

Understanding the Cutaneous Functional Unit (CFU) in Burn Care Therapy Outcome

Authors: Allen Romero Espelita, OTD, OTR/L, C/NDT, CLT, CEAS I, CPAM; & Sarah Xiao, M.D.



BACKGROUND

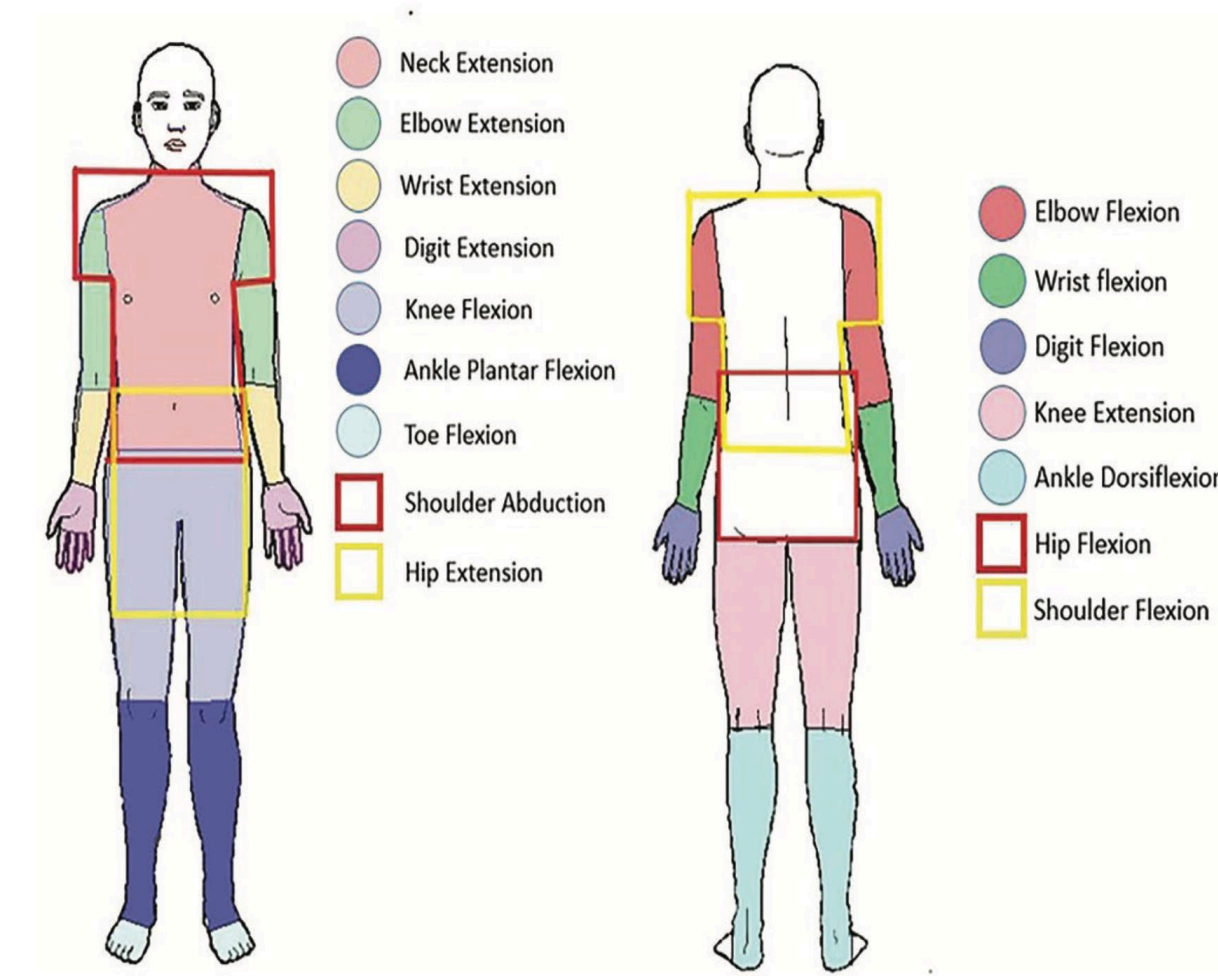
Regarding total body surface area (TBSA), calculating burn wound size is a critical clinical component in caring for patients experiencing severe burn injuries (Richard et al., 2015). The Cutaneous Functional Unit (CFU) skin segment accommodates movement and becomes contracted. CFU can estimate burn severity more accurately based on functional skin segments that accommodate movement (Hartl et al., 2023). CFU can be used to assess burn severity based on functional consequences more accurately. The CFU concept is crucial in burn care and therapy, emphasizing the integrated approach to treating burns involving the skin, underlying tissues, and functional dynamics. This poster elucidates the significance of CFU in managing burn injuries and optimizing rehabilitation outcomes.

