ACLSMED EST. 2013

ACLSMED™ PACER · INSTRUCTOR MANUAL · REVISION 1.0

Turn the dial. Read the strip.

The instructor guide to **ACLSMED™ PACER**, the temporary pacemaker trainer: a pulse generator and a bedside monitor on one tablet, driven by a live heart model. Every dial, key and page, the lessons, the scored cases, and TEACH mode, where the class watches the monitor while students hold the generator.

PRODUCT	WRITTEN AGAINST	RUNS ON	GENERATOR ONLY	AUDIENCE	SUPPORT
ACLSMED™ PACER	PACER 1.0.0	IPAD · ANDROID TABLET	IPHONE · ANDROID PHONE	INSTRUCTORS & EDUCATORS	SUPPORT@ACLSMED.COM

What ACLSMED™ PACER is

A self-paced trainer for **temporary transvenous and epicardial pacing** with an external pulse generator. The learner sets the generator while watching a bedside monitor, and the heart answers beat by beat.

- Recognize capture and loss of capture, in each chamber.
- Find the capture threshold and the sensing threshold, and set a safety margin.
- Recognize undersensing, oversensing and failure to output, and know what to check.
- Know every mode, AOO to DDD, and rapid atrial pacing.
- Dual-chamber timing: AV interval, upper rate, PVARP, upper-rate behavior, pacemaker-mediated tachycardia.
- Read a paced rhythm on any lead and on the 12-lead.

WHAT IT IS NOT

Training only. Not a medical device. It does not connect to any pacemaker, generator or patient, and must not be used for any decision about a real patient. It gives no medical advice.

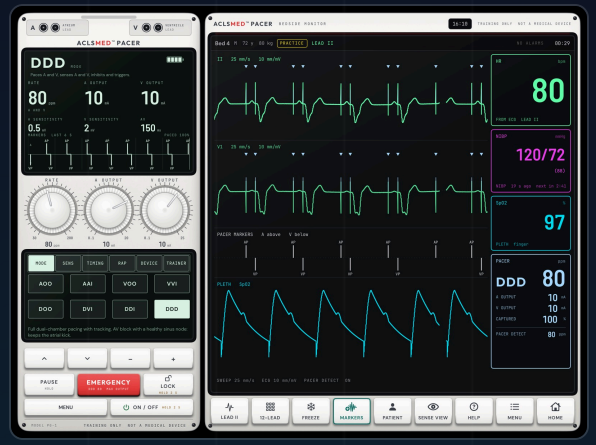
A GENERIC GENERATOR

The generator and monitor are our own design. Their keys, menus, alarm names and numbers match no manufacturer's device. Real generators differ: your unit's policy and the operator's manual for your generator always come first.

NO ACCOUNT

No sign-in, no server, nothing collected. It works offline.

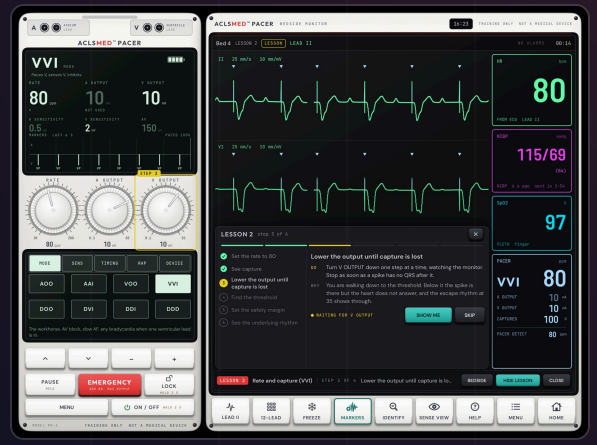
Five ways to use one trainer



Practice

Free run, nothing scored. Change the patient and add faults from the generator's TRAINER page.

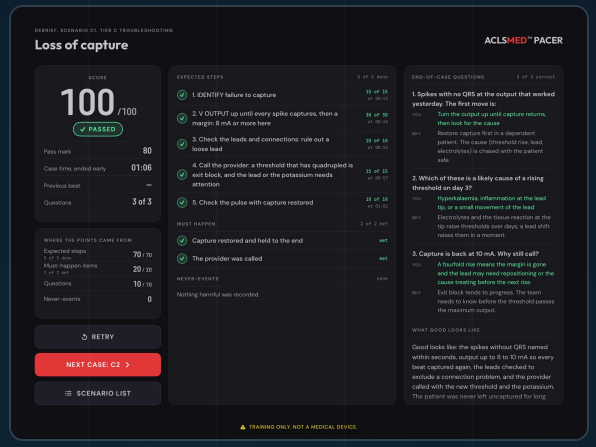
§ 04



Learn: 8 lessons

Stepped lessons on the real dials, with SHOW ME and check questions. All free.

§ 05



Scenarios and the strip drill

20 scored cases in four tiers with a full debrief, and ten-strip drill rounds: name it, then fix it.

§ 06 · § 07



TEACH: two devices

The monitor at the front of the room, the generator in a student's hand. Every dial turn is applied on the monitor.

§ 08

START HERE

How this manual is built

§	CHAPTER	READ IT WHEN
01	**Devices, plans & privacy**	Choosing hardware, Free or Pro
02	**The generator**	Every dial, key, screen and page
03	**The monitor**	Leads, 12-lead, markers, SENSE VIEW, MENU, sound
04	**Practice**	Free run, patients and faults, the tour and DEMO
05	**Learn**	The 8 lessons
06	**Scenarios**	Running a case, scoring, the debrief, all 20 cases
07	**Strip drill**	Ten strips a round
08	**TEACH mode**	Two devices for a class
09	**Running a class**	Checklist and a session plan
10	**Reference**	Troubleshooting, FAQ, ranges, glossary

READING ON SCREEN

`←` `→` or `space` to move · `Home` / `End` · `P` prints · `F` fullscreen. Add **#n** to the address to open slide n. The PDF is the same deck, one slide per page.

EVERY FIGURE IS REAL

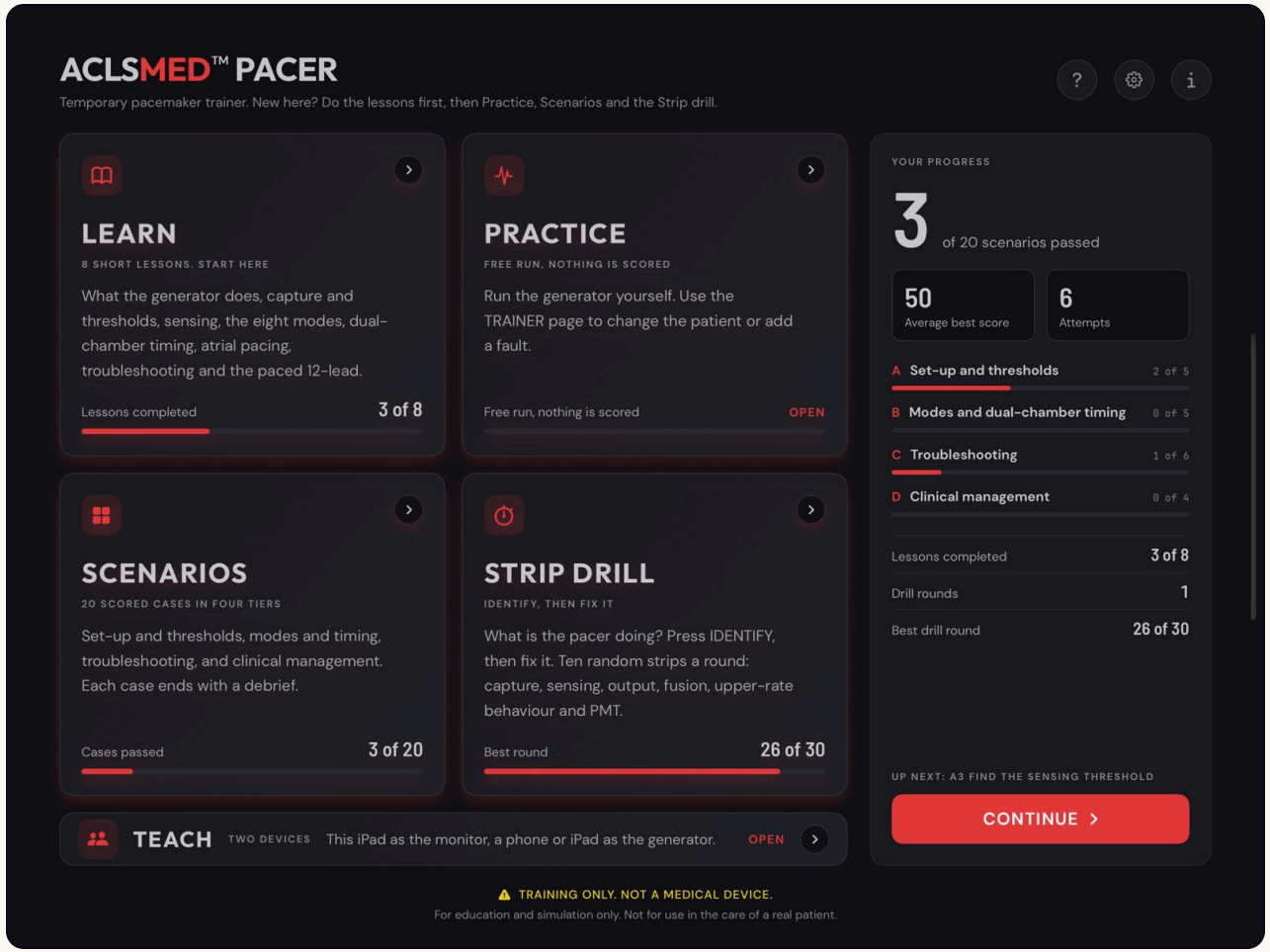
Each picture is a capture of the app on an iPad or an iPhone, not a mockup. Numbered markers on a figure match the numbered list beside it.

WHAT IS NOT HERE

Medical advice. The numbers in the lessons and cases are this trainer's teaching defaults. Follow your unit's policy.

START HERE

Home: the five modes



- **LEARN**: 8 short lessons. Start here.
- **PRACTICE**: free run, nothing scored.
- **SCENARIOS**: 20 scored cases in four tiers.
- **STRIP DRILL**: identify, then fix it.
- **TEACH**: this iPad as the monitor, a phone or iPad as the generator.

The right panel shows the learner's own progress: cases passed by tier, lessons completed, drill rounds and the case **up next**. Across the top: `GET PRO` (free tier only), `?` Help, `⚙` Settings and `i` the training notice.

> THE ORDER THE APP SUGGESTS
>
> Lessons first, then Practice, then Scenarios and the Strip drill. Before any case is tried, the up-next key starts the next lesson.

§ 01

Devices, plans & privacy

A tablet runs the whole trainer. A phone is the generator a student holds. Pro is one purchase inside the app.

§ 01.01 — WHICH DEVICE DOES WHAT

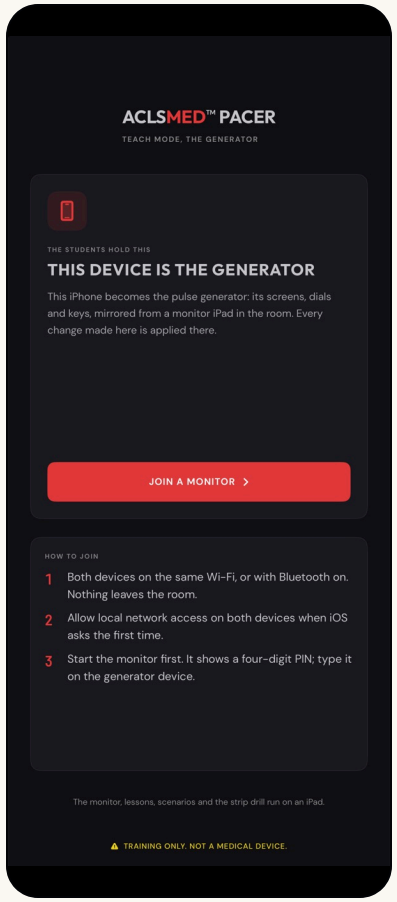
The tablet is the trainer. The phone is the generator.

DEVICE	WHAT IT RUNS	TEACH ROLE
iPad	The whole trainer, in landscape: Practice, lessons, scenarios, the drill, TEACH	Monitor or generator
iPhone	Only the TEACH generator. It opens on TEACH's role screen and nothing else; the monitor, lessons, scenarios and drill run on an iPad	Generator
iPhone Duo	Open: the whole trainer, as an iPad runs it. Closed: a screen that asks you to open it	Open: either role
Android tablet	The whole trainer, in landscape; a foldable opened flat counts as a tablet	Monitor or generator
Android phone	Only the TEACH generator, joined to an Android tablet on the same Wi-Fi	Generator

TEACH PAIRS LIKE WITH LIKE

iPad and iPhone pair with each other over Wi-Fi or Bluetooth. Android devices pair with each other over the same Wi-Fi. An iOS device cannot pair with an Android device (§ 08.02).

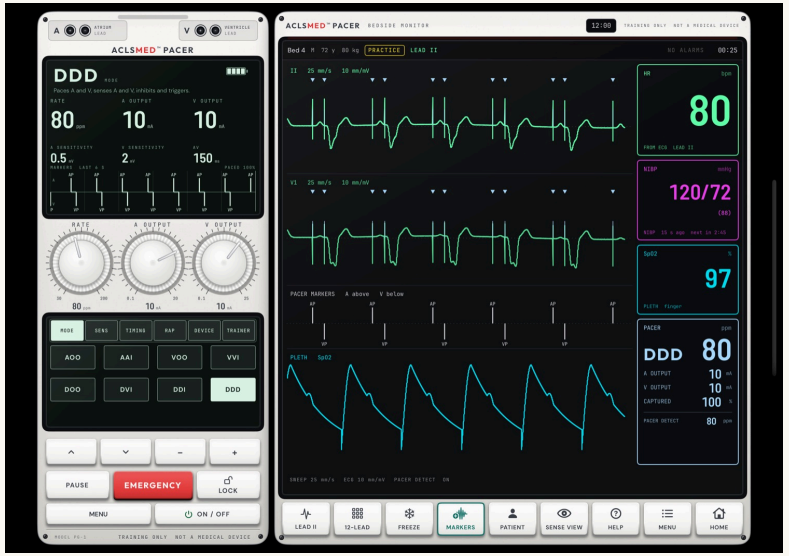
What a phone shows



IPHONE · OPENS ON TEACH



IPHONE · THE GENERATOR



IPHONE DUO · OPEN



IPHONE DUO · CLOSED

An ordinary iPhone shows "The monitor, lessons, scenarios and the strip drill run on an iPad." Closing an iPhone Duo pauses whatever was running (Practice, a lesson, a case, the drill, a TEACH link) without ending it; opening it resumes from the same moment. In TEACH the link is kept.

Free to start. Pro when you are ready.

	FREE	PRO, YEARLY	PRO, LIFETIME
Price	USD 0	**USD 39.99** a year, renews automatically	**USD 79.99** once, never renews
Practice and TEACH Practice	INCLUDED	INCLUDED	INCLUDED
All 8 lessons	INCLUDED	INCLUDED	INCLUDED
Scenarios	4 cases: **A1, A2, B1, C1**	All 20	All 20
Strip drill	One round a calendar day	No limit	No limit

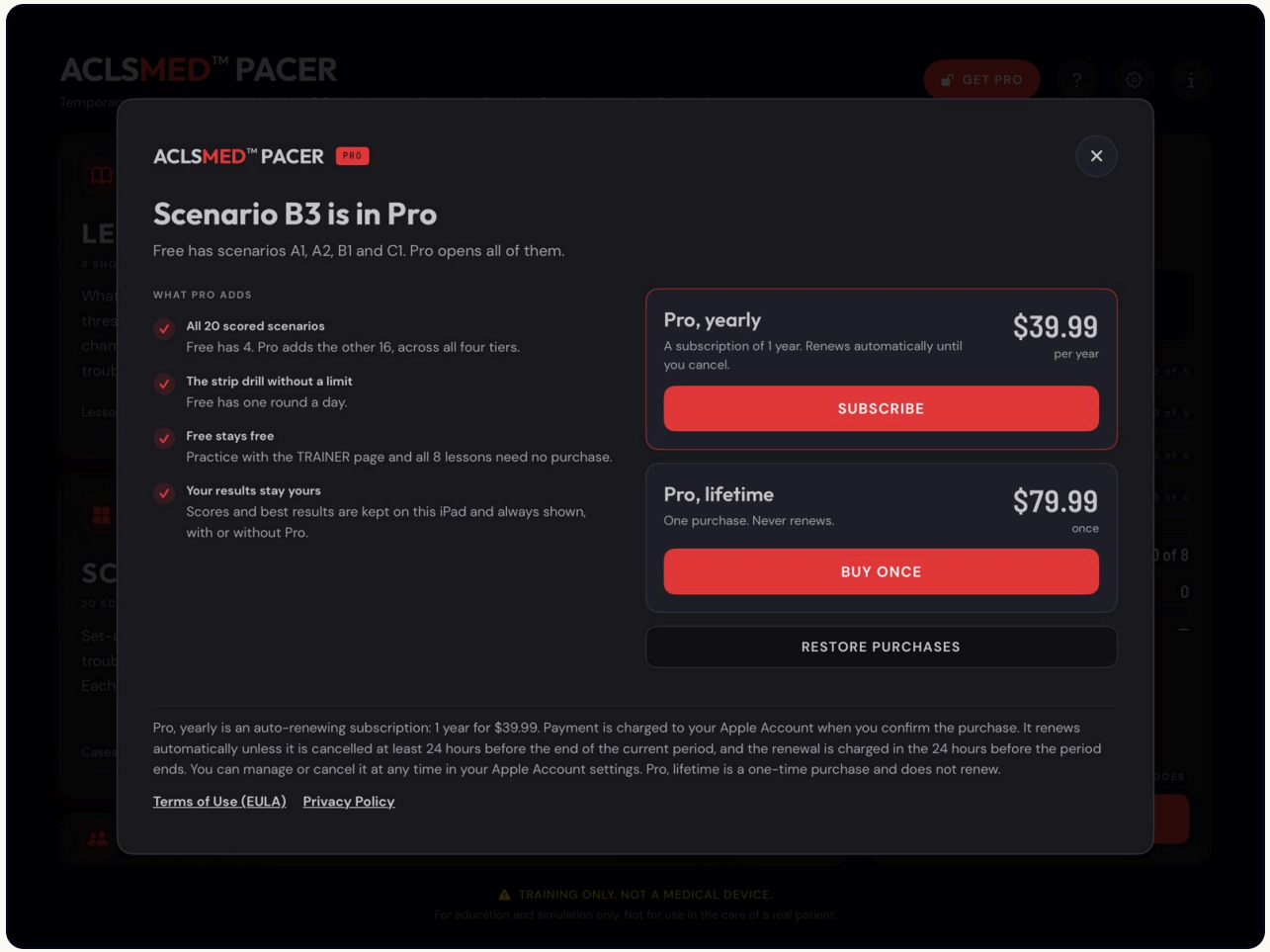
No trial
There is no trial period. The free tier does not expire.

Its own purchase
ACLSMED™ PACER Pro is bought inside this app. It is **not** part of ACLSMED™ SIM Pro or the Suite.

Pro on the monitor
In TEACH the scenarios keep their Pro gate on the monitor device. A phone holding the generator needs nothing.

Prices in US dollars at the time of writing; the store shows your local price. Buy and restore through the App Store or Google Play.

Where Pro is offered, and how to restore it



The paywall opens from three places:

- `GET PRO` on Home.
- A locked case in Scenarios: "Scenario B3 is in Pro".
- A second drill round on the same day: "Today's free drill round is used".

