safeMedicate Prospectus 2018



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: safeMedicate

Our Company

The safeMedicate® suite of medication dosage calculation problem-solving environments was launched in 2004 by UK based company Authentic World Ltd. Our mission is to improve patient safety by reducing medication error through high quality education and innovative software solutions.

Our safeMedicate® product and services portfolio is founded upon a series of innovative educational software applications derived from 25 years of PhD and post-doctorate translational research. All products are web-based and capable of standalone use or of seamless integration with existing learning management systems.

In 2018, safeMedicate® is used by higher education institutions and healthcare systems in 11 countries across five continents and is informing the competence development and assessment of over a quarter of million healthcare students and practitioners across the globe.



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

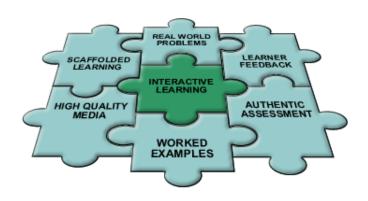
Based upon constructivist theories of learning, this unique approach provides a platform for learning that is proven to be highly effective in assisting the development of key problem solving skills.

Distinguishing Features

- Exposure to real world problems presentation of authentic dosage calculation problems as they exist in real world environments
- High quality media authentic visual representations of what learners will see and use in practice
- Worked examples step-by-step walk-throughs that illustrate expert dosage calculation problem solving techniques that support a range of learning styles
- Interactive learning use of immersive techniques that encourage active learner engagement with authentic features of clinical dosage calculation problems



- Scaffolded learning use of innovative techniques that support the systematic construction of competence in dosage calculation
- Authentic assessment diagnostic assessment of learner dosage calculation competence in a 'real world' context
- Learner feedback evaluation of learner performance, measured against expert problem solving models that facilitates rapid diagnosis of competence and identification & correction of errors.



Developing Competence Through Research-Based Evidence



Safety in Numbers

Clinical drug dosage calculation problems need to be learned and assessed under conditions where the mathematics in the real world is messy and complex, highly embedded and often hidden or invisible ('Tout, 2014).

safeMedicate virtual environments are designed to immerse the learner and practitioner at the interface of the authentic and complex world of drug dosage calculation problem-solving and the abstract world of healthcare mathematics.

The safeMedicate authentic competence model and suite of programs, is underpinned by a 25-year programme of translational research, reported in 2013 by Elsevier in an eight-paper *Safety in Numbers* virtual special issue of Nurse Education in Practice. The series is available online at

www.nurseeducationinpractice.com/content/safety.

To date over 3,000,000 safeMedicate authentic assessments have been undertaken across the globe and are contributing to advancing patient safety via evidenced based education, error diagnosis and competence development.

The safeMedicate Competence Model

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

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

- Conceptual competence understanding the problem in context.
- 2. Calculation competence accurately calculating dosage and rate numerical values and measurement units.
- 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 cognitive competence (knowledge) in an authentic virtual clinical context. It also sensitizes and prepares the user for the general principles underpinning the functional competence (know-how and skills) requirements of dosage calculation problem solving in clinical practice.

Competence Calculation Competence Perminical Measurement Competence

Typical Student Path Through safeMedicate **Modules**



Essential Skills

Advanced Skills

calculation competence under virtual simulated AA used to evaluate nedication dosage clinical conditions

conceptual, calculation ADA used to evaluate

& technical measurement competence & diagnose

errors

support development of infusion rate calculation Learning zone used to problem-solving skills injectable medicine

Adult IV Injectable Medicines

competence in the Authentic Diagnostic Jsed following demonstration of

Used at key stage formative and Assessment & prior to study of summative assessment points Advanced Skills & registration

skills phases of the undergraduate Used throughout the essential

Authentic Assessment (AA)

Authentic Diagnostic Assessment (ADA) D Learning Environment

B

throughout the undergraduate

and/or commencement of **Jsed at point of selection** undergraduate programs program

D

a

AA used to evaluate medication dosage calculation competence under virtual simulated clinical conditions

Diagnostic Assessment (ADA) 100% Scored D

ADA used to evaluate

technical measurement competence & diagnose

conceptual, calculation &

Learning zone used to

errors

problem-solving skills support development of pediatric bodyweightbased dosage calculation

B

medication dosage calculation competence Authentic Assessment used to evaluate under virtual simulated clinical conditions

