**Project Summary for EPUAP website**

**Project Title:**  
ASPECT: EvaluAtion of Soft tissues Properties in the context of prEssure ulCer prevenTion in high-risk populations

**Project Team:**

Geriatricians: Maher ABOU KARAM; Amina LAHLOU; Fatma MAAZOUN

Physical/occupational therapists: Reine MOGHAMES; Melvil JOYAUX

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**Project Focus:**  
This project focuses on improving the prevention of pressure ulcers (PU) by developing a new risk assessment protocol that quantifies several PU risk factors in high-risk populations such as the elderly and spinal cord injury patients.

**Introduction:**Pressure ulcers are a significant global health concern, particularly affecting elderly and immobile patients. The current standard of care in PU prevention is based on visual assessment of the skin in areas prone to pressure injury combined with clinical risk assessment, which may include standardized scales such as the Norton, Waterlow and Braden scales. This approach has **several significant challenges, including inadequate reliability and predictive power, while critical thresholds for standardized risk scores vary across clinical care settings and/or patient populations.** Recent research has highlighted the importance of **local mechanical deformations** in the onset of PUs (Gefen et al., 2021; Luboz et al., 2014; Stekelenburg et al., 2007) as well as **tissue micro vascularization** and **cellular changes**, which are crucial predictors of PU (Balasubramanian et al., 2021; del Río-Sancho et al., 2023). Several imaging technologies and tools have been proposed to quantify these factors, however most research was conducted on **small samples**, or only on **healthy young subjects**, or **lacked follow up** for PU occurrence in order to really assess reliability.

**Project Aim:**

ASPECT aims to **address the limitations of current risk assessment paradigms** by creating and evaluating a risk assessment protocol that quantifies several PU risk factors in high-risk populations. The novelty of this project resides in assessing a **large sample** of high-risk subjects at **bedside** in live clinical setting, q**uantifying** risk factors using specific **objective measurement** tools and imaging tools, **Integrating clinical personnel** in the process of evaluation and **Follow up** patients for PU occurrence

**Key Milestones:**

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| Milestone | Status |
| Ethical requirements | Completed |
| Preliminary protocol definition | Completed |
| Preliminary protocol testing in lab and clinical care | In progress |
| Data collection | Start: October 2024 End: April 2026 |
| Data analysis | Start: April 2025 End: August 2026 |

**References:**

Balasubramanian, G.V., Chockalingam, N., Naemi, R., 2021. The Role of Cutaneous Microcirculatory Responses in Tissue Injury, Inflammation and Repair at the Foot in Diabetes. Frontiers in Bioengineering and Biotechnology 9.

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Gefen, A., Brienza, D.M., Cuddigan, J., Haesler, E., Kottner, J., 2021. Our contemporary understanding of the aetiology of pressure ulcers/pressure injuries. Int Wound J 19, 692–704. https://doi.org/10.1111/iwj.13667

Luboz, V., Petrizelli, M., Bucki, M., Diot, B., Vuillerme, N., Payan, Y., 2014. Biomechanical modeling to prevent ischial pressure ulcers. J Biomech 47, 2231–2236. https://doi.org/10.1016/j.jbiomech.2014.05.004

Stekelenburg, A., Strijkers, G.J., Parusel, H., Bader, D.L., Nicolay, K., Oomens, C.W., 2007. Role of ischemia and deformation in the onset of compression-induced deep tissue injury: MRI-based studies in a rat model. Journal of Applied Physiology 102, 2002–2011. https://doi.org/10.1152/japplphysiol.01115.2006