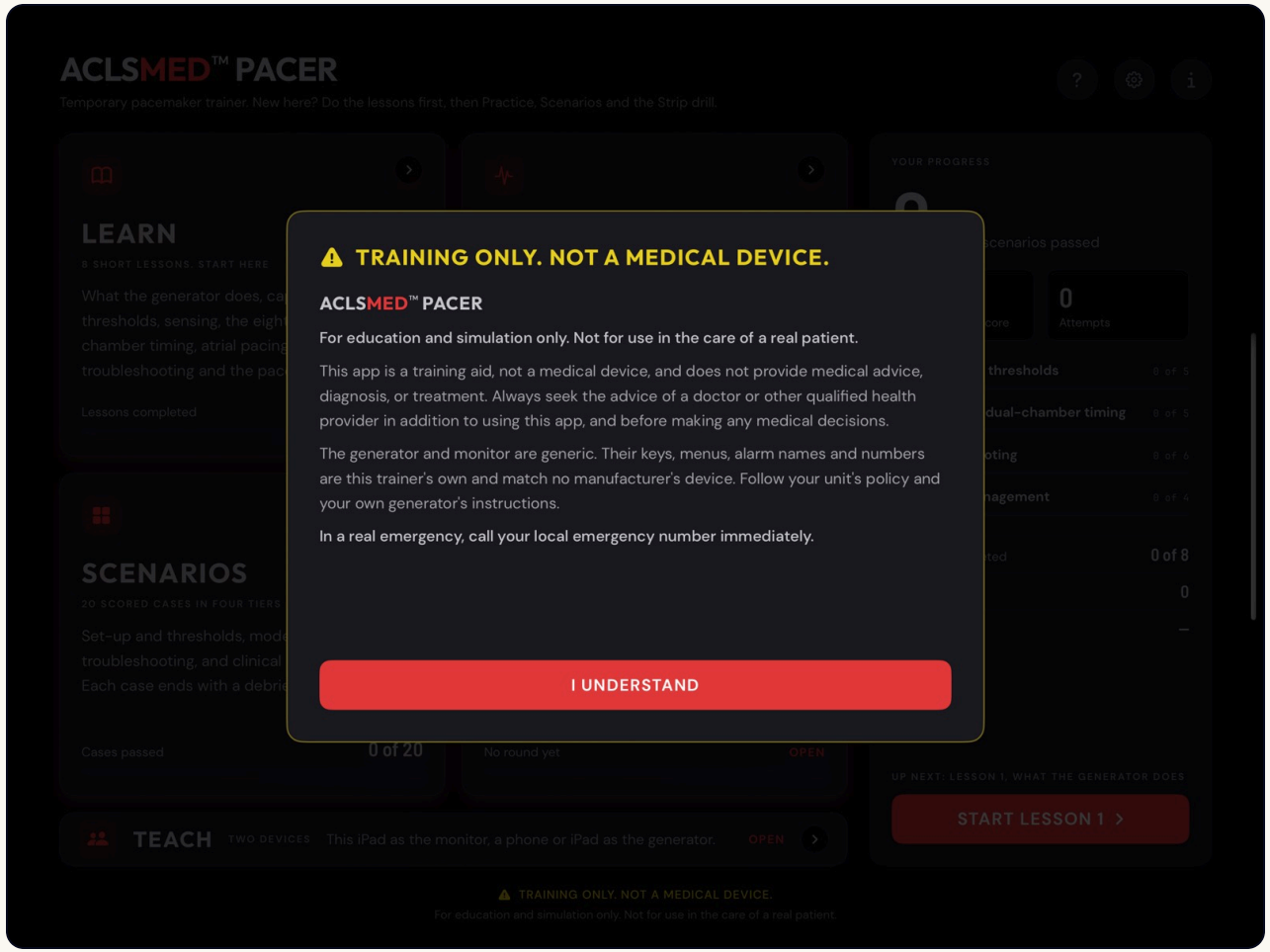
NEW IPAD, SAME APPLE ACCOUNT

`RESTORE PURCHASES` is on the paywall and in Settings, beside `Manage subscription`. Settings shows "Pro is active on this Apple Account" once it is.

RESULTS STAY

Scores and best results are kept on the device and shown with or without Pro. Locking never hides anything already earned.

The training notice comes first



A fresh install opens on this notice. The learner taps `I UNDERSTAND` once. It says:

- For education and simulation only. Not for use in the care of a real patient.
- A training aid, not a medical device. No medical advice, diagnosis or treatment.
- The generator and monitor are generic and match no manufacturer's device.
- In a real emergency, call your local emergency number.

Read it again any time from `i` on Home or **Settings > Training notice**. The device itself is printed TRAINING ONLY, NOT A MEDICAL DEVICE.

§ 01.06 — PRIVACY

Nothing to sign in to. Nothing collected.

NO ACCOUNT

NO SIGN-IN, NO SERVER, NO ANALYTICS, NO ADS

The app collects no data. It runs on the device and needs no connection. Only buying or restoring Pro talks to the App Store or Google Play.

TEACH STAYS IN THE ROOM

LOCAL NETWORK ONLY

The link carries dial positions, key presses, generator screen frames and the session PIN between two devices in the same room. Nothing is stored, logged or sent anywhere else.

LOCAL NETWORK PERMISSION

ASKED ONCE, FOR TEACH

iOS asks for local network access the first time TEACH starts. Deny it and the app still works in full on one device; only TEACH cannot find a partner.

WHAT IS SAVED

ON THIS DEVICE ONLY

Scenario best scores, drill rounds and completed lessons. **Settings › Your progress › Reset progress** clears them after two confirmations. Pro is not affected.

> For TEACH, each install keeps one random identifier so a phone that drops can rejoin as itself. It is not personal data. Privacy policy: aclsmed.com/privacy.html

§ 02

The generator

Hand-held, three dials, two screens. Our own generic device. Everything the learner sets lives here.

The generator, part by part



1. **Lead terminals**: atrium (A) and ventricle (V), each + and −. A loose or missing lead here is the first thing to check when pacing fails.
2. **Top screen**: the mode and what it means, RATE, A OUTPUT, V OUTPUT, both sensitivities, the AV interval, the battery.
3. **Marker strip**: the last 6 s of what the generator did, and PACED %.
4. **Dials**: RATE, A OUTPUT, V OUTPUT.
5. **Menu screen**: page tabs MODE · SENS · TIMING · RAP · DEVICE · TRAINER.
6. **Softkeys**: the legends follow the page. On most pages ▲ ▼ pick a row and − + change it; hold to run. Every row can also be tapped.
7. **PAUSE · EMERGENCY · LOCK**.
8. **MENU · ON / OFF**.

On an iPad the generator takes the left third and the monitor the right two thirds. On a phone the generator fills the screen (§ 02.13).

RATE, A OUTPUT, V OUTPUT

TURN
DRAG AROUND THE DIAL

The pointer and the engraved value follow. Each step clicks (Dial clicks, § 03.09).

TAP
UPPER OR LOWER HALF

One step up or down.

HOLD
KEEPS RUNNING

The value keeps stepping while a finger stays on it.

DIAL	RANGE	STEPS	FACTORY
RATE	30 to 200 ppm	1 ppm to 100 · 2 ppm to 170 · 5 ppm to 200	80
A OUTPUT	0.1 to 20 mA	0.1 to 1 · 0.2 to 2 · 0.5 to 5 · 1 to 20	10
V OUTPUT	0.1 to 25 mA	0.1 to 1 · 0.2 to 2 · 0.5 to 5 · 1 to 25	10

TEACH THE GRID

The step gets finer near the small numbers. Between 1 and 2 mA the output moves in 0.2 mA steps, so a threshold of 1.5 mA reads 1.6 on the dial. The lessons and cases allow for this.

What the generator did, and why

The top screen shows the **mode in large letters** with its meaning under it (DDD: "Paces A and V, senses A and V, inhibits and triggers"), then RATE, A OUTPUT and V OUTPUT in big numerals, the two sensitivities in mV, the AV interval, and the battery. Banners appear for PAUSED, LOCKED and EMERGENCY.

> **PACED % IS NOT CAPTURE**
>
> PACED % says how often the generator paced instead of sensed. The generator cannot confirm capture. Capture is read on the monitor: the complex after each spike, the PACER tile's CAPTURED, the pulse.

FLAG	MEANING
AP	Atrial pace (above the line)
AS	Atrial sense that reset a timer
VP	Ventricular pace (below the line)
VS	Ventricular sense that reset a timer
AR · VR	A sense inside a refractory period: seen, not acted on
N	Noise
bar	Joins an atrial event to the ventricular pace that followed (the AV interval)

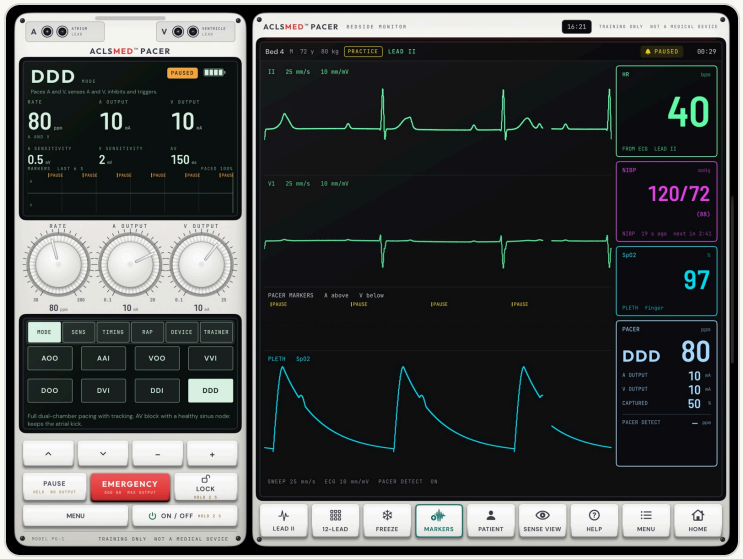
The strip scrolls the last 6 seconds. It is the teaching heart of the device: read it before you touch a dial.

PAUSE, EMERGENCY, LOCK, MENU, ON / OFF

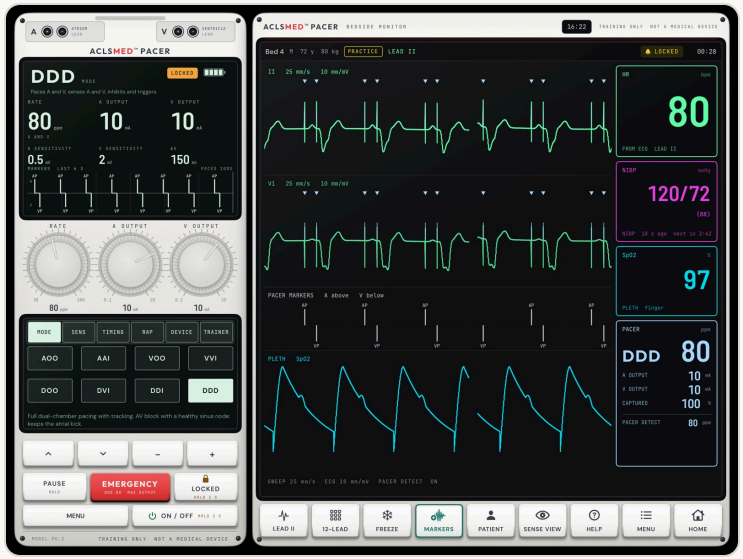


KEY	PRESS	WHAT HAPPENS
PAUSE	hold	No output and no sensing while held, so the patient's own rhythm shows. Lets go by itself after 10 s. Use with care in a dependent patient.
EMERGENCY	one press	**DOO 80, A 20 mA, V 25 mA**, whatever was set, even if the generator was off. The key then reads EXIT EMERG.
EXIT EMERG	press or change	Any change you make settles the emergency; the values stay until you change them. A second press leaves it too. Nothing is restored.
LOCK	hold 2 s	Every dial and key is ignored, the screen says LOCKED. Hold again to unlock.
MENU	press	Turns the pages of the lower screen.
ON / OFF	hold 2 s	Switches the generator off or on. Off: no output, dark screens.

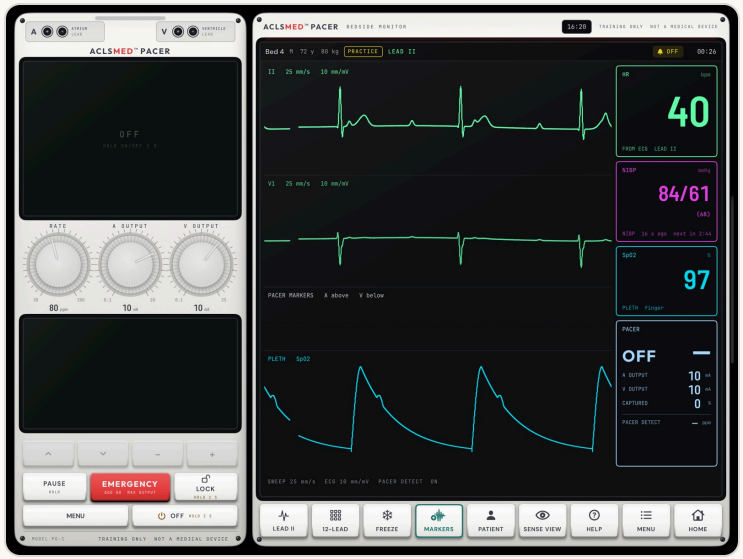
PAUSE, LOCK and OFF on the device



PAUSE HELD · THE ESCAPE SHOWS



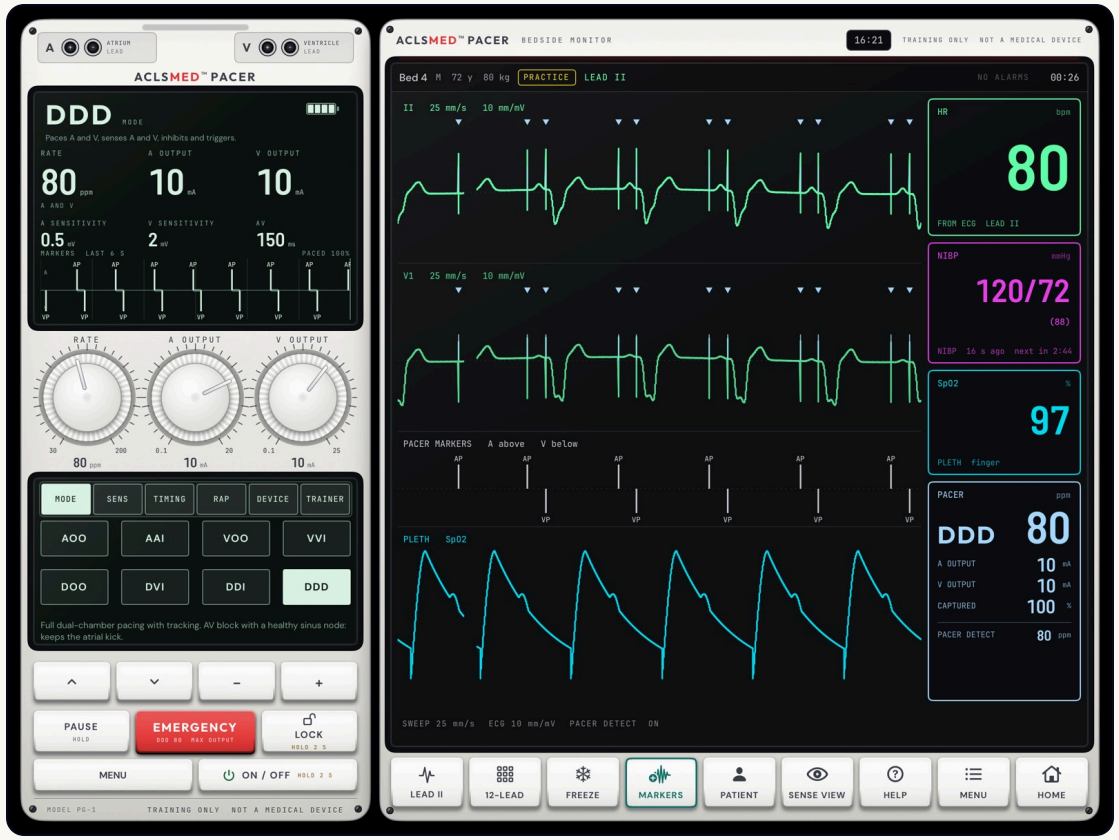
LOCK · CONTROLS IGNORED



OFF · NO OUTPUT

Settings > Practice opens > **GENERATOR OFF** starts Practice with dark screens, to practice turning on and setting up from nothing.

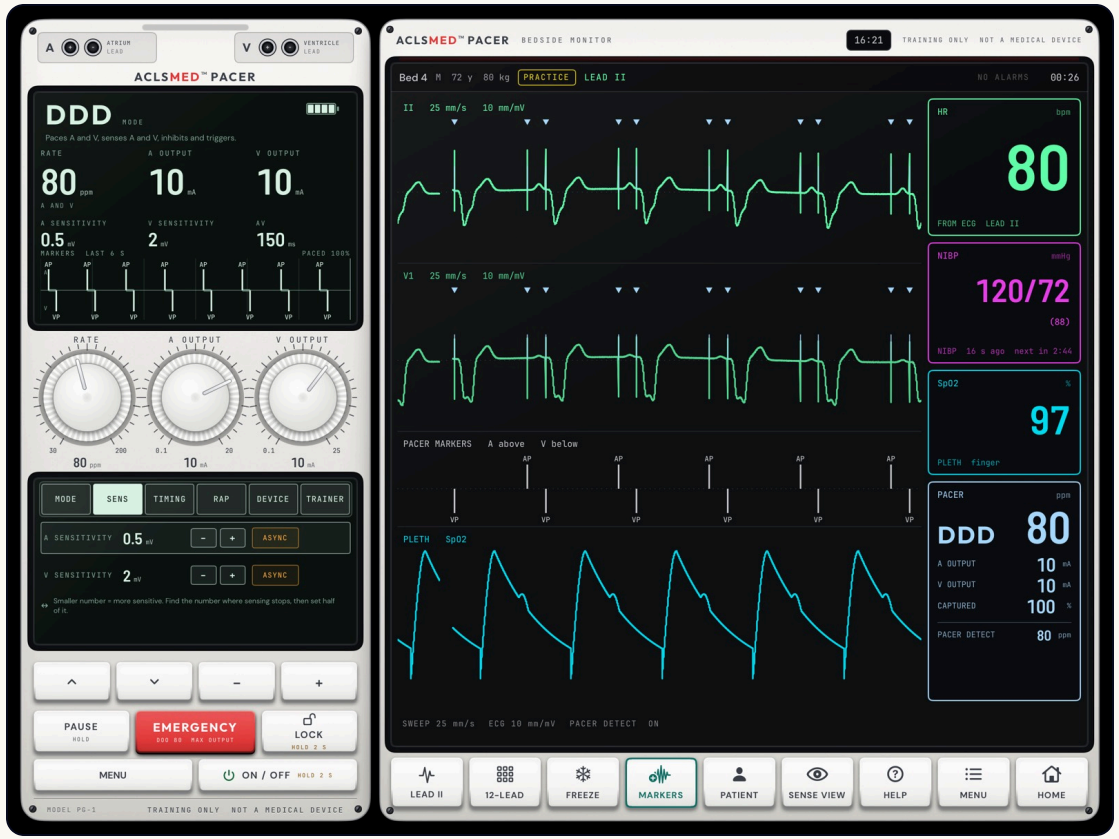
Eight modes, one tap each



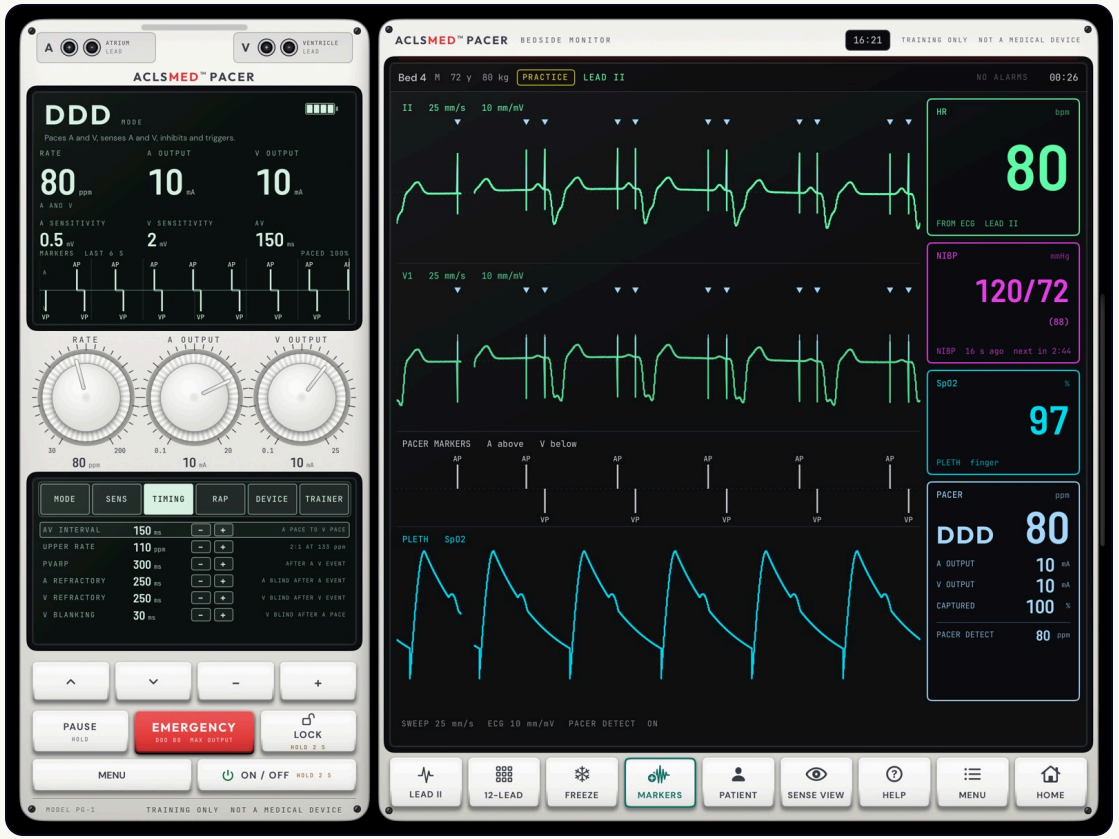
MODE	THE APP'S OWN ONE-LINER
AOO	Asynchronous atrial pacing. Rare; testing, or electrical noise with intact AV conduction.
AAI	Sinus bradycardia or sinus arrest with intact AV conduction. Keeps AV synchrony with one lead.
VOO	Asynchronous ventricular pacing. Noise, or when sensing cannot be trusted and the patient is dependent.
VVI	The workhorse. AV block, slow AF, any bradycardia when one ventricular lead is in.
DOO	Emergency asynchronous AV sequential pacing. The EMERGENCY key sets it.
DVI	AV sequential pacing without atrial sensing. Historic; competes with intrinsic P waves.
DDI	Dual-chamber pacing without atrial tracking. Atrial arrhythmias with AV block.
DDD	Full dual-chamber pacing with tracking. AV block with a healthy sinus node: keeps the atrial kick.

A tapped mode takes effect at once. The line under the keys repeats the one-liner for the mode chosen.

