

## Using DIMS for Real-Time Monitoring of Patient Dietary Intake and Plate Waste: A Pilot Study at Herlev Hospital

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The process of collecting and analyzing dietary data to monitor patient dietary intake and plate waste in hospitals is considered to be time consuming and troublesome and as a consequence often neglected in hospital wards. It is against this background that the dietary intake monitoring system (DIMS) was developed. The first prototype (DIMS 1.0) is an integrated technology based on imaging, weighing scale, infrared thermometer and RFID technology for real-time data acquisition and offline analysis of the captured data for the purpose of monitoring dietary intake and plate waste. The DIMS 1.0 has been piloted and applied in a hospital foodservice research for improved nutritional care [1, 2]. Based on the feedback from technology and as a result of the obvious potentials the DIMS 1.0 was taken into a further development. This had the goal of automatizing data analysis for real-time monitoring of dietary intake and plate waste and at the same time improves the feasibility and usability of the technology. As a result, the new DIMS 2.0 has been developed to include an integrated wireless connection and a dietary analysis software application which runs on a handheld device, mobile tablet. The integrated wireless connection allows online transmission of the data at the same time it is being captured to the mobile tablet for real-time analysis. In addition, the application offers the functionality of being used in a co-creational mode in which user inputs can be added from a mobile tablet to improve accuracy. This paper presents the development and the feasibility of using the DIMS 2.0 for real-time monitoring of patient dietary intake and plate waste in the first phase of an ongoing study aimed at evaluating a new meal serving system at Herlev hospital.

A prospective study conducted in medical and surgical wards over 9 weekdays in the pre-implementation phase. The DIMS 2.0 (see Figure 1) was used to collect paired before and after meal consumption photos and weight of plate contents for lunch and supper meal sessions. The study was approved by the hospital and all patients gave oral informed consent.

With the DIMS, we collected data on 104 meals served to patients from the food trolley, without interrupting meal serving routines. The developed system permits an investigator to assess patient meal composition, the total portion consumed and plate waste online from the mobile tablet (see Figure 2). The time frame for generating a complete patient dietary report can take up to two minutes. The interesting aspect of the DIMS 2.0 is that report on patient dietary intake and plate waste can be generated immediately after eating.

The DIMS 2.0 application facilitates a real-time monitoring of patient dietary intake and plate waste. It allows an investigator to have a quick and efficient overview of a patient with inadequate food intake. Photos of before and after meal servings may relevantly be used for guiding improved food intake in patients, and for improved communication between kitchen and clinical department.



Figure 1. DIMS 2.0 for measuring before and after meal consumption photos and weight of plate contents

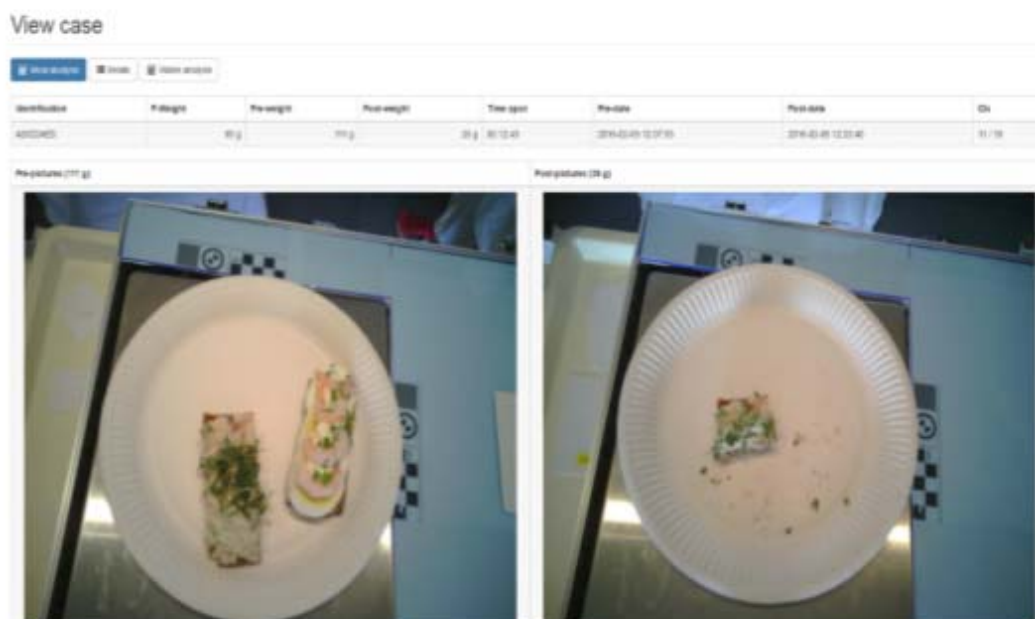


Figure 2. Screenshot of an example of the type of real-time data that can be seen on the tablet

## References

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2. Ofei, K. T., Holst, M., Rasmussen, H. H., & Mikkelsen, B. E. (2015). Effect of meal portion size choice on plate waste generation among patients with different nutritional status. An investigation using Dietary 4