Full Instructor Guide

EM Evidence Sim · updated 10 October 2026

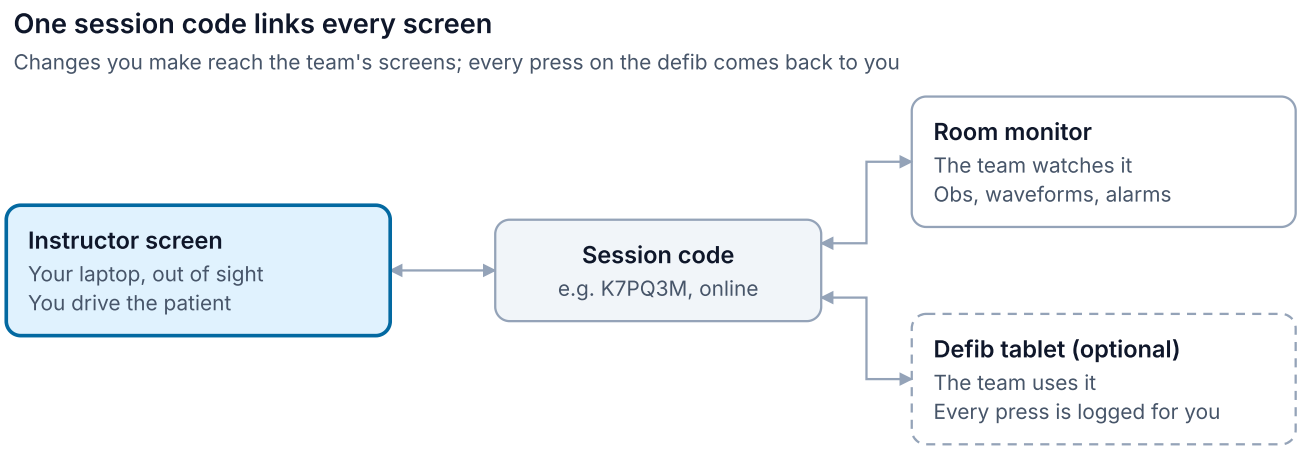
This guide explains everything an instructor needs to set up, run and debrief a scenario. New to the app? Start with the Quick Start Guide.

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At a glance

A simulation uses up to three screens, all linked online by one six-character session code.



How the screens link: three devices, one session code.

You drive the patient from the instructor screen. The room monitor shows the team only what they have attached. The defib tablet, if used, sends every press back to your event log.

Before the session

Allow 10 minutes to set up the screens and test them before the team arrives.

Equipment

Device	Role	Where it goes
Laptop or tablet	Instructor screen: you drive the patient from here	Out of the team's sight, ideally where you can see the room
Second screen, TV, projector or device	Room monitor: the patient monitor the team watches	Where a real monitor would be, visible to the whole team
Tablet (optional)	Defibrillator	At the bedside, for Defib Sim or any scenario that needs a defib
Tablet (optional)	Ventilator (HAMILTON-T1, or the Dräger Atlan A350 anaesthetic machine or HAMILTON-C6 for Anaesthetics / ICU)	At the bedside, for Ventilator Sim or any ventilated patient. It can also show on the room monitor tablet
Speakers (optional)	Alarms and monitor beeps	Next to the room monitor

All devices need an internet connection, and any up-to-date web browser. You do not need an account to run the built-in scenarios.

Pre-flight checklist

- ☐ Open emsimulator.com on the instructor laptop and note the session code
- ☐ Open the room monitor and tap **Tap to Enable Sound** if it shows (it only appears while the browser is blocking sound)
- ☐ Link the defib tablet, if you are using one
- ☐ Check the badge on the instructor screen reads **Live** and names the linked screens
- ☐ Load your scenario and read its brief
- ☐ Turn the room monitor's volume up and check you can hear an alarm
- ☐ Change one vital sign and check the room monitor follows

Session codes and linking screens

The six-character session code (for example K7PQ3M) links every screen in one simulation. It never uses look-alike characters (no 0/O or 1/I/L), so it is easy to read out. It shows at the bottom of

the start screen and as "Session ID" in the top right corner during a scenario.

- **Same code all day:** one code can run any number of scenarios with the same group. The linked screens stay linked between scenarios.
- **New code:** open **Connect patient screens** on the start screen and press **New code** for a new group. Screens on the old code must join again.

Ways to link a screen

Screen	On the same laptop	On a separate device
Patient screens	On the start screen press **Connect patient screens** (or, once running, **Screens**), then **Open a patient screen on this computer** once for each extra screen. Each opens in its own window: drag it onto its screen and make it full screen. Keep them as windows, not tabs	Scan the QR code in **Connect patient screens** (or **Screens**) with the device; or, on the device, open the site, choose **Patient screen** when it asks what the device is for, type the code and press **Connect**. The device asks nothing else
What each screen shows	The controller numbers each screen as it joins, and while the Screens panel is open every screen shows its big number. For each numbered screen, tick **Monitor**, **Defib** and/or **Ventilator**, or press a **Quick set-up** (for example **Monitor | Defib + ventilator** for two screens, or **Monitor | Defib | Ventilator** for three). You can change it at any time, and the screen changes at once. A screen with the monitor switches to the defib or ventilator when you bring it in with your **Defib** and **Ventilator** buttons, and the candidate can switch back with the buttons at its bottom left; a screen without the monitor shows its device all the time. A device stays running while it is switched away from. A new screen starts with everything; a screen always shows at least one thing; and if you bring in a device that no screen shows, the controller warns you	

Checking the link: the badge in the instructor top bar shows the connection.