A smaller number is more sensitive



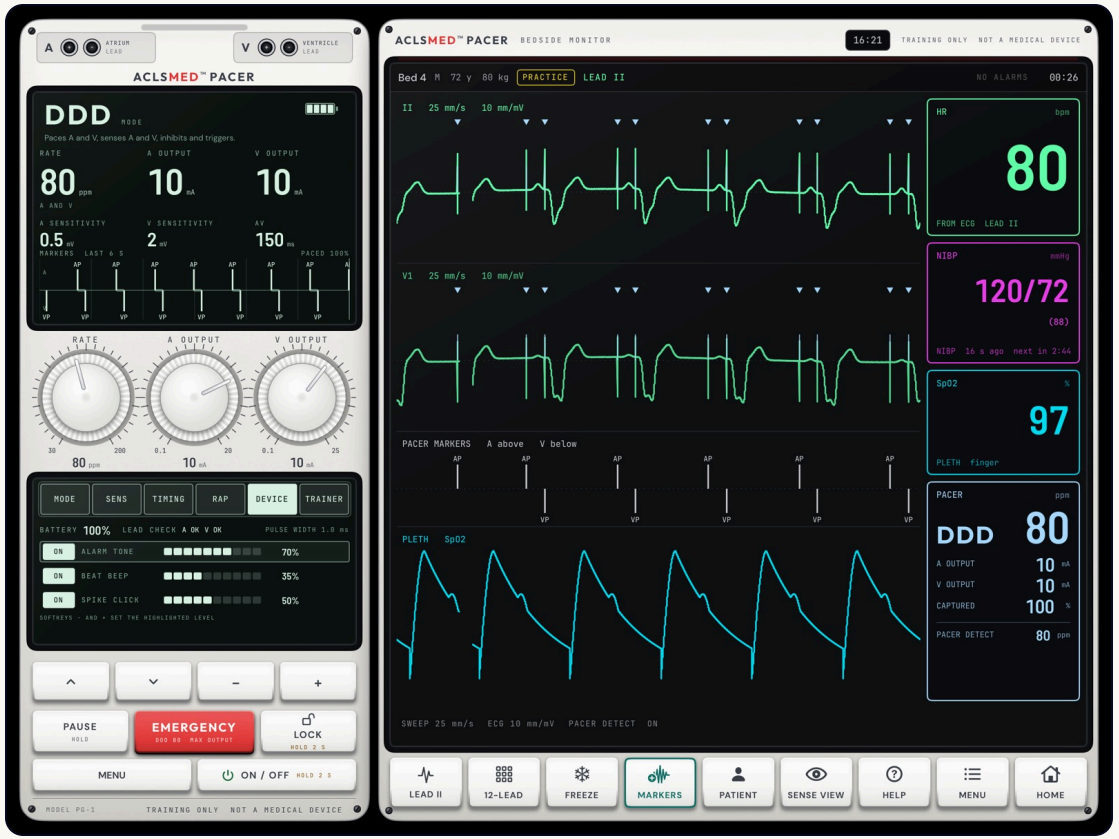
A SENSITIVITY 0.4 to 10 mV (factory 0.5) and **V SENSITIVITY** 0.8 to 20 mV (factory 2.0), each with `-` `+` and `ASYNC`, which switches sensing off on that channel. A row the mode does not use says NOT IN and the mode.



AV INTERVAL · **UPPER RATE** (its note shows where the 2:1 point falls) · **PVARP** · **A REFRACTORY** · **V REFRACTORY** · **V BLANKING** after an A pace. Rows a mode does not use are dimmed.

Rapid atrial pacing, battery, leads, tones

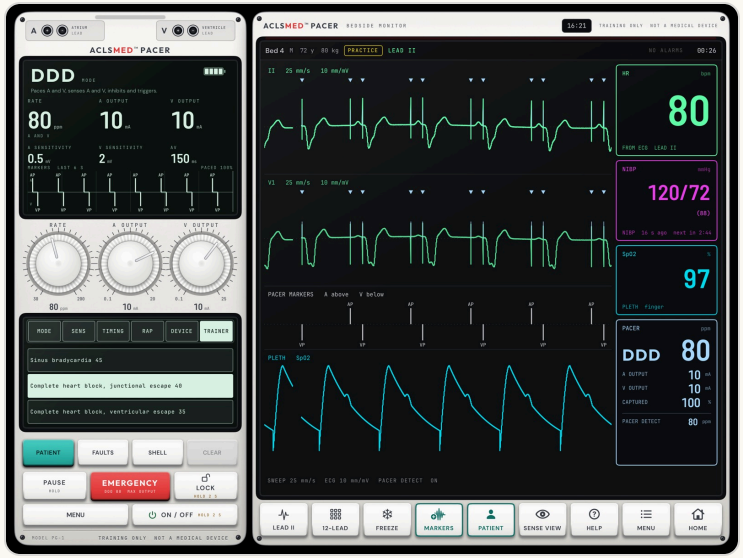




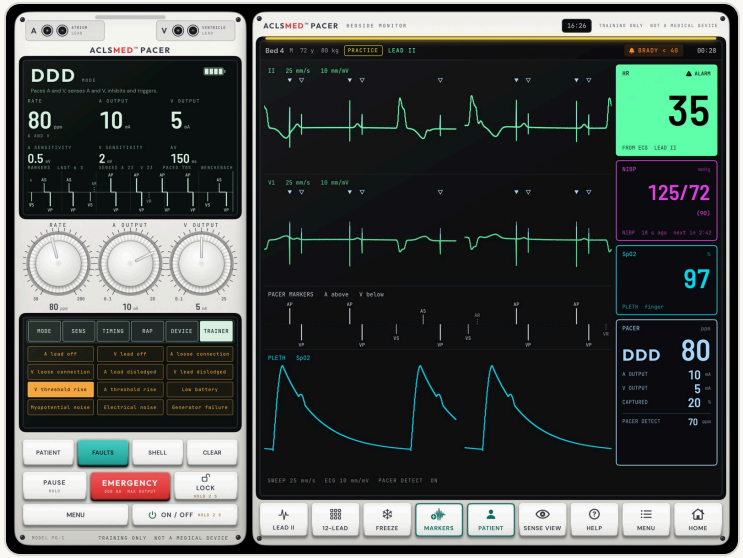
RAP RATE 80 to 800 ppm (factory 300). Hold the `RAP` softkey (the third key on this page): atrial pacing at the RAP rate, no sensing, the ventricular channel off. Let go and the previous mode returns. Used to overdrive atrial flutter (Lesson 6, case B5).

BATTERY %, **LEAD CHECK** A and V (OK or OPEN), pulse width 1.0 ms fixed, and the device's three tones, **Alarm tone**, **Beat beep** and **Spike click**, each ON or OFF with a level set by the − + softkeys.

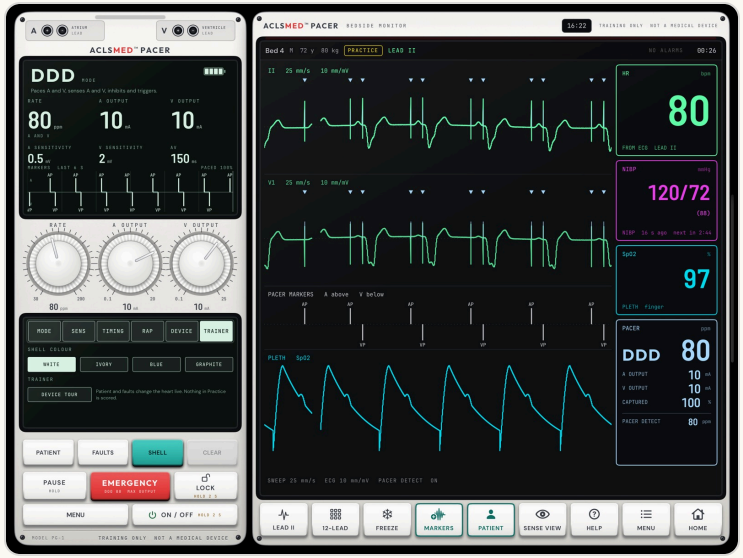
The instructor's drawer, on the generator



PATIENT · TEN PATIENTS



FAULTS · V THRESHOLD RISE ON



SHELL · COLOUR AND TOUR

On this page the softkeys read **PATIENT** · **FAULTS** · **SHELL** · **CLEAR** (clear all faults). The monitor's **PATIENT** key jumps here. Patient and faults change the heart live; nothing in Practice is scored. The TRAINER page is not offered in lessons or scored cases, and in TEACH the same controls move to the instructor panel (§ 08.06).

Ten patients, twelve faults

PATIENT
Sinus rhythm 75
Sinus bradycardia 45
Complete heart block, junctional escape 40
Complete heart block, ventricular escape 35
Complete heart block, no escape
Slow atrial fibrillation 45
Atrial flutter 2:1
Mobitz II 2:1
Asystole
Complete block with retrograde conduction

FAULT	WHAT IT DOES
`A / V lead off`	No output reaches the lead, nothing is sensed
`A / V loose connection`	Output and sensing drop out at random for 0.5 to 3 s
`A / V lead dislodged`	Threshold above any output; sensing falls
`A / V threshold rise`	Exit block: the threshold rises above the set output
`Low battery`	10%, falling 1% every 20 s until depleted
`Myopotential noise`	Muscle bursts on the V channel (oversensing)
`Electrical noise`	Mains interference on both channels and the monitor
`Generator failure`	No output on either channel

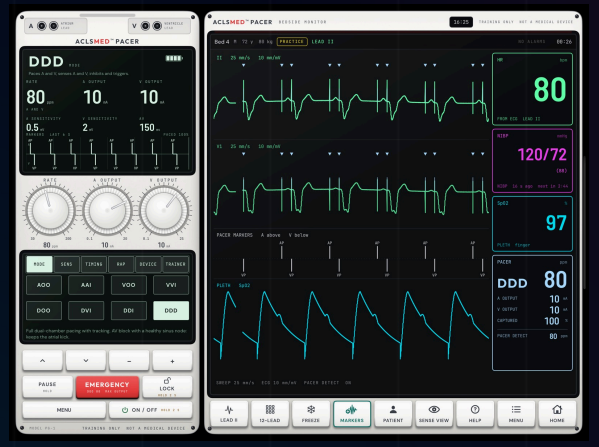
A fault stays on until it is cleared.

What each alarm means on this generator

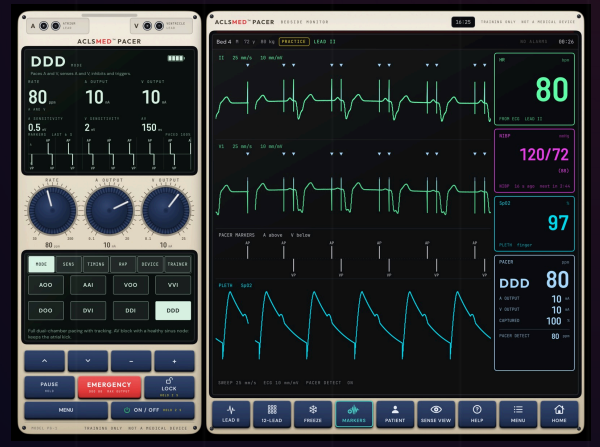
ALARM	WHAT TO CHECK (THE APP'S OWN ADVICE)
LOW BATTERY	Change the battery soon. Have a second generator at the bedside.
BATTERY DEPLETED	No output. Press EMERGENCY on the spare generator and connect the leads.
A LEAD OFF	Check the atrial lead at the terminal block and at the patient.
V LEAD OFF	Check the ventricular lead at the terminal block and at the patient.
NOISE A	Interference on the atrial channel. Check the lead, the connections and nearby equipment.
NOISE V	Interference on the ventricular channel. The generator paces asynchronously until it clears.
PAUSED	No output while PAUSE is held. Release it.
LOCKED	Controls are locked. Hold LOCK for 2 seconds to unlock.
EMERGENCY	DOO at 80 with maximum outputs. Settle the settings once the patient is stable.
HIGH RATE	Sensed ventricular rate over 150 for 10 seconds. Look at the rhythm and the upper rate.
OUTPUT AT MAXIMUM	Capture may still be lost. Check the lead position and call.
OFF	The generator is off. Hold ON/OFF.

> Red rows are high priority. The monitor raises its own alarms too, such as BRADY < 40 when the ventricular rate falls below 40. The monitor's **HELP** key lists the alarms showing right now with this advice (§ 03.07). Alarm tones are this trainer's own.

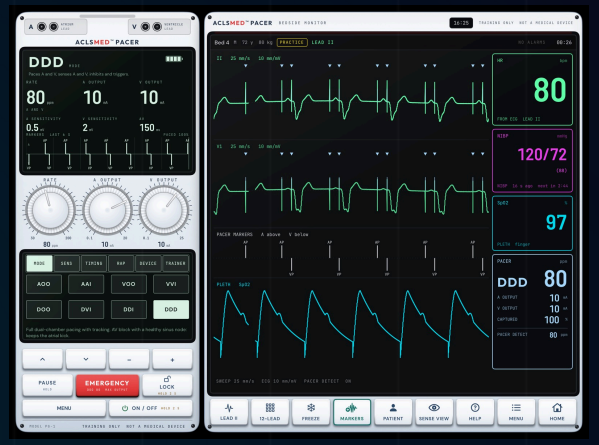
Four housings, same controls



WHITE



IVORY



BLUE



GRAPHITE

Pick the colour on the generator's TRAINER > SHELL tab, on the monitor's MENU, or in Settings > Generator. The dials, keys and screens are the same in every one.

The same generator, in one hand



LINKED



LINK DOWN

In TEACH the phone (or a second iPad) shows only the generator: its screens, dials and keys, full screen and upright. It runs **no engine of its own**. It mirrors the monitor's frames ten times a second, and every dial turn and key press goes back to the monitor and is applied there.

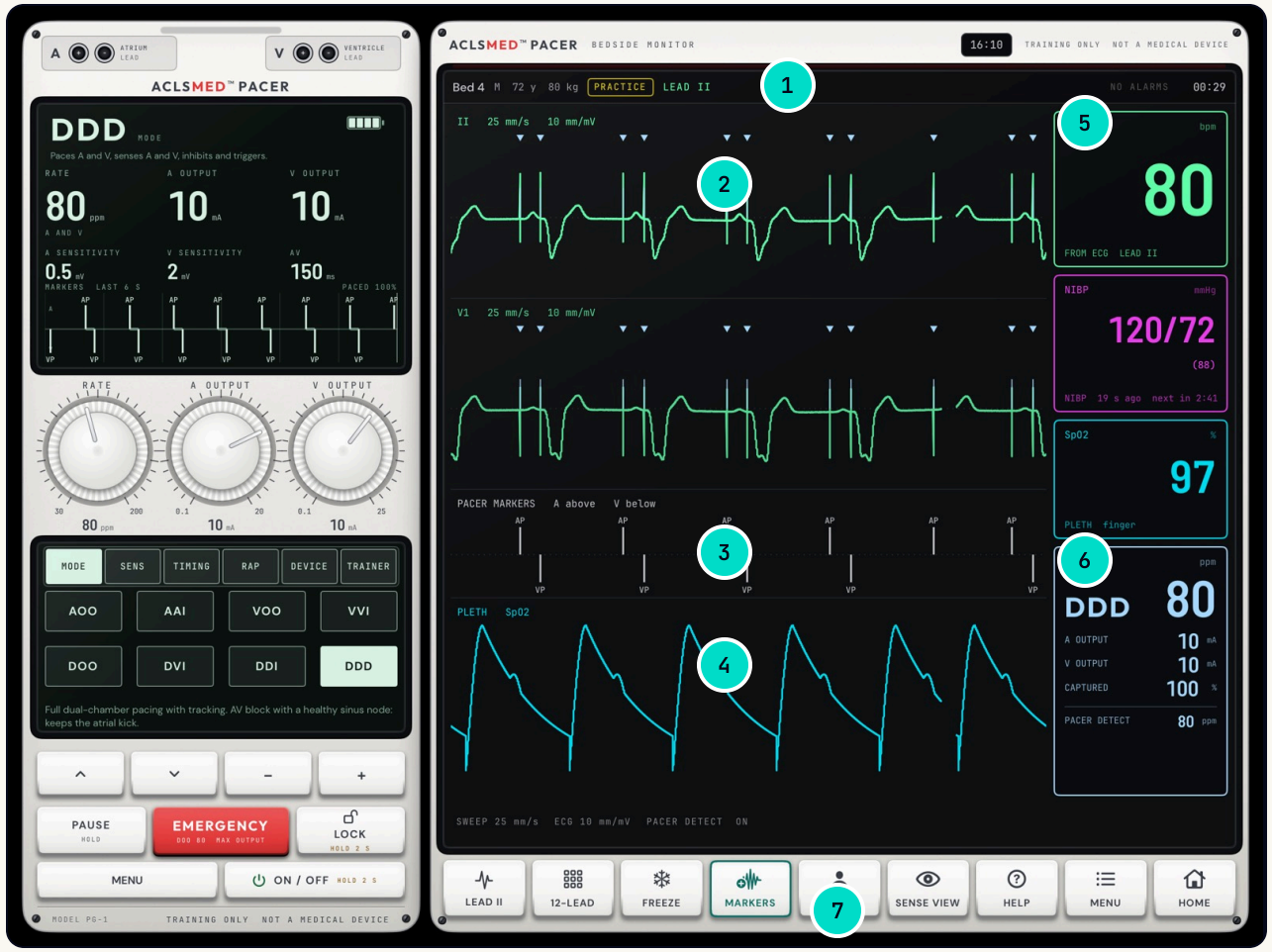
- Top left: the monitor's name and **LINKED** with the round trip in ms.
- Top right: `LEAVE`, held for 1 second.
- Link down: the controls dim behind **RECONNECTING** and THE MONITOR KEEPS RUNNING. A touch only shows a notice.
- The screen stays awake while it is linked.

§ 03

The monitor

What the class watches. The surface ECG, the generator's own markers lined up underneath, and the numbers.

The monitor, region by region



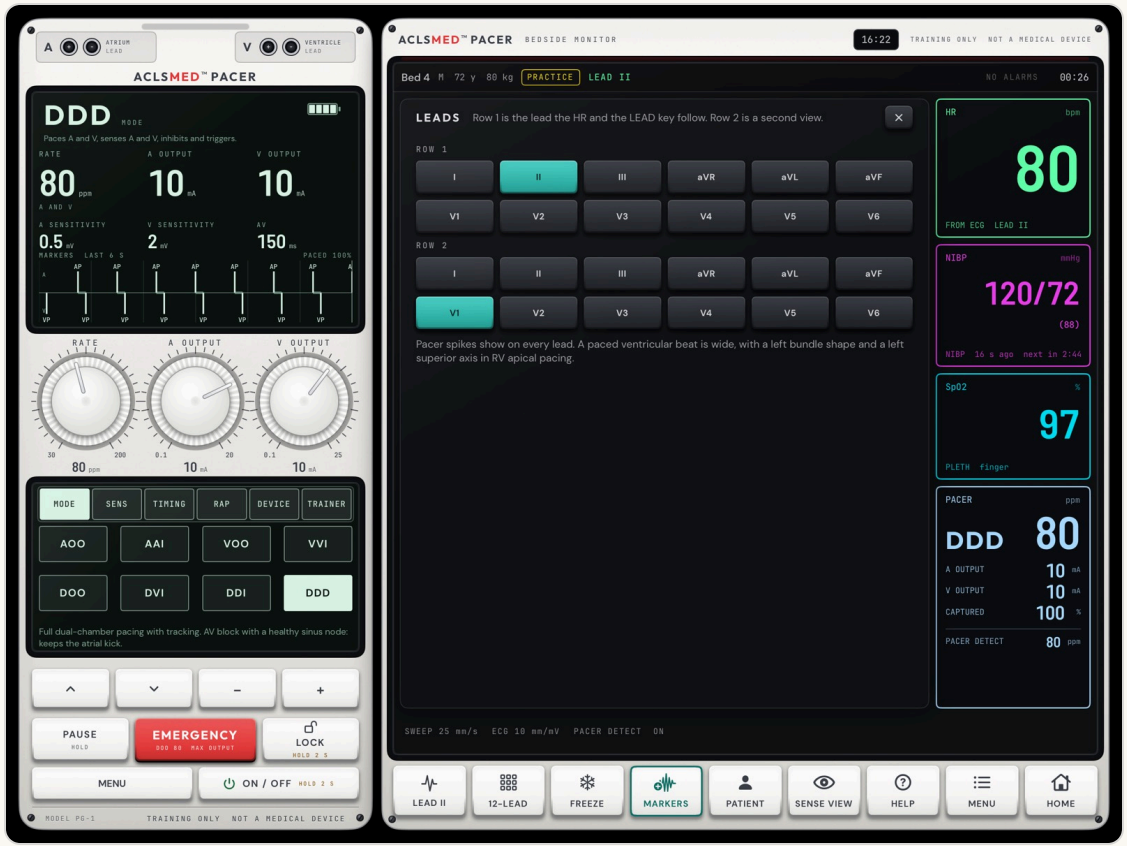
1. **Status line**: bed, patient, PRACTICE or the case chip, the lead, alarms, elapsed time. The lamp on the bezel blinks for a high-priority alarm.
2. **Two ECG rows**: row 1 is the lead the LEAD key cycles; row 2 is a second view, V1 by default. Pacer detect draws a small blue mark above each spike it sees; an open mark is a spike that did not capture.
3. **PACER MARKERS**: the generator's flags, A above, V below, on the monitor's time base.
4. **Pleth**, or the arterial line when the patient has one. SENSE VIEW swaps in the electrogram.
5. **HR** from the ECG, and **BP**: a cuff every 3 minutes with a "next in" countdown, or ART live.
6. **SpO_2** and the **PACER** tile: mode, rate, outputs, CAPTURED %, and PACER DETECT in ppm.
7. **Keys** (§ 03.02).

