Adam,Rouilly

SERVING MEDICAL EDUCATION WORLDWIDE

AR28/AR28-B GLUCOHAND® - DIGITAL GLUCOMETER SIMULATOR

Instruction Manual

Coventry University

Thank you for purchasing this **AR28 GlucoHand® - Digital Glucometer Simulator.**

Diabetes affects some 415 million people globally and it is expected to affect one person in 10 by 2040, raising this international figure to 642 million. In the UK an estimated 4.5 million people live with diabetes. Effective diabetes management is now a growing part of those general skills which all clinicians must possess.

Blood glucose monitoring remains key in managing diabetes. This model was designed by **Nina Godson, Assistant Professor and Lead for Clinical Skills at Coventry University.** The GlucoHand® has been developed in recognition of this rising disease. It aids the understanding and teaching of blood sampling and the interpretation of glucose level data and its implications in patient treatment planning. The GlucoHand® also facilitates patient education, as approximately 700 people a day in the UK are diagnosed with diabetes.

Please read this instruction manual carefully and retain it for future reference.

Skills

- Patient communication
- Glucometer handling and test strip loading
- Aseptic technique around blood sampling
- Obtaining a blood sample and placement of this onto the test strip
- Interpreting the blood glucose reading as part of wider patient treatment planning

Features

- Easy to set up and use
- Natural size, realistic adult left hand. Middle and ring finger with removable blood pads for blood glucose sampling
- Simulated glucometer functions just like as a real glucometer with readings in mmol/L or mg/dL
- Scenario control - the tutor or technician may pre-program the simulated glucometer to give a high, medium, low or completely random blood glucose reading for training or simulation scenarios
- Refillable finger blood pads use Adam,Rouilly mock blood - no need for sugar or control solutions
- Ideal for scenario based simulation, hybrid simulation as well as patient education
- Reusable simulated glucose test strips for economical training

Safety and Precautions

Not for use with patients. The digital simulated glucometer and simulated glucose test strips are for use only with the GlucoHand® model in simulation training scenarios and patient education.

Indicated blood glucose levels are populated by the simulated glucometer's electronics - either pre-programmed or randomised which may be altered by the user in the settings menu. The device will not read blood or control solutions.

Use only 1x 9V battery (not included) in the battery compartment of the simulated glucometer as indicated. Do not attempt to use any other type or size of battery. Other battery sizes may damage the simulator, and invalidate your guarantee.

Do not leave or store the fingertips with blood still inside. These should be drained and flushed with clean water.

Do not power down and leave or store the simulated glucometer with batteries still installed for prolonged periods. Always remove batteries before storage.

The simulated glucometer contains no user serviceable parts. Do not attempt to open or disassemble. Doing so could cause damage and will invalidate your guarantee.

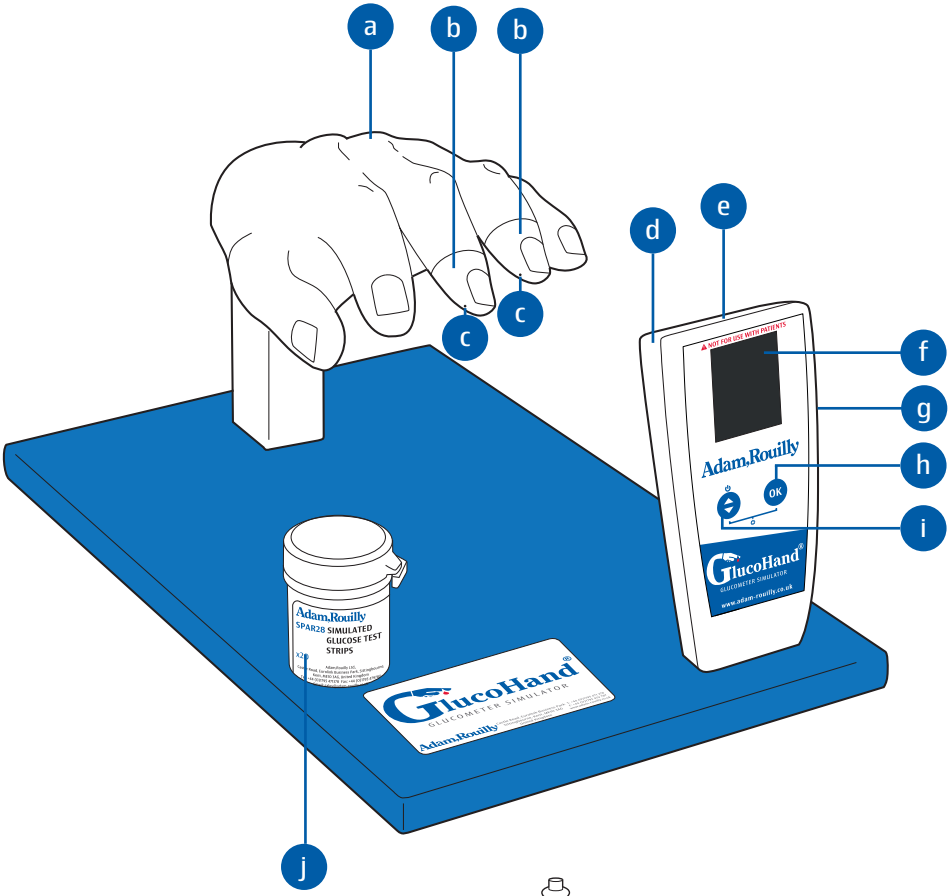
The removable, replaceable middle and ring fingertips contain a pre-inserted hole which may be milked to obtain a blood sample. Lancet devices may be used with the fingertips but will not pierce the fingertip skin. We recommend using devices of 28G or smaller with a maximum depth of 1.8 mm to avoid accelerated wear.