Badge	Meaning
Live · no screens linked	Your session is online but nothing has joined yet
Live · patient monitor (or "2 screens linked")	Linked and working
Syncing	Connecting; wait a few seconds
Sync error	The connection has failed; check the internet

Hover over the badge to see each linked screen and when it was last heard from.

Choosing a scenario

When you open the app it asks **What is this device for?** Choose **Controller** on your laptop (a patient screen chooses **Patient screen**). The start screen then asks **What do you want to run?** with a card for each way to start; **All options** takes you back to the cards. The Scenario library covers

most teaching; Defib Sim is for defibrillator skills and Ventilator Sim for ventilator skills. Setting up the patient screens is optional before you start: with nothing set up the app uses one screen, and **Connect patient screens** (or **Screens** during a scenario) sets them up whenever you are ready.

Card	What you get	Best for
Scenario library	254 written scenarios in 8 categories: Adult Medical, Trauma, Paediatric, Cardiac Arrest, Toxicology, Obs & Gynae, Elderly, Psychiatric	Planned teaching with set objectives
Quick Sim	A blank patient: you set age, weight, sex, name and starting rhythm. No scenario, drugs or scoring	Ad-hoc teaching, rhythm recognition, obs drills
Defib Sim	Defibrillation, cardioversion and pacing on the defib tablet, with its own controller	Defib skills and assessment (see Running a Defib Sim)
Ventilator Sim	Nine ventilator scenarios on the HAMILTON-T1: NIV, CPAP, lung-protective and asthma ventilation, setting up after RSI, troubleshooting, mucus plugging and transfer, with the full instructor screen	Ventilator skills and assessment (see The ventilator and Ventilator Sim)
Anaesthetics / ICU	The Dräger Atlan A350 anaesthetic machine for ten anaesthetic emergencies for novice anaesthetists (eight following the Association of Anaesthetists' Quick Reference Handbook, plus an oesophageal tube and a leak or disconnection) and three machine skills scenarios (machine check and induction, low-flow sevoflurane, emergence), and the HAMILTON-C6 intensive care ventilator for ICU ventilation (the emergencies run on either)	Anaesthetic emergencies and ICU ventilation (see Anaesthetics / ICU)
Random scenario	A generated patient from your choice of category, age group and acuity	Unpredictable cases for experienced teams
My scenarios: Saved	Scenarios you have saved or imported as a file, kept in your account so they follow you to any device. You must be signed in to see, save or import them. **Edit**, **Load** or **Delete** each one (Delete asks you to confirm and removes it from your account). Scenarios saved in a browser before accounts held them are listed as *saved on this device only*: sign in and press **Add to my account** to keep them	Your own material
My scenarios: Builder	A form to write a scenario field by field. Signed in, **Save** or **Save and run**; signed out, **Run without saving** runs it once and does not keep it	Writing new scenarios

Card	What you get	Best for
Restricted (in the Scenario library)	Copyright-restricted scenarios (for example RCUK)	Only if your account has been given access

Human factors. Random and Builder can add a challenge: Blindfolded Lead, Silent Team, New Junior, Missing Kit or Distracted Senior. It shows as a badge on your screen so you can brief the right person.

Paediatric scenarios. WETFLAG starts hidden on the room monitor. Tick **Show WETFLAG on Monitor from the start** on the start screen (under the scenario options) if you want the team to see it straight away. You can show or hide it at any time during the scenario (see Paediatric scenarios).

The brief. Loading a library, random or saved scenario opens a brief before anything starts:

- **Patient Brief:** name, history, medicines and allergies
- **Required Equipment**
- **Clinical Progression:** how the scenario is expected to unfold
- **Key Interventions** the team should perform
- **Guidelines & Resources**
- **Learning Objectives:** what the debrief scores against

Press **Start Scenario** to begin, or **Back to Setup** to choose another.

Resume Previous? If the instructor tab was closed during a scenario, the setup screen offers to resume it. The app saves your progress every few seconds.

Scenario paused. Pressing **Back** during a scenario pauses it and returns to the setup screen, which shows **Return to scenario**. Press it to carry on where you left off, then **START**. Starting a different scenario replaces the paused one.

A tour of the instructor screen

The screen has a top bar, the patient on the left, and treatments and the event log on the right. Drag the divider between the columns to widen either side.

Top bar

Control	What it does
Back	Pauses the scenario and returns to the setup screen; **Return to scenario** there brings you back
Finish	Ends the scenario and opens the debrief (asks you to confirm)
PAUSE / START	Stops or restarts the clock

Control	What it does
Connection badge	Shows the session is live and which screens are linked
Safety flags	Appears when the team does something out of the usual order; opens the list
Muted	Appears in red while alarms are muted; press to unmute
Simple / Full	Hides or shows the advanced controls (below)
Screens	The patient screens: the QR code to join one, **Open a patient screen on this computer**, and every numbered screen with what it shows (Monitor, Defib, Ventilator), which you can change at any time. Every screen shows its number while this is open
Tools ▾	Drug calculator, Timer alerts, Full simulation log, where sound plays, Mute alarms, Keyboard shortcuts

Left column: the patient

Each grey bar is a section. Click its title to open or close it; a closed section shows a one-line summary. The app remembers which sections you keep open on that device.