Authentic Assessment (AA)

O

Authentic Diagnostic Assessment used to evaluate essential conceptual, calculation & technical measurement competence development & diagnose errors

Authentic Diagnostic

Assessment (ADA)

U

Learning zone used to support competence development in tablet & capsule, oral liquid nedicine, injection & IV Infusion of crystalloid & blood/blood product infusion calculations

Learning Environment **Essential Skills** O

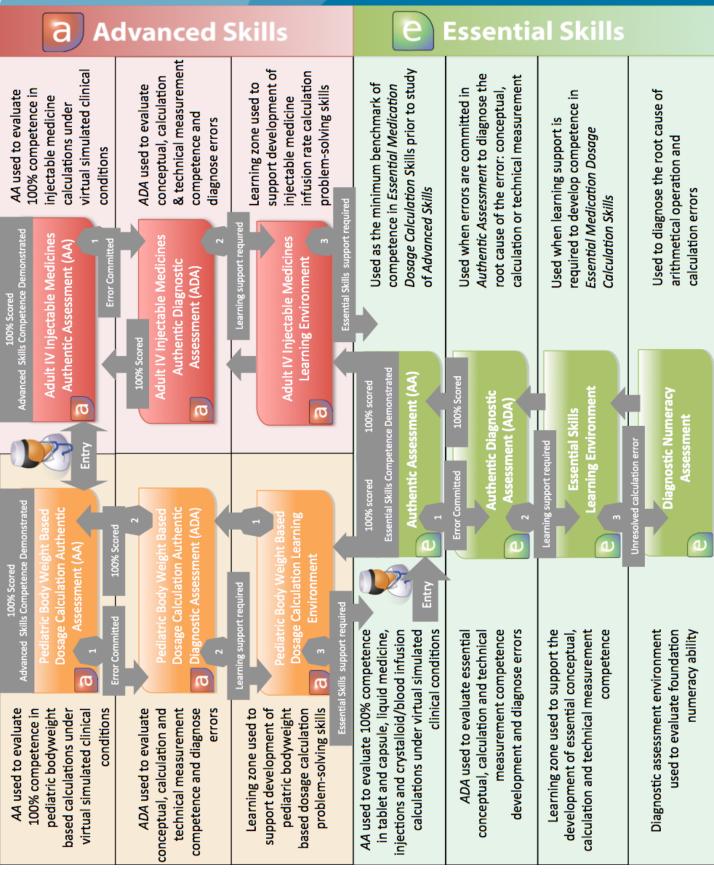


Diagnostic Numeracy

Assessment

environment used to evaluate start-point Diagnostic assessment. numeracy ability

Typical Registered Practitioner Path Through safeMedicate Modules



The safeMedicate Pathways

The safeMedicate Student Path

The figure on page 4 illustrates the main components of our *safeMedicate* learning and assessment environment and outlines how healthcare students typically engage with each module.

For the student, the emphasis is on skills development and assessment in preparation for the role of registered healthcare 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 33 requirements of the UK Nursing & Midwifery Council (NMC).

The Essential Skills learning environment sits at the heart of this learning process, whilst the associated assessment tools provide a structured and comprehensive platform for measuring cognitive competence in tablet and capsule, oral liquid medicine, injection and IV infusion medication dosage calculation skills required for safe medication administration at the point of registration and beyond.

Beyond registration requirements, the continuing professional development needs of practitioners are fully supported via our Advanced Skills *Pediatric Bodyweight-Based Calculation* and *Adult IV Injectable Medicines* learning and assessment environments, that focus on complex calculations associated with solving bodyweight-based drug dosing problems and infusion rates.

Finally, in recognition of healthcare systems that typically employ word-based problems as a component of pre-employment testing, we offer our *Word Problem Skills* module that supports and assesses understanding of how to solve these types of problems.

The safeMedicate Practitioner Path

The figure on page 5 illustrates the main components of our *safeMedicate* learning and assessment environment and outlines how registered healthcare practitioners typically engage with each module.

For the registered practitioner, the emphasis at the Essential Skills Entry Point is on audit of the minimum benchmark of competence in tablet and capsule, oral liquid medicine, injection and IV infusion medication dosage calculation skills. If a practitioner achieves 100% on the Authentic Assessment, cognitive competence is demonstrated. Where competence deficits are identified, a detailed analysis of conceptual, calculation and technical measurement performance is made using our Authentic Diagnostic Assessment system. Where necessary subsequent remediation and competence development is facilitated within the Essential Skills learning environment.

