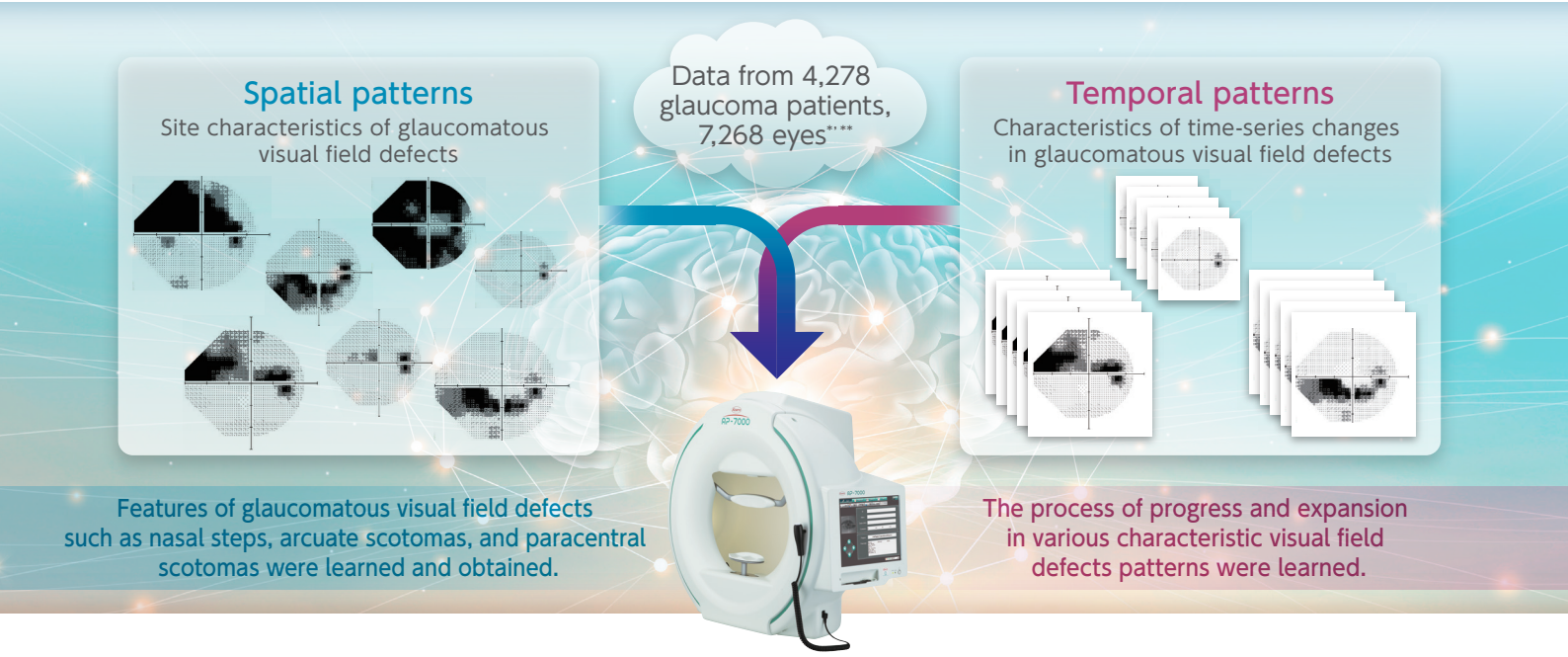
Automatic Perimeter KOWA AP-7000™

Technology for Life Science

Short-time measurement algorithm using visual field prediction backed by variational Bayes linear regression method.

smart Strategy is born!

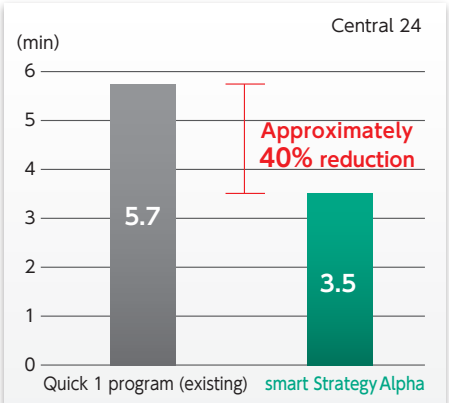
The KOWA AP-7000 Automatic Perimeter is now equipped with **smart Strategy**, an original threshold test algorithm. We made it possible to achieve a highly accurate visual field test with a significantly reduced test time by adopting a visual field prediction model obtained by machine learning. The prediction model references the enormous number of spatial patterns and temporal patterns of glaucomatous visual field defects. The reduction in test time reduces patient fatigue.