Section	Starts	Contains
Patient details	Quick Sim only	A one-line summary of the patient. In other scenarios the scenario sits in the **Patient now** strip at the top instead: name, age, the story and what happens next, with a **Full scenario** button for everything from the briefing (history, injuries, starting obs, what Better and Worse do, key interventions, learning objectives)
Patient picture	Always shown, in the **Patient now** strip	A full-body picture of the patient (a man, a woman, a pregnant woman or a child, from the scenario; grey in arrest, blue when cyanosed, eyes closed when unconscious) with what is attached, the injuries the scenario describes (for example a fractured leg drawn bent) and kit the team applies (collar, pelvic binder, traction splint, splints, tourniquet, chest seal, dressings). **Change**, beside the injuries, adds or removes injuries for this run
Set up patient	Beside START, until the scenario starts (every mode)	Sets the injuries and what is already done when the team arrives (for example both legs amputated, tourniquets, an IV cannula and an oxygen mask). Kit put on here does not change the obs and is not marked as the team's; the team can still take it off
Show on monitor	In the **Patient now** strip, and in Set up patient	Shows the patient picture on the room monitor for the team, before or after START, as a handover or a guide to the moulage. Press it again (**Hide from monitor**) to take it off; a result sent to the monitor also replaces it

Section	Starts	Contains
Monitoring & access	Closed	What is attached (ECG, sats, cuff, temperature, capnography, arterial line, IV access); **Attach** stays on the bar
Monitor strip and vitals	Always shown	The waveforms, **Show timer**, **Change rhythm**, and tiles for HR, BP, SpO2, RR, Temp and ETCO2
More obs	Open	GCS and glucose (plus pH and K+ in Full view)
Drugs on board	Open, once a drug is given	Each drug's phase, strength and time left
Patient condition	Closed	AUTO or MANUAL deterioration; **Better** and **Worse** stay on the bar
Rhythm & resus	Open	ARREST, ROSC, Arrest View, Defib, Cycle NIBP Now, Auto NIBP, Manual Reading, Show/Hide WETFLAG on Monitor (child scenarios), and the rhythm and shock tally

Right column: treatments and the log

- **Search** finds any treatment by name or route (for example "IM").
- **Tabs:** Common, Drugs, Airway, Breathing, Circulation, Procedures, Investigations, Voice and Assessment. In Common, the scenario's **Recommended actions** sit at the top in an amber box.
- **Voice:** type what the patient says and press **Speak**; it is read aloud on whichever screen plays sound.
- **Assessment:** tick or cross Safe Approach, Team Leadership, Communication, CPR Quality, Defib Safety and Re-evaluation as you watch.
- **Event log** (bottom): always on screen; see The event log, notes and flags.

Simple and Full view

Simple is the default and is remembered on each device. It hides:

- the drug-timing detail lines in Drugs on board
- the "+ Invasive" button that attaches IV access, an arterial line and capnography in one go (the separate buttons stay)
- the pH and K+ tiles
- the defib's shock-response settings and "Next shock converts to" (one line shows what is set; click it to switch to Full)
- the Quick Sim preset list (a preset that is running stays on screen)

Nothing is removed in either view.

On a phone, the obs tiles, rhythm, clock and START/PAUSE sit at the top, and the page scrolls.

Running the patient

You mirror what the team does: they act in the room, you press the matching control, and the patient and room monitor respond.

Monitoring and access

The room monitor only shows what the team has attached. Open Monitoring & access to see a chip for each item.

- Click a chip to attach it (○) or remove it (●). Removing one blanks its trace and number on the room monitor. Every change is logged.
- **Attach** puts on the standard four: ECG, SpO2 probe, NIBP cuff and temperature probe. Capnography, the arterial line and IV access are separate, deliberate steps.
- **Remove all** takes every monitor off. IV access stays, because it is a route, not a monitor.
- **POC glucose** and **POC VBG** take a one-off reading at that moment. Click again to take a new one.

Vital signs

Your tiles always show the patient's true values, even when the team cannot see them; "not on monitor" means the team cannot see that number yet.

1. Click a vital's tile.
2. Type the new value. For ETCO2 you can also pick the capnogram shape: Auto, Obstructive, Force normal, Rebreathing or Curare cleft (see Capnography).
3. Under **Get there**, choose **Now**, **30 s**, **2 min** or **5 min** for a gradual change. BP starts on **Now**; everything else starts on 30 s.
4. Press **Confirm**. For BP there are two buttons instead (see below).

A heart rate you set yourself is kept if you later change the rhythm. ARREST and ROSC reset it.

What you type wins over treatments already given. For example, with high-flow oxygen on, setting the SpO2 lower takes it lower and keeps it there; the oxygen no longer pushes that number up. Treatments given afterwards act as normal.

Blood pressure

Changing the BP never sends it to the team by itself. The room monitor and the defib tablet keep showing the last cuff reading until the cuff cycles, as in real life. The cuff cycles when the team presses **Cycle** on the monitor or **NIBP** on the defib, when you press **Cycle NIBP Now**, or every 3 minutes while auto is on.

When you set a BP with **Now** and the cuff is on, you choose:

- **Change, don't send**: the patient's BP changes now. The team sees it the next time the cuff cycles.

- **Change and cycle cuff now**: the BP changes and the cuff starts measuring straight away. The cuff noise plays and the new reading appears after about 5 seconds.

If you pick 30 s, 2 min or 5 min instead, the BP drifts to the new value and the team sees wherever it has got to at the next cuff cycle.