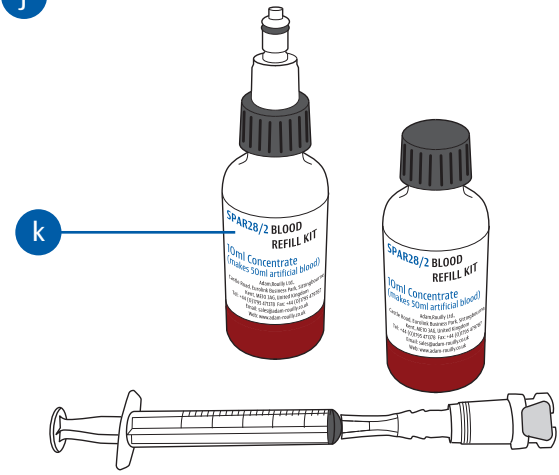
This simulator is designed to facilitate training in obtaining and deciphering a blood glucose reading. The procedures demonstrated in this manual serve as a guide only. Local policies will determine the correct way of performing the procedure.

Please treat the simulator with the same care you would a patient.

Contents

Parts





SCAN ME

a Simulated hand

b **SPAR28/1 REFILLABLE FINGERTIPS (X2)**

c Pre-inserted hole for blood sampling

d Simulated glucometer

e Simulated glucose test strip insertion port 

f Digital display

g Battery compartment (at rear) for 1x 9V battery (not included)

h OK Button OK (Long press for power on/off)

i Up/Down Button

Settings Menu (press and hold OK and buttons simultaneously)

