December 15, 2023

FUJIFILM Corporation
% Kotei Aoki
Manager, Regulatory Affairs
FUJIFILM Healthcare Americas Corporation
81 Hartwell Avenue, Suite 300
Lexington, MA 02421

Re: K230751
Trade/Device Name: EW10-EC02 Endoscopy Support Program
Regulation Number: 21 CFR 876.1520
Regulation Name: Gastrointestinal Lesion Software Detection System
Regulatory Class: Class II
Product Code: QNP
Dated: November 16, 2023
Received: November 16, 2023

Dear Kotei Aoki:

We have reviewed your section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (the Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. Although this letter refers to your product as a device, please be aware that some cleared products may instead be combination products. The 510(k) Premarket Notification Database available at https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm identifies combination product submissions. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration. Please note: CDRH does not evaluate information related to contract liability warranties. We remind you, however, that device labeling must be truthful and not misleading.

If your device is classified (see above) into either class II (Special Controls) or class III (PMA), it may be subject to additional controls. Existing major regulations affecting your device can be found in the Code of Federal Regulations, Title 21, Parts 800 to 898. In addition, FDA may publish further announcements concerning your device in the Federal Register.

Additional information about changes that may require a new premarket notification are provided in the FDA guidance documents entitled "Deciding When to Submit a 510(k) for a Change to an Existing Device"

(https://www.fda.gov/media/99812/download) and "Deciding When to Submit a 510(k) for a Software Change to an Existing Device" (https://www.fda.gov/media/99785/download).

Your device is also subject to, among other requirements, the Quality System (QS) regulation (21 CFR Part 820), which includes, but is not limited to, 21 CFR 820.30, Design controls; 21 CFR 820.90, Nonconforming product; and 21 CFR 820.100, Corrective and preventive action. Please note that regardless of whether a change requires premarket review, the QS regulation requires device manufacturers to review and approve changes to device design and production (21 CFR 820.30 and 21 CFR 820.70) and document changes and approvals in the device master record (21 CFR 820.181).

Please be advised that FDA's issuance of a substantial equivalence determination does not mean that FDA has made a determination that your device complies with other requirements of the Act or any Federal statutes and regulations administered by other Federal agencies. You must comply with all the Act's requirements, including, but not limited to: registration and listing (21 CFR Part 807); labeling (21 CFR Part 801); medical device reporting (reporting of medical device-related adverse events) (21 CFR Part 803) for devices or postmarketing safety reporting (21 CFR Part 4, Subpart B) for combination products (see https://www.fda.gov/combination-products/guidance-regulatory-information/postmarketing-safety-reporting-combination-products); good manufacturing practice requirements as set forth in the quality systems (QS) regulation (21 CFR Part 820) for devices or current good manufacturing practices (21 CFR Part 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR Parts 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR 807.97). For questions regarding the reporting of adverse events under the MDR regulation (21 CFR Part 803), please go to https://www.fda.gov/medical-devices/medical-device-safety/medical-device-reporting-mdr-how-report-medical-device-problems.

For comprehensive regulatory information about medical devices and radiation-emitting products, including information about labeling regulations, please see Device Advice (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance) and CDRH Learn (https://www.fda.gov/training-and-continuing-education/cdrh-learn). Additionally, you may contact the Division of Industry and Consumer Education (DICE) to ask a question about a specific regulatory topic. See the DICE website (https://www.fda.gov/medical-devices/device-advice-comprehensive-regulatory-assistance/contact-us-division-industry-and-consumer-education-dice) for more information or contact DICE by email (DICE@fda.hhs.gov) or phone (1-800-638-2041 or 301-796-7100).

Sincerely,

Shanil P. Haugen -S

Shanil P. Haugen, Ph.D.
Assistant Director
DHT3A: Division of Renal, Gastrointestinal, Obesity and Transplant Devices
OHT3: Office of Gastrorenal, ObGyn, General Hospital, and Urology Devices
Office of Product Evaluation and Quality
Center for Devices and Radiological Health

Enclosure

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

# Indications for Use

Form Approved: OMB No. 0910-0120
Expiration Date: 06/30/2023
*See PRA Statement below.*

510(k) Number *(if known)*
K230751

Device Name
Endoscopy Support Program EW10-EC02

Indications for Use *(Describe)*
This software is a computer-assisted reading tool designed to aid endoscopists in detecting colonic mucosal lesions (such as polyps and adenomas) in real time during standard endoscopy examinations of patients undergoing screening and surveillance endoscopic mucosal evaluations. This software is used with standard White Light Imaging (WLI) and Linked Color Imaging (LCI) endoscopy imaging. This software is not intended to replace clinical decision making.

Type of Use *(Select one or both, as applicable)*

☒ Prescription Use (Part 21 CFR 801 Subpart D) ☐ Over-The-Counter Use (21 CFR 801 Subpart C)

**CONTINUE ON A SEPARATE PAGE IF NEEDED.**

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## 5. 510(k) Summary

a. Company Name, Address:

FUJFILM Corporation
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Ashigarakami-Gun, Kanagawa,
258-8538, Japan

b. Contact:

Kotei Aoki
Manager, Regulatory Affairs
E-Mail: kotei.aoki@fujifilm.com
Telephone: (765) 246-2931

c. Date prepared

December 15, 2023

d. Subject Device

| | |
|---|---|
| 510(k) Applicant/Owner: | FUJIFILM Corporation |
| Device Name: | EW10-EC02 Endoscopy Support Program |
| Common Name: | EW10-EC02 |
| Classification Product Code: | QNP |
| Device Class: | Class II |
| Regulation Number: | 21 CFR 876.1520 |
| Regulation Description: | Gastrointestinal Lesion Software Detection System |
| Review Panel: | Gastroenterology/Urology |

e. Predicate Device

The EW10-EC02 Endoscopy Support Program is substantially equivalent to:

| | |
|---|---|
| 510(k) Number: | K211951 |
| Applicant: | Cosmo Artificial Intelligence - AI Ltd |
| Device Name: | GI Genius |
| Common Name: | GI Genius |
| Classification Product Code: | QNP |
| Device Class: | Class II |
| Regulation Number: | 21 CFR 876.1520 |
| Regulation Description: | Gastrointestinal Lesion Software Detection System |
| Review Panel: | Gastroenterology/Urology |

f. Device Description

There is an increasing interest in the application of artificial intelligence (AI) in health care to improve disease diagnosis, management, and the development of effective therapies. The remarkable development of AI from deep learning in recent years has increased the possibility of machines assisting assessments by human visual observation. The subject device represents application of AI technology to endoscopic images to assist in detecting the presence of potential lesions. This development greatly contributes to improving the quality of colonoscopy.

In recent years, computer-aided diagnosis (CAD) systems employing AI technologies have been approved and marketed as radiological medical devices for use with computed tomography (CT), X-ray, magnetic resonance imaging (MRI), and mammogram diagnostic images. In endoscopy as well, many images for diagnosis are taken. Since increasing the polyp detection rate is also in demand, CAD systems for endoscopy are being actively developed.

Against this background, the company has developed this software (EW10-EC02), a new AI-based CAD system, to support Health Care Provider (HCP) detection of large intestine polyps in colonoscopic images. EW10-EC02 detects suspected large intestine polyps in the endoscope video image in real-time.

g. Intended Use / Indications for Use

This software is a computer-assisted reading tool designed to aid endoscopists in detecting colonic mucosal lesions (such as polyps and adenomas) in real time during

standard endoscopy examinations of patients undergoing screening and surveillance endoscopic mucosal evaluations. This software is used with standard WLI (White Light Imaging) and LCI (Linked Color Imaging) endoscopy imaging. This software is not intended to replace clinical decision making.

h. Statement of Substantial Equivalence

A comparison of the technological characteristics between the subject and predicate device is provided in **Table 1** below. EW10-EC02 and GI Genius (K211951) share the same intended use and similar indications and technological characteristics. The differences in indications and technological characteristics between the subject and predicate devices do not raise new concerns regarding safety and effectiveness as demonstrated by the non-clinical and clinical performance evaluation results. Therefore, the Company believes that GI Genius is an appropriate predicate device for EW10-EC02, and EW10-EC02 can be submitted as a 510(k) under product code QNP.

i. Comparison Table

**Table 1: Comparison of EW10-EC02 to GI Genius**

| Feature | EW10-EC02 Endoscopy Support Program (Under Review) | GI Genius (K211951) | Comment |
|---|---|---|---|
| Manufacturer | FUJIFILM Corporation | Cosmo Artificial Intelligence – AI Ltd | N/A |
| Product Code | QNP | QNP | Same |
| Intended Use / Indications for Use | This software is a computer-assisted reading tool designed to aid endoscopists in detecting colonic mucosal lesions (such as polyps and adenomas) in real time during standard endoscopy examinations of patients undergoing screening and surveillance endoscopic mucosal evaluations. This software is used with standard WLI (White Light Imaging) and LCI (Linked Color Imaging) endoscopy imaging. This software is not intended to replace clinical decision making. | The GI Genius System is a computer-assisted reading tool designed to aid endoscopists in detecting colonic mucosal lesions (such as polyps and adenomas) in real time during standard white-light endoscopy examinations of patients undergoing screening and surveillance endoscopic mucosal evaluations. The GI Genius computer-assisted detection device is limited for use with standard white-light endoscopy imaging only. This device is not intended to replace clinical decision making. | Substantially Equivalent (The only difference in the intended use / indications for use between the subject device and the predicate device is the EW10-EC02 Endoscopy Support Program can also be used with LCI endoscopy imaging). |
| Site | Large intestine | Large intestine | Same |
| Modality | Colonoscopy | Colonoscopy | Same |
| CAD Function | Detection | Detection | Same |
| Method of reading | Concurrent read | Concurrent read | Same |
| Algorithm(s) | The EW10-EC02 Endoscopy | The GI Genius system utilizes an | Same |

| Feature | EW10-EC02<br>Endoscopy Support Program<br>(Under Review) | GI Genius<br>(K211951) | Comment |
|---|---|---|---|
| | Support Program utilizes an artificial intelligence-based algorithm to perform the polyp detection function. | artificial intelligence-based algorithm to perform the polyp detection function. | |
| Identified risks | Algorithm failure leading to:<br>• False positives resulting in unnecessary patient treatment; or<br>• False negatives resulting in delayed patient treatment<br>Failure to identify lesions, resulting in delayed patient treatment, due to software/hardware failure including:<br>• Incompatibility with hardware and/or data source<br>• Inadequate mapping of software architecture<br>• Degradation of image quality<br>• Prolonged delay of real-time endoscopic video<br>False positive or false negative due to user overreliance on the device | Algorithm failure leading to:<br>• False positives resulting in unnecessary patient treatment; or<br>• False negatives resulting in delayed patient treatment<br>Failure to identify lesions, resulting in delayed patient treatment, due to software/hardware failure including:<br>• Incompatibility with hardware and/or data source<br>• Inadequate mapping of software architecture<br>• Degradation of image quality<br>• Prolonged delay of real-time endoscopic video<br>False positive or false negative due to user overreliance on the device | Same |

j. Performance Data

The following testing was conducted for the EW10-EC02 Endoscopy Support Program.

