Aidoc Medical, Ltd.
% John J. Smith, M.D., J.D.
Partner
Hogan Lovells US LLP
555 Thirteenth Street NW
WASHINGTON DC 20004

April 26, 2022

Re: K213886
Trade/Device Name: BriefCase
Regulation Number: 21 CFR 892.2080
Regulation Name: Radiological computer aided triage and notification software
Regulatory Class: Class II
Product Code: QAS
Dated: April 1, 2022
Received: April 1, 2022

Dear Dr. Smith:

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 (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 located 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.

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 803) for

devices or postmarketing safety reporting (21 CFR 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 4, Subpart A) for combination products; and, if applicable, the electronic product radiation control provisions (Sections 531-542 of the Act); 21 CFR 1000-1050.

Also, please note the regulation entitled, "Misbranding by reference to premarket notification" (21 CFR Part 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,

Jessica Lamb, Ph.D.
Assistant Director
Mammography Ultrasound and Imaging Software Branch
Division of Radiological Health
OHT7: Office of In Vitro Diagnostics
and Radiological Health
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: 06/20/2023
See PRA Statement on last page

510(k) Number *(if known)*

K213886

Device Name

BriefCase

Indications for Use *(Describe)*

BriefCase is a radiological computer aided triage and notification software indicated for use in the analysis of contrast-enhanced chest CTs (not dedicated CTPA protocol) in adults or transitional adolescents age 18 and older. The device is intended to assist hospital networks and appropriately trained medical specialists in workflow triage by flagging and communication of suspect cases of incidental Pulmonary Embolism (iPE) pathologies. The device is intended to be used on single-energy exams only.

BriefCase uses an artificial intelligence algorithm to analyze images and flag suspect cases on a standalone desktop application in parallel to the ongoing standard of care image interpretation. The user is presented with notifications for suspect cases. Notifications include compressed preview images that are meant for informational purposes only and not intended for diagnostic use beyond notification. The device does not alter the original medical image and is not intended to be used as a diagnostic device.

The results of BriefCase are intended to be used in conjunction with other patient information and based on their professional judgment, to assist with triage/prioritization of medical images. Notified clinicians are responsible for viewing full images per the standard of care.

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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510(k) Summary
Aidoc Medical, Ltd.'s BriefCase
K213886

Submitter:

Aidoc Medical, Ltd.
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Phone: +972-73-7946870

Contact Person: N. Epstein, Ph.D.

Date Prepared: April 1, 2022

Name of Device: BriefCase

Classification Name: Radiological computer-assisted triage and notification software device

Regulatory Class: Class II

Product Code: QAS (21 C.F.R. 892.2080)

Predicate Device: BriefCase (K203508, for iPE triage)

Device Description

BriefCase is a radiological computer-assisted triage and notification software device. The software system is based on an algorithm programmed component and consists of a standard off-the-shelf operating system, the Microsoft Windows server 2012 64bit, and additional applications, which include PostgreSQL, DICOM module and the BriefCase Image Processing Application. The device consists of the following three modules: (1) Aidoc Hospital Server (AHS); (2) Aidoc Cloud Server (ACS); and (3) Aidoc Worklist Application that is installed on the user's desktop and provides the interface in which notifications from the BriefCase software are received and the worklist is presented.

DICOM images are received, saved, filtered and de-identified before processing. Filtration matches metadata fields with keywords. Series are processed chronologically by running the algorithms on each series to detect suspected cases. The software then flags suspect cases by sending notifications to the Worklist desktop application, thereby prompting triage and prioritization by the user. As the BriefCase software platform harbors several triage algorithms, the user may opt to filter out notifications by pathology, e.g., a chest radiologist may choose to filter out notifications on LVO cases, and a neuro-radiologist would opt to divert PE notifications. Where several medical centers are linked to a shared PACS, a user may read cases for a certain center but not for another, and thus may opt to filter out notification by center. Activating the filter does not impact the order in which notifications are presented in the Aidoc worklist application.

The Worklist Application displays the pop-up text notifications of new studies with suspected findings when they come in. Notifications are in the form of a small pop-up containing patient name, accession number and the relevant pathology (e.g., iPE). A list of all incoming cases with suspected findings is also displayed. Hovering over a notification or a case in the worklist pops up a compressed, small black and white, unmarked image that is captioned "not for diagnostic use"

and is displayed as a preview function. This compressed preview is meant for informational purposes only, does not contain any marking of the findings, and is not intended for primary diagnosis beyond notification.

Presenting the users with notification facilitates earlier triage by prompting them to assess the relevant original images in the PACS. Thus, the suspect case receives attention earlier than would have been the case in the standard of care practice alone.

Intended Use / Indications for Use

BriefCase is a radiological computer aided triage and notification software indicated for use in the analysis of contrast-enhanced chest CTs (not dedicated CTPA protocol) in adults or transitional adolescents age 18 and older. The device is intended to assist hospital networks and appropriately trained medical specialists in workflow triage by flagging and communication of suspect cases of incidental Pulmonary Embolism (iPE) pathologies. The device is intended to be used on single-energy exams only.

BriefCase uses an artificial intelligence algorithm to analyze images and flag suspect cases on a standalone desktop application in parallel to the ongoing standard of care image interpretation. The user is presented with notifications for suspect cases. Notifications include compressed preview images that are meant for informational purposes only and not intended for diagnostic use beyond notification. The device does not alter the original medical image and is not intended to be used as a diagnostic device.

The results of BriefCase are intended to be used in conjunction with other patient information and based on their professional judgment, to assist with triage/prioritization of medical images. Notified clinicians are responsible for viewing full images per the standard of care.

Comparison of Technological Characteristics

The subject BriefCase for iPE triage and the predicate device BriefCase for iPE triage (K203508) are identical in all aspects. The subject device is intended for use with additional CT scanners. Specifically, the predicate device was cleared for use with GE and Siemens CT scanners. In this submission, additional performance data were generated for using the BriefCase iPE device with Philips and Toshiba CT scanners.

Both devices are radiological computer-aided triage and notification software programs. Both devices are artificial intelligence algorithms incorporated software packages for use with DICOM 3.0 compliant CT scanners, PACS, and radiology workstations. Both devices are intended to aid in triage and prioritization of radiological contrast-enhanced chest images containing suspected incidental Pulmonary Embolism (iPE) findings. Both devices are intended to provide the users with notifications and unannotated preview images of suspect studies for the purpose of preemptive triage.

Both software devices notify the users of the availability of time sensitive radiological images for review based on computer aided image analysis. Both devices send notifications and low-quality compressed previews to the user's desktop. Both devices feature a notifications filter in the user interface. Notifications are for informational purpose only and are meant to prompt the user to triage the flagged case, upon which he may decide after observing the unannotated, low quality preview on his desktop app, to turn to the local PACS to perform evaluation of the original series earlier than would have been the case without BriefCase.

Thus, the subject and predicate BriefCase raise the same types of safety and effectiveness questions, namely, accurate detection of findings within the processed study. It is important to note that, like the predicate, the subject device does not remove cases from the standard of care reading queue and does not modify them. Both devices operate in parallel with the standard of care, which remains the default option for all cases.

A table comparing the key features of the subject and predicate devices is provided below.

Table 1. Key feature comparison

	Predicate Device **Aidoc Briefcase iPE triage (K203508)**	**Subject Device** **Aidoc Briefcase iPE triage (K213886)**
Intended Use / Indications for Use	BriefCase is a radiological computer aided triage and notification software indicated for use in the analysis of contrast-enhanced chest CTs (but not dedicated CTPA protocol). The device is intended to assist hospital networks and appropriately trained medical specialists in workflow triage by flagging and communication of suspected positive cases of incidental Pulmonary Embolism (iPE) pathologies. For the iPE pathology, the software is only intended to be used on single-energy exams. The device is intended to work with GE and Siemens scanners only. BriefCase uses an artificial intelligence algorithm to analyze images and flag suspect cases on a standalone desktop application in parallel to the ongoing standard of care image interpretation. The user is presented with notifications for suspect cases. Notifications include compressed preview images that are meant for informational purposes only and not intended for diagnostic use beyond notification. The device does not alter the original medical image and is not intended to be used as a diagnostic device. The results of BriefCase are intended to be used in conjunction with other patient information and based on their professional judgment, to assist with triage/prioritization of medical images. Notified clinicians are responsible for viewing full images per the standard of care.	BriefCase is a radiological computer aided triage and notification software indicated for use in the analysis of contrast-enhanced chest CTs (not dedicated CTPA protocol) in adults or transitional adolescents age 18 and older. The device is intended to assist hospital networks and appropriately trained medical specialists in workflow triage by flagging and communication of suspect cases of incidental Pulmonary Embolism (iPE) pathologies. The device is intended to be used on single-energy exams only. BriefCase uses an artificial intelligence algorithm to analyze images and flag suspect cases on a standalone desktop application in parallel to the ongoing standard of care image interpretation. The user is presented with notifications for suspect cases. Notifications include compressed preview images that are meant for informational purposes only and not intended for diagnostic use beyond notification. The device does not alter the original medical image and is not intended to be used as a diagnostic device The results of BriefCase are intended to be used in conjunction with other patient information and based on professional judgment, to assist with triage/prioritization of medical images. Notified clinicians are responsible for viewing full images per the standard of care.
User population	Appropriately trained medical specialists	Appropriately trained medical specialists
Anatomical region of interest	Chest	Chest

Inclusion/ Exclusion criteria	Inclusion criteria - Contrast-enhanced chest CTs (not dedicated CTPA protocol. - Single energy exams. - Scans performed with a 64 slice or greater number of detectors. - Scans performed on adults/transitional adults ≥ 18 years of age. - Slice thickness; 0.5 - 2.0 mm axial. Exclusion Criteria All studies that are technically inadequate, including studies with motion artifacts, severe metal artifacts, or inadequate field of view.	Inclusion Criteria - Contrast-enhanced chest CTs (not dedicated CTPA protocol. - Single energy exams. - Scans performed with a 64 slice or greater number of detectors. - Scans performed on adults/ transitional adolescents ≥ 18 years of age. - Slice thickness; 0.5 - 2.0 mm axial. Exclusion Criteria All studies that are technically inadequate, including studies with motion artifacts, severe metal artifacts, or inadequate field of view.
Data acquisition protocol	Contrast-enhanced chest CTs (not dedicated CTPA protocol)	Contrast-enhanced chest CTs (not dedicated CTPA protocol)
View DICOM data	DICOM Information about the patient, study and current image	DICOM Information about the patient, study and current image
Segmentation of region of interest	No; device does not mark, annotate, or direct users' attention to a specific location in the original image	No; device does not mark, annotate, or direct users' attention to a specific location in the original image
Algorithm	Artificial intelligence algorithm with database of images	Artificial intelligence algorithm with database of images
Notification/ Prioritization	Yes	Yes
Preview images	Presentation of a low-quality, compressed, grayscale preview image that is captioned "Not for diagnostic use".	Presentation of a low-quality, compressed, grayscale preview image that is captioned "Not for diagnostic use".
Alteration of original image	No	No
Removal of cases from worklist queue	No. The device operates in parallel with the standard of care, which remains the default option for all cases.	No. The device operates in parallel with the standard of care, which remains the default option for all cases.
Structure	- AHS module/Orchestrator (image acquisition). - ACS module (image processing). - Aidoc Worklist application for workflow integration (worklist and non-diagnostic basic Image Viewer).	- AHS module/Orchestrator (image acquisition). - ACS module (image processing). - Aidoc Worklist application for workflow integration (worklist and non-diagnostic Image Viewer).

Performance Data

Pivotal Study Summary

Aidoc conducted a retrospective, blinded, multicenter study with the BriefCase software with the primary endpoint to evaluate the software's performance in identifying Contrast-enhanced chest CTs (not dedicated CTPA protocol, acquired through Philips and Toshiba scanners), containing Incidental Pulmonary Embolism in 159 cases from 3 clinical study sites (2 in the US, 1 OUS). There were 78 positive cases and 81 negative cases (images with iPE versus without iPE) included in the analysis.

Primary Endpoints

Sensitivity and specificity exceeded the 80% performance goal. Specifically, sensitivity was 89.7 % (95% CI: 80.8%, 95.5%) and specificity was 90.1% (95% CI: 81.5%, 95.6%). The primary

endpoints were met.

Secondary Endpoints

Time saving data were presented in the original iPE 510(k) Summary (K201020) and remain applicable to this device. In summary, the contribution of the BriefCase software is in reducing the time span until an exam is opened to several minutes for cases with suspect findings (4.7 min BriefCase time to notification compared to 223.3 min time-to-exam-open in the standard of care).

Positive/Negative Predictive Values, and Positive/Negative Likelihood Ratios are given below.

Table 2. PPV/NPV with Associated Two-sided 95% Confidence Limits (population prevalence of positive = 2.6%[1], Confidence limits computed using the "exact" Clopper-Pearson method

Parameter	Estimate	95% Lower CL	95% Upper CL
Negative Predictive Value	99.7%	99.4%	99.8%
Positive Predictive Value	19.5%	11.1%	32.0%

Table 3. PLR/NLR Ratios with Two-Sided 95% Confidence Limits (Efficacy Population)

Parameter	Estimate	95% Lower CL	95% Upper CL
Negative Likelihood Ratio	0.11	0.06	0.22
Positive Likelihood Ratio	9.09	4.69	17.62

Covariate Analysis for Poolability

None of the potential covariates demonstrated statistical significance. In other words, device performance does not meaningfully interact with location (center), gender or age.

Conclusions

The subject BriefCase for iPE triage and the predicate BriefCase for iPE triage are both intended to aid in prioritization and triage of radiological images for the indications of incidental Pulmonary Embolism. The predicate was cleared for GE and Siemens CT scanners; the subject device is also intended for use with Philips and Toshiba CT scanners. Both devices are software packages with identical technological characteristics and principles of operation, both incorporating the same deep learning AI algorithms that process images, and software to send notifications and unannotated compressed preview images to the user's desktop. In both devices, the labeling states that the devices are not for diagnostic use and instructs the user to further evaluate and diagnose based only on the original images in the local PACS.

Both devices operate in parallel to the standard of care workflow in the sense that they do not change the original image, do not provide any marking on the output preview, and neither remove nor deprioritize images from the standard of care FIFO queue, thus not disturbing standard interpretation of the images by the users. Both devices notify the user of time-sensitive critical cases within the range of several minutes, and thus contribute similarly to the standard of care workflow turnaround time reduction through preemptive triage.

The subject BriefCase device for iPE triage is thus substantially equivalent to the predicate BriefCase device for iPE triage.

[1] Dentali F, Ageno W, Becattini C, et al. Prevalence and clinical history of incidental, asymptomatic pulmonary embolism: a meta-analysis. Thromb Res 2010; 125:518–522