# Texas Association of Surgical Skills Laboratories (TASSL) Flexible Endoscopy Training Curriculum

## Description

Training within a proficiency-based, virtual-reality training program can increase competency and reduce errors and complications during real GI endoscopies. The following curriculum is based on the GI Mentor simulator and intended to promote the acquisition of endoscopic skills.

## Objectives

- Practicing and demonstrating proficiency in scope maneuvers requiring hand-eye coordination
- Acquiring essential endoscopic capabilities to a measurable competency level
- Achieving competence in basic colonoscopy skills
- Demonstrating proficiency in colonoscopy required skills, based on validated bench mark level of skills
- Reaching confidence level in complete colonoscopy performance
- Demonstrate proficiency performing a variety of cases for complete diagnostic colonoscopy
- Mastering the performance of upper and lower GI procedures

## Specialties

Gastroenterology, General surgery, Gastrointestinal surgery, Internal Medicine

## Target Audience

Individuals or groups interested in following a structured curriculum to acquire skills to a predetermined level of proficiency. The acquired skills should be transferable to the real clinical environment, as was demonstrated in various studies.

## Assumptions

It is recommended to include a cognitive skills module in the beginning of the training program. No previous procedural or technical knowledge is required.

## Suggested Time Length

Proficiency in each segment is to be achieved within a 60 days limit from starting in order to be considered successful.

## Authors

This curriculum is based on A multicenter, simulation-based skills training collaborative using shared GI mentor II systems: results from the Texas association of surgical skills laboratories (TASSL) flexible endoscopy.

(Van Sickle KR et al Surg Endosc. 2011 Sep;25(9):2980-6), *Van Sickle KR, Buck L, Willis R, Mangram A, Truitt MS, Shabahang M, Thomas S, Trombetta L,Dunkin B, Scott D.*

The study was performed by the University of Texas Health Science Center–San Antonio (UTHSCSA), Texas A & M University (TAMU), Methodist Hospital (MHD), Brooke Army Medical Center (BAMC), and University of Texas Southwestern (UTSW).

## Introduction to Curriculum – Instructors

Training with a proficiency-based, virtual-reality curriculum may reduce errors during real GI procedures. The evaluation metrics are done automatically by the GI Mentor.

The curriculum could be performed as a self-directed learning, following pre-established goals through a modular curriculum.

The following is quoted from the above study (Van Sickle KR et al Surg Endosc. 2011 Sep;25(9):2980-6)
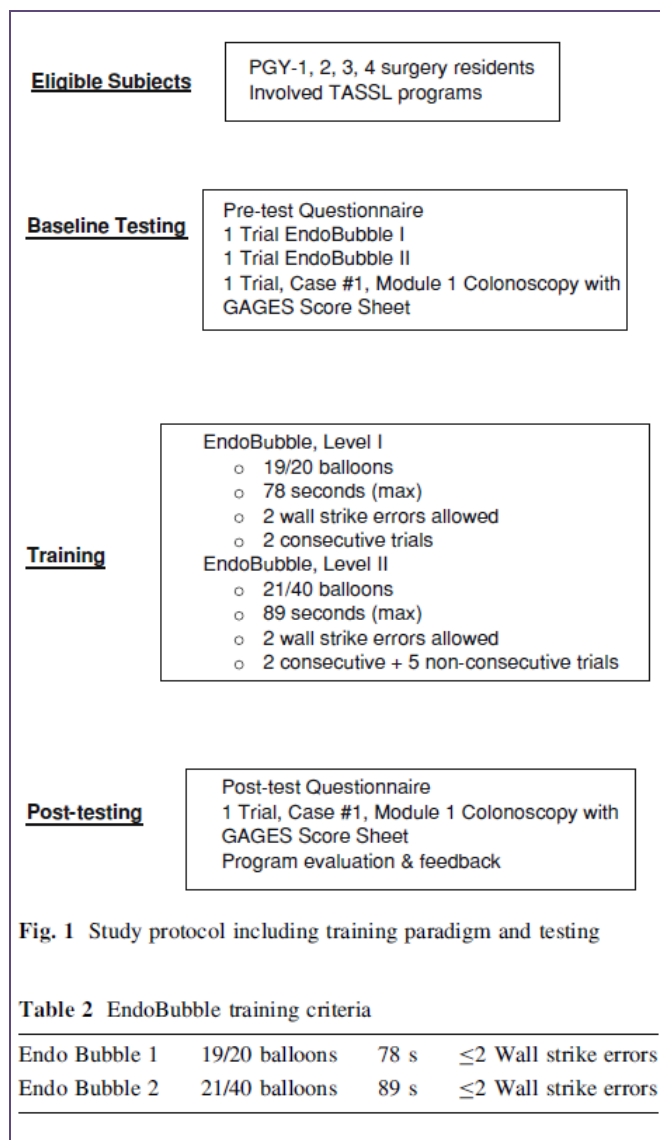
Flexible Endoscopy Training Curriculum:

