Solar GI HRM

Advanced and Cost-efficient High Resolution Manometry

- QuickView data analysis program
- 3D Esophageal Pressure Topography
- Latest Chicago Classification
- Economical and customizable

MMS
Medical Measurement Systems

Introducing Solar GI HRM

High Resolution Manometry (HRM) was the concept and innovation of a remarkable esophagologist, researcher and educator, the late Ray Eugene Clouse, MD. HRM has its roots in conventional perfused manometry. Clouse decided that the esophagus was holding secrets between the widely spaced recording points of conventional manometry catheters.

A collaboration between Ray Clouse, Medical Measurement Systems and Dentsleeve in 1995, resulted in the development of the Clouse Contour Plot, an HRM solution using a 21 channel silicone water perfused catheter, and a UPS 2020 manometry system from MMS[1)].

Because of the availability of new catheter technologies, smart perfusion systems and faster computers, HRM is becoming the standard to diagnose swallowing disorders and measure pressures in the esophagus.

The most advanced HRM system on the market

The Solar GI HRM is currently the most advanced HRM system available. Latest developments such as the Chicago Classification criteria, QuickView analysis program, 3D Esophageal Pressure Topography (EPT) and new catheter technology make Solar GI HRM:

- Extremely easy to use
- Procedures more accurate and reliable
- Data analysis better, simpler and quicker
- Procedure costs lower

Solar GI HRM Highlights

- Measuring simultaneously up to 36 pressure channels and 16 Impedance channels
- Reusable and single use catheter solutions (solid state and water perfused, both up to 36 pressure channels)
- Variety of catheter diameters, to ensure accurate HRM measurement for different patient groups
- Intuitive MMS software with remote control leads to simple HRM procedures
- Event-based analysis software, where events can be Resting periods, Swallows, etc.
- QuickView program for fast and easy analysis
- Latest HRM results and Chicago Classification criteria included
- 3D Esophageal Pressure Topography plots for a new perspective on the events
- Synchronized video manometry optional (X-Ray, C-Arm, Ultrasound)
- Expandable with HRIM, HRSM, HRCM and HRAM
- Flexible HRM systems solutions for every budget

1) Neurogastroenterology & Motility, March 2012, Vol. 24, Suppl. 1, 2-24. High resolution manometry: the Ray Clouse legacy.

Latest clinical developments available

High Resolution Manometry (HRM) is the latest approach of measuring pressures in the esophagus. The Solar GI HRM system simplifies clinical procedures and offers fast and accurate diagnostic reports. Up to 36 closely spaced pressures capture the entire esophageal motor function from the pharynx to the stomach. Visual sphincter recognition makes accurate sphincter location so easy that specialized technical training is no longer required.

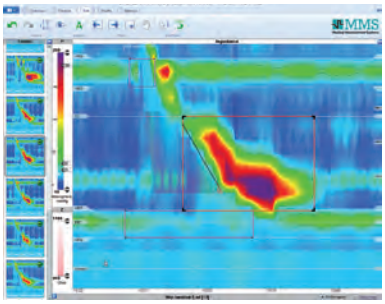
HRM combined with Impedance: HRIM

While HRM measures peristalsis, Impedance tracks the actual bolus movement, making it a very powerful combination as 51% of patients with Inefficient Esophageal Motility (IEM) have normal bolus transit[2]. Solar GI HRIM offers the new standard for total esophageal function monitoring.

Latest HRM results

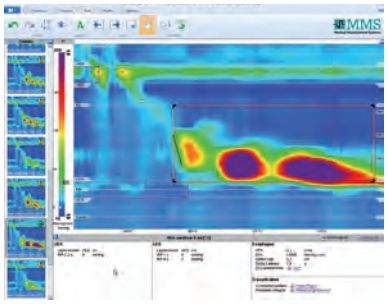
Solar GI HRM includes the latest results for esophageal motility, as recently published by the HRM working group[3]. New results available are:

- IRP, DCI, CDP
- CFV, DL and Peristaltic integrity



Automatic categorization of swallowing disorders

The new Solar GI HRM program automatically categorizes patient swallowing disorders according the latest Chicago Classification criteria. Individual swallows are automatically classified, and an overall classification is given for the entire HRM study.

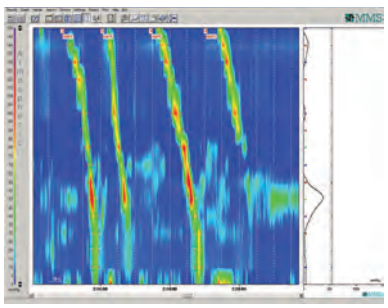


Flexible clinical solutions

Solar GI HRM procedures can be performed with solid state as well as water perfused catheters, with a variety of diameters and pressure channels. It is even possible to customize the system for use of a combination of solid state and water perfused catheters. For example: use a solid state catheter for esophageal HRM studies in combination with (single use) water perfused catheters for (HR) Anorectal Manometry. This makes the Solar GI HRM system the most flexible system on the market, offering clinical solutions for all patient groups.

