May 30, 2019

Food and Drug Administration
Attention: Dockets Management Staff (HFA-305)
5630 Fisher's Lane, Rm. 1061
Rockville, MD 20852

On behalf of the more than 30 members of the Electronic Health Record Association (EHRA), we thank you for the opportunity to share feedback regarding the discussion paper, *Proposed Regulatory Framework for Modifications to Artificial Intelligence/Machine Learning (AI/ML)-Based Software as a Medical Device (SaMD)*, published by the Food and Drug Administration (FDA) in April 2019.

EHR Association members serve the vast majority of hospitals and ambulatory care organizations that use electronic health records (EHRs) and other health information and technology (IT) to deliver high quality, efficient care to their patients. EHRA operates on the premise that the rapid, widespread adoption of health IT has and will continue to improve patient care quality, as well as the productivity and sustainability of the healthcare system.

We appreciate FDA's recognition of the unique challenges presented in the regulation of AI/ML software that qualifies as a medical device (AI/ML SaMD), and its request for feedback on the agency's proposed regulatory framework. We ask that FDA consider the following principles as it identifies a path for regulating AI/ML SaMD.

1. AI/ML Technologies and Clinical Decision Support (CDS)

Many AI/ML technologies are not SaMD subject to regulation as a medical device by FDA, and the EHR Association appreciates FDA's recognition of this fact.

A common use of AI/ML technology in healthcare is algorithms used as clinical decision support. So long as the requirements of Section 520(o)(1)(E) of the Federal Food, Drug & Cosmetic Act (as amended by the 21st Century Cures Act) are met, a CDS function does not qualify as a medical device regulated under the Act. While FDA briefly acknowledges the Cures Act SaMD exception for CDS, the discussion paper is insufficient in its explanation given this common use of AI/ML technologies.

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May 30, 2019

With AI/ML algorithms used for clinical decision support poised to become even more prevalent, FDA should more clearly demarcate the exclusion of CDS as it develops its AI/ML technology regulatory framework.

2. Locked vs. Unlocked Models

FDA acknowledges AI/ML SaMD exists on a spectrum "from locked to continuously learning," but FDA's proposed framework is too strongly focused toward the rarer case of continuous learning algorithms. In doing so, FDA is grouping together algorithms that change their behavior and are implemented with fully automated processes with algorithms that are locked after being localized in preparation for deployment to specific sites.

For a particular algorithm to be safe and effective, it may be optimal to locally train the AI/ML SaMD. Localization can therefore result in the same input source types and features, but different training data sets for SaMD, used in two different healthcare organizations, resulting in different outputs between those two organizations. For example, if an AI/ML SaMD addresses risks related to diabetes, variation may be observed in the relative prevalence of outcomes across different regions in the United States. Under FDA's framework, locally trained AI/ML SaMD with differing outputs are grouped with continuously learning AI/ML SaMD, even though a locally trained AI/ML algorithm is locked prior to clinical use.

Given FDA's recognition that these technologies exist on a spectrum, it is important for the agency to recognize that certain AI/ML SaMD may be more appropriately grouped with locked algorithms even where an output may vary across institutions using the technology. AI/ML SaMD may essentially still be "locked" even if it is most effective when initially trained on local data before deployment at a specific location. Initial localization can be accounted for in FDA's pre-market review without the full spectrum of processes FDA proposes in the discussion paper.

While certain aspects of FDA's proposed framework are still appropriate, such as explanations of local training processes and verification of the local training data set, other components such as ongoing real-world performance data reporting are inappropriate and unduly burdensome in these scenarios. This is especially true where local training would require clinical review and validation before the technology is deployed. Given that AI/ML SaMD exists on a spectrum from locked to continuously learning, FDA's framework should not force all unlocked AI/ML SaMD into a structure meant for AI/ML technologies with the highest levels of risk.

3. Incorporation of Software Precertification Program

Throughout the discussion paper, FDA references and incorporates its Software Precertification Program. FDA has previously stated that the Precertification Program is envisioned as a voluntary pathway to market for SaMD developers. Yet the proposed framework is vague as to whether participation in the Precertification Program is a prerequisite under the proposed framework. We strongly encourage FDA to continue its approach of voluntary participation in the Precertification Program and not divert SaMD developers whose products include AI/ML SaMD into that program. It

would be inappropriate for FDA to require participation in a voluntary program as a prerequisite for developing AI/ML SaMD.

EHR Association members include companies that may develop AI/ML-based SaMD as a small component of a much larger product suite. If FDA intends to require participation in the Precertification Program, or to impose substantially similar requirements, such as demonstrating a culture of quality and organizational excellence, FDA should permit companies to seek approval for particular business units defined by the company. Companies should be permitted to retain full discretion to determine the scope of their covered business units, so long as a unit has internally-defined and understood boundaries.

In addition, FDA should recognize ISO certifications and CE marking of devices under the European Medical Device Directives as reasonable substitutes to participation in the Precertification Program or similar requirements. ISO certifications and the attainment of a CE mark under Europe's new safety and performance requirements both involve third party review that adequately addresses FDA's concerns while reducing duplicative effort for those companies.

4. Healthcare Organization Modifications

EHR Association members frequently provide technical frameworks with which healthcare organizations can customize and create algorithms based on their own research and clinical judgment to best serve their patient populations. While an expected scenario in which healthcare organizations develop AI/ML technologies is CDS excluded from regulation as SaMD, as discussed above, it is nonetheless important for FDA not to inhibit innovation and customization that takes place at the healthcare organization level. It is similarly important for FDA not to inhibit software developers from supporting their healthcare organization customers in the use and deployment of AI/ML technologies.
FDA's proposed regulatory framework accounts for changes an algorithm developer anticipates, and these modifications would reasonably be part of the SaMD's intended use. However, the framework inappropriately expects a developer to anticipate, control, and monitor all modifications a healthcare organization may pursue, including the universe of foreseeable misuse, which is an overly burdensome expectation that a SaMD developer cannot reasonably pre-validate. Directing AI/ML technology developers to limit the scope of changes undertaken by a healthcare organization inappropriately limits healthcare organization innovation.

FDA's framework does account for some of these potential changes, such as its recognition of "type ii" modifications (i.e. modifications related to inputs with no change to intended use). In allowing these types of modifications, FDA should allow for broad categories of input changes. Similarly, the burdens imposed under the Algorithm Change Protocol (ACP) should permit variation and validation by healthcare organizations so that as healthcare organizations implement type ii modifications the varied results across healthcare organizations are permitted and acceptable.

May 30, 2019

5. *Real World Performance Monitoring and Transparency*

Under FDA's proposed framework, real world performance monitoring is focused on the accuracy of the model. Narrowly focusing on accuracy can present particular challenges.

First, over time the algorithm may continue to operate appropriately given the data inputs, but the quality of those data inputs may lead to a decline in accuracy. Overly focusing performance monitoring on accuracy may suggest that an AI/ML SaMD algorithm is not safe or effective when in fact data quality, even with no changes to inputs, is at fault. Especially in light of a push to incorporate a wide array of data over which the SaMD developer may have minimal or no control. Instead, FDA should encourage controls that assure AI/ML SaMD developers detect problems with the data inputs to their AI/ML technologies. Also, FDA should consider whether incorporating data quality thresholds into ACPs; identifying when data inputs are risky or substandard can provide a better structure for assessing ongoing safety and effectiveness.

Second, focusing solely on accuracy can be skewed when the AI/ML algorithm can directly impact the "outcome" it is meant to predict. Where clinical intervention regularly occurs because of health risks identified by an algorithm, the adverse event identified may grow more infrequent. If the AI/ML algorithm prompts clinical intervention, the accuracy of a model, as measured by the frequency with which the risk identified actually results in the adverse outcome, will be altered which can be, generally, the goal of putting the algorithm into use in the first place. Accordingly, FDA should allow flexibility in assessing accuracy so that, where appropriate, determinations of accuracy take into account how clinicians respond to the identified risk, including the interventions taken by clinicians.

The EHR Association appreciates and supports the flexibility FDA proposes regarding what constitutes transparency as it relates to real-world performance monitoring. The most appropriate audiences and means of communication are likely to vary based on the AI/ML SaMD. Accordingly, FDA should avoid being overly prescriptive in this regard. FDA's provision of transparency key performance indicator examples, from the Precertification Program pilot or from its Case for Quality Initiatives, may be beneficial in guiding SaMD developers to meet transparency expectations. Ultimately, SaMD developers must retain flexibility to tailor any data collection mechanisms to the nature of the AI/ML software, the context in which it is used, and data privacy concerns.

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Thank you again for this opportunity to comment. The EHR Association and its member companies strongly believe in the power of health IT to support safe and high quality healthcare. We are committed to identifying and capitalizing on opportunities to ensure that innovative software has an efficient pathway to reach providers and patients.

Sincerely,

Cherie Holmes-Henry	Sasha TerMaat
Chair, EHR Association	Vice Chair, EHR Association
NextGen Healthcare	Epic

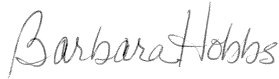## HIMSS EHR Association Executive Committee

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About the EHR Association

Established in 2004, the Electronic Health Record (EHR) Association is comprised of more than 30 companies that supply the vast majority of EHRs to physicians' practices and hospitals across the United States. The EHR Association operates on the premise that the rapid, widespread adoption of EHRs will help improve the quality of patient care as well as the productivity and sustainability of the healthcare system as a key enabler of healthcare transformation. The EHR Association and its members are committed to supporting safe healthcare delivery, fostering continued innovation, and operating with high integrity in the market for our users and their patients and families.

The EHR Association is a partner of HIMSS. For more information, visit www.ehra.org.

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