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Systems and Methods for Assessing Hydration Status

-Dehydration, underhydration and hypohydration can cause headache, lethargy, constipation, weakness and dizziness. In severe cases they may cause serious damage to the kidneys heart and brain and could even be life threatening. Underhydration often occurs without the perception of thirst or a change in plasma osmolality concentration, thus it is particularly difficult to identify. Current methods of evaluating urine concentration include lab-based techniques, however, these are not amenable to rapid assessment as may be needed in hospitals, nursing homes, community or residential dwellings, athletic training or sport facilities, and more.

Researchers at Arizona State University have developed two technologies to help determine the hydration status of an individual. The first technology includes a urine color and concentration assessment system for self-assessment of urine concentration from a void of undiluted urine. This system includes a urine collection container and a urine color chart adjacent to said container. It enables easy and rapid evaluation of urine color and concentration in undiluted urine. A plurality of different light conditions were evaluated to develop a system that yielded greater accuracy in urine color and concentration assessment.

The second technology includes a new and efficient lavatory urine color chart and method for self-assessment of urine concentration via urine color. This chart and method gives results similar to those of traditional urine color charts, however, it provides an immediate assessment of hydration status based on scoring urine color directly from the toilet bowl. Further, because this chart is intended to be kept in the lavatory, it bypasses urine collection in a container, providing a simple and convenient strategy for individuals to immediately self-assess hydration status.

These systems and methods offer inexpensive, non-technical and immediate means to assess an individual's hydration status which could be used almost anywhere.

Potential Applications

- Assessment of an individual's hydration status

- Particularly relevant in assessing underhydration

Benefits and Advantages

- Offers greater standardization of urine color assessment
- Could enable early detection of underhydration which can occur without the perception of thirst or a change in urine concentration
- Inexpensive
- Rapid
- Non-technical – does not require laboratory facilities or equipment

For more information about this opportunity, please see

[Wardenaar et al – J Athl Train - 2021](#)

[Wardenaar et al – Eur J Nutr - 2021](#)

[Wardenaar – Dietetics – 2022](#)

[Wardenaar et al – J Athl Train - 2022](#)

For more information about the inventor(s) and their research, please see

[Dr. Wardenaar's departmental webpage](#)