The nine keys under the glass

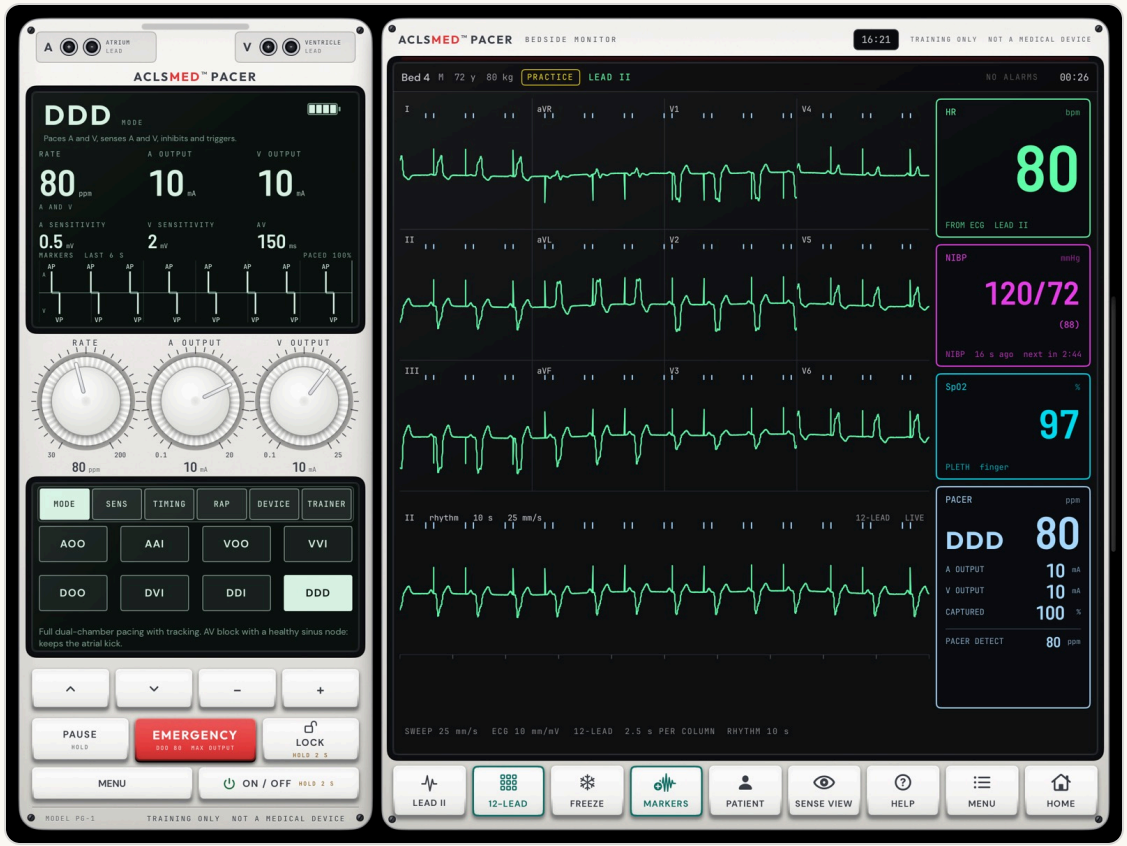
KEY	TAP	HOLD OR NOTES
LEAD II	Row 1 to the next of the twelve leads. The label shows the lead.	Hold opens the lead picker for row 1 and row 2
12-LEAD	All twelve leads, three by four, with a 10 s lead II rhythm strip	Tap again to go back
FREEZE	Holds the traces; the status line shows FROZEN	Tap again to run
MARKERS	Shows or hides the PACER MARKERS channel	Lit when on
PATIENT	Practice: opens the generator's TRAINER page	TEACH: tap for patients, hold for faults on the instructor panel
IDENTIFY	Replaces PATIENT in lessons, scenarios and the drill: tick what the strip shows, SUBMIT	§ 06.04
SENSE VIEW	Swaps the pleth row for what the generator sees	§ 03.05
HELP	The alarms showing with what to check, what the strip can show, the two rules	§ 03.07
MENU	Sound, shell colour, DEVICE TOUR, HOME or LEAVE	§ 03.08
HOME	Back to Home	In TEACH it asks before leaving

> The first tap on LEAD ever shows "Hold LEAD to pick a lead". Every panel opens on the glass over the traces, so the tiles stay in view.

Any lead, or all twelve



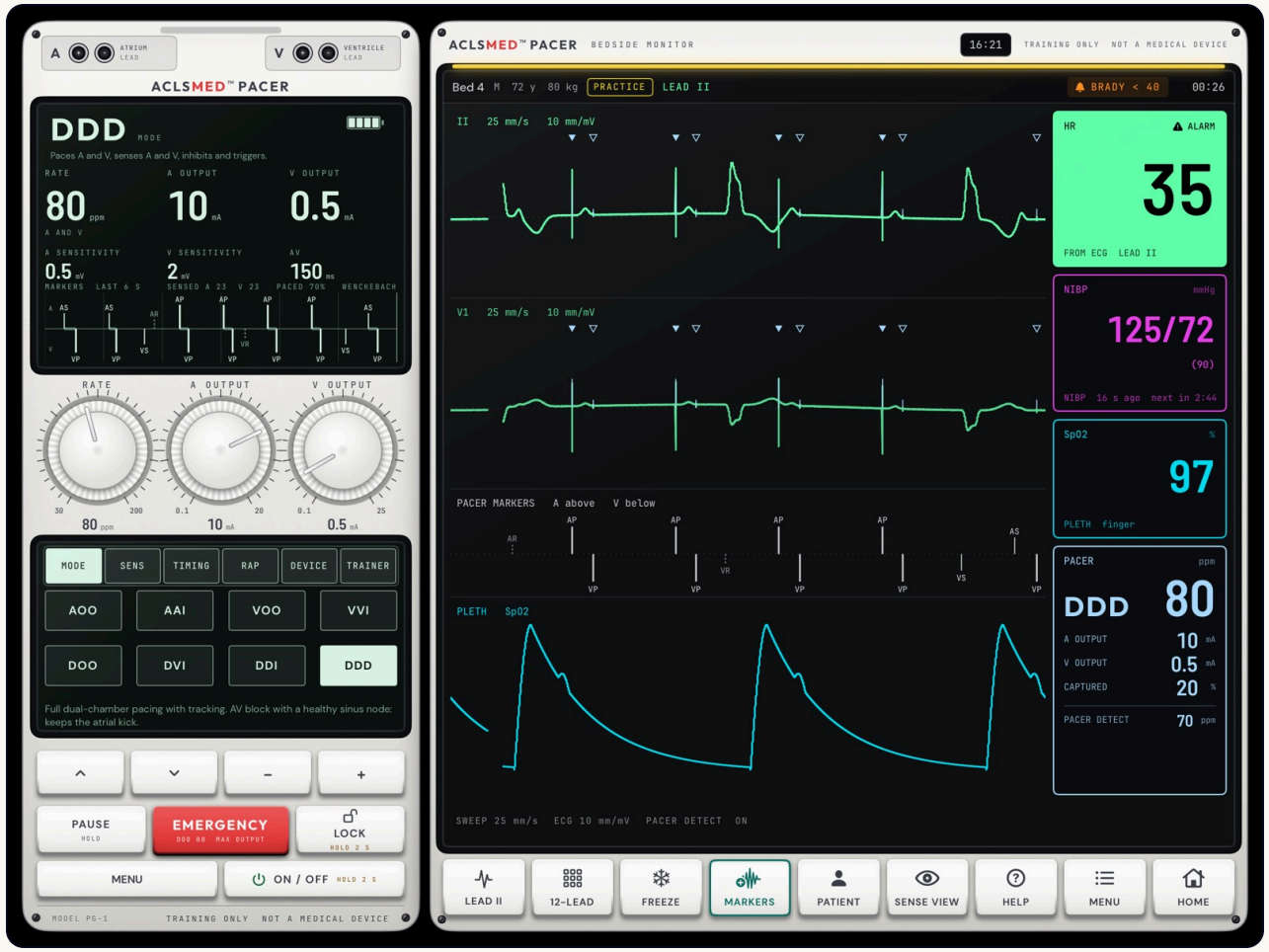
HOLD LEAD · PICK ROW 1 AND ROW 2



12-LEAD · 2.5 S PER COLUMN, RHYTHM 10 S

> Pacer spikes are drawn on every lead, taller at a higher output (a simplification). Lesson 8 reads the paced 12-lead: a wide QRS, left bundle shape, left superior axis, discordant T waves.

Where undersensing and oversensing show

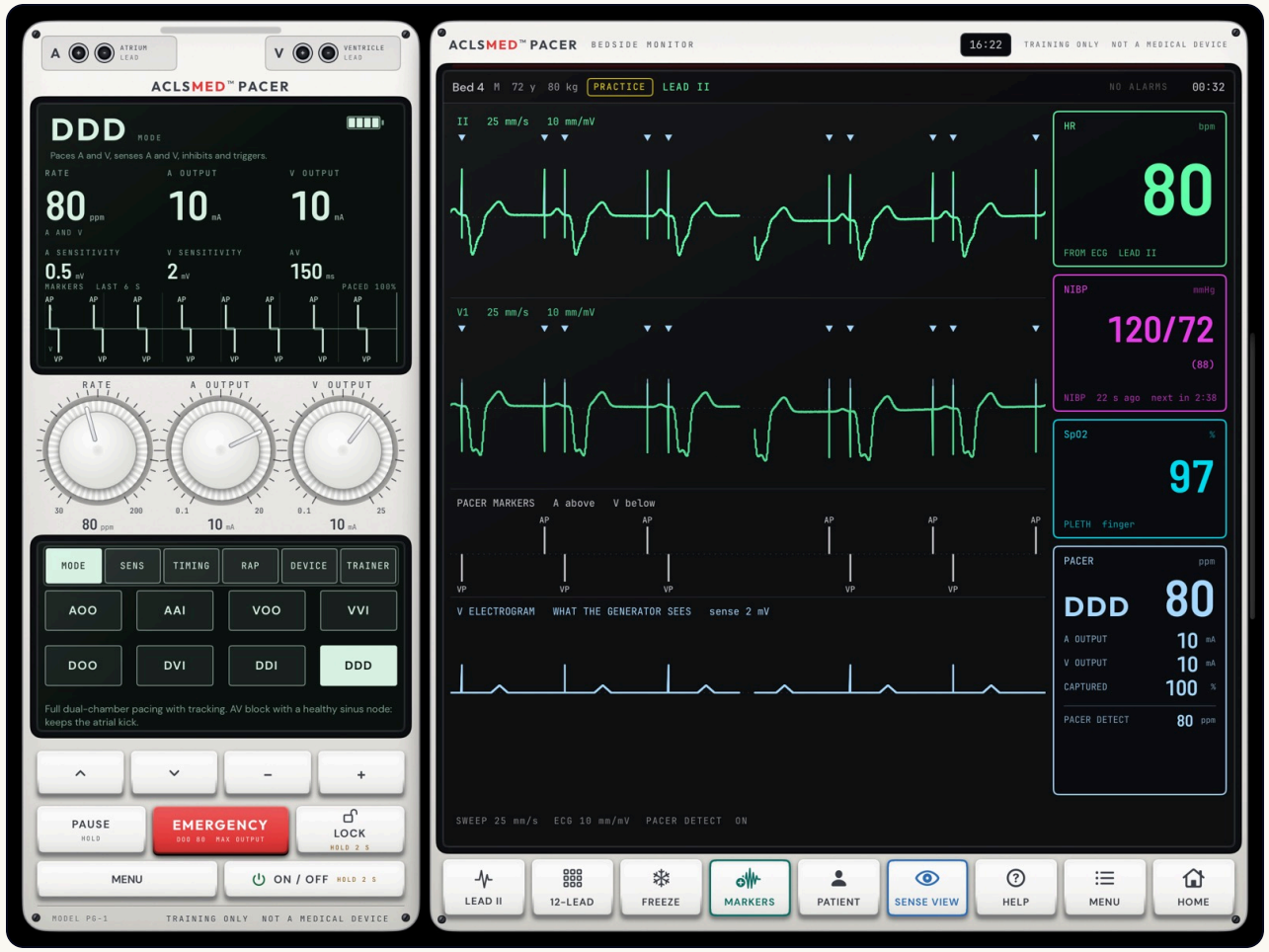


The marker channel lines the generator's AP, AS, VP and VS flags up with the ECG above. A spike can be matched to what the generator thought it was doing.

- **Loss of capture** (left): every VP has its spike but no QRS after it; the slow escape shows through.
- **Undersensing**: a VP where the generator should have seen a beat.
- **Oversensing**: a pause with a VS where nothing real happened.

> FREEZE BEFORE YOU TEACH
>
> FREEZE holds every trace so you can point at a spike and its marker together. Lesson 8 uses it to show AP then P at 40 ms, VP then QRS at 30 ms.

What the generator sees



SENSE VIEW swaps the pleth row for the electrogram the generator sees on its lead, in mV, next to the sensitivity number. What rises above the line is sensed.

Sensing is on the device, so what the class sees on the surface ECG and what the generator senses can disagree. That gap is the teaching.

> THE SENSING RULE, AS THE APP TEACHES IT
>
> Raise the sensitivity number until the marker strip stops showing AS or VS. That is the sensing threshold. Then set half of it.

Heart rate, pressure, SpO_2 and the PACER tile

HR

BPM, FROM THE ECG LEAD

The heart's rate on the ECG, in bpm. The generator's set rate and PACER DETECT are in ppm.

BP

NIBP EVERY 3 MINUTES, OR ART

A cuff reading at the start of every session, then every 3 minutes with a "next in" countdown. A case with an arterial line shows ART live. Loss of the atrial kick shows here.

SpO_2

WITH THE PLETH

The pleth follows each captured or intrinsic beat.

PACER

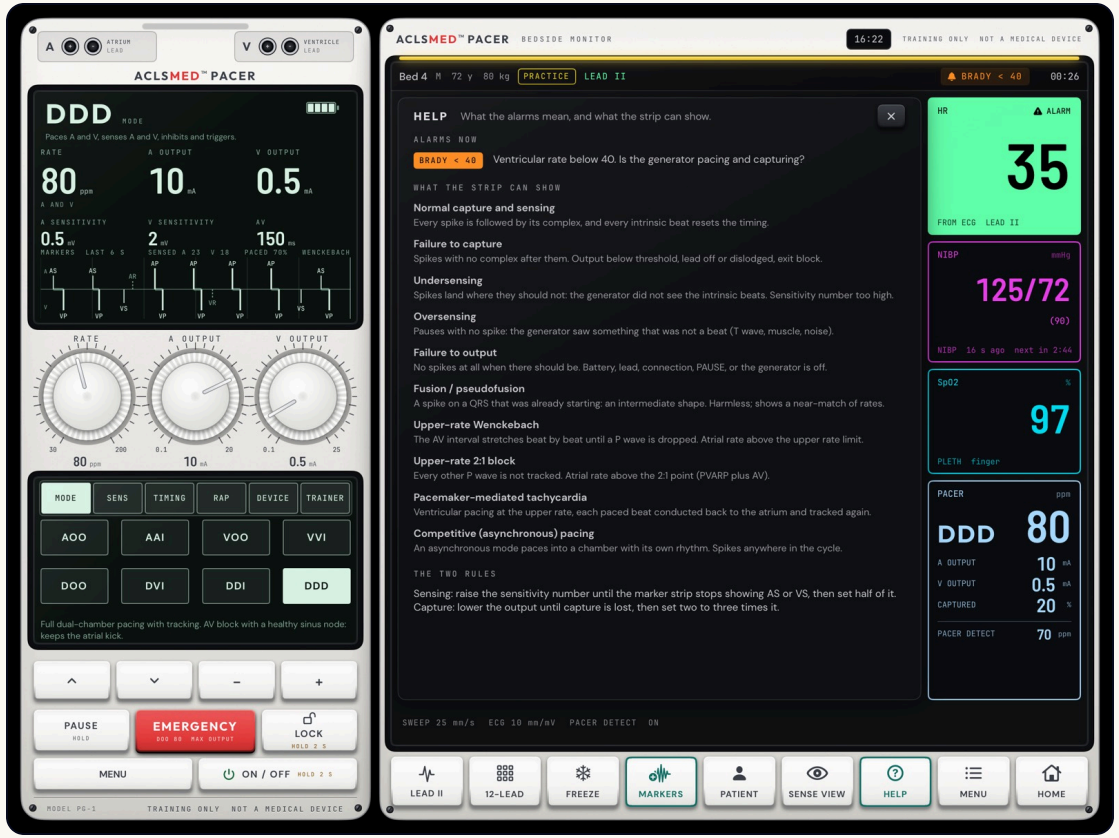
THE MONITOR'S VIEW OF PACING

Mode and rate, A and V output, **CAPTURED** % and **PACER DETECT**, the spike rate the monitor detects in ppm. Capture is reported here, never on the generator.

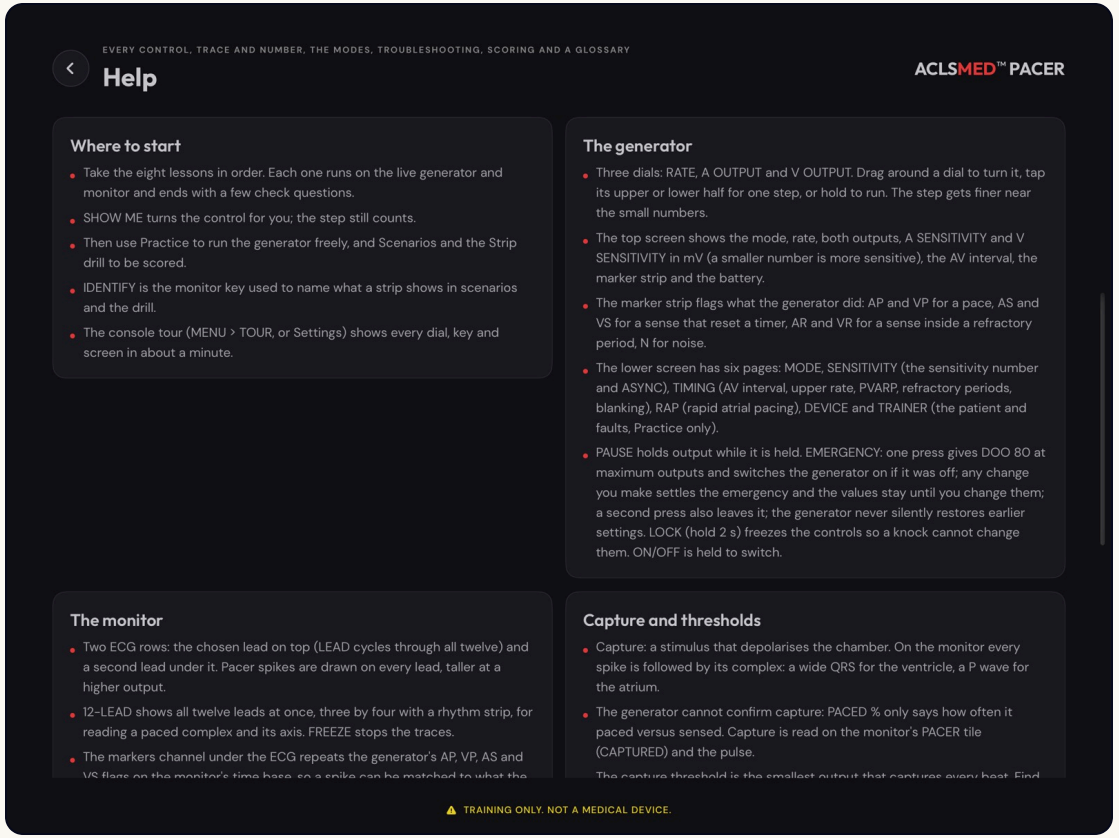
PPM OR BPM

Keep the two words apart with learners. A generator pacing at 80 ppm with loss of capture can sit beside a heart rate of 35 bpm.