Auto NIBP: on/off, next to Cycle NIBP Now, is the same switch as **Auto** on the room monitor: the cuff measures every 3 minutes. Like everything else it waits until you press START. An arterial line, once attached, shows the BP continuously. **Manual Reading** shows a one-off cuff reading on the room monitor without changing the patient (for example a spurious reading).

Capnography

Once capnography is attached, the room monitor draws the capnogram at half the speed of the ECG, as the ZOLL R Series does. Several breaths fit on screen, and each one is wide enough to read its shape. The height of the plateau always matches the ETCO2 number.

Shape	When you see it
Normal: a sharp rise, a flat plateau ending at the ETCO2, then a sharp drop to zero as the patient breathes in	Normal breathing or ventilation. A slow rate gives wide waves with a long plateau; a fast rate gives narrow ones
Obstructive ("shark fin"): a slow, sloping rise with no flat plateau	Bronchospasm. On Auto it follows the scenario's bronchospasm and softens as bronchodilators work; Obstructive forces it
Rebreathing: the trace does not return to zero between breaths	Choose Rebreathing
Curare cleft: a notch in the plateau	Choose Curare cleft
No waveform: a flat line at zero	Shows by itself when nothing is moving gas: apnoea, an oesophageal tube or a disconnected circuit
Low trace with small ripples from chest compressions, a breath every 6 seconds	During CPR (10 ventilations a minute)

The ETCO2 control (tap the ETCO2 tile) chooses the shape: Auto, Obstructive, Force normal, Rebreathing or Curare cleft.

Treatments and drugs

Find the treatment by search or tab and click it. The app then:

- logs it with the time
- applies its effect over a realistic time course: onset, peak and wearing off
- shows it in **Drugs on board** with its phase (for example ONSET), strength and time left
- for infusions and oxygen, keeps it running until you click it again; use **+** and **−** in Drugs on board to change an infusion's rate

If the team gives a drug before its prerequisite (for example an IV drug with no IV access), the app records a **safety flag**. Child doses follow the RCUK paediatric guidance (see Paediatric scenarios).

Investigations

The team can tap **12-Lead**, **VBG**, **CXR**, **Urine**, **POCUS** or **CT Head** on the room monitor to see results. From the **Investigations** tab you can also send a result yourself:

- **Scenario finding**: the scenario's own result. The box under the button shows what it says (and its image) before you send it.
- **Results with a real image**: real X-rays, CT scans, 12-lead ECGs and ultrasound images, each with a written report. Untick **Show the written report with the image** to send the image alone, so the team has to interpret it.
- Written reports without an image, or a result you type.

In Quick Sim and Defib Sim, **Investigations: send or change** lists every result with a purple **Send** button, so you can put any result on the patient screens whenever you choose.

On the room monitor an image appears with its report; tap it to fill the screen. Many scenarios now come with their own real image (for example a tension pneumothorax, subarachnoid haemorrhage or anterior STEMI). When the team taps **12-Lead** in a scenario with a real ECG, they see that ECG while the patient is still in that rhythm; after a change of rhythm (for example into VF) the monitor draws the 12-lead from the live rhythm instead. The images are real, openly licensed clinical images from Wikimedia Commons; their authors are credited under each image and on the image credits page.

Deterioration

Patient condition shows the mode:

- **AUTO:** the patient gets worse on their own, at the rate the scenario sets, unless the team treats them.
- **MANUAL:** the obs only change when you change them.

Better and **Worse** move the patient towards the scenario's improved or worsened obs over 30 seconds, in either mode. In many scenarios, giving one of the key treatments starts the improvement by itself, and the log says "Patient condition IMPROVING".

Quick Sim has no scenario, so it leaves out treatments, drugs, deterioration and scoring. Its right side holds the full rhythm list, presets (Full view), Better and Worse, and the event log.

Arrests, rhythms and the defibrillator

All rhythm and resuscitation controls are in the **Rhythm & resus** section.

Control	What it does
ARREST ▾	Pick the arrest rhythm. The obs drop to arrest values and the arrest timer starts

Control	What it does
ROSC ▾	Pick the post-ROSC rhythm. Circulation returns
Change rhythm (above the vitals)	Change to any rhythm without an arrest or ROSC, for example sinus to AF
Arrest View	Switches the room monitor to the arrest layout: Lead II, pads and, when capnography is attached, the capnogram with the ETCO2. It does not open a defib
Defib	Opens a working defibrillator on the room monitor, with the obs still visible, and a defib panel on your screen

The panel under these buttons shows the current rhythm (marked shockable, sync cardiovert or pulseless), the number of shocks, total and last energy, and whether CPR is running.

Using the defib panel on your screen: choose the energy (the recommended energy is marked), then **Charge** and **SHOCK**. **SYNC** switches synchronised cardioversion on and off. **CPR start/stop** and **Rhythm check +2m** (jump forward two minutes) are there too, with the CPR cycle timer.

What a shock does. By default a realistic model decides: the energy, the rhythm, whether CPR is running and the drugs given all count. In Full view you can override it:

- **Next shock converts to:** the next shock gives exactly the rhythm you pick.
- **Shock response:** converts on the 1st to 5th adequate shock, never (refractory), Auto or the realistic model.
- **Unsync shock with a pulse:** whether an unsynchronised shock into a perfusing rhythm causes VF (never, sometimes or always).
- **After ROSC:** whether VF comes back.
- **Cardioversion succeeds at:** the lowest energy at which cardioversion works.

When a shock converts the rhythm, or fails to, a pop-up tells you on your screen only. The team never sees it.

