

# Standardization of urine particle counting in Switzerland: Flowcytometry UF-100 and disposable KOVA Cell Chamber System

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## Introduction:

Microscopic urine sediment analysis is still used world-wide for the examination of cells and particles in the urine. However, it is well known for its restrictions in giving precise results and in the enormous amount of manual labour. Standardization of urinalysis, including sediment analysis, has been recommended by NCCLS in 1995. As an improvement the European Urinalysis Guidelines 2000 propose to use an automated system or minimally a standardized procedure to count the cells in a chamber within a predefined volume. A new approach has been developed implementing the flowcytometer technique. This revolutionizes the traditional sediment analysis used up today. In some cases the samples have to be microscopically checked for the identification of pathological casts and other particles. In addition, small laboratories have not the means for automation and need an alternative system. For these purposes a standardized disposable cell chamber system was tested to determine whether results are comparable with flowcytometry.

## Methods:

We compared the flowcytometer Sysmex UF-100 and dipstick results with the disposable KOVA cell chamber system and traditional urine sediment analysis. The number of urine which need a microscopic confirmation was established.

## Results:

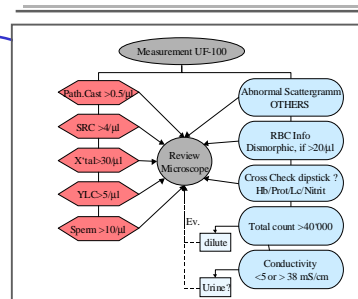
252 urines were analysed and compared. 34% of the urine samples had to be reviewed and microscopically confirmed. 212 results for RBC and 241 results for WBC were included in the General Deming regression analysis, a weighted least-squares regression model. For RBC the regression was calculated and gave an excellent correlation coefficient of 0.966. For WBC a similar good correlation coefficient of 0.935 was found. RBC and WBC results from UF-100 were also compared with the traditional sediment estimation. Interestingly, under the condition of a standardized preparation of the sediment with a definite volume, the correlation for RBC was 0.951 and for WBC was 0.887.

## Proposed procedure for the standardization of particle counting

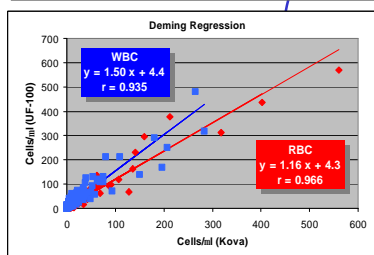
Flowcytometer Sysmex UF-100 and dipstick reader



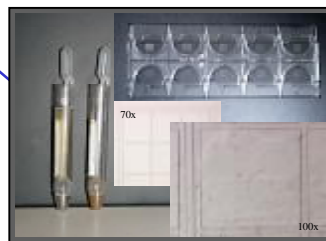
Flow-diagram for UF-100



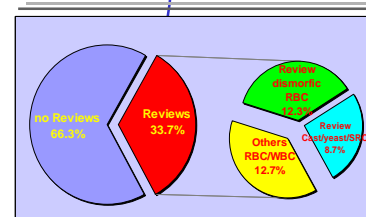
Comparison UF-100 with KOVA system



KOVA cell chamber system



Review rate



## Conclusion:

We recommend the introduction of standardization for the counting of particles in urine in Switzerland. The flowcytometer UF-100 and the standardized KOVA cell chamber system both fulfil the recommendations of the international guidelines and should be used in concert in large laboratories. For small laboratories the KOVA system is recommended instead of the traditional sediment.

## References:

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