PURPOSE

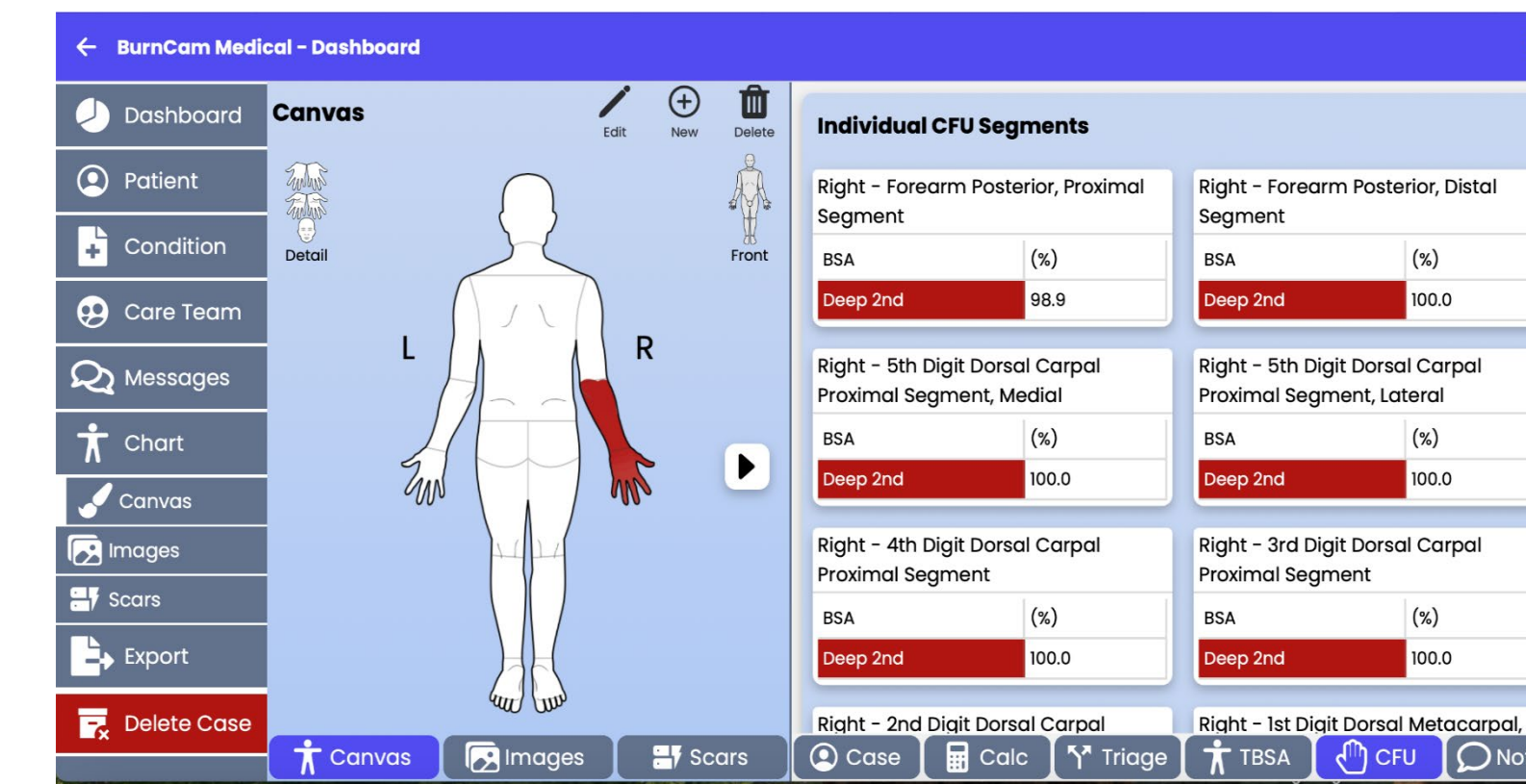
- To define the Cutaneous Functional Unit (CFU) and its relevance in burn care.
- To explore assessment tools in cutaneous functional unit
- To explore surgical interventions aimed at preserving and restoring CFU.
- To discuss the impact of CFU-focused therapy on patient recovery and quality of life.