HELP on the glass, and Help on Home

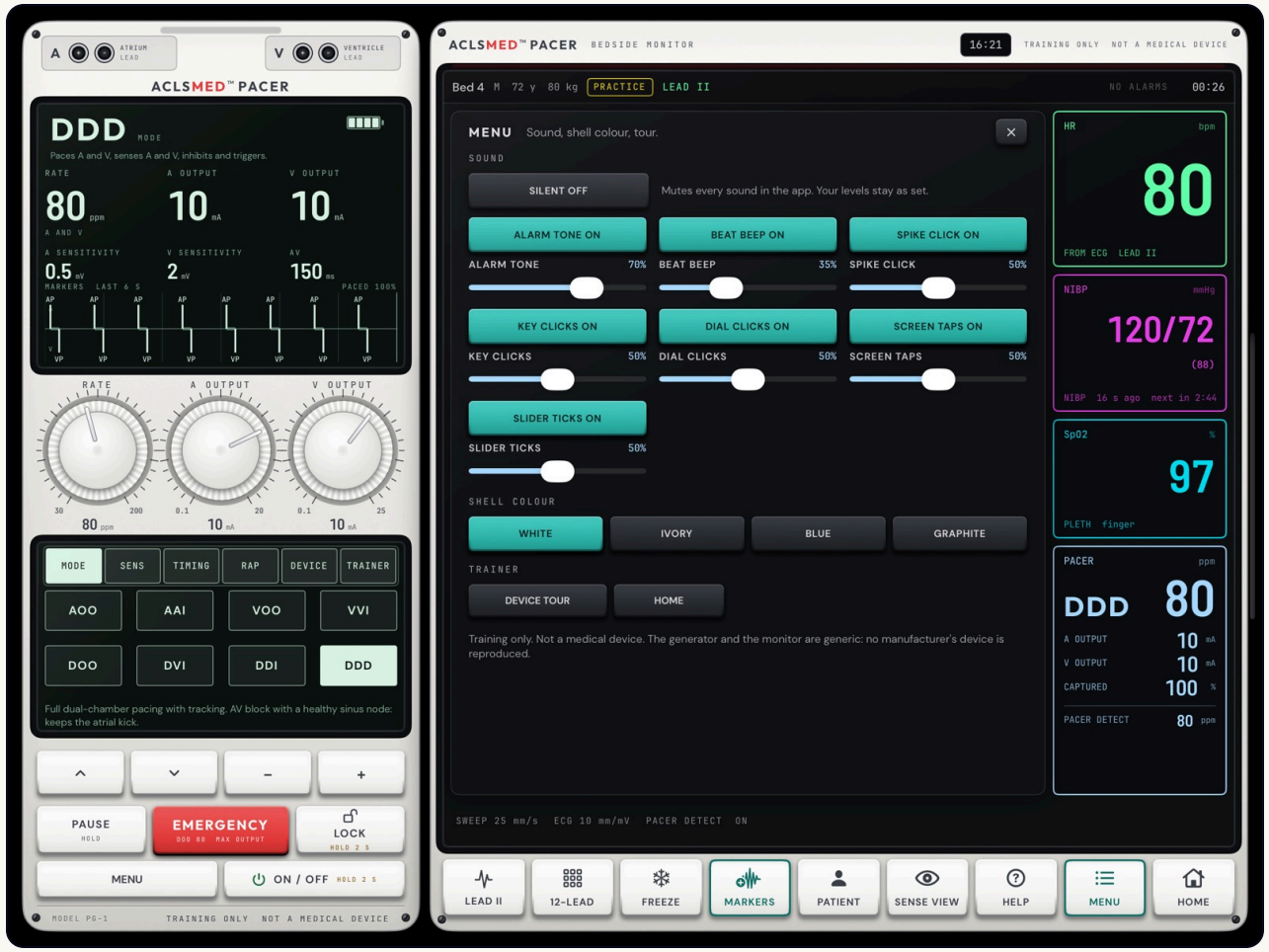


The monitor's **HELP**: ALARMS NOW, each with what to check; WHAT THE STRIP CAN SHOW, the ten findings; THE TWO RULES for sensing and capture.



Help from **?** on Home or Settings: where to start, every control, capture and sensing, the modes, dual-chamber timing, troubleshooting, scoring, a glossary, and what is saved.

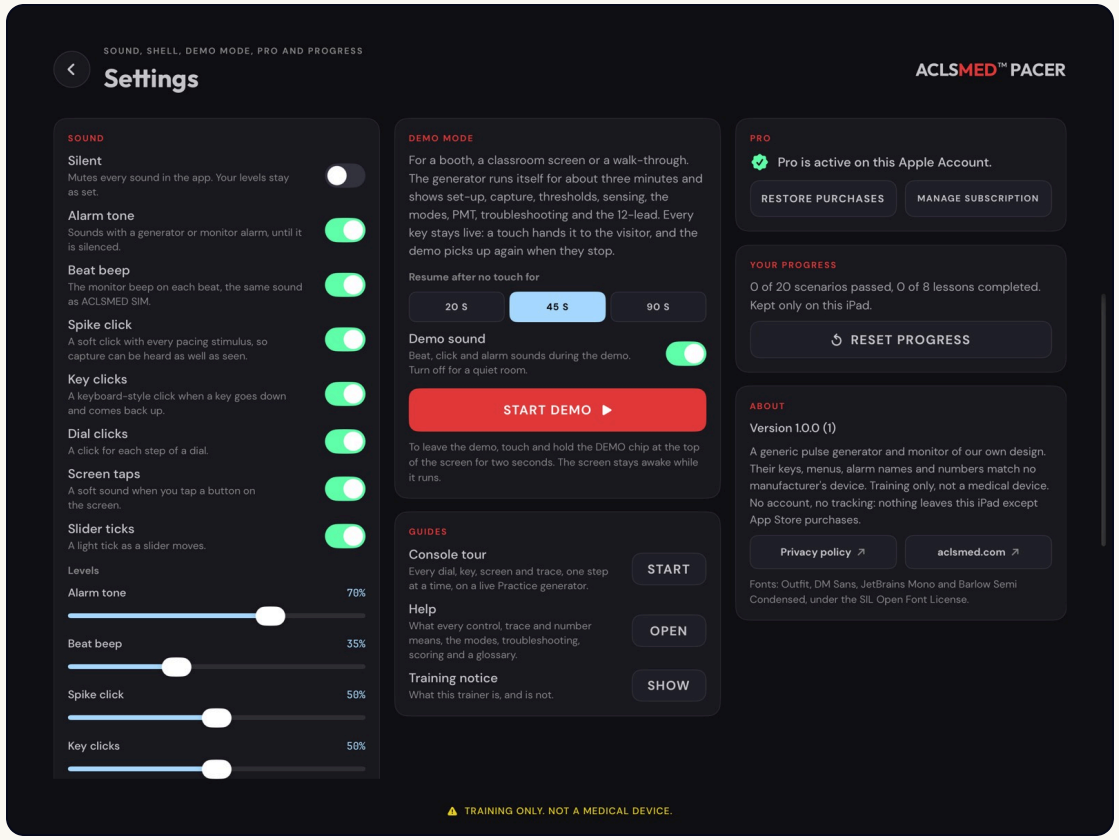
Sound, shell colour, tour, home



- `SILENT ON / OFF` mutes every sound in the app. Your levels stay as set.
- The device's tones: **ALARM TONE · BEAT BEEP · SPIKE CLICK**, each ON or OFF with a slider.
- The interface sounds: **KEY CLICKS · DIAL CLICKS · SCREEN TAPS**, then **SLIDER TICKS**.
- **SHELL COLOUR**: White, Ivory, Blue, Graphite.
- `DEVICE TOUR` and `HOME` (`LEAVE` in a lesson, case or drill).

> ONE SET OF SWITCHES
>
> MENU and Settings write the same values, so they always agree. Letting go of a slider plays a sample at the new level. While SILENT is on, the rows are dimmed but still live.

Settings, from the gear on Home



Generator: shell colour; **Practice opens** DDD 80 CAPTURING, VVI 80 CAPTURING or GENERATOR OFF. **Demo mode** (§ 04.04). **Guides**: console tour, Help, training notice. **Pro**, **Your progress**, **About**.

SOUND	WHAT IT IS	DEFAULT
`Silent`	Mutes every sound in the app	Off
`Alarm tone`	With a generator or monitor alarm, until silenced	70%
`Beat beep`	The monitor beep on each beat	35%
`Spike click`	A soft click with every stimulus, so capture is heard as well as seen	50%
`Key clicks`	When a key goes down and comes back up	50%
`Dial clicks`	For each step of a dial	50%
`Screen taps`	When you tap a button on the screen	50%
`Slider ticks`	As a slider moves	50%

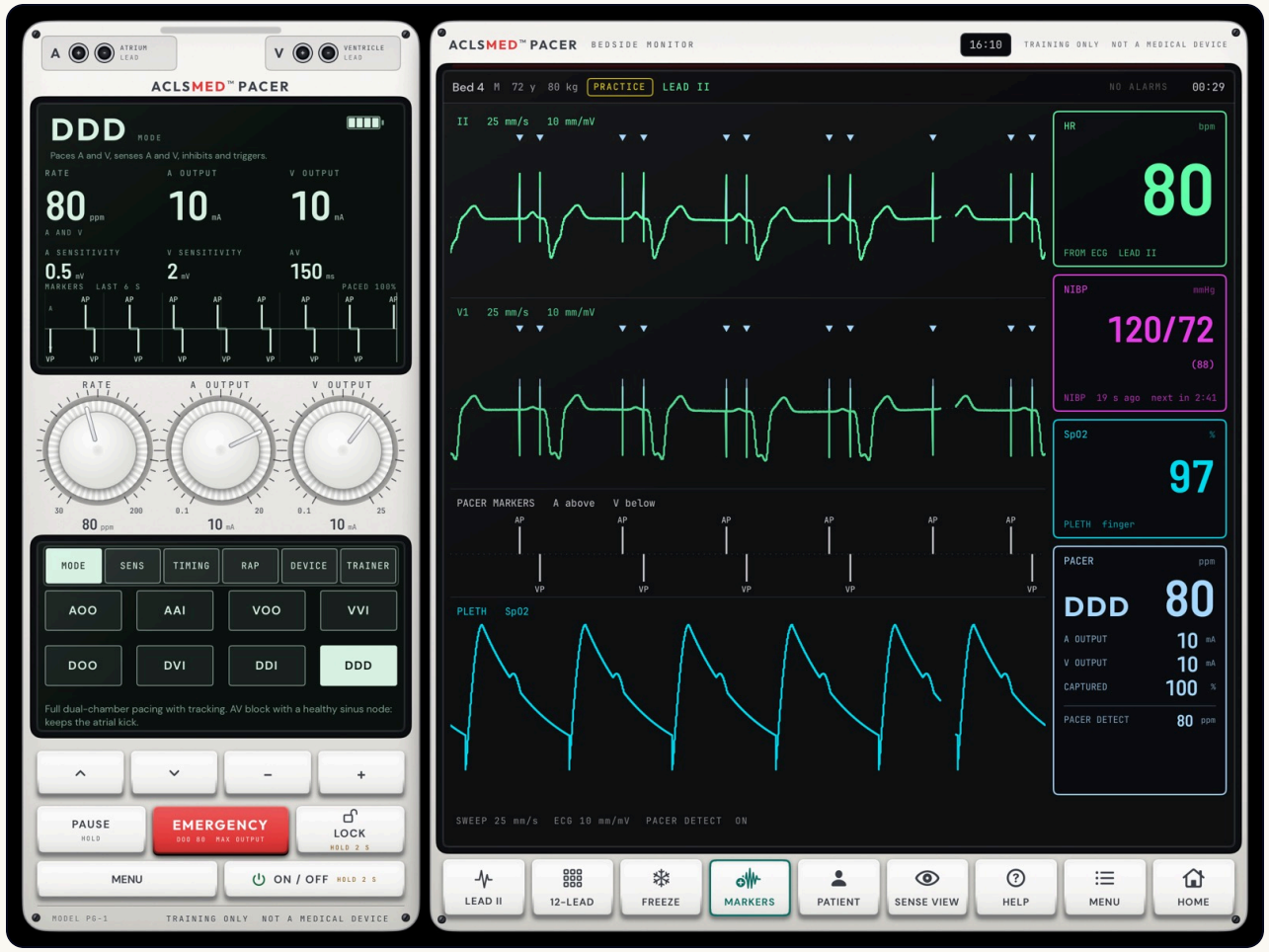
Each sound has an on/off switch and a level. The device's volume buttons set the overall loudness.

§ 04

Practice

Free run. Nothing is scored. The best place to demonstrate on a projector and to let learners play.

DDD 80 over complete heart block

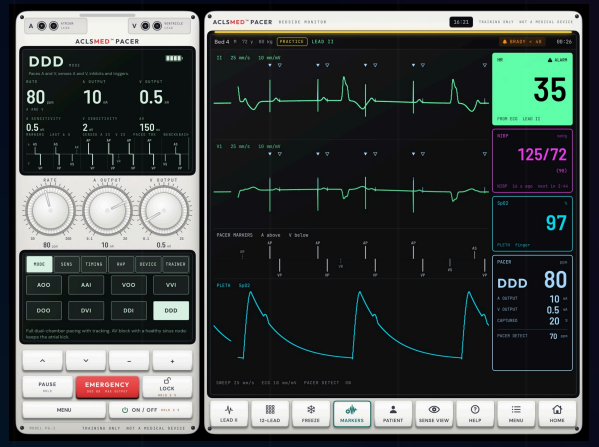


Practice opens pacing **DDD 80** at 10 mA over **complete heart block with a junctional escape of 40**, capturing, sound on. Change the start in Settings > Practice opens.

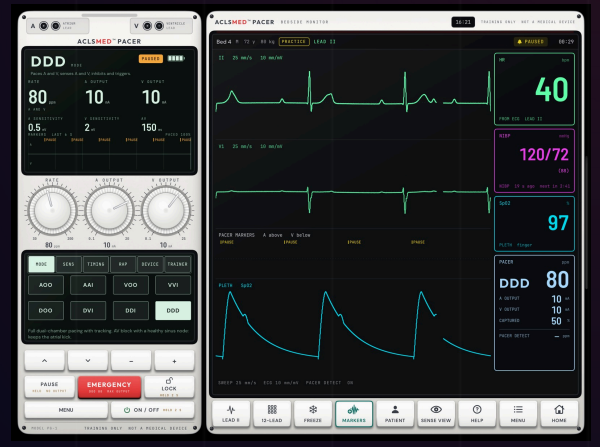
The first Practice on a device starts the console tour; after that it is under MENU > DEVICE TOUR or Settings.

> A TWO-MINUTE DEMONSTRATION
>
> Drag the V OUTPUT dial down below 1 mA. The spikes lose their QRS and the rate falls to the escape. Turn it back up and capture returns. Then try PAUSE, EMERGENCY and the MODE page.

Change one thing, watch the strip



V OUTPUT 0.5 MA · LOSS OF CAPTURE



PAUSE HELD · THE UNDERLYING RHYTHM



VVI 80 · NO ATRIAL PACING



SLOW AF 45 · VVI

Every one of these is a real engine state reached through the same keys a learner presses.

Every dial, key and screen in about two minutes

The tour spotlights one part at a time on a live Practice generator while the patient keeps running. NEXT and BACK step through it; SKIP ends it. Start it from MENU > DEVICE TOUR, TRAINER > SHELL > DEVICE TOUR, or Settings > Guides.

#	STEP	#	STEP
1	Welcome	11	The four softkeys
2	Lead terminals	12	PAUSE
3	The top screen	13	EMERGENCY
4	The marker strip	14	LOCK, MENU, ON/OFF
5	RATE	15	The monitor: two ECG leads
6	A OUTPUT and V OUTPUT	16	The marker channel
7	The menu screen: MODE	17	Pleth, ART, or what the generator sees
8	SENSE	18	Numbers
9	TIMING	19	LEAD, 12-LEAD, FREEZE, MARKERS
10	RAP · DEVICE	20	PATIENT, SENSE VIEW, HELP, MENU, HOME

> Take the tour yourself once before class. It is the fastest way to learn where everything is.

A trainer that runs itself



For a booth, a classroom screen as people arrive, or a walk-through. The generator runs itself for about three minutes, pressing its own keys: set-up, capture, thresholds, sensing, the modes, PMT, EMERGENCY and the 12-lead. Then it loops.

1. Settings > Demo mode > `Start demo`.
2. Any touch hands the device to the visitor. After **20, 45 or 90 s** without a touch the demo starts again on a fresh patient.
3. **Demo sound** off for a quiet room.
4. To leave, touch and hold the **DEMO** chip at the top for two seconds.

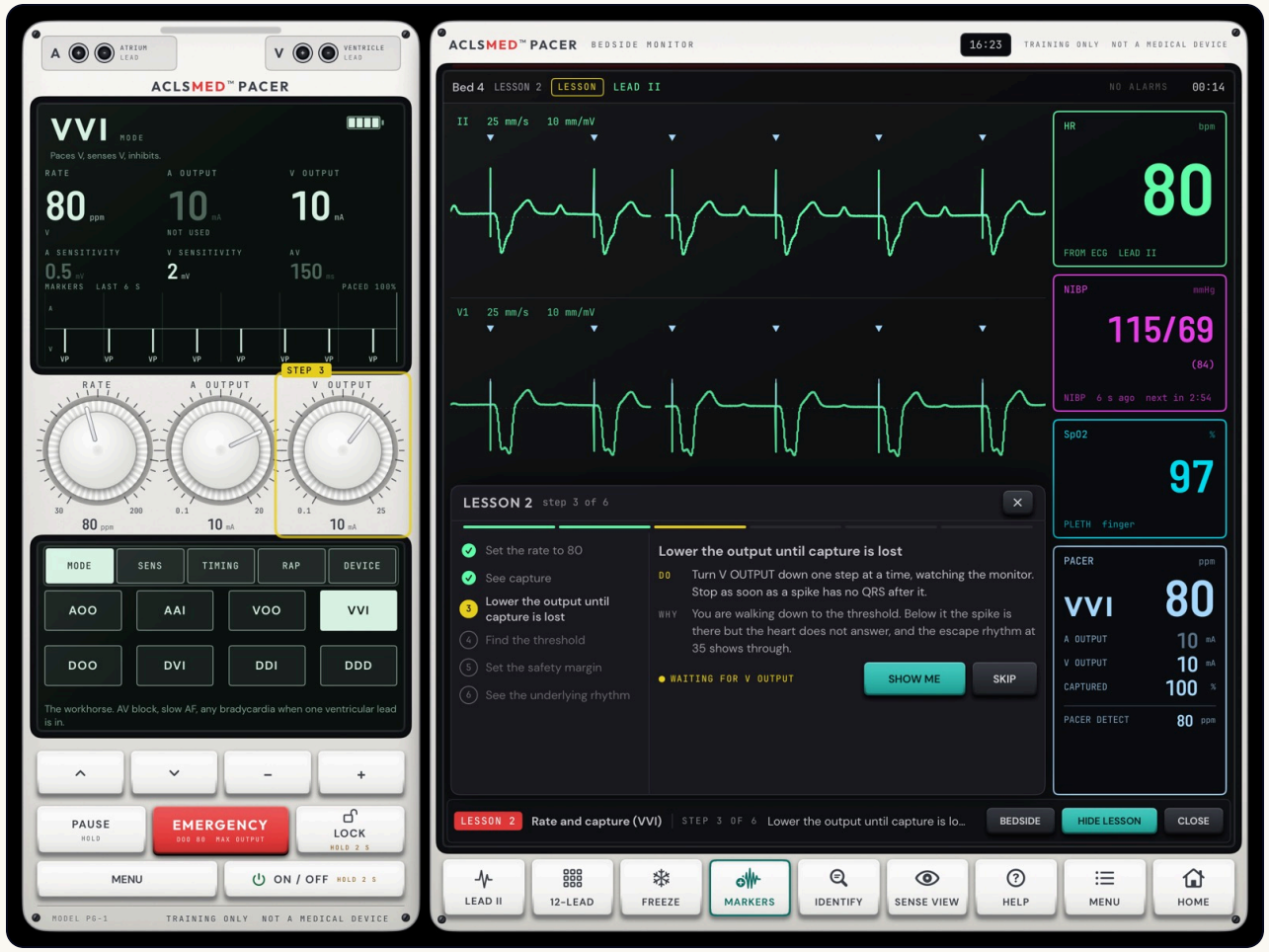
The screen stays awake while it runs.

§ 05

Learn: the 8 lessons

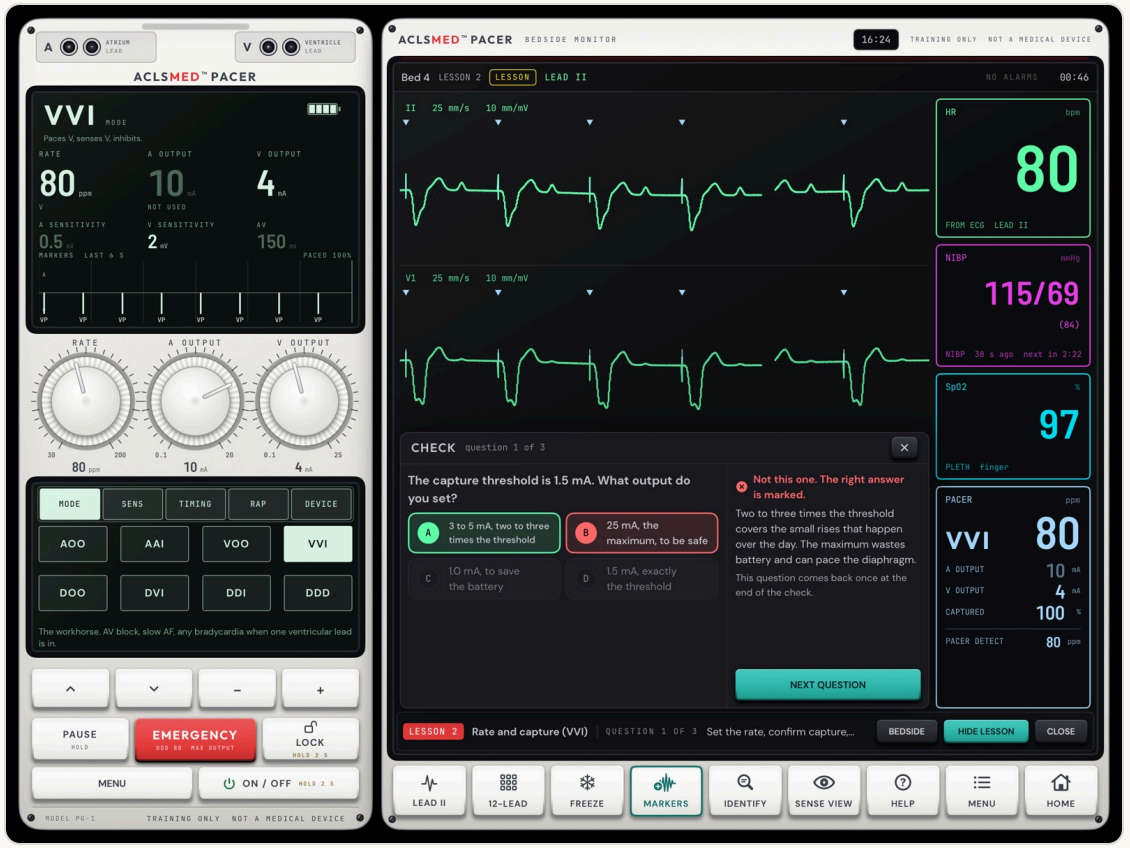
Stepped lessons on the live generator and monitor. About six to eight minutes each. All free.

