



Be competent, be safe

*There is no room for error with drug calculations.
Develop and assess your skills with the world's
leading resource for healthcare students and
practitioners.*

Introducing: Authentic World Ltd.

Our Company

Founded in 2004 by a team of nurse educators in Wales, Authentic World Ltd is a spin-out company of Glamorgan & Cardiff Universities whose mission is to improve patient safety by reducing medication error through the development of innovative educational software solutions.

Authentic World's product and services portfolio is founded upon a series of innovative educational software applications derived from PhD research. All products are internet based and capable of standalone use or of seamless integration with existing learning management systems.

Our medication dosage calculation products are being used by higher education institutions and healthcare systems internationally.



Our Products

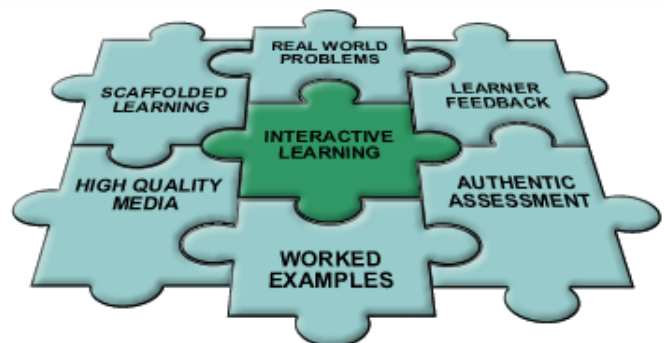
Authentic World® learning environments aim to guide users through an experiential learning process that effectively bridges the gap between theory and practice.

Based upon constructivist theories of learning, this unique approach provides a platform for learning that is proven to be highly effective in assisting the development of key problem solving skills.

Distinguishing Features

- **Exposure to real world problems** – presentation of problems as they exist in real world environments
- **Scaffolded instruction** - the systematic sequencing of content and tasks to support and optimize learning
- **High quality media** - authentic visual representations of what learners will see and use in practice
- **Interactive learning** – to encourage active learner engagement with the content using a range of techniques

- **Worked examples** - step-by-step walk-throughs of the entire problem solving and calculation processes to aid understanding
- **Authentic assessment** – assessment of learner understanding and ability in a ‘real world’ context
- **Learner feedback** – comprehensive evaluation of performance to identify and help remedy any calculation errors or provide positive reinforcement of abilities



