

# A9

Anesthesia system

## All-round safety





## Classic meets high-tech

With appreciation for established ways of working, the A9 retains many traditional features while also introducing some cutting-edge technologies to allow intuitive and safe management of the anesthetic procedure for broad patient populations.



### Introducing the new safety

Mindray's innovative electronic platform on the A9 empowers clinicians to ensure the safety of patients throughout peri-operative periods, from induction to recovery, to improve patient outcomes.

### Less is more

With deep insights into the clinical workflow of the operating room, the A9's user interface has been designed around clinicians for reduced workloads and maximum patient safety.

### Together, stronger

The A9 provides flexible data integration to meet the demands of various clinical scenarios. Compatible with Mindray patient monitors and third-party clinical information systems, the A9 helps significantly enhance the workflow efficiency in the operating room.







Inadequate preoxygenation was observed in approximately 56% patients.<sup>[1]</sup>

[1] *Ann Fr Anesth Reanim*, 33: e55-8 (2014)

## Automatic Controlled Anesthesia (ACA)

ACA is based on A9's new electronic platform that automatically adjusts the fresh gas and vaporizer output to quickly achieve the preset target end-tidal agent and inspiratory oxygen concentration.

- Direct setting of the target EtAA and FiO<sub>2</sub> reduces user interaction of fresh gas and vaporizer settings.

- Delivery of fresh gas and agent is adjusted cycle by cycle to rapidly respond to changes in patient status, keeping a stable level of anesthesia during surgery.

- Reduce cost by minimizing the consumption of fresh gas and anesthetic agents throughout the case.



## Introducing the new safety

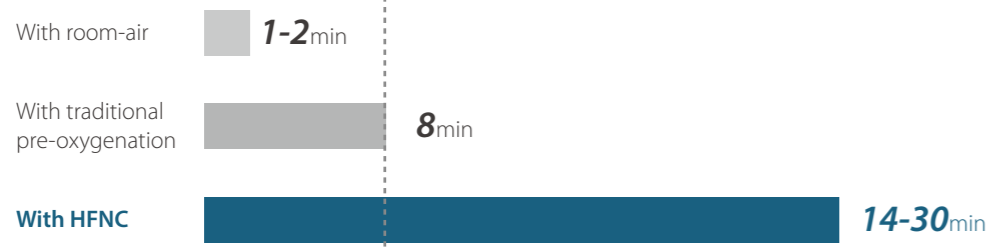
### High Flow Nasal Cannula



High flow nasal cannula (HFNC) plays an important role in maintaining safe oxygen saturation of patients as it extends the safe apnoeic oxygenation time to 30min during induction.

HFNC can help clinicians intubate more easily, especially for patients with poor oxygen saturation such as bariatric, pediatric, critical ill or difficult airway.

- Direct setting of total flow and O<sub>2</sub> concentration with maximum flow up to 100L/min.
- Built-in design with no additional gas or power source to remove clutter and save space.
- Quick start-up for emergency situations to improve patient saturation instantly.



The duration of apnoea without desaturation<sup>[2] [3]</sup>

[2] *British Journal of Anaesthesia*, 118 (4): 610-7 (2017)

[3] *British Journal of Anaesthesia*, 115 (6): 827-48 (2015)



The number of interventions to stabilize EtAA is at least 50% lower using automatic control mode.

[4] *Anaesthesia*, 64:1229-1235 (2009)

[5] *J Clin Monit Comput*, 28:117-121 (2014)





Atelectasis may develop in nearly 90% of patients under general anaesthesia.<sup>[6]</sup>

[6] British Journal of Anaesthesia 91 (1): 61-72 (2003)

## Innovative breathing system for ICU-level ventilation

The A9 introduces the volume exchanger (VE) as an innovative breathing system that brings extremely precise and reliable ventilation.

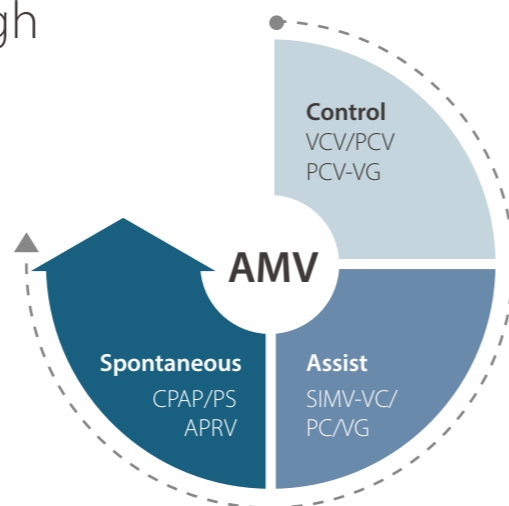
- Quick wash-in & wash-out by small system volume.
- Precise ventilation for all patients, from adults to neonates with tidal volume down to 5 ml.
- Showing the state of breathing system clearly by visual VE indicator.
- Less risk of malfunction with no moving components, providing extremely reliable and a greater service life.