METHODS

Functional Integrity: To highlight the need to preserve the integrity of the CFU to speed up recovery, maintain functionality, prevent contractures, and improve quality of life. A holistic approach to addressing functional aspects of burn healing is using Cutaneous Functional Unit assessment tools such as BurnCam.



(Yelvington & Parry, 2023)



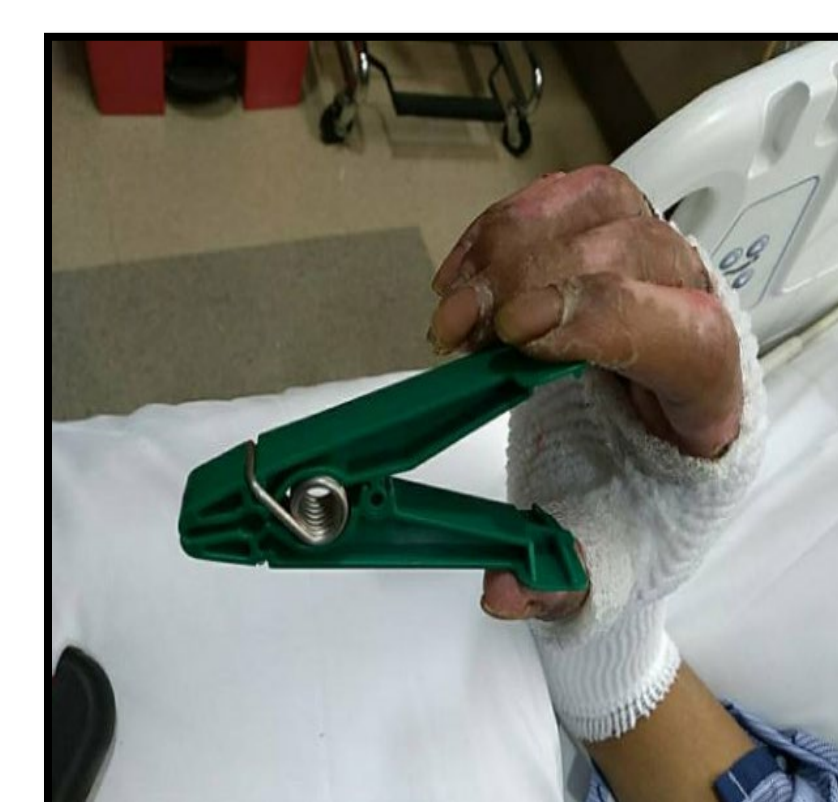
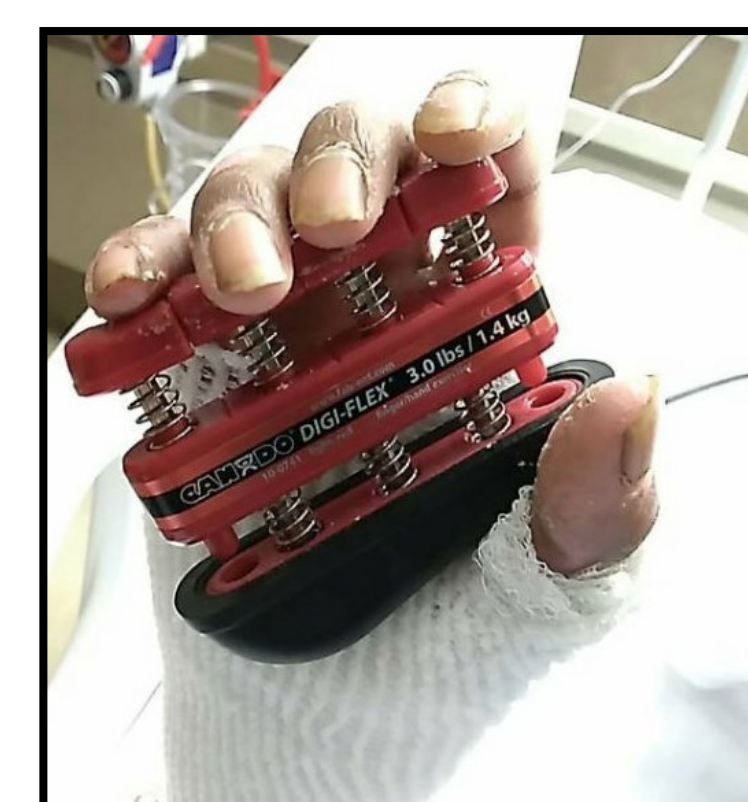
Wilmerding, T. O. (2024)