Learner defib on a tablet. For defib skills with a real-looking device, use the defib tablet (see Running a Defib Sim). It works in a normal scenario too: join the tablet as a patient screen (the QR code in **Screens**), then tick only **Defib** for its number.

Running a Defib Sim

In a Defib Sim the learner works a ZOLL-style defibrillator on a tablet, and you run the patient from the **Defib controller**, which replaces the normal instructor screen.

Setting it up

1. On the setup screen, choose the **Defib Sim** card.
2. Choose the mode:

- **Education:** the defib shows pulse-check results and RCUK hint cards.
- **Assessment:** no pulse-check results or hint cards, as on a real defib. Feedback comes in the debrief.

3. Choose a scenario: Ventricular Fibrillation, Pulseless VT, VT with a pulse (unstable), SVT with life-threatening features, Fast AF with life-threatening features, Complete heart block, Symptomatic bradycardia, **Free play** (starts in sinus rhythm; you change it), or **Custom scenario**.
4. Check age, weight and sex. A patient under 18 gets the paediatric hint cards, energies and drug prompts.
5. Press **Start Defib Sim**, then link the tablet with **Join** (QR code) or **Open defib**.

Hover hints. On the defib, resting the mouse on any button or display shows what it does (keyboard focus shows it too). On a tablet a tap just presses the button, with no hint. The hints describe the controls only, so they show in Assessment as well.

Custom scenarios run a sequence of up to five rhythms. Each step moves on at a trigger you pick: on analyse, on shock, on pacing capture, or after 30 s, 60 s or 2 min. Save, Load, Export file and Import file keep sequences on that device or share them. During the run, **Next step** and **Restart sequence** let you move it on by hand.

The clock. It starts when you press **START**, or by itself at the learner's first press on the defib. A banner warns you while it is not running. If you **PAUSE**, presses are still logged but the clock stays stopped until you press START.

The Defib controller

Area	What it does
Patient	Who the patient is, plus tags such as Needs SYNC, Needs pacing and the RCUK energy advice
What the pads show	The rhythm and the patient's true obs (the BP here is the live BP, not the last cuff reading)
The learner's defib	A live mirror of the tablet: mode, energy, SYNC, pacer settings and the screen message, plus shocks given
Rhythm	Click a rhythm to change it; **All rhythms** shows the full list
Shock response (closed)	How shocks resolve, and **Cardioversion succeeds at** (see Arrests, rhythms and the defibrillator)
Pacing & artefacts (closed)	The capture threshold (± 5 mA; a pulse needs about 10 mA more), and movement, mains interference or lead-off artefact

Area	What it does
Arrest	Time in arrest and shocks, the cycle timer, **Start CPR**, **Metronome**, **Rhythm check (+2:00)**, **ROSC**, **Capnography** and **Cycle NIBP**. Capnography on puts a capnogram under the ECG and the ETCO2 number on the learner's defib; while it is off, the defib shows "--" for ETCO2, as a real one without its CO2 sensor does. The defib's NIBP shows only the last cuff reading: it changes when the learner presses **NIBP** on the defib or you press **Cycle NIBP**
RCUK prompts	When adrenaline or amiodarone is due. You see these in both modes; the learner never does
Drugs (closed)	Adrenaline, amiodarone, atropine, adenosine, isoprenaline, adrenaline infusion, fentanyl and midazolam
Event log	Every press on the defib with its time; add notes and flags

Closed sections show a one-line summary, for example "Never converts · cardioversion at 200 J".

How shocks resolve by default. Defib Sim uses **Auto**: an arrest converts on the third adequate shock, and a cardioversion on the first adequate synchronised shock. "Adequate" means at least 150 J for an adult (3 J/kg for a child) to defibrillate, and 75 J (1 J/kg) to cardiovert. These thresholds are simulator settings, not guideline values. An unsynchronised shock into a rhythm with a pulse causes VF.

Pacing captures electrically at the scenario's threshold (it varies by up to 15 mA each run) and gives a pulse about 10 mA above it. Demand pacing is inhibited by a faster native rate.

Debrief. The debrief lists good practice and areas for improvement: pulse checks, mode, SYNC, energies, time to first shock, drug timing, sedation before cardioversion, analgesia for pacing and capture. **Certificate** prints a certificate of completion.

The ventilator and Ventilator Sim

The simulator includes a HAMILTON-T1 ventilator: the same device as the standalone ventilator trainer. It works in any scenario, and Ventilator Sim builds scenarios around it. The physiology is a teaching model, not validated physiology.

Where the candidate uses it

- **On the room monitor tablet.** In the controller's **Ventilator** section, press **Show the ventilator on the patient screens** (Ventilator Sim does this for you; the same button then reads **Take the ventilator off the patient screens**). The candidate can flip between the ventilator and the obs without stopping it. The defib and the ventilator share that screen, so opening one closes the other.
- **On its own tablet.** Join the tablet as a patient screen, then in **Screens** tick only **Ventilator** for its number. Monitor, defib and ventilator screens can all run at once, in sync.

Starting a Ventilator Sim

1. On the setup screen, choose the **Ventilator Sim** card.
2. Choose **Education** (the ventilator shows its alarm troubleshooting help) or **Assessment** (no help on the screen; feedback in the debrief).
3. Choose a scenario: AECOPD (start NIV), cardiogenic pulmonary oedema (CPAP), obesity hypoventilation (NIV), ARDS (lung-protective ventilation), severe asthma (intubated), after RSI in the ED (set up from scratch), troubleshooting (DOPES), mucus plugging (bronchoscopy teaching) or interhospital transfer. Intubated scenarios start with the tube recorded and the patient sedated and paralysed.
4. Press **Start Ventilator Sim**. The ventilator opens on the room monitor; link a tablet instead if you prefer.
5. Press **START** when the candidate begins, so the event log, the obs graph and the debrief have real times.