j **SPAR28 SIMULATED GLUCOSE TEST STRIPS (X20)**

k **SPAR28/2 BLOOD REFILL KIT**

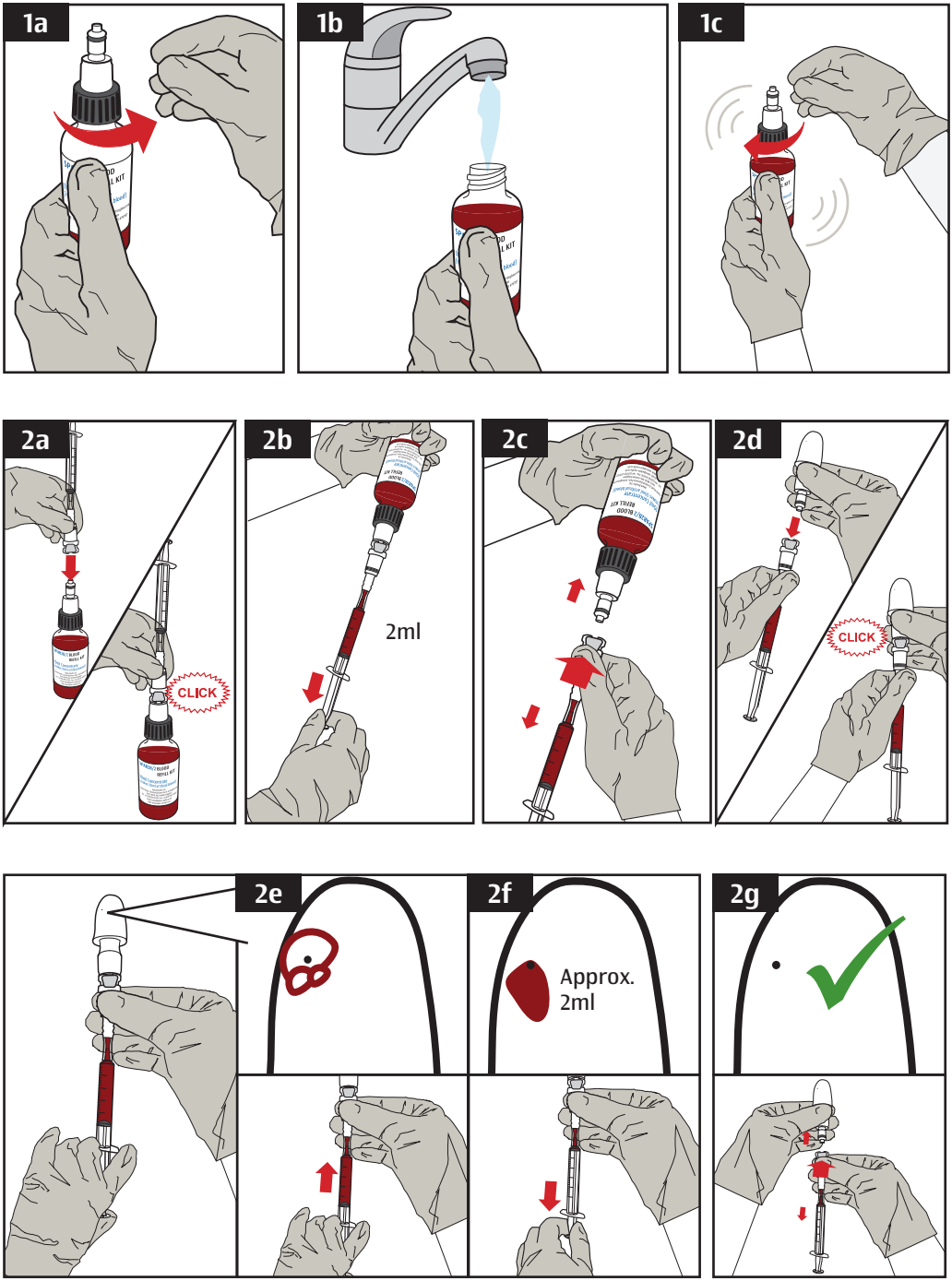
Supplied With

S321B LUBRICATING JELLY

If you require replacement parts please contact our Sales Department, quoting codes where applicable.

Scan the QR code to access the product video.
https://youtu.be/nTrbSF-q5iM

Before Use



Mix the Blood Concentrate

Ensure the work area is clean and dry.

Keep paper towels nearby in case of any spillage.

Only use the supplied SPAR28/2 BLOOD REFILL KIT with the simulator. This contains a formulation which has been specifically designed to work with the fingertips in the simulated hand.

1a Before first use unscrew the connector bottle cap of one of the included **SPAR28/2 BLOOD REFILL KIT**

1b Set the cap aside. Fill with approximately 40ml of fresh water, to the neckline of the bottle.

1c Replace the connector bottle cap and shake well to mix. The fingertips may now be filled with the blood mix, see **2a** below.

Fill the Fingertips with Mock Blood

2a With the blood now mixed, connect the refill syringe connector to the blood bottle connector, ensuring it clicks into place.

2b Turn the bottle upside down to ensure air cannot enter the syringe. Draw mock blood into the syringe, filling to the maximum 2ml.

2c Disconnect the blood bottle from the syringe and filling line by pressing the silver button on the quick release connector. Note some residual mock blood may still remain in both connectors.

2d Connect a fingertip to the refill syringe connector, ensuring it clicks into place.

2e Holding the fingertip upright, gently advance the syringe to fill fingertip with blood. Allow air to escape from the pre-inserted hole, visible as bubbles as the fingertip begins to fill.

2f The fingertip accepts approximately 2ml of mock blood. If blood begins to leak, reduce the blood volume by pulling back on the syringe.

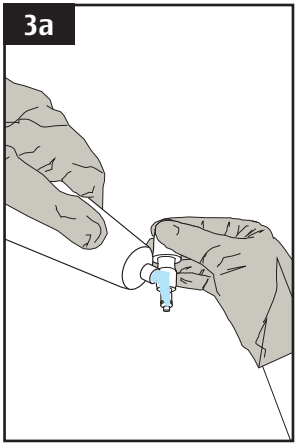
2g Stop filling when the fingertip has slight positive pressure - blood should not leak freely from the pre-inserted hole, only when the fingertip is lightly squeezed.

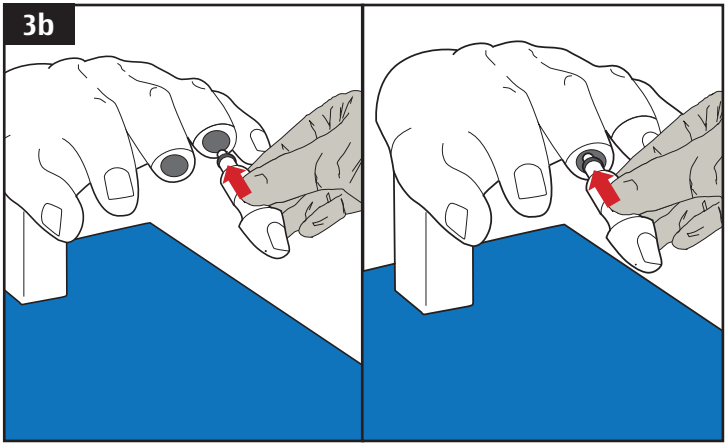
Disconnect the fingertip from the syringe and filling line by pressing the silver button on the quick release connector. The connectors are self sealing so the pressure will be maintained in the fingertip.

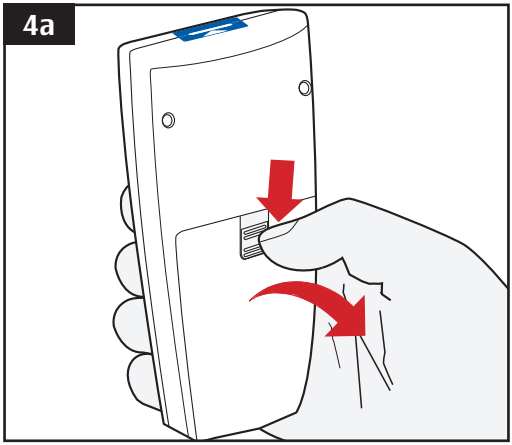
Repeat the filling steps for the second fingertip.