CASE STUDY

ST is a 21 y.o. Male with a 5 % TBSA 2d and possible 3rd-degree hot oil burns to right forearm and right hand. The burn occurred when his mom made egg rolls when the oil caught fire. He went to bring the pot out of the house, but the oil spilled on his arm. He is complaining of 12/10 pain that started after the burn, feels like it's on fire, worsens with palpation, especially on the palm, and is relieved with pain meds.

Final Surgery:

Placement of Split thickness skin graft to right hand 8 x 8 cm dorsum 8 x 8 cm, right-hand palm 4 x 2 cm, right index finger 3 x 7 cm, right middle finger 3 x 1 cm, right ring finger 2 x 1 cm, right little finger 1 x 1 cm equaling a total of 91 square centimeters. CPT CODE(S): 15120



The Cutaneous Functional Unit Principle guided surgeons and therapists with the following:

1. Identifying optimal application and positioning of autograft
2. Orthotic fabrication after autograft,
3. Soft tissue elongation techniques/exercises

RESULTS

This concept has led to several guiding tenants for burn intervention:

1. Body segment and extremity length change as joint ROM occurs.
2. ROM requires serial recruitment of pools of skin, which extend well beyond the joint being moved.
3. The adjacent joints directly impact the amount of skin available for recruitment.
4. They are accommodating the ROM by fields of skin, which are called CFUs.
5. Greater degrees of joint ROM require serial recruitment of percentages of the associated CFU well beyond the joint itself. The burn size within has negatively affected CFU in correlation with the ROM of the joint of a specific CFU.

CONCLUSIONS

Early recognition of contractures can lead to a more targeted surgical and therapy regimen, potentially preventing a range of motion losses and improving function and quality of life. The principle of cutaneous functional units (CFUs) allows collaboration between surgeons and therapists to explain motion limitations and formulate patient-specific treatment plans. Evidence-based research demonstrates the potential of using these principles to improve the current standard of care.

REFERENCES

- Parry, I., Sen, S., Sattler-Petrocchi, K., Greenhalgh, D., & Palmieri, T. (2017). Cutaneous Functional Units Predict Shoulder Range of Motion Recovery in Children Receiving Rehabilitation. *Journal of burn care & research : official publication of the American Burn Association*, 38(2), 106–111. <https://doi.org/10.1097/BCR.0000000000000429>
- Wilmerding, T. O. (2024). *BurnCam Medical Platform* (ver. 1.2)[Computer software]. BurnCam Medical Inc. <https://burncammedical.com>
- Yelvington, M., & Parry, I. (2023). 46 Integration of Cutaneous Functional Units Principles in Burn Rehabilitation: A Diffusion of Innovations Assessment. *Journal of Burn Care & Research*, 44(Supplement_2), S17–S17. <https://doi.org/10.1093/jbcr/irad045.020>

