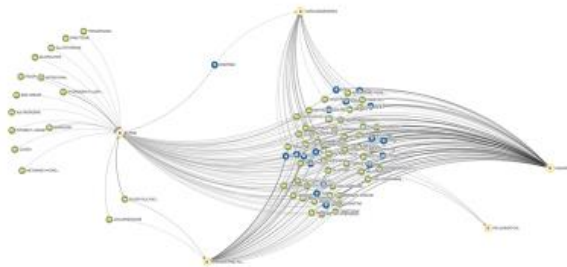What is the role of the stress of burn on cellular senesce?

What is the role of regenerative not scar repair?

Valvis, S.M., Waithman, J., Wood, F.M., Fear, M.W., Fear, V.S., The immune response to skin trauma is dependent on the etiology of injury in a mouse model of burn and excision J Invest Dermatol (2015), 138(8):2119-2128.

Watson for Drug Discovery looks broadly across public, licensed and private data to unlock hidden information and deliver insights to researchers

700,000+ Scientific Articles

90,000+ Distinct Conditions

25 Million+ Medline Abstracts

130+ Medical Textbooks

10,000+ Distinct Drugs

4+ Million Patents

35,000+ Genes

200+ Scientific Journals

Public and Licensed Data Sources

Private Ontologies

Toxicology Reports

Other Proprietary Data

Clinical Trial Data

Electronic Lab Notes

Private Data (Client Confidential)

Explore a Network can uncover relationships across entity types to give a holistic perspective

DATA our future?

Data linkage management, coding and cognitive computing with automated feature identification will revolutionise our understanding of the key drivers to basic parameters such as LOS and of complex clinical decision making.

The use of data stored to test hypothesis and guide the resource allocation for investigation has the potential to stream line and accelerate innovation.

Data linkage, data management and coding capacity embedded with subject matter experts at the frontline will facilitate improved S&Q into the future.

Professor Andrew Burd Hong

Working Together