Do it on the real keys

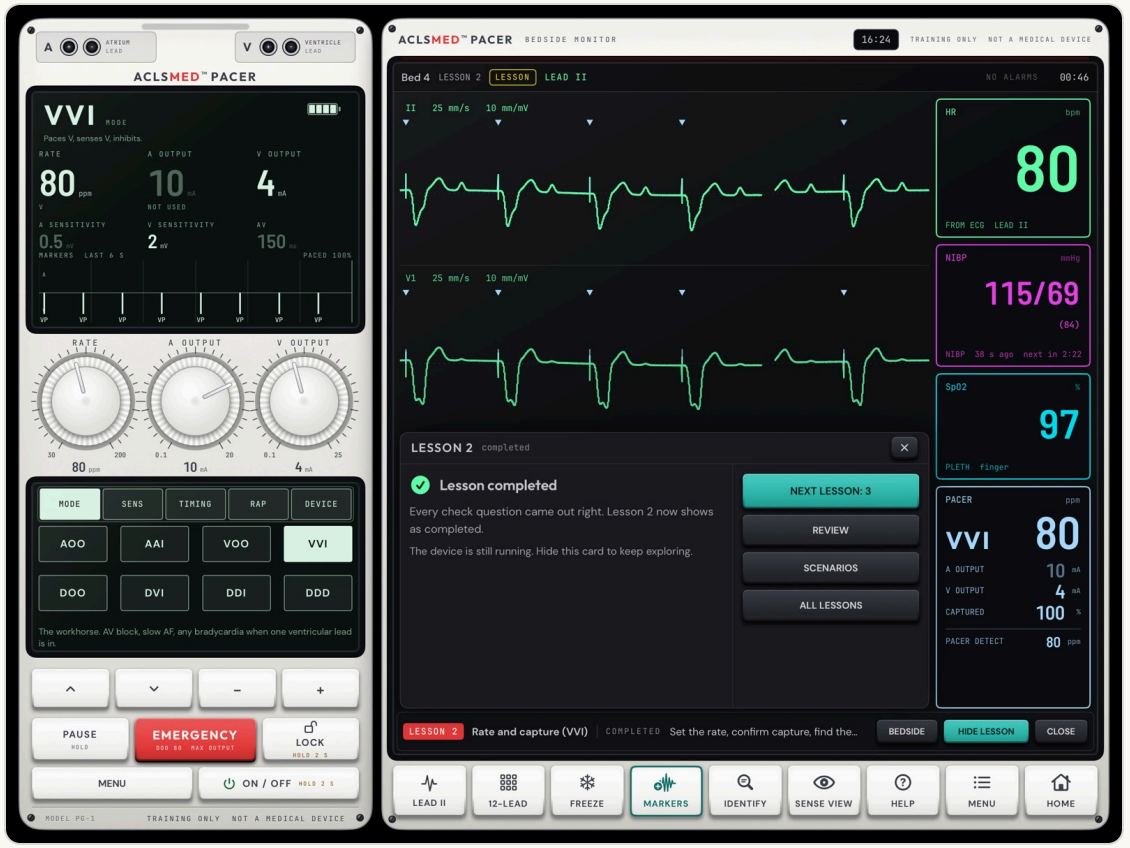


1. An intro card sets the patient and the goal.
2. Each step says what to **do** and **why**. It is done when the engine sees it happen, not when a button is pressed.
3. `SHOW ME` turns the control for you; the step still counts.
4. The card sits over the marker and pleth rows so HR, BP, SpO_2 and PACER stay visible. Hide it to look at the whole monitor; the patient is live behind it.
5. When every step is done, three check questions follow.

Completed when every answer is right



A MISSED QUESTION · THE RIGHT ANSWER MARKED



LESSON COMPLETED

> The first tap is the answer. A wrong answer shows the right one and the reason, and the question comes back once at the end. A question still wrong at the second try leaves the lesson "Not completed yet", with TRY THE CHECK AGAIN.

Take them in order

#	LESSON	OBJECTIVE (FROM THE APP)	MIN
L1	**What the generator does**	Name the parts, turn it on, read the top screen and the marker strip while it paces a patient in complete heart block.	6
L2	**Rate and capture (VVI)**	Set the rate, confirm capture, find the ventricular capture threshold and set the output with a safety margin.	7
L3	**Sensitivity and sensing (VVI)**	Watch a sensed beat inhibit the generator, find the sensing threshold, set half of it, and see asynchronous pacing.	7
L4	**The modes**	Read the NBG letters and try every mode on one patient with sinus bradycardia and intact conduction.	7
L5	**Dual-chamber timing**	AV interval, upper rate limit and PVARP in DDD; Wenckebach and 2:1 upper-rate behavior and PMT, and ending each.	8
L6	**Atrial pacing and overdrive**	AAI for sinus bradycardia, the atrial threshold, and rapid atrial pacing to overdrive atrial flutter.	7
L7	**Troubleshooting**	Failure to capture, undersensing, oversensing and failure to output, and what to check in which order.	8
L8	**The paced 12-lead**	RV apical pacing, the paced P wave, fusion and pseudofusion, where the spikes fall; then the EMERGENCY key.	6

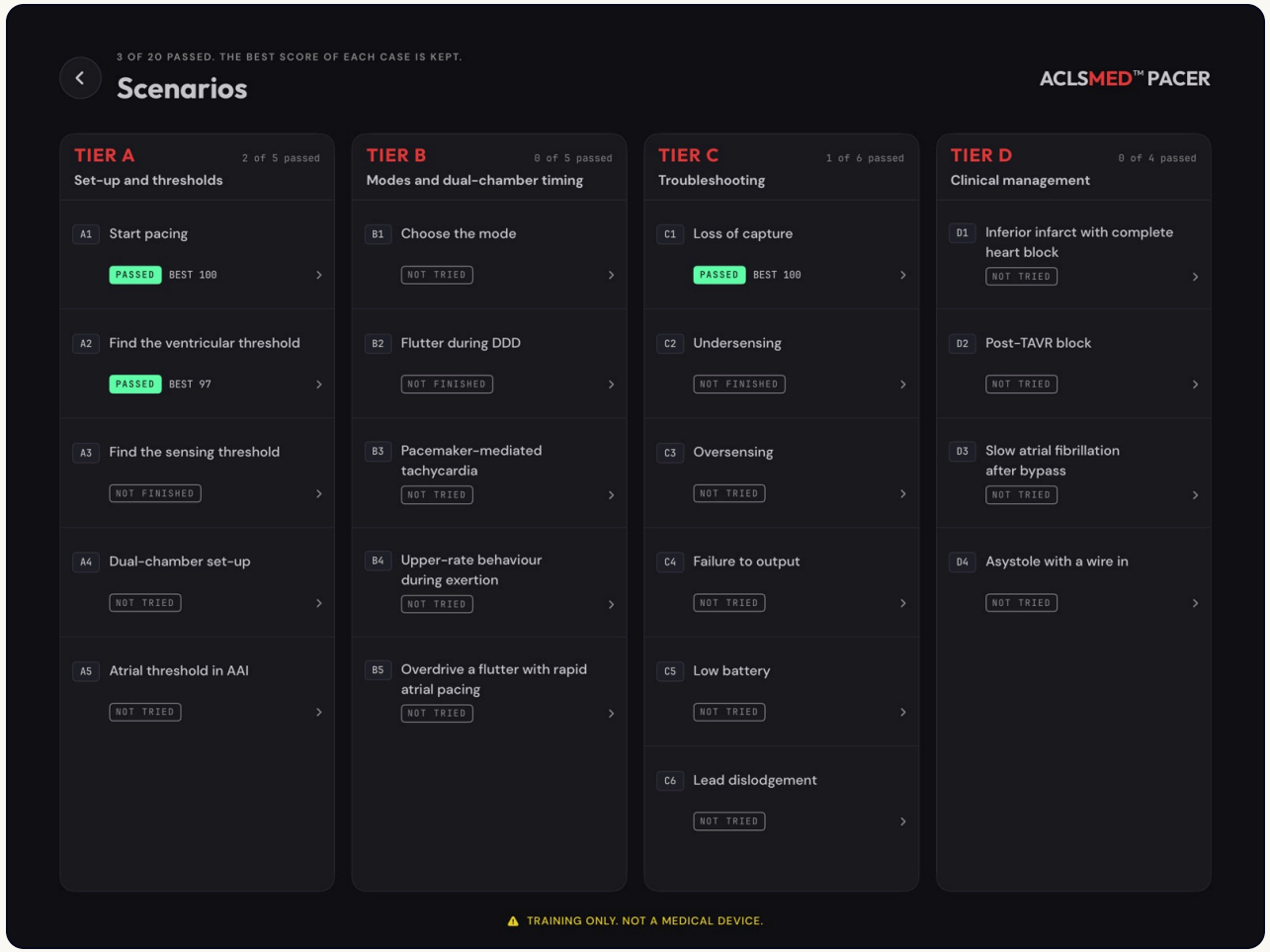
> Lesson 2 is the best first lesson to show a group: the stepped card, SHOW ME on the real dial, and the questions.

§ 06

Scenarios

Twenty scored cases in four tiers. The patient and the room change; the learner reads the monitor and works the generator.

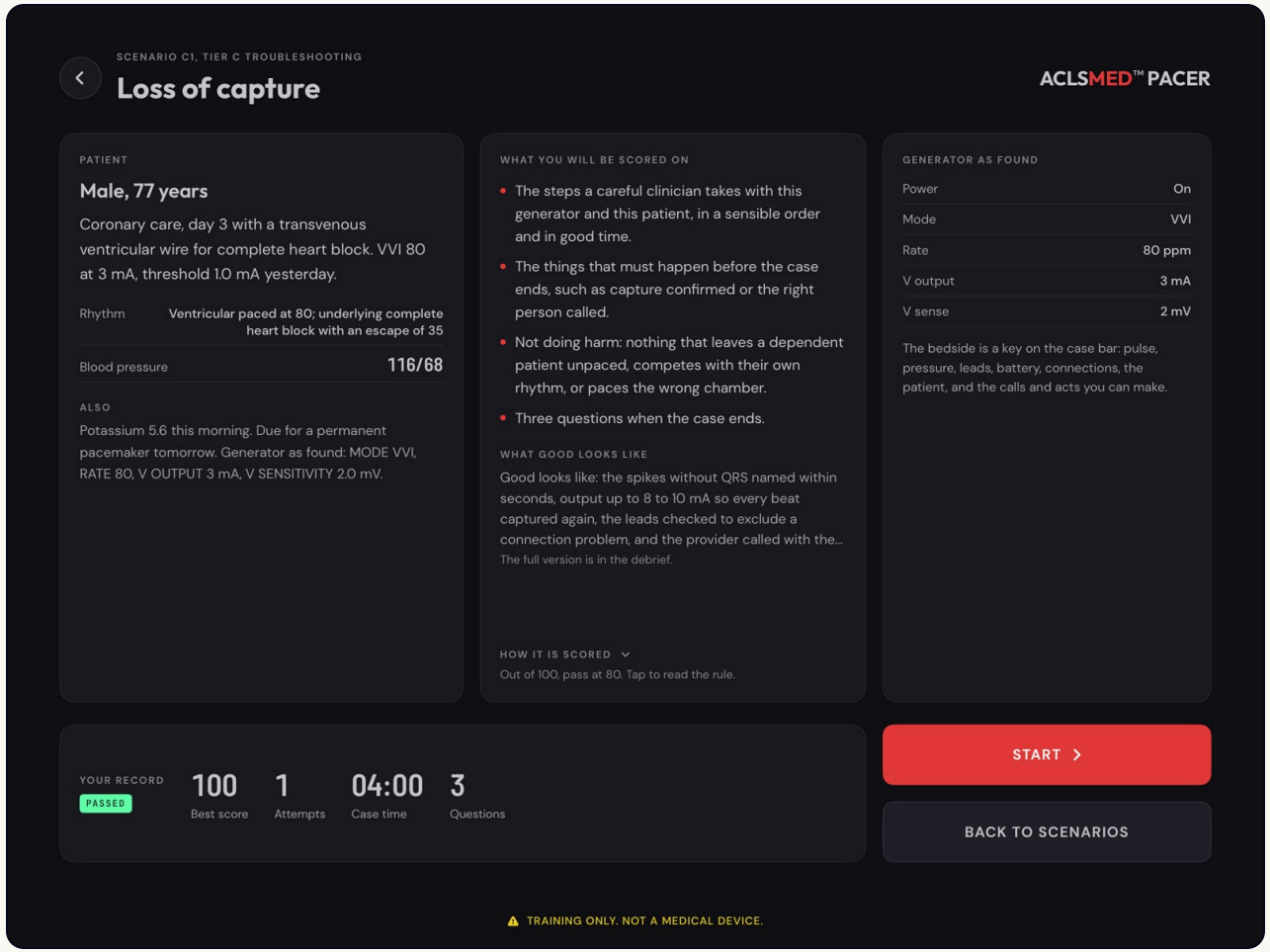
Four tiers, twenty cases



TIER	NAME	CASES
A	Set-up and thresholds	5
B	Modes and dual-chamber timing	5
C	Troubleshooting	6
D	Clinical management	4

Each row shows the learner's best score. Free cases are **A1, A2, B1 and C1**; the rest wear a lock until Pro. A locked case still shows the best score earned in it.

Read the patient, then start



- The patient: age, setting, rhythm, blood pressure, and the **generator as found**.
- **How it is scored**: expected steps in a sensible order and in good time; things that must happen before the end; not doing harm; three questions at the end.
- The bedside is a key on the case bar: pulse, pressure, leads, battery, connections, the patient, and the calls and acts.

> **THE CASE TEXT NEVER NAMES THE ANSWER**
>
> Events describe the patient and the room: symptoms, what the nurse says, which alarm sounds. The learner reads the monitor and the marker strip for the finding.

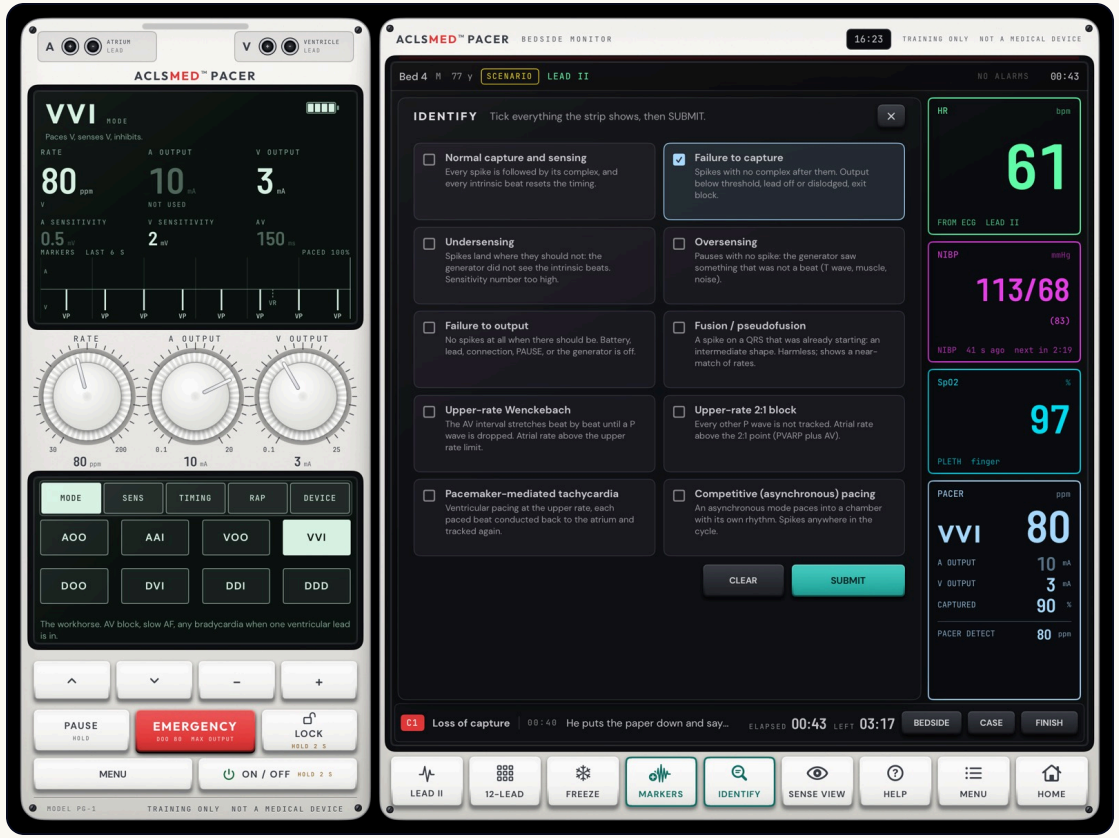
The case bar and the event card



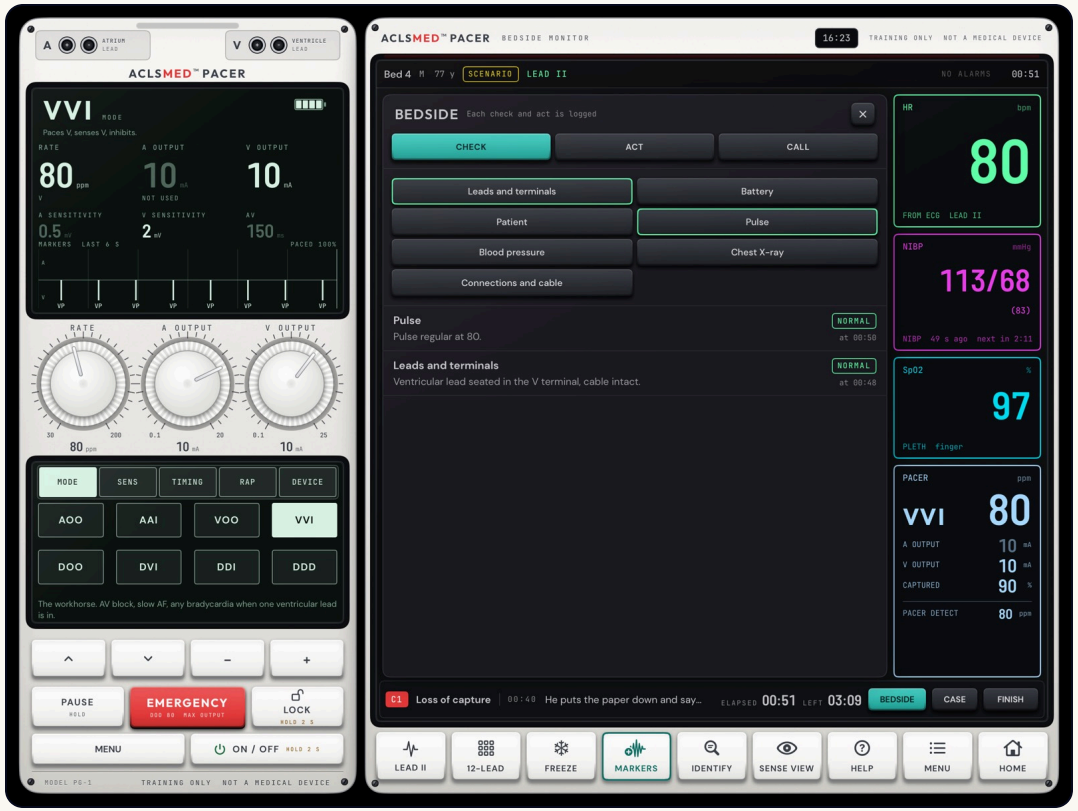
1. An **event card** appears when something happens. Tap it to dismiss.
2. The **case bar** at the foot of the monitor shows the latest event, `BEDSIDE` and `FINISH`. If the expected step has been open a while, the bar shows it as a **HINT** (never on a TEACH monitor).
3. Work the case on the generator. Name what you see with `IDENTIFY`: speed counts.
4. Use the bedside for checks, acts and calls.
5. Press FINISH when done, or let the clock run out.

Leaving a case before it ends saves nothing; it can be started again from the list.

Name it. Check it. Call it.



IDENTIFY: tick everything the strip shows, then SUBMIT. The ten findings are the drill's (§ 07.02).



CHECK	Leads and terminals · Battery · Patient · Pulse · Blood pressure · Chest X-ray · Connections and cable
ACT	Swap the generator · Change the battery · Secure the leads and connections · Transcutaneous pads as backup · Ask for the lead to be repositioned · Give atropine
CALL	Call the provider · Call electrophysiology

Out of 100, passed at 80

```
Score = expected steps 70 + must-happen items 20 + questions 10
```

EXPECTED STEPS · 70
Each step has a window. Done in time: full points. Done late: half. A step judged on a setting pays only after the learner has touched that control, so a setting already right at the start pays nobody.

MUST-HAPPEN ITEMS · 20
Things that must be true before the case ends, such as capture held to the end or the provider called. Every one must be met to pass.