Advanced clinical use

MMS offers HRM/HRIM applications covering the whole GI tract, such as Small Bowel / Antroduodenum (HRSM), Colon (HRCM) and Anal sphincter (HRAM). HRM/HRIM combined with synchronized Video recording capabilities is available too!



Solar GI HRM 36 solid state system

Solar GI HRM 24-36 channel water perfused system

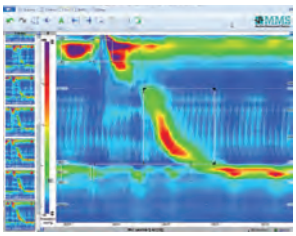
Solar GI HRM Compact 24 channel water perfused system

2) Tutuian R, Castell DO, American Journal of Gastroenterology, 2004, 2:230-236
3) Neurogastroenterology & Motility, March 2012, Vol. 24, Suppl. 1, 1-65.

High Resolution Manometry has never been so easy

HRM studies in less than 10 minutes

The easy positioning of the HRM catheter makes the esophageal manometry examination so simple that a consistent high quality measurement will be achieved. With the help of intuitive MMS software, the UES and LES can easily be recognized.



MMS catheters are easily intubated and do not need calibration and temperature compensation, which is convenient and saves valuable time!

Accurate HRM procedures with MMS Intuitive software

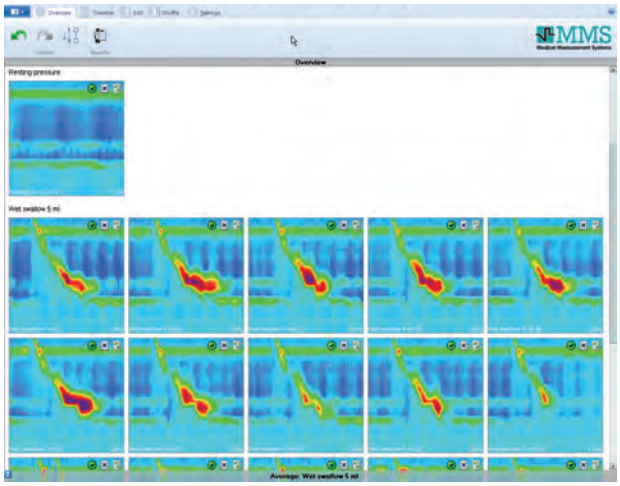
After locating both sphincters the HRM examination can be started. By using the remote control, you will be able to stay focused on your patient. Up to 36 pressures cover the complete esophagus. A stepwise pull-back of the catheter is not needed, which saves time compared to conventional manometry.

The Solar GI HRM software automatically instructs the examiner when the patient has to swallow water, viscous or solid food. The Solar GI HRM procedure for an assessment of the complete esophagus normally takes less than 10 minutes.

The MMS software program can predefine a selection of HRM protocols for every individual medical professional and/or patient group. This saves preparation time and prevents making mistakes during the study.

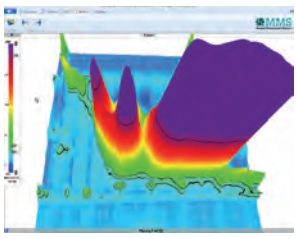
MMS QuickView makes analysis simple

The new Solar GI HRM software has the unique QuickView software program, which has been developed to make HRM analysis more accurate, faster and easy.

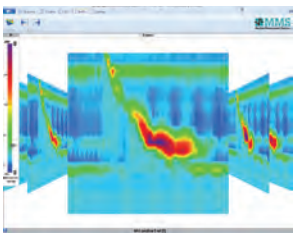


QuickView benefits:

- All events will be displayed automatically on screen, providing a quick overview of the study
- QuickView assists you to focus on relevant parts of the study (events) only
- For each event HRM results will be automatically calculated and marked
- Easy adjustment of marker locations, provides you with full control of the calculations
- Calculated results are shown for the selected event
- Clear overview of which events have been analyzed already and which events still need to be reviewed
- Landmarks for UES and LES can easily be adjusted for each event in case of catheter movement
- Automatic classification of each swallow, and overall study classification per latest edition of the Chicago Classification[4)]
- Automatic classifications can always be overridden by the user, for full control of the analysis
- Flexible and fully customizable report software (HRM Reporter)
- 3D Esophageal Pressure Topography plots, for a new perspective on the events
- "Shuffle mode" for easy event scrolling



'Jackhammer' in 3D Esopageal Pressure Topography



QuickView shuffle mode

4) *Neurogastroenterology & Motility, March 2012, Vol. 24, Suppl. 1, 57-65. Chicago classification criteria of esophageal motility disorders defined in high resolution esophageal pressure topography.*

Economical and customizable HRM solutions

Solar GI HRM configurations meeting every budget

With the Solar GI HRM, studies can be performed with either reusable solid state or single use / reusable water perfused catheters. This offers maximum flexibility in system configuration set-up, clinical solution, investment and procedure costs.