- Software Verification and Validation

Software verification and validation was conducted for the EW10-EC02 Endoscopy Support Program to validate it for its intended use per the design documentation in line with recommendations outlined in *General Principles of Software Validation, Guidance for Industry and FDA Staff*. The EW10-EC02 Endoscopy Support Program demonstrated passing results on all applicable unit, integration, and requirements testing.

- Non-clinical Performance Testing

The purpose of the standalone performance testing is to demonstrate that the object-level, frame-level and overall algorithmic performance is sufficient to fulfill the indications for use of the EW10-EC02. The standalone performance evaluation was carried out using the dataset shown in **Tables 2-4**. This evaluation was performed in both WLI (White Light Imaging) and LCI (Linked Color Imaging) modes. Fujifilm performed this standalone performance testing using a total of 149 (WLI mode) and 144 (LCI mode) colonoscopy videos.

**Table 2: Patient demographics**

| Item | WLI | LCI |
|---|---|---|
| **Number of Patients** | 149<br>(With lesion:119, Without lesion: 30) | 144<br>(With lesion: 114, Without lesion: 30) |
| **Age (range)** | 56.6 ± 10.8 (23 - 85) | 56.5 ± 10.7 (23 - 85) |
| **Male sex** | 81 % | 81 % |
| **Race** | Asian 100% | Asian 100% |
| **Number of Patients for screening** | 146 | 142 |
| **Number of Patients for surveillance** | 3 | 2 |

**Table 3: Detailed Dataset of standalone performance testing**

| Mode | Item | Total number | Lesion Type | | | Lesion Size (mm) | | | Lesion Form | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Adenoma | HP | Others | 1-5 | 6-9 | ≥ 10 | Polypoid (Type I) | Non-Polypoid (Type II) |
| **WLI** | **Number of lesions** | 164 | 133 | 26 | 5 | 119 | 34 | 11 | 139 | 25 |
| **LCI** | **Number of lesions** | 154 | 127 | 25 | 2 | 112 | 32 | 10 | 131 | 23 |

**Table 4: Summary of Number of Cases and Frames**

| Mode | Number of Cases | | Number of Frames | | | | |
|---|---|---|---|---|---|---|---|
| | | | With lesion | | | Without lesion | Total number |
| | With lesion | Without lesion | Adenoma | HP | Others | | |
| **WLI** | 119 | 30 | 23,861 | 4,680 | 900 | 1,330,539 | 1,359,980 |
| | 149 | | 29,441 | | | | |
| **LCI** | 114 | 30 | 21,932 | 4,297 | 360 | 335,014 | 361,603 |
| | 144 | | 26,589 | | | | |

Based on the results in the case of evaluation per frame, the evaluation values for each case were calculated by counting the number of consecutive frames of each metric. Since lesion detection was performed and evaluated at the lesion level (object level) in the actual clinical cases, we set sensitivity per lesion as the primary endpoint. We evaluated whether the lower limit of the confidence interval (95%) of sensitivity per lesion of EW10-EC02, exceeds the criteria. We also evaluated FP Objects/Patient. The confidence interval (95%) was calculated by non-parametric cluster bootstrap analysis, considering within-patient correlation.

## Standalone performance results

The evaluation results of object level performance for Standalone performance testing were shown in **Tables 5-6** below.

**Table 5: Main evaluation results of object level performance for standalone performance testing**

| Item | Results | |
|---|---|---|
| | WLI mode | LCI mode |
| **Sensitivity per lesion** | 95.1% | 95.5% |

| | | |
|---|---|---|
| **(Lesion-based sensitivity)** | 91.1 – 98.3% | 91.5 – 98.7% |
| **FP Objects/Patient (Number of $FP_C$ per Case)** | 1.42 | 0.76 |
| | 1.09 – 1.81 | 0.42 – 1.21 |

**Table 6: Evaluation results for each target lesions and cases**

| **Target lesion** | | **Sensitivity per Lesion** | | **FP Objects/Patient** | |
|---|---|---|---|---|---|
| | | **WLI mode** | **LCI mode** | **WLI mode** | **LCI mode** |
| **Lesion Type** | **Adenoma** | 96.2% (92.3 – 99.3%) | 96.1% (91.9 – 99.2%) | 1.44 (1.06 – 1.93) | 0.71 (.26 – 1.34) |
| | **HP** | 92.3% (80.0 – 100%) | 92.0% (79.2 – 100%) | 0.88 (0.38 – 1.46) | 0.35 (0.13 – 0.61) |
| **Lesion Size (mm)** | **1-5** | 95.0% (89.9 – 99.1%) | 93.8% (88.4 – 98.2%) | 1.41 (0.99 – 1.94) | 0.79 (0.31 – 1.47) |
| | **6-9** | 97.1% (90.6 -100%) | 100% (–) | 1.03 (0.60 – 1.50) | 0.25 (0 – 0.57) |
| | **≥10** | 90.9% (70.0 – 100%) | 100% (–) | 0.80 (0.20 – 1.50) | 0 (–) |
| **Lesion Form** | **Polypoid** | 97.8% (94.9 – 100%) | 97.0% (93.4 – 99.3%) | 1.36 (0.97 – 1.86) | 0.75 (0.28 – 1.36) |
| | **Non-Polypoid** | 80.0% (62.5 – 95.8%) | 87.0% (70.8 – 100%) | 0.83 (0.38 – 1.38) | 0.18 (0 – 0.41) |
| **Type & Size** | **1-5mm Adenoma** | 95.7% (90.5 – 100%) | 94.4% (88.3 – 98.9%) | 1.54 (1.04 – 2.07) | 0.83 (0.28 – 1.65) |
| | **6-9mm Adenoma** | 96.7% (89.7 – 100%) | 100% (–) | 1.19 (0.69 – 1.69) | 0.24 (0 – 0.60) |
| | **≥10mm Adenoma** | 100% (–) | 100% (–) | 1.00 (0.25 – 1.75) | 0 (–) |
| **Screening** | | 95.0% (91.0 – 98.2%) | 95.4% (91.5 – 98.7%) | 1.43 (1.09 – 1.82) | 0.77 (0.42 – 1.25) |
| **Post-treatment surveillance** | | 100% (–) | 100% (–) | 0.67 (0 – 2.0) | 0 (–) |
| **Cases with Others polyps (without any identified polyps subgroup)** | | 80.0% (40.0 – 100%) | 100% (–) | 0.20 (0 – 0.60) | 0 (–) |
| **Cases without lesion** | | – | – | 1.80 (1.07 – 2.67) | 1.03 (0.47 – 1.77) |

