## PK Graph: a new freely available pharmacokinetic simulation application for medical education

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Introduction. Many pharmacology departments use pharmacokinetic simulations to teach students about drug

disposition. Unfortunately the cost of using licensed software is frequently prohibitive and departments are also keen to reduce costs or divert funds to research activities.

Aims. We set out to create a new pharmacokinetic simulation program to address a current instructional need with both flexibility and low cost.

Methods. The freely available (for educators) game development platform Unity (https://unity3d.com/) and textbook PK formulas were used to developed an application able to model both introductory situations and advanced clinically relevant circumstances.

Results. The application is capable of simulating both oral and IV

dosing situations including repeat dosing. It has a basic and advanced mode (pictured). In the advanced mode the student can set the microconstants for a drug with 2-compartment pharmacokinetics and thus learn about more complex models of drug disposition.

Discussion. This software will be trialled at Sydney Medical School in 2019 with a series of exercises for students to work through. Drugs with special pharmacokinetic properties such as gentamicin and digoxin will be featured. The simulator will be able to exemplify the effects of renal insufficiency, repeat dosing and the selection of the most parsimonious model (as in the case of digoxin where a 2-compartment model provides the most accurate results). It is hoped that other institutions will take up our offer of free access to the software and code therein and let us know about the results. The application is freely available as is at the following link: <a href="http://bit.ly/PK-graph">http://bit.ly/PK-graph</a>