Developing Competence

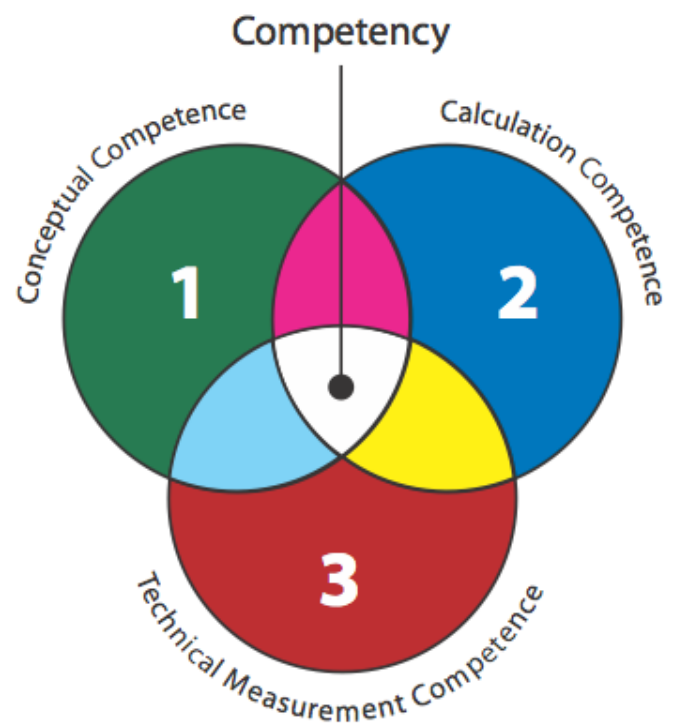


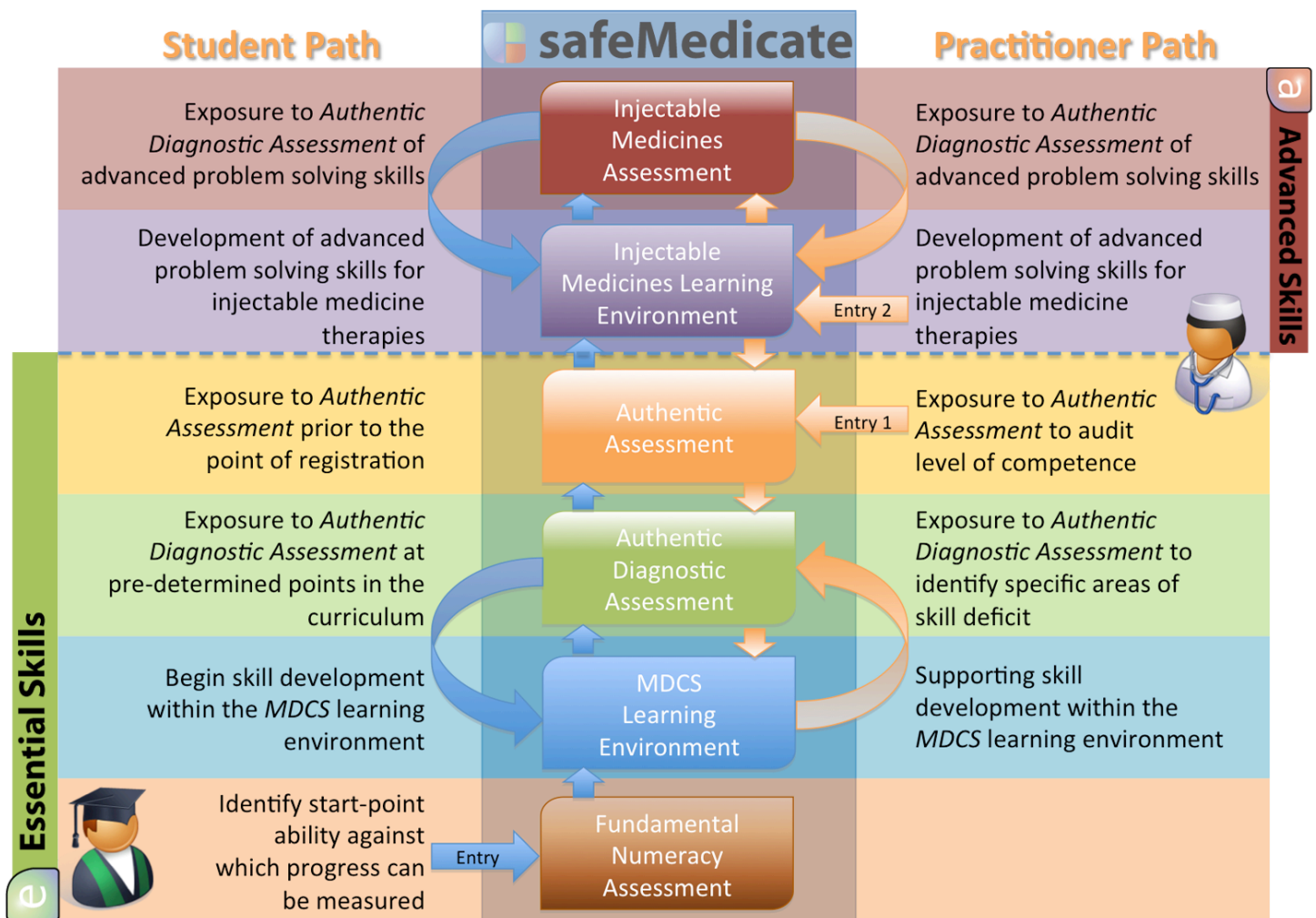
Every healthcare professional with responsibility for medication administration must develop, demonstrate and maintain competence within this domain of clinical practice.

Competency in medication dosage calculation problem solving is dependent upon three interrelated sub-elements:

1. Conceptual competence – understanding the problem
2. Calculation competence – accurately calculating dosage and rate numerical values
3. Technical measurement competence – transferring the numerical values to a medication measurement vehicle e.g. syringe or IV pump

Our software provides a unique and innovative environment for developing and assessing competence in an authentic virtual clinical context.





The figure above illustrates the main components of our *safeMedicate* learning and assessment environment and outlines how students and practitioners typically engage with each pathway.