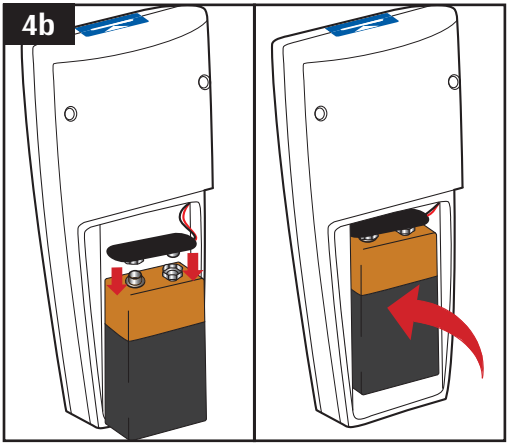
Once filled, proceed to **3a** on **page 9.**

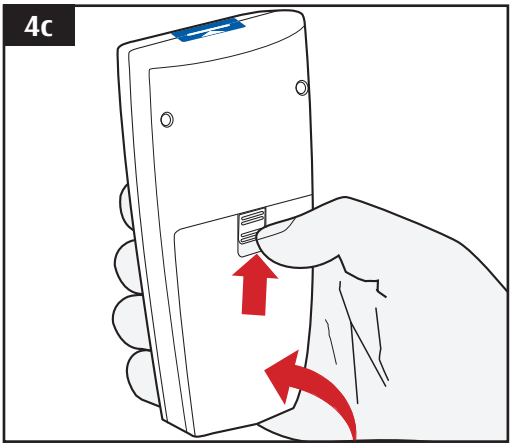
Before Use











Insert the Fingertips into the Simulated Hand

3a With the fingertips now full of mock blood, apply a small amount of the included lubricating jelly onto the white connector.

3b Orientate the fingertip correctly with the hand. Guide the white connector into the finger until the fingertip sits in place against the finger, with no visible gap.

Do not squeeze the fingertip too tightly as this may cause blood to leak.

Fingertips are interchangeable and fit either the middle or ring finger.

The hand is now ready for use.
See 4a below for set up of simulated glucometer.

Installing a Battery in the Simulated Glucometer

The simulated glucometer requires 1x 9V battery (not included).

Use only 1x 9V battery (not included) in the battery compartment of the simulated glucometer as indicated. Do not attempt to use any other type or size of battery. Other battery sizes may damage the simulator, and invalidate your guarantee.

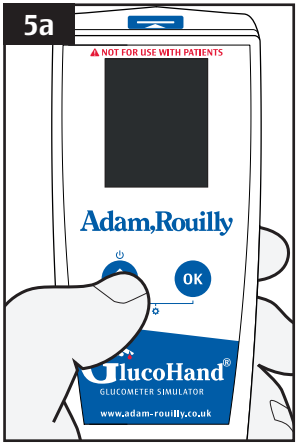
Do not power down and leave or store the trainer with batteries still installed for prolonged periods. Always remove batteries before storage.

4a At the rear of the simulated glucometer, move the tab down and remove the battery compartment door.

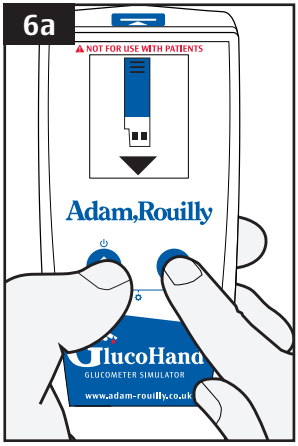
4b Attach a 9V battery using the connector cap and insert the battery into the compartment.

4c Replace the battery compartment door and move the tab up to lock in position.

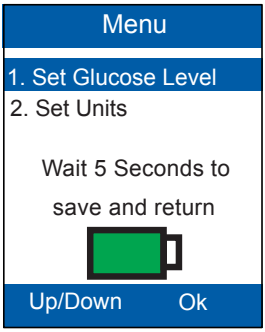
5a


NOT FOR USE WITH PATIENTS
Adam,Rouilly
OK
GlucoHand®
GLUCOMETER SIMULATOR
www.adam-rouilly.co.uk

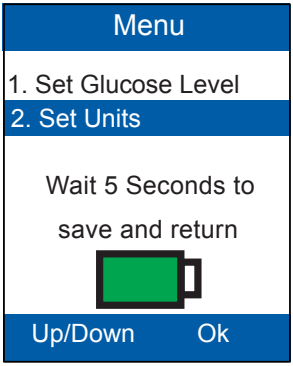
6a


NOT FOR USE WITH PATIENTS
Adam,Rouilly
GlucoHand
GLUCOMETER SIMULATOR
www.adam-rouilly.co.uk

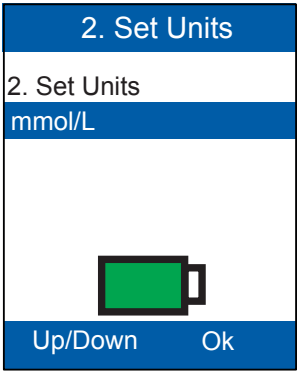
6b


Menu
1. Set Glucose Level
2. Set Units
Wait 5 Seconds to
save and return
Up/Down
Ok

7a


Menu
1. Set Glucose Level
2. Set Units
Wait 5 Seconds to
save and return
Up/Down
Ok

7b


2. Set Units
2. Set Units
mmol/L
Up/Down
Ok

Powering On the Simulated Glucometer

5a To power on, press and hold the up/down button  until the digital display illuminates.

