OMOM RC

Robotic Capsule Endoscopy System

JINSHAN | Life Insights

OMOM RC

One Step Further to
AUTOMATION

Diagnostic Gastroscopy,
Reimagined with Robotic Capsule.

The Challenge: Conventional gastroscopy remains the widely accepted "gold standard" method for detecting and treating gastric pathology. However, patients with relative contra-indications, such as severe cardiac or respiratory dysfunction, may not tolerate the stress of conventional examination. Patient's discomfort and the need for sedation also limit its use for screening purposes. In addition, most gastroscopy procedures do not need a biopsy or further intervention. The COVID pandemic has placed an unprecedented challenge on endoscopy units worldwide.

The Alternative: Is there an alternative to diagnostic gastroscopy? Magnetic-controlled Capsule Endoscopy (MCE) seems a good option. There is growing clinical evidence that capsule endoscopy, controlled by an external magnetic field, can be successfully utilized in diagnostic gastroscopy. MCE has similar pathology detection accuracy with conventional gastroscopy but is preferred by most patients. However, existing MCE technologies rely on a human operator to control capsule movement. Therefore, there is a learning curve, and it would take an operator about 20 minutes to manually navigate the capsule in an MCE proce-dure.

The Solution: The new generation of *OMOM RC*, the fully automated MCE, does not require a human operator to control the capsule movement. Innovative *JINSHAN* robotic technology and proprietary controlling algorithms allow the *OMOM RC* movement unit to automatically navigate the capsule and provide a complete stomach examination when the AUTO mode is enabled. A prospective study by two tertiary centres shows that *OMOM RC* has a similar diagnostic performance with conventional gastroscopy in 114 patients.

OMOM RC, **the real robot that frees your hands.**

Reference

Xiao Y-F et al. Fully automated magnetically controlled capsule endoscopy for examination of the stomach and small bowel: a prospective, feasibility, two-centre study.
*Lancet Gastroenterol Hepatol.* 2021; 6: 914-921. doi: 10.1016/S2468-1253(21)00274-0

Introducing *OMOM RC*

The Components

OMOM RC offers a safe, noninvasive, and fully automated diagnostic gastroscopy, allowing not only gastroscopy but a thorough check of the small bowel, in just one sitting, due to its extended capsule battery life. The system consists of a *Robotic Movement Unit*, a *Control Console* (with reporting software), a *Recording Unit* and the disposable *Robotic Capsule*.
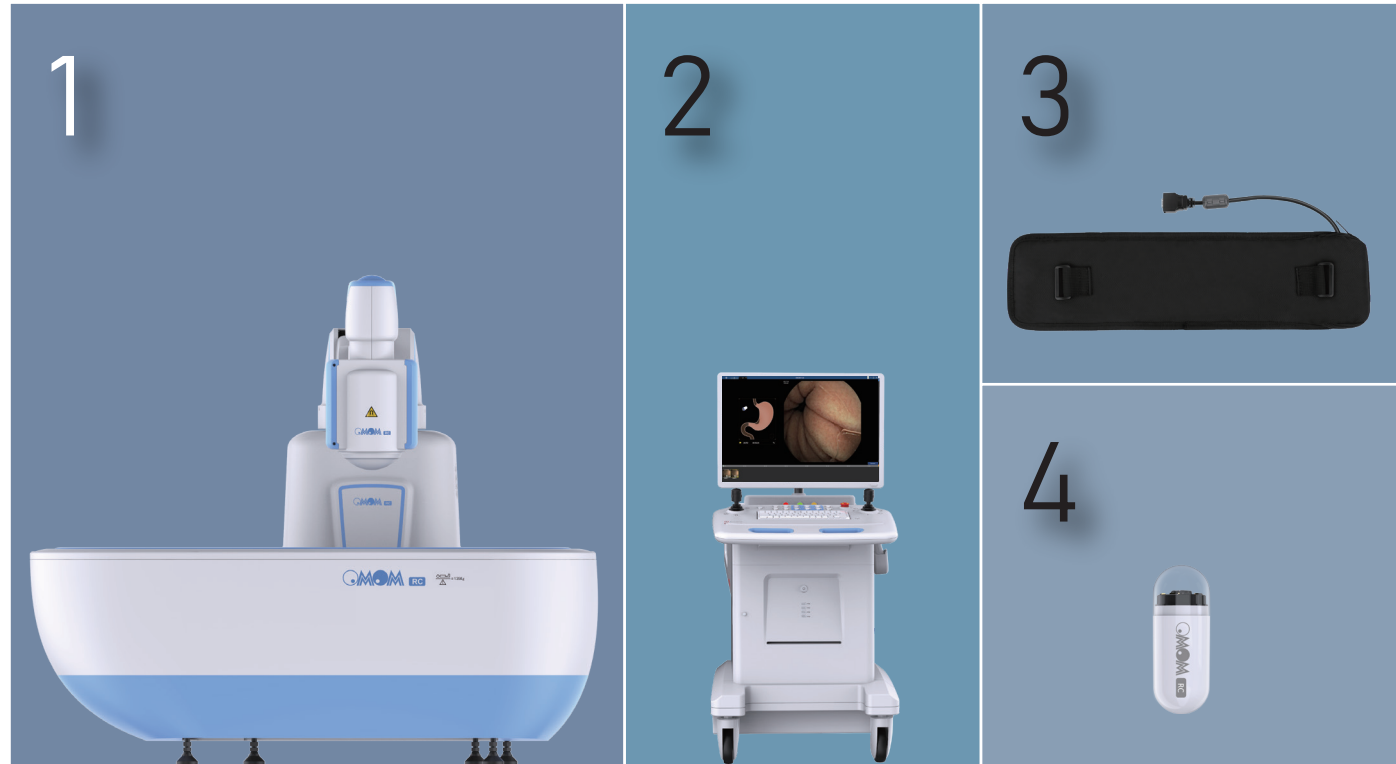
1. Robotic Movement Unit