## Enjoy maximum performance through all stages of anesthesia

The A9 offers ventilation modes to meet different patient demands throughout the peri-operative period.

- Adaptive Minute Ventilation Mode (AMV) allows easy switchover between controlled and spontaneous ventilation without extra adjustment.



## Powerful protective ventilation toolkits to prevent PPCs

Powerful toolkits have been integrated into the A9 to support confident decision-making for protective ventilation, reducing the incidence of post-operative complications (PPCs) and improving patient outcomes.



### Transpulmonary pressure monitoring

Independent monitoring for esophageal pressure, to support customized ventilation settings for individual patient.



### Lung Recruitment Tool

Two optional maneuvers: stepwise PEEP or sustained inflation. Multiple criteria to evaluate recruitment effectiveness.

A scheduled recruitment maneuver can be performed automatically.



### TV/IBW indicator

TV/IBW can be calculated as the TV changes, which offers clinicians clear hint of appropriate tidal volume settings to avoid barotrauma.





# Less is more

## Automatic system check



### Comprehensive

- Follows the ASA guidelines
- Checks various parts automatically to ensure proper functioning



### Fast

- All checks completed in 3.5 minutes
- Scheduled system check to save preparation time



### Simple

- No manual intervention required during system check
- Graphic display of error correction

## Customizable profiles for smart working

Configuration profiles can be customized and loaded easily for different clinical scenarios or use requirements, including default values, screen layout and system configuration.



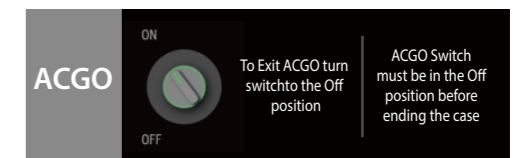
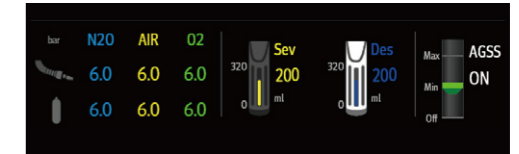
1-2s

As anesthesiologists look at the monitor in 1- to 2-second glances, displays should be developed to optimize the information.<sup>[7]</sup>

[7] Anesth Analg., 111 (3): 653-8 (2010)

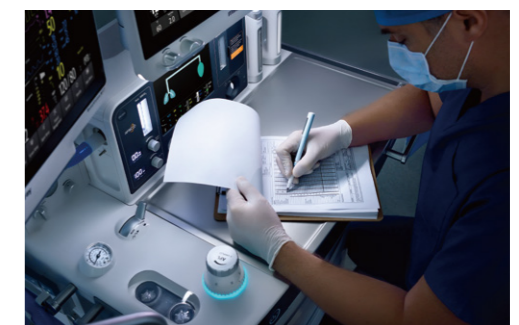
## Clear system status indicators

- Real-time system status display to help address malfunctions quickly.
- Clear prompts for certain scenarios, to allow easy viewing of the current working mode.



## Light up the workspace

- Illumination around APL valve in manual mode, to make the current working mode more obvious.
- Lighting for workspace with adjustable angles and brightness, to satisfy the requirement for working in low light environments.







Using desflurane for 1 hour is equivalent to 235-470 miles of driving.<sup>[8]</sup>

[8] Anesth Analg. 111(1): 92-98 (2010)

# Together, stronger

## Integration

Highly flexible integration options allow the A9 to work together with a variety of devices, including patient monitors, infusion pumps and information systems, to meet diverse clinical needs.



## A green operating room

The A9 employs anesthetic gas reduction strategies during surgery to provide both environmental and economic benefits.

**Optimizer**  
A series of clinical decision-support tools including Optimizer, AA Prediction and ACA, can advise clinicians of the lower fresh gas flow.

**AA measurement**  
This helps the delivery of low flow anesthesia by monitoring real-time anesthetic agent consumption during and after surgery.

Fresh Gas+Agent Usage	
Start:	2019-11-21 9:42
End:	2019-11-21 14:42
SEV	100.0 ml
Iso	50.5 ml
O2	150.5 L
Air	150.5 L
N2O	0.0 L

**Flow Pause**  
Flow Pause prevents unnecessary leaks of anesthetic gases into the operating room during intubation, suction and other operations.

**e-AGSS system**  
e-AGSS monitors the scavenging flow rate and indicates abnormalities; automatically switches off when in standby to reduce energy consumption.

## Connectivity

As a part of the IT solution, the A9 offers information connectivity safety and seamlessly to streamline clinical workflows.