For the student, the emphasis is on skills development and assessment in preparation for the role of registered health professional. Our *Essential Skills* modules are designed to develop and assess the competencies required for safe medication dosage calculation at the point of registration and are compliant with the Essential Skills Cluster requirements of the UK Nursing & Midwifery Council (NMC).

The *Medication Dosage Calculation Skills (MDCS)* learning environment sits at the heart of this learning process whilst the associated assessment tools provide a structured and comprehensive platform for measuring the cognitive competencies required for safe medication administration at the point of registration and beyond.

For the registered practitioner, the emphasis at Entry Point 1 is on the audit of existing drug calculation skills using the *Authentic Assessment* module of our *Essential Skills* suite. If practitioners commit no error then no further action is needed. Where skill deficits are identified, a detailed analysis of performance is made using our *Authentic Diagnostic Assessment* system with subsequent remediation and skill construction facilitated within the *MDCS* learning environment.

At Entry Point 2, our *Advanced Skills* modules address skills development and assessment in the domain of *Injectable Medicines Therapy*. Here the focus is on the more complex problem solving, calculation and technical measurement skills required for working safely with IV bolus, intermittent and continuous IV infusion regimes.



Essential Skills

Essential Skills comprises a highly interactive, visual and self-paced learning environment designed by experienced nurse educators and clinical pharmacists. It is designed to develop and assess the competencies required for safe medication dosage calculation at the point of registration.

Essential Skills can be used to replace traditional methods of teaching and assessing drug calculation skills and locates seamlessly within a typical pre-registration curriculum. The integrated assessment features provide a platform for formative or summative assessments with automated and detailed diagnostic feedback on performance for the individual user and institution.

Essential Skills comprises 4 key modules:

1. Foundation Numeracy Assessment (FNA)
2. Medication Dosage Calculation Skills (MDCS)
3. Authentic Diagnostic Assessment (ADA)
4. Authentic Assessment (AA)

Foundation Numeracy Assessment

This module is designed to gauge the learner's start-point understanding of basic numeracy concepts. It consists of a 40-point assessment split into 5 sections:

- Division
- Multiplication
- Conversion of fractions to decimals
- Multiple Computations
- Conversion of SI Units

The problems are typical of the arithmetic that underpins medication dosage calculations. The assessment provides useful diagnostic feedback from the outset to pinpoint areas of strength and weakness to help guide and promote learning.





Medication Dosage Calculation Skills

MDCS is the key learning environment of *Essential Skills* which assists learners to:

- Understand the essential clinical features of dosage and rate problems.
- Recall and develop the computation skills required to accurately calculate dosages and IV infusion rates.
- Develop the technical skills to accurately measure the dose or rate using typical administration vehicles.
- Practice at their own pace and continually assess and evaluate their learning and understanding

Learners work through 6 sections that combine to provide the understanding and skills required to safely and accurately perform drug calculations in clinical practice.

1. Introduction
2. Prescriptions and SI Units
3. Tablets and Capsules
4. Liquid Medicines
5. Injections
6. IV Infusions

Practice diagnostic assessments are available after each key section with questions drawn randomly from our extensive database of authentic dosage problems.

Authentic Diagnostic Assessment

The ADA module is designed to periodically assess drug calculation competence and provide error diagnosis and feedback. It does this by simulating the real world environments that students and practitioners will be exposed to in clinical practice. Detailed diagnostic feedback to the learner and institution ensures that learning is always optimized.

Authentic Assessment

With a design informed by a 3-year programme of research commissioned by NHS Education for Scotland (NES), *Authentic Assessment* takes one step closer again to the reality of medication dosage problem solving in practice. AA is used as a 'point of registration' assessment for learners and meets the requirements of the Nursing & Midwifery Council (NMC).

For registered practitioners, AA provides for pre-employment testing and periodic audit activities according to local need. Powerful reporting tools make it easy to swiftly and accurately verify drug calculation competencies and identify those staff requiring further training and support.