The *Robotic Movement System* is integrated with the examination bed. Upper and lower magnetic fields are located in the robotic arm and examination bed, functioning together to control capsule motion. During the examination, there is no need for the patient to change position.

2. Control Console

The *Control Console* serves as the control center. When connected with the *Robotic Movement Unit*, health-care professionals can start the gastric examination automatically by simply pressing the AUTO button on the *Control Console* after the patient is ready. Manual mode is also available in case doctors want to control the capsule manually. The *Control Console* is installed with *VUE Smart* software for reporting.

3. Recording Unit

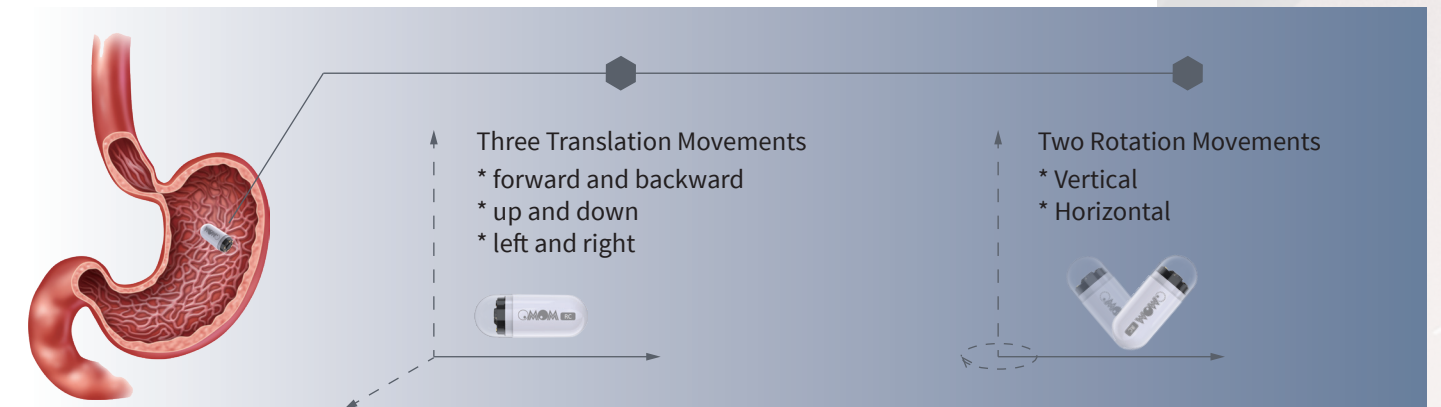Recorder with antenna will receive images captured by capsule with radiofrequency technology.