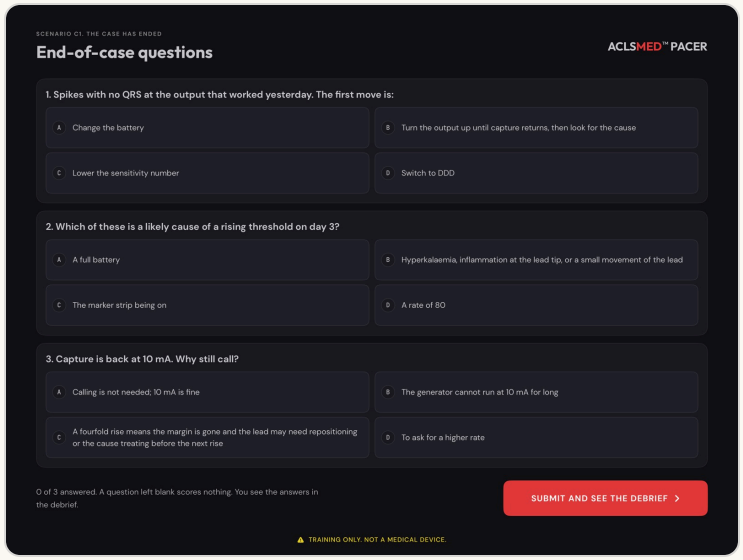
QUESTIONS · 10
Three questions at the end, worth 4, 3 and 3. The answers are shown in the debrief.

NEVER-EVENTS
Harmful actions, such as leaving a dependent patient without capture too long. Any one fails the case and caps the score at 59.

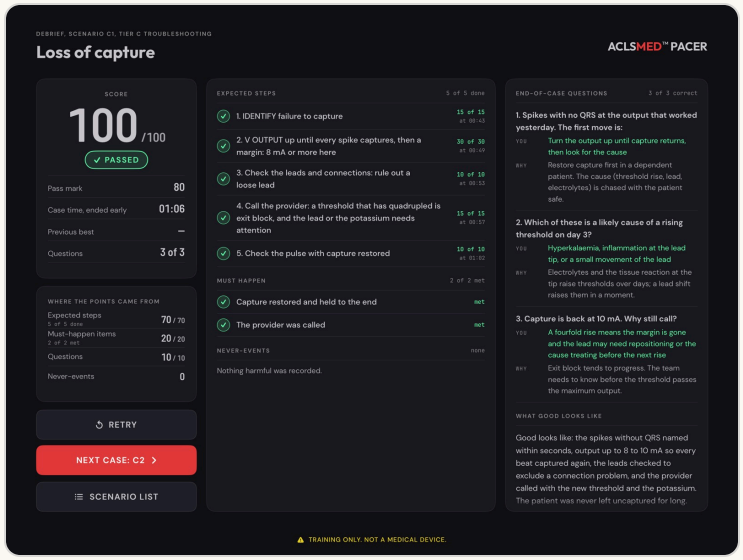
PASS RULE

Score 80 or more, **and** every must-happen item met, **and** no never-event. A learner who does nothing scores 0. Only the best score of each case is kept.

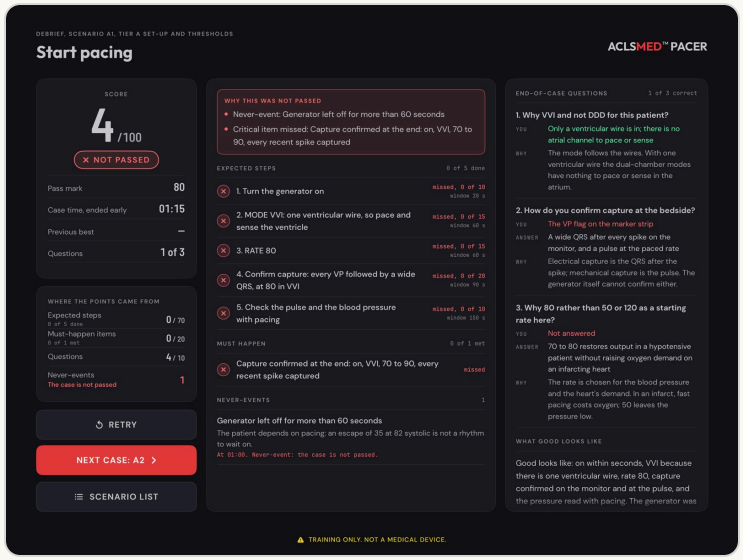
Every step, and when it was done



END-OF-CASE QUESTIONS



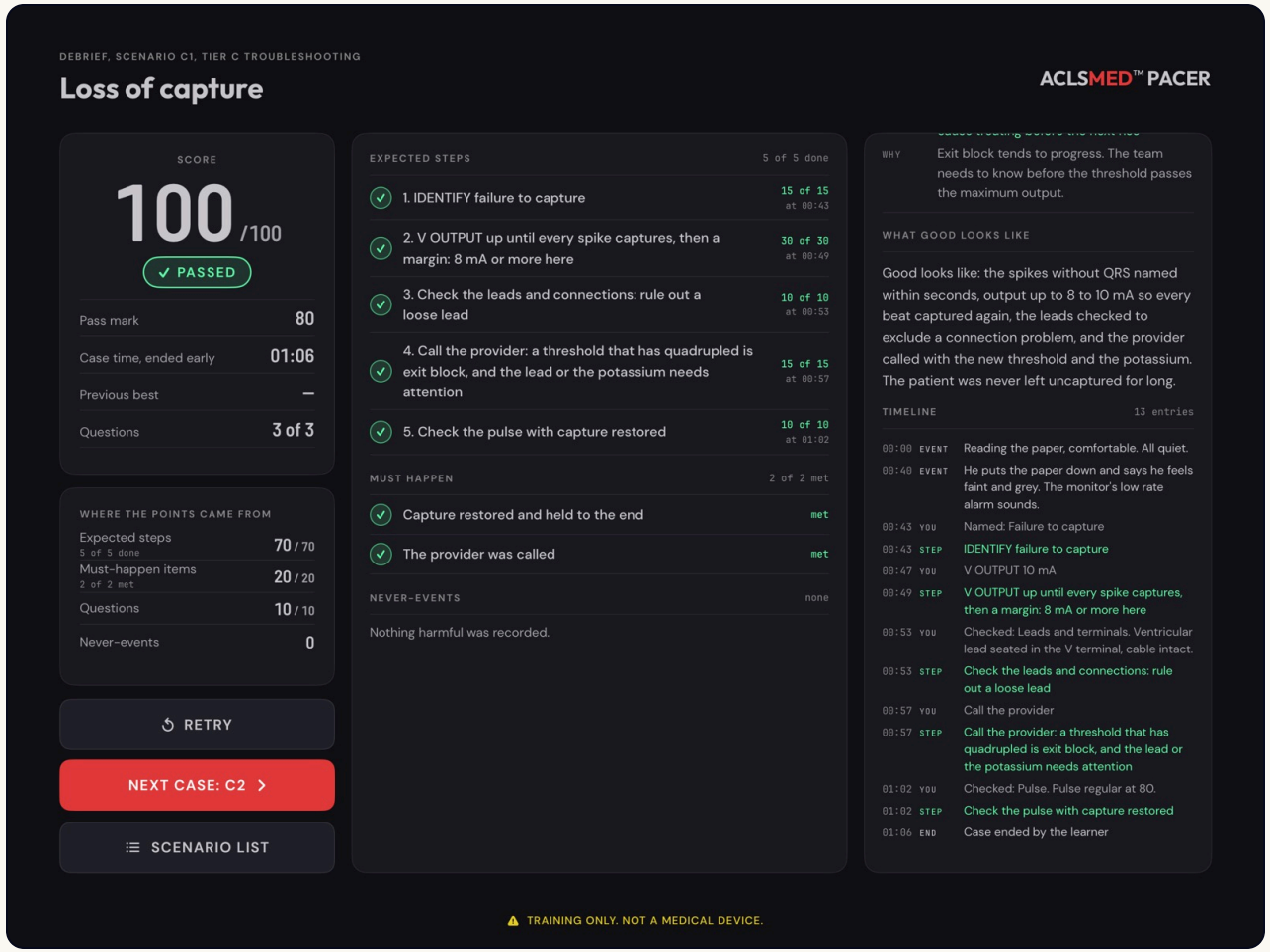
DEBRIEF · PASSED



DEBRIEF · NOT PASSED

The debrief shows the score and where the points came from, the must-happen items met or missed, each expected step with the time it was done, any harmful action and why it matters, the questions with their reasoning, "What good looks like", and a timeline of events, alarms and actions. RETRY returns to the briefing.

Teach from the timeline



1. Start with the event: what did the patient and the room tell you?
2. When was the finding named with IDENTIFY, and what did the strip show at that moment?
3. Walk the expected steps in order. Which were late, and why?
4. If the case was not passed, read "Why this was not passed" aloud.
5. Finish with "What good looks like".

> **IN TEACH**
>
> The questions and the debrief appear on the monitor, so the whole class debriefs from the same screen (§ 08.07).

Tiers A and B

ID	CASE	PATIENT AND SETTING	WHAT THE CASE TEACHES	TIME	
A1	**Start pacing**	68 M · inferior infarct day 1 · new V wire, generator off	Turn on, VVI, rate 80, confirm capture, check pulse or BP	4:00	FREE
A2	**Find the ventricular threshold**	74 F · complete heart block · VVI 80 at 10 mA	Lower to loss of capture, find the threshold, set a margin	4:00	FREE
A3	**Find the sensing threshold**	61 M · after valve surgery · sinus rhythm, backup V wire	Raise the number until undersensing, find the threshold, set half	4:00	PRO
A4	**Dual-chamber set-up**	66 F · first evening after aortic valve replacement · both wires	DDD 90, both thresholds, both margins	6:00	PRO
A5	**Atrial threshold in AAI**	72 M · day 2 after bypass · atrial wire only	Atrial threshold and margin in AAI	4:00	PRO
B1	**Choose the mode**	58 F · day 1 after mitral repair · sinus bradycardia, set VVI 60 overnight	A mode that keeps the atrial kick, atrial capture, check BP	4:00	FREE
B2	**Flutter during DDD**	70 M · day 3 after bypass · heart block, DDD 90	Recognize tracking at the upper rate, change to a non-tracking mode	4:00	PRO
B3	**Pacemaker-mediated tachycardia**	64 F · transvenous A and V leads · DDD 70, ectopics	Recognize PMT and end it with PVARP	4:00	PRO
B4	**Upper-rate behavior during exertion**	54 M · day 2 after bypass · DDD 70, upper rate 100	Recognize Wenckebach then 2:1, set the upper rate	5:00	PRO
B5	**Overdrive a flutter with rapid atrial pacing**	69 M · day 2 after bypass · new atrial flutter	Set the RAP rate, deliver the burst, back to a pacing plan	5:00	PRO

Tiers C and D

ID	CASE	PATIENT AND SETTING	WHAT THE CASE TEACHES	TIME	
C1	**Loss of capture**	77 M · coronary care day 3 · VVI 80 at 3 mA	Recognize failure to capture, output up, check leads, call	4:00	FREE
C2	**Undersensing**	63 F · day 2 after valve surgery · sinus rhythm returned	Recognize undersensing, set the sensitivity	4:00	PRO
C3	**Oversensing**	81 M · heart block with no escape · VVI 70	Recognize oversensing, fix the sensitivity	4:00	PRO
C4	**Failure to output**	70 F · VVI 80 · back from the commode	Check the leads first, then secure them	4:00	PRO
C5	**Low battery**	79 M · no escape · generator running five days	Check the battery, swap or change it in time	4:00	PRO
C6	**Lead dislodgement**	66 F · wire placed yesterday · coughing	Recognize failure to capture, pads as backup, call for repositioning	5:00	PRO
D1	**Inferior infarct with complete heart block**	71 F · emergency department · hypotensive, wire just placed	Turn on, VVI 70 to 80, capture, check BP, call	4:00	PRO
D2	**Post-TAVR block**	84 M · six hours after transcatheter valve · both wires	Complete block arrives: rate, DDD, capture, check BP, call	5:00	PRO
D3	**Slow atrial fibrillation after bypass**	75 M · day 1 after bypass · slow AF, DDD	A non-tracking ventricular mode, rate, capture	4:00	PRO
D4	**Asystole with a wire in**	73 F · backup VVI 40 at 2 mA · both wires	EMERGENCY at once, then settle to a pacing plan with capture	4:00	PRO

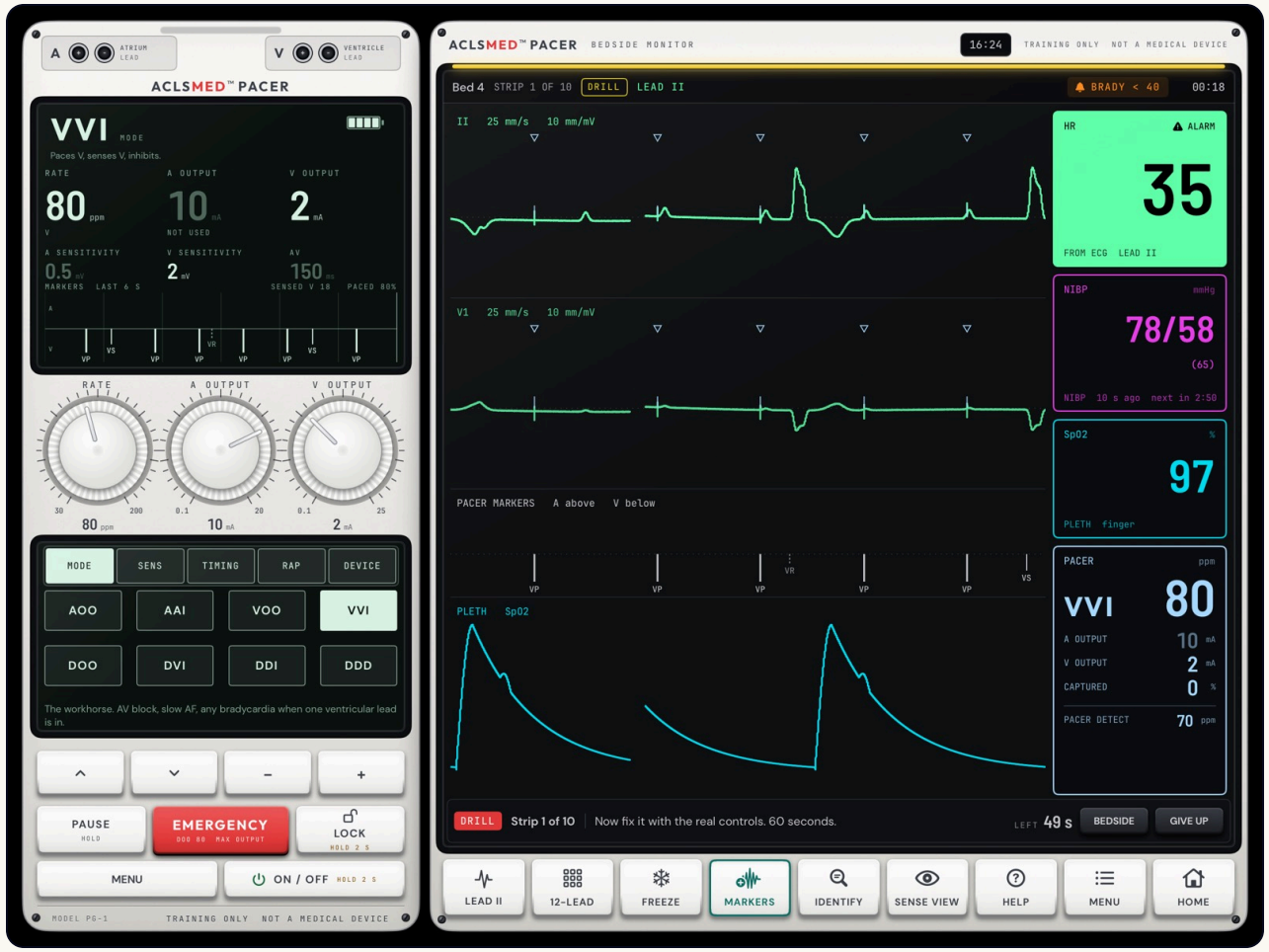
> Every case ships a patient, the generator as found, timed events, expected steps, must-happen items, never-events, three questions and a debrief. The numbers are this trainer's teaching defaults.

§ 07

The strip drill

What is the pacer doing? Ten random strips a round. Name it, then fix it with the real controls.

Name it, then fix it

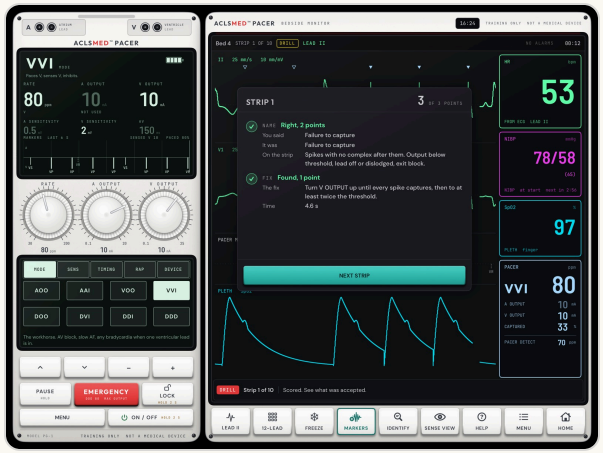


1. An 8-second strip plays on the monitor.
2. Press `IDENTIFY`, tick one finding, SUBMIT. Right: **2 points**.
3. Now fix it with the real controls within **60 seconds**, then DONE. Found: **1 point**.
4. The feedback shows what was accepted. Then the next strip.

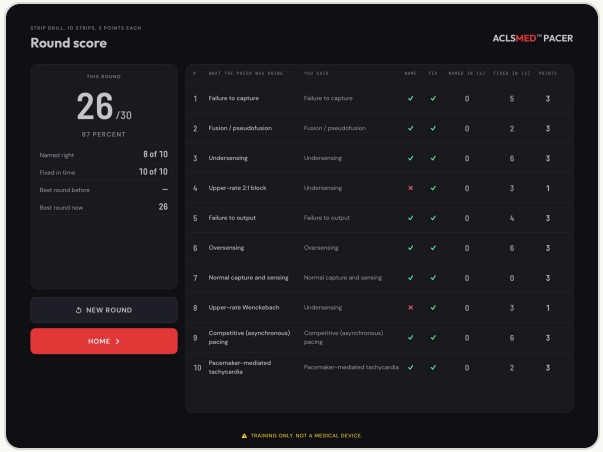
10	3	30
STRIPS A ROUND	POINTS A STRIP	BEST ROUND

Free: one round a calendar day. Pro: no limit. Leaving a round saves nothing.

What the strip can show



FEEDBACK FOR ONE STRIP



END OF THE ROUND

FINDING	ON THE STRIP (THE APP'S OWN WORDS)
Normal capture and sensing	Every spike is followed by its complex, and every intrinsic beat resets the timing.
Failure to capture	Spikes with no complex after them.
Undersensing	Spikes land where they should not: the generator did not see the intrinsic beats.
Oversensing	Pauses with no spike: the generator saw something that was not a beat.
Failure to output	No spikes at all when there should be.
Fusion / pseudofusion	A spike on a QRS that was already starting.
Upper-rate Wenckebach	The AV interval stretches beat by beat until a P wave is dropped.
Upper-rate 2:1 block	Every other P wave is not tracked.
Pacemaker-mediated tachycardia	Pacing at the upper rate, each paced beat conducted back to the atrium and tracked again.
Competitive pacing	An asynchronous mode paces into a chamber with its own rhythm.

§ 08

TEACH mode

Two devices, one class. One tablet is the monitor the class watches. A phone or a second tablet is the generator the students hold.

§ 08.01 — HOW TEACH WORKS

One engine, on the monitor

THE MONITOR

IPAD OR ANDROID TABLET · THE CLASS WATCHES THIS

Runs the one heart and generator model, the scoring, and the instructor panel in its left third. The bedside monitor keeps the right two thirds, exactly as on one tablet.

THE GENERATOR

A PHONE OR A SECOND TABLET · THE STUDENTS HOLD THIS

The generator's screens, dials and keys, mirrored from the monitor ten times a second. No engine runs on it.

THE LINK

LOCAL NETWORK, A FOUR-DIGIT PIN

Every dial turn and key press on the generator is applied on the monitor through the same path a local key uses. Latency on a local network reads as immediate.

WHY THIS MATTERS

A scored case in TEACH scores the students' actions exactly as it scores one learner on one iPad, and the two devices can never disagree about the patient.

TEACH runs Practice and scored Scenarios. Lessons and the strip drill stay single-device.