At the Advanced Skills Entry Point, depending upon the needs of the practitioner, emphasis in Advanced Skills is on competence development and assessment in the domains of body weight based pediatric and/or intermittent and continuous Injectable Medicines infusion problems. If a practitioner achieves 100% on the Authentic Assessment, cognitive competence is demonstrated. Where competence deficits are identified, a detailed analysis of conceptual, calculation and technical measurement performance is made using our Authentic Diagnostic Assessment system. Where necessary subsequent remediation and competence development is facilitated within the Advanced Skills learning environment(s).

Essential Skills

Essential Skills Learning

Essential Skills is a highly interactive, visual and self-paced learning and assessment 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.

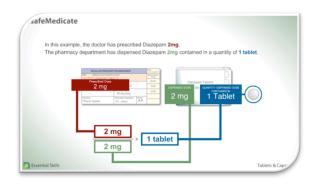
Essential Skills is designed to assist learners to:

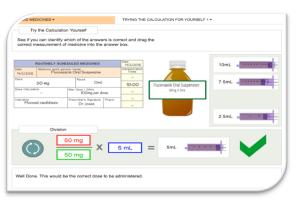
- Understand the essential clinical features of dosage and rate problems.
- Recall and develop the computation skills required to accurately calculate dosages and IV infusion
- Develop the technical skills to accurately measure the dose or rate using typical administration vehicles.
- Practice at their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

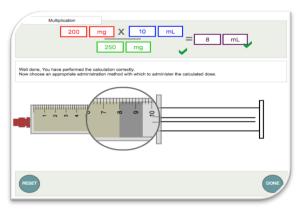
Students work through six sections that combine to support the development of cognitive competence in drug dosage calculation problem-solving and to sensitize them to the functional competence requirements of clinical practice.

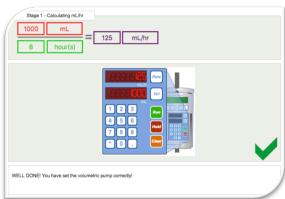
- 1. Introduction
- 2. Prescriptions and SI Units
- 3. Tablets and Capsules
- 4. Liquid Medicines
- 5. Injections
- 6. IV Infusions

Essential Skills enables students to undertake practice assessments in each of the four medication domains. Medication problems are drawn randomly from a structured assessment rubric of increasing levels of complexity.











Essential Skills Assessment

Essential Skills provides a number of assessment options for either formative or summative testing. All question sets are randomly generated with no two learners receiving the same mix of questions at the same sitting. However, all learners receive the same mix of problem complexity ensuring that there is parity across the group. Scoring and reporting is fully automated with release of results under the control of the organisation.

Diagnostic Numeracy Assessment (DNA)

This module is designed to gauge the learner's start-point understanding of basic numeracy concepts and can be used pre or post selection of candidates. It consists of a 40-point assessment split into six sections that include Division; Multiplication; Conversion of fractions to decimals; Multiple Computations (integers); Multiple Computation (decimals) and Conversion of SI Units.

The problems are typical of the arithmetical operations and calculations that underpin 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.

Authentic Diagnostic Assessment (ADA)

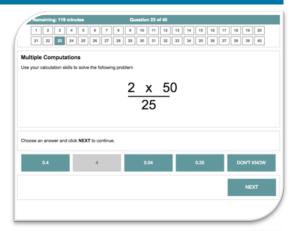
ADA is designed to periodically assess the development of drug calculation competence and provide error diagnosis and feedback within conceptual, calculation and technical measurement domains. It does this by simulating the real world problems that students and practitioners will be exposed to in clinical practice and capturing each aspect of the problem solving process.

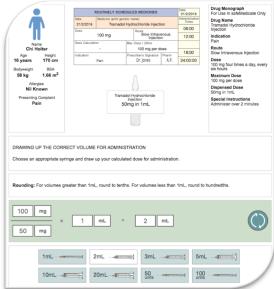
Detailed diagnostic feedback is provided to the learner and institution within the framework of the *safeMedicate Competence Model* ensuring that learning is always optimized.