4. Robotic Capsule

Robotic Capsule contains ingenious magnetic module, allowing to be navigated easily and accurately. After completing the gastric examination, the capsule could continue its journey to the small bowel by peristalsis when equipped with an extended battery.

How Automatic Control Achieved?

Fully Automated, *OMOM RC* has revolutionized capsule movement control.
Proprietary algorithms have been developed to detect the anatomical gastric landmarks. Those algorithms have been pre-programmed into the control system to automatically guide the *Robotic Movement Unit* to navigate the capsule. The capsule is moved in translational and rotational direction to capture the gastric images until the full gastric coverage is achieved when the *Robotic Movement Unit* stops automatically.

Three Translation Movements
* forward and backward
* up and down
* left and right

Two Rotation Movements
* Vertical
* Horizontal

All six gastric anatomical landmarks, cardia, fundus, body, angulus, antrum and pylorus, are covered. It takes about 12 minutes to complete the gastric examination.


CARDIA

FUNDUS

BODY

ANTRUM

PYLORUS

ANGULUS
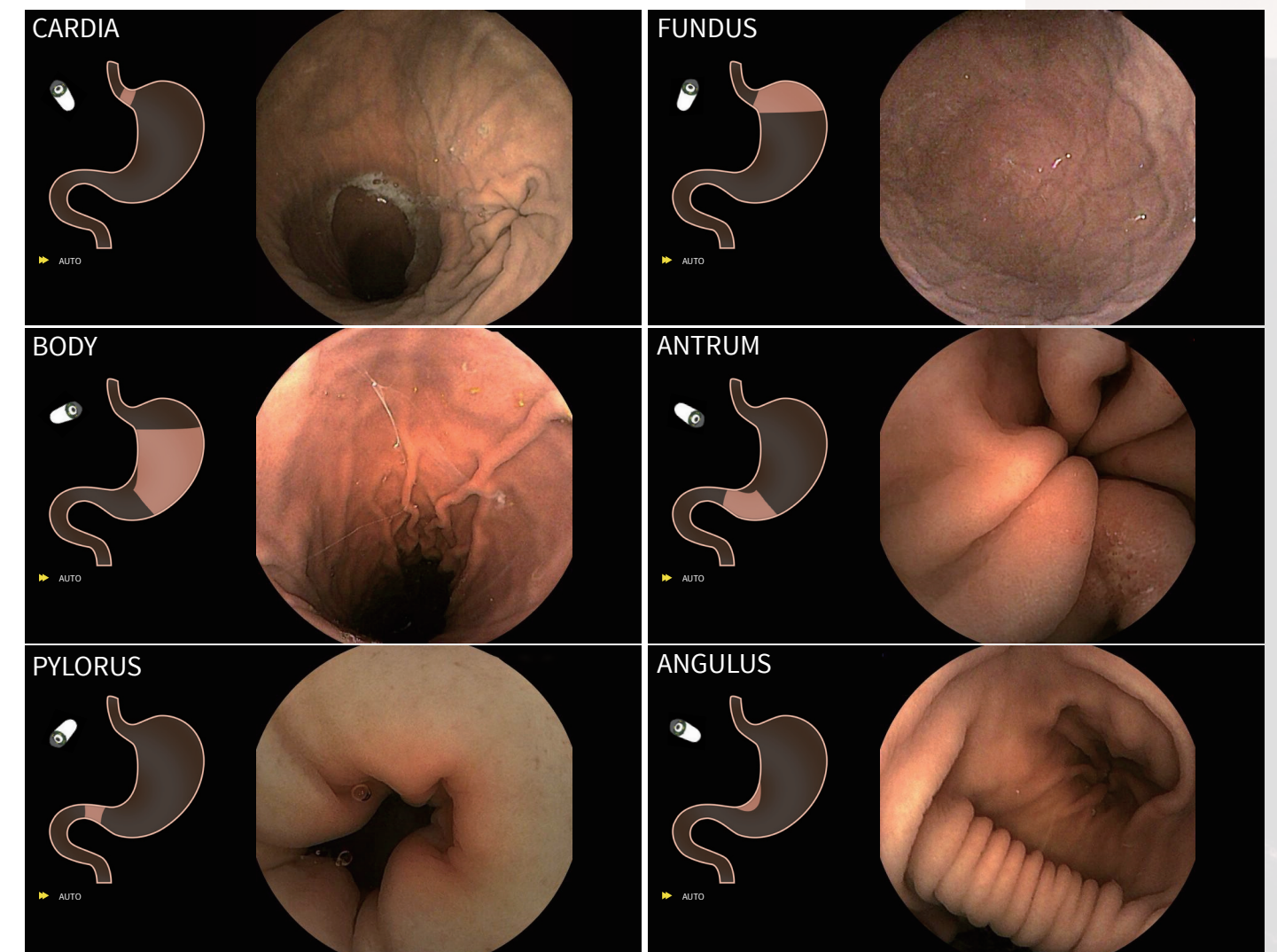
VUE Smart Assisted Diagnosis

During a gastric examination, eight types of focal lesions (gastritis, polyps, tumors, ulcers, erosions, xanthomas, telangiectasia and diverticulum) can be detected and tagged with real-time display. In addition, intelligent abnormality detection assists in quick and accurate diagnosis.

Typical Findings

Polyp

Erosion

Gastritis

Ulcer
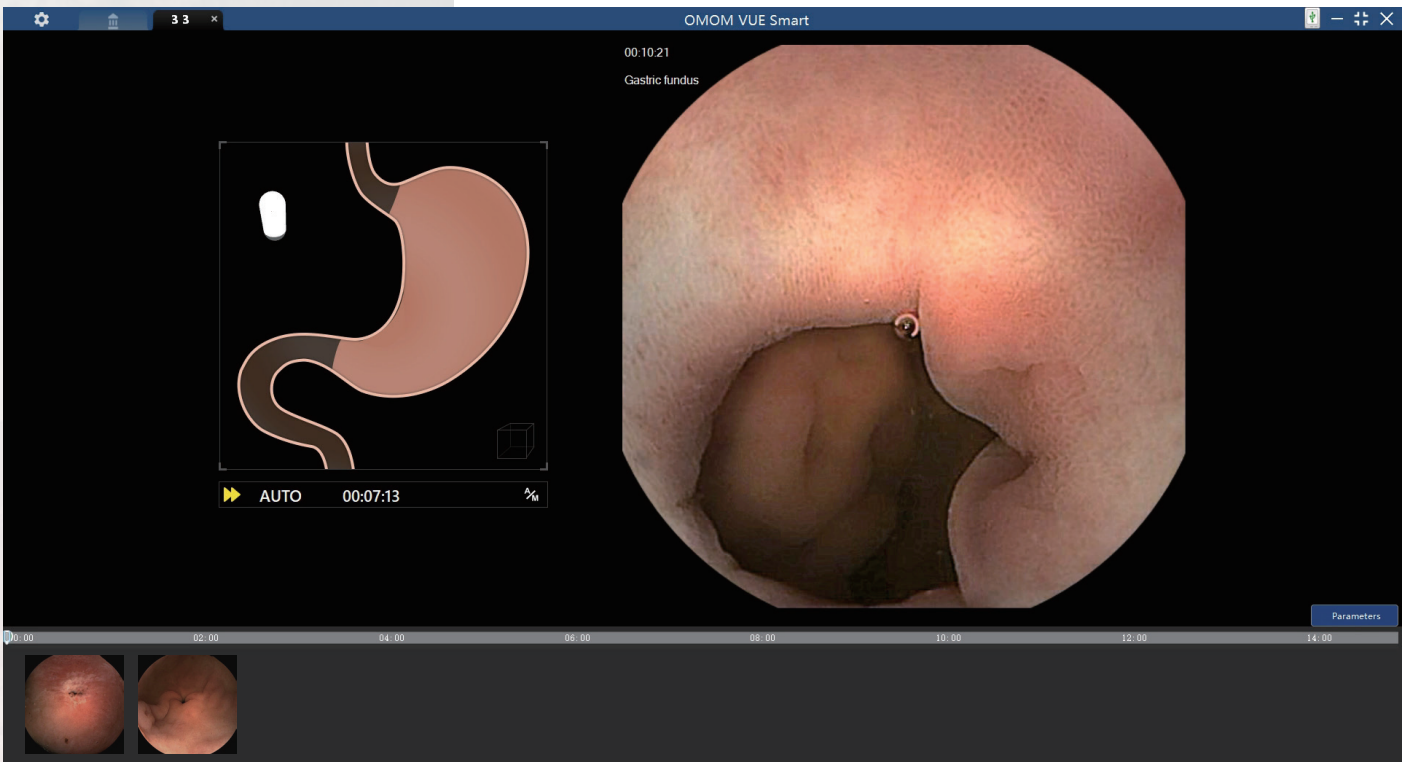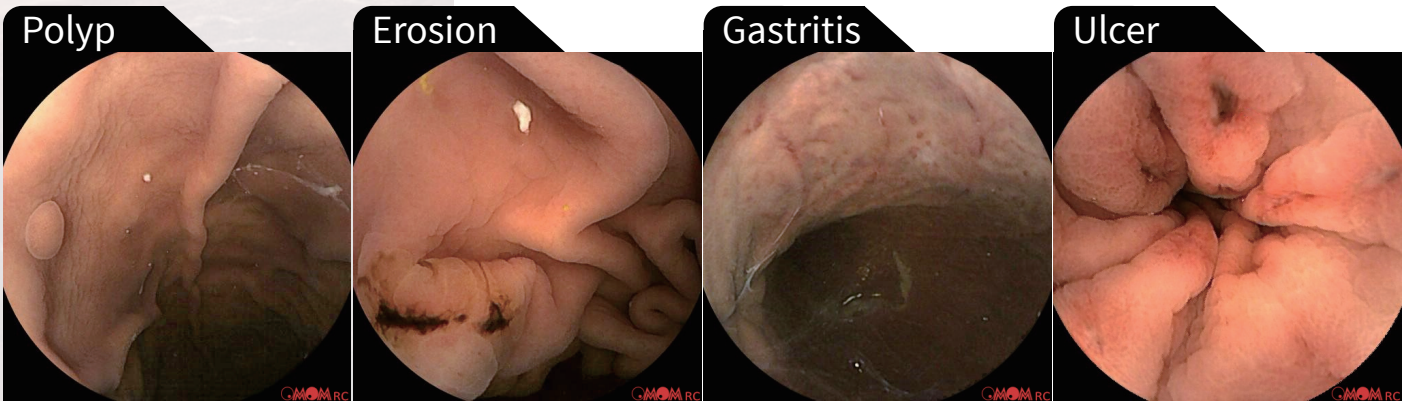
Optional Application