The simulated glucometer also turns on automatically when a test strip is inserted.

Settings Menu

The simulator has a number of settings which can be altered.
To access the Settings Menu:

6a With the glucometer powered on and the insert test strip screen shown,

press **both** the up/down button  and the ok button **OK** simultaneously

6b The settings main menu will display as shown.

Use the up/down button  to scroll through options or alter a value

Use the ok button **OK** to access a menu option or confirm a setting

To **save/exit** the settings menu return to the main menu and wait for a brief moment - the simulator will return to the default insert test strip screen.

Changing the Default Unit Display

Depending on local policy, the glucometer can be set to display simulated blood glucose levels in **mmol/L (millimoles per litre - factory default)** or **mg/dL (milligrams per decilitre).**

To change unit displayed, proceed as follows:

7a In the settings menu select “Set Units”

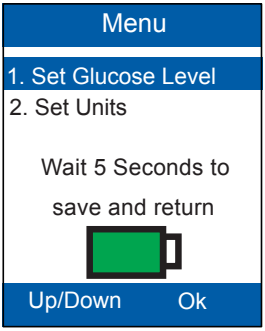
7b Use the up/down button  to select the desired unit display.

Press **OK** to confirm and save.

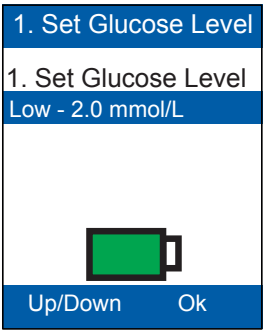
When the simulated glucometer is powered down or the battery is removed the unit setting is retained.

Before Use

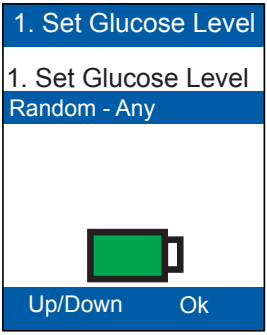
8a



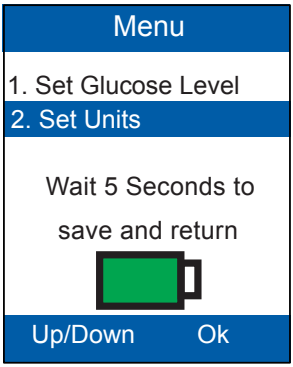
8b

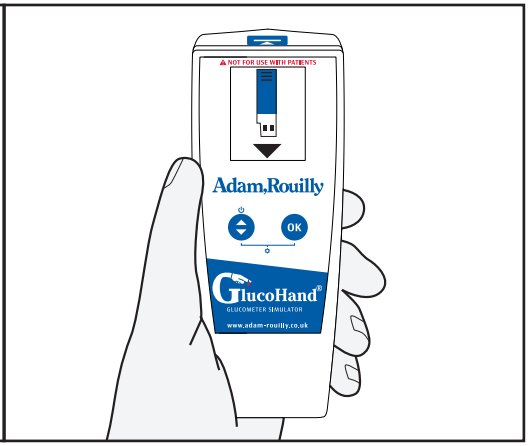


8c



8d





Pre-programming the Simulated Blood Glucose Level

The simulated glucometer may be pre-programmed to give a high, medium, low or random blood glucose reading for different training or simulation scenarios.

8a In the settings menu select "Set Glucose Level"

8b Use the up/down button to select the desired level.

Levels are displayed in either mmol/L or mg/dL as specified in default unit setting **(see 7a page 11)** and may be selected as follows:

Selectable Value mmol/L	Selectable Value mg/dL
Low - 2.0 mmol/L	Low - 36 mg/dL
Low - 2.3 mmol/L	Low - 41.4 mg/dL
Low - 3.4 mmol/L	Low - 61.2 mg/dL
Low - Random (any low value)	Low - Random (any low value)
Normal - 4.5 mmol/L	Normal - 81 mg/dL
Normal - 5.2 mmol/L	Normal - 93.6 mg/dL
Normal - 6.8 mmol/L	Normal - 122.4 mg/dL
Normal - Random (any normal value)	Normal - Random (any normal value)
High - 8.8 mmol/L	High - 58.4 mg/dL
High - 12.4 mmol/L	High - 223.2 mg/dL
High - 16.7 mmol/L	High - 300.6 mg/dL
High - High - Random (any high value)	High - Random (any high value)
Random Any low, normal or high value	Random - Any low, normal or high value

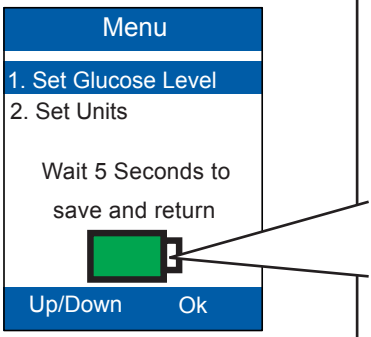
8c Press **OK** to confirm and save the desired value.

8d Wait briefly for the menu display to save and exit.