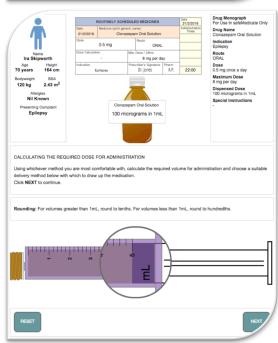
Authentic Assessment (AA)

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' summative assessment for learners and, in the UK, 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.







a Advanced Skills



Advanced Skills Learning

Advanced Skills is a highly interactive, visual and selfpaced 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 pediatric bodyweight-based problems and Adult IV injectable medicines therapies.

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

Pediatric Bodyweight-Based Dosage Calculations

This module is designed to assist learners to:

- Use the 5-Rights of Medication Administration to deliver prescribed medications to an infant or child.
- Determine safe and therapeutic dosage ranges for the pediatric population.
- Calculate single and daily divided drug dosages based on the pediatric patient's body weight.
- Scrutinize medication orders and to identify errors in prescribed medication dosages.
- Demonstrate medication administration skills by selecting the correct syringe and measuring the correct volume of oral and injection medications.

Injectable Medicines Therapies

This module will prepare health professionals for safe IV medication practice on general and specialist wards, high dependency and intensive care units.

Learners will use our unique authentic dimensional analysis system as the equation framework for solving injectable medicines calculations for intermittent and continuous infusions.

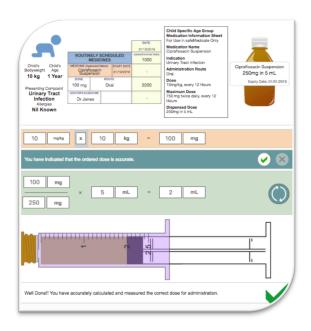


Advanced Skills Assessment

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.

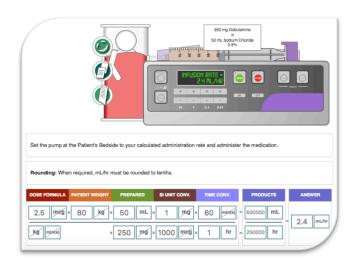
All problems are authentic and are typical of the broad range of complexity seen in clinical practice settings.

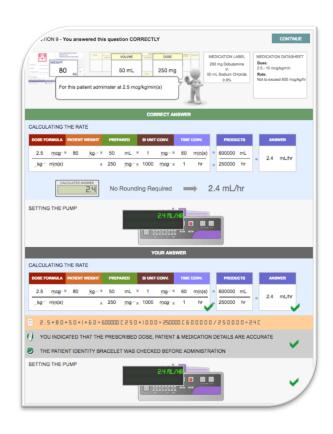
For pediatric bodyweight-based problems, assessments feature both single dose and divided dose problems.



For IV injectable medicines therapies, the problem solving process provides a comprehensive assessment of cognitive competence that includes a range of safety checks, equation setup and calculation and the accurate setting of rate of administration and volume of IV infusions.

Depending on the needs of the practitioner or organisation, assessments can feature both modes of administration (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.







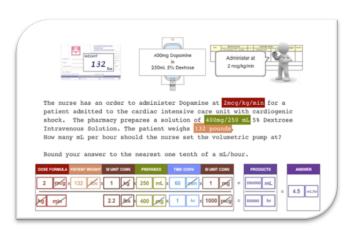
Word Problem Skills

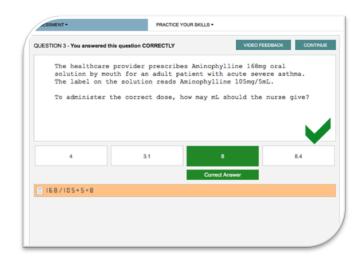
The Word Problem Skills module has been designed to support learners to undertake word-based dosage calculation problems that are typical of North American licensure type examinations such as NCLEX and are also commonly used for pre-employment testing purposes.

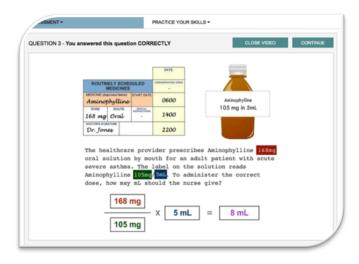
Word problem formats include multiple-choice questions and fill in the blank/gap type questions as illustrated in the examples on this page.