Question 24 of 48
Current Section: Multiple Computations

Use your calculation skills to solve the following problem:

$$\frac{90 \times 5}{120}$$

Choose your answer and click NEXT to CONTINUE:

3.7 3.75 3.8 4.23 Don't Know

NEXT

Tablets & Capsules
Using an Equation to Solve Tablet & Capsule Dosage Calculation Problems
Setting up the Division Orientation

2mg 1 Tablet

2mg 1 tablet = 1 tablet

Liquid Medicines
Trying the Calculation Yourself

Amoxicillin 120mg / 5mL

7.5mL
5mL
2.5mL

Division Model

250 mg X 5 mL = 10mL

125 mg

Injections
Arranging the Calculation

200 mg X 10 mL = 8 mL

250 mg

Draw your calculated dose into the syringe, then click DONE

I.V. Infusions
Calculating Milliliters per Hour
STEP 2 - PERFORMING THE DIVISION CALCULATION CORRECTLY

STAGE 1 - Calculating mL/hr

1000 mL = 167 mL/hr
6 hours

Now try setting this I.V. Infusion Pump.



Advanced Skills

Advanced Skills Learning Environment

Advanced Skills comprises a highly interactive, visual and self-paced learning environment designed by experienced nurse educators and clinical pharmacists. It is designed to develop and assess the competencies required for safe medication practice with the more complex problem solving and calculations associated with injectable medicines therapy.

Advanced Skills provides everything required to support the continuing professional development needs of the registered practitioner.

Based upon National Patient Safety Agency (NPSA) recommendations for best practice, *Advanced Skills* will prepare health professionals for safe IV medication practice on general and specialist wards, high dependency and intensive care units.

Advanced Skills comprises 4 key learning modules:

1. Competency modelling
2. Slow iv/bolus injections
3. Intermittent infusions
4. Continuous infusions



Advanced Skills Assessment

The *Advanced Skills* assessment module provides a platform for institution-wide formative and summative assessments with detailed diagnostic feedback to the user and to the organisation. All IV problems are authentic and are typical of the broad range of complexity seen in clinical practice settings. The entire problem solving process is modelled providing a comprehensive assessment of cognitive competency with up to 25 opportunities for error in any one dosage problem.

Depending on the needs of the practitioner or organisation, assessments can feature all three modes of administration (slow IV, intermittent and continuous infusions) or focus only on one mode typical to the area in which the practitioner normally works. This means that users will not have to jump through unnecessary hoops by being subjected to problems they will likely not see in day-to-day practice.



Authentic World Training Workshop



Our Authentic World Training Workshop is designed specifically to help you get the most out of the software and to support its successful implementation within your organization. The workshop is for staff that will take responsibility for its local administration, supporting learners and monitoring their engagement and performance.

The workshop is delivered using a blend of seminar type presentation, discussion and hands-on computer training. Our professional trainers will come to your organization to deliver the workshop which typically lasts a full day. In order for participants to get the most out of the day and the support they need, we normally limit the number of attendees to 12. However, if you would like to send more then please let us know so that we can make appropriate arrangements for additional trainers (this may incur additional cost).

We normally rely upon you to provide suitable facilities and to arrange refreshment and lunch breaks. Ideally all participants will have their own computer workstation for the hands-on sessions.

Typical Workshop Schedule

- Introduction to the materials and underlying educational approach
- Competence in medication dosage calculation
- Overview of *safeMedicate* software suite
 - Content and scope
 - Key features and functionality
 - Interpretation and optimization of learner performance
 - Administrative tools
 - Assessment types, scheduling and reporting
- Curriculum integration (higher education users)
- Strategies for successful organization-wide implementation
- Workshop evaluation



Access and Security

Authentic World offers higher education institutions and healthcare providers with the definitive online solution for developing, assessing and maintaining the essential skills that underpin competency within the domain of safe medication dosage calculation.

All of our products are internet based and our website is available 24 hours a day and 365 days a year from anywhere in the world providing you have access to the internet via a network or reliable broadband connection. All that is required to run our software is an up-to-date web browser such as Internet Explorer or Firefox with the latest version of the Adobe Flash plug-in. Our user guides are also online in PDF format and require the Adobe Reader software to view them. Both Adobe Flash and Adobe Reader are free downloads.

Access to all our software is via our secure website portal providing up to 256 bit encryption thereby offering the highest level of security possible. This means you can rest assured that communications between your browser and our site are private and secure.

Please visit our website at www.authenticworld.co.uk for more information. You'll find everything you need to know about our company, the features of our safeMedicate software including interactive demos of the various components that make up **safeMedicate**.

Authentic World Ltd

Unit 25 Cardiff Medicentre
Heath Park, Cardiff CF14 4UJ

Tel: 00 44 (0) 29 2076 2936
Email: info@authenticworld.co.uk
www.authenticworld.co.uk