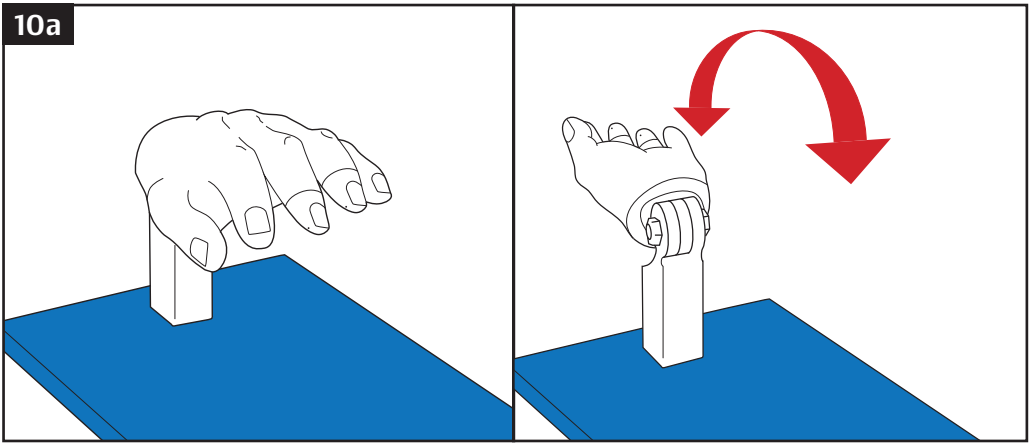
When the insert test strip screen is shown, the simulator is ready for use.

When the simulated glucometer is powered down or the battery is removed the glucose level setting is retained.

9a


Menu
1. Set Glucose Level
2. Set Units
Wait 5 Seconds to
save and return
Up/Down
Ok

10a



Battery Power Status

9a In the settings menu, the battery power is displayed as an icon:

Green battery - full capacity

Yellow battery- half full

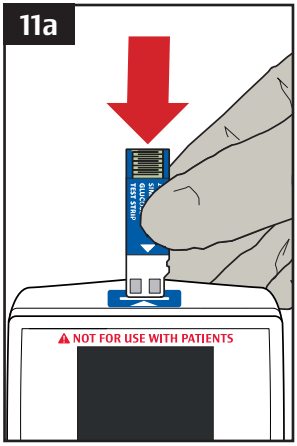
Red battery - little or no charge remains, replace battery

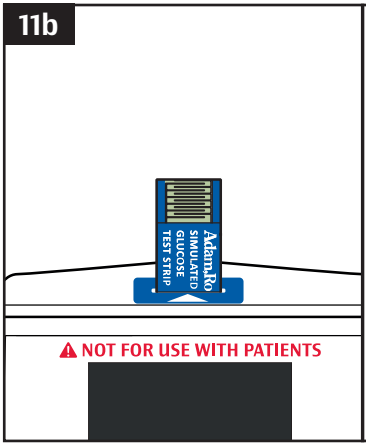
Positioning the Simulated Hand

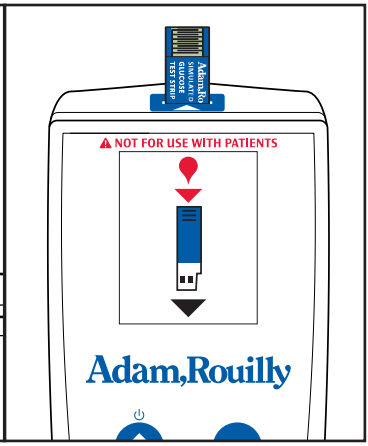
The simulated hand can be used with the palm facing up or down, or the hand vertically for use in different simulation scenarios, or with a simulated patient.

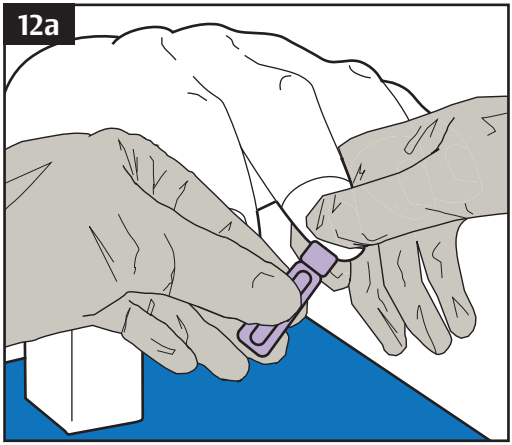
10a To move the hand, lift from the palm and to the desired position.