OMOM RC is also equipped with optional module featuring *Remote Control* and *Cloud Reporting*.

Remote Control
5G module is optional for *Robotic Movement Unit* to realize remote control.

Cloud Case Reading.
Cloud data center will be offered to provide the case report as value-added service.

Procedure Steps

Step 1 : Preparation
- Patient drinks 1 liter of water.
- Wear antenna belt with recorder.
- Ingest the capsule and lay flat on the examination bed.

Step 2 : Inspection
- Doctor presses 'AUTO' button on the console for automatic gastric examination.
- Real-time monitoring with pathological descriptions.
- *Robotic Movement Unit* stops automatically when completing visualization of stomach.

Step 3 : Report
- Data download.
- *VUE Smart* assisted reading.
- Generate the report.

Specifications

Robotic Movement Unit

Weight: 570kg
Dimension: 210*160*185cm
Installation Space: 3.5 m*2.0 m*2.5m
Magnet Rotation Scope: 0-360°
Upper Magnet Filed Intensity ≤400mT
Lower Magnet Filed Intensity ≤100mT
Intensity Scope: 0-350mm

Control Console

Weight: 80kg
Dimension: 75*60*135cm
Screen Size: 24 inch
System: win10
RAM: 16 GB

Robotic Capsule

Dimension: 30*11.5mm
Weight: 5g
Battery Life:
-Model RC12: 3 hours (for gastric only);
-Model RC22: 12 hours (for gastric+small bowel)
View Angle: 172°
Definition: 512*512 pix
Depth-of-field: 0-50mm
Frame: 2-10 fps

Recording Unit

Dimension: 131*80*36mm
Working Capacity: 14 hours
Electricity: 9000mAh
Storage: 8 GB