MW16 Laparoscopic Suture Simulator -Assessment System-

**Skin Suture**
Simple interrupted skin suturing can be assessed quantitatively by validated criteria. Objective evaluation score encourages trainees to hone their skills.

**Assessment Criteria**
1. Force and tension
   - Time
   - Force on tissue
   - Suture tension
2. Image analysis
   - Spacing of stitches
   - Width of stitches
   - Wound dehiscence

**Forceps Training**
Forceps training mode enables dry box training for handling of laparoscopic instruments.

*Laparoscopic instruments and training pad or games are not supplied with the set.*

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**Award Winner Innovation**
2nd Place Technology Innovation - IMSIA 2014
Munenori Uemura, Makoto Yamashita, Morimasa Tomikawa, Satoshi Leiri, Noryuki Matsuoka, Tomotsu Katayama and Makoto Hashizume

“A New Objective Assessment System of Suture Ligature Method of the Intestinal Anastomosis Model for Laparoscopic Surgery”

**Publication References**
Munenori Uemura, Makoto Yamashita, Morimasa Tomikawa, Satoshi Obata, Ryota Souzaki, Satoshi Leiri, Kenso Ohuchida, Noryuki Matsuoka, Tomotsu Katayama, Makoto Hashizume

“Objective assessment of the suture ligature method for the laparoscopic intestinal anastomosis model using a new computerized system” Surgical Endoscopy DOI: 10.1007/s00464-014-3681-9

Jorge Soto, Nohsuki Ohshima, Hiroaki Ishi, Noryuki Matsuoka, Kazuyuki Hatake, Atsushi Tanaka


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**Specifications**

<table>
<thead>
<tr>
<th>Size</th>
<th>650 x D110 x H160 cm</th>
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<tbody>
<tr>
<td>Weight</td>
<td>93kg</td>
</tr>
<tr>
<td>Power</td>
<td>AC100 240V 50/60Hz</td>
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<td>Power consumption</td>
<td>180VA</td>
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**Set Includes**

- 1 monitor
- 1 touch monitor
- 1 video camera for assessment
- 1 video camera for procedure recording
- 1 tono body
- 1 unit base
- 1 printer
- 1 key board
- 1 set of instrac
- 30 pieces of suturing sheet (intestinal tract)
- 30 pieces of suturing sheet (skin)
- 1 container
- 1 instruction manual

* Specifications are subject to change. 2016/06/08

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**KYOTO KAGAKU**

**Laparoscopic Suture Simulator -Assessment System-**

MW16 11395-000

**Product Supervision**
Makoto Hashizume, Professor, Center for Advanced Medical Innovation, Kyushu University, Japan
Munenori Uemura, PhD Professor (Assistant), Center for Advanced Medical Innovation, Kyushu University, Japan

“Real”, “Objective” and “Quantitative” assessment develops skills for first class surgeons.

**Real**
- Non-virtual physical experience
  - softness and anatomy of intestinal wall and skin
  - training using non-specific devices

**Objective**
- Quantitative and multiple skills assessment and feedback
  - laparoscopic suture (5 criteria)
  - skin suture (6 criteria)
  - conventional training
Innovative assessment criteria and quantitative measurement provide objective feedback to trainers.

- Trainees’ personal skills assessment data can be saved for reviewing and analysis.
- True-to-life simulated tissues that provides convincing hands-on experiences.
- Real clinical instruments can be used.
- A variety of training options.
- All in one unit is convenient for training.

Laparoscopic intestinal suture
- Skin suture under direct vision
- Handling of laparoscopic instruments

### Point 1: Integrating Advantages of Different Training Methods

- **Box trainers**
  - Advantage: Simple task only
  - Advantage: Easy to use
- **Wet lab**
  - Advantage: Realistic
- **Virtual reality simulators**
  - Disadvantage: No realistic sense
  - Advantage: Objective skills assessment

### Point 2: 3 Training Modes

Three training modes can be automatically switched with touch panel operation.

- **Laparoscopic Intestinal Suture**
- **Evaluation on Skin Suture under Direct Vision**
- **Laparoscopic Forceps Training**

Use forceps to start training in suture skills. Trainees’ skills can be assessed in 5 criteria.

Without the training box, the unit can be used for skin suture under direct vision.

Trainees can learn how to use forceps in the built-in training box of the unit model.

### Point 3: Real-Time Feedback, Group Sessions, Reviewing and Debriefing

Large Monitor and its Feedback Function

Large monitor shows an ongoing demonstration or recorded movie for group learning.

Sub-monitor shows past assessment data. The trainee’s present suture skills can be compared with previous sessions to review and analyze skills development.

The training data approx. 21,000 times (20 minutes on average) can be stored.

### Point 4: Quantitative Feedback combined with Realistic Hands-on Experience

**Intestinal Tract Suture**

**Assessment Criteria**

5 assessment criteria give feedbacks are given in two levels:
- Successfulness: higher possibility of leak-free suturing.
- Skills level: lower negative impact on patients.

- Is the wound sutured without a leak?
- Is suture completed through muscular layer to mucosal layer?
- Is ligature appropriate for suture?
- How much open area is there in mucosal layer?
- How long does it take for suturing procedure?

![Image](image.png)

Image analysis is done from back side (Mucosal Layer)

- **Serosal Layer**
- **Muscular Layer**
- **Submucosal Layer**
- **Mucosal Layer**

Intestinal tract has four layers with respective characteristics. When holding with forceps and suturing, these four layers react like real tissue.

- **Suture Tension**
  - **Measuring Area**
  - **Tightening Time**

Air leak from the sutured area can be checked by applying air pressure on the intestinal tract sheet.

Acceptable Range