**Figure 1** showed how detection persistence in time (the duration of time a mark persists on the same target based on an IoU overlap criterion applied to the EW10-EC02 marks across frames) correlates with sensitivity per lesion and FP Objects /Patient. This testing considers repeated marking overlays of the same target (lesions and false positives) as a single statistical event. This allows for an estimate of the number of unique targets (or objects) identified by EW10-EC02 as a function of the time those targets persist in the field of view. In this standalone performance testing, WLI has about four times more evaluation images than LCI, so there is a difference in FP Objects/Patient, but the relationship between FP Objects/Patient and Sensitivity per lesion in both modes was almost equivalent.

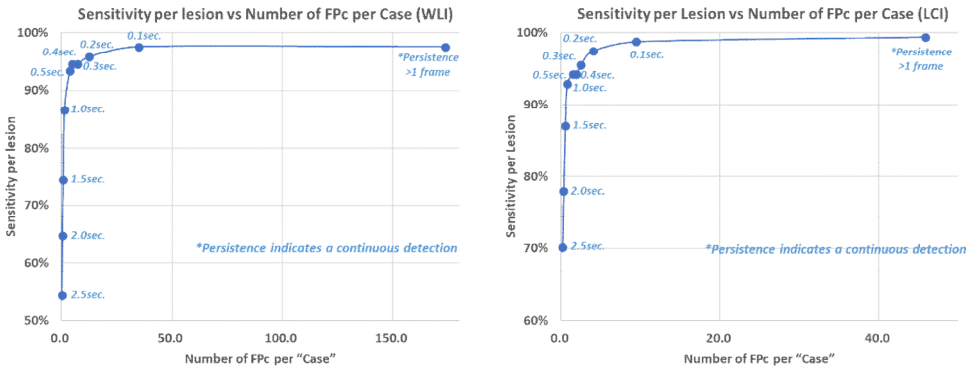


**Figure 1: Figure demonstrating how detection persistence in time correlates with sensitivity per lesion and the number of FPc per "Case" (FP Objects/Patient); (L)WLI mode, (R)LCI mode**

The frame-level performance is an assessment of the accuracy of the algorithm at sorting endoscopic images for quantification of false positives, false negatives, true positives, and true negatives. The image-level evaluation results were shown in the **Table 7**.

**Table 7: Results of frame level performance in Standalone performance testing**

| Items | | Results | |
|---|---|---|---|
| | | **WLI mode** | **LCI mode** |
| **Frame level performance** | **Total number of $TP_F$** | 21,166 | 21,723 |
| | **Total number of $TN_F$** | 1,273,229 | 317,600 |
| | **Total number of $FP_F$** | 69,075 | 22,454 |
| | **Total number of $FN_F$** | 8,275 | 4,866 |
| **Sensitivity per frame** | **Case with lesion (All lesion)** (Total number of $TP_F$ / (Total number of $TP_F$ + Total number of $FN_F$)) | 71.9%<br>% of polyps: 97.6%<br>(71.4 – 72.4%) | 81.7%<br>% of polyps: 99.4 %<br>(81.2 – 82.2%) |
| | **Case for Screening** | 72.0%<br>(71.4 – 72.5%) | 81.8%<br>(81.3 – 82.2%) |
| | **Case for Post-treatment surveillance** | 68.2%<br>(64.3 – 72.0%) | 76.7%<br>(72.2 – 81.1%) |
| | **Cases with Others polyps** | 73.4%<br>(70.8 – 76.7%) | 98.6%<br>(97.2 – 99.7%) |
| **False Positive Rate per frame** | **All cases** ($FP_F$ / Number of all frames) | 5.08%<br>(4.46 – 5.88%) | 6.21%<br>(4.45 – 8.31%) |
| | **Case for Screening** | 5.12%<br>(4.49 – 5.92%) | 6.22%<br>(4.54 – 8.28%) |
| | **Case for Post-treatment surveillance** | 3.43%<br>(2.10 – 4.27%) | 4.01%<br>(2.44 – 12.9%) |
| | **Cases with Others polyps** | 4.14%<br>(3.56 – 4.83%) | 0.54%<br>(0 – 1.07% |
| | **Cases without lesion** | 5.32%<br>(3.92 – 7.26%) | 6.42%<br>(4.12 – 9.36%) |

**Figures 3-4** showed the results of ROC and FROC analysis. The AUC values of ROC curves were respectively 0.79(WLI) and 0.87(LCI). These curve and value showed that the recognizer algorithm has high accuracy.

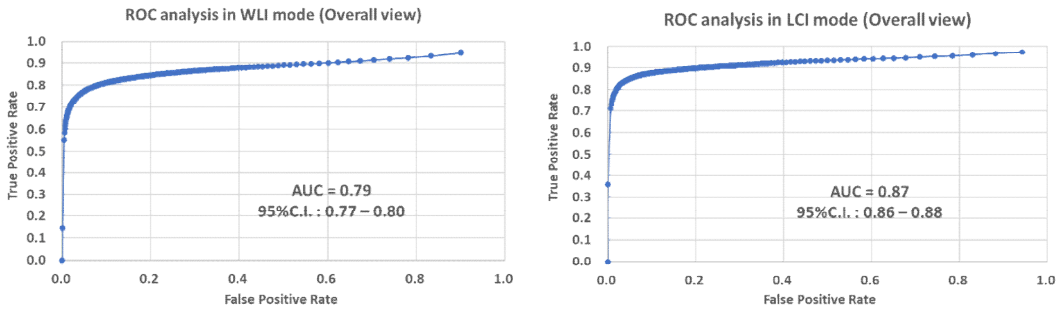


**Figure 3: ROC analysis; (L)WLI mode, (R)LCI mode**

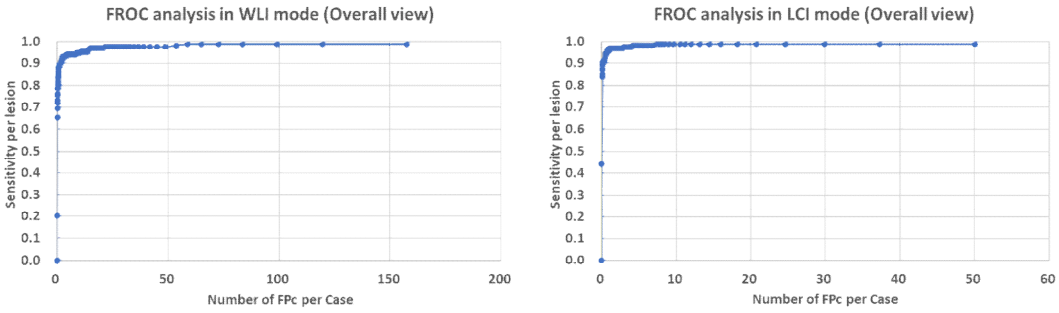


**Figure 4: FROC analysis; (L)WLI mode, (R)LCI mode**

## Standalone Performance Conclusions

EW10-EC02 achieved all criteria in both modes and showed good results for each subgroup on both items of sensitivity and false positives. In addition, sensitivity analysis and FPc analysis further support robust results for EW10-EC02. ROC-AUC and FROC analysis also supports that performance of the EW10-EC02 algorithm.

## Special Control Testing

- ✓ Pixel-level comparison of degradation of image quality due to the device; No visually detectable differences between images were found with the introduction of the EW10-EC02.
- ✓ Video delay due to marker annotation was 4.00 frames average (66.7 msec).
- ✓ Real-time endoscopic video delay due to the device was 3.67 frames average (61.2 msec).

• Human Factors

The data collected in the pivotal clinical study is sufficient to support usability as it demonstrates the ability to appropriately use the device in an actual clinical setting.

- Clinical Testing

**Study Design**

This study was a multi-center, prospective, randomized controlled trial. Each subject had a colonoscopy, using FUJIFILM's High Definition (HD) endoscope, video processor and the EW10-EC02 endoscopy support program. The study was conducted at 12 centers in the United States.

Subjects met all eligibility criteria were randomly allocated to 1 of 2 arms:

(1) CAC(Computer Assisted Colonoscopy) group: inspection with computer assisted colonoscopy. Or

(2) CC(Conventional Colonoscopy) group: inspection with conventional colonoscopy.

As per standard of care, polyps were resected when found, and sent to histopathology.

**Study Population**

This prospective study enrolled a total of 1,166 subjects. Of these subjects enrolled, 135 subjects were excluded from the analysis due to exclusionary reasons. A total of 1,031 subjects were analyzed, 600 were average risk subjects undergoing average risk screening colonoscopy and 565 subjects scheduled for follow-up colonoscopy due to a previous history of polyps 3 years or greater.

These subjects provided an informed consent and were aged 45 or older. Patients were not enrolled if they were pregnant, refused to give an informed consent or had a history of colon resection, Inflammatory Bowel Disease (IBD), Familial Adenomatous Polyposis (FAP), severe comorbidity, including end-stage cardiovascular/pulmonary/liver/renal disease. A key demographics is provided below:

| | Total | Randomized to | | P-Value |
|---|---|---|---|---|
| | n = 1031 | CAC<br>n = 509 | CC<br>n = 522 | |
| Age | 59.1 ± 9.8 | 58.9 ± 9.5 | 59.3 ± 10.1 | 0.498 |
| Sex<br>Male<br>Female | <br>514 (49.9%)<br>517 (50.1%) | <br>262 (51.5%)<br>247 (48.5%) | <br>252 (48.3%)<br>270 (51.7%) | 0.304 |
| Hispanic | 57 (5.5%) | 25 (4.9%) | 32 (6.1%) | 0.391 |
| Race<br>1 Caucasian<br>2 Af Am<br>3 Asian<br>4 Native Haw/PI<br>5 Native Am<br>6 Other<br>Missing | <br>743 (72.3%)<br>169 (16.5%)<br>63 (6.1%)<br>4 (0.4%)<br>2 (0.2%)<br>46 (4.5%)<br>4 | <br>363 (71.6%)<br>86 (17.0%)<br>37 (7.3%)<br>2 (0.4%)<br>1 (0.2%)<br>18(3.6%)<br>2 | <br>380 (73.1%)<br>83 (16.0%)<br>26 (5.0%)<br>2 (0.4%)<br>1 (0.2%)<br>28 (5.4%)<br>2 | 0.448 |
| Reason for the colonoscopy<br>1 Screening Colonoscopy<br>2 Surveillance Colonoscopy | <br>540 (52.4%)<br>491 (47.6%) | <br>254 (49.9%)<br>255 (50.1%) | <br>286 (54.8%)<br>236 (45.2%) | 0.116 |

**Equipment**

The following Equipment was used in the study, as in real-world use of the device.

- VP-7000 Video Processor

The Processor relays the image from the endoscope to a video monitor. The Processor provides the optional image enhancement function (BLI, LCI, FICE) at the user's option.

- BL-7000 LED Light Source

The Fujifilm endoscope employs fiber bundles to transmit light from the light source and subsequently to the body cavity. The Light Source employs four LED lamps. Brightness control is performed by the user.

- 700 series Colonoscopes

The Fujifilm 700 series Colonoscopes are intended for the visualization of the lower digestive tract, specifically for the observation, diagnosis, and endoscopic treatment of the rectum and large intestine. The endoscope is used in combination with FUJIFILM's video processors, light sources and peripheral devices such as monitor, printer, foot switch, and cart.

**Study Endpoint**

The purpose of this study was to demonstrate the superiority of colorectal polyp detection using computer assisted colonoscopy compared to conventional colonoscopy. To accomplish this objective, two primary endpoints were evaluated:

**Co-Primary Endpoints**

- Adenoma per colonoscopy (APC)

APC, defined as the total number of histologically confirmed adenomas detected in the colonoscopy divided by the total number of colonoscopies.

- Positive predictive value (PPV)

PPV, defined as the total number of histologically confirmed adenomas detected during the colonoscopy, divided by the total number of excisions in the colonoscopy.

- Positive percent agreement (PPA)

PPA, defined as the total number of histologically confirmed Clinically Significant Excised Lesions , divided by the total number of excisions. For calculating this endpoint, clinically Significant Excised Lesions defined as follows:

- Neoplastic lesions (classical adenomas and carcinomas)
- Sessile serrated lesions (SSL) classified according to the serrated lesion classification

- Hyperplastic polyps (HP) of the proximal colon (caecum, ascending colon, hepatic flexure and transverse colon), classified according to the serrated lesion classification.

**Secondary Endpoint**

Additional secondary endpoints were assessed:

- Adenoma detection rate (ADR)

ADR, defined as the proportion of patients with at least one histologically confirmed adenomas detected in the colonoscopy.

- Sessile serrated lesion per colonoscopy (SPC)

SPC, defined as the total number of histologically confirmed sessile serrated lesion detected in the colonoscopy divided by the total number of colonoscopies.

- Sessile serrated lesion detection rate (SDR)

SDR, defined as the proportion of patients with at least one histologically confirmed sessile serrated lesion detected in the colonoscopy.

- Polyp per colonoscopy (PPC)

PPC, defined as the total number of histologically confirmed clinically relevant detected in the colonoscopy divided by the total number of colonoscopies.

- Polyp detection rate (PDR)

PDR, defined as the proportion of patients with at least one histologically confirmed clinically relevant polyp detected in the colonoscopy.

- Adverse events

Adverse Events number and severity.

- Cecal intubation rates and withdrawal times
- Serrated Lesions per Colonoscopy (SLPC)

SLPC, defined as the number of histologically confirmed serrated detected, divided by the total number of colonoscopies.

- Serrated Lesions Detection Rate (SLDR)

SLDR, defined as the proportion of patients with at least one histologically confirmed serrated lesions detected.

- Advanced Adenoma Detection Rate (aADR)

aADR, defined as proportion of patients with at least one histologically confirmed adenoma ≥ 10 mm or any adenoma < 10 mm, which was either of high-grade dysplasia or villous or tubulovillous

- Small Adenoma Detection Rate (sADR)

sADR, defined as proportion of patients with at least one histologically confirmed adenoma smaller than 5 mm detected

- Flat Adenoma Detection Rate (fADR)

fADR, defined as the proportion of patients with at least one histologically confirmed non-polypoid adenoma detected

- Proximal Adenoma Detection Rate (pADR)

pADR, defined as the proportion of patients with at least one histologically confirmed adenoma in transverse colon, Hepatic F, ascending colon, or the cecum

- False Positive Rate (FPR)

FPR, defined as the proportion of colorectal lesions resected or biopsied and subsequently not histologically confirmed to be clinically relevant colorectal polyps. All the biopsied or ablated specimens, which were histologically confirmed not to be polyps (e.g., normal mucosa, inflammatory tissue, stool, or debris, etc.), were classified as False Positive.

- True Histology Rate (THR)

THR, defined as Total number of histologically confirmed adenomas, sessile serrated lesions, and large (>10 mm) hyperplastic polyps of the proximal colon resected, divided by the total number of excisions in the colonoscopy.

**Study Primary Results**

The study met primary success criteria with APC in CAC being superior with a p-value of 0.018. PPV criteria was also met with a margin of -9.56%.

Adenoma Per Colonoscopy: APC

| | Total | Randomized to | | Incidence Rate Ratio (95% CI) | Difference in APC (95% CI) | P-Value |
|---|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | | |
| Mean Number of Adenomas (+/- sd) | 0.919 ± 1.548 | 0.990 ± 1.610 | 0.849 ± 1.484 | 1.17 (1.01, 1.36) | 0.141 (0.01, 0.28) | 0.018 |

Positive Predictive Value: PPV

| | Total | Randomized to | | Bootstrapped 95% Confidence Interval |
|---|---|---|---|---|
| | n = 1857 | CAC n = 1037 | CC n = 820 | |
| Adenoma Detected | 947 (51.0%) | 504 (48.6%) | 443 (54.0%) | -9.56%, -1.48% |

Positive Percent Agreement (PPA)

| | Total | Randomized to | | Bootstrapped (95% CI) |
|---|---|---|---|---|
| | n = 1857 | CAC n = 1037 | CC n = 820 | |
| Positive Detected | 1172 (63.1%) | 629 (60.7%) | 543 (66.2%) | -10.50%, -2.30% |

**Study Secondary Results**

Additional secondary endpoints of note were:

- Polyp per colonoscopy (PPC) with a p-value <0.001, defined as any neoplastic or hyperplastic polyp.

- Serrated Lesions per Colonoscopy (SLPC) and Serrated Lesions Detection Rate (SLDR) with p-values of <0.001 and 0.027 respectively.
- Proximal Adenoma Detection Rate (pADR), just missing statistical significance with a p-value of 0.053.
- False Positive Rate (FPR) was non-inferior with a 95% confidence interval of 1.39 - 7.82%.

All other secondary endpoints did not meet criteria for statistical significance. No significant differences were noted in adverse events and withdrawal times.

Poolability and interaction analysis showed statistically significant interaction (p-value = 0.019) when assessing Screening versus Surveillance colonoscopy. Surveillance colonoscopies had a significant affect on APC. PPV and ADR was not significant and similar between the 2 strata.

Adenoma Detection Rate (ADR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any adenoma Detected | 462 (44.8%) | 238 (46.8%) | 224 (42.9%) | 3.85% (2.22%,9.91%) | 0.214 |

Sessile Serrated Lesion Per Colonoscopy (SPC)

| | Total | Randomized to | | Incidence Rate Ratio (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Mean Sessile Serrated | 0.150 ± 0.490 | 0.171 ± 0.502 | 0.130 ± 0.478 | 1.31 (0.96, 1.80) | 0.094 |

Sessile Serrated Lesion Detection Rate (SDR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any SS Detected | 119 (11.5%) | 66 (13.0%) | 53 (10.2%) | 2.81% (-1.09%,6.72%) | 0.157 |

Polyp Per Colonoscopy (PPC)

| | Total | Randomized to | | Incidence Rate Ratio (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Mean Number of Polyps | 1.501 ± 1.941 | 1.680 ± 2.070 | 1.328 ± 1.791 | 1.27 (1.14, 1.40) | <0.001 |

Polyp Detection Rate (PDR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any Polyp Detected | 635 (61.6%) | 325 (63.9%) | 310 (59.4%) | 4.46% (-1.47%,10.39%) | 0.140 |

## Adverse Events

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Adverse Events<br>Yes<br>No | 8 (0.8%)<br>1023 (99.2%) | 5 (1.0%)<br>504 (99.0%) | 3 (0.6%)<br>519 (99.4%) | 0.41% (-0.67%,1.48%) | 0.501 |

## Cecal Intubation

| | Total | Randomized to | | P-Value |
|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | |
| Cecal Intubation | 1033 (100.0%) | 510 (100.0%) | 523 (100.0%) | NA |

## Withdrawal Times

| | Total | Randomized to | | P-Value |
|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | |
| WD Time in Seconds | 663.2 ± 282.4 | 677.5 ± 275.3 | 649.3 ± 288.8 | 0.109 |

## Serrated Lesions Per Colonoscopy (SLPC)

| | Total | Randomized to | | Incidence Rate Ratio (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Mean Serrated | 0.581 ± 1.142 | 0.690 ± 1.249 | 0.475 ± 1.016 | 1.45 (1.23, 1.71) | <0.001 |

## Serrated Lesions Detection Rate (SLDR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any Serrated Detected | 333 (32.3%) | 181 (35.6%) | 152 (29.1%) | 6.44% (0.74%,12.14%) | 0.027 |

## Advanced Adenoma Detection Rate (aADR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any Advanced Adenoma Detected | 66 (6.4%) | 33 (6.5%) | 33 (6.3%) | 0.16% (-2.83%,3.15%) | 0.915 |

## Small Adenoma Detection Rate (sADR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any Small Adenoma Detected | 340 (33.0%) | 181 (35.6%) | 159 (30.5%) | 5.1% (-0.63%,10.83%) | 0.081 |

## Flat Adenoma Detection Rate (fADR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any fADR Detected | 64 (6.2%) | 34 (6.7%) | 30 (5.7%) | 0.93% (-2.02%,3.88%) | 0.534 |

Proximal Adenoma Detection Rate (pADR)

| | Total | Randomized to | | Absolute Difference (95% CI) | P-Value |
|---|---|---|---|---|---|
| | n = 1031 | CAC n = 509 | CC n = 522 | | |
| Any pADR Detected | 357 (34.6%) | 191 (37.5%) | 166 (31.8%) | 5.72% (-0.08%,11.53%) | 0.053 |

False Positive Rate (FPR)

| | Total | Randomized to | | Bootstrapped 95% confidence interval |
|---|---|---|---|---|
| | n = 1857 | CAC n = 1037 | CC n = 820 | |
| FPR Detected | 305 (16.4%) | 182 (17.6%) | 123 (15.0%) | 1.39%, 7.82% |

True Histology Rate (THR)

| | Total | Randomized to | | Bootstrapped 95% confidence interval |
|---|---|---|---|---|
| | n = 1857 | CAC n = 1037 | CC n = 820 | |
| THR Detected | 1102 (59.3%) | 591 (57.0%) | 511 (62.3%) | -10.3%, -2.06% |

Interaction with Screening/Surveillance

| STRATA | | Total | Randomized to | | Incidence Rate Ratio (CAC vs CC, 95% CI) | P-Value | Interaction P-Value |
|---|---|---|---|---|---|---|---|
| | | | CAC | CC | | | |
| APC | | | | | | | |
| Screening | Mean Number of Adenomas (+/- sd) | 0.763 ± 1.491 | 0.748 ± 1.322 | 0.776 ± 1.628 | 0.96 (0.79, 1.17) | 0.862 | 0.019 |
| Surveillance | Mean Number of Adenomas (+/- sd) | 1.090 ± 1.593 | 1.231 ± 1.824 | 0.936 ± 1.285 | 1.31(1.11, 1.56) | 0.002 | |
| PPV | | | | | | | |
| Screening | Adenoma Detected | 412 (47.2%) | 190 (43.5%) | 222 (51.0%) | | | 0.892 |
| Surveillance | Adenoma Detected | 535 (54.3%) | 314 (52.3%) | 221 (57.4%) | | | |
| ADR | | | | | | | |
| Screening | ADR | 209 (38.7%) | 101 (39.8%) | 108 (37.8%) | | | 0.696 |
| Surveillance | ADR | 253 (51.5%) | 137 (53.7%) | 116 (49.2%) | | | |

Polyp Characteristics

Polyps were classified according to their size, location and morphology (pedunculated, sessile and non-polypoid). Non-polypoid (flat and depressed) lesions were defined as lesions endoscopically high less than half wide, according to Paris classification. Location was considered proximal if proximal to the splenic flexure. On the basis of

histological examination, polyps were categorized according to revised Vienna classification and serrated lesion classification.

| | Total | Randomized to | | P-Value |
|---|---|---|---|---|
| | n = 1857 | CAC n = 1037 | CC n = 820 | |
| Polyp Location | | | | 0.070 |
| Cecum | 160 (8.7%) | 98 (9.5%) | 62 (7.6%) | |
| Ascending | 342 (18.5%) | 197 (19.1%) | 145 (17.8%) | |
| Hepatic F | 61 (3.3%) | 22 (2.1%) | 39 (4.8%) | |
| Transverse | 422 (22.8%) | 234 (22.7%) | 188 (23.1%) | |
| Splenic F | 18 (1.0%) | 8 (0.8%) | 10 (1.2%) | |
| Descending | 243 (13.1%) | 136 (13.2%) | 107 (13.1%) | |
| Sigmoid | 409 (22.1%) | 228 (22.1%) | 181 (22.2%) | |
| Rectum | 193 (10.4%) | 110 (10.6%) | 83 (10.2%) | |
| Missing | 9 | 4 | 5 | |
| Polyp Shape | | | | 0.002 |
| lp | 96 (5.2%) | 41 (4.0%) | 55 (6.7%) | |
| ls | 1502 (80.9%) | 868 (83.7%) | 634 (77.3%) | |
| lla | 224 (12.1%) | 109 (10.5%) | 115 (14.0%) | |
| llb | 19 (1.0%) | 12 (1.2%) | 7 (0.9%) | |
| llc | 4 (0.2%) | 3 (0.3%) | 1 (0.1%) | |
| III | 1 (0.1%) | 1 (0.1%) | 0 (0.0%) | |
| Other | 11 (0.6%) | 3 (0.3%) | 8 (1.0%) | |
| Polyp Size (mm) | | | | 0.003 |
| 1.0 to <5 | 1182 (63.9%) | 692 (66.9%) | 490 (60.0%) | |
| 5 to <10 | 556 (30.1%) | 291 (28.1%) | 265 (32.5%) | |
| 10 to 60.0 | 112 (6.1%) | 51 (4.9%) | 61 (7.5%) | |
| Missing | 7 | 3 | 4 | |
| Non-neoplastic | | | | 0.025 |
| Not NONNEOPLASTIC | 1111 (59.8%) | 592 (57.1%) | 519 (63.3%) | |
| Hyperplastic | 441 (23.7%) | 263 (25.4%) | 178 (21.7%) | |
| Other | 305 (16.4%) | 182 (17.6%) | 123 (15.0%) | |
| Neoplastic | | | | 0.014 |
| NOT NEOPLASTIC | 751 (40.4%) | 445 (42.9%) | 306 (37.3%) | |
| Adenoma | 927 (49.9%) | 495 (47.7%) | 432 (52.7%) | |
| Traditional Serrated | 3 (0.2%) | 1 (0.1%) | 2 (0.2%) | |
| Sessile Serrated | 152 (8.2%) | 86 (8.3%) | 66 (8.0%) | |
| Villous | 16 (0.9%) | 5 (0.5%) | 11 (1.3%) | |
| High-grade dysplasia | 4 (0.2%) | 4 (0.4%) | 0 (0.0%) | |
| Submucosal Invasion | 3 (0.2%) | 1 (0.1%) | 2 (0.2%) | |
| Other | 1 (0.1%) | 0 (0.0%) | 1 (0.1%) | |

**Clinical Testing Conclusions**

With meeting primary success criteria and demonstrating additional secondary benefits, the Computer Assisted AI Colonoscopy (CAC) is an appropriate aid to endoscopists, trained in intestinal polyp detection, to further assist the clinician through detection of suspected findings during the exam, as a video image superimposed on the endoscope monitor.

k. Conclusion

The EW10-EC02 Endoscopy Support Program has the same intended uses and similar indications, technological characteristics, and principles of operation as its predicate device, GI Genius (K211951). The differences in indications and technological characteristics between the subject and predicate devices do not raise new concerns regarding safety and effectiveness as demonstrated by the non-clinical and clinical performance evaluation results. Therefore, the EW10-EC02 Endoscopy Support Program can be considered substantially equivalent to the similar legally marketed device.