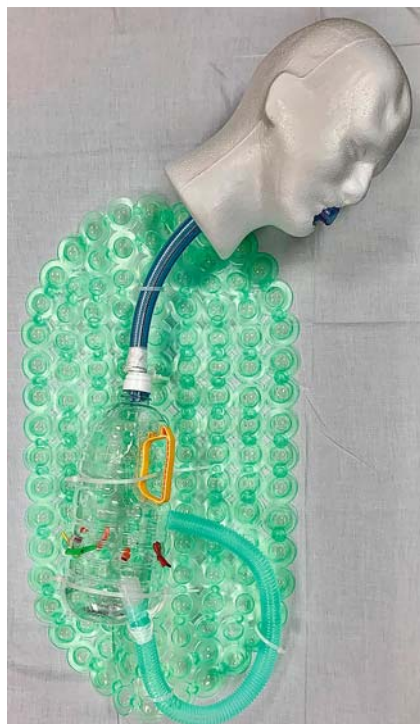


A low-cost endoscopy trainer for novice endoscopy training in COVID-19

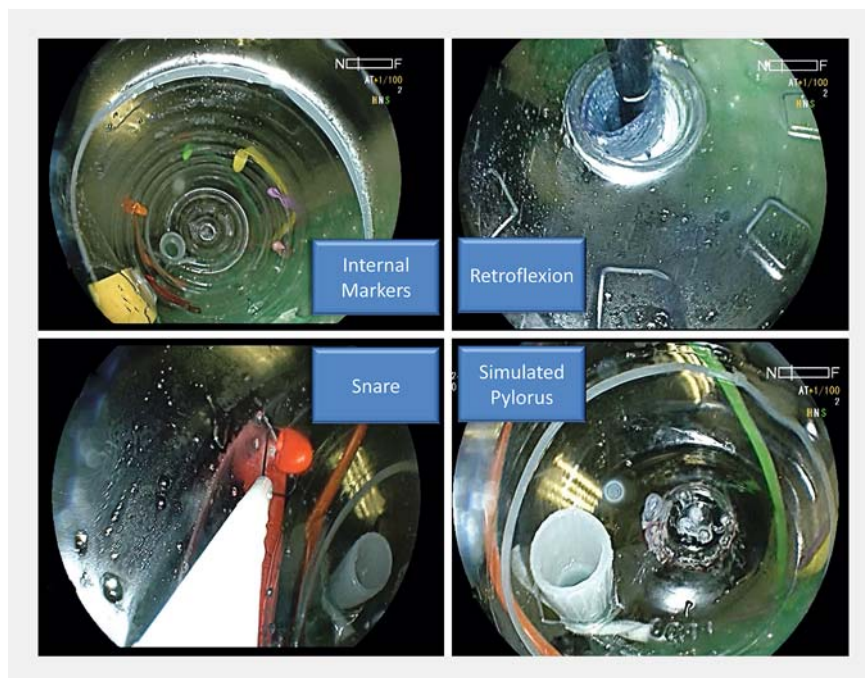


► **Fig. 1** Components of a low-cost model for endoscopy training.

The coronavirus disease 2019 (COVID-19) pandemic has significantly impacted gastroenterology and endoscopy training. Nonurgent endoscopies have been postponed; trainees have been redeployed; and trainee participation in endoscopies that are still being executed has also been limited [1].

For most gastroenterologists, endoscopy training begins with gastroscopy. More than 200 gastroscopies may be required before trainees can be certified as proficient [2]. Endoscopy trainees from all around the world have reported a reduction in case volume, leading to trainee concerns regarding their ability to develop sufficient procedural competency in a training period often of finite duration [3].

Although nothing can replace active participation in procedures, hands-on models have long been used as effective aids



► **Fig. 2** Internal view of the model.



► **Video 1** A low-cost endoscopy training model for novice endoscopy training.

for endoscopic education. This can help trainees develop the manual dexterity and familiarize themselves with the basic technical skills required prior to moving on to actual patients.

We developed a low-cost model (► **Fig. 1**, ► **Video 1**) comprising common household and hospital items including a 20-mm-diameter water hose, a 2-L plastic bottle, differently-colored balloons,

and ventilator tubing with a total cost < \$30. This model will assist novice endoscopy trainees with learning basic endoscopic movements including scope insertion and manipulation, different methods of applying scope torque, one-handed wheel deflection, scope retroflexion, instrument targeting, and snaring of targets. The clear plastic bottle (which can be easily covered) also allows the trainee to directly visualize how their scope control movements translate to scope tip behavior, and helps to shorten the cognitive gap and to build muscle memory. This model is highly adaptable and can also be used for training and simulation of infrequent but serious events such as Sengstaken-Blakemore tube insertion. The targets can also be swapped out depending on need, with the colored balloon tip simulating a polyp (► **Fig. 2**).

Endoscopy_UCTN_Code_TTT_1AU_2AB

Competing interests

The authors declare that they have no conflict of interest.

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Endoscopy 2020; 52: E463–E464
DOI 10.1055/a-1230-3325
ISSN 0013-726X
published online 3.9.2020
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Georg Thieme Verlag KG, Rüdigerstraße 14,
70469 Stuttgart, Germany

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