Biological Clocks: What Do They Actually Tell Us?

BIOLOGICAL CLOCK	WHAT IT MEASURES AND HOW IT SCORES	WHAT THE SCORE MEANS	COMMERCIAL EXAMPLES
First-generation epigenetic: Horvath Clock	DNA methylation patterns associated with chronological age; score expressed in years.	A 55-year-old scoring 48 has methylation patterns more typical of age 48.	myDNAge (Horvath-derived)
Risk-oriented epigenetic: DNAm PhenoAge / GrimAge / GrimAge2	Methylation linked to clinical aging phenotypes (PhenoAge) or mortality-related smoking and protein proxies (GrimAge); GrimAge2 adds CRP and HbA1c proxies. Scores in years.	A biological-age score higher than chronological age suggests a DNA-methylation profile associated with elevated mortality risk compared with others of the same chronological age.	Clock Foundation (research testing)
Pace-of-aging: DunedinPACE	DNA methylation linked to multi-system physiological decline; reports a relative rate, not an age in years.	A score of 1.1 estimates aging about 10% faster than its reference rate.	TruDiagnostic
Multiomic-informed epigenetic: OMICmAge	DNA methylation proxies that integrate proteomic, metabolomic and clinical signals; a model trained on mortality-related health information.	An age-like score associated with disease and mortality risk; protein and metabolite signals are inferred from DNA methylation.	TruDiagnostic
Clinical / composite: Phenotypic Age; PCAge / LinAge	Routine blood biomarkers and age; some composite models add blood pressure, BMI, smoking status and medical history.	For Phenotypic Age, a 55-year-old scoring 62 has a biomarker profile corresponding to the modeled mortality risk of a typical 62-year-old in the reference population. PCAge and LinAge generate related estimates using different inputs and calibrations.	AgelessRx (Phenotypic Age) InsideTracker (related model)
Organ-specific proteomic: Organ Aging Clocks	Blood proteins associated with specific organs; model estimates organ-related age in years.	A 55-year-old assigned a 'brain age' of 65 has a blood-protein profile the model associates with older age; higher scores are linked to neurological risk.	Vero OrganAge (investigational / research access)
Metabolomic: Metabolomic aging risk score	Patterns of blood metabolites (including lipids and amino acids); mortality-trained risk score rather than age in years.	A higher score indicates a metabolic profile associated with greater short-term mortality risk in the study population.	Nightingale Health (related model)
Immune / inflammatory: GlycanAge / iAge	IgG glycosylation patterns (GlycanAge) or circulating inflammatory proteins (iAge).	GlycanAge estimates biological age from IgG glycosylation patterns, while iAge estimates inflammatory age from circulating proteins. Higher scores suggest older glycomic or inflammatory profiles relative to the respective reference population.	GlycanAge Edifice Health (iAge)

Commercial examples may use the named clock or a related proprietary model; some offerings are research-only. Availability does not establish independent clinical validation, demonstrated health benefits, or broad consumer adoption.