

Introduction of a Simple Web-Based Calculator for Drug Dosing

Sir,

The calculation of body surface area (BSA), creatinine clearance and ideal body weight (IBW) is central to accurate dosing of many drugs, especially, but not exclusively, chemotherapy. Calculations can be time consuming and may lead to random and/or systematic errors. Computers on the other hand are ideal for carrying out repetitive calculations with consistent, reliable results. This lead to elimination of known sources of error, improving patient safety. These calculations are integral to full electronic prescribing systems but many hospitals currently lack such systems, while having good intranet support. In collaboration with the IT department we developed a simple web-based calculator located on the hospital's intranet in a university teaching hospital, any computer connected to the intranet has access to this calculator. We utilised the IT department resource as a convenient and cost effective way to integrate the calculator into existing systems.

The calculator requires input of the patient's height, weight, gender, age, and optional serum and urinary creatinine. These data are then used to calculate the following; Body surface area (BSA), ideal body weight (IBW), body mass index (BMI), estimated creatinine clearance using the Cockcroft and Gault formula and measured 24 hour creatinine clearance. Easy access to such calculators is required for accurate prescription of commonly-used hospital drugs other than chemotherapy, such as antibiotics.

This e-form was created using HyperText Markup Language (HTML), JavaScript and Active Server Pages (ASP). It was designed for ease of use and speed of completion and generates a standardized data-set via radio buttons and mandatory fields. A printable version allows the results to fit on a single A4 page for filing in paper-based clinical notes. The calculator was validated using 100 completed chemotherapy prescriptions. Manually and electronically calculated BSAs were compared with existing prescriptions with excellent concordance. The calculator prompts users to recheck their data if extremes of height (greater than 212cm) and weight (greater than 122kg) are entered. However, the system gives the user the opportunity to edit the details or continue to submit. The chemotherapy calculator achieved significant usage rates in just the first 6 months of use with over 1500 hits on the intranet in 6 months, an average of 280 hits per month or over 10 times per working day. Further development is currently being undertaken to integrate the resulting e-form in to the electronic patient record (EPR) for each patient.

This calculator may be part of electronic prescribing modules, however small increments such as this can ease users towards full electronic systems without significant costs and provide interim solutions towards electronic prescribing. It gives users a better understanding of their systems requirements before full implementation of a fully electronic system in the future. While this calculator is individual, a similar system could be introduced to other hospitals. The development of clinical resources such as this as a result of close collaboration between healthcare and informatics departments can yield significant benefits to the systems as a whole, both in terms of using resources and cost savings.

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References

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3. Cockcroft DW, Gault MH (1976). "Prediction of creatinine clearance from serum creatinine". Nephron 16: 31-41

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