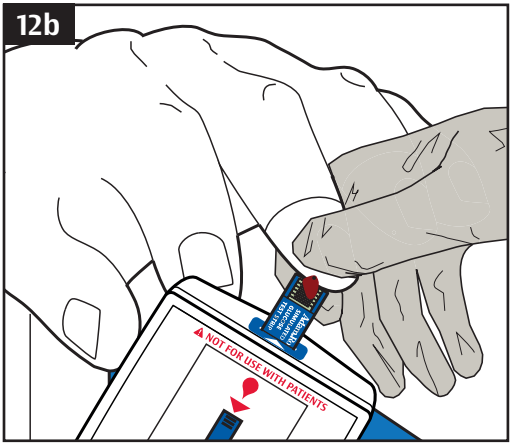
During Use - Blood Sampling Procedures

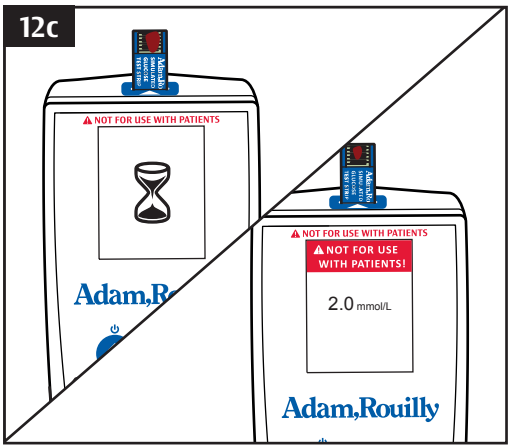


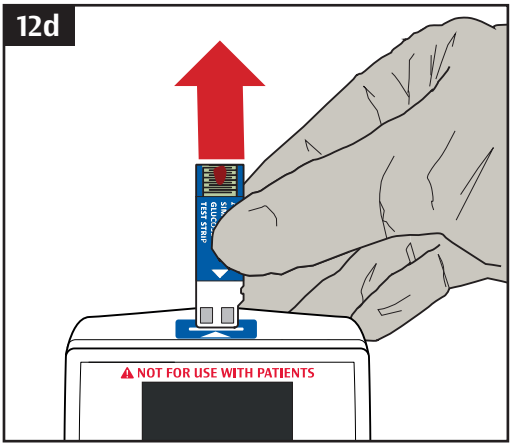












Not for use with patients. The digital simulated glucometer and simulated glucose test strips are for use only with the GlucoHand® model in simulation training scenarios and patient education.

Indicated blood glucose levels are populated by the glucometer simulator's electronics - either pre-programmed or randomised which may be altered by the user in the settings menu. The device will not read blood or control solutions.

This simulator is designed to facilitate training in obtaining and deciphering a blood glucose reading. The procedures demonstrated in this manual serve as a guide only. Local policies will determine the correct way of performing the procedure.

Inserting a Test Strip into the Simulated Glucometer

11a Ensure test strips are clean and dry if used previously. Insert a test strip into the top of the glucometer, ensuring the white arrows on both the test strip and the insertion point align.

11b Push the test strip into the simulated glucometer until it stops. When inserted correctly, the glucometer will power on and display the blood sampling screen.

Obtaining a Blood Sample from the Fingertips and Simulated Blood Glucose Level Reading

12a Each fingertip contains a pre-inserted hole which must be milked to obtain a blood sample. Lancet devices can be used to simulate finger prick practice - please observe the advice below for lancet size and use:

The removable, replaceable middle and ring fingertips contain a pre-inserted hole which may be milked to obtain a blood sample. Lancet devices may be used with the fingertips but will not pierce the fingertip skin. We recommend using devices of 28G or smaller with a maximum depth of 1.8 mm to avoid accelerated wear.

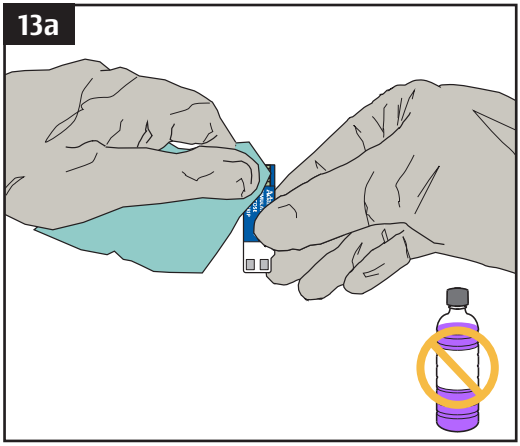
12b Gently milk a small sample of mock blood from the pre-inserted hole in the fingertip onto the metallic contacts at the end of the simulated test strip.

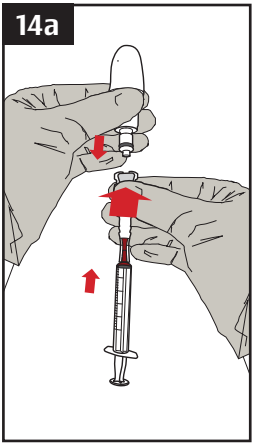
12c When a sufficient amount of mock blood is placed onto the test strip, the simulated glucometer will present a brief hourglass symbol then display the pre-programmed or randomised blood glucose level reading.

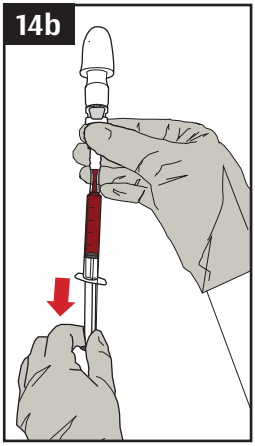
12d Once finished, remove the test strip from the simulated glucometer. The unit will switch off automatically, ready for another procedure.

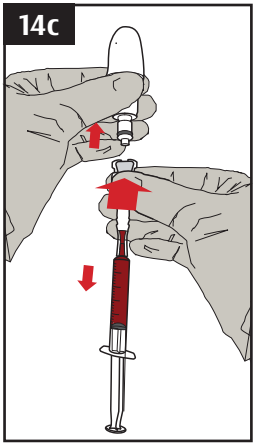
The test strips are reusable. Be sure to clean the test strip of mock blood promptly after use. See **13a** page 19.

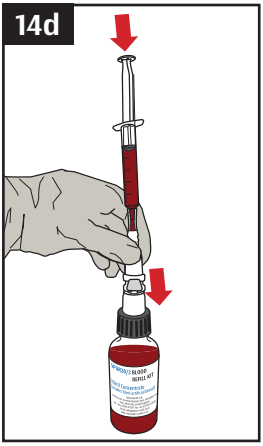
After Use

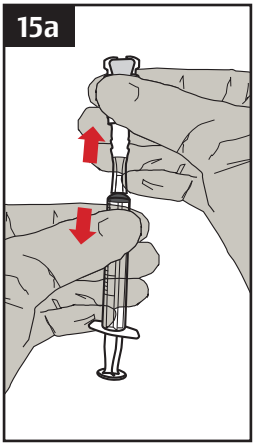


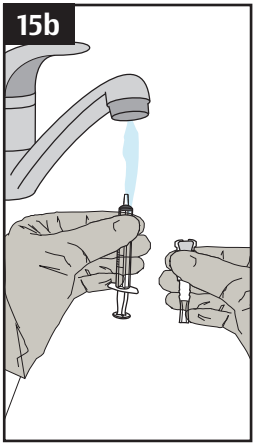


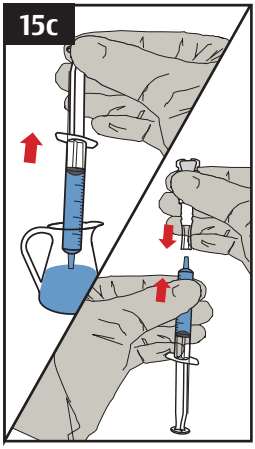


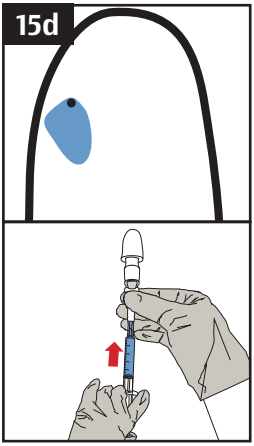


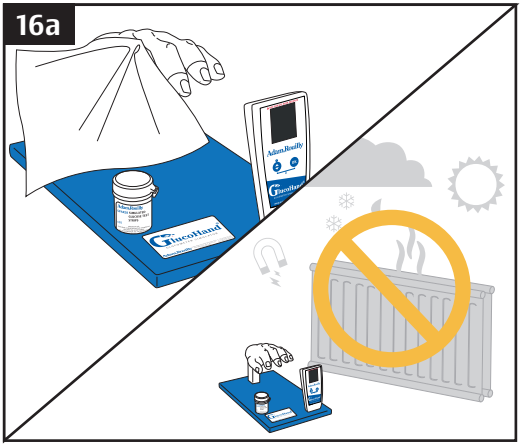












Cleaning the Test Strips for Re-use

13a After use, promptly wipe mock blood samples from the test strips with a damp cloth. A mild detergent solution can be used if necessary. Allow to dry fully before use.

Some colour transfer from mock blood is normal and will not affect performance of the test strip.

Do not use harsh chemical cleaners or immerse to clean the test strips. This could damage the strips and cause a malfunction

Empty the Fingertips of Mock Blood

Blood remaining in fingertips can be placed back in the blood refill kit bottle, ready for the next training session.

Before storage, or at the end of a training session, the fingertips must be completely emptied of blood and flushed through with clean water to prevent mould growth.

14a Connect a fingertip to the syringe and filling line, ensuring it clicks into place.

14b Draw the syringe to empty the fingertip of blood.

14c Disconnect the syringe and filling line from the fingertip.

14d Reconnect the syringe and filling line and inject the blood back into the blood bottle. Repeat for the second fingertip. Disconnect and store safely.

Flush the Fingertips with Fresh Water

15a Disconnect the syringe from the clear filling line and connector.

15b Rinse out any residual blood out of both the syringe, filling line and connector.

15c Fill the syringe with fresh, clean water. Reconnect the syringe to the filling line and connector.

15d Connect the syringe and filling line to the fingertip and flush through with clean water. Slightly over pressurise so that the pre-inserted hole is also flushed through. Withdraw all of the water and repeat using fresh water for the second fingertip.

Cleaning and Storage

16a The simulated hand, fingertips and simulated glucometer may be cleaned with a mild detergent solution and soft cloth.
Store the model appropriately when not in use.

The trainer contains sensitive electronic parts. Do not store near heat or where it may experience extremes in temperature, humidity or magnetic fields.

2 Year Guarantee

All products manufactured by Adam,Rouilly are covered by our full 2 Year Guarantee. This guarantee applies to models which have been used correctly and covers durability and functionality.

Adam,Rouilly

As part of our policy of continual product development, the specification of products may alter without prior notice.

Adam,Rouilly has over 100 year's experience in providing quality medical models and simulators.

Should you require any further information please contact our Sales Department who will be pleased to help with your enquiry.

Adam,Rouilly Limited
Castle Road
Eurolink Business Park
Sittingbourne
Kent
United Kingdom
ME10 3AG

T: +44(0)1795 471378

F: +44(0)1795 479787

E: sales@adam-rouilly.co.uk

www.adam-rouilly.co.uk

S0033 NBY M2