* Murata H, Zangwill LM, Fujino Y, et al. Validating variational Bayes linear regression method with multi-central datasets. Invest Ophthalmol Vis Sci. 2018;59:1897–1904. https://doi.org/10.1167/iovs.17-22907

** Murata H, Araie M, Asaoka R. A new approach to measure visual field progression in glaucoma patients using variational Bayes linear regression. Invest Ophthalmol Vis Sci. 2014;55:8386–8392. https://doi.org/10.1167/iovs.14-14625

Average inspection time



About smart Strategy

smart Strategy is a short-time measurement algorithm combined with a visual field prediction model based on variational Bayes linear regression. The prediction model learns spatial and time series patterns of glaucomatous visual field defects using an enormous amount of glaucomatous visual field data.
During the test, the visual field is continually updated according to the reactions of the patient. By updating the visual field prediction model and updating the intensity of stimuli and determining the sensitivity of each point during the test, the number of stimuli is reduced to shorten the test time.
Thanks to a substantial increase in accuracy of visual field prediction, test time is reduced without losing reliability.
Further reduction of test time can be expected by using Kowa's existing short time algorithm (Quick 1) in combination with the highly accurate visual field prediction function offered by **smart Strategy Alpha**.

Internal material: AP-7000 joint research with The University of Tokyo material No.1
† Simulation based on data from 547 glaucoma patients, 911 eyes

Automatic Perimeter KOWA AP-7000™

Visual field prediction model update and threshold determination by variational Bayes linear regression method

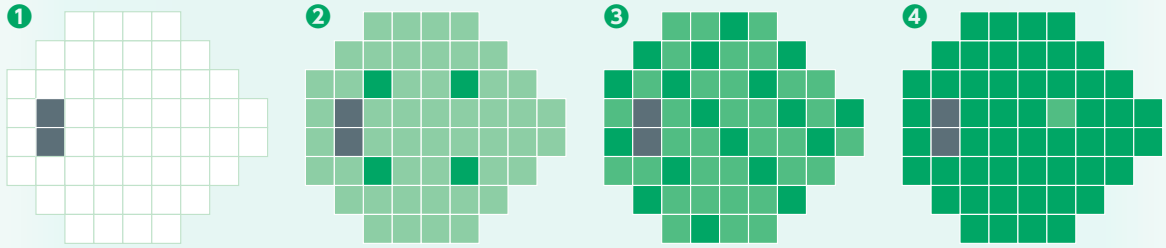
The test proceeds according to the following flow :

❶ Prior to the test, there is no visual field information except for the patient's age.

❷ The threshold values of the primary points (first 4 points) are tested, and the other test points in the visual field prediction model are updated from the results.

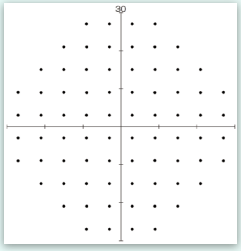
❸❹ As the threshold value of each test point is determined, the other test points in the visual field prediction model are updated. The intensity of stimuli is updated, and the threshold is determined.

As the sensitivity of a test point is determined, → Other test points in the visual field prediction model are updated.

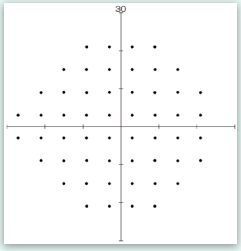


Supported programs

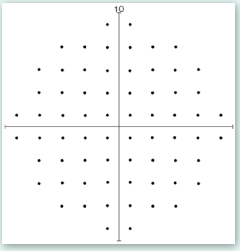
smart Strategy supports all threshold test programs, Central 30 (30-2), Central 24 (24-2), and Central 10 (10-2)



Central 30
(equivalent to HFA 30-2)
: 76 points



Central 24
(equivalent to HFA 24-2)
: 54 points



Central 10
(equivalent to HFA 10-2)
: 68 points

CE

Images in the LCD monitor are compositions.
Specifications and appearances are subject to change without notice.

Distribution name : KOWA AP-7000

Kowa Company, Ltd.

REF FT11_2198CO