Water perfused HRM: up to 50% lower procedure costs

The price attractiveness of reusable water perfused HRM catheters allows purchase of multiple catheters. Furthermore water perfused catheters do not break or need repairs, so procedure costs can be significantly lower.

Other advantages of water perfused HRM are:

- No risk of cancelling studies due to catheter failure
- Reusable water perfused catheters are autoclaveable
- Time saving: single use catheters do not need cleaning
- No risk for cross infections using single use catheters

Upgradability and flexibility

Are you looking for an HRM system that is extremely flexible and upgradable with new clinical applications now or in the future? Don't look further!

The Solar GI HRM can be upgraded:

- From 24 to 36 pressure channels
- From water perfused HRM (24-36) to 36 pressure solid state HRM
- With 12 Impedance channels (water perfused and solid state)
- With conventional 4-8 channel ARM or HRAM water perfused or solid state
- With Sphincter of Oddi Manometry

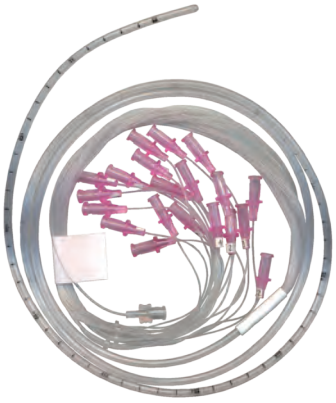
Upgrade to HRAM at any time

Time saving network and HIS-link solutions

MMS offers a broad range of system network and Hospital Information System (HIS) / Electronic Medical Record (EMR)-link options. Multiple workstations to view and analyze HRM studies in your own room, patient data import and export from the HIS/EMR, and DICOM PACS solutions offer time saving routines and paperless procedures.

Solar GI HRM 36 channel reusable solid state catheter

Solar GI HRM 20-36 channel reusable water perfused catheter



Solar GI HRM 20 or 24 channel single use water perfused catheter

Service, Science and Simplicity

Why choose MMS?

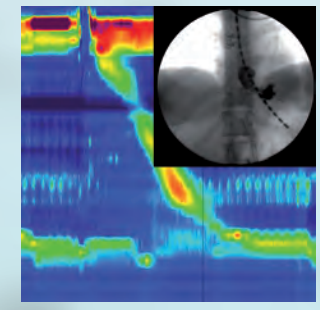
MMS, based in the Netherlands, is a world leader in the development, manufacture and distribution of equipment for measuring liquid flows, pressure and muscle activity (EMG) in the urinary tract, and for measuring acidity, impedance and motility in the gastro-intestinal tract. Our customers are academic medical centers, hospitals, diagnostic clinics and large general practices. Working together with customers, we seek to make a substantial contribution to the effective and efficient diagnosis of ailments affecting these areas of the body.
Stability and reliability are important to guarantee your local support and service. Medical Measurement Systems has been providing an unsurpassed wide range of GERD and GI solutions since 1991. Today, MMS is a world leader in GERD diagnostics and GI manometry.

Our complete line of GERD and GI motility equipment

MMS is not only offering a broad line of HRM and HRIM solutions, but also brings GERD recorders and catheters and accessories to the market. The Orion *II* pH recorder and the Ohmega Impedance-pH recorder are extremely easy to use and provide accurate measurement results. The Ohmega can be expanded with pressure recording function.

An overview of the MMS GI line

- Orion *II* pH recorder
- Ohmega Impedance-pH recorder
- Solar GI 4-8-16 channel conventional manometry
- Solar GI HRM / HRIM for esophageal studies
- Solar GI HRAM for proctology studies
- Specialties for academic and research institutions:
  - Stationary pH recording
  - Small bowel (antroduodenal) manometry (HRSM)
  - Sphincter of Oddi manometry
  - Colonic manometry (HRCM)
  - 6 channel EGG system
  - TMPD interface
  - Barostat systems and interface
- Biofeedback
- Neuro / High Speed EMG and Stimulation
- (High Res) Synchronized Video manometry (swallow studies and defecography)
- Networking and HIS/EMR-links (HL-7, ODBC)



HRM synchronized with X-Ray studies of an abnormal swallow

If you are interested in one of the MMS GERD and GI Motility products, please contact us through one of our branch offices or through one of our official distributors.

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