Like pairs with like

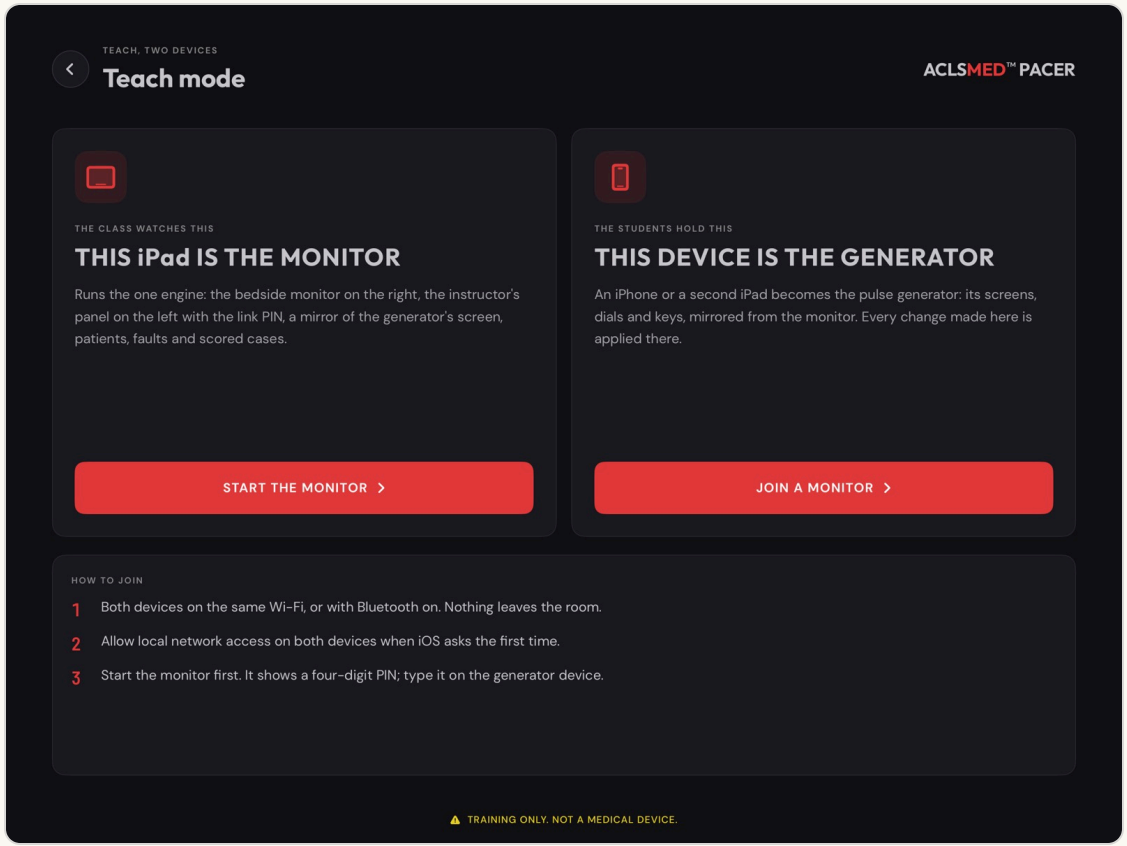
MONITOR	GENERATOR	LINK	
iPad (or open iPhone Duo)	iPhone, or a second iPad	Wi-Fi or Bluetooth, no network set-up	PAIRS
Android tablet	Android phone, or a second Android tablet	The same Wi-Fi network	PAIRS
iPad	Android phone	None	NO
Android tablet	iPhone	None	NO

Same version
Both devices need the same version of ACLSMED™ PACER. If they differ the join is refused: "Update both, then join again."

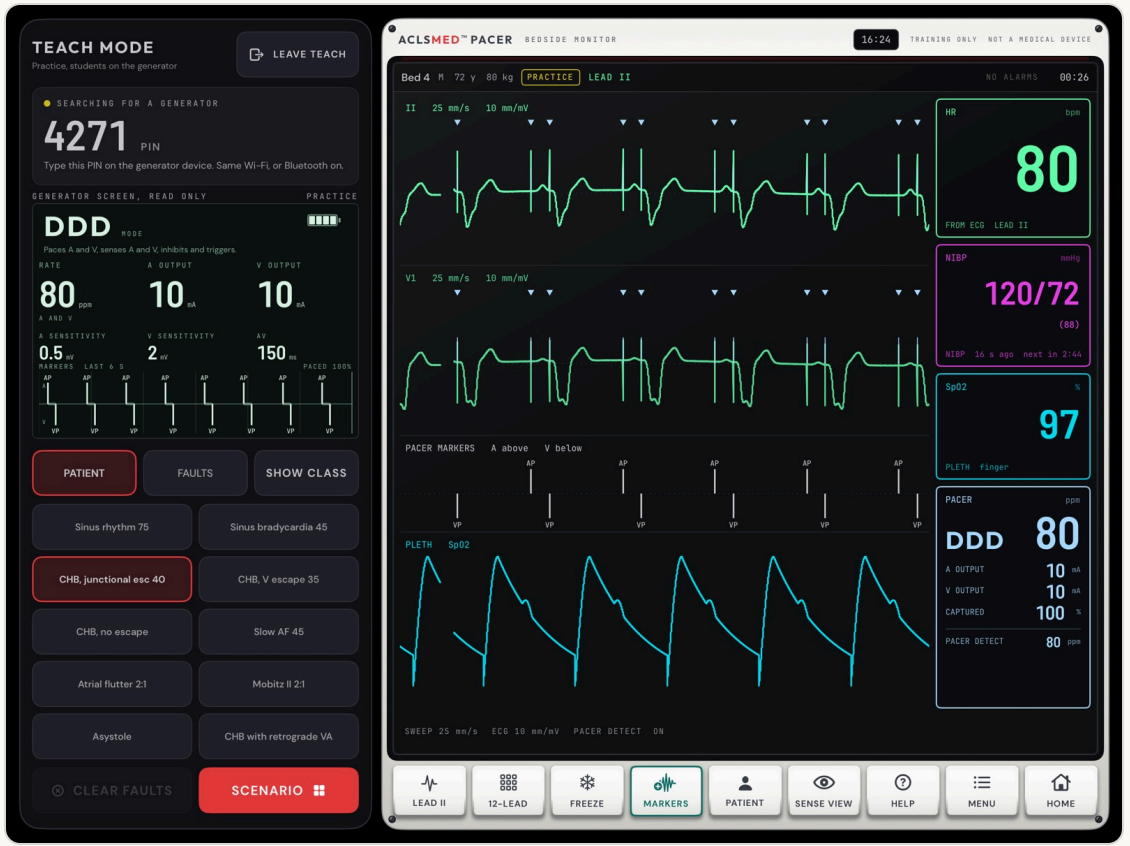
Local network allowed
Allow local network access on both devices the first time it is asked.

One generator per monitor
A second device is told "This monitor already has a generator".

Start the monitor first



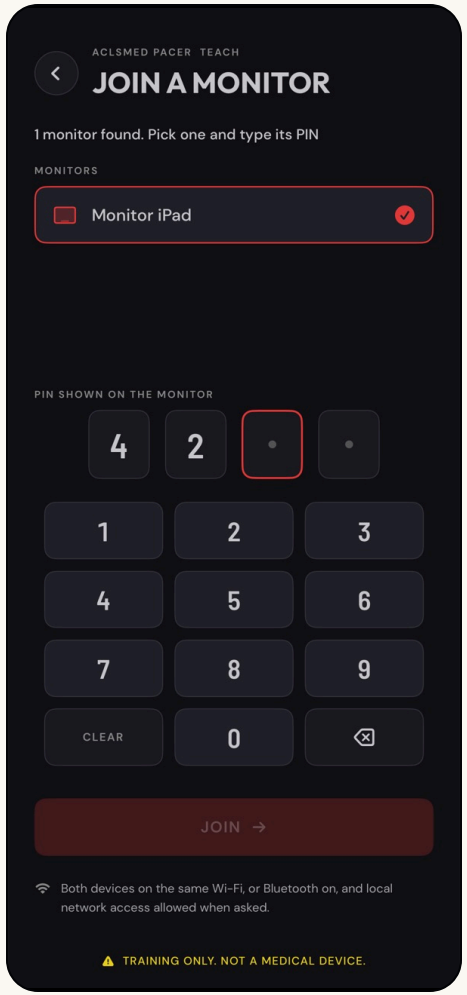
HOME > TEACH · THE ROLE SCREEN



START THE MONITOR · SEARCHING, WITH THE PIN

On the tablet at the front: Home > **TEACH** > **START THE MONITOR.** Allow local network access when asked. The left third shows SEARCHING FOR A GENERATOR and a four-digit PIN large enough for the room to read. The monitor keeps its screen awake for the whole session.

Pick the monitor, type the PIN



JOIN A MONITOR



JOINED

1. Open the app on the phone. A phone opens on TEACH; a second iPad goes Home > TEACH.
2. Tap `JOIN A MONITOR`. Allow local network access when asked.
3. Pick the monitor from the list. With only one, it is picked for you.
4. Type the four-digit PIN shown on the monitor, then `JOIN`.
5. The generator appears. Turn a dial: the monitor's ECG, markers and the instructor's mirror follow at once.

> **NO MONITOR IN THE LIST?**
>
> After about 10 seconds the phone says: check both devices are on the same Wi-Fi and that ACLSMED PACER is allowed Local Network in Settings > Privacy & Security.

The left third is yours



1. **TEACH MODE** and `LEAVE TEACH` (asks first).
2. **Link card**: CONNECTED, the device's name, the round trip in ms, and `RELEASE GENERATOR`.
3. **Generator screen, read only**: a mirror of the students' top screen, so you see what they set.
4. `PATIENT` · `FAULTS` tabs and `SHOW CLASS`.
5. **The grid**: the ten patients, or the twelve faults.
6. `CLEAR FAULTS` and `SCENARIO`, which opens the case list.

The monitor's own PATIENT key works too: tap for the patients, hold for the faults.

They see the effect, not the name



FAULTS · V THRESHOLD RISE ON



SHOW CLASS · SETTINGS IN BIG TYPE

A fault stays on until it is cleared. The students see its effect on the monitor, never its name, so they have to find it. SHOW CLASS fills the left third with the mirror and MODE, RATE, outputs, sensitivities and AV interval in big type for the back of the room; CONTROLS brings the panel back.

The class scores as one learner



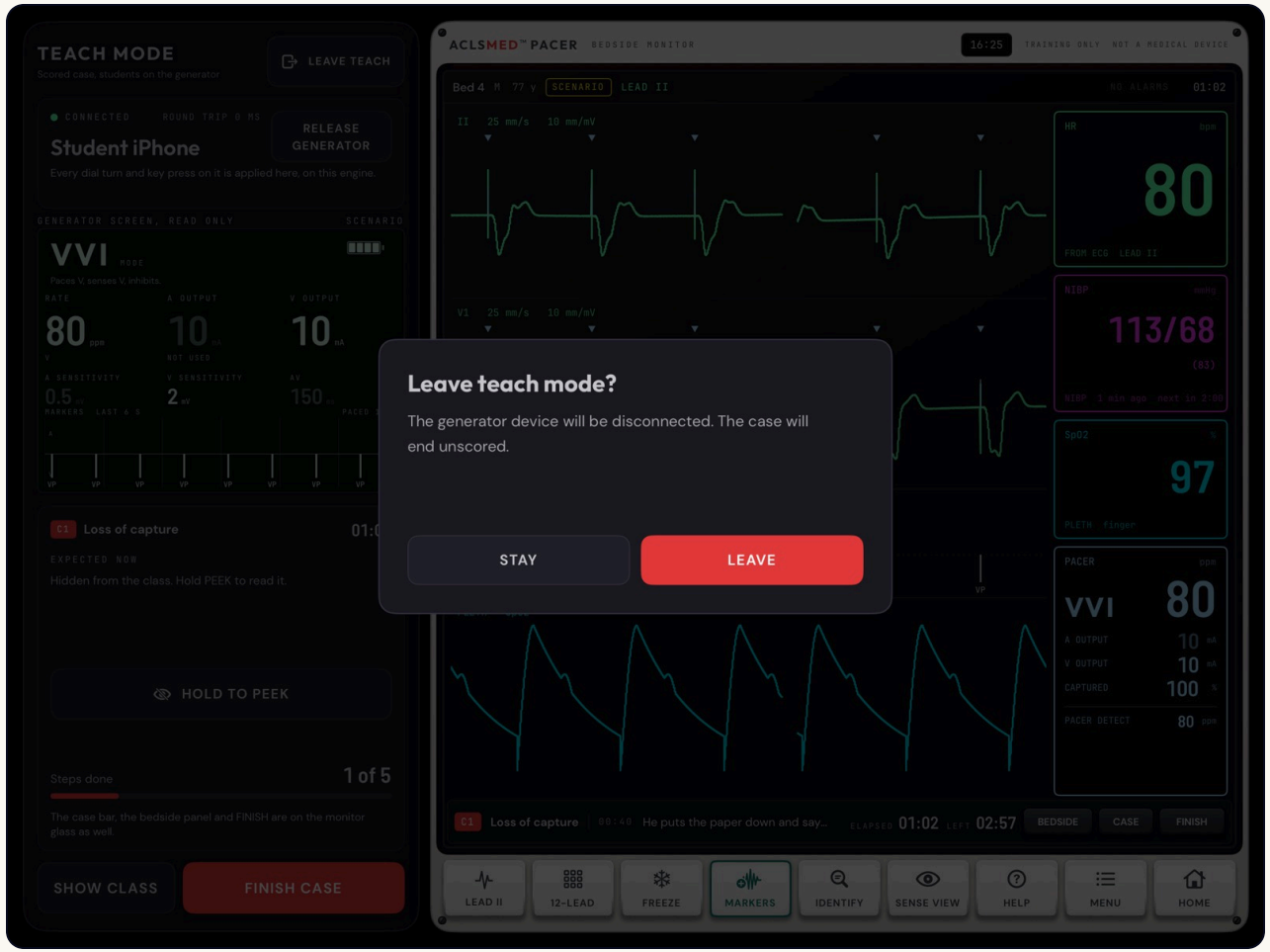
1. `SCENARIO` on the panel opens the case list. A locked case opens the paywall on the monitor.
2. The case bar and the bedside panel sit on the monitor glass, under your hand. The students hold the generator. The bar never shows a hint here.
3. The panel shows the case, the clock and **EXPECTED NOW**, hidden from the class. Hold `HOLD TO PEEK` to read it; let go to hide it.
4. Steps done and a progress bar show how the class is doing.
5. `FINISH CASE` ends it. The questions and the debrief come up on the monitor for the whole class.

The monitor keeps running



YOU SEE	WHAT TO DO
GENERATOR OFFLINE	Nothing yet. The generator rejoins by itself with the same PIN when it comes back. Nothing on the monitor is lost.
RECONNECTING	On the phone: its controls are greyed until the link returns.
RELEASE GENERATOR	Frees the seat at once. A linked device is sent back to JOIN; an away one just loses the seat. A seat with no connection frees itself after 30 s.
Already has a generator	Another device holds the seat. Release it, or wait 30 s if it is offline.
Wrong PIN	Read the four digits on the monitor again.
5 wrong PINs	New joins are paused for 30 s and the panel says so. The device in the seat can still rejoin.
LINK FAILED	Check local network access in Settings, leave TEACH and start it again.

Leave from either end, on purpose



ON THE MONITOR
`LEAVE TEACH` on the panel, or HOME on the monitor, asks "Leave teach mode? The generator device will be disconnected." During a case it adds "The case will end unscored."

ON THE GENERATOR
Hold `LEAVE` for one second. A short tap only shows "HOLD LEAVE 1 S", so a student cannot leave by accident.

A SHORT APP SWITCH
A phone that locks or switches apps briefly says hello again on return and rejoins without the PIN.

§ 09

Running a class

A checklist for the hour before, and one way to use the hour itself.

The ten-minute check

1. Charge both devices. Update both to the same version.
2. Open the app once on each and accept the training notice.
3. Start TEACH once on each and allow local network access, so the prompt never interrupts class.
4. iOS: both on the same Wi-Fi, or Bluetooth on. Android: both on the same Wi-Fi.
5. Join once to check the link, then leave.
6. Set Practice opens and the shell colour in Settings.
7. Set the sound: Beat beep and Spike click up for a room, or SILENT for a quiet one.
8. Pro on the monitor device if you will run cases beyond A1, A2, B1 and C1.
9. Take the console tour yourself.
10. Put the monitor where the class can see it, ideally mirrored to a projector.

One way to run an hour

MIN	ACTIVITY	APP
Arrival	Let the trainer run itself on the class screen	DEMO mode
0–10	Parts of the generator, the marker strip, capture	Lesson 1 or 2 on the class screen, a learner on the dials
10–25	Pass the generator. Each student turns one thing: rate, output to loss of capture and back, sensitivity, a mode	TEACH, Practice
25–35	Inject faults from the panel; the class finds them from the strip	TEACH, FAULTS tab
35–50	One scored case with the class on the generator, then the debrief on the big screen	TEACH, SCENARIO (C1 is free)
50–60	Questions; set the lessons and the drill for self-study	Learn, Strip drill

A SUGGESTION, NOT A RULE

Lessons run about six to eight minutes and cases four to six. Build your own plan around your unit's objectives and policy.

Make the room read the strip

ASK BEFORE THEY TURN
Before a student touches a dial, ask what the marker strip will show next. Then turn it and look.

USE FREEZE
Freeze the traces to point at a spike, its marker and the complex after it at the same moment.

SENSE VIEW FOR SENSING
Show the electrogram against the sensitivity line when the class argues about undersensing and oversensing.

HIDE THE ANSWER
Faults show their effect, not their name, and the expected step stays hidden until you PEEK. Let the class find it.

LISTEN FOR CAPTURE
Spike click and Beat beep together let the room hear a stimulus with no beat after it.

RELEASE, DON'T RESTART
To hand the generator role to another device, press RELEASE GENERATOR. The patient keeps running.

§ 10

Reference

Troubleshooting, frequent questions, the generator's ranges, and a glossary.

If something looks wrong

SYMPTOM	LIKELY CAUSE	FIX
Dials and keys do nothing	LOCKED	Hold LOCK for 2 s
Dark generator, no pacing	Generator off, or Practice opens GENERATOR OFF	Hold ON / OFF for 2 s
No sound	SILENT on, a sound switched off, or device volume low	MENU or Settings > Sound; the volume buttons
No TRAINER page	A lesson, case or drill is running	TRAINER is in Practice only; in TEACH use the panel
An iPhone shows only TEACH	By design: a phone is the generator	Run the trainer on an iPad or open iPhone Duo
No monitor found	Different networks, or local network access denied	Same Wi-Fi; allow it in Settings > Privacy & Security
iPad cannot see an Android phone	By design: iOS pairs with iOS, Android with Android	Use two devices of the same platform
Join refused: versions	The two apps differ	Update both, then join again
A case is locked	Not in the free set	Pro, or Restore purchases on a new device
STRIP DRILL: free round used today	Free tier allows one a day	Tomorrow, or Pro
"Saved results could not be read"	The results file on the device could not be read	Progress starts again from there; the old file is kept on the device and nothing else changes

§ 10.02 — FREQUENT QUESTIONS

What instructors ask

Is it a real generator's interface?
No. It is a generic generator of our own design. Keys, menus, alarm names and numbers match no manufacturer's device. Teach your own unit's generator from its operator's manual.

Does it need the internet?
No. Everything runs on the device. TEACH uses the local network or Bluetooth between two devices in the room.

Do students need an account or Pro?
No account exists. A phone used as the generator needs nothing. Pro matters on the device that runs the cases.

Can two phones join one monitor?
No. One generator per monitor. Use RELEASE GENERATOR to hand the role to the next device.

Are lessons available in TEACH?
Not in this version. TEACH runs Practice and Scenarios. Lessons and the drill are single-device.

Is my class's work saved?
Best scores, drill rounds and lessons are saved on the device that ran them, only there. Nothing is uploaded.

Is Pro shared with ACLSMED™ SIM?
No. PACER Pro is a separate purchase inside this app.

Can it be used on a patient?
Never. It does not connect to any pacemaker, generator or patient. Training only.

Every setting, its range and factory value

SETTING	RANGE	STEPS	FACTORY
MODE	AOO · AAI · VOO · VVI · DOO · DVI · DDI · DDD	—	DDD
RATE	30 to 200 ppm	1 · 2 above 100 · 5 above 170	80
A OUTPUT	0.1 to 20 mA	0.1 · 0.2 · 0.5 · 1	10
V OUTPUT	0.1 to 25 mA	0.1 · 0.2 · 0.5 · 1	10
A SENSITIVITY	0.4 to 10 mV, or ASYNC	0.1 · 0.2 · 0.5 · 1	0.5
V SENSITIVITY	0.8 to 20 mV, or ASYNC	0.2 · 0.5 · 1	2.0
AV INTERVAL	20 to 300 ms	10	150
UPPER RATE	80 to 230 ppm	5	110
PVARP	150 to 500 ms	10	300
A · V REFRACTORY	150 to 500 ms	10	250
V BLANKING	20 to 60 ms after an A pace	5	30
RAP RATE	80 to 800 ppm	10 · 20 above 200 · 50 above 400	300
Pulse width	1.0 ms, fixed	—	—

These are this trainer's teaching defaults, not any manufacturer's values. The 2:1 point the TIMING page shows is 60000 / (PVARP + AV interval).

The words, as the app uses them

ppm	Pulses per minute: the generator's set rate, and PACER DETECT.
bpm	The heart's rate on the ECG.
Pacing spike	The stimulus as the monitor draws it, a thin vertical line on every lead.
Capture	A stimulus that depolarizes its chamber. Loss of capture: a spike with no complex after it.
Capture threshold	The smallest output that captures every beat, in mA.
Sensing	The generator detecting the heart's own depolarization on its lead.
Sensitivity	The number in mV a signal must pass to be sensed. Smaller is more sensitive.

Inhibit · Trigger	A sensed beat stops the pace that was due. A sensed atrial beat starts the AV interval and a ventricular pace follows.
Asynchronous	Pacing at the set rate with no sensing (AOO, VOO, DOO, or ASYNC on a channel).
AV interval	Atrial event to ventricular pace, in ms.
PVARP	The atrial refractory period after a ventricular event, in ms.
Upper rate limit	The fastest tracked ventricular paced rate in DDD.
Fusion · Pseudofusion	A spike landing on a beat already starting; a spike on a complex it did nothing to.
Exit block	The threshold at the lead tip has risen above the output.

FIN

Now go turn the dial.

ACLSMED™ PACER is education software for a simulated patient. It is not a medical device, it does not connect to any pacemaker, generator or patient, and it must not be used for any decision about a real patient. The generator is a generic teaching generator; real generators differ, and your unit's policy and the operator's manual for your generator always come first. It does not give medical advice. In a real emergency, call your local emergency number.

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WRITTEN AGAINST
ACLSMED™ PACER 1.0.0

SUPPORT
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