

# A new matrix: Using Liverpool percentile and Void % to counsel symptomatic men

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References  
1. Haylen, B.T. et al. Maximum and Average Urine Flow Rates in Normal Male and Female Populations—the Liverpool Nomograms. British Journal of Urology 1989; 64: 30-38. 2. A Sutton et al. Using two nomogram percentiles and post void residual in the analysis of a large male uroflowmetry database. Continence 2023; 7(S1):100920

## Background and Aims

The Liverpool nomogram [1] can indicate LUT voiding dysfunction. A simple cut-off for Qmax is not useful as percentile curves are not horizontal and Qmax depends on voided volume. Uroflowmetry interpretation is influenced by post void residual (Void%=voided vol/ bladder vol) but this is not considered in the Liverpool nomogram.

A calculation for nomogram percentile with voided volume has been developed [2].

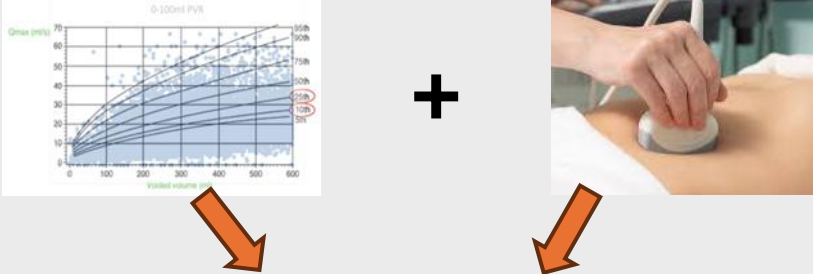
In a single tertiary clinic, we investigated the proportion of diagnoses from symptomatic urodynamic patients against their Liverpool percentile and void% in each cell of a matrix.

## Methods

Database of 6,700 anonymised male urodynamic patients. 4,113 had recorded pre urodynamics uroflow and urodynamics. The Liverpool percentile and void% was calculated from uroflowmetry against their urodynamic void diagnosis. For each cell, prevalence of BOO and DU were calculated.

## Results (figure 1)

Shows the likelihood of BOO/DU when observing uroflowmetry percentile position. The correlation between percentiles for a given patient’s uroflowmetry and pressure flow diagnosis was 0.38 (weak). The correlation between Void% for free uroflow and pressure flow diagnosis was 0.55 (moderate).



| Prevalence of BOO/DU in symptomatic males' free uroflow |      |      |       |       |       |       |       |        |
|---------------------------------------------------------|------|------|-------|-------|-------|-------|-------|--------|
|                                                         | 0-4  | 5-9  | 10-24 | 25-49 | 50-74 | 75-89 | 90-94 | 95-100 |
| 1-4                                                     | 100% | 100% | 55%   | 33%   | 0%    | 0%    | 0%    | 0%     |
| 5-9                                                     | 50%  | 67%  | 60%   | 36%   | 60%   | 0%    | 0%    | 100%   |
| 10-24                                                   | 47%  | 33%  | 39%   | 31%   | 36%   | 33%   | 0%    | 33%    |
| 25-49                                                   | 72%  | 62%  | 63%   | 58%   | 51%   | 19%   | 33%   | 27%    |
| 50-74                                                   | 32%  | 31%  | 32%   | 31%   | 27%   | 31%   | 0%    | 13%    |
| 75-89                                                   | 61%  | 62%  | 57%   | 49%   | 41%   | 13%   | 38%   | 26%    |
| 90-94                                                   | 33%  | 29%  | 32%   | 29%   | 27%   | 29%   | 0%    | 11%    |
| 95-100                                                  | 53%  | 52%  | 48%   | 40%   | 29%   | 11%   | 11%   | 7%     |
|                                                         | 38%  | 34%  | 34%   | 32%   | 26%   | 25%   | 15%   | 24%    |

Liverpool %

% of male patients in sector with BOO DU

## Interpretation

The weak correlation (0.38) between uroflowmetry and pressure flow percentiles shows the stability of Liverpool patient percentiles should be investigated. Some variability may be due to the catheter, environment and invasive nature of the pressure flow study.

Further work will use uroflowmetry clinic data for more representative flows, revision of % ranges in the matrix for utility, and colour coding for comprehension.

## Conclusion

This matrix can be utilised in patient counselling after uroflowmetry to consider need for further investigations. It can also be used for training regarding uncertainty of uroflowmetry testing. Further matrix refinements are needed to mitigate the above limitations.