Video Feedback associated with each of these problem types assist learners to:

- identify the important elements of the word problem required for undertaking the calculation.
- understand the relationship between those elements and the real life clinical objects such as prescriptions/medication orders and medication containers etc.
- set up an equation and accurately calculate the answer to the word problem.









Licence Costs & Purchase Options

Higher Education Pricing

Duration/Module	Essential Skills	Essential Skills + Pediatric Bodyweight Based Calculations	Essential Skills + Injectable Medicine Therapies	Essential Skills + Pediatric Bodyweight Based Calculations + Injectable Medicine Therapies
6 months	£6.00	£7.00	£7.00	£8.00
1 Year	£10.00	£12.00	£12.00	£13.00
2 Years	£15.00	£18.00	£18.00	£21.00
3 Years	£20.00	£25.00	£25.00	£28.00
4 Years	£25.00	£30.00	£30.00	£33.00

All prices are exclusive of VAT and come into effect 1st September 2016.

For higher education institutions, we provide access to a range of module combinations across the suite of *safeMedicate* **Essential Skills** and **Advanced Skills** modules as 6-month, 1-year, 2-year, 3-year or 4-year options.

The **Essential Skills** module provides a learning and assessment platform that is congruent with the NMC Essential Skills Cluster for Medicines Management and meets the requirements for dosage calculation competence at the point of registration.

Should you wish to expose your students to the more complex calculations associated with either of our **Advanced Skills** modules then you can choose to include either or both to meet the needs of your curriculum.

Licences are typically purchased in bulk by the institution according to total student numbers on the course. Licences are issued on receipt of an official purchase order from the institution. All licences will be associated with the purchasing institution for student administration purposes.

On first implementation of *safeMedicate* at a particular higher education institution, if purchasing 3-year licences in bulk for 1st year students beginning their undergraduate studies, we are pleased to offer discounted prices for existing 2nd year and 3rd year students. Further details can be provided at time of purchase.

Licence Costs & Purchase Options

Healthcare System Pricing

Duration/Module	Essential Skills + Pediatric Bodyweight Based Calculations + Injectable Medicine Therapies
6 months	£8.00
1 Year	£13.00

All prices are exclusive of VAT and come into effect 1st September 2016.

For healthcare organisations, we provide access to the entire suite of *safeMedicate* **Essential Skills** and **Advanced Skills** modules as a 6-month or 1-year option.

Licences are typically purchased in bulk by the institution according to total user numbers required. Licences are issued on receipt of an official purchase order from the institution. All licences will be associated with the purchasing institution for user administration purposes.

safeMedicate Administrator Licence Costs

There is no cost associated with administrator licences for faculty or healthcare system managers, or for access to our Administrative Portal (see below) when the institution purchases student or practitioner licences in bulk.

safeMedicate Customer Support is also provided to the institution at no additional cost.

safeMedicate Administrative Portal

The Administrative Portal provides faculty and healthcare system managers with a platform for managing safeMedicate within the institution. Features and functionality include:

- Assessment scheduling
- Fully automated assessment generation, marking and feedback provision
- Student/practitioner engagement and performance monitoring tools
- Powerful reporting and data export facilities

Training Workshop & Webinars



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

Workshops are 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.

Alternatively, our interactive workshops/webinars are typically delivered online by our professional e-learning specialists and comprise a blend of slide presentation, discussion and live product demonstration.

Workshop/Webinar Schedule

- Introduction to the materials and underlying educational approach
- Competence in medication dosage calculation
- Overview of safeMedicate software suite
 - Content and scope
 - o 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/webinar 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 and advanced skills that underpin competence within the domain of safe medication dosage calculation.

All of our products are web-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 Google Chrome, Microsoft Internet Explorer or Mozilla Firefox. Our user guides are also online in PDF format and require the Adobe Reader software to view them. Adobe Reader is a free download.

Access to all our software is via our secure website portal providing encryption of the highest standard thereby offering the utmost 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.safemedicate.com for more information. You'll find everything you need to know about our company, the features of our safeMedicate software and our safeMedicate Interactive Demo (SID), that allows you to engage with and undertake example diagnostic assessments from our entire suite of safeMedicate environments.

Authentic World Ltd

Unit 32 Cardiff Medicentre Heath Park, Cardiff CF14 4UJ

Tel: 00 44 (0) 29 2068 2152 Email: info@safemedicate.com www.safemedicate.com | www.safemedicate.net