The full instructor screen is available, with the scenario's brief at the top of the **Ventilator** section and its likely treatments in **Recommended actions**: needle decompression and finger thoracostomy, bronchoscopy, suction, sedation and paralysis, nebulisers and the rest of the treatment list. Re-running the same scenario gives the candidate a fresh ventilator.

What the ventilator does to the patient

While it is ventilating, SpO2 follows the oxygen and PEEP, CO2 follows the ventilation and settles over 3 to 5 minutes, the RR is the ventilator's rate, and low SpO2, high CO2 and air trapping change HR and BP. This happens whether or not the clock is running, and not in a cardiac arrest. Any obs you type yourself stay as you set them until you press **Release to ventilator**; **I set them** turns the link off altogether.

Controlling it

Control	What it does
Lungs and Own breathing	The lung profile (normal, AECOPD, pulmonary oedema, obesity hypoventilation, ARDS, severe asthma) and whether the patient breathes for themselves
Lungs (adjust)	Compliance, resistance, CO2 production, oxygenation impairment and the patient's own rate
Ventilator model	The HAMILTON-T1 (transport), the HAMILTON-C6 (ICU) or the Dräger Atlan A350 (anaesthetic machine). Changing it swaps the device on every screen; the new one starts switched off

Control	What it does
Problems	One press to inject, again to fix: leaks, disconnection, coughing, kinked expiratory limb, apnoea, oxygen failure, mains lost, tiring, cracked circuit, displaced tube (no CO2), blocked tube, bronchospasm, tension pneumothorax (needle, finger thoracostomy or a drain fixes it), a low battery, mucus plugging (SpO2 in the high 80s on 100% oxygen, high pressures, small breaths; the Bronchoscopy intervention or the **Bronchoscopy done** button clears it) breath stacking (AutoPEEP builds and the BP falls) and an endobronchial tube (one lung: higher pressures, SpO2 falls; the **Pull tube back** intervention or the **Tube pulled back** button fixes it). Grouped as tube and circuit, lungs, patient and equipment; once a problem is in, the panel says what the candidate should see.
Education / Assessment	Shows or hides the ventilator's alarm help
Control this ventilator	Under each ventilator's mirror: switch on or off, start or standby, mode, every setting and alarm limit (step or type a value), silence, O2 enrichment, lock the screen and a fresh ventilator. Use it to hand over a ventilator with deliberate errors. Your changes are logged as yours

Anaesthetics / ICU: the Atlan A350 and the HAMILTON-C6

The **Anaesthetics / ICU** card asks which **Machine**: the Dräger Atlan A350 anaesthetic machine (the default) or the HAMILTON-C6 ICU ventilator. The anaesthetic emergencies run on either; the ICU ventilation scenarios run on the C6.

The Atlan A350 is a recreation of the anaesthetic machine: it starts switched off. Press **On / Standby**; the Standby page shows whether the system test and leak test have been passed today. The tests need the Y-piece sealed on the circuit plug (touch the Y-piece beside the bag) and the APL valve set (not at Spont), and fail with a leak (the circuit leak problem). **Start...** then the rotary knob starts therapy; **Quick start Man/Spon** starts hand ventilation at once. In Man/Spon, press and hold the bag to give a breath: the APL valve sets the pressure limit, and left closed with a high fresh-gas flow the bag fills and the airway pressure climbs ("Airway press. continuously high"); Spont opens it. The ventilator modes are on the tabs along the therapy bar (VC - AF, VC, PC, PSV, with SIMV/CMV). As on the machine, touch a setting (yellow), turn the knob, and press the knob to confirm: a change that is not confirmed within 15 seconds is dropped, and a new mode shows in light green until the knob confirms it. The fresh gas (Air or N2O, FG O2, FG flow), the sevoflurane vaporiser, O2+ and the emergency O2 (Aux. O2 / Add. O2) are all simulated: the inspired O2 rises slowly at low fresh-gas flows, and the gas field shows the inspired and end-tidal gases and xMAC (set the patient's age in the Start dialog). The screen areas, setting names, ranges, start values, alarm texts and priorities follow Dräger's instructions for use; the layout, colours, the hardware arrangement, the gas model and some alarm wording and delays are the simulator's. The controller's remote control works as for the other ventilators; on the A350 its O2 button sets FG O2 to 100%.

Hints and the guide on the A350. Resting the mouse on any control, display or part of the hardware shows what it is and how to use it (on a tablet, a tap simply presses it). In **Education**, a **Guide** column beside the machine says in plain words what is happening (the mode, the breaths, the gas, the tidal volume per kg, why an alarm is showing and what to check) and has **How do I...** step-by-step help, for example changing mode to PC-SIMV: it outlines the next thing to touch and ticks off each step. The candidate can hide it with its **Guide** button; it is not shown in **Assessment**. The hint and guide wording is the simulator's own teaching text, not Dräger's.