Eligible Subjects
: PGY-1, 2, 3, 4 surgery residents
Involved TASSL programs

Baseline Testing
: Pre-test Questionnaire
1 Trial EndoBubble I
1 Trial EndoBubble II
1 Trial, Case #1, Module 1 Colonoscopy with GAGES Score Sheet

Training
: EndoBubble, Level I
o  19/20 balloons
o  78 seconds (max)
o  2 wall strike errors allowed
o  2 consecutive trials
EndoBubble, Level II
o  21/40 balloons
o  89 seconds (max)
o  2 wall strike errors allowed
o  2 consecutive + 5 non-consecutive trials

Post-testing
: Post-test Questionnaire
1 Trial, Case #1, Module 1 Colonoscopy with GAGES Score Sheet
Program evaluation & feedback

**Fig. 1** Study protocol including training paradigm and testing

**Table 2** EndoBubble training criteria

| Endo Bubble 1 | 19/20 balloons | 78 s | $\leq$2 Wall strike errors |
| Endo Bubble 2 | 21/40 balloons | 89 s | $\leq$2 Wall strike errors |

Training Data:

**Table 4** Training data

| | EndoBubble 1 | EndoBubble 2 |
|---|---|---|
| No. of trials to proficiency | 13 ± 10 | 22 ± 16 |
| Range | 2–48 | 5–70 |
| Proficiency levels, difficulty 1 (easy) to 5 (hard) | 2.1 ± 0.9 | 3.4 ± 0.7 |
| Training protocol appropriateness (1 = not appropriate; 5 = appropriate) | 4.2 | 4.3 |

Performance Data:

**Table 5** Performance data

| | Before | After | $p$ Value |
|---|---|---|---|
| GAGES | 14.9 ± 2.4 | 19.6 ± 1.5 | 0.001 |
| Mucosal surface (%) | 85.6 ± 3.6 | 85.7 ± 3.7 | NS |
| Screening efficiency (%) | 84.8 ± 13.5 | 93.0 ± 1.7 | 0.002 |
| Clear view time (%) | 94.8 ± 1.8 | 95.1 ± 3.4 | NS |
| Cecal intubation time (s) | 229 ± 97 | 152 ± 57 | 0.001 |
| Total procedure time (s) | 454 ± 147 | 334 ± 115 | 0.001 |
| Colon looped time (s) | 21 ± 30 | 12 ± 22 | NS |
| Total errors | 10 | 6 | NS |
| Lumen view lost ($n$) | 0.6 ± 1.3 | 0.0 ± 0.2 | 0.024 |

*GAGES* Global Assessment of Gastrointestinal Endoscopic Skills, *NS* not significant

Paired samples *t*-test (mean differences); $df = 35$, two-tailed

Self Assessment Data:

**Table 6** Subject's self-reported questionnaire data

| | Before | After | $p$ Value |
|---|---|---|---|
| Comfort levels w/flex endo tasks (range, 0–8) | 3.4 ± 3.0 | 7.2 ± 1.2 | 0.001 |
| Endoscopy self-rating (range, 0–4) | 1.5 ± 1.0 | 2.7 ± 0.6 | 0.001 |

*w/flex endo* with flexible endoscopic

## Task Descriptions and Curriculum Steps

The trainee is required to independently follow a structured step-by-step curriculum set in a hierarchical order, incorporating three consecutive segments:

A. **Baseline Testing**

B. **Hands-on Training**

C. **Post Training Testing**