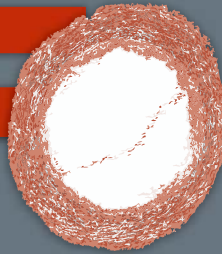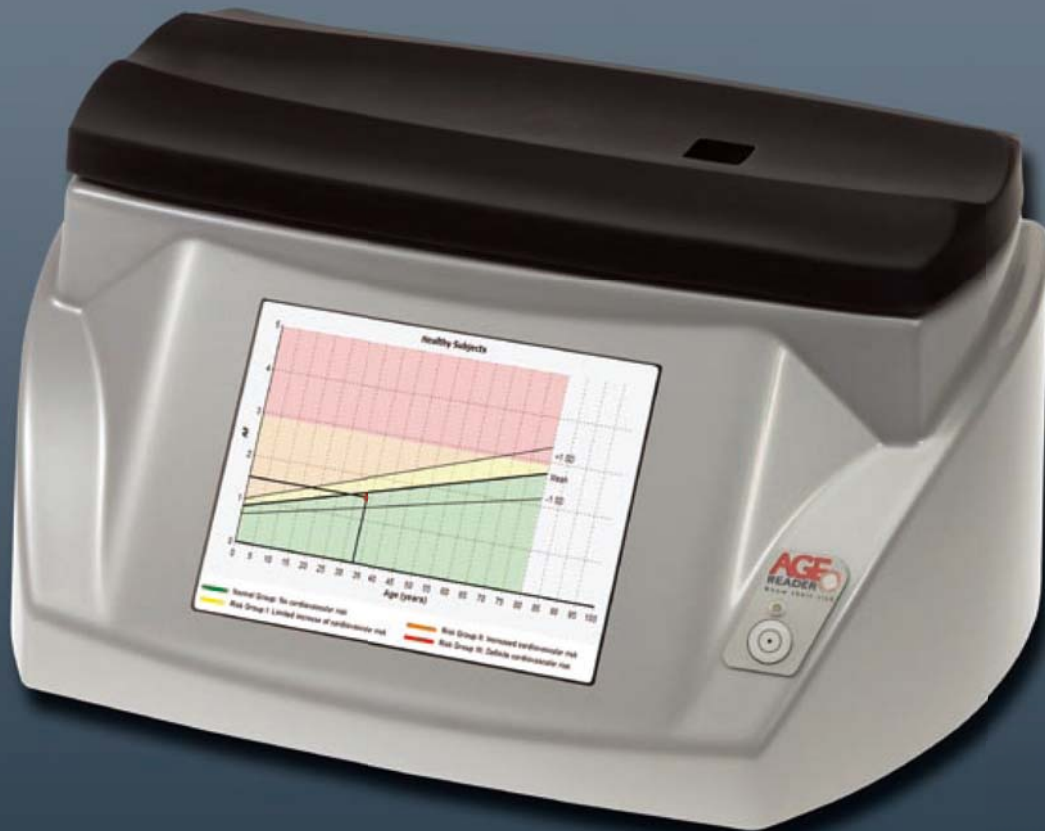# AGE READER

Know their risk.

Non-invasive assessment of cardiovascular risk

Convenient, easy and validated

AGE Reader

The AGE Reader provides an immediate risk prediction for major chronic diseases, such as diabetes, cardiovascular disease and renal failure. The AGE Reader yields a real time and non-invasive assessment of cardiovascular risk. The method is convenient, easy to use and validated.

The AGE Reader measures tissue accumulation of Advanced Glycation Endproducts (AGEs) by means of fluorescence techniques (skin autofluorescence (skin AF)). AGEs play a key role in the pathogenesis of many age-related diseases, such as diabetes, cardio-vascular disease and renal failure.

In less than a minute
Non-invasive, real time, convenient, easy to use, proven

Predict the risk of:
Complications of diabetes, cardiovascular disease, renal failure, neurological disorders and more...

AGE Reader SU

Know their risk

AGE Reader SU

The AGE Reader SU is the classic model. The measurement device is connected to a pc or laptop and is controlled by the AGE Reader software. It allows users to process and analyze the data immediately on the external computer. A printout of the measurement report can be made. It is particularly suitable for users who wish to do immediate analysis on their measurement results.
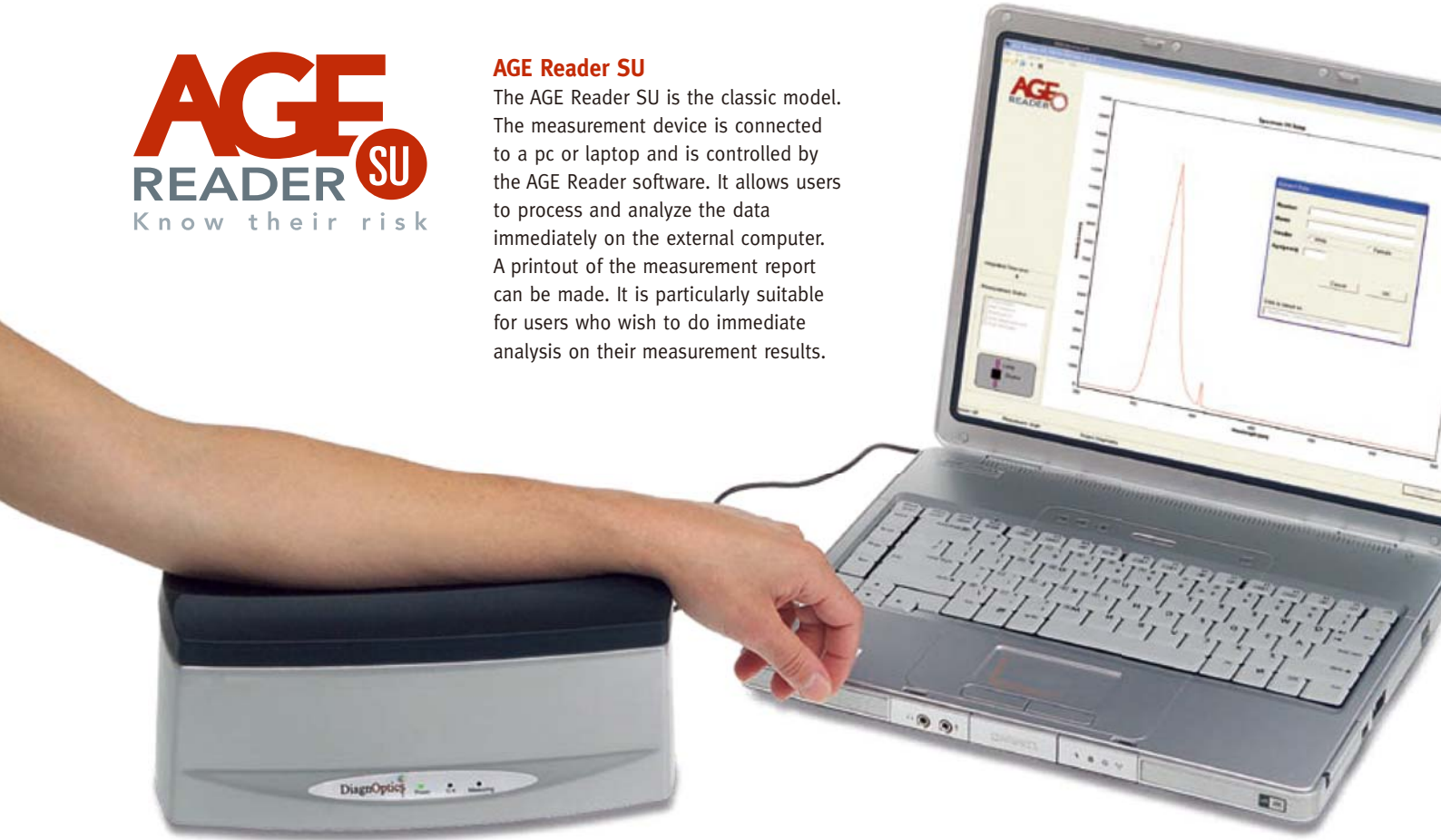
Validated
Supported by over 10 years of clinical data

Easy and non-invasive
• **Results within a minute**
• **Safe and convenient**
• **Minimum training requirements for operator**

Results
within a minute

AGE Reader CU

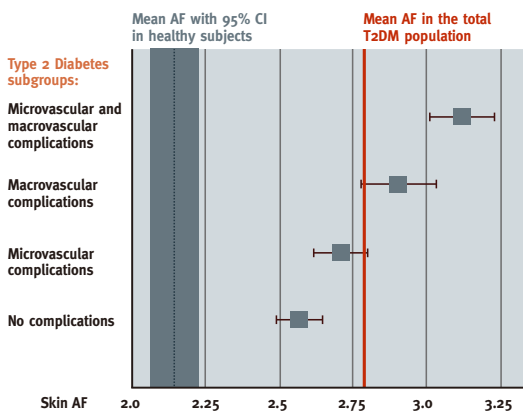## Know their risk

AGE Reader CU

The AGE Reader CU is the latest model in the AGE Reader series. This compact device features a built-in mini computer and battery and is operated through a touch screen panel. The AGE Reader CU is mobile and requires no setup. After the measurement, a direct printout of the report can be made by using a pre-selected printer. Optional pc software to perform further analysis on the data is available (AGE Reader CU Dataview).
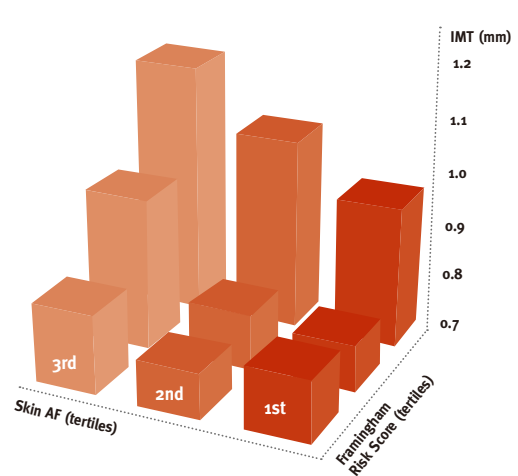
A cardiovascular risk assessment tool

Type 2 Diabetes population (n=987)

Mean AF with 95% CI in healthy subjects — Mean AF in the total T2DM population

Type 2 Diabetes subgroups:
- Microvascular and macrovascular complications
- Macrovascular complications
- Microvascular complications
- No complications

Skin AF: 2.0 2.25 2.5 2.75 3.0 3.25

Persons with moderate cardiovascular risk

IMT (mm): 1.2 1.1 1.0 0.9 0.8 0.7

Skin AF (tertiles): 3rd 2nd 1st — Framingham Risk Score (tertiles)

AGE Reader in diabetes

- Best single risk predictor of cardiovascular risk in combination with UKPDS risk score, except age[1].
- Independent predictor of microvascular complications in type 2 diabetes[2].
- Reflects vascular damage in the diabetes outpatient clinic and identifies diabetic patients who are at risk of developing complications[3].
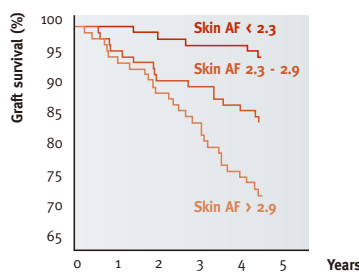
AGE Reader in comparison with conventional risk engines (SCORE, Framingham, UKPDS and IMT)

- A viable and economical assessment tool that adds value to conventional risk engines[1].
- Related to early (IMT) and clinical artherosclerosis (cardiovascular morbidity and mortality) independent of conventional risk factors and engines (SCORE, Framingham and UKPDS)[1,4].
- AGEs reflect pathogenetic pathways not covered by conventional risk factors[5].

AGE Reader in renal disease

- An independent predictor of cardiovascular disease associated mortality in hemodialysis patients[6].
- Strong and independent predictor of mortality and chronic graft loss in renal transplant recipients[7].
- AGEs correlated to arterial elasticity and diastolic function in both hemodialysis and peritoneal dialysis patients[8,9].
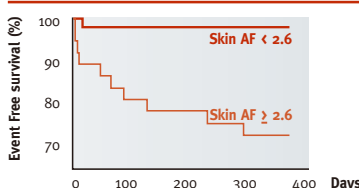

Renal transplantation patients

Graft survival (%): 100 95 90 85 80 75 70 65

Skin AF < 2.3
Skin AF 2.3 - 2.9
Skin AF > 2.9

Years: 0 1 2 3 4 5

AGE Reader in cardiovascular disease

- An independent marker for acute myocardial infarction[10].
- A non-invasive marker for inflammatory stress in stable coronary artery disease[11].
- AGEs predict future cardiovascular morbidity and mortality in STEMI patients[11,12].
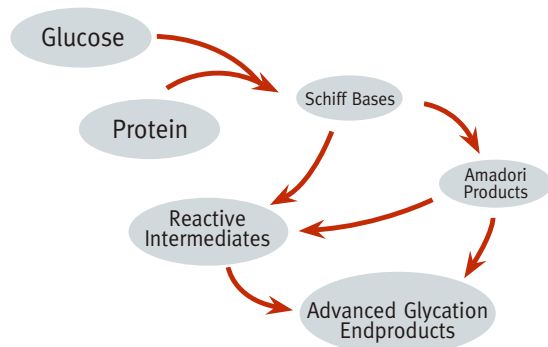

Myocardial infarction patients

Event Free survival (%): 100 90 80 70

Skin AF < 2.6
Skin AF ≥ 2.6

Days: 0 100 200 300 400

*For references, see backside of this brochure.

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Kuo Yang Sci. Corp. 國揚

AGEs - Advanced Glycation Endproducts
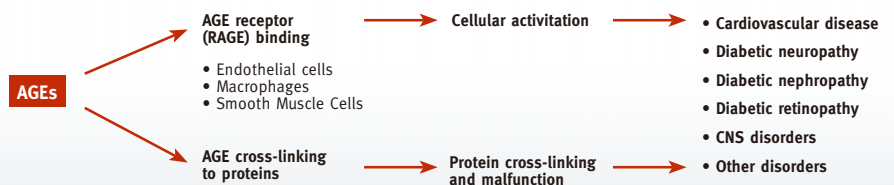
AGE Reader validation

The AGE Reader has been validated against skin biopsy (the gold standard) in clinical settings[13] and its clinical value was proven in several large scale clinical studies involving thousands of patients with diabetes, cardiovascular disease and renal failure[3,6,14,15].

Glucose → Schiff Bases
Protein → Schiff Bases
Schiff Bases → Amadori Products
Amadori Products → Reactive Intermediates
Reactive Intermediates → Advanced Glycation Endproducts

About AGEs - Advanced Glycation Endproducts

AGEs play a pivotal role in the development of chronic age-related diseases such as diabetes, renal failure and cardiovascular disease. The level of AGEs in long-lived tissues (not in blood!) serves as a memory of glycometabolic and oxidative stress and is a valuable predictor of cardiovascular complications. AGEs quite normally accumulate over a person's lifetime, but this process occurs more rapidly in patients with conditions such as diabetes mellitus, renal failure and cardiovascular disease[16].

Accumulation of AGEs is an important factor in the development of chronic complications of these conditions. Tissue AGEs correlate closely with early kidney, eye and nerve disease in patients with diabetes mellitus and they are valuable predictors of future cardiovascular morbidity and mortality[1]. New drugs, aimed at preventing formation of AGEs or breaking AGEs, are currently in (late) clinical development.

AGEs

AGE receptor (RAGE) binding
- Endothelial cells
- Macrophages
- Smooth Muscle Cells

→ **Cellular activitation** →
- Cardiovascular disease
- Diabetic neuropathy
- Diabetic nephropathy
- Diabetic retinopathy
- CNS disorders
- Other disorders

AGE cross-linking to proteins → **Protein cross-linking and malfunction** →

AGE Reader applications

Patient management
- Assessment of cardiovascular risk
- Identifying patients at high risk
- End point for measuring treatment response
- Improving targeted cost effective treatment plan

Clinical studies
- Studies on diabetes
- Studies on renal failure and cardiovascular disease
- Studies on other AGE related conditions

Scientific research
- Nutritional research
- Aging research
- Skin care research

Treatment selection and monitoring
- Identify good drug responders
- Pharmaceutical evaluation
- Intensive care patient monitoring
- Dialysis patient and renal transplant monitoring

New Drug development
- Inhibition of AGE formation
- AGE breakers and blockers
- New drug evaluation

Public screening
- Identify undiagnosed diabetic patients
- Identify individuals with high cardiovascular risk
- Professional health assessment

References

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[16] Meerwaldt R et al. Cardiovascular Diabetology. 2008; 7: 29.

For an up-to-date list of publications regarding the AGE Reader and AGEs, please visit our website.

AGE
READER
K n o w   t h e i r   r i s k .

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