The HAMILTON-C6:

The **Anaesthetics / ICU** card uses a recreation of the HAMILTON-C6 intensive care ventilator: a widescreen display with the main controls along the bottom and the keys below the screen. It has everything the T1 page has, plus volume-controlled **(S)CMV** and **SIMV** with an inspiratory pause (so Ppeak and Pplateau separate a resistance problem from a compliance problem), wider ranges, and the C6's names for the adaptive modes (APVcmv, APVsimv). Start it like Ventilator Sim: pick Education or Assessment, a scenario, then **Start ICU ventilator scenario** (or **Start anaesthetic machine scenario** on the A350). A ventilator tablet joined to the session moves to the chosen machine by itself.

Anaesthetic emergencies (listed first) follow the Association of Anaesthetists' Quick Reference Handbook (QRH, June 2023 edition), with the guideline number in each name: cardiac arrest under anaesthesia (2-1), desaturation after intubation with an endobronchial tube (2-2), high airway pressure (2-3), bronchospasm (3-4), anaphylaxis at induction (3-1), hypotension and bradycardia after induction (2-4, 2-6), malignant hyperthermia (3-8: CO2 production starts at twice normal, dantrolene brings it back; you raise the temperature) and oxygen and power failure (4-1, 4-2). For the anaphylaxis and hypotension scenarios, set **Patient condition** to Auto for a patient who worsens until treated. The theatre drugs added for them are ephedrine, glycopyrronium and IV adrenaline 50 micrograms. The scenario text and effect sizes are the simulator's and should be checked by the facilitator.

Debrief. Any session that used the ventilator gets **Ventilator feedback**: when ventilation started, the pre-use check, alarm limits, tidal volume per kg of ideal body weight, plateau and driving pressure, AutoPEEP, SpO2 time in target, and when each problem was injected and how long it took to fix (for example "fixed 2 min 10 s later"). A Ventilator Sim debrief is headed with the scenario and its mode and is not scored against learning objectives. The targets are the simulator's teaching targets for each scenario, not a guideline: the troubleshooting scenarios (DOPES, mucus plugging, transfer) accept up to 8.5 ml/kg, the tidal volume the ventilator starts on, while ARDS and after RSI keep 6 to 8 ml/kg.

Paediatric scenarios

Child scenarios follow the Resuscitation Council UK (RCUK) Guidelines 2025: the Paediatric advanced life support and Paediatric cardiac arrhythmias algorithms, and the Paediatric emergency drug chart.

WETFLAG. The brief for a child scenario shows the WETFLAG values worked out from the child's weight. If you do not give a weight, it is estimated from age using the RCUK chart. WETFLAG starts hidden on the room monitor. To show it to the team, press **Show WETFLAG on Monitor** in the Rhythm & resus section; press **Hide WETFLAG on Monitor** to take it away again. To have it showing from the start, tick **Show WETFLAG on Monitor from the start** on the setup screen.

Letter	Value used
W	Weight in kg
E	Defibrillation energy, 4 J/kg
T	Tracheal tube size (cuffed and uncuffed), from the RCUK chart
F	Fluid bolus 10 ml/kg, up to 500 ml
L	Lorazepam 0.1 mg/kg, up to 4 mg
A	Adrenaline 10 micrograms/kg, up to 1 mg
G	10% glucose 2 ml/kg, up to 50 ml

Doses during the scenario. When the team gives a drug to a child, the log shows the weight-based dose (for example atropine, adenosine, amiodarone, buccal midazolam, levetiracetam, 10% glucose and calcium gluconate). IM adrenaline for anaphylaxis follows the age bands. **Tools → Drug calculator** works out doses for any weight.

Shocks for a child. Defibrillation is 4 J/kg. From the 5th shock in refractory VF or pulseless VT, up to 8 J/kg is accepted without a flag. Cardioversion starts at 1 J/kg and doubles up to 4 J/kg.

Newborns. Newborn scenarios show the Newborn life support steps (Guidelines 2025) as prompts in the log.

The event log, notes and flags

Everything that happens is logged with its scenario time: treatments, obs changes, rhythm changes, shocks, monitoring on or off, and your notes. The log feeds the debrief.

- **Where:** the Event log section at the bottom right of the instructor screen, newest first. It stays on screen throughout. **Full log** (or **Tools → Full simulation log**) opens the whole log.
- **Add a note:** type in the box under the log and press **Add note**, for example "Team leader identified".
- **Add a flagged note:** type the note and press **Flag** instead.
- **Flag an existing entry:** click the small flag beside it. Click again to remove the flag.

Flagged entries appear in the **Flags and warnings** row of the debrief graph, so you can find the moments to discuss.

Safety flags count sequence deviations: actions done before their usual prerequisite was in place, such as an IV drug before IV access. Nothing is blocked; the team can still do it. When there is at least one, an amber **Safety flags** button appears in the top bar. It opens the list, with arrests, shocks and your flagged moments shown separately as significant events. Safety flags are not used in Quick Sim.

Finishing and the debrief

Press **Finish** (or `F`) and confirm. The debrief opens on your laptop only. The room monitor shows "Simulation complete" and asks the team to turn to you, with no score or diagnosis.

Pressed Finish by mistake? **Back to scenario**, at the top of the debrief, returns to the same run, paused, and the patient screens come back with it. Press START to carry on.

Part of the debrief	What it shows
Performance Summary	Objectives met and the score (fully met, and with partial credit). The session's duration is at the top of the debrief. Quick Sim, Defib Sim and Ventilator Sim are not scored against objectives
Learning Objectives	Each objective as fully met, partly done or not in place, with the steps behind it
Obs, interventions and changes	The graph described below, at the top of the debrief
Sequence Deviations	The safety flags
Defibrillation & Rhythm	Shown only when a shock was given: shocks, the shocks counted towards ROSC (a shock stacked within 5 s of the last one does not count), energies and each rhythm change
Defib Sim feedback	Defib Sim only: good practice and areas for improvement
Ventilator feedback	Any session that used the ventilator: when ventilation started, the pre-use check, settings against the scenario's targets, good practice, areas for improvement and each problem injected (see The ventilator and Ventilator Sim)
Simulation Log	Every entry with its time
Instructor Notes	A box for your own feedback notes

Quick Sim has no scenario, so it has no score; the graph and the log still work.

The obs graph

Every version (a full scenario, Quick Sim and Defib Sim) finishes with the same graph, **Obs, interventions and changes**. It shows the patient's true obs every 5 seconds over the whole

session. What the team could see depended on what was attached.

- **Rhythm** along the top. Time without a pulse is red, and the same red shading runs down every chart below.
- One small chart each for heart rate, blood pressure (systolic and diastolic), SpO2 and respiratory rate. ETCO2 is added while capnography was attached. Temperature, glucose, pH and GCS are added only if they changed.
- Numbered markers underneath, in four rows: **Rhythm, arrest and shocks**; **Team actions and treatment**; **Facilitator changes** (the obs you changed or trended, with the values before and after, the patient's voice, presets, and the ventilator problems, lungs and settings you changed); and **Flags and warnings**. Markers that would overlap share one label, such as "5 +2".
- **What happened**, under the graph, lists every numbered marker with its time. Click one to mark it on the graph.
- Move the pointer over the graph, or click it and use the arrow keys, to read every value at that moment.
- **Show the obs as a table** lists the values every 30 seconds.

The graph records while the scenario clock runs. Every mode opens **not started** (the controller says "Not started: press START"): nothing about the patient changes until you press START, and anything given before then is recorded and starts acting when you press it. In Defib Sim the clock also starts at the learner's first action on the defib, and in Ventilator Sim when the ventilator first breathes for the patient. Press START at the beginning or there will be no graph. The graph is kept if you reload the page and resume, and it is in the printed and downloaded report.

Keeping a copy

- **Download PDF** saves the debrief as a PDF you can open on any phone, tablet or computer, including the log and your instructor notes. Write your notes before you download.
- **Print** opens the report ready to print or save as PDF.
- **Certificate** (Defib Sim only) asks for the learner's name and prints a certificate of completion.

Exit to Menu returns to the setup screen. The session code and any linked screens stay the same, ready for the next scenario.

Tools, sound and shortcuts

The **Tools ▾** menu in the top bar holds the extras.

Tool	What it does
Drug calculator (`D`)	Doses for any weight you enter; child doses follow the RCUK chart
Timer alerts (`T`)	Set a reminder at a scenario time, for example "5 mins: bloods back". It plays a tone, appears in the log, and is marked FIRED

Tool	What it does
Full simulation log	The whole event log in a window
Sound plays on	Choose where the pulse tone, alarms, the cuff noise, sound effects and the patient's voice play: room monitor (the default), this controller, or both. **Mute alarms** silences the pulse tone and alarms only. The defib tablet always makes its own sounds (charging, shock, metronome and, in Defib Sim, the cuff)
Mute / Unmute alarms	While muted, a red **Muted** button stays in the top bar so alarms are never silently off
Keyboard shortcuts (`?`)	The list below

Room monitor timer. Show Timer, above the waveforms, puts a timer on the room monitor that you start and pause from your screen. It is useful for the team's own timings.

Keyboard shortcuts (they work straight after you click a button, except `Space`, which then presses that button again; they do nothing while you are typing in a box or a pop-up is open)

Key	Action
`Space`	Pause or start the clock
`F`	Finish the scenario
`D`	Drug calculator
`T`	Timer alerts
`?`	Show the shortcuts

Troubleshooting

Problem	Likely cause	Fix
Room monitor shows no numbers or "No sensor detected"	Monitoring not attached yet	Press **Attach**, or click the chips in Monitoring & access
A value you set is not on the room monitor	That sensor is not attached (your tile says "not on monitor")	Attach it when the team does

Problem	Likely cause	Fix
BP on the room monitor has not changed	The cuff has not cycled (this is deliberate)	Press **Cycle NIBP Now**, or use **Change and cycle cuff now** when you set the BP
No sound	Sound not enabled, muted, or playing on the other screen	Tap **Tap to Enable Sound** on the monitor if it shows; check for the red **Muted** button; check **Tools → Sound plays on**; check the device's volume
Badge says Sync error	The internet connection has dropped	Check the connection on each device
Room monitor or defib not following your changes	It is on a different session code, for example after **New code**	Join it again with the current code
Defib tablet asks for a code	It was opened without one	Type the session code. Or join the tablet as a patient screen instead (QR code in **Screens**) and tick **Defib** for it
Defib Sim log times all 00:00	The clock has not started	Press **START**; it also starts at the learner's first press
Space bar does nothing, or presses a button	A button you clicked is still selected (Space presses it), or you are typing in a box or a pop-up is open	Click an empty part of the screen and try again; the other shortcuts work with a button selected
Instructor tab closed or crashed	—	Reopen the site and press **Resume** under "Resume Previous?"
The Restricted tab is locked	Restricted scenarios need an account with access	Sign in, then use **Request access**
A screen looks out of date after an update	The browser is showing the old version	Reload the page