Japanese Regulatory Considerations for Digital Health Technology

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Pharmaceuticals and Medical Device Agency (PMDA)

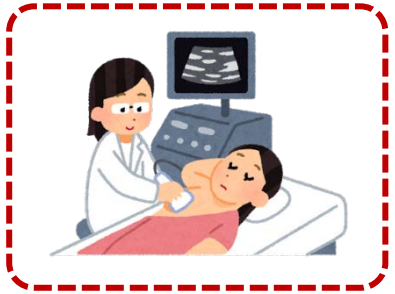
Tokyo, JAPAN

Transition of Regulations for SaMD

before November 2014

program which determines performance of medical device

install



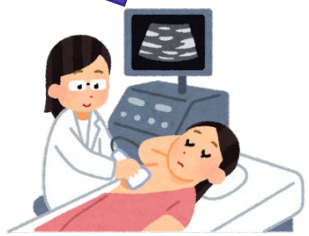
Medical device
（tangible object including software）

after November 2014

program which determines performance of medical device

Medical device（software itself）

install



DX(Digital Transformation) Action Strategies in Healthcare for SaMD: DASH for SaMD

- While there were high expectations for the utilization of SaMD (Software as a Medical Device), there were issues regarding the direction of efficient development of SaMD because it is still a new field for all stakeholders in Japan.

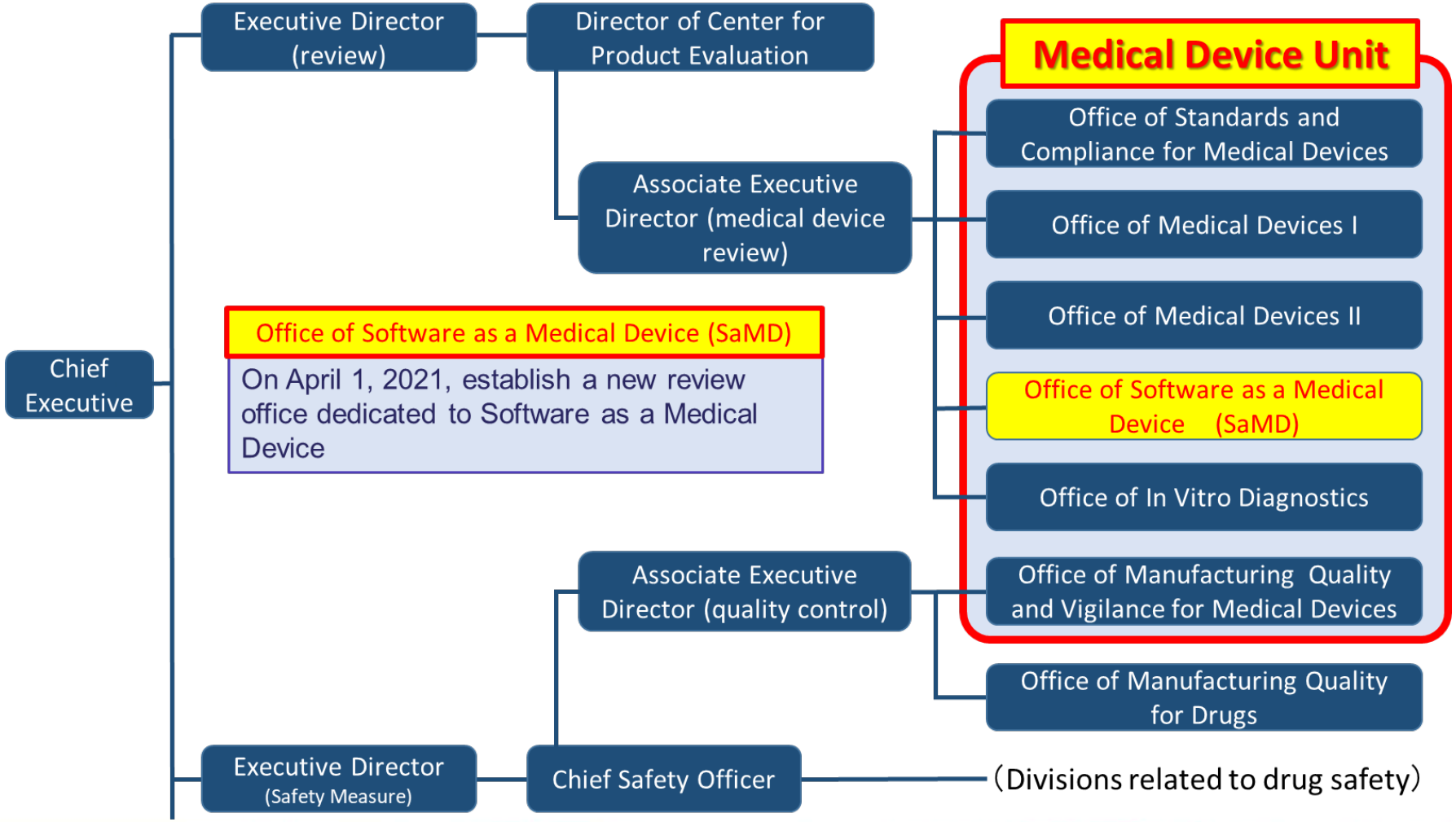
- To tackle the issues, on November 24, 2020, MHLW launched **“DASH for SaMD”** (Package Strategy for Accelerating the Commercialization of SaMD) , and the institutional infrastructure was established mainly to efficiently obtain pharmaceutical approval under the PMD Act.

DASH for SaMD

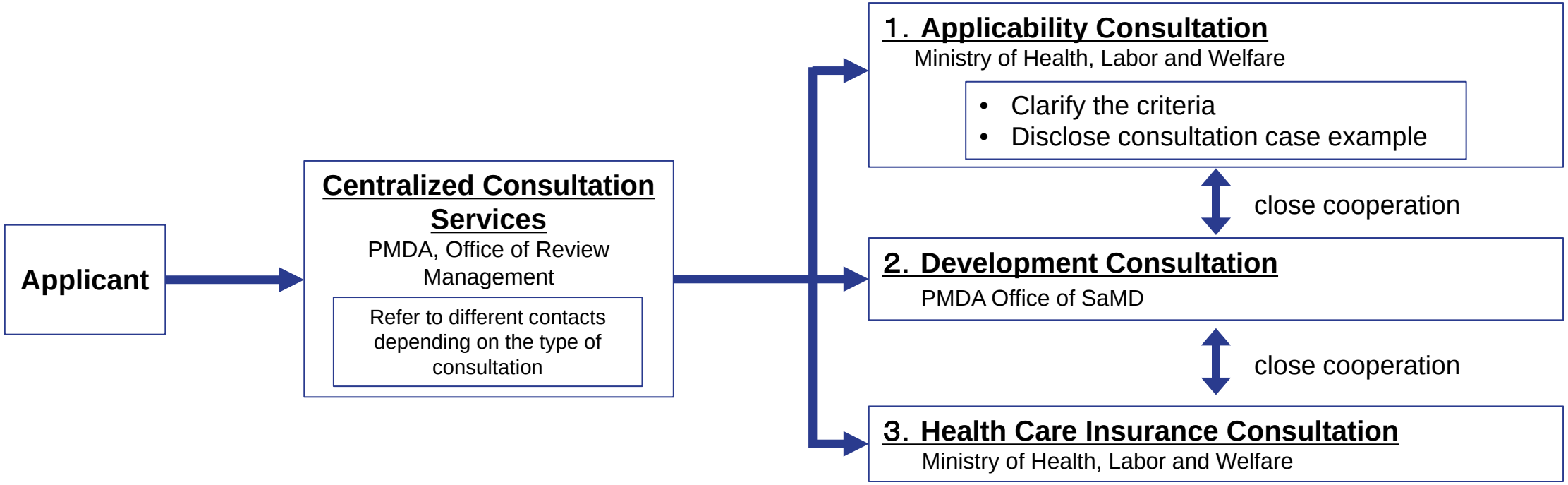
DASH for SaMD（2020/11/24）

- Setup an office to review SaMD in MHLW and PMDA
- Establishment of SaMD centralized consultation service
- Next-generation medical device evaluation index, development guidance, audit points, and certification criteria formulation
- Trial implementation of priority review, etc. for innovative SaMD
- Promote the use of IDATEN (Improvement Design within Approval for Timely Evaluation and Notice) and streamline procedures, etc.

Introduction of Medical Device Unit in PMDA



Centralized Consultation Services



The number of consultation ※It is possible to apply several consultations per one application

※2021/4～2023/3

Year	Total	1． Applicability	2． Development	3． Health Care Insurance
FY 2021	238	175	110	43
FY 2022	216	166	79	36

Guidance for Next Generation Evaluation

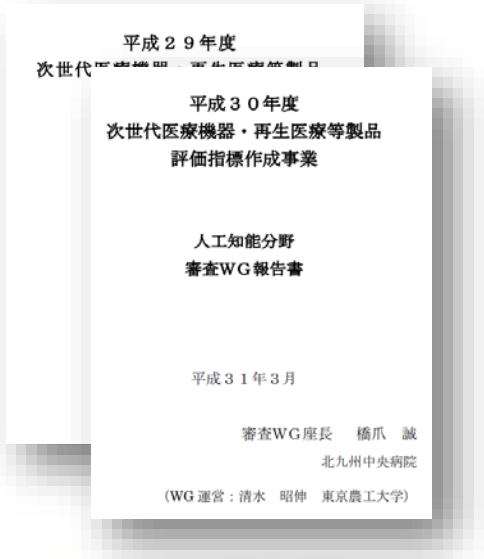
○ This project is designed to accelerate the review process by identifying key review pathways and confirmation points for the transition from nonclinical to clinical.
○ The guidance for evaluating CAD using Artificial Intelligence / machine learning was notified in 2019.
○ Meanwhile, guidance for evaluating SaMD for behavior change in 2022.

2017～2018

< AL/ML- enabled CAD>

https://dmd.nihs.go.jp/jisedai/Imaging_AI_for_public/H29_AI_report_v2.pdf

https://dmd.nihs.go.jp/jisedai/Imaging_AI_for_public/H30_AI_report.pdf



2020～2021

< SaMD for behavior change>

https://dmd.nihs.go.jp/jisedai/koudouhenyou/R2_koudouhenyou_report.pdf

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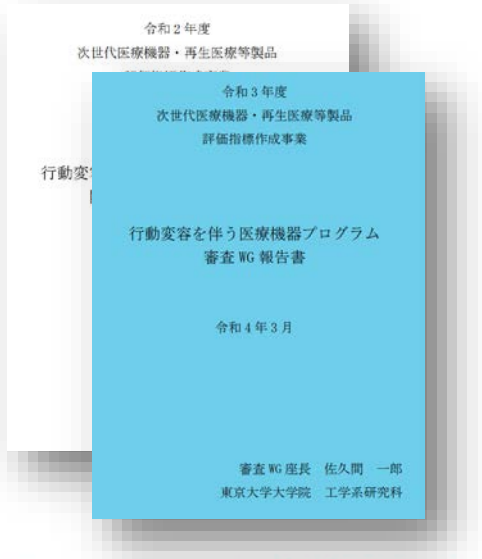


Review Points / Certification Criteria for SaMD

○ In this project, PMDA summarize and disclose the key review points (e.g., test conditions and evaluation points for efficacy and safety) in order to improve predictability for manufacturer.
○ Five review points and two certification criteria have been disclosed since 2022.
○ These review points and certification criteria were presented as an educational webinar for all manufacturers, notified bodies, etc.

< Certification Criteria >

Class	Disclosure date	Medical Device Nomenclature
III	2023 /3/7	Software for radiation planning
II	2023/3/7	Supporting software for respiratory treatment

< Review Points >

Class	Disclosure date	Medical Device Nomenclature
III	2022/9/30	Software for peritoneal dialysis treatment
II	2022/11/2	Supporting software for dental implant treatment
III	2023/3/3	Software for ophthalmic surgery treatment planning
II	2023/3/10	Computer-Aided Detection for endoscopy
II	2023/3/10	Computer-Aided Detection for medical imaging

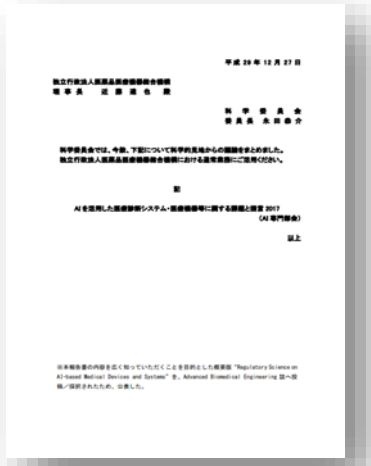
The Science Board

○ The purposes of the Science Board are, advancing regulatory science and evaluate products with advanced science and technology in appropriate manner by enhancing cooperation and communication with academia and medical institutions
○ The outcome document, entitled "Regulatory Science on AI-based Medical Devices and System", was published for the first time in 2017.
○ In 2023, the outcome document, summarizing "test data reuse", "AI/ML bias" and "database", etc. has been published.

2017

< Regulatory Science on AI-based Medical Devices and System>

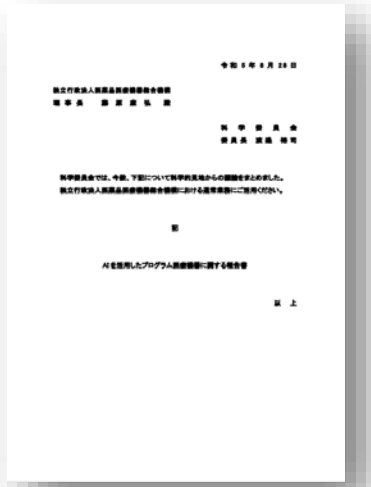
https://www.pmda.go.jp/files/000224080.pdf



2023

< Regulatory Science on SaMD enabled machine learning >

https://www.pmda.go.jp/files/000263891.pdf



Application for Digital Therapeutic

Medical Device Nomenclature	Smoking cessation treatment support system
Intended Use	Assistance in smoking cessation treatment of patients with nicotine dependence
Notes	This application was submitted for marketing approval of a smoking cessation treatment support system, consisting of a digital therapeutic and an exhaled CO meter to support the smoking cessation treatment for patients with nicotine dependence, to be used as an adjunct to the standard smoking cessation treatment program.

Medical Device Nomenclature	Supporting software for hypertension treatment
Intended Use	Adjunctive treatment of essential hypertension in adults
Notes	The application was submitted for marketing approval of a supporting software for hypertension treatment used to support the treatment of hypertension by helping to modify lifestyle in the treatment of hypertension in patients with essential hypertension.

Medical Device Nomenclature	Software for insomnia disorders
Intended Use	To provide support for cognitive behavioral therapy that is administered by physicians in the treatment of insomnia disorders.
Medical Device Nomenclature Definition	Software, which to designed to provide support for cognitive behavioral therapy that is administered by physicians in the treatment of insomnia disorders. This term may involve the recording media where the software are stored.

The Example of Approval AI/ML-enabled SaMD

Approval data	Medical Device Nomenclature (JMDN)
2018.12.6	Supporting software for differential diagnosis with endoscopic imaging
2019.9.17	Software for MRI system workstation
2019.12.25	Software for general-purpose imaging system workstation
2020.4.27	Supporting software for differential diagnosis with endoscopic imaging
2020.5.8	Software for general-purpose imaging system workstation
2020.6.3	Software for diagnostic X-ray imaging system workstation
2020.6.19	Software for general-purpose imaging system workstation
2020.6.29	Supporting software for detecting lesion with endoscopic imaging
2020.6.29	Software for diagnostic X-ray imaging system workstation
2020.7.15	Supporting software for differential diagnosis with endoscopic imaging
2020.8.20	Software for diagnostic X-ray imaging system workstation
2020.9.2	Supporting software for differential diagnosis with endoscopic imaging
2020.11.24	Software for ultrasound imaging system workstation
2020.11.30	Supporting software for detecting lesion with endoscopic imaging
2021.5.26	Software for general-purpose imaging system workstation

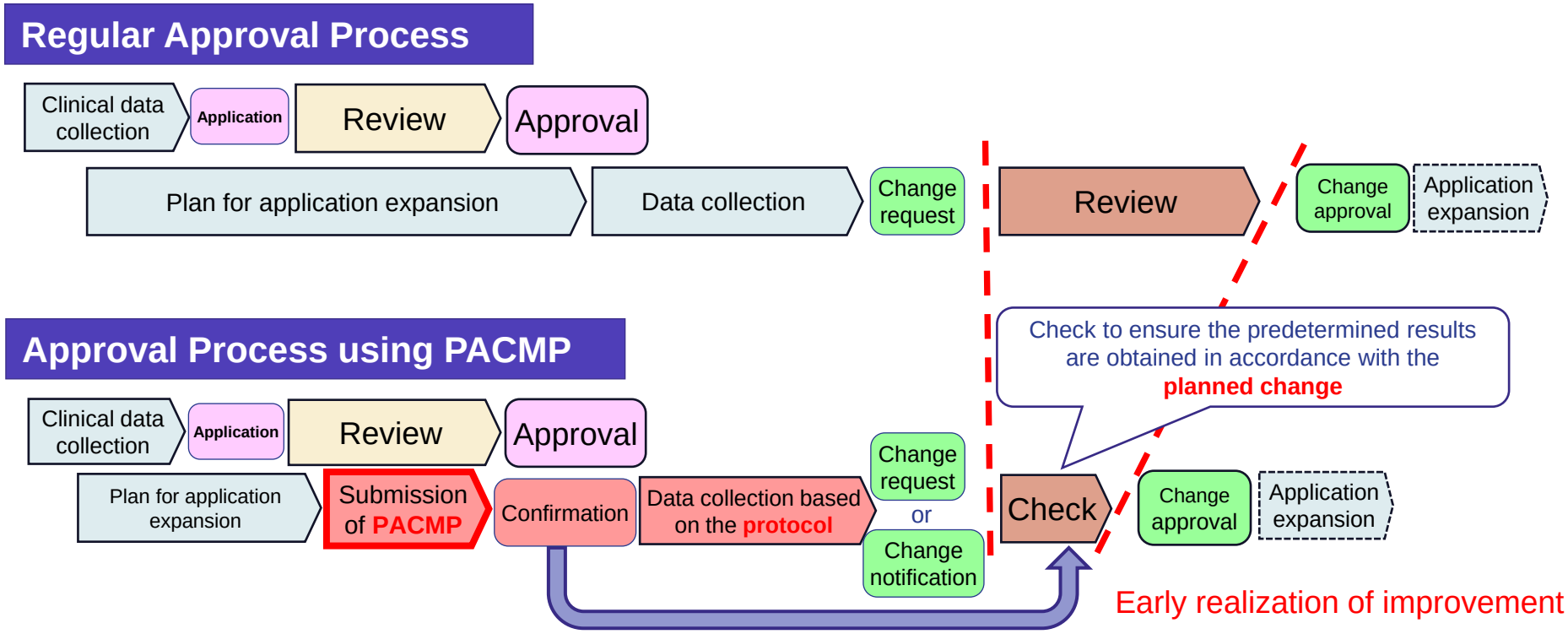
Approval data	Medical Device Nomenclature (JMDN)
2021.5.26	Software for general-purpose imaging system workstation
2021.7.7	Software for general-purpose imaging system workstation
2021.9.1	Software for general-purpose imaging system workstation
2021.10.11	Software for diagnostic X-ray imaging system workstation
2021.12.9	Software for general-purpose imaging system workstation
2021.12.24	Software for diagnostic X-ray imaging system workstation
2022.6.2	Software for diagnostic X-ray imaging system workstation
2022.9.20	Supporting software for detecting lesion with endoscopic imaging
2022.11.14	Supporting software for detecting lesion with endoscopic imaging
2022.12.16	Software for diagnostic X-ray imaging system workstation
2023.1.17	Supporting software for differential diagnosis with endoscopic imaging

The example of approval AI/ML-enabled SaMD

- Type of Machine Learning：
  Support Vector Machine, Deep Neural Network, Convolutional Neural Network,
- Target Disease：
  Lung nodules, Brain tumor, Breast tumor, Colorectal cancer, Covid-19
- Modality：
  X-ray, CT, MRI, Ultrasound, Endoscopy, etc.

IDATEN (Improvement Design within Approval for Timely Evaluation and Notice)

Post-Approval Change Management Protocol (PACMP) is introduced for medical devices to enable continuous improvements through product lifecycle.



DX(Digital Transformation) Action Strategies in Healthcare for SaMD: DASH for SaMD 2

- However, in order to further promote the practical application of SaMD in the future, we need to do more, such as the following.
  - ✓ **Clarify various paths to commercialization (two-step approval scheme for SaMD, SaMD for the general public)** in cooperation between the regulatory and insurance authorities to ensure predictability from approval to insurance coverage.
  - ✓ **Accelerate research and development of Japan-originated SaMD and promote their expansion into international markets.**
- Based on the above, MHLW have just compiled a new strategy, namely **"DASH for SaMD 2"** on September 6, 2023, **with some goals for the next five years.**

DASH for SaMD 2

DASH for SaMD 2 （2023/9/6）

- Organize and publicize the two-step approval scheme for SaMD
- Develop guidelines for approval review and marketing procedures for SaMD for the general public
- Promotion of overseas acceptance of MHLW's review results (such as English translation of review reports)
- Subsidies for development funds for SaMD developers
- Support for SaMD developers to actively business overseas

DASH for SaMD（2020/11/24）

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<Expand and continue>

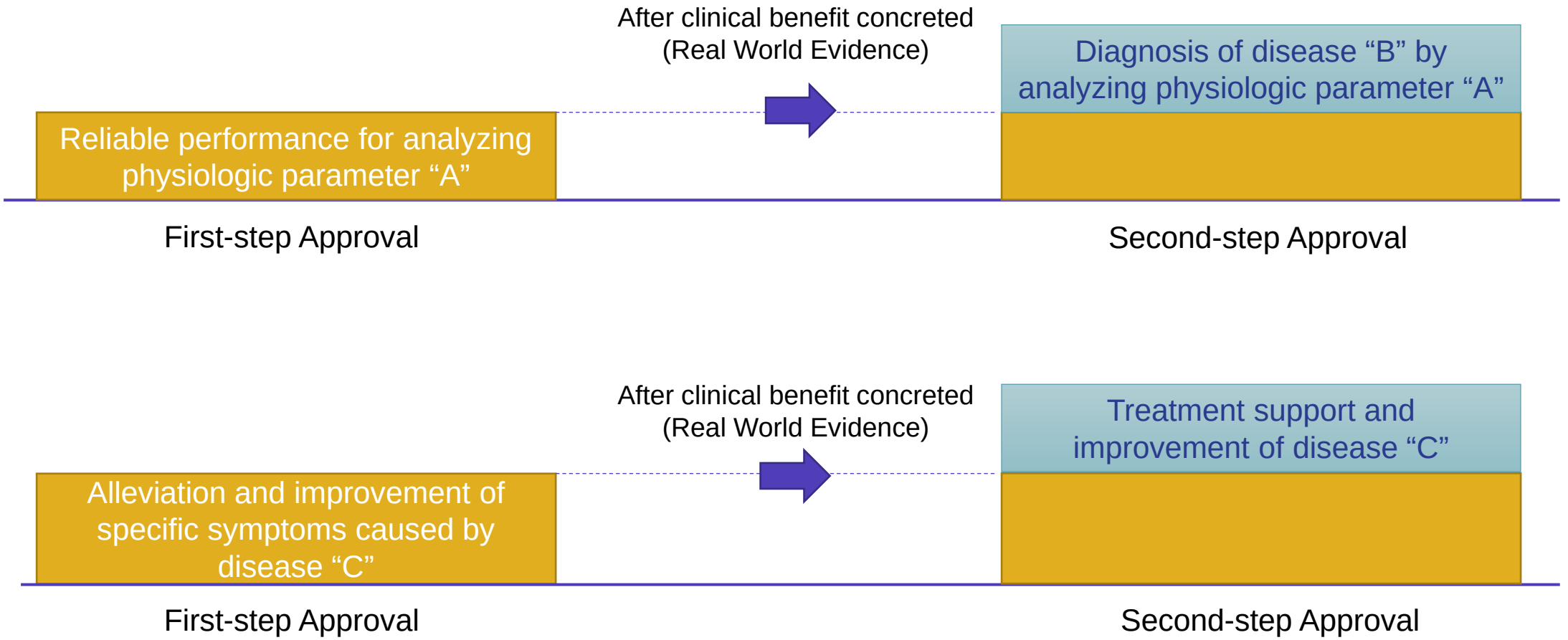
- Upgrade from office to Department for reviewing SaMD in PMDA
- Establishment of SaMD-specific consultation service
- (Continue)
- (Continue)
- (Continue)

DASH for SaMD 2

Goals for the next 5 years

- Achieve early market introduction and establish clinical significance
- Expansion of more enhanced self-care options
- Promotion of better health for the public
- Exporting more and market acquisition of innovative SaMD developed in Japan
- Shorten the development cycle time of SaMD by contributing to a smooth and efficient market introduction
- Realization of efficient commercialization of SaMD
- Creation and early commercialization of innovative SaMD
- Smooth and efficient post-marketing performance improvement of SaMD

Two-step Approval Scheme for SaMD (draft)



Thank you for your kind attention