

# Malnutrition and Fluid Overload in HD patients – prevalence and risk

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## Introduction

- The increased mortality risk in HD patients as a consequence of malnutrition and fluid overload is well established.
- Accurate and objective estimation of both of these parameters is essential for clinical management of patients
- Bioimpedance spectroscopy combined with a body composition model enables the determination of fluid overload (FO) and nutrition status. See Fig 1.
- Nutrition status by this method is derived as Lean Tissue Index (LTI) which is the lean tissue mass normalised to body height.
- The purpose of this study was to establish whether the parameters Fluid Overload and Lean Tissue Index are useful in the assessment of prevalence and risk in HD patients.

## Methods

- Fluid Overload (FO) and Lean Tissue Index (LTI) were measured in 250 HD patients using a BCM-Body Composition Monitor which has been validated previously.
- Mild fluid overload was defined as FO<2.5 L and moderate to gross fluid overload defined as FO>2.5 L.
- Malnutrition was defined as an LTI below the 10<sup>th</sup> percentile of a healthy reference population (n=1000) analysed previously.
- Patient outcome was recorded after 3.5 years and the impact of Fluid Overload and Lean Tissue Index on patient outcome was analysed.

## RESULTS

- The prevalence of Fluid Overload (FO) and Lean Tissue Index (LTI) are reported in Fig 5, in four groups in the Nutrition - Fluid Overload Plot.
- According to the FO and LTI criteria, 35% of patients were found to be malnourished.
- FO exceeded 2.5 L in 24% of patients.
- The serum albumin was not different between each of the groups.
- The impact of FO and LTI on survival is shown in Fig 6.

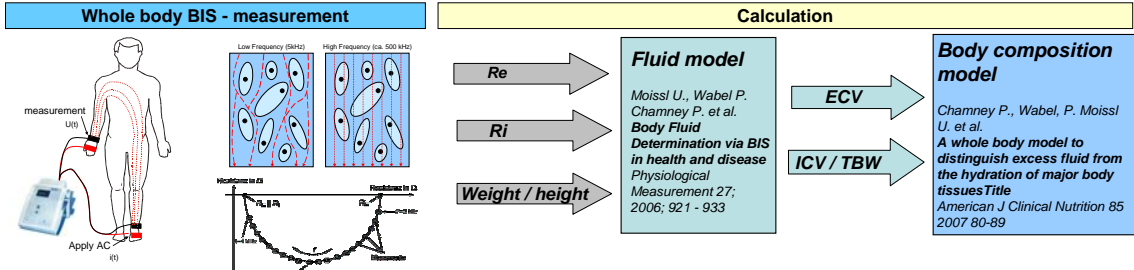


Figure 1: Procedure of measurement and calculation of the BCM. From the measurement via the fluid model to the body composition model distinguishing overhydration from lean tissue and adipose mass.

## CONCLUSION

- Lean Tissue Index determined with the BCM is a more specific indicator of malnutrition than serum albumin
- Malnutrition combined with excessive fluid overload significantly increases mortality risk

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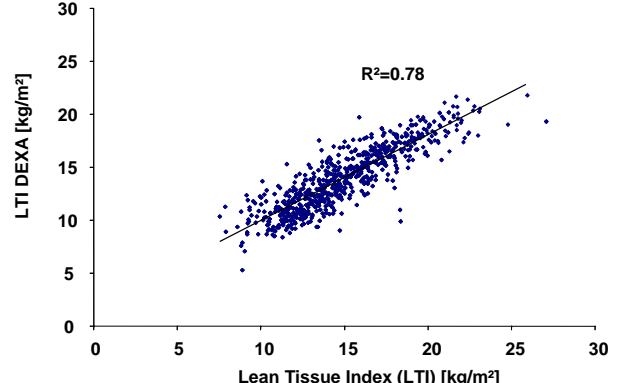
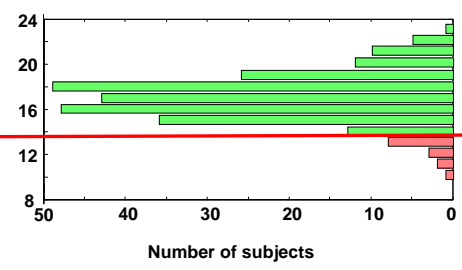
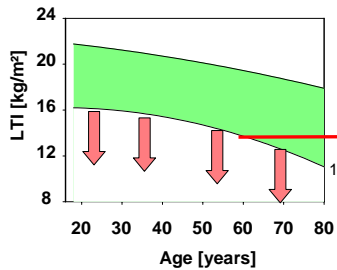
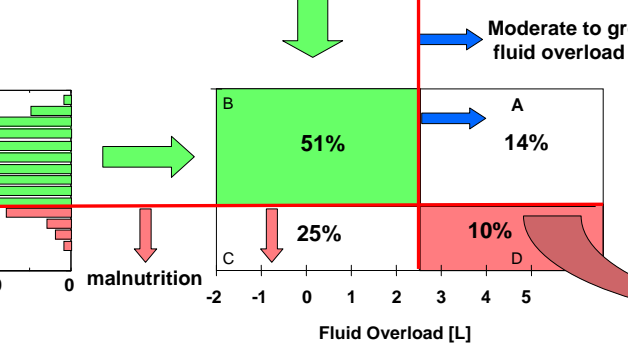
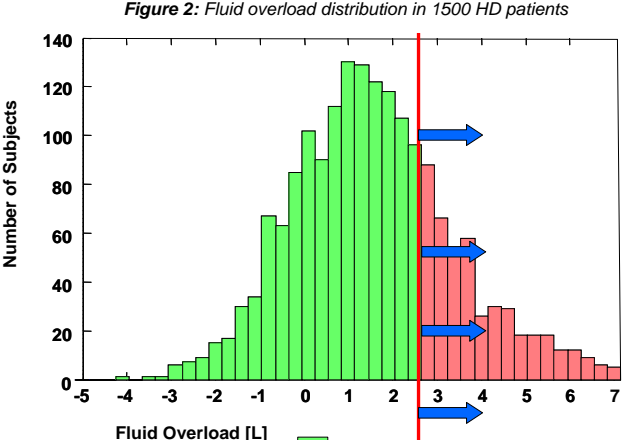


Figure 3: Validation of Lean Tissue Index in 673 healthy subjects and patients

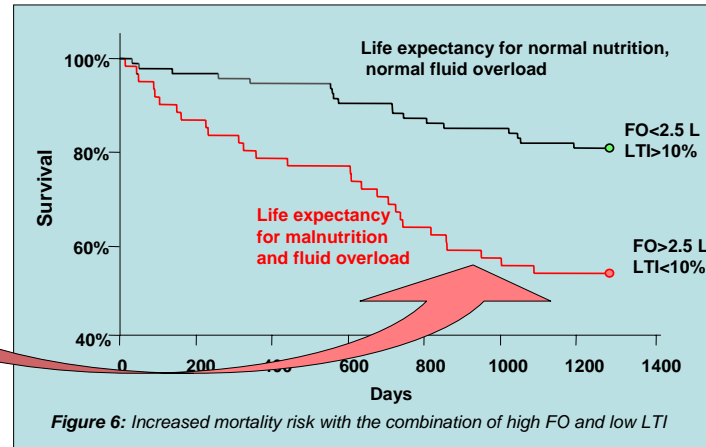


Figure 6: Increased mortality risk with the combination of high FO and low LTI

Figure 4a: Reference range of the Lean Tissue Index (LTI) for male subjects (n=1000)

Figure 4b: LTI distribution for healthy male subjects age 55-65 (n=250)

Figure 5: Nutrition